Appendix H

Odour Assessment

11 November 2020 Project No. 20438027_7403-002-L-Rev0

Jeremy Phillips
Novo Group
Level 1, 279 Montreal Street
Christchurch

REVIEW OF ODOUR EFFECTS RELATING TO HOLMES AND SKELLERUP BLOCKS - ROLLESTON WEST PLAN CHANGE

Dear Jeremy,

This letter report[1] provides a review of the potential odour effects due to the odour generating activities in the vicinity of the "Holmes" and "Skellerup" blocks (the blocks) located to the west of Rolleston if these blocks are changed to a residential land use. It is understood that Rolleston West Residential Ltd (RWRL) intend to submit on the Selwyn District Council (SDC) Plan change with the aim of achieving the rezoning the blocks from rural-residential to conventional residential (12 households/hectare density). These blocks currently have areas where housing density is restricted due to potential reverse sensitivity effects upon existing nearby waste management activities which discharge odour. The areas are referred to as Odour Control Setback Area in the operative Selwyn District Plan (the Plan) and are shown in Appendix 39 and 40 of the Plan for the Holmes and Skellerup blocks respectively. The location of the Holmes and Skellerup blocks are shown in Figure 1 and Figure 2.

The Odour Control Setback Areas are understood to be based on reviews of consented and existing activities in the vicinity of the blocks during the SDC plan change 8 and plan change 9 hearings (PC8 and PC9). These were private plan changes by the Selwyn Plantation Board Limited (SPBL) during 2010-2011 to change the zoning of these blocks to be rural-residential. Golder Associates (NZ) Ltd (Golder 2008) provided advice to the SPBL in support of these plan changes.

The scope of this review is an assessment on the requirements to avoid significant reverse sensitivity to odour effects due to the proposed rezoning of the Holmes and Skellerup blocks. This review utilises previous work by Golder (2008) for the SPBL in the regards to the Reverse sensitivity effects associated with PC8 and PC9. The review also accounts for changes in land use since 2008 including consideration of any new consented activities, cessation of activities and known consented changes in operation of odour generating activities. Any changes in published buffer distances referred to by Golder (2008) will also be considered. Where necessary, Golder has used its professional judgement in combination with available buffer guidance to assess a suitable buffer for each of the activities to ensure only minor or less reverse sensitivity effects from the proposed land use changes. This review relies on information publicly available at the time.

[1] This letter is subject to the limitations provided in Attachment 1.

A brief description of the odour generating activities and any changes to these is provided in Section 1.0. This is followed by a review of buffer distance criteria for each activity and any other mitigating factors that may be applied - Section 2.0. Finally, overall recommendations on limitations on the locations of residential dwellings is provided Section 3.0.

1.0 ODOUR GENERATING ACTIVITIES

1.1 Overview

Activities identified in the previous Golder (2008) assessment include the following three potentially odorous activities:

- The Rolleston Wastewater Treatment Plant and disposal site (herein referred to as the "Pines WWTP");
- Rolleston Resource Recovery Park (herein referred to as Pines Resource Recovery Park "PRRP"); and
- Tegel Foods Limited's intensive poultry farming sheds (herein referred to as "Tegel's poultry operation").

Our review of existing consents in the vicinity of the Holmes and Skellerup blocks finds that the Pines WWTP and the PRRP hold active air discharge consents with the Canterbury Regional Council (CRC). Tegel's poultry operation does not – and it is understood that one is not required. We have also identified dairy effluent irrigation consents on the north side of State Highway 1, however due to the buffer distance to these activities and restrictions within the associated air disharge consents for these activities, these activities are not expected to result in significant odour effects on the Holmes or Skellerup blocks. These activities have not been considered further.

A description of the operation of the above activities is provided in Golder (2008) and a summary of the operation and changes to the consented operation since the Golder (2008) report are provided in the sections below.

1.2 Pines WWTP

Golder (2008) concluded that potential odour nuisance from the Pines WWTP would be associated with:

- Biosolids handling, storage and disposal;
- Secondary treated effluent irrigation; and, to a lesser degree;
- The primary effluent treatment process.

Based on our current understanding of the activity, these are still the main sources of potential odour nuisance for the blocks, if developed to residential areas.

Based on a review of the consents associated with the Pines WWTP, it appears that no changes have been made to the primary effluent treatment processes.

There have been changes[2] to the consent for biosolids application to land (current consent is CRC210644). It is noted that the current consent clarifies that the method of further processing biosolids is solar drying in

[2] These are for reduced bore monitoring following upgrades to reticulated water supply for the potentially affected parties, and increases to the limits of zinc and copper contained in the biosolids.

glasshouses. This method of processing is expected to have a lower odour potential compared to biosolids processing via composting.

