IN THE MATTER OF	The Resource Management Act 1991
AND	
IN THE MATTER OF	Applications by Canterbury Landscape Supplies Limited for a discharge permit to discharge contaminants into air from a composting operation and a discharge permit for the discharge of contaminants onto land in circumstances where contaminants may enter water, as the result of composting and stockpiling compost on land.
BETWEEN	**CANTERBURY LANDSCAPE SUPPLIES LIMITED** **Applicant**
AND	**CANTERBURY REGIONAL COUNCIL** **Consent Authority**

REPORT AND DECISION OF HEARINGS COMMISSIONERS

Sharon McGarry and John Iseli

26 June 2018

Heard on the 6-9 March 2018 in 'The Atrium', 455 Hagley Avenue, Christchurch.

Representations and Appearances

Applicant:

Mr G. Cleary, Solicitor (Anthony Harper)
Mr P. Wylie, Director (Canterbury Landscape Supplies Limited)
Ms H. Mongillo, Principal Environmental Engineer and Hydrogeologist (Sephira Environmental)
Ms P. Harwood, Senior Associate – Environmental Engineering (Beca Limited)
Ms M. Dyer, Environmental Engineer (Beca Limited)
Mr B. Loe, Resource Management Consultant (Loe Pearce Associates Limited)

Submitters:

Mr A. Nikoloff
Eyre District Environment Association – Mr N. Fraser
Mr K. Dodds
Oxford and Ohoka Community Board – Mr D. Nicoll, Mr J. Lynn and Ms S. Powell
Mr R. and Mrs C. Briggs
Mr D. Power
Mandeville Residents Association – Mr T. McBrearty and Mrs. R. Rouse
Ms A. Hazeldine
Oderings Nurseries – Mr M. Odering
Mr G. and Mrs R. Rouse
Mr J. Madeley
Ms J. Madeley
Mr M. and Mrs J. Randle
Wai Eyre Farm Limited - Mr D. Brown
Silver Fern Farms – Mr D. Jemmett
Mr G. and Mrs J. Greenwood

Tabled Statement
Mr A. Millar

Section 42A Reporting Officer:

Ms T. Wadworth, Consents Planner (Canterbury Regional Council)

- **Mr Z. Etheridge,** Senior Hydrologist (Canterbury Regional Council)
- **Ms C. Nieuwenhuijsen**, Senior Air Quality Consultant (Golder Associates)
- **Mr N. Dougherty,** Senior Resource Management Officer Incident Response Zone Delivery (Canterbury Regional Council)

It is the decision of the Canterbury Regional Council, pursuant to sections 104, 104B, 105 and 107, and subject to Part 2 of the Resource Management Act 1991, to REFUSE the application by Canterbury Landscape Supplies Limited for the following resource consents:

(i) Discharge Permit CRC175344 – To discharge contaminants into air; and

(ii) Discharge Permit CRC175345 – To discharge contaminants onto and into land, in circumstances where contaminants may enter water.

BACKGROUND AND PROCEDURAL MATTERS

1. This is the report and decision of independent Hearings Commissioners Ms Sharon McGarry (Chair) and Mr John Iseli. We were appointed by the Canterbury Regional Council (**CRC**) to hear and decide applications by Canterbury Landscape Supplies Limited (**CLS** or 'the Applicant') pursuant to the Resource Management Act 1991 (**RMA** or 'the Act') for resource consents to operate a stockpiling and composting operation located at 97 Diversion Road, Swannanoa, Waimakariri, legally described as Part RS 33406 and Lot 2 DP 25643.

2. The application site is owned by Ms Jacinta Mackle and Ms Katherine Hewson. We were told a formal lease exists between the landowners and the Applicant for part of the property that corresponds with the application site.

3. The Applicant is seeking retrospective resource consents to authorise the discharge of contaminants into air and onto land associated with the existing unauthorised stockpiling and composting operation at Diversion Road. Composting activities have been occurring at the application site since September 2016.

4. The existing composting operation has been the source of a significant number of complaints relating to odour and health effects. The CRC issued the Applicant with an Abatement Notice on 14 August 2017. The Abatement Notice required the Applicant to cease and continue to cease the discharge of odour from the production of compost, stockpiling or storage of compost, or the stockpiling or storage of material for the production of compost, beyond the boundary of the property.

5. The Applicant appealed the Abatement Notice to the Environment Court. A stay was granted and mediation occurred on 31 October 2017. A 'heads of agreement' was signed by representatives of CRC, Waimakariri District Council (**WDC**), the Applicant and the section 274 parties (which includes a number of submitters to this application).

6. In accordance with the mediated agreement, the Applicant was to remove the compost piles in the north-east corner of the site, as an identified source of odour, by 9 December 2017. The section 274 parties agreed to not lodge odour complaints up until this time. CRC agreed to not enforce the Abatement Notice (as amended by the appeal[1]) before 16 December 2017. The Applicant agreed commercial kitchen and grease trap waste, municipal treatment biosolids, wool scouring material, chicken litter, solids from meat processing and waste mushroom compost would not be brought to the site.

7. The Applicant has continued to operate the composting operation since this time. Waste material continues to be delivered to the application site.

8. The Applicant has applied to the Waimakariri District Council for land use consent to operate a waste transfer station.

[1] Environment Court Consent Order (ENV-20170CHC-68) amended the Abatement Notice to add '*cease and continue to cease'* and '*Assessment of whether or not odours associated with the production of compost on the property are offensive or objectionable is to be undertaken in accordance with the "Criteria for assessing offensive or objectionable odour" contained within Schedule 2 to the Proposed Canterbury Air Regional Plan*.'

9. The resource consent applications were lodged on the 5 April 2017. The applications were accepted as complete under section 88(2) of the RMA on 11 April 2017. The applications were placed on hold under section 88E(4) of the RMA while the Applicant was trying to obtain written approvals. The Applicant advised they ceased trying to obtain written approvals on the 15 June 2017.[2] Further information was sought from the Applicant by CRC on 28 June 2017, under section 92 of the RMA. The final response to the request for further information was submitted on 14 September 2017. [3]

10. The application was publicly notified on 27 September 2017. A total of 46 submissions were received, with 41 submissions in opposition and five submissions in support of the application. Thirty submitters indicated they wished to be heard.

11. Prior to the hearing, a report was produced pursuant to section 42A of the Act by CRC's Reporting Officer, Ms Tegan Wadworth. This 's42A Report' included a technical review of the applications by Ms Maureen Whalen, Groundwater Science Team Leader North for CRC, Mr Zeb Etheridge, Senior Hydrologist for CRC, and Ms Cathy Nieuwenhuijsen and Mr Roger Cudmore, Air Quality Consultants for Golder Associates.

12. The s42A Report provided an analysis of the matters requiring consideration and recommended the resource consents sought should be refused on the basis of ongoing odour effects and adverse groundwater effects. In recognising that the Reporting Officer's recommendation is not binding on the decision-makers, the s42A Report included draft consent conditions for our consideration.

13. Prior to the hearing, we received a minute dated 23 February 2018 from the Jakeli Family Trust requesting that the hearing be deferred under section 91 of the Act until the resource consent application to the Waimakariri District Council has been made and is complete. We considered this request and set out our response and reasons for not deferring the hearing in our Minute #1 dated 28 February 2018. We also responded in the minute to concerns raised that the Reporting Officer's s42A Report had not adequately considered the relevant provisions of Chapter 6 of the Regional Policy Statement (**RPS**).

14. The hearing to decide the application commenced at 9 am on Tuesday 6 March 2018 and evidence was heard over four days. The hearing was adjourned at 4.30 pm on Friday 9 March 2018 to enable the Applicant to provide written details of the amendments to the applications made verbally at the hearing, further information requested throughout the hearing, and revised proposed consent conditions.

15. We undertook a site visit in the afternoon on Thursday 8 March 2019. We visited the application site and the surrounding properties and roads. The wind conditions were changeable with light east to north-east breezes. We viewed the headwaters of the Silverstream located on Mr Brown's property, close to their office buildings. We returned to the application site the next morning, Friday 9 March 2018 at 8-9am, in calm wind conditions.

[2] Section 42A Officer's Report dated 6 December 2017 by Tegan Wadworth. Date in report corrected to date at hearing from 2016 to 2017).
[3] Ibid.

16. We confirmed the provision of the further information requested and a timeframe for the circulation of that material by issuing Minute #2, dated 19 March 2018.

17. We received a memorandum from Mr Cleary on behalf of the Applicant on 5 April 2018 requesting an amendment to the direction in Minute #2. The Applicant sought to delete reference to providing details of the source of the raw material taken to the site since September 2018, or, to order protection the information under section 42 to avoid commercial prejudice to the Applicant. The Applicant also advised that the lessor of the land was unwilling to disclose the lease agreement and sought direction regarding the specific lease information sought.

18. We addressed the matters raised in our Minute #3 dated 9 April 2018. We agreed to grant a protection order over the source of the raw material under section 42(2) and requested a redacted version for release to the parties. We also clarified the information sought in relation to 'the source' and the information sought in relation to the lease agreement of the application site.

19. The Applicant provided the further information requested on 6 April 2018 and 16 April 2018. This material and the final set of proposed consent conditions were circulated to submitters for written comment and subsequently to the Reporting Officer for written comment.

20. Following receipt of further comments from the parties, we issued Minute #4 dated 15 May 2018, directing the Applicant to provide a written right of reply (**ROR**) by 23 May 2019. We subsequently received a request from the Applicant on 17 May 2018 seeking an extension to the timeframe for the provision of the ROR until 31 May 2018.

21. A written ROR on behalf of the Applicant was received on 31 May 2018. We formally closed the hearing on 8 June 2018.

THE APPLICATION

22. The application and Assessment of Environmental Effects (**AEE**) was prepared by Mr Barry Loe of Loe Pearce and Associates Limited. The application states the Applicant operates a bulk material processing and storage, wholesale and retail yard at 1250 Main North Road, Kainga, Christchurch. It states the Applicant had decided to move most of its material processing and storage to the application site.

23. The AEE and s42A Report included a description of the existing stockpiling and composting operation. The application states that the bulk handling of materials is not part of the composting process.

24. The application seeks the following resource consents associated with the existing composting operation:

    (i) CRC175344 to discharge contaminants into air; and
    (ii) CRC175345 to discharge contaminants into or onto land, in circumstances where contaminants may enter water.

25. The s42A Report notes the Applicant originally applied for a land use consent to use land for stockpiling decomposing organic matter. However, it was determined that the applicant is not required to obtain a land use consent as the rules in the Canterbury Land and Water Regional Plan (**LWRP**) do not apply to the proposal.

26. The application site is 9.8 hectares (**ha**) of leased land from a property of 278 ha. The application states that the land was, until September 2012, fully planted in production trees, however a wind storm at that time caused widespread damage to trees across the property.

27. The retrospective component of the application relates to the estimated 4,500 – 4,800 cubic metres (**m^3**) of material already processed and stockpiled on the site. It is proposed that the material currently onsite will be subject to ongoing composting processes, screening and mixing.

28. The proposed component of the application seeks ongoing authorisation to bring up to 40,000 m^3 of raw materials to the application site each year, to produce approximately 16,000 tonnes of compost annually. The process involves mixing raw materials, creating windrows, and regularly turning the windrows following the industry guidelines set out in New Zealand standard NZS:4454:2005.

29. It is proposed that material will be processed at a handling rate of 20 tonnes per hour. The following materials are currently used in the composting process:
    a) Sawdust and bark;
    b) Mushroom compost;
    c) Waste pallet and untreated wood shavings;
    d) Gib board off-cuts;
    e) Soil;
    f) Dewatered paunch grass;
    g) Scoured wool fragments;
    h) Mussel shells (pre-crushed); and
    i) Green waste.

30. Potential use of the following materials in future in the composting process is noted in the s42A Report:
    a) Egg shell;
    b) Compostable packaging with some residual food waste;
    c) Grease trap waste;
    d) Bio solids that comply with New Zealand standards mixed into bark fines for use as potting mix; and
    e) Leaf Litter.

31. The s42A Report noted chicken litter would no longer be used on site as part of the composting material.

32. It is proposed that compost will be stockpiled on a total of approximately three hectares of land with approximately seven hectares of land used for bulk material storage. CLS proposes to operate the site from 6.30am to 4.30pm.

33. The Applicant has provided a draft Site Management Plan (**SMP**) setting out operating procedures for site activities, monitoring and site closure on completion of the activities. It is proposed that on completion of the activities, the soil beneath the stockpiles will be sampled and analysed for contamination and if necessary any contaminated material removed and disposed of at a licensed facility.

34. Consent durations of 35 years are sought.

35. In response to a section 92 request for further information the Applicant provided the following information:
    a) '*Preliminary Hydrogeologic and Nitrogen Transport Assessment*' dated August 2017 by Sephira Environmental;
    b) '*Nitrogen Transport Model*' dated August 2017 by Sephira Environmental;
    c) *'Precipitation/Adsorption Assessment'* (undated) by Sephira Environmental;
    d) Laboratory test reports;
    e) Information on wells recommended for use in monitoring;
    f) A planning assessment by Loe Pearce and Associates Limited dated 23 August 2017;
    g) '*Canterbury Landscape Supplies – Assessment of Environmental Effect of Discharge to Air'* dated 17 August 2017 by Beca; and
    h) A letter dated 7 September 2017 from Ms Mongillo assessing expected nitrogen loss rates from composting piles to groundwater.

NOTIFICATION AND SUBMISSIONS

36. The applications were publicly notified in the Press and the Northern Outlook on 27 September 2017. Notice of the applications was sent to parties within 2,200 metres (**m**) of the application site.

37. The written approval of the property owners was provided with the application. A further written approval from Mr Russell Wix, the owner of 955 South Eyre Road was provided at the hearing by Mr Cleary.

38. A total of 46 submissions were received; 41 in opposition and five in support.

39. The s42A Report summarised the submissions by issue and number of submissions raising the following issues – odour, health effects, groundwater quality, drinking water quality, amenity values, dust, cultural effects, flood risk and process/operational/best practice.

40. The s42A Report notes concerns raised in submissions in relation to fire risk, noise, traffic, road wear and tear, pests and property values are matters controlled by the WDC or are not relevant matters for us to consider.

THE HEARING

Applicant's Case

41. **Mr Gerard Cleary,** a Solicitor with Anthony Harper, conducted the Applicant's case presenting a synopsis of submissions on behalf of the Applicant and calling five witnesses. In summary, he made the following key points:
    a) CLS is the leading supplier of compost products in the South Island and has operated composting processes for 20 years at Kainga;
    b) As a result of an Abatement Notice issued in August 2017 and mediation regarding the appeal of the Abatement Notice in November 2017, CLS agreed to remove a number of anaerobic compost piles in the north-east corner of the site;
    c) Measures have been taken to ensure there is not a repeat of the experience, including use of sawdust beds, pumping excess surface water, and elevation of the active[4] composting rows;
    d) An approved Environment Court Consent Order dated 20 November 2017 amended the Abatement Notice to require avoidance of offensive or objectionable odours beyond the boundary of the site, and use of the Canterbury Air Regional Plan as the assessment criteria;
    e) CLS have had full compliance with the Abatement Notice since mid-December 2017, demonstrating the process can be managed to avoid offensive or objectionable odours;
    f) Potential discharges of leachate can be avoided and monitored;
    g) The Applicant is providing further information to WDC including, an updated fire management plan and rodent/pest management plan;
    h) Case law indicates applications for retrospective consent should not be treated in a punitive manner;
    i) Positive effects and the benefits of composting in reducing waste streams must be considered;
    j) There is a high level of consistency between the compost operation and the higher order documents including the New Zealand Waste Management Strategy and the objectives and policies of Chapter 19 of the RPS;
    k) An impermeable pad is now proposed to avoid further potential drainage issues;
    l) The RMA is not a 'no effects' statute, there is a distinction between 'odour' and 'offensive and objectionable odour' and the volume of complaints is unreliable as an indicator of offensive or objectionable odours;
    m) Complaints can be made by people who are sensitised or have vested interests and are far removed from objective assessments;
    n) Numerous objective assessments using good practice guidance[5] indicate odours beyond the boundary of the site are not offensive or objectionable and that odours experienced are not inconsistent with odours that may be experience in the rural environment;
    o) Day to day management, such as avoiding high risk fugitive odour activities including turning compost rows in unfavourable wind conditions are proposed;

[4] Mr Cleary defined the 'active' phase as the first 12 weeks of composting.

[5] Ministry for the Environment's Good Practice Guide for Assessing and Managing Odour.

p) The relevant experts have reached full agreement on appropriate wording of conditions for testing the absorption capacity of sawdust beds and monitoring potential discharges;
q) The is no retail component to the composting facilities and such facilities are linked to rural land uses and can typically be found in rural areas;
r) The potential adverse effects of the applications will be either avoided or mitigated to the point where they are minor, and the proposal will have significant positive effects; and
s) On the basis of the expert evidence, the applications should be regarded favourably under all of the relevant statutory considerations, including Part 2 of the Act.

42. On the second day of proceedings, Mr Cleary advised that the Applicant was formally amending the application to incorporate an impermeable layer beneath the active compost piles (first 12 weeks). He noted the layer would comprise of an impermeable layer (e.g. plastic), a layer of sawdust and a layer of aggregate. He said all runoff would be collected and there would be no discharge onto land, therefore avoiding the need for groundwater monitoring. He advised there would be more detail provided and the amendment would be followed up in writing.

