PATTLE DELAMORE PARTNERS LTD
Level 4, CSC House
111 Customhouse Quay, Wellington 6011
PO Box 6136, Wellington 6141, New Zealand

Office+64 4 **471 4130**
Web **www.pdp.co.nz**
Auckland Tauranga Hamilton **Wellington**
Christchurch Invercargill

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memorandum

TO	Selwyn District Council	FROM	Chris Bender
		DATE	17 August 2022
RE	Plan Change 82 – Odour Assessment Review		

Background

1. Brookside Road Residential Limited has lodged a private plan change request (Plan Change 82, or PC82) with Selwyn District Council (SDC) to rezone approximately 110 hectares of Rural Outer Plains zoned land to Living MD and Business 1 zoning. An assessment of the effects on the environment (AEE) in support of the application has been prepared by Aston Consultants.
2. The PC82 property is located to the west of Dunns Crossing Road in Rolleston and is one of a number of other proposed plan changes in the vicinity, as indicated in Figure 1 below.

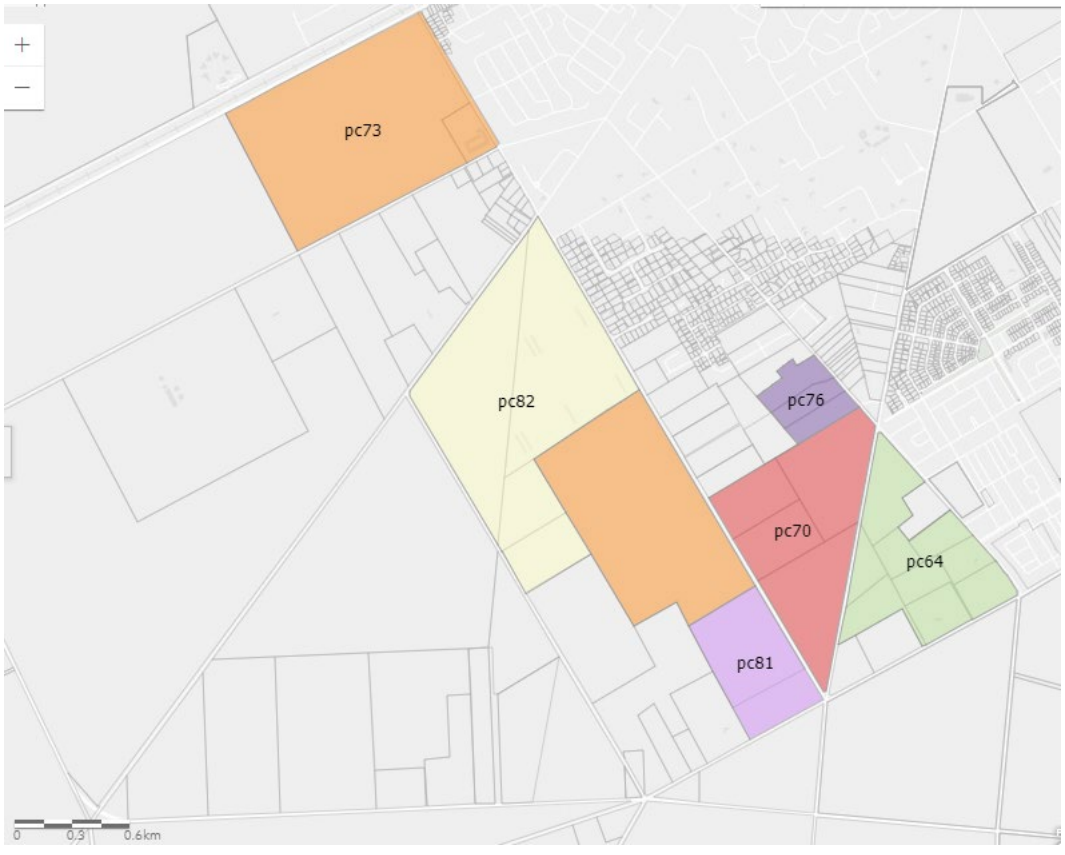

Figure 1 Map showing land affected by plan change requests (Selwyn District Council, August 2022)

3. Among the proposed plan changes is Plan Change 73 (PC73). On 16 July 2021, SDC requested that I review the PC73 application material as they pertain to reverse sensitivity effects from nearby odour generating activities. My findings are detailed in a memo report to SDC dated 3 September 2021 and in my summary evidence for a hearing dated 29 September 2021.