There are no changes to the classification (i.e., Class Aa) required by this consent for the biosolids that can be applied to land, which would alter the odour potential from this activity.

There have been several changes to the conditions of the Pines WWTP consent (current consent number CRC153952) which impact the extent of the potential odour effects due to irrigation of the treated effluent. The consent now defines different restrictions for treated effluent irrigation for various areas, including that adjacent to the western boundary of the Holmes Block. There are specific additional conditions in CRC153952 (Conditions 35 to 42) that were contingent on the then proposed Plan Change 8 to the Selwyn District Council resulting in the Holmes block being rezoned rural residential. As the proposed plan change was successful, it is assumed that Conditions 35 to 42 apply.

Under these consent conditions, the irrigation of treated effluent is allowed to occur up to 25 m from the common boundary (Condition 40c), subject to meeting criteria related to the irrigated water quality, method of irrigation and boundary planting. The distance to the boundary is increased if:

- The water quality limits are not achieved. This would mean that during wind conditions that would put the Holmes block downwind, irrigation cannot occur within 200 m from the common boundary (Condition 39a).
- The method of the irrigation does not meet Condition 43, irrigation cannot occur within 150 m of the common boundary. Condition 43 sets irrigation nozzle parameters to maximise droplet size,
- The shelter belt planting does not meet the requirements of Condition 40. In this case irrigation cannot occur within 150 m of the common boundary.
- The irrigator has been turned off for 24 hours there can be no irrigation with 200m of the boundary. This is to prevent treated effluent that is potentially anaerobic being irrigated close to this boundary.

From a review of recent aerial photographs, it appears that irrigation is undertaken up to 150 m from the boundary, and this appears to be due to the incomplete shelterbelt planting.

All of the above consent provisions reduce the risk of odour, pathogens and aerosols causing significant air quality impacts within the Holmes block. Given the water quality parameters required of the irrigated effluent (e.g., mean suspended Solids of 20 g/m^3, mean biological oxygen demand of 15 g/m^3), it is considered to be of a tertiary treated standard, and therefore the potential for adverse odour effects is expected to be low. However, there is a risk of pathogens (pathogens can include bacteria, parasites and viruses that are contained in human waste) being discharged and impacting the Holmes block if pathogens in the treated effluent significantly exceed the consent limit of 500 CFU/100 ml (median).

In terms of land that may be used in the future for treated effluent irrigation, there does not appear to be any additional blocks of land that are in the immediate vicinity of the Skellerup or Holmes blocks that appear to be obvious candidates for treated effluent irrigation.

1.3 Pines Resource Recovery Park - PRRP

The operations at the PRRP includes a composting facility and a refuse transfer operation. Changes to the operation of these are discussed below.

1.3.1 Composting

At the time of the Golder (2008) report, composting of green waste and putrescible waste (excluding biosolids) was consented (CRC041489) to be undertaken at the PRRP using an in-vessel process. An indicative maximum of 2,000 tonnes per annum of organic material was consented to be processed at the site. A HotRot system had been proposed to be used for the initial stages of composting with static piles used for the final maturation.

In 2019 (CRC190492) consent was granted for the removal of the in-vessel based system and for composting to be undertaken using an open windrow-based system. Also included in the application was explicit reference to the types of organic waste composted. These include kerbside organics (considered to be mostly garden waste and food scraps) and green waste.

A Golder review[3] of the application for Environment Canterbury prior to it being granted, concluded that the site was likely to produce more odour than it had in the past. However, due to the distance to the nearest sensitive receptors, it was unlikely to increase odour effects. The review noted that the scale of the operation is not explicitly constrained via consent condition (either in the previous consent or in the application for CRC190492), but the assessment of effects was on the basis of the current throughput of 4,200 Tonnes per year. The Golder review also recommended regular oxygen monitoring to confirm that compost was maintained in an aerobic state.

The use of an open air windrow-based composting system is considered to have increased risk of odour compared to the originally consented in-vessel system.

1.3.2 Refuse transfer operations

There have been no documented or consented changes associated with the refuse handling.

1.4 Tegel's Poultry Operation

Tegel operates seven breeder (egg laying) sheds between Dunns Crossing Road and Edwards Road. The Tegel operation is directly adjacent and to the north of the Skellerup block. Based on discussion with RWRL, Golder understands there have been no changes to the Dunns Crossing Road farm and there are no increases in operation planned.