43. **Mr Phillip Wylie**, a director of CLS provided a written statement of evidence and presented a written summary of evidence at the hearing. His evidence addressed the background to CLS's business, an overview of the operation at the application site, ongoing refinement of the operation, day to day management of the site, requests to enclose the operation, community engagement and the term of consent. He considered the composting process is being carried out in accordance with New Zealand Standard (NZS) 4454:2005 or industry best practice; and that he had not experienced any odour with the composting process since August 2017 when the change to the new system was implemented. He explained that heavy rainfall in July 2017 caused ponding at the base of the piles and anaerobic conditions causing strong ammonia odours. He considered use of a 0.5m layer of sawdust beneath the piles and replacement of that saturated material during frequent turning would prevent any future reoccurrence. He also noted that within six months of approval the first 12 weeks of compost piles would be on a compacted gravel and impermeable layer to prevent leaching to groundwater. He noted implementation of an Odour Management Plan for the site. He emphasised the importance of the application site to the future of the company, in order to expand its current activities to meet growing demand. He said that full enclosure of the composting process would be financially prohibitive and not warranted given the scale of the operation and the separation distance to residential houses.

44. In response to questions, Mr Wylie confirmed that of the raw materials listed in paragraph 16 of Ms Dyer's statement of evidence, only sawdust, bark and wood shavings, dewatered paunch grass, and paper from crushed gib offcuts were currently used in the existing compost operation. He said the application sought authorisation of the other raw materials listed, which includes scoured wool fragments, egg shell, composting packaging with some residual food waste, grease trap waste, biosolids, green waste and leaf litter.

45. In his later statement of evidence (dated 31 May 2018) provided with the Applicant's ROR, Mr Wylie clarified that CSL had not been aware that the dewatered paunch grass from Silver Fern Farms also contained solids from the wastewater system screens. He also clarified

that pig manure is stored at the application site, blended with other materials and screened and sold as a specific product.

46. **Ms Helen Mongillo**, a Principal Environmental Engineer and Hydrogeologist with Sephira Environmental, presented a statement of evidence addressing hydrogeological conditions at the application site and surrounding environment, site management issues and remedial action taken, the hydrogeological conceptual site model applied, and efficacy of the proposed mitigation. Ms Mongillo noted that surface soils at the site are not free draining and that stormwater ponding has occurred frequently in the past. She considered that moving the composting from the low-lying area in the north-east corner, using sawdust to absorb water, and pumping standing water had prevented the bottom of the piles from becoming saturated. She noted upgradient surface flows were diverted around the site and there was no stormwater outlet observed on the site. She outlined the use of analytical models to evaluate the potential for nitrogen loss and the two approaches used. On the basis of this modelling, she concluded that reducing infiltration of the compost pile runoff and seepage by 85% would be needed to maintain acceptable ammonia-nitrogen loading at the Silverstream and for drinking water standards in groundwater taken from downgradient wells to be met. She concluded that the second modelling exercise indicated the reduction needed could be achieved by the absorptive capacity of the sawdust. Ms Mongillo considered the efficacy of the proposed mitigation and concluded any potential for loss of nitrogen impacted water into groundwater would be less than minor.

47. **Ms Pru Harwood**, a Senior Associate - Environmental Engineering with Beca Limited, provided a written statement of evidence and presented a written summary of evidence at the hearing. Her evidence addressed the approach to assessing odour effects and key conclusions, aspects of the receiving environment, potential effects of odours, dust and bioaerosols, the Compost Management Plan, comments on submissions and the s42A Report, proposed conditions, and conclusions and recommendations. Ms Harwood noted that the assessment of air quality effects followed the guidance included in the Ministry for the Environment's '*Good Practice Guide for Assessing and Managing Odour'* (November 2016) and '*Good Practice Guide for Assessing and Managing Dust*' (November 2016). Her key findings included that any dust impacts would be less than minor; and that due to separation distances, pre-dominant wind directions and implementation of an Odour Management Plan any odour effects can avoided, remedied and mitigated. Ms Harwood also addressed the effects of bioaerosols and concluded that the risk of discharges to air from the site causing health effects was 'negligible'. Overall, she considered that the changes implemented at the site since 2017 had reduced the risk of offensive or objectionable odour being generated at the site in the future, and that subject to the conditions proposed the effects should be less than minor.

48. In response to questions, Ms Harwood stated that research showed that a shelter belt of trees is advantageous for mitigating dust. She confirmed her assessment had been undertaken without any consideration of the existing pine trees surrounding the site. In relation to odour complaints, she acknowledged these were hard to substantiate and noted there was therefore no firm evidence either that these did or didn't occur at levels that would be offensive or objectionable. She considered the use of biosolids was acceptable from a health perspective if it has been through a process to sterilise the material and it met the appropriate standards. She noted that grease trap waste had a higher potential

odour risk, but noted that under the proposal it would be limited to less than 1% of raw material. She said that site management was critical to managing odours and that the avoidance of standing water was important.

49. **Ms Michelle Dyer**, an Environmental Engineer with Beca Limited, provided a written statement of evidence and presented a written summary of evidence at the hearing. Her evidence addressed her involvement in preparing the assessment of odour effects, potential odour sources, operational management measures to be adopted, day-to-day management, the odour monitoring regime, an analysis of complaints, comments on the s42A Report, and conclusions and recommendations. She concluded that there may have been odour events in mid-2017 that were offensive or objectionable at neighbouring sensitive receptors, but that the changes to operations on the site including locations of the compost and the planned compacted aggregate pad for the active composting phase would reduce the risk of significant adverse odour effects outside of the boundary of the site in future. She stated that providing the compost is produced using the guidance of NZS4454:2005 and other good practice guidelines, with the raw materials stated, the piles are located above standing water, no other odourous material is stored on site, the piles are turned with adequate frequency, and the proposed conditions are complied with, then it was her opinion that any offensive or objectionable odours outside the site boundary would be less than minor.

50. **Mr Barry Loe**, a Resource Management Consultant with Loe Pearce Associates Limited, provided a written statement of evidence and responded to some of the matters raised throughout the hearing. His evidence addressed preparation of the application, descriptions of the operation and changes to the operation since notification, the national context for the operation, the regional planning framework, the s42A Report and proposed conditions, management plans, and conclusions and recommendations. Mr Loe noted that CLS had a good environmental record at the Kainga site for over 20 years, until August 2016 when anaerobic conditions had developed. He outlined the transfer of material to the application site, without resource consent, and the subsequent lodging of the application. He considered that much of the activity onsite (i.e. handling or storage of bulk material) is a permitted activity, but that the discharges to air, land and water from the composting activity require resource consent as discretionary activities. He set out current operations since the s42A Report and future changes in Table 1 to improve the efficiency of the operation and to reduce adverse effects on the environment. He noted that the surrounding environment was subject to a range of effects such as noise, dust and odour generated from rural activities, including effluent spreading. He said that the SMP and complementary Odour Management Plan had bee updated to include the changes to operations and incorporated into the draft CMP for the site.

51. Mr Loe advised that the Applicant had applied to the WDC for resource consent for earthworks (although he considered it was unclear what district plan rule had been breached), but had been advised consent was required for a solid waste transfer station. He noted the application was currently on hold pending the provision of further information relating to fire prevention and response, and vermin control.

52. Mr Loe highlighted the importance of utilising waste material in achieving waste minimisation and the provisions of the Waste Minimisation Act 2008 and the New Zealand

Waste Strategy (MfE 2010). He noted the resource recovery industry is growing and that diverting waste materials to recover material for agricultural use is important in achieving waste minimisation objectives.

Submitters

53. **Mr Anton Nikoloff** presented a written statement in opposition to the application on behalf of himself and his wife Mrs Christine Nikoloff. He explained he had 40 years of experience in horticulture and farming, and that he was familiar with rural smells. He outlined their difficulty in locating the source of the 'vile' odours up until September 2017 and that they were unaware of CRC's 24 hour pollution hotline, so had not complained. He said that odours were worst after south-west and strong southerly winds. He was particularly concerned about paunch grass and understanding potential contaminants and pathogens that may be discharged. He suggested an investigation into all raw products transported to the site to enable potential contaminants to be assessed. He said he was pleased the Applicant was taking notice of submissions during the hearing, but considered 'tweaking conditions' would not achieve the change that is necessary for the operation because the 'bar needed to be set at a higher level'. He noted that the science around windrow composting was well established and that there will be odour and leachate discharges unless these are adequately controlled. He contended that use of sawdust was not a long-term way of mitigating leachate or stormwater drainage. He considered the Applicant was taking a 'let's monitor and see what happens' approach instead of foreseeing future risks and developing a strategy to mitigate them. He highlighted the potential for drinking water contamination and the need to avoid further nutrient discharges. He emphasised the rural-residential development in the area and estimated there were approximately 170 houses within a 4 kilometre (**km**) radius of the application site. He noted that the failure of the composting process had had a significant and long lasting effect on the surrounding community. He emphasised the need for constant monitoring of the parameters associated with composting and the need to develop infrastructure. Appended to his statement were two papers entitled *'Water Quality Protection – Cornell Composting'* and '*Excessive Pile Size – Cornell Composting'* by Tom Richard, CRC rainfall data and a copy of the South Australia Environmental Protection Authority's Compost Guideline.

54. Mr Nikoloff provided an addendum to his written statement on 9 March 2018 requesting clarification regarding potential heavy metals and other nutrients in compost. He expected any potential contaminants or pathogens in paunch grass would have been investigated and the discharge assessed.

55. **Mr Noel Fraser** made a presentation in opposition to the application on behalf of himself and his family, and on behalf of the **Eyre District Environment Association.** Mr Fraser explained he had chosen to do what he considered to be the difficult, but right thing, and oppose the application. He said it was not operating in accordance with best practice and unlawfully without resource consents. He was concerned the raw material on trucks smelled and that there were trucks delivering loads at night. He acknowledged the strong offensive and objectionable odours had reduced since December 2017, but still occurred intermittently. He was concerned about pathogens in paunch grass and biosolids. He showed photographs of dust blowing from the site over the southern boundary of the site in strong north-west winds taken on 5 November 2017; aerial views of the site; and ponded

water at the site following rain on 22 February 2017. He highlighted the fire risk posed by composting operations and the difficulties at the site given the surrounding trees, lack of water and power pylons nearby. He said there had been 17 fires at the Kainga site over 10 years, with nine over the last two years. He emphasised this demonstrated the need for vigilant temperature monitoring and the fire risk posed if it is not managed appropriately. Following the adjournment, Mr Fraser provided a copy of his power point slides and annotated photographs, a copy of the Fire Service call out records to support his statements, and copies of the following three studies referred to by submitters –

(a) CRC Report No. R15/108 '*Review of Eyre River – Christchurch West Melton Groundwater Allocation Zone Interaction'* May 2015;
(b) '*Rangiora Effluent Irrigation Preliminary Soils and Hydrogeological Investigation'* by Pattle Delamore Partners Limited dated February 2001, prepared for WDC; and
(c) '*Further Evaluation of Eyreton Land Disposal Site*' by Pattle Delamore Partners Limited dated February 2001, prepared for WDC

56. **Mr Karl Dodds** provided a comprehensive written statement of evidence on behalf of himself and his wife Mrs Alison Dodds. Mr Dodds spoke to his written statement and summarised the key points in opposition to the application. He emphasised his increasing unease that the application was being 'dressed up' to appear to meet best practice, when there was no evidence to back these claims up. He noted there had been no odour issue prior to the CLS operation, but that since this time odours had been appalling and had precluded use of their property prior to January 2018. He was concerned the information used for the Beca reports had not been independently verified. He considered the Applicant's air quality experts had failed to recognise the variability of wind conditions and had relied on Christchurch airport wind data. He said that smell intensity was not the only indicator of an issue and urged us to look at the frequency and ongoing nature of the odours over a long period. He noted the evidence of Ms Mongillo confirmed there were risks to groundwater and that these additional risks should be avoided. He noted the increased frequency of 50 year rainfall events and the need to cope with 100 year rainfall events to avoid major inundation at the site. He considered the Applicant had underestimated the number of people living in the area and the large number of people using South Eyre Road every day. He said the area '*was not a rural area, but a major metropolis of people*'. He noted the lack of documentation to show how the operation would be controlled and managed, thus ensuring quality control and assurance. He suggested there was suitable electronic monitoring equipment available, but there is no evidence how this will be done proactively. He considered Ms Harwood's evidence confirms the lack of operational control. He emphasised the need for the operation to be fully compliant with NZS 4454:2005 and that evidence of this must be provided by the Applicant through continuous monitoring. He considered the operation was inappropriate use of rural farmland and that the site is located downstream of a recently consented water storage dam.

57. **Mr Doug Nicoll, Mr John Lynn** and **Ms Shirley Powell** presented a written statement on behalf of the **Oxford and Ohoka Community Board** in opposition to the application. They outlined their role in supporting the community and the role of the Community Board in representing and advocating for the interests of 8,000 residents within the Oxford area. They outlined the community concerns in relation to their rights to drink clean water and breathe fresh air. They did not consider the operation was appropriately located taking into account the surrounding existing land uses and sensitive activities, and highly sensitive

groundwater conditions. They supported the amendment to the application to capture leachate and stormwater, but highlighted the system would need to be able to cope with large volumes of stormwater. While they remained in opposition to the application, In the event the consents are granted, they requested a short duration and tight monitoring conditions.

58. **Mr Ray and Mrs Cheryl Briggs** presented a written statement and spoke to their submission in opposition to the application. They outlined that they are one of the closest houses to the site (approximately 900m from the site boundary). They explained that although they do not have a direct line of sight of the operation, the trees do not mitigate the odours and the smell is putrid. They had also experienced uncontrolled dust clouds from the site and provided photographs showing dust coming from the north-west corner of the site during south-east winds. They raised concerns regarding purported contradictions in Ms Harwood's evidence and the accuracy of Ms Dyer's evidence. They noted most of the offensive odours occurred in the morning in calm wind conditions. Mrs Briggs said the offensive odours from the site had prevented them from opening windows or hanging out washing. She acknowledged the frequency of odours had reduced since December 2017, but still occurred. She noted a significant increase in flies and seagulls. They considered the operation was not being undertaken in line with recognised best practice and questioned how the operation can continue to operate without resource consent. Appended to their written statement were photographs, excerpts from Ms Dyer and Ms Harwood's evidence, a map, and page 6 from the '*Paunch Contents Land Spreading Management Guidelines*' March 2017 by the Australian Environmental Protection Authority.

59. **Mr Daniel Power** presented a written statement and spoke in opposition to the application on behalf of himself and his wife, Mrs Michelle Power. Mr Power outlined their main concerns relate to air quality, odour and water quality. He noted his wife's health problems, with her experiencing increased dermatitis since the operation commenced at the site. He acknowledged this could be dismissed as coincidental, but that there were no other environmental changes that would explain the sudden onset of his wife's health problems. He recognised this was difficult to prove, but that they were looking for reassurance the there would be testing for airborne pathogens and that the operation would meet best practice standards. He said that while the frequency of vile odours had reduced since December 2017, they were ongoing. He expressed his shock at the state of the site during his visit and the lack of systems and facilities. He emphasised concerns regarding groundwater pollution and increased fire risk. He considered a concrete pad was the only way to avoid discharges to groundwater and that a liner or aggregate pad could be breached or damaged.

60. **Mr Tom McBrearty** and **Mrs Rosina Rouse** presented a written statement and spoke in opposition to the application on behalf of the **Mandeville Residents Association**. Mr McBrearty explained how offensive odours from the site drifted around a large area (up to 9 km) particularly in low wind or calm conditions. He said the community was not anti-business, but people were suffering adverse effects from the operation. He was particularly concerned that the odours had resulted in some people suffering social isolation because the odours precluded visitors. He considered the site was poorly managed and that the operation was not consistent with best practice. He noted there were systematic failures

and the operation should not have been able to continue operating without resource consent. He considered the site was unsuitable for a composting operation due to the potential for groundwater to rise and the high degree of connection to the Eyre River. He referred to dye testing that had been undertaken in the area for proposed biosolid disposal and the potential for groundwater contamination. While he supported the capture and containment of leachate and stormwater, he emphasised the need for engineering advice on the size of the sump and storage required. He was concerned about adequate water supply for fire, changes in the composition of raw material coming to the site, and that the site was not operating to best practice.

61. **Ms Anna Hazeldine** spoke in opposition to the application. She considered she was the closest property. She explained that the smells were extremely vile and that a face mask was required. She noted her eczema and allergies had been worse since the operation was established and was concerned for her drinking water supply. She considered a 30 year consent duration was crazy and that monitoring does not mitigate adverse effects. She noted South Eyre Road is a main arterial route and that the odours had devalued her property. She also experienced dust clouds from the site. She said disgusting odours had continued (including the night before) and were worst during hot still wind conditions. She was shocked and disgusted that the operation had continued for so long without resource consent and that it continued to regularly adversely affect her and her family.

62. **Mr Michael Odering** presented a written statement in support of the application on behalf of **Oderings Nurseries.** He highlighted the importance of good quality compost supply to the business. He supported a 25-35 year consent duration to give certainty to the operation and to the ongoing supply of compost.

63. **Mr Graeme and Mrs Rosina Rouse** presented a written statement in opposition to the application. They live approximately 2 km to the east of the site and have lived there for 40 years. They are concerned about water issues, health issues, odour issues, general effects on the community, fire risk and operating issues. They consider a 35 year consent duration is inappropriate and unacceptable. They said there was no trust between the Applicant and the community. They are concerned for their drinking water quality supplied from their well downgradient of the site. They provided water quality testing results showing that nitrate-nitrogen concentrations in their water are very close to the Maximum Acceptable Value (MAV) of 11.3 g/m^3 and had steadily increased over the last 3 years. They emphasised that the land is unsuitable for the operation as it has no impermeable barrier to prevent contamination and no certainty of protection.

64. Mr and Mrs Rouse told us that their water supply well (11.3m deep) was downgradient of the site and that the present water level was 1.2m below ground level. They provided water quality testing results from their well by Hill Laboratories showing nitrate-N concentrations of 11.0 (21 October 2014) and 11.2 (16 February 2018) g/m^3. They also provided water testing results for the neighbouring Randle's well (15.3m deep), which is also downgradient of the site, showing a nitrate-N concentration of 10.4 g/m^3 (16 February 2018); and Stuart Paull's well, which is upgradient of the site, showing a nitrate-N concentration of 8.6 g/m^3.