4. The PC73 proposal was declined by Council on the Commissioner's recommendation on 5 April 2022 for reasons of reverse sensitivity due to odour from nearby land uses, and matters related to urban form and connectivity. Given the proximity of PC82 to odour generating activities identified in the PC73 application, the issues of reverse sensitivity identified for PC73 remain relevant to PC82.

5. Among the issues identified in the PC82 AEE are reverse sensitivity effects on existing activities near the proposed development which have the potential to generate residual odours that have the potential to cause annoyance in some people. An assessment of reverse sensitivity effects from PC82, including recommendations for separation distances from the odour generating activities, was provided in the PC82 AEE and subsequent response to a Request for Further Information (RFI). The applicant's assessment and recommendations for the PC82 application were consistent with those which supported the application for PC73.

6. On 6 July 2022, SDC requested that I review the odour assessment supporting the PC82 application together with information provided in the response to the RFI and provide comment on the assessment of reverse sensitivity effects on existing activities from the proposed PC82.

7. This memorandum summarises the findings of my review of the available information. I note that my findings are also consistent with those in my review of the PC73 application and associated summary evidence.

Summary of Odour Generating Activities Assessed for Reverse Sensitivity

8. The proposed plan change area consists of a single block of land to be rezoned. As with the previous PC73 proposal, the existing activities potentially impacted by reverse sensitivity effects from PC82 include:

    - The Pines wastewater treatment plant (WWTP), which includes a sludge drying plant and spraying of treated effluent to land;
    - The Pines Resource Recovery Park (PRRP), which includes a waste transfer station and composting facility for green and household organic wastes; and,
    - A series of Tegel poultry sheds.

Overview of Odour Separation Distances

9. In assessing the potential reverse sensitivity effects of PC73, which has also been applied to PC82, the applicant has relied primarily on recommended separation distances for the proposed plan change areas to the various odour producing activities.

10. The Golder (now WSP) Odour Assessment for PC73 determined applicable buffer zones for each of these activities from various Australian EPA guidelines based on the nature and scale of the activities, and from site-specific assessments of the activities. These are summarised in Table 1 below.

Table 1: Summary of Applicant's Recommended Separation Distance Guidelines from Odour Generating Activities for PC73

Authority	Odour Source	Size Criteria	Separation Distance
Victoria EPA[1]	Wastewater treatment plant	120,000 Person Equivalents	500m
Australian Central Territory EPA[2]	Biosolids handling and drying	All	400 m
Golder Assessment	Application of biosolids to land	Site specific assessment	500 m
Golder assessment	Spray irrigation of treated wastewater	Site specific assessment	75 m
Victoria EPA[1]	Pines Resource Recovery Park – Waste Transfer Operations	All	300 metres from transfer facility
Victoria EPA[1]	Pines Resource Recovery Park – Composting Operations	4,200 tonnes per annum	600 metres from active composting area
Golder Assessment	Tegel Poultry Operation	Site specific assessment	150 metres from sheds

Sources:

1. *Victoria Environmental Protection Authority, Recommended separation Guideline distances for industrial residual air emissions, March 2013.*
2. *Australian Capital Territory, Separation Distance Guidelines for Air Emissions, November 2018.*

11. Where the buffer zones impinged upon the PC73 plan change areas, these were designated as Odour Control Setback Areas (OCSAs) within which the development of housing will be restricted. The OCSAs relevant to PC73 were determined primarily by the 600 metre setback from the active composting area of the PRRP, which resulted in a setback area within the southwestern corner of the Holmes Block of PC73. The 150 metre setback from the Tegel Poultry Operation sheds resulted in OCSAs of the Skellerup Block of PC73. The Holmes and Skellerup blocks of PC73 together with the OCSAs are shown in Figure 2.