65. Mr and Mrs Rouse described their research into composting operations and outlined their inspection of three different composting operations. They noted all of the operations were on completely sealed surfaces with collection and storage of leachate and stormwater, with 24/7 monitoring of temperature and moisture. They highlighted that use of sawdust/bark was unproven and does not provide adequate certainty that contamination will not occur. They suggested the photographs of ponding and stormwater flows at the site show that the Applicant's claims that there will be no stormwater generated from the site are false. They also suggested these photographs show the land has been more than 'slightly modified'. They questioned how a 'thrasher pump' would be used to vacuum up excess water.

66. Mr and Mrs Rouse referred to classification of de-watered paunch grass, grease trap waste, scoured wool fragments and eggshell as Category 3 – having the greatest potential environmental impact according to the '*Composting and related Organics Processing Facilities'* prepared by the Department of Environment and Conservation (NSW). They noted de-watered paunch grass comprises between 40-50% of the production of compost and is known to contain high levels of microorganisms, potentially including pathogens. They noted that a well-managed treatment process is essential to avoid pathogens. They said there was no evidence of a site management plan specifying methods for the capture and treatment and/or reuse of contaminated stormwater and leachate.

67. Mr and Mrs Rouse considered the number of complaints and the wide location of the people affected indicates that odours are not being contained. They considered the information provided gave them no certainty that the offensive and objectionable odours will be contained in the future. They raised concerns about the health effects of very small dust particles, the increased fire risk, firefighting issues and operating issues. They considered the site should be bunded, preventing stormwater discharges (as seen at the site) into the pine trees. They noted the new site was an opportunity to set up in accordance with best practice, but this had not happened. They considered the Applicant is operating at the lower end of the spectrum and the site is not suitable for a composting operation given the sensitivity of the groundwater zone to increased nutrients. They noted the Applicant has had over 18 months to demonstrate best practice and mitigation of potential adverse effects and has not done so. They questioned the commencement of the operation in September 2016, given the date of 27 July 2016 for the leachate sample included with the application documentation. Appended to their evidence were photographs of a Timaru composting plant, analysis reports from Hill Laboratories, and a photograph of stormwater discharging from the application site through a breach in the bund dated 22 February 2018.

68. **Mr John Madeley** spoke in opposition to the application. He noted particular concern regarding the use of sewage sludge and the potential discharge of heavy metals. He was concerned the operation could commence without resource consent and had continued for so long, without records of what products were disposed of. He considered the site looked and smelled like a rubbish dump. He acknowledged odours had decreased since December 2017, but considered they were still unacceptable. He said he was still experiencing 'deeply offensive smells' for 20-30 minutes on occasions of southerly winds and in still fog conditions. He noted he had relinquished a consent to spread pig effluent on his land, some 15 years ago, in respect for his neighbours right to live here. He said in the event consent is granted, the operation should be fully contained and monitored, and the duration should be no more than 10 years.

69. **Ms Janet Madeley** provided a written statement in opposition to the application. She described the odours from the site as a sulphurous, rotten-egg type smell which is very objectionable. She was concerned for the health consequences for people with asthma, sinus or lung conditions and aggravation of these due to dust and smell reactions. She noted the increased number of people in the area and the adverse effects on their enjoyment of the outdoors. She outlined the consequences for bees from offensive odours and the potential for disruption and displacement of bees. She expressed a lack of confidence that the offensive odours would not occur again and considered measures such as the use of sawdust were unproven and ineffective over the long term. She noted the close proximity if the site to the Waimakariri River and the Eyre River, and the sensitivity of groundwater to increased nitrates.

70. **Mr Melvyn and Mrs Jill Randle** provided a written statement in opposition to the application. Their key concerns related to operational issues (including fire risk and fire-fighting issues), air contamination and health risks, water quality, and general effects on the community. They noted their support for composting providing the operation follows the best practice at every step of the process from site and raw management selection, transportation and storage – through to mature compost fit for purpose. They acknowledged the recent amendment to the application to mitigate leachate discharge, but considered this seemed too little, too late. They noted that given the experience of the Applicant it was difficult to understand the lack of management and best practice. They questioned the provenance of the leachate sample taken on 27 July 2016 or the timing of set up given the Applicant claims to have begun at the site in September 2016. They considered the potential for spontaneous combustion of the compost is high and operational procedures are inadequate to mitigate this risk. They questioned the reliability of odour assessments given the unpredictable nature of wind conditions, emission rates and habituation. They noted other rural type odours from effluent spray or bonfires were occasional, seasonal and tolerable, as opposed to odours from the site which were ongoing obnoxious, putrid and sickening in nature. They spoke of being unable to plan outdoor events due to the chance of putrid odours occurring. They noted concern about the health effects of dust, bioaerosols and pathogens. They highlighted the high levels of nitrates in the surrounding groundwater zone and in their downgradient well used for drinking water supply. While they acknowledged the amendment to collect leachate was a big step forward, they remained unconvinced that the use of sawdust was a long-term solution. They referred to previous investigations undertaken into the suitability of the land for wastewater disposal. They considered the site was not suitable for purpose and the composting operation was not meeting best practice. In the event consent is granted, they requested a short term with the right of renewal for 5 years provided all consent conditions are complied with.

71. **Mr Darryl Brown** provided a written statement in opposition to the application on behalf of **Wai Eyre Farm Limited.** Mr Brown highlighted concerns regarding fire risk, contaminant leaching, odour, hours of operation, dust and traffic movements. He highlighted the lack of site preparation during the setup of the site and questioned the effectiveness of a compacted surface and sawdust to avoid discharges to groundwater. He said his farm workers were exposed to extremely strong odours when working adjacent to the site (on leased land) and that offensive odours are regularly experienced at the farm office and at

his house, which is 4.2 km from the site. He described the odours as so disgusting you cannot breathe and sulphurous like Rotorua. He noted that his staff had asked questions about the health effects of the odours. He questioned whether there were recommended setback distances for animals. He supported composting business, but considered there was a lack of information, trust and operational systems. Appended to his evidence was an aerial photograph of the surrounding area showing the land owned and leased by Wai Eyre Farm Limited and photographs showing ponded stormwater on the application site taken in winter 2017 and February 2018.

72. **Mr Daryn Jemmett**, Group Environmental Manager for **Silver Fern Farms** (**SFF**) provided a written statement in support of the application**.** Mr Jemmett outlined the company's background with composting at the Belfast meat processing site, their experience in producing good compost, and the arrangement for the Applicant to take over composting activities at a nearby off-site location. He noted the movement of the composting operation had freed up land for industrial development to help the city recover and minimised issues of reverse sensitivity. He estimated the current volume of organic waste material (predominantly paunch grass) was approximately 8,000 tonnes per year from the SFF Belfast plant. He noted the transportation of the waste off site was a significant cost and it was therefore only feasible if the compost facility is located in close proximity to the plant. He emphasised the service provided by diverting material from land fill and the need to divert and recycle organic material for beneficial use. He said that they had entered into an agreement with the Applicant to take over the composting operation at a nearby location. He noted the importance of management systems and controls in avoiding and mitigating adverse effects and the need to focus on practical solutions to provide the appropriate level of control. In conclusion, he stated that any restriction on the existing compost operation would place a significant risk to SFF's Belfast operation that was not foreseen at the time of entering into the agreement. He said that if consent were not granted it would put SFF in an untenable position.

73. In response to questions, Mr Jemmett described the Belfast plant's waste streams and treatment process. He described paunch grass and biosolid material from screening of wastewater streams from the plant. He acknowledged that the biosolids and the paunch grass could potentially contain pathogens and noted the active phase of composting was critical in killing these.

74. To assist us in understanding the raw waste material, Mr Jemmett reappeared at the hearing and showed us a video explaining the wastewater treatment process. He also provided a letter with further information describing the waste material and volumes collected by the Applicant. He said that from the start of March 2017 to the end of February 2018 a total of 3,456 tonnes of material had been supplied to the Applicant by 221 truck movements. He noted that up to 8,000 tonnes per year could be supplied. He roughly estimated the volume proportion of waste was 67% paunch grass (screenings post screw press) and 33% biosolids (post belt press), but noted this was highly variable. He provided information on the likely moisture percentage of the waste material.

75. **Mr Greg and Mrs Janine Greenwood** provided a written statement in opposition to the application. They noted that they resided at one of the closest properties to the application site. They said that when they had installed a new Oasis system and a pool, groundwater

was only 2.5m below ground level. They considered the Applicant had demonstrated very little regard for the environment and the community, and had bullied and intimidated the community. They emphasised the Applicant was not meeting best practice standards. They said the odours were regular and extremely objectionable. They described how the odours had taken away the enjoyment of their property and affected their ability to entertain. They outlined the mediation agreement and the dates of occasions since this time (after 16 December 2017) when they had called the CRC pollution hotline. They listed each occurrence and ranked the odours on a scale of (6) 'vile' – (1) 'noticeable'. They estimated they had called CRC over 40 times in a 12 week period when the odours were offensive and that these effects were ongoing. They noted their family were living and working in fear of the odours causing stress. They noted the consent applied for is for much larger volumes than is currently processed and therefore there is potential for odours to increase. They noted concern regarding bioaerosols containing bacteria, fungi, viruses and allergens, and that these are not currently contained or monitored by the Applicant. They emphasised groundwater is already extremely high in nitrate-N concentrations and the community is reliant on this resource for drinking water. They questioned how SFF could partner with a company that has a history of disregarding the law and trading when it has been illegal. They noted concern regarding fire risk, asthma caused by odours, chest infections, an increase in flies and vermin, operations late at night and adversely effected property values.

76. Mrs Greenwood gave a further written statement describing the adverse effect of the 'revolting, rotting odours' on her and her family. She described being woken up to the 'stench' and feeling physically sick, and the effect this had on their ability to have visitors to their house. She considered the community had honoured the mediated agreement but that the Applicant had continued to cause offensive odours. She felt let down by CRC for failing to keep our environment safe and noted the difficulties in investigating complaints given the odours could come and go with small wind changes. She described the ongoing occurrences of strong odours and their anxiety of knowing it will return and potentially get worse. She described how the smell had invaded her working life causing her to now work away from home.

77. A written statement in opposition to the application from **Mr Alastair Millar** was tabled at the hearing. The statement noted that offensive odours continued to occur offsite and that this should not be occurring with a good quality product and management. He emphasised the difficulties with odour assessment and detection given the variable winds and noted problems occurred when winds were from the southerly quarter.

Section 42A Report

78. **Mr Nathan Dougherty,** Senior Resource Management Officer Incident Response Zone Delivery for CRC, attended the hearing to outline the complaint response procedures and the complaint history recorded. He noted the difficulties in substantiating the occurrence of odours, given their potentially intermittent nature, changeable weather conditions and delayed response time (30-40 minutes or longer). He answered questions in relation to the Abatement Notice and the legal advice to issue it in response to complaints regarding offensive and objectionable odours from the application site. He said the Abatement Notice remained in force and that if consent was not granted it would be pursued as an enforcement matter. He described the substantiated odours as offensive, distinctive and

very unpleasant, with a distinctive hydrogen sulphide smell. In response to our request, Mr Dougherty provided further information detailing complaints recorded for 2018.

79. **Mr Zeb Etheridge**, Senior Hydrologist for CRC, provided a review (6 November 2017) of the modelled nitrogen losses in the s42A Report and a further written review (8 March 2018) of the groundwater quality issues at the hearing.

80. **Ms Cathy Nieuwenhuijsen**, Senior Air Quality Consultant with Golder Associates, provided a review of the AEE in conjunction with Mr Roger Cudmore, Principal Air Quality Consultant with Golder Associates, in the s42A Report. Ms Nieuwenhuijsen attended the hearing and responded to questions regarding dust control and odour discharges. In relation to public health effects from air discharges, she provided a copy of the evidence in chief of Dr Francesca Kelly on behalf of Southern Horticultural Products Limited (dated 4 August 2015) for an application for the discharge of dust and odour from compost storage.

81. **Ms Tegan Wadworth**, Consents Planner for CRC, tabled her s42A Report and provided a written summary responding to the amendments made to the application at the commencement of the hearing. She noted that the main mitigation measure for discharges to air and discharges to groundwater were set out in the Compost Management Plan (**CMP**). She considered that preventing the compost from becoming waterlogged, keeping it aerated and use of an impermeable layer under the active phase would be effective mitigation measures if implemented properly and consistently. She noted Mr Ethridge considered an impermeable pad should be used under all compost piles to avoid discharges of leachate to groundwater. She concluded that providing the mitigation measures were implemented and operating procedures were consistently followed the proposal would be consistent with the relevant planning provisions and consent could be granted.

82. However, Ms Wadworth requested further information on the amendments to the application to enable the revision of proposed consent conditions and to confirm her recommendation. She considered the increase in the volume of material processed could potentially be addressed through adaptive management and a 10 year consent duration.

83. Ms Wadworth provided us with rainfall totals and return periods (based on HIRDS V3) for three events referred to by submitters – July 2017, January 2018 and February 2018. She also provided well depths and nitrate-N concentrations for M35/3312 (Rouse), M35/2596 (Randle), and M35/10452 and M35/5618 (Frampton).

Further evidence

84. We received the following further information from the Applicant:
    (a) a Memorandum of Counsel on behalf of the Applicant accompanying the further information;
    (b) a letter dated 5 April 2018 from Ms Mongillo, Sephira Environmental;
    (c) information on the aerated static pile compost management process by CLS;
    (d) a Fly and Vermin Management Plan;
    (e) revised recommended conditions of consent;
    (f) a further statement of evidence by Mr Wylie (dated16 April 2018);

(g) a spreadsheet showing records of materials taken to Diversion Road and compost produced from September 2016 – February 2018.

85. We received written comment in relation to the further information and revised proposed consent conditions from the following submitters:
(a) Mr and Mrs Rouse;
(b) Mr McBrearty;
(c) Mr Brown on behalf of Wai Eyre Farm;
(d) Mandeville Residents Association;
(e) Mr and Mrs Nikoloff;
(f) Mr Fraser on behalf of the Eyre District Environmental Association[6]; and
(g) Mr and Mrs Randle.

86. We received an addendum to the s42A Report from the Reporting Officer on 10 May 2018. Ms Wadworth considered that the Applicant had not provided a detailed assessment of potential effects of the proposed ASP process or an assessment of the mitigation provided in terms of adverse odour effects. She noted Ms Nieuwenhuijsen considered there was insufficient information to review the change to the application in relation to air quality effects. She recommended no new composting material should be brought to the site until the aerated concrete pad is installed. Given the limited information and limited assessment of potential adverse effects arising from the ASP composting process, she recommended that in the event consent is granted, the Applicant should maintain the turned windrow pile process in accordance with appropriate consent conditions.

87. In relation to the control of runoff or leachate, Ms Wadworth considered the Applicant had demonstrated adverse effects on water quality could potentially be mitigated and that drinking water standards and water quality standards in the Silverstream would therefore not be breached as a result of allowing the activity. She noted this was based on the proposed containment and collection of runoff and leachate from the active phase of composting on a sealed pad and use of a sawdust/bark fines pad and sawdust aprons between the compost rows. However, she emphasised that this would require a high level of operational control and vigilance to ensure the base of the compost piles do not become saturated.

88. Overall, she considered that the consents sought could be granted with the imposition of consent conditions requiring implementation of mitigation measures. In light of her recommendation to grant consent for the turned pile method of composting (rather than the ASP process), she provided separate recommended conditions for both composting processes and separate conditions for the discharge to land.

89. Ms Wadworth also provided further information on complaints recorded between 9 March – 30 April 2018 and results of proactive odour monitoring undertaken between 5-13 April 2018. No analysis of this was provided.

[6] Endorsed by Mr and Mrs Greenwood, Mr and Mrs Briggs, Mr and Mrs Beswick, Mr and Mrs Power, Mr McBrearty, Mr and Mrs Brittenden, and Ms Madeley,

Applicant's Right of Reply

90. Mr Cleary provided a written right of reply on behalf of the Applicant on 31 May 2018. He noted the unanimous view of the experts that the consents can be granted subject to recommended conditions developed with input from technical advisors. He submitted the change to an ASP composting process is a positive step and will mitigate odours. He submitted the implementation of aerated concrete pads and use of sawdust/bark material would avoid discharges to groundwater, except in rainfall event exceeding a one in 50 year event. He addressed matters raised in the addendum to the s42A Report and provided a further statement of evidence from Ms Dyer (dated 31 May 2018) and a further statement of evidence from Mr Wylie (dated 31 May 2018).

ASSESSMENT

91. In assessing the applications, we have considered the application documentation and AEE, the s42A Report and technical reviews, all submissions received and the all evidence provided during and after the hearing adjournment. We have summarised this evidence above.

92. We accept that the amendments to the application made during the hearing and the proposed further amendment to change the operation to an ASP composting process is within the scope of the application, as notified. We accept that the character, nature and scale of any adverse environmental effects are not likely to be greater than the original application for the existing operation.

93. We acknowledge the Act allows the Applicant to seek retrospective consent for the existing unauthorised activities and confirm our assessment of the applications is in no way punitive. We have focused our assessment of the application on the actual and potential adverse effects on the environment of the existing and proposed activities.

94. In making our assessment, we are required to consider the actual and potential effects of the activities on the existing environment. The existing environment is as it is at the time this determination is made and includes lawful existing activities, permitted activities and activities authorised by existing resource consents.

95. We record we have considered the existing environment without the presence of the existing compost and stockpiling operation. We have considered the information provided in relation to the environmental effects of the existing composting operation, as well as the information provided in relation to the proposed aerated static pile process. In this regard, we have assessed the applications for the existing operation and the proposed operation separately.