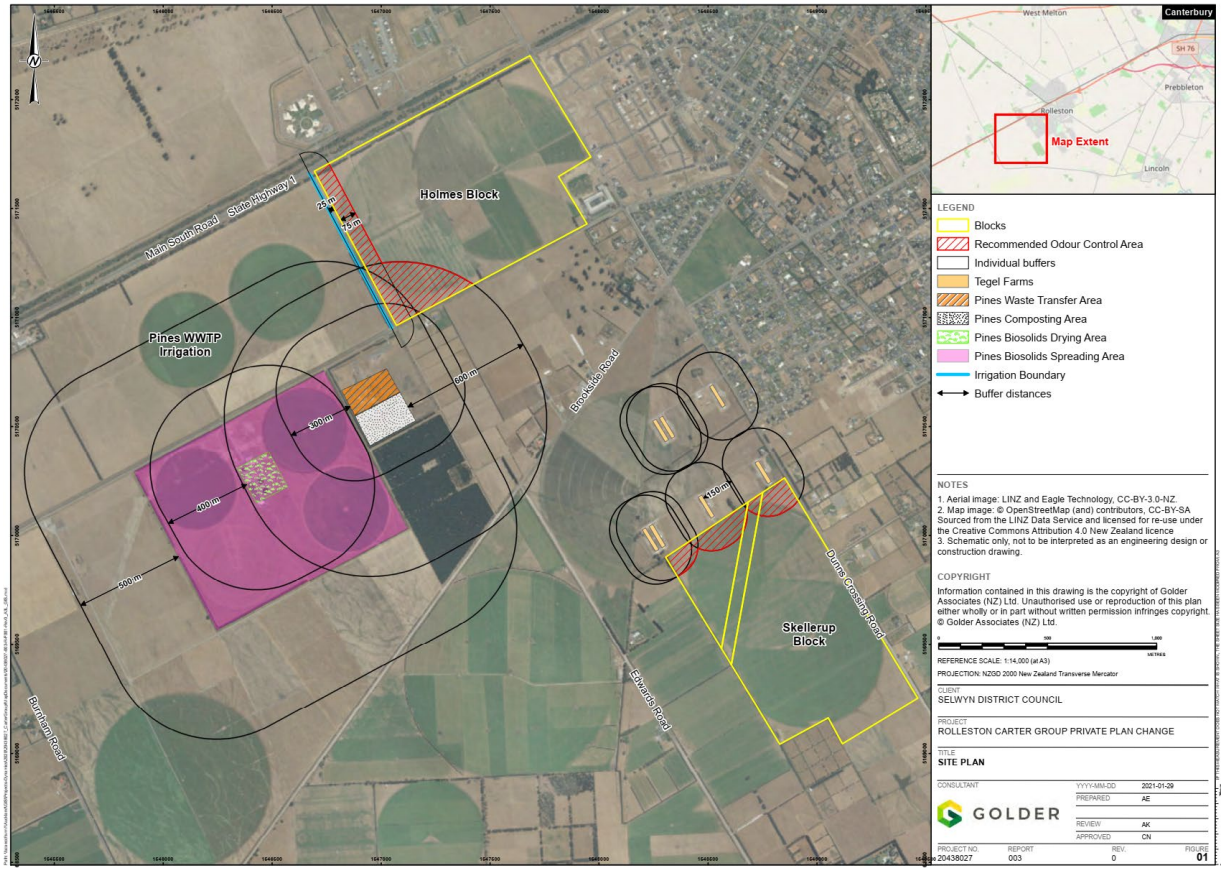

Figure 2 Proposed Plan Change Area 73 with Separation Distances from Odour Generating Activities

12. The 600 metre setback also results in a small OCSA near the western boundary of the PC82 plan change area, as indicated in Figure 3.

Figure 1: Odour Constrained Area and WWTP Setbacks

Figure 3 PC82 and Separation Distances from Odour Generating Activities

Tegel Poultry Sheds

13. I understand that the poultry sheds are located within the PC82 area and will be decommissioned prior to any development of the PC82. I agree with the applicant that there will be no reverse sensitivity effects on the poultry sheds as a result of PC82.

Pines WWTP

14. In regard to the separation distances set out for the various Pines WWTP activities, the PC82 area is outside of the determined setback areas provided in Table 1, and the applicant considers there is no potential for reverse sensitivity effects on the WWTP infrastructure.

15. I note that Mr Murray England (SDC Asset Manager Water Services) states in his evidence for PC73 that SDC has received 11 odour complaints regarding the operation of the Pines WWTP during the three-year period August 2018-August 2021. An additional two complaints of odour from the WWTP have been received since August 2021. The locations of the odour complaints are not stated and would be needed to understand the implications for reverse sensitivity effects from the proposal. The complaints do, however, indicate that nuisance levels of odour can be observed

outside the site boundary. In general, the frequency of complaints can be expected to increase with increased residential development around an odour source.

16. Notwithstanding the odour complaints received about the current operations of the WWTP, I note that the PC82 area is located around 1,000 metres from the WWTP treatment infrastructure, and over 500 metres from the areas of application of biosolids and treated wastewater to land, which in my view should provide sufficient separation from the odour generating activities from a well-designed and well-run WWTP.

17. I note that the both the PC73 and PC82 proposals includes provision to:

> "*Preclude development of residential allotments within 1500m of the Pines WWTP buildings prior to certification by Council's Asset Manager that the resource management approvals required to enable the Plant to provide treatment capacity for 120,000 person equivalents of incoming flow have been obtained or 31 December 2025, whichever is the sooner.*"

I understand this provision is to provide additional protection for the WWTP against reverse sensitivity effects until upgrades to the WWTP and associated processes are made. The 1,500m setback is shown by the green contour line in Figure 3 and shows that the western portion of the PC82 area is affected by this provision.

Pines Resource Recovery Park

18. The PRRP was identified in the PC73 application as having the greatest likelihood of having reverse sensitivity effects on the proposed plan change, due primarily to the proximity of the PRRP to the proposed plan change areas. This also applies to PC82.

19. The PRRP is an established municipal waste transfer station, owned and operated by the SDC. Landfill waste, recycling and organic waste from the entire Selwyn District is collected, sorted and processed on the site. The activities with potential for odour generation at the PRRP include a waste sorting and transfer, and a composting facility.

20. The PRRP accepts green and organic wastes for open air composting in static windrows within a designated area of the site. The windrows are turned every 3 to 7 days to provide aeration for the composting process. The compost windrows are managed to be progressively more mature as they are located nearer to the eastern site boundary.

21. The PRRP currently accepts less than 10,000 tonnes of mixed green and household waste per year and is consented to accept up to 53,000 tonnes of green and household waste on an annual basis. Mr Andrew Boyd (Solid Waste Manager for Selwyn District), stated in his evidence for the PC73 hearing that the volume of organic wastes to be accepted at the PRRP is projected to further increase over time with the growth of kerbside recycling programmes for organic wastes.

22. A discussion of separation distances recommended by various regulatory authorities for composting works was provided in the PC73 application and hearing. I have summarised recommended separation distances from a range of sources in Table 2 below.

Table 2: Summary of Separation Distance Guidelines from Australian Jurisdictions for Odour from Composting Processes

Authority	Source	Criteria	Separation Distance
South Australia EPA	Unspecified composting works	<20 tonnes per year	100 m
		>20 and <200 tonnes per year	300 m
		>200 tonnes per year	1,000 m
Victoria EPA	Waste acceptance type: – Green waste – Vegetable organics – Grease inceptor trap waste Treatment technology: – Open air receival – Enclosed aerobic composting with secondary odour capture and treatment equipment – Open air maturation	1,200 tonnes per annum	>300 m
		14,000 tonnes per annum	>500 m
		36,000 tonnes per annum	>800 m
		55,000 tonnes per annum	>1,000 m
		75,000 tonnes per annum	>1,200 m
		90,000 tonnes per annum	>1,400 m
	Waste acceptance type: – Green wastes Treatment technology: – Open air receival – Open turned windrow – Open air maturation	1,200 tonnes per annum	>600 m
		14,000 tonnes per annum	>1,100 m
		36,000 tonnes per annum	>2,000 m
		50,000 tonnes per annum	>2,000 m
Australian Capital Territory	Unspecified composting works	>20 and <200 tonnes per year	300 m
		>200 tonnes per year	1,000 m
Nova Scotia Environment; Newfoundland-Labrador DMAE	Open windrow composting facilities	<1,000 tonnes per year food waste, and <10,000 tonnes per year total feedstock	>500 m from any structure
		>1,000 tonnes per year food waste, or >10,000 tonnes per year total feedstock	>1,000 m from any structure
DEFRA	Open windrow composting facilities	>20,000 tonnes per year production rate	>700 m