96. We have not considered any matters raised that are outside of the CRC's jurisdiction, such as the storage of bulk material that does not cause offensive or objectionable odours off-site, fire risk, pest control, traffic, road wear and tear, and noise. However, we acknowledge that some of the concerns raised by submitters in relation to some of these matters are linked to public health concerns and the spread of pathogens, which we address in relation to water quality and air quality effects.

97. Submitters raised concern regarding adverse effects on property values and the ability to sell their properties with such odours. Ms Wadworth noted that the components that contribute towards property values such as amenity values, visual amenity, effects on human health and nuisance effects such as odour should be taken into account. We agree. However, we note that case law indicates that taking into account adverse effects on property values in addition to adverse effects on amenity values and water and air quality could result in double counting adverse effects. We acknowledge this. We accept that adverse effects on amenity values and water and air quality can impact on property values.

98. Mr Dodds considered the composting operation had no business requirement for the activity to be located at this site. We accept that the applicant is allowed to make an application for resource consents for such activities in the rural zone.

Status of the Application

99. The starting point for our assessment of the applications is to determine the status of the activities.

100. Ms Wadworth noted the discharge to air of dust from sawdust, bark fines, gib board off cuts, wood pallets, timber and soil is a permitted activity under Rule 7.36 and 7.37 of the CARP, provided the conditions of the rules can be met, and therefore the storage of these materials does not require a resource consent.

101. The discharge of odour from the storage of bulk materials such as pig manure (mixed with straw bedding) and mushroom compost is not covered by these permitted activity rules that address dust effects. Given the potential for storage of such bulk materials to generate significant odour and undergo a degree of composting within the storage piles, consent may be required for the discharge of odour from this activity. Where the discharge from bulk material storage of such products causes objectionable or offensive odour beyond the property of origin, consent would be required under Rule 7.5 or catch-all Rule 7.63 of the Canterbury Air Regional Plan (**CARP**).

102. Ms Wadworth also noted there were no rules under the LWRP for the use of land for the storage of bulk materials and therefore resource consent is not required.

103. Ms Wadworth considered the discharge of contaminants into air (odour and dust) from the composting activity is classified as a discretionary activity under Rule 7.63 of the CARP.

104. Ms Wadworth considered the discharge of liquid waste (leachate) from an industrial or trade process onto land where a contaminant may enter water is classified as a discretionary activity under Rule 5.92 of the LWRP, as the activity cannot comply with Rule 5.91.

105. Ms Wadworth noted that a resource consent for any excavation to install the proposed concrete pad may be required under Rule 5.175 of the LWRP. No comment was made in relation to any resource consent that may be required for the construction of a pond for

the collection of stormwater and leachate. We note this has not been applied for and accept that storage could be provided by tanks. However, earthworks at the site are likely to be extensive in preparation for the aerated concrete pad, saw dust pads, water storage areas and mixing area and further resource consents may be required.

106. Mr Loe agreed with Ms Wadworth that the applications should be considered as discretionary activities. In response to questions, Mr Loe noted that there was no regional rule preventing a discharge of material onto land, unless it can enter water. He considered if it was onto an impervious surface and there was no possibility of contaminants entering water, no rule is breached. However, he acknowledged there could be a discharge in significant rainfall events. He noted there were two parallel operations on the site – active composting; and the bulk storage and handling of bulk material. He said these activities were covered by two different rules in the CARP – Rule 7.63 and Rule 7.36. Mr Wylie considered CLS can comply with the conditions for the storage and handling of bulk material to be a permitted activity.

107. In terms of the discharge to air and the discharge to land, we agree with Ms Wadworth that they are linked and that neither consent could be granted without the other. We agree that the applications should be considered as a **discretionary activity** under section 104B the Act.

Statutory Considerations

108. In terms of our responsibilities for giving consideration to the applications, we are required to have regard to the matters listed in sections 104, 104B, 105 and 107 of the Act.

109. In terms of section 104(1), and subject to Part 2 of the Act, which contains the Act's purpose and principles, we must to have regard to-

(a) Any actual and potential effects on the environment of allowing the activity;
(ab) Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment offset or compensate for any adverse effects on the environment that will or may result from allowing the activity;
(b) Any relevant provisions of a national environmental standard, other regulations, a national policy statement, a New Zealand coastal policy statement, a regional policy statement or a proposed regional policy statement, a plan or proposed plan; and
(c) Any other matters the consent authority considers relevant and reasonably necessary to determine the application.

110. Section 104(2) states that when forming an opinion for the purposes of section 104(1)(a), we may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect. This is referred to as consideration of the 'permitted baseline'.

111. In terms of section 104B for a discretionary activity, we may grant or refuse the application, and if granted we may impose conditions under section 108.

112. In terms of section 105, when considering section 15 (discharge) matters, we must, in addition to section 104(1), have regard to-
    (a) The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
    (b) The applicant's reason for the proposed choice; and
    (c) Any possible alternative methods of discharge, including discharge to any other receiving environment.

113. In terms of section 107(1), we are prevented from granting consent allowing any discharge into a receiving environment which would, after reasonable mixing, give rise to all or any of the following effects-
    (c) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended material:
    (d) Any conspicuous change in the colour or visual clarity:
    (e) Any emission of objectionable odour:
    (f) The rendering of fresh water unsuitable for consumption by farm animals:
    (g) Any significant adverse effects on aquatic life.

114. We consider each of these sections of the RMA below and our consideration of the environment as it exists at the time this application is determined, referred to as 'the existing environment'.

The Existing Environment

115. The s42A Report included an accurate description of the affected environment, which we adopt[7] and will not repeat here in any detail. We focus on the points of difference between the parties in the descriptions of the affected environment below.

116. There was agreement at the hearing that the closest well (M35/9767) is located approximately 1,020m cross-gradient from the application site and that the closest down-gradient well (M35/12018) is located approximately 1,450m from the site.

117. The Applicant provided further details on the location of the headwaters of the Silverstream and any recorded springs in the surrounding area. Submitters considered this was misleading given it only showed springs recorded in the CRC database. They also noted that the location of the headwaters of the Silverstream identified by the Applicant conflicted with the evidence of Mr Brown. At the hearing, Mr Brown showed us the location of one of the headwaters of the Silverstream on a map of his property. We also visited the location and saw the stream during our site visit. We agree it is located approximately 2.7 km downgradient from the application site. We accept that the maps show this to be some 4 km from the site.

118. There was discussion at the hearing in relation to likely groundwater levels at the application site. The application stated that the highest groundwater levels beneath the application site are 3m (1978) – 4.2m (2010) below ground level (**bgl**), as measured in bore M35/0658 (850m downgradient of the application site), and are not reasonably expected

[7] Under section 113(3)(b)

to be less than 4m bgl. The Sephira Report noted a further review of water level information showed the range of groundwater levels was 3-9m bgl.

119. Mr Etheridge noted that the depth to groundwater at the application site is likely to be slightly greater than the highest level of 0.82m bgl recorded in well M35/0658, as the application site was approximately 2 km inland of this well. He considered the long-term average depth to water beneath the application site is likely to be around 4m; and that the minimum seasonal depth to water is likely to be approximately 1.2m bgl.

120. We accept there is variation between wells due to the heterogenous nature of the geology across the area and the variable distance of wells from surface waterways. We note that groundwater level data within 2 km of the site show a highest recorded reading of 0.82m bgl. We accept that highest groundwater levels below the site are in the order of 1m bgl.

121. There was also discussion on groundwater flow velocities at the hearing. Again, this was acknowledged to be highly variable due to the heterogenous nature of the groundwater system and the existence of preferential flowpaths or underground channels of highly permeable material. Mr Etheridge considered the groundwater velocities in the shallow aquifer in this area are generally relatively fast, probably in the order of several kilometres per year. He noted that nitrate concentrations in spring-fed streams respond relatively quickly (e.g. within 12-18 months) to 'flush throughs' of nitrate concentrations accumulated in soils above the aquifer in wet periods. He said groundwater travel time through highly permeable channels from the recharge area (including the application site) to the spring-fed stream would be relatively short i.e. a few years.

122. Mr Etheridge agreed that groundwater flow is likely to be very slow in the low permeability material described in the bore logs used by Ms Mongillo and in any monitoring well installed in such material, but that water supply wells do not tap such low permeability material and therefore travel times can be relatively quick (e.g. several years, or possibly less than a year).

123. There was a high level of agreement that intermittent odours associated with normal farming activities were part of the existing environment.

124. Mr Dodds highlighted the number of people in the area and that the surrounding community must travel along South Eyre Road when driving to Christchurch. We accept there are a moderate number of people living in the area, particularly to the north-west and north-east of the site, and that there is rapid population growth occurring. We do not agree with Mr Dodd's description of a 'metropolis', but rather accept it is an area of growing rural-residential use.

125. We note concerns raised by submitters in relation to a proposed dam for a water storage pond upgradient of the site and potential flood risk at the application site. We note the documentation from Mr Fraser showing the hazard zone area. However, we have not had any regard to the concerns raised about the application site in relation to the proposed water storage pond, as Ms Wadworth advised that the resource consents sought had not been granted. We accept the view of Ms Wadworth and the legal advice she received that

we cannot take into account a proposal with no consent to undertake the activity as part of the existing environment.

126. The existing composting operation does not form part of the existing environment, as it only includes lawful activities.

Permitted baseline

127. We do not consider there are any permitted activities that are relevant to our consideration of the applications. We do not accept that the odours caused by the composting operation, as described by submitters and Mr Dougherty, are similar in character, nature or scale to typical odours associated with permitted rural or rural-residential land uses.

Section 104(1)(a) Actual and potential effects on the environment

128. The following actual and potential effects on the environment were assessed in the s42A Report:
    (a) Effects of the discharge of odour;
    (b) Effects of the discharge of dust;
    (c) Effects of the discharge to land on groundwater quality and hydraulically connected surface water;
    (d) Effects of the discharge to land on drinking water supplies;
    (e) Effects of the discharge to air on health;
    (f) Effects of the discharge to air on amenity values; and
    (g) Effects of the proposal on Tangata Whenua values.

129. We record we have considered all of these actual and potential effects in relation to the existing composting operation and the proposed composting operation.

130. We have also considered the positive effects of the application in terms of reducing waste disposal to landfill, the recovery and recycling of waste into useable products, and the benefits of the operation to other businesses.

131. On the basis of the evidence presented, our assessment focusses on adverse water quality effects and air quality effects of the existing operation and of the proposed operation. Our assessment of water quality effects and air quality effects below includes impacts on amenity values and public health.

Water Quality Effects – The Existing Operation

132. A key concern of many submitters is the adverse effects of the operation on groundwater quality and drinking water supplies. Submitters highlighted the need to avoid runoff and contaminant discharges into groundwater and to ensure protection of their drinking water supplies. Concerns were raised about adverse effects of contaminants on the headwaters of the Silverstream and the Kaiapoi River catchment. Many submitters are of the view that the application site is not appropriate given the shallow depth to groundwater, proximity to surface water (headwaters of the Silverstream) and the permeable nature of the soil.

Submitters expressed concern that the application site is subject to regular surface flooding and that stormwater flows are uncontrolled.

133. The original application stated that the composting material, when managed using best practice, will not produce significant amounts of leachate. The contaminant analysis results by Hill Laboratories of one sample of labelled 'compost leachate' received on 4 August 2016 were appended to the application.

134. The '*Preliminary Hydrogeologic and Nitrogen Transport Assessment*' dated August 2017 by Sephira Environmental ('Sephira Report') concluded the assessment indicated a low chance of adverse environmental effects and recommended groundwater monitoring to confirm the assessment conclusions.

135. The application stated that there will be no stormwater runoff from the site. The Sephira Report stated that earthen bunds (1m high) on the boundary of the application site and interceptor drains adjacent to the site to divert upgradient surface water had been constructed to prevent stormwater runoff from entering the site during large rainfall events. The report noted that surface water ponding occurs onsite and can be absorbed by using sawdust and bark fines. The report stated the placement of 0.5m of sawdust beneath the compost pile and around its base had been assessed to adequately absorb average rainfalls on the property.

136. The Sephira Report stated that the highest potential for leaching of nitrogen and other contaminants is present at the compost mixing area, which is on a cement pad and rainwater is directed to a concrete lined sump. It noted that accumulated water is absorbed with sawdust and bark fines and is then mixed into the compost. The report stated that the nitrogen release from the compost piles is minimised by management of the carbon to nitrogen (C:N) ratio and use of sawdust beds and bunds to absorb rainwater. It noted saturated sawdust would be replaced every 3-4 weeks when the compost is turned.

137. The Sephira Report concluded that based on the current hydrogeologic conceptual site model, evaluation of the composting system, and numerical modelling of the potential for nitrogen to seep from the compost piles and be transported in groundwater to the downgradient Kaiapoi River (Silverstream), any adverse effects on groundwater were assessed as less than minor.

138. The Sephira Report acknowledged that the Silverstream is ecologically sensitive and that the ANZECC[8] guideline for ammonia-nitrogen is low. However, it concluded that the planned site controls were likely to be effective in mitigating adverse effects and that monitoring would allow adequate time to adapt site controls before adverse effects occur, if conditions are different to those modelled.

139. The Sephira Report stated permeability/hydraulic conductivity of the alluvial gravels underlying the site were likely to be relatively low (for gravel), as indicated by ponded water and low water yields in nearby shallow bores; and that groundwater movement is relatively

[8] Australia and New Zealand Environment and Conservation Council (2000)

slow. It stated that sawdust and bark fines could absorb up to 327% of their own dry weight, reducing the chance of rainwater or leachate infiltration.

140. The Sephira Report modelled concentrations of nitrate-nitrogen, nitrite-nitrogen and ammonia-nitrogen based on leachate sample concentrations and hydrogeological assumptions. It stated that the 'worst-case' model run output showed that without the prevention of rain infiltration, the Eyre River Diversion Drain and Silverstream water quality would be at risk of exceeding the ANZECC guideline value of 0.021 milligrams per litre (mg/L) for lowland rivers. It noted that it was anticipated that the Silverstream could be predominantly fed by groundwater derived from the site vicinity during dry periods. The report considered that the modelling was likely to overestimate ammonia-nitrogen concentrations because the model did not account for leachate reductions from enhanced biological controls through C:N ratio management in the composting process.

141. The Sephira Report noted a re-run of the worst-case model, assuming 85% of rainwater is absorbed by the sawdust, showed the concentration of ammonia-nitrogen in groundwater to be below the ANZECC guideline at the headwaters of the Silverstream.

142. The Sephira Report stated that the groundwater modelling showed no concentrations were predicted to exceed the NZ Drinking Water Standards (2008) for nitrate-nitrogen or nitrite-nitrogen, or the aesthetic guidance value for ammonia at the location of the nearest downgradient well used for domestic or stock water supply. It stated the installation of monitoring wells would enable adaptive management and calibration of the model to reduce uncertainty. The Report noted that the most sensitive parameter of the model was the uncertainty around hydraulic conductivity.

143. The letter from Ms Mongillo to Mr Etheridge (dated 7 September 2017), clarified Tables 4a-4g, Table 5 and Table 6 of the 'Nitrogen Transport Model' (Sephira Environmental, August 2017) and provided updates to the these to clarify the results. Ms Mongillo also reviewed water levels in suggested wells and assessed the model's sensitivity to the input value for thickness of the unsaturated ('vadose') soil zone above the water table. She noted the results indicated the thickness of the unsaturated zone does not change the outcomes of the modelling.

144. Ms Mongillo briefly summarised her nitrogen transport assessment and use of analytical models to evaluate the potential for nitrogen loss using the SEVIEW model in her statement of evidence. She highlighted that the model showed that reduction of infiltration of the compost pile runoff and seepage by 85% would maintain acceptable ammonia-nitrogen loading at the Silverstream and would maintain drinking water standards at wells downgradient. She considered the absorptive capacity of the sawdust would achieve the required 85% reduction in infiltration. She noted the model demonstrated that, assuming the proposed pile sizes and a 0.5m thick sawdust bed, the '*…readily water-absorbing materials could immobilize all average rainfall and the rain from a 5-year storm event'* (pg. 9). However, she also stated '*A 50-year storm event could potentially oversaturate the sawdust and bark fine pad, therefore allowing a small loss of nitrogen'* (pg. 9).

145. Ms Mongillo referred to her letter sent to Mr Etheridge (on 14 February 2018) detailing the second-phase and absorption modelling. The letter detailed site conditions and how the composting facility will be operated, the absorptive nature of the compost, sawdust and bark fines, and monitoring proposed. She calculated that mass loading in a one in 50-year storm event was assessed to be 6 to 65 kg of ammonia-nitrogen, which when diluted with 142mm of rainfall equated to a maximum of 1.5 mg/L in the stormwater. She noted that the October 2017 sampling of surface water indicated the C:N ratio was improved and that the projected concentration in surface water during a one in 50 year storm event does not exceed the NZ Drinking Water Standard (aesthetic) for ammonia-nitrogen. She also recommended visual inspection of the sawdust/bark fine pad.

146. Ms Mongillo considered the assessments undertaken were *'*rigorous*'* and demonstrated that the use of sawdust to absorb rainfall would be effective *'in all but the most high intensity storms (e.g. 50-year storm)'*. She said that –

> *'In the very rare event of a 50-year storm some water may escape capture by the sawdust/bark fine pad adjacent to the piles. Further modelling suggests that ponded water at the ground surface would be diluted to concentration that are below any risk-based thresholds. Much of the ponded stormwater could be captured through pumping or absorbed by placing additional sawdust and bark fines on the ground where stormwater has accumulated.'*

147. Overall, Ms Mongillo considered the risk of nitrogen release from the site is low due to the nitrification process caused by maintaining an appropriate C:N ratio; the high water retention of the compost, sawdust and bark fines; the relatively low permeability of the near surface soil; the slow movement of groundwater in the relatively flat aquifer; and the diluting capacity of groundwater before downgradient users or surface water bodies are reached.

148. In response to questions, Ms Mongillo considered the key mitigation proposed was use of sawdust to absorb stormwater and operational procedures for the composting process. She considered the revised approach to modelling provided more confidence given the lack of empirical site-specific data. She considered that the use of absorptive material and ensuring the base of the piles were kept dry were key in avoiding nitrogen loss to groundwater. She confirmed the modelling had relied on HIRDS data for a one in 5 year and a one in 50 year storm event, with an 2% increase for climate change.

149. Ms Whalen reviewed the initial modelling undertaken by Ms Mongillo, noting that groundwater quality in wells downgradient of the site already showed high nitrate concentrations. She considered any additional nitrate leaching to groundwater to be of concern. She noted no concerns with the modelling and considered it was very conservative in terms of predicted effects on surface waters, given it assumes all of the nitrogen load would reach the Silverstream. Ms Whalen considered the predicted 2% increase to nitrogen loading at the Silverstream, relative to the existing nitrogen load, is not a significant proportion currently. However, she noted that this area is a red zone for nutrient allocation and, if future mitigations are required by farmers in the area, the relative proportion of nitrogen contributed by CLS would become larger.

150. Ms Whalen suggested prevention/minimisation of stormwater flows into the compost area and receiving area by use of engineering controls such as diversion ditches and bunds. She recommended a robust groundwater monitoring programme, sampling of stormwater runoff and leachate, and testing waste for pathogens.

151. Mr Etheridge reviewed the Sephira Report and the initial modelling undertaken. He acknowledged that there was a degree of conservatism because nutrient transformation processes in the compost had not been simulated. However, he considered the default rate constants and temperature coefficients used in the model were inappropriate without local empirical data to support them, or undertaking a wide-ranging sensitivity analysis. He noted the Sephira s92 response letter (dated 7 September 2017) shows the variation in results from varying parameters such as rainfall infiltration rate and the thickness of the vadose zone. By way of example, he explained that changing the thickness of the vadose zone from 6m to 3m significantly increase leachate concentrations of ammonia and nitrate-nitrogen. He said this suggested that the nitrogen transformation rate constants have a significant impact on the modelled results and that significant vadose zone denitrification is being assumed. However, he did consider that denitrification was unlikely to occur due to lack of organic carbon and the relatively permeable nature of the subsurface sediments. He therefore concluded that the modelling results may not be indicative of the actual concentration that could be discharged to groundwater beneath the site.

152. Mr Etheridge considered that there was potential for ammonia-nitrogen to be oxidized to nitrate-nitrogen in the vadose zone and in groundwater whilst being transported towards sensitive receptors such as the Silverstream, and that this could cause significantly higher nitrate concentrations than those measured in the site surface water samples.

153. Mr Etheridge noted that the application site is approximately 4 km upgradient of where the spring-fed Silverstream issues. He stated that nitrate concentrations in the Silverstream are very high and exceed the National Bottom Line limit of 6.9 mg/L for nitrate-nitrogen in the National Policy Statement for Freshwater (**NPS-FW**), for the protection of fish species. He noted that the CRC had a statutory obligation to implement control measures in order to reduce nitrate concentrations to below 6.9 mg/L. Likewise, he noted nitrate-nitrogen concentrations in groundwater in shallow wells in 2015 showed average nitrate-nitrogen concentrations of 9 mg/L and that a relatively small increase could cause drinking water standards to be breached in some wells. He highlighted the more recent results of Mr and Mrs Rouse's well used for domestic supply, approximately 2 km downgradient of the application site, has recorded nitrate concentrations very close to the drinking water limit.

154. In his addendum, Mr Etheridge referred to studies that have shown that dissolved organic matter in compost leachate can effectively sorb and mobilise heavy metals. He considered that –

> *'…specific studies would be required to assess the exact quantity and nature of the materials leached from a given compost. A site specific-assessment of the concentrations of these (and any other) metals in the compost leachate, together with analysis of their mobility/sorption in the soil and vadose zone beneath the site, would be required to determine whether they pose a contamination risk'* (pg. 1)

155. Mr Etheridge noted that taste and odour impacts in groundwater downgradient of the site are also a potential cause for concern. He said that some organic compounds have a detectable taste and odour at extremely low concentrations; and that '*…there is a reasonable probability that the dilution rates will be insufficient to mitigate taste and odour impacts in groundwater if these substances were discharged to groundwater beneath the site'* (pg. 2). Given that some of these compounds may be present in compost leachate, he considered very robust mitigation measure were required to ensure that the likelihood of even very small rates of contaminant discharge to ground is very low.

156. Mr Etheridge commented on the ability to monitor the effects of the existing runoff and leachate on groundwater using downgradient groundwater monitoring wells. He noted that given the heterogenous nature of the aquifer beneath the site it would be necessary to install a large number of monitoring wells to maximise the chance of intercepting preferential flow paths. He was of the view that installing two downgradient monitoring wells would be unlikely to detect any contaminant discharges from the site. He said that such monitoring was rather 'hit and miss'. However, in the event that groundwater monitoring is required, he recommended that a number of downgradient groundwater monitoring wells would be needed, and that sampling should be targeted at August and November and that parameters monitored should include electrical conductivity and acidity (pH).

157. In her s42A Report, Ms Wadworth concluded that the modelling provided by the Applicant is not indicative of the actual level of effect and that the level of effect is uncertain. She considered that the relevant water quality standards would not be maintained and that there is uncertainty whether the standards of the NPS-FM will be exceeded. Ms Wadworth considered there was also uncertainty in relation to the actual level and nature of adverse effects on water quality. However, she noted the modelling indicated there was potential for the nutrient discharge from the site to cause nitrate-nitrogen concentrations in downgradient wells to exceed drinking water limits and the water quality limits set out in Schedule 8 of the LWRP for surface water. Given the sensitivity of the groundwater and surface water catchment, she considered there was potential for significant cumulative effects.

158. Ms Wadworth recommended that, without avoidance or mitigation of adverse effects on surface water and groundwater quality, the application to discharge contaminants onto land from the existing composting operation should be declined.

159. Appended to the s42A Report was a letter on the flood risk assessment from Mr Callum Margetts, Natural Hazards Analyst for CRC. Mr Margetts noted the property borders the Eyre River Diversion, is on the floodplain of the Waimakariri River and is at risk of surface flooding. He appended photographs of aerial photographs of flooding along the Eyre River Diversion in 1974 and 1986, and a map showing the extent and depth of rainfall runoff in a one in 200 year return period flood. On the basis of rainfall runoff modelling, he estimated the maximum depth across the site in a one in 200 year event would be 0-60mm. He noted that a breakout of the Waimakariri River from the flood protection scheme is unlikely to affect the application site.

Findings

160. The current operation is undertaken directly on land, except for a small raw materials bin and concrete pad mixing area. There is currently no runoff or stormwater containment or collection, except for a small sump at the bin and mixing area and a low bund around the perimeter of some of the site. There is no secondary containment of the bin and mixing area, or the small sump. At the time of our site visits the compost piles were not located on 0.5m thick beds of sawdust, as proposed at the hearing. Sawdust and bark fines are being used to absorb ponded water between the rows and around the site. This is the existing operation for which retrospective consent and consent until the proposed changes are implemented is sought.

161. We accept the risk of significant flooding from the South Eyre Diverson and the Waimakariri River is low based in CRC advice. However, submitter evidence shows the application site is prone to surface water flooding and the CRC flood risk advice also notes this.

162. The land is highly permeable (well drained silt and loam) and groundwater can seasonally be as high as 1m bgl. No site-specific work has been undertaken to investigate infiltration rates. While we accept the evidence of Ms Mongillo that surface water ponds at the site, we do not agree this necessarily indicates soils beneath the application site are generally impermeable or that groundwater flows are slow.

163. Ponded surface water between the rows and on the access tracks around the site was evident during our site visit, despite little recent rainfall. Photographs provided by submitters show this surface ponding occurs frequently and is extensive after moderate rainfall events of 45-75mm over 24-48 hours. Rainfall data provided by Ms Wadworth indicates significant surface water ponding has occurred in rainfall events that had an average return interval of 2-5 years (July 2017 event) and 10 years (February 2018 event).

164. Despite the Applicant's claim that there is no stormwater discharge from the site, photographs from submitters clearly show water flows through a breach in the eastern bund on the application site boundary, discharging into the trees adjacent to the site. We observed this gap in the boundary bund had been filled, however the low point was still apparent on our site visit. We consider this is evidence that surface flows of stormwater from the application site have previously occurred, whether controlled or not. We do not accept that there is no stormwater discharge from the existing site. The evidence shows that the existing operation has inadequate site drainage and stormwater management.

165. We agree with submitters that there has been insufficient site preparation, prior to bringing material to the site, to provide a suitable working surface. Use of heavy machinery appears to have compacted the ground and formed low areas where stormwater runoff and leachate ponds. The use of sawdust to mop up water around the site is *ad hoc* and relies on operator diligence. We agree with submitters that it is inappropriate and ineffective to mitigate existing surface water ponding with sawdust and use of a thrasher pump, without proper engineering design of the site to control and manage stormwater.

166. Mr Cleary submitted that ponding of rainwater was not a generator of leachate that could impact on the quality of groundwater and that this was more of a matter of good housekeeping than adverse environmental effect. We disagree. Ponded water and

saturated soil and material poses a significant risk to water quality, particularly given the small depth to groundwater below the site, and provides a pathway for the transportation of contaminants into groundwater.

167. We consider the groundwater modelling indicates that the potential contaminant loads from the existing operation and the potential adverse effects on surface water and groundwater could be significant. The results show that without avoidance or mitigation the discharge to land could result in the exceedance of drinking water standards and surface water quality standards downgradient of the site. The evidence shows that concentrations of nitrate-nitrogen in downgradient wells used for drinking water supply and in the Silverstream are already very close to exceeding water quality standards.

168. We do not agree with Ms Mongillo that the assessments undertaken are robust, given the limited amount of site specific empirical data and the limited information on the actual contaminant loads in the compost. While we accept that the modelling undertaken is likely to be conservative, we note that it is sensitive to the depth to groundwater and that the groundwater leachate model is intended for assessing the unsaturated zone in soils and not compost, and is therefore, as noted by Ms Mongillo, operating at its limits. We acknowledge that some of the uncertainty with the first modelling undertaken by Ms Mongillo was addressed in the second round of modelling, but consider there remains a high level of uncertainty.

169. We accept the evidence of Mr Etheridge that without site specific empirical data such as contaminant loads and infiltration rates, the groundwater modelling is highly uncertain and that nitrate-nitrogen contaminant concentrations, after transportation in the groundwater system, could be significantly higher than the concentrations in surface water samples. We agree with Mr Etheridge that given the limited depth to groundwater during winter, it is unlikely there is significant denitrification occurring.

170. We do not accept that the installation of groundwater monitoring wells would provide any useful measure of actual contamination in this case and agree that such monitoring wells would be unlikely to intercept preferential groundwater flows beneath the site, unless there were a large number of downgradient monitoring wells. We do not consider this would enable adaptive management or the calibration of the model to reduce uncertainty, as suggested in the application.

171. In our view, given the high sensitivity of the groundwater and surface water to any additional nitrogen inputs, any increase to the nutrient load to groundwater or surface water should be avoided or minimised to the greatest extent practicable. In our view, this can only be achieved by appropriate site preparation, stormwater management, and compost runoff and leachate collection and containment. This is not reflected in the current site.

172. The assumptions adopted by the experts in assessing potential water quality effects are highly dependent on implementation of robust and effective site management practices. In reality there is a significant risk that use of sawdust as mitigation in the prescribed manner and quantity would not be able to be achieved at all times by site operators. We

consider there is a very high risk that the base of a large proportion of the compost piles could become saturated in a relatively large rainfall event (one in 20 years), resulting leachate discharge to groundwater. We conclude that the existing composting operation poses an unacceptably high risk to surface water and groundwater quality and that even small increases in nutrient loads could result in significant adverse effects.

173. The potential effects of pathogens on groundwater beneath the site were raised as a concern by submitters. The expert evidence has focussed on the effects of nutrients discharged to water, primarily nitrogen. We have been provided with little information regarding the potential effects of pathogens on water quality. Given the full range of raw materials proposed for composting, including biosolids and paunch grass, we accept that leachate and stormwater discharged to ground would contain some pathogens. We find that because of the small depth to groundwater beneath the site, diligent control of stormwater and leachate from the receival and active composting areas would be required to minimise the risk of adverse effects. Taking into account the mitigation measures proposed, we find that there is a moderate degree of uncertainty associated with the potential effects of pathogens discharged to groundwater from the existing site.

174. We also agree with Mr Etheridge that specific studies are required to assess the quantity and nature of the contaminants that could potentially be leached, and an analysis of their mobility/sorption in the soil to determine whether they pose a contamination risk. In particular, we consider there is insufficient information on the likely contaminants in the material collected from wastewater screens, which we were told may be up to 33% of the material received from SFF.

Water Quality Effects – Proposed Aerated Static Pile Operation

175. The Applicant provided a document entitled 'Aerated Static Pile Compost Management Process' outlining the proposed operation and including site plans, and the layout and drainage details of the aeration pads.

176. Ms Mongillo stated that the stormwater management plan is to contain runoff from compost on the concrete mixing pad and aeration pad, or within bunds that can contain a one in 20 year rainfall event. She noted that the areas inside the bunds would have a 0.3m deep pad of sawdust or bark fines upon which stormwater can accumulate until it is absorbed.

177. Ms Mongillo undertook further sampling on 23 March 2018 (following 9.6mm of rainfall), including two surface water samples from the access road puddles and samples from the compost piles and 'sawdust aprons'. She presented the results of the analyses in Tables 1-3 in relation to the moisture content and absorptive capacity of the samples. She noted a programme to test the moisture content of the compost and sawdust pads would be developed to ensure that no materials were approaching saturation.

178. Ms Mongillo stated that the 1,000m^2 ASP concrete pad and the concrete mixing pad would direct stormwater and leachate towards a stormwater containment area (lined pond or holding tanks) to hold a one in 50 year storm event. She presented the estimated runoff and volume of stormwater for one in 10 year, 20 year and 50 year storm events in Table 4.

She noted that the leachate and stormwater for all compost would be managed to mitigate the seepage of compost-influenced water into ground, except in very high intensity storm events, which would likely have very dilute amounts of nitrogen in the runoff.

179. Ms Mongillo provided plans showing 'Site layout with stormwater management features' (Figure 1); 'Typical curing and mature compost storage area SW Management features' (Figure 2); and 'Conceptual section for compost storage area stormwater management features' (Figure 3). In relation to the location of recorded springs and the headwaters of the Silverstream, she provided Figures 4 and 5.

180. Ms Mongillo provided nitrogen results for the surface water samples taken on 20 July 2017, 12 October 2017 and 23 March 2018 in Table 5. She stated that the latest data showed runoff from the compost pile was likely to have low concentrations of ammonia-nitrogen and essentially no nitrate-nitrogen or nitrite-nitrogen.

181. Ms Mongillo noted that a groundwater flow rate of 5m/day used in the PDP models was slower than the assumed hydraulic conductivity used in the Sephira contaminant modelling. She considered the estimate used in the Sephira assessments '*…is reasonable and continues to demonstrate that some discharge of nitrogen from the site is unlikely to cause adverse effects to the downgradient receptors.'*

182. Submitters were of the view that the existing mixing pad and proposed active compost pad were too small and should be increased in size given the volumes of raw material proposed. Some submitters noted the need for an engineer's report to require the entire application site to be sloped to enable efficient drainage, collection and treatment of stormwater. Some submitters considered all compost operations should be undertaken on a concrete pad as leachate is produced in all three stages of composting. Some submitters also requested that the entire site be sealed to prevent discharges occurring in all rainfall events and sufficient storage to capture runoff and leachate.

183. Submitters considered there was insufficient information to provide certainty that the proposed ASP composting process will mitigate effects of the discharge to air and the discharge onto land.

184. In her addendum to the s42A Report, Ms Wadworth highlighted that the Applicant would not be able to install an aggregate pad or concrete pad until 1 September 2018 at the earliest. She therefore recommended that no new composting materials should be brought to the site until this work is completed.

185. Ms Wadworth considered the Applicant had provided more certainty around the effectiveness of the mitigation measures, in particular the absorptive capacity of the compost, sawdust and/or bark fines. She noted that the recommended conditions included monitoring to ensure any adverse effects on groundwater and drinking water supplies will be mitigated and water quality standards will not be exceeded. She considered the potential for a discharge to occur in a one in 50 year storm event, but noted adverse effects on groundwater are unlikely given the infrequency of these events.

186. Ms Wadworth considered the Applicant had demonstrated the proposed mitigation measures were likely to be effective in mitigating adverse effects on water quality. She concluded the composting facility no longer poses a significant risk to groundwater or surface water, as long as robust and effective mitigation measures are implemented.

187. Mr Etheridge focussed on the adsorptive capacity of the compost and sawdust, as the key mitigation of groundwater effects. He noted that the assessment undertaken by Ms Mongillo indicated that there would only be a discharge to groundwater infrequently and therefore significant effects on groundwater quality were unlikely. He also noted that the absorptive capacity of the sawdust could be exceeded during wet months such as in July 2017, when 192mm of rainfall occurred, and that 0.5m of sawdust could only absorb around 130mm of this rainfall. He considered this information highlighted the need for regular checking of the sawdust material and replacement of saturated material during wet periods. Overall, he agreed with the Applicant's conclusion that the compost facility was unlikely to discharge significant contamination to groundwater, subject to implementation of robust and enforceable consent conditions which ensure adequate collection and control of runoff and leachate.

188. Mr Wylie advised that CLS had included a number of measures in the existing CMP to ensure the materials coming onto the site meet the required specifications including:
    (a) Independent laboratory testing of materials before acceptance;
    (b) Inspection of materials received at the time of delivery;
    (c) Preparation of a Compost Production Manual.