Sources:

1. *South Australia Environment Protection Authority, Evaluation distances for effective air quality and noise management (2019 version), March 2019.*
2. *EPA Victoria, Recommended separation Guideline distances for industrial residual air emissions, March 2013.*
3. *Western Australia Environment Protection Authority, Separation Distances between Industrial and Sensitive Land Uses, June 2005.*
4. *Australian Capital Territory Separation Distance Guidelines for Air Emissions, 2018.*
5. *Nova Scotia Environment Composting Facility Guidelines, September 2010.*
6. *Newfoundland-Labrador Department of Municipal Affairs and Environment Environmental Standards for Composting Facilities, August 2020.*
7. *Department for Environment, Food and Rural Affairs (DEFRA) Good Practice and Regulatory Guidance on Composting and Odour Control for Local Authorities, March 2009.*

23. With regard to the Victoria EPA guidance, a separation distance for the PRRP which is currently consented to accept up to 53,000 tonnes of green and household waste on an annual basis would default to greater than 2,000 metres separation distance for the basic open air treatment technology. With more advanced treatment technology, i.e. enclosed aerobic composting with secondary odour capture and treatment, the separation distance could be reduced to 1,000 metres.

24. The South Australia EPA guidance on separation distances does not differentiate between composting feedstocks or treatment technologies, however a separation distance of greater than 1,000 metres is recommended for composting facilities accepting more than 200 tonnes per year. In addition to the above guidance from South Australia EPA, the South Australia Compost Guideline (2019) states that in regard to existing composting facilities:

    "*Existing composting facilities should be protected from encroachment from new developments. In the absence of site specific risk information an effective buffer is 1,000 m between new developments and composting facilities, measured from the outer boundary of the area licensed to undertake composting.*"

25. The Canadian provinces of Newfoundland and Nova Scotia/Labrador also recommend a minimum separation distance of 1,000 metres for open row composting works which accept greater than 1,000 tonnes per year of organic waste or 10,000 tonnes per year of total material.

26. In summary, the majority of the separation distances summarised in Table 2 suggest that minimum separation distance of 1,000 metres for an open windrow composting facility of the size of the PRRP. However, I note that that the separation distances are guidelines only and lower separation distances may be adequate depending on other factors such as the specific makeup of the organic waste, procedures for ensuring the waste remains aerobic, and FIDOL[1] criteria such as the prevalence of winds which may carry odour from the composting site toward the sensitive locations.

27. A separation distance of 600 metres was initially adopted by Golder for the composting operations in the odour assessment and is based on the EPA Victoria's *Designing, constructing and operating composting facilities* (June 2017), which has recommended separation distances of >600 metres for an open air composting plant with 1,200 tonnes per annum. The composting rate on which the separation distance is based is lower than the approximately 8,000 tonnes of organic waste that was received and processed at the PRRP during the 2020/2021 fiscal year, and significantly lower than the consented volume of 53,000 tonnes per year.

28. The applicant subsequently concluded that a 600 metre separation distance from the active compost rows is also appropriate for the full scale operations of the PRRP. This was due the site-specific considerations as described in the resource consent application for the PRRP, which included the development of an odour and dust management plan (ODMP) that outlines management procedures to mitigate the potential for adverse odour effects from the site.