189. Mr Wylie stated the materials will be '*tested for nutrient status, including the carbon and nitrogen content as well as a heavy metal analysis; to ensure the material is suitable for composting and that the guidelines for finished compost as outlined in NZS4454:2005 can be achieved.'*

Findings

190. The Applicant proposes to operate an ASP system that follows the good practice measures outlined in the New Zealand Standard for Composts, Soil Conditioners, and Mulches (NZS4454:2005). The Applicant will continue to avoid using the northeast corner of the site for composting piles to reduce the risk of waterlogging of compost and the onset of anaerobic conditions.

191. Mr Loe could not point to the use of sawdust as a sorbent at another composting site, but he considered that the Applicant was a leading practitioner in its use and that its use onsite had been informed by assessments. We observe that the use of sawdust at the existing site has been somewhat *ad hoc* with a primary use being to attempt to absorb ponded water around the site. Nevertheless, we note that the photographs provided by submitters indicate areas of significant ponding on site continues to occur, despite 'treatment' with sawdust. This gives us little confidence. We agree with submitters that this is not a long-term solution for a site prone to surface water flooding.

192. We note that the key mitigation measures proposed are the installation of a concrete pad with runoff collection for the ASP process and the use of sawdust and bark fines to avoid ponded water and saturation of the base of the compost piles. Operating procedures to achieve consistent application of the prescribed depth and ratio of sawdust and bark material are critical to avoiding leachate discharges to groundwater from the proposal. We consider the use of sawdust as effective mitigation of groundwater impacts is untrialled for composting operations of this type; and we agree with submitters that typically such operations, particularly in circumstances where the groundwater resource is sensitive, are conducted on a largely sealed site to avoid contamination of soil and water. We hold concerns that there would be substantial difficulty in achieving the somewhat complex site management measures and self-monitoring procedures now required by the proposed conditions of consent.

193. We accept Mr Etheridge's conclusion that very robust mitigation measures are required in this case, given the nature of the source material and the high sensitivity of groundwater and surface waters to contamination. We are mindful of the concerns of submitters, including Mr and Mrs Rouse, that nitrate-nitrogen concentrations in downgradient groundwater wells are very close to exceeding the acceptable limit for drinking water. Our finding is that the mitigation measures proposed are not sufficiently robust to provide adequate certainty that significant adverse effects on water quality would not occur. Overall it is our conclusion that the potential adverse effects on water quality from the proposal before us, being based on a largely unsealed site with limited stormwater containment measures, are significant.

Air Quality Effects – Existing Composting Operation

194. The evidence of submitters indicated that odour from the existing CLS composting operation has been detected at neighbouring dwellings on numerous occasions since the activity was established on the site without authorisation. While several submitters confirmed that the intensity and frequency of odour experienced had reduced since the anaerobic piles of compost were removed in late 2017, many noted that the effects of odour are ongoing and remain unacceptable.

195. Several submitters discussed the offensive character of the odours typically experienced, noting that the odour is different from normal rural smells that might be anticipated in the local area. They noted that activities such as effluent spreading could generate significant odour, but that such effects are intermittent and infrequent. By way of contrast, submitters considered that the ongoing frequency of odours experienced from the existing composting operation is such that adverse effects are significant.

196. Mr Nikoloff noted that, because odour from the composting plant had been experienced several kilometres from the site, a large number of residents are affected in the local area. He stated that 170 dwellings have been identified within a 4 km radius of the site. Mr and Mrs Randle, and Mr and Mrs Greenwood submitted that the ongoing yet unpredictable nature of the odour experienced had impacted their ability to hold outdoor entertaining events and enjoy the rural environment. Mrs Greenwood further stated that the odour from the plant has forced her to work away from home.

197. Poor site management and inability to follow best practice measures for composting were raised by submitters as significant matters of concern. Mr Fraser raised the CLS Kainga site as an example of poor management, noting that numerous compost fires have occurred at that site in recent years. Mr and Mrs Rouse visited three other composting plants and stated that in all those cases the sites were sealed. Given the issues experienced with water ponding on the CLS site, it was submitted that sealing the site would be consistent with best practice.

198. The nature of the material to be composted at the site is a matter of concern to submitters, in relation to both the discharge of pathogens and odour. Mr and Mrs Rouse stated that the proposal includes several raw materials that have high odour generating potential when composted, including paunch grass, biosolids, grease trap waste, scoured wool fragments and egg shell waste. Mr Power and Ms Hazeldine also noted concern regarding potential health risks associated with pathogens discharged from paunch grass and biosolids.

199. The submitters questioned the reliability of odour assessments undertaken by Ms Dyer and by CRC. Given the fickle and transient nature of odours typically experienced, particularly during light wind conditions, and the response time for CRC officers to attend complaints, they highlighted the difficulties involved with substantiating odour complaints. Taking into account the subjective nature of odour assessments and the ongoing odour effects of the existing composting operation, submitters considered that any consent granted should be of short duration with review clauses that would require the Applicant to prove that adverse effects could be adequately controlled.

200. Ms Dyer stated that she had undertaken several site visits and odour surveys in relation to the CLS composting operation. Initially, these visits occurred due to a large number of complaints lodged with CRC as a result of odour from the anaerobic compost piles on site in late 2017. Ms Dyer explained that off-site monitoring occurred on 12 occasions during July 2017 to February 2018, noting that on eight of those occasions she (or her colleagues from Beca) did not detect odour.

201. Ms Dyer observed that on site, odour appears to be generated primarily by turning of compost. She stated that this finding particularly applies since the removal of the anaerobic compost piles from the northeast corner of the site was completed in December 2017. She therefore considered that turning of compost should be minimised during southerly, south-westerly and westerly wind conditions. This guidance has been included in the CMP. However, Ms Dyer noted that to maintain aerobic conditions in the windrows, it may be necessary to turn compost during 'unfavourable wind conditions'. Ms Dyer further noted that mushroom compost has been removed from the site as a potential source of odour, reducing the overall cumulative effects of odour from the CLS operation.

202. Ms Dyer stated that a total of 194 complaints were made to CRC regarding odour from the CLS site during the period 25 May 2017 to 25 January 2018. She analysed these complaints to attempt to assess the degree of improvement in experienced odour effects after removal of the anaerobic compost piles in December 2017. However, we note that only a brief period was able to be assessed prior to preparation of Ms Dyer's evidence. She pointed out

the apparent difference in character and intensity of effects identified by complainants and CRC monitoring officers, noting that the officers generally recorded less severe effects.

203. Ms Harwood considered the sensitivity of the receiving environment in relation to the proximity of the CLS operation to neighbouring properties and prevailing wind conditions. She noted that the Hazeldine dwelling is the closest to the composting site, being approximately 820m north-northwest of the site. This dwelling is downwind of the site during south-easterly winds, which Ms Harwood noted occur very infrequently at the site. She stated that other dwellings are situated approximately 1,000m or more from the CLS site.

204. Ms Harwood discussed evaluation distances for assessment of odour effects from composting facilities. She provided a list of recommended separation distances published by various Environmental Protection Authorities (EPAs) in Australia and in a discussion document on separation distances for industry prepared for Auckland Council[9]. Separation distances vary based on the size of the operation and the nature of the raw material processed. The evaluation distances analysed by Ms Harwood indicated that a separation distance in the order of 1,000m to 1,500m from the proposed CLS composting operation to dwellings would be appropriate.

205. A detailed draft compost management plan (**CMP**) has been prepared for the current CLS operation by Beca. Ms Harwood discussed the procedures required to be undertaken to control odour and dust emissions from the site. She considered that adherence to the procedures in the CMP could result in composting being undertaken on the site without causing objectionable or offensive odour effects. She further stated that the lack of offensive odour events substantiated by CRC since removal of the anaerobic piles in December 2017 demonstrates that composting can be carried out without causing such effects.

206. Ms Harwood briefly discussed the potential effects of dust discharged from the site. She stated that dust emissions are minimised by the use of water to keep the compost piles damp. She considered that the nearest dwellings are located beyond the distance from the site where dust would be expected to cause adverse effects. Ms Harwood concluded that the dust control measures incorporated in the CMP and the proposed tree shelter belt around the CLS site would be sufficient to prevent dust nuisance effects.

207. The potential health effects of bioaerosols discharged from the composting operation was raised as a matter of concern to some submitters. Bioaerosols are particles that can contain potentially pathogenic microorganisms, including bacteria and fungal spores. Ms Harwood assessed the effects of bioaerosols on neighbouring properties, based on a review of published papers. She stated that bioaerosols are most likely to be discharged when dust is discharged and thus the use of dust control measures such as water sprays and boundary vegetation is also effective in minimising the effects of bioaerosol emissions. She observed that most studies of environmental exposure to bioaerosols around composting plants found that bioaerosol concentrations decrease to near background levels within 250m of the composting operation. Overall Ms Harwood concluded that, given the separation

[9] Evidence of P. Harwood, Attachment 4.

distance to neighbouring dwellings, the risk of adverse health effects caused by bioaerosols discharged from the composting site is negligible.

208. The assessment of odour effects undertaken by Beca on behalf of the Applicant was reviewed by Mr Cudmore and Ms Nieuwenhuijsen of Golder Associates, as requested by CRC. The reviewers found the AEE had not given sufficient weight to the complaint information and appeared to dismiss the evidence of potential objectionable effects too readily, particularly in relation to the 2017 complaint period when the anaerobic piles were present at the CLS site. Mr Cudmore and Ms Nieuwenhuijsen considered that the odour survey data showed clues that there may have been times when odours from the site were far more significant than indicated by the AEE's 'less than minor' conclusion. They noted that dwellings are located downwind of the application site during drainage flow conditions, with potential for adverse effects to occur if anaerobic conditions develop in the compost. However, the reviewers observed that if the Applicant can better manage the drainage of site water and maintain all phases of compost to reduce anaerobic conditions to a minor level, then operation of the proposed site so that odour effects are minor would appear feasible given the separation from sensitive activities.

209. Ms Wadworth relied on the advice of Mr Cudmore and Ms Nieuwenhuijsen in reaching her conclusions regarding the effects of odour from the composting operation, as proposed at the time of the hearing. She considered that if the proposed composting facility continues to discharge odour causing offensive or objectionable effects, in reality the current location may not be appropriate. However, based on recommended conditions requiring improved drainage at the site, she observed that odour effects are likely to be mitigated to an acceptable level in future. We note that waterlogging of the site is a significant issue and we will discuss this further in our findings.

210. A substantial period of time has now passed since the hearing, due to the late amendments to the application and further information required, and the necessary time for responses to that new information. Further comments from several submitters state that the existing composting operation, now undertaken in accordance with the CMP, continues to cause objectionable and offensive odours at their dwellings. Mr and Mrs Randle stated they had cause to ring the CRC pollution hotline three times in the previous eight week period. Mr McBrearty stated that between 12 March and 3 May 2018, 50 complaints were received on 24 different days. Mr Brown observed that he detected odour three times at his farm office (over 2.7 km west-southwest of the site) since the hearing, with 'exceptional' odour detected on farmland closer to the application site. Mr Nikoloff, who resides at Mandeville Park Drive approximately 4 km from the site, stated that he noticed odour on 10 occasions during the previous two months, particularly during light south-westerly winds. Mr Fraser stated that Mr and Mrs Greenwood had lodged seven odour complaints during March and April 2018.

211. Submitters expressed concern regarding the ongoing ponding of stormwater on site and the difficulty in removing this water. Mr and Mrs Rouse provided photographs of the site from 12 April and 1 May 2018 that show extensive ponding of water across the application site. Their site visit on 12 April occurred after 75mm of rainfall and they observed that the waste receiving pit was covered in water. Mr and Mrs Rouse re-iterated that the site should be sealed in the manner that typically occurs at other composting sites, whereby

stormwater can be collected and treated without risk of ponding and waterlogging of the compost.

212. The CRC odour complaints history for the site between 9 March and 30 April 2018 was provided by Ms Wadworth, as an attachment to her addendum to the s42A Report. In addition, she provided a proactive monitoring report from CRC for the period 5 April to 13 April 2018.

213. Neither Ms Wadworth nor Ms Nieuwenhuijsen provided analysis of the recent complaints record or the proactive monitoring information, in terms of the degree of adverse effects experienced by residents living nearby the application site. Ms Wadworth stated that 22 complaint events were investigated during the 9 March to 30 April period, with four events being substantiated with written warnings issued in relation to the Abatement Notice for the site. The extent to which Ms Wadworth took into account the recent complaints and monitoring information in reaching her recommendation to grant consent to the existing composting operation is unclear in her addendum report.

214. Ms Dyer's response to the updated s42A Report included an analysis of the recent complaints record and proactive monitoring by CRC officers. She noted that one of the incidents (on 24 March 2018) where a written warning was indicated had not been recorded correctly and no warning was in fact issued. Consequently, there were three events between 9 March and 30 April where CRC monitoring officers substantiated odour in breach of the Abatement Notice applying to the CLS site and written warnings were issued.

215. Ms Dyer's response was somewhat dismissive of the odour complaints made by residents. In her statement of response, she noted that '*complaint records indicate the odours detected by complainants continue to be of a greater perceived intensity and offensiveness than those detected by the CRC officers.'*[10] She also noted that '*CRC officers have received a number of odour complaints from residents located to the east of the site during northerly winds. The residents would be upwind during these conditions and any odour emitted from the site, would be apparent to the south boundary of the site*'.[11] Ms Dyer was also critical of the monitoring approach taken by CRC officers, particularly in relation to monitoring downwind of the site during windrow turning at locations where there are no dwellings. We have considered Ms Dyer's comments when analysing the information in the complaints record and proactive monitoring report.

Findings

216. The effect of odour discharged from the existing composting operation is a primary issue that has required our careful consideration when evaluating this proposal. The assessment of odour impact is complicated by the somewhat subjective analyses undertaken by the experts and submitters and by the need to differentiate between effects observed during 'upset conditions' when anaerobic piles were present in 2017 and 'normal conditions' in 2018 when windrow composting is occurring as proposed (prior to any aerated static pile system being developed).

[10] Michele Dyer Statement of Response to S42A Addendum, dated 31 May 2018, para 23.
[11] Ibid, para 26.

217. In their review of the application, Mr Cudmore and Ms Nieuwenhuijsen observed that if CLS can better manage the drainage of site water and maintain all phases of compost to reduce anaerobic conditions to a minor level, then operation of the proposed site so that odour effects are minor would appear feasible given the separation from sensitive activities. However, we note that these comments were based on limited information because at the time of the hearing, odour complaint records were only available for a brief period of time since the removal of anaerobic compost piles in December 2017. The March and April 2018 complaints record and the CRC proactive monitoring report were not available at the time of the hearing and Ms Nieuwenhuijsen has not commented on or reviewed that information. Furthermore, the photographic evidence from submitters indicates that management of stormwater on the site continues to be an issue and there remains uncertainty as to whether waterlogging of compost (and subsequent onset of anaerobic conditions) could be prevented under the current proposal for managing stormwater. We therefore find that we are able to apply only limited weight to the conclusions of the expert odour reviewers for CRC in terms of potential odour impact.

218. The evaluation distances discussed by Ms Harwood indicated that a separation distance in the order of 1,000m to 1,500m from the CLS composting operation to dwellings would be appropriate. Ms Harwood argued that an evaluation distance closer to 1,000m would be appropriate, while Ms Wadworth concluded that an evaluation distance of 1,500m would be more consistence with the guidance documents. We have reviewed this information and, taking into account the nature of raw materials processed and the proposed scale of operation, find that an initial evaluation distance in the order of 1,500m is appropriate.

219. We note that the nearest dwelling (Hazeldine) is approximately 820m to the northwest of the site and other dwellings are in the order of 1,000m to the northeast of the site. We accept the evidence of Ms Harewood that south-easterly winds are infrequent at the application site and thus the potential for odour exposure at the Hazeldine dwelling is limited. However, we find that there is potential for frequent odour exposure at dwellings to the northeast of the site during south-westerly winds and also at dwellings to the east of the site (Harrs Road area) during westerly drainage flow conditions. We observe that the evaluation guidance provides only an indication of the potential distant of effect and assumes that composting occurs in accordance with good practice procedures. The evidence we have received, our site visit observations, the odour complaints record and the compliance monitoring information indicate that good practice measures are unlikely to be consistently achieved. We note that numerous odour complaints have been received (including during the March to April 2018 period) from residents well over 1,500m from the site. Even under current operation, conducted according to the CMP procedures the Applicant has stated are now applied at the site, a substantiated strong odour was detected by an CRC compliance officer approximately 2.4 km from the site (the 11 April 2018 event discussed below).

220. We accept there are significant difficulties associated with compliance monitoring of odour for this type of discharge activity. The nature of odour detected at one location is often fickle and transient. There is a significant response time between a complaint being made and an CRC officer attending the area, even if the officer is available to respond immediately. During very light wind conditions, when dispersion is poor and odour is often

strongest, the location of impact can vary and reporting of wind direction becomes unreliable. In addition, the sensitivity of individuals to odour varies substantially. We are aware of the frustration expressed by submitters who, based on the evidence, have been subjected to ongoing odour effects for the past thirteen months. Overall, we found the evidence from submitters regarding odour effects to be reasonable and measured. Further, given the monitoring difficulties outlined above, we consider that there is a reasonable level of alignment between odour complaints and the observations by CRC compliance officers. We have therefore applied little weight to the comments by Ms Dyer and Mr Cleary that submitters' record of odour impacts is unreliable.

221. We have carefully examined the odour complaints record for 9 March and 30 April 2018 provided by Ms Wadworth, and the proactive monitoring report prepared by CRC for 5 April to 13 April 2018. On 6 April at 8:19am, a CRC compliance officer substantiated odour from CLS at strength '4' (on a scale where 6 is the strongest) on Diversion Road to the east of the site. CRC received complaints on the same day at 8:30am and 8:58am from residents at Harrs Road (further to the east of the site) who described odour strengths of '2' and '3' in conditions of no noticeable wind. On 10 April at 7:45am, a CRC compliance officer observed odour from CLS at strength '3' on Diversion Road, to the northeast of the site. CRC received complaints later on the same day at 1:05pm and 1:14pm from residents at South Eyre Road (further to the northeast of the site), with one complainant describing an odour strength of '4-5' in southerly wind conditions. An officer was unable to attend these complaints.

222. On 11 April at 7:46am, a CRC compliance officer observed odour from CLS at strength '2' on Diversion Road to the northeast of the site, then at 8:05am observed odour at strength '2' at South Eyre Road to the northeast of the site, then at 8.39am observed odour from CLS at strength '5' at the intersection of Harrs Road and South Eyre Road, approximately 2.4 km northeast of the site. CRC received complaints on the same day at 8:19am, 5:50pm and 6:18pm. These complainants were located at South Eyre Road (to the northeast of the site). They reported odour at observed strength of between '3' and '5' under strong south to southwest wind conditions.

223. We consider that the proactive compliance monitoring undertaken by CRC has been helpful in assessing the extent of odour effects occurring while windrow composting is undertaken according to the proposed CMP procedures for the existing operation. We note there is good consistency between odour complaints and the observations by CRC monitoring officers, bearing in mind the often fickle nature of odour impacts at a single location and the difficulties we have identified. We find that there is sufficient evidence from monitoring during the March to April 2018 period to indicate that windrow composting at the CLS site is continuing to cause significant adverse odour effects at neighbouring dwellings. We have taken into account the FIDOL (frequency, intensity, duration, offensiveness and location sensitivity) factors when reaching this conclusion.

224. At the hearing, Ms Harwood stated that she considered that adherence to the procedures in the CMP could result in composting being undertaken on the site without causing objectionable or offensive odour effects. She further stated that the lack of offensive odour events substantiated by CRC since removal of the anaerobic piles in December 2017 demonstrates that composting can be carried out without causing such effects. We find that the odour complaint and monitoring record since the hearing does not support that

conclusion. We consider that the Applicant has had more than sufficient time to instigate improved composting procedures and has failed to demonstrate that objectionable and offensive effects can be avoided.

225. Ms Wadworth in her s42A Report relied on the advice of Mr Cudmore and Ms Nieuwenhuijsen in reaching her conclusions regarding the effects of odour from the composting operation, as proposed at the time of the hearing. She considered that if the proposed composting facility continues to discharge odour causing offensive or objectionable effects, in reality the current location may not be appropriate. Given the ongoing odour effects experienced by local residents and the continued waterlogging of the site, we agree that this site may not be appropriately located for windrow composting on an unsealed surface.

226. Waterlogging of the site, as highlighted by submitters, is an issue of relevance to odour emissions from the compost. Mr Cudmore and Ms Nieuwenhuijsen noted that dwellings are located downwind of the application site during drainage flow conditions, with potential for adverse effects to occur if anaerobic conditions develop in the compost. The reviewers and Ms Harwood observed that if the Applicant can better manage the drainage of site water and maintain all phases of compost to reduce anaerobic conditions to a minor level, then operation so that odour effects are minor, would appear feasible given the separation from sensitive activities. However, the odour monitoring record for March and April 2018 and the degree of ponding on site evident after only moderate rainfall, indicate a low probability that this goal can be achieved by use of sawdust and a thrasher pump as proposed.

227. The submitters discussed the offensive character of the odour typically experienced from the composting operation, noting that the odour is different from normal rural smells that might be anticipated in the local area. It was accepted that activities such as effluent spreading could generate significant odour in the rural area, but that such effects are intermittent and infrequent in nature. However, we agree with the submitters that the ongoing frequency and nature of odours experienced from the existing composting operation in 2018 (after removal of the anaerobic piles in the northeast corner of the site) is such that adverse effects are significant.

228. Submitters, including Mr and Mrs Randle, and Mr and Mrs Greenwood submitted that the ongoing, yet unpredictable nature of the odour experienced from the CLS site, had impacted their ability to hold outdoor entertaining events and enjoy the rural environment. Mrs Greenwood also stated that the odour from the operation has forced her to work away from home. We accept that submitters have experienced significant adverse effects caused by the existing unauthorised composting operation. However, it is not our role to be punitive and we have reached our decision based on the application before us.

229. In his closing submissions Mr Cleary was, in our view, unjustifiably dismissive of the Greenwoods' submission[12]. He observed that '*no logical or objective reason has been provided as to why their experience should be so different to other neighbours, whom one would expect to be impacted to a similar degree. Nor has any logical reason been provided*

[12] G Cleary, Submissions in Reply, para 2.4

to explain why the Greenwoods complain about experiencing odours at times when absolutely nothing is occurring on the site (i.e. evenings and at night).' We observe that the Greenwood dwelling is located approximately 1,260m to the northeast of the site, downwind of the site during prevalent south-westerly winds. We also note that personal sensitivity to odour varies and the frequency of impact will be influenced by the amount of time individuals spend at home. Further, we observe that onset of anaerobic conditions in compost and also storage of mushroom compost on site up until February 2018 could cause significant odour at times when there is no operational activity on the CLS site.

230. Mr Cleary went on to submit that there is no proper explanation as to why the Greenwoods' assessment of the level of effect differs so markedly from the objective findings of either Ms Dyer or all of the compliance monitoring staff at CRC. For the reasons already discussed, we are able to apply only limited weight to the evidence of Ms Dyer and consider there is a substantial degree of subjectivity involved in her assessment. It is not uncommon for perceived odour intensity to vary among individuals and for substantial changes in the location of impact to occur under light wind conditions. The proactive monitoring undertaken by Mr Dougherty and his CRC compliance monitoring team in April 2018 indicates good correlation with complaints (given the practical difficulties associated with odour monitoring), including those originating in the South Eyre Road area where the Greenwoods reside. The monitoring in March and April identified three odour events where a breach of the Abatement Notice occurred and written warnings were issued. Consequently, we do not accept Mr Cleary's opinion in regards to the Greenwoods' submission.

231. Mr Cleary submitted in closing that – '*It is the unanimous view of all relevant experts that the Applications can be granted under the framework provided by the relevant Regional Plans. Significant, if not exclusive, weight should therefore be given to this expert consensus in deciding whether or not the effects of the composting operation can be appropriately managed to the level considered acceptable by these Plans.'*

232. As we have discussed during our evaluation of odour effects, the opinions of the various experts are qualified based on several significant factors, including the effective implementation of mitigation measures, following procedures in the CMP, and preventing waterlogging so that anaerobic conditions do not develop in the compost. Based on the recent odour complaints record and the proactive monitoring undertaken by CRC compliance officers, we are not convinced that those qualifying factors could be achieved by a windrow composting operation at this location on an ongoing basis. Overall, we find that windrow composting of the proposed materials at the application site is likely to continue to cause objectionable and offensive effects of odour at neighbouring dwellings.

233. The potential effects of dust discharged from the site were assessed by Ms Harwood. She concluded that the nearest dwellings are located beyond the distance from the site where dust would be expected to cause adverse effects. Ms Harwood observed that standard dust control measures could be implemented, including maintaining a tree shelter belt around the application site, to prevent dust nuisance effects at neighbouring sensitive receptors. Bearing in mind the large separation distance to those receptors, we accept her conclusions regarding dust effects. We note that the photographs of dust emissions from the site indicate that the degree of dust control applied to the existing operation appears to have

been limited. Nevertheless, we find that improved controls, including the use of water cart and sprinklers, could be applied to a composting operation on the site such that adverse effects of dust would be no more than minor.

234. We have considered the potential health effects of bioaerosols discharged from the composting operation. Ms Harwood assessed the effects of bioaerosols on neighbouring properties, noting that bioaerosols are most likely to be discharged when dust is discharged and thus the use of dust control measures such as water sprays and boundary vegetation is also effective in minimising the effects of bioaerosol emissions. Her review of studies of environmental exposure to bioaerosols around composting plants found that generally bioaerosol concentrations decrease to near background levels within 250m of a composting operation. We have also had regard to the comments of Ms Nieuwenhuijsen and the evidence she referenced from Dr Kelly (a health effects expert) in relation to bioaerosol emissions from the Southern Horticultural Products Limited composting operation. We find that, taking into account the separation distance of over 800m to neighbouring dwellings and assuming that appropriate dust control measures are applied, the risk of adverse health effects caused by bioaerosols discharged from the composting site is less than minor.

Air Quality Effects – Proposed Aerated Static Pile Composting Operation

235. The late amendment of the proposal to an aerated static pile (ASP) method raises the issue of potential odour effects of the revised proposal, relative to odour effects of the windrow composting operation. The Applicant now proposes that the ASP would be located on a 1,000m^2 concrete pad, with aerated composting in the active phase occurring for a minimum of six weeks. It is proposed that the ASP composting would be undertaken in a manner similar to that used by SFF at their Belfast composting operation that was recently closed. The ASPs would not be turned during the active phase and continuous temperature monitoring of the aerated piles is proposed. An insulating layer would be formed over the static piles from a layer of finished compost, acting as a biofilter to reduce odorous emissions.

236. While some submitters were supportive in principle of the proposed change to an ASP operation, they expressed concern that insufficient information had been included to provide any certainty regarding the effects of the new proposal. Several submitters considered that the site should be sealed (not just the ASP pad) and provided calculations indicating that the 1,000m^2 pad is too small for the scale of the proposed operation. They noted that an updated CMP had not been provided and that the success of the proposed mitigation measures remains unproven. Overall submitters expressed concern at the 'trial and error' nature of the composting on site to date and of the application itself. Some submitters raised concern that the operation, as amended, could continue to discharge dust and particulate matter, including pathogens into the air. Mr Dodds was concerned that bioaerosols and gases could cause adverse health effects and trigger conditions such as asthma or cause Legionnaires disease.

237. In her addendum s42A Report, Ms Wadworth discussed the potential effects of the amended ASP composting process now being proposed. She stated that Ms Nieuwenhuijsen had reviewed the further information regarding the ASP method and in summary advised the following:

> *'a. There is insufficient assessment of the new ASP method, including its potential for adverse odour effects, to enable a review of the change to the application.*
> *b. For the system originally proposed, the mechanical turning of the piles provided aeration for the first few weeks of active composting and oxygen monitoring was proposed. For the ASP system, there is no turning and while information has been provided describing the structural design of the ASP, there is no information on the air flow, in pile oxygen monitoring or how it will be ensured that aerobic conditions are measured or maintained (either for the runoff/leachate water or throughout the compost piles).*
> *c. Furthermore, there is no information about the amount of air required by the compost and the ability of the fan to provide it.*
> *d. There is no turning of the ASP and this will eliminate offsite odour effects from this activity, but the potential for anaerobic/odorous conditions to occur and the potential odour effects of the revised method have not been evaluated.*
> *e. Regarding the solids from meat and milk processing wastewater treatment an age limit on this material (24 hours maximum) should be specified and also that it will be premixed with the paunch grass immediately on receipt.'*

238. Ms Wadworth stated that given the limited information and limited assessment of potential adverse effects arising from the ASP process provided by the Applicant, her recommendation was that, if consent is granted, the composting operation should maintain the turned windrow process of composting. However, she attached a set of conditions for the ASP process to her addendum, should we decide that consent could be granted to the amended proposal.

239. Ms Dyer attempted to address Ms Wadworth's and Ms Nieuwenhuijsen's concerns regarding the adequacy of assessment of effects for the ASP process in her further statement of evidence. She stated that the ASP process would be carried out in accordance with the New Zealand Standard for Compost, Soil Conditioners and Mulches NZ4454:2005 (Composting Standards). She considered that the ASP process would give the Applicant more control over the active stage of the composting, reduce the likelihood of anaerobic conditions forming within the piles, remove the need for turning piles in the active stage, offer consistent airflows through the material, and allow for constant measurement of the temperature within the piles. Ms Dyer observed that this would minimise the potential for odour to be generated during the active stage of composting.

240. In her response to the addendum s42A Report, Ms Dyer noted that the decomposition rate (and therefore the highest potential for odour generation), is highest in the earliest stages of the composting process. She observed that by adopting an ASP process the most active stages of decomposition occur within a static pile and are not disturbed, which avoids the potential for odour from the turning process. Ms Dyer also provided some technical details regarding the operation of the proposed ASP process, in reply to the issues raised by Ms Nieuwenhuijsen. She stated that the Bioblend Operations Manual, supplied by SFF, would be modified and adapted to suit the details of the CLS system. She referred to the success of the upgrade from windrow composting to an ASP process formerly undertaken at SFF Belfast, as discussed in the evidence of Mr Jemmett.

241. Ms Dyer considered that the proposed upgrade to an ASP process would further reduce the potential for odour nuisance caused by the CLS site. She recommended that the current CMP be amended to include the Bioblend Operations Manual and also specific measures to control odour from the proposed runoff collection tank for the ASP pad. Ms Dyer concluded that the proposed change to an ASP system reduces the potential for odour nuisance

beyond the application site boundary. However, she did not specifically assess the extent of adverse odour effects expected to occur if the revised proposal proceeded, relative the extent of adverse effects that currently occur.

Findings

242. We accept the evidence that, at least theoretically, change from the current windrow composting process to an ASP process would be expected to result in a reduction in the adverse effects of odour discharged from the application site. However, we share the concerns of Ms Nieuwenhuijsen and the submitters regarding the limited information supplied and the inadequacy of the assessment of odour effects of the revised proposal. We have not been provided with an updated CMP and do not have any expert evidence on the degree of reduction in odour impacts relative to the original proposal. The proposed ASP system has not been trialled by CLS and it is reasonable to expect that some odour issues could occur during the establishment phase while operating parameters (such as airflow rate, raw material mixing ratio, pile size) are being refined. We are mindful of the submitters concerns regarding the 'trial and error' nature of the proposal.

243. Based on the evidence before us, we have determined that the windrow composting system as proposed at the hearing would likely result in ongoing objectionable or offensive odour effects beyond the application site boundary. We consider we do not have sufficient information before us to determine if the revised proposal to an ASP system will reduce adverse odour effects experienced by CLS's neighbours to a level that is acceptable. Careful process and site management would be required to implement such a proposal successfully, bearing in mind the potentially odorous nature of the raw material and the ongoing issues with stormwater management at the site. The last-minute nature of the ASP proposal is such that the system design appears to be evolving reactively and rapidly with limited detail provided regarding process management and monitoring. We have not been provided with an updated CMP and air quality experts have not reviewed the revised proposal. Given these issues, we are unable to be satisfied that the changes as proposed would be able to be implemented to achieve acceptable adverse effects of odour beyond the application site.

244. We have considered the evidence of Mr Jemmett for SFF and found his submission helpful. His evidence was that SFF was able to achieve a significant reduction in odour nuisance effects caused by the former Belfast composting plant after an ASP process with proper management was established. We accept that the Bioblend operations manual would be a useful source of information for development of an ASP system specific to the CLS site. However, there are clear differences between the two sites in terms of potential feedstock materials (bearing in mind the full range of raw materials proposed) and site management requirements, particularly in terms of drainage and stormwater management. While our decision is not punitive in relation to the adverse effects of unauthorised composting occurring on the CLS site, we are mindful that the ongoing poor site and process management practices, evidenced by continued odour nuisance effects, do not contribute to confidence regarding the Applicant's ability to adequately manage a revised composting process. Given the limited detail and assessment provided for the ASP system, we consider that there is a significant risk that allowing the proposed change could result in ongoing odour nuisance for neighbouring residents.

245. Our concerns regarding the ability of the Applicant to adequately operate an ASP process also extend to the issue of ponding on the site and the risk of waterlogging of compost that could result in anaerobic conditions developing. The submitters expressed concern that the proposal does not involve sealing of the site or proper stormwater management, and provided calculations indicating that the proposed 1,000m^2 concrete pad is too small for the ASP operation. We have reviewed these calculations and accept that the proposed pad appears to be inadequately sized based on the proposed volume of compost to be processed.

246. We observe that the proposed use of sawdust to absorb stormwater has limitations, as indicated by ongoing ponding issues at the site, and that there is an ongoing risk of waterlogging of compost piles during wet conditions. We accept the evidence of Ms Nieuwenhuijsen that such waterlogging can contribute to the onset of anaerobic conditions with resultant odour impacts. Flooding of the receival pit/mixing bin, as indicated by the submitters' photographs, also poses serious issues for site management and odour generation in the need to store raw materials until ponded water is drained or removed. We find that the proposal to continue to conduct composting operations, in the manner described, on a largely unsealed site at this sensitive location poses significant risk of offensive or objectionable odour effects at neighbouring properties. The recurrence of anaerobic conditions in compost piles could potentially result in a repeat of the significant adverse odour effects experienced by submitters in 2017.

247. Theoretically, it may be that a new application for an ASP process at this site that included appropriate site sealing and stormwater management, along with a comprehensive CMP and assessment of odour effects, could demonstrate that off-site adverse effects could be managed to an acceptable level. However, that is not the situation we are faced with under the current proposal. Overall, taking into account all the evidence before us, we are not satisfied that the proposed ASP composting operation could be consistently operated in a manner that did not cause significant odour effects beyond the application site boundary.

248. We have discussed our findings regarding the potential effects of dust and bioaerosols in relation to the existing windrow composting operation. These conclusions are also applicable to the proposed ASP composting process. We find that either of these composting systems could be undertaken in a manner that does not cause dust nuisance effects or adverse health effects, given the separation distance from sensitive receptors.

Overall Conclusion on Environmental Effects

249. We find on the basis of the evidence before us, that the existing composting operation is causing significant adverse odour effects beyond the application site boundary; and is likely to be resulting in significant adverse effects on groundwater and surface water quality downgradient of the site. We agree with Mr Loe that we (and submitters) have had the benefit of assessing actual environmental effects of the existing operation. Overall, we find the existing operation is having unacceptable adverse effects on air and water quality.