29. The applicant has measured the OCSA from the active compost windrows, which I agree have the greatest risk of generating offensive odours. The proposed separation distance of 600 metres results in a small OCSA of approximately 20-30 metres within the southwest corner of the PC82 area (refer Figure 3).

[1] Frequency, Intensity, Duration, Offensiveness/Character, and Location. These factors are considered to assess whether an odour is likely to be offensive or objectionable to the extent that there is an adverse effect.

30. The operations of the PRRP as described in the resource consent application documents and ODMP were developed to ensure that the site can operate without generating adverse off-site air quality effects. On this basis, I accept that the site should be able to operate without resulting in offensive odours beyond the separation distance of 600 metres. In practice, however, upset conditions may occur in which offensive odours are released, e.g. if pockets within a windrow of active compost become anaerobic and are subsequently exposed to air. If abnormal emissions do occur, the increased density of housing and associated increase in sensitivity of the receiving environment could contribute to additional odour complaints from any incident.

31. Furthermore even a well-managed composting operation will have odour (variously described as a 'musty' or silage odour) which may not be particularly offensive in a rural residential area but would likely be offensive to some people in a more densely populated residential area. The strength of this odour will be proportional to the amount of compost processed onsite. For this reason it would be more appropriate to determine separation distances from the composting area as a whole, including the area for maturing/aging of compost.

32. Other than increasing separation distance from the composting site, options to mitigate odour from the composting site may include process controls, e.g.in vessel composting or active aeration (Victoria EPA 2017). While alternative systems with improved odour control could be more appropriate for composting facilities near to sensitive land uses, these mitigations are not within the control of the applicant for the plan change. In my opinion, a future requirement for the composting facility to adopt more expensive composting technologies is a possible outcome of the intensification of residential development and the establishment of residences beyond the proposed 600 metre separation distance from the composting activity.

33. Regardless of the current and future performance status of the PRRP, some level of odour will remain due to the nature of the composting process. Even if it the best practical options of odour control are implemented, which fully enclosed and controlled odour, the operation would still be subject to failure and residual odour, from for example the maturation of compost outside the controlled areas. A suitable separation distance is the only practicable mitigation for the PRRP to dissipate residual odour.

Conclusion

34. I have reviewed the application and associated documentation for the proposed Plan Change 82, with particular focus on reverse sensitivity effects of the proposed plan change areas on nearby odour generating activities. Overall, I agree that the approach of using minimum separation distances applicable to the nature and scale of the odour-generating activities is appropriate for minimising the potential for reverse sensitivity effects of the proposed plan change. However, I consider the proposed separation from the PRRP activities to be low.

35. The proposed separation distance of 600 metres from the active composting area of the PRRP is significantly less than the separation distances recommended by various international authorities for a composting facility of the size and type of the PRRP.

36. The site specific assessment of potential odour discharges from the composting facility undertaken by SES, as accepted by Environment Canterbury, assessed the effects of the composting operations on the nearest residences as being minor or less than minor. The site specific assessment of the composting facility furthermore states that the PRRP should be able to increase the scale of operations to allow an increase in organic matter processed of up to 53,000 tonnes per year provided the procedures in the ODMP are followed.

37. While I consider this a reasonable assertion, I note that there is potential for upset conditions to occur in any large scale composting facility, which may lead to adverse odour effects being experienced. I also consider that residual odour from composting operations which may be considered acceptable in a rural residential area may be considered offensive in a more developed environment such as a medium density zoning, and that any agreed upon separation distance should be determined from the composting area as a whole including the compost maturation areas. In my opinion the Odour Setback Control Area proposed for PC82 is insufficient to avoid the potential for reverse sensitivity effects on the PRRP.

References

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- Specialist Environmental Services Ltd, *Assessment of Effects of Discharges into Air from a Composting Operation.* July 2018.
- Specialist Environmental Services Ltd, *Assessment of Effects of Odour and Dust from Windrow Composting at Pines RRP, Rolleston – Update to Consider any Requirement for Volume Restrictions.* June 2020.

Limitations

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Prepared by

Chris Bender
Service Leader – Air Quality

Review and Approved by

Andrew Curtis
Technical Director – Environmental Management