250. We find on the basis of the evidence before us, that there is insufficient information to adequately assess the air quality effects of the proposed ASP operation. We find that the mitigation measures proposed to avoid and mitigate adverse effects on water quality are

likely to be insufficient in providing adequate protection of water quality, given the highly sensitive nature of the receiving waters to additional nitrogen inputs.

Section 104(1)(ab) Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment offset or compensate for any adverse effects on the environment that will or may result from allowing the activity

251. No relevant measures were identified by any party for our consideration under s104(1)(ab).

Section 104(1)(b) Relevant objectives and policies

252. An analysis of the relevant provisions of the National Policy Statement for Freshwater Management (NPS-FM), the National Standards for Sources of Human Drinking Water (NZSDW), the Canterbury Regional Policy Statement (RPS), the Canterbury Air Regional plan (CARP) and the Land and Water Regional Plan (LWRP) was provided in the s42A Report and on behalf of the Applicant by Mr Loe. We note that these analyses were undertaken in relation to the existing composting operation. We outline our findings based on the evidence before us below.

Freshwater Management (NPS-FM)

253. We noted the relevance of Objective A1 of the NPS-FW and the view of Ms Wadworth that the existing operation is not consistent with the objective because the adverse effects on water quality are likely to be more than minor. However, she considered the proposed ASP system could be operated in a way that would avoid significant adverse effects on water quality. She concluded the proposal could therefore be consistent with Objective A1 of the NPS-FW with the imposition of conditions.

254. Mr Loe did not comment on the provisions of the NPS-FW.

255. We agree with Ms Wadworth that the existing operation is not consistent because the adverse effects of the discharge of contaminants on groundwater are significant given the sensitivity of groundwater and surface water downgradient of the site, and the proximity of the discharge to groundwater and the headwaters of Silverstream. We consider that given the sensitivity of the receiving environment to additional inputs of nitrogen, the proposed ASP system would need to be undertaken in order to avoid and mitigate any adverse effects on water quality. In our view, the proposed use of sawdust beds and the details provided regarding stormwater containment and collection are insufficient to ensure significant adverse effects are avoided or mitigated, to the greatest extent practicable.

256. While we agree with Mr Cleary that the RMA is not a 'no effect' statute, we consider there is an overarching duty to avoid, remedy and mitigate significant adverse effects. Given the location of the discharge and the highly sensitive nature of the receiving waters to further nutrient contamination, we consider any new activity must be required to avoid, as far as practicable, any further decrease in water quality and any cumulative effects. In this case,

we accept the evidence of Mr Etheridge that even a small relative increase in nitrogen inputs (compared to total inputs) could have a significant effect on the receiving waters. We are not satisfied that the mitigation measures proposed for stormwater management provide a sufficient level of protection to safeguard the life-supporting capacity of freshwater or the health of people and communities, as required by Objective A1. We therefore find the application is contrary to this objective.

National Environmental Standard for Sources of Human Drinking Water (NESDW)

257. Ms Wadworth considered the existing operation is not consistent with the NESDW because the potential adverse effects on drinking water quality have been assessed as more than minor. However, she considered the proposed operation could be consistent with the proposed mitigation and the imposition of conditions.

258. Mr Loe did not consider the NESDW.

259. We accept the evidence presented by Mr Etheridge and submitters that drinking water wells downstream are extremely close to breaching the limits of the NESDW for nitrate-nitrogen. We consider this application has the potential to increase levels of nitrate-nitrogen in groundwater drinking water wells downgradient. We do not accept this risk has been adequately addressed in the proposed application given the high sensitivity of the receiving environment and the potentially significant impact of even a small increase of nitrogen contamination. We find the application is contrary to the NESDW.

Canterbury Regional Policy Statement (RPS)

260. In terms of the RPS provisions in relation to water quality, we have considered Objectives 7.2.1, 7.2.2 and 7.2.4, and Policies 7.3.6, 7.3.7 and 7.3.13 of Chapter 7 (Fresh Water). We note that Objective 7.2.2 requires the maintenance of high quality water and the improvement of water quality where it is degraded; and the restoration or enhancement of degraded fresh water bodies. The existing operation is contrary to this objective. There is insufficient information to ensure the proposed application will not further degrade water quality. We agree with Mr Loe that the that the existing degraded water quality needs to be addressed through a holistic approach reducing nutrient discharges across the zone to improve water quality over time. However, we consider it is contrary to the intent of the policies, when read together, to allow for increased contamination in degraded water or for new activities to potentially cause water quality standards to be breached.

261. In terms of the RPS in relation to air quality, we have considered Objectives 14.2.1 and 14.2.2, and Policies 14.3.3 and 14.3.5. Overall, we consider the application is contrary to Objective 14.2.2 because the evidence before us demonstrates the CSL composting operation has caused, is causing, and is likely to continue to cause, significant adverse effects on the surrounding community's social and amenity values. Objective 14.3.3 requires us to set standards, conditions and terms for discharges of contaminants into air to avoid, remedy and mitigate localised adverse effects on air quality. We consider there is insufficient information on the proposed operation and any likely reduction in adverse effects to set standards and conditions that will adequately protect localised air quality.

262. We have also considered Policy 19.3.1 relating to waste management and minimisation, as set out by Mr Loe. We find the application is consistent with this policy.

Canterbury Air Regional Plan (CARP)

263. Mr Loe outlined the relevant objectives and policies of the CARP noting the emphasis on appropriate location and avoiding localised effects of a discharge to air, thereby protecting amenity values. He considered that the evidence of Ms Dyer and Ms Harwood, and the assessments of Mr Cudmore and Ms Nieuwenhuijsen, support the operation as being capable of avoiding localised effects that might impact amenity values. We note that the conclusions of those experts are contingent on a range of mitigation measures being effectively implemented.

264. Ms Wadworth outlined the relevant objectives and policies of the CARP. She concluded that, provided the mitigation measures were adhered to and the location of the application site is considered appropriate, the application is consistent with the provisions of the CARP.

265. We have considered Objective 5.2, 5.5, 5.6 and 5.7, and Policies 6.1, 6.5, 6.6, 6.14, 6.20 and 6.22B. While it is agreed that the Applicant should theoretically be able to avoid adverse effects on the health and well-being of the surrounding community, and to maintain amenity values of the receiving environment, we find the Applicant has not demonstrated it can do so. We do not accept that implementation of an updated CMP will avoid offensive and objectionable adverse effects beyond the site boundary. The Applicant has demonstrated that the separation distance between the operation and the surrounding dwellings is not sufficient to avoid adverse odour effects. We have insufficient information to assess the likely reduction in odour from the proposed ASP operation. Overall, we find that the application is not consistent with the objectives and policies of the CARP.

Land and Water Regional Plan (LWRP)

266. Mr Loe outlined the relevant objectives and policies of the LWRP and the potential for adverse effects on water quality. He considered that the Applicant would undertake the operation in accordance with best practice methods to avoid any actual or potential adverse effects on groundwater. He said the effects on water quality and mitigation measures to avoid adverse effects on groundwater had been assessed in the AEE and by Ms Mongillo. He outlined Schedule 8 water quality limits to be achieved in surface water by 2030 for the Waimakariri Zone (in the absence of catchment-specific limits) and noted monitoring in the Silverstream catchment by CRC in 2015 indicated these limits were met. He considered the effect of the operation would be negligible given the measures proposed to avoid discharge to groundwater.

267. Ms Wadworth outlined the relevant objective and policies of the LWRP in her s42A Report. She concluded that the existing operation is not consistent with the key provisions due to potential adverse effects on drinking water supplies, and existing groundwater and surface water quality (the Silverstream). She considered the proposed mitigation measures were unlikely to mitigate adverse effects to an acceptable level. However, she considered that the proposed operation could be consistent with the LWRP provisions with the mitigation proposed and the imposition of conditions.

268. We have considered Objective 3.8A and 3.24, and Policies 4.4, 4.7, 4.8A, 4.8B, 4.14 and 4.23 and find that overall the existing operation does not adequately protect drinking water supplies, or groundwater and surface water quality. We find that the mitigation measures and conditions proposed for the ASP operation do not provide sufficient certainty that groundwater and surface water quality will be protected.

Findings

269. We confirm we have considered the all of the objectives and policies of the above statutory documents in making our determination.

270. Overall, we find that the application is either inconsistent with or is directly contrary to the key objectives and policies of the NPS-FW, NESDW, RPS, LWRP and CARP that seek to protect air and water quality from significant adverse effects of allowing the activity.

Section 104(1)(b) Other matters

271. We requested a copy of the lease agreement for the application site. The Applicant advised that the lessors did not wish to make a copy of the agreement public. The Applicant asked that we request specific details of any relevant matters under s104-105 of the Act. We found this unhelpful and obstructive. The Applicant could have sought a protection order under s42(2), as was sought for the source of the raw material information. We consider a copy of the lease agreement is relevant to the determination as it gives certainty to the terms and conditions of the formal agreement with the land owner to undertake the existing activity and the proposed activity. However, ultimately, this matter has carried little weight given our findings on environmental effects.

272. Ms Wadworth considered the Applicant's compliance history at the Kainga site and the environmental effects of the existing operation at the application site over the last 18 months were relevant matters. We have not scrutinised the Applicant's compliance at the Kainga site in making our determination, but accept the evidence of submitters that the activities at Kainga indicate the fire risks associated with composting. We have separated our consideration of the existing operation and the proposed ASP operation due to the need for retrospective consent and consent for the proposed activities.

273. We have considered the Waste Minimisation Act (2008) (**WMA**) and the New Zealand Waste Management Strategy (MfE 2010), as set out by Mr Loe. We note the purpose of the WMA is to encourage a reduction in the amount of waste generated and disposed of in New Zealand to protected the environment from harm and to provide environmental, social, economic and cultural benefits. We do not consider the application adequately protects the environment from harm, nor does it provide environmental and social benefits for the surrounding community. We accept it provides wider social benefits by diverting waste streams from landfill and economic benefits to the Applicant and businesses it services.

Sections 105 and 107

274. Mr Cleary addressed section 105 matters. In relation to the discharges into air, he noted that the application site and surrounding environment is rural in character and, as such cannot be considered a pristine environment free of typical rural effects such as noise and odour. He considered that the 4 ha rural blocks to the northwest and northeast along South Eyre Road have a moderate-high sensitivity to odours, under the MfE guidelines. He noted the nearest 'sensitive activity' under the Air Plan is the rural-residential community at Mandeville approximately 3.5 km away.

275. In relation to the discharges into groundwater, Mr Cleary stated there was *'a degree of sensitivity associated with the site given its location within the Ashley-Waimakariri Nutrient Allocation Zone*'. He noted this did not mean further discharges are prohibited and highlighted water quality limits in the LWRP for the groundwater zone were currently being met.

276. Mr Cleary noted that other locations had been considered and alternative methods such as fully enclosing the composting process were not appropriate or practicable. He stated the current operation (as amended) is the best practicable option for CLS.

277. Mr Etheridge considered the groundwater catchment was highly sensitive to additional nitrogen inputs and had a low level of tolerance for any increases. He considered this increased the need to ensure any additional nitrogen contamination is avoided.

278. Ms Wadworth considered the surface water and groundwater receiving environment is highly sensitive to any additional discharge of nutrients. She considered the receiving environment surrounding the application site is moderately to highly sensitive to odour discharges.

279. Ms Wadworth noted the Applicant had considered alternative methods of discharge and discharge to alternative receiving environments for the air discharge and the land discharge.

280. In relation to the existing operation, Ms Wadworth considered the effects on groundwater quality were likely to be more than minor, but noted there is too much uncertainty to determine whether the proposal will cause any of the issues covered by section 107(1)(f) and (g). In her addendum, she concluded that the adverse effects could be minor with the mitigation proposed and the imposition of conditions.

Findings

281. We consider sensitivity of the receiving environment is a key consideration in relation to water quality effects. We accept the evidence of Ms Wadworth and Mr Etheridge that groundwater and surface water quality in the area are highly sensitive to additional nitrogen inputs. We note that surface water quality is already degraded to a level where breaches of water quality standards could be caused by even relatively small additional inputs. We note that nitrate-nitrogen levels in downgradient drinking water wells are extremely close to exceeding drinking water standards. We agree with Ms Wadworth that there is too much

uncertainty to determine whether the application will cause any breaches of s107(1), but highlight the evidence of Mr Etheridge that small increases of nitrate-nitrogen and ammonia-nitrogen could have significant adverse effects on fish and the life-supporting capacity of the Silverstream.

282. While we agree with Mr Cleary that the discharge of contaminants, onto land in circumstances where contaminants may enter water, is not a prohibited activity, we consider the highly sensitive nature of the receiving environment to additional nitrogen contamination requires the Applicant to avoid any further decrease in water quality as a result of the proposed activity.

283. We agree with Ms Wadworth and Mr Loe that the receiving environment in terms of air quality effects, is moderately to highly sensitive to odour effects.

284. We accept that other alternatives such as enclosing the operation and sealing the operating area have been considered by the Applicant and rejected on the basis of cost. However, we find that such measures, particularly in relation to sealing and stormwater management, may well be required at this location to ensure adverse effects on air and water quality are avoided, remedied and mitigated, and that potentially significant effects are avoided.

Part 2 of the Act

285. Ms Wadworth undertook a brief Part 2 analysis in the s42A Report. She considered the existing operation was not consistent with section 6(a) and 6(e), and section 7(b) and 7(d) without further certainty around the level of effects on water quality and mitigation measures. However, in her addendum, she concluded the proposed operation could be consistent with section 6 matters with the mitigation measure proposed and the imposition of conditions.

286. Mr Cleary agreed with Ms Wadworth that there was no need to revert back to Part 2 matters, as relevant considerations are encapsulated in the regional planning documents.

287. We note there is still some uncertainty in relation to the need for an 'overall assessment' under part 2 of the Act, given the appeal of the High Court decision in *Davidson*[13]. Accordingly, we consider it is prudent, given the pending appeal of the *Davidson* decision, to consider the application in the context of Part 2, as well as the above relevant statutory plans.

288. All the considerations we have described are subject to Part 2 of the Act. In accordance with Part 2, we consider that granting the application is unlikely to achieve the purpose of the Act and the principles of the sustainable management of natural and physical resources, as defined in section 5.

289. We have had particular regard to section 7(aa), (c) and (f) matters, and find that the application is contrary to the ethic of stewardship, the maintenance and enhancement of amenity values, and the maintenance and enhancement of the quality of the environment

[13] *R J Davidson Family Trust v Marlborough District Council [2017] NZHA 52*

given the actual and potential significant adverse effects on air and water quality. We have taken into account section 8 matters in making this decision.

290. In achieving the purpose of the Act, we have taken into account the principles of the Treaty of Waitangi/Te Tiriti o Waitangi.

Overall Conclusion

291. Mr Loe noted that in this situation we have the benefit of assessing actual environmental effects and that the Applicant has proven it can change its practice to minimise effects. He urged us to not judge the historical operation but rather the proposed operation.

292. Given the Applicant is seeking retrospective consent for the existing composting activities and consent for the proposed composting activities, we have considered the environmental effects of the existing operation and the proposed operation, as amended after the adjournment of the hearing.

293. We do not accept the Applicant has sufficiently demonstrated that it has sufficiently changed its existing operation to avoid, remedy or mitigate adverse effects on air and water quality, other than to remove the highly odourous anaerobic material from the site and to use sawdust to absorb ponded water. These are reactive remedial actions. Actions taken to reconfigure the site and to no longer store some types of odourous material at the site are prudent, but do not effectively address the existing adverse effects from the composting process. We note Table 1 of Mr Loe's evidence sets out the changes to the site operation, however, these are mostly proposed measures. We are perplexed as to why some these mitigation measures are still only <u>proposed</u> after 18 months of operating at the site.

294. The mitigation measures proposed by the Applicant have been evolving throughout the hearing, as is often the case with resource consent applications when changes are made to address issues and concerns. However, we agree with submitters that the proposed measures are too little and too late for the existing operation to gain consent.

295. We disagree with Mr Cleary that CLS have complied with the Abatement Notice since December 2017. The evidence shows ongoing breaches. We do not understand why new raw material continues to be deposited at the site without resource consent.

296. We have considered the proposed ASP operation and the proposed mitigation measures. We conclude that there is insufficient evidence on the detail and design of the ASP operation to allow for a robust assessment of environmental effects or to give us assurance the site can be remediated and redesigned to sufficiently manage and control discharges to water and air, within the context of sensitivity of the receiving environment. We do not accept the use of sawdust, as proposed, provides sufficient certainty of the long-term protection of water quality. We do not have sufficient evidence regarding the type and nature of contaminants in the raw materials to adequately assess actual and potential risks to the environment, particularly with regard to the material from the wastewater treatment screening process. Furthermore, we do not consider there is evidence to support the proposed increase in the volumes of waste material processed at the site.

297. We understand this refusal of consent will have significant ramifications for SFF and other industries depending on CLS's waste services. However, these considerations do not, in our view, override the purpose of the RMA and the intent of the statutory plans. We consider this situation can not be considered to be unforeseen when SFF entered into a contract with a party who did not hold the necessary resource consents to undertake the activity.

Decision

298. For the above reasons, it is the decision of the Canterbury Regional Council, pursuant to sections 104, 104B, 105 and 107, and subject to Part 2 of the Resource Management Act 1991, to REFUSE the application by Canterbury Landscape Supplies Limited for the following resource consents:
(i) Discharge Permit CRC175344 – To discharge contaminants into air; and
(ii)Discharge Permit CRC175345 – To discharge contaminants onto and into land in circumstances where contaminants may enter water.

Dated at Christchurch this 26th day of June 2018

Sharon McGarry
Hearings Commissioner (Chair)

John Iseli
Hearings Commissioner