2.0 RECOMMENDED BUFFER DISTANCES

2.1 Pines WWTP

2.1.1 Wastewater Treatment plant

Both the South Australia (SA) EPA and Victoria (Vic) EPA (EPA Victoria, 2012, South Australia Environment Protection Authority 2019) recommend buffer distances for wastewater treatment plants. These guidance documents have been updated since Golder, 2008. The SA EPA and the Vic EPA guidance reports buffer

[3] Letter M McCauley to Matthew Harrison (Environment Canterbury) dated 20 August 2018. Golder Ref 1791554-7403-007-LR-Rev0

distances are based on the installation treatment capacity (population equivalent - PE) and the type of treatment process. Golder (2008) discussed that the Pines WWTP had a future design capacity for a PE greater than 80,000, and this has been assumed.

The SA EPA reports the same buffer criteria of 300 m for a mechanical/biological treatment plant with PE <15,000. No buffer guidance is available for a treatment capacity PE greater than this.

Vic EPA provides an equation to calculate the buffer distance and based on this, a 430 m buffer is calculated for the 80,000 PE.

Previously Golder (2008) recommended a buffer distance of 500 m from the WWTP based on experience with similar operations in New Zealand, and this is retained in this assessment.

2.1.2 Biosolids handling, storage and disposal

For biosolids, the method of further processing the biosolids has been refined to be solar drying in glasshouse. ACT EPA recommend a distance of 400 m for this activity. No other relevant buffer criteria could be identified. This is a reduction on the 1,000 m recommended by Golder (2008) and which was based on potential composting of biosolids – composting is considered to be a potentially more odorous activity than solar drying.

With regard to land spreading of biosolids, Golder (2008) recommended a 500 m buffer to residential areas and as there have been no changes to the classification of the biosolids that could have impacted on the potential for odour effects. The recommendation of a 500 m buffer between land spreading of Class Aa biosolids and residential areas is retained.

2.1.3 Spray irrigation

While it is considered that the mitigation in place (See Section 1.2) will minimise the risk of odour. There is still a residual health risk due to pathogens associated with the consented irrigation of treated wastewater, and this is heightened with any discharge that does not comply with the consent limit of 500 CFU/100 ml.

It is considered that aerosol's generated from an irrigator nozzle, can travel up to approximately 200 m prior to desiccation. The planting required by the Pines WWTP is likely to provide a reasonably effective mitigation to aerosol carryover, as the ability for trees to act as a physical barrier to aerosols is considered effective[4]. RWRL have indicated that bunding and planting will be installed on the western boundary of the Holmes site. It is considered dense planting – similar to that required by the Pines WWTP would further reduce the potential for irrigation generates aerosols and associated pathogen risk, impacting beyond the shelter belts.

While the risk of pathogens being dispersed is generally associated with the risk of aerosol carryover, virus' are understood to potentially be more resilient and not reliant on droplets and we cannot comment on the ability to virus' to survive after desiccation. Although, as with aerosols, the shelter belts are expected to be effective at removing viruses, including those that have become desiccated.

Given the planting (both on the Pines WWTP side and the Holmes block side) and other consent conditions relating to the effluent quality, it is considered that no internal setback within the Holmes block is required to adequately mitigate odour effects.

[4] Evidence R Chilton for the Selwyn Plantation Board in the matter of applications CRC 101109, CRC1011111 and CRC 040100.1 related to the expansion of the Pines WWTP.

With regard to pathogen risk, it is considered likely that a 200 m setback would usually be sufficient to protect against pathogen risk associated spray irrigation of tertiary treated municipal effluent, assuming no shelter belts.

This buffer can be significantly reduced (given the proposed shelter belts on both the Pines WWTP property and a similar shelter belt on the adjacent Holmes block boundary. We recommend a setback of 100 m (between irrigated areas and nearest residential notional boundary) is maintained between the at this stage. To achieve this, with the Pines WWTP current consented operation, a setback of 75 m within the Holmes Block is required. However, a further detailed assessment at the time of any subdivision consent application may confirm that a lesser standard of mitigation/separation distance is appropriate'

Alternatively to the above, a setback could be maintained within the Pines WWTP irrigation area to mitigate against pathogen risk, rather than relying on a buffer/mitigation within the Holmes block.

2.2 Pines Resource Recovery Park

2.2.1 Waste transfer operations

The waste transfer operations have not changed since Golder (2008) and there are no changes to the reported buffer distances in the South Australia, Victoria and Western Australian EPA guidance. Therefore, Golder's previous recommendation of a 300 m buffer is retained.

2.2.2 Composting

As discussed in 1.3.1, the current consent allows for an uncovered windrow system and while there are no limits in the conditions, the application for the current active consent was based on a throughput of 4,200 T/year.

South Australia EPA, Victoria EPA, Western Australia EPA all provide recommended buffer distances for composting operations, these are discussed further below.

South Australia EPA: The SA EPA buffer guidance (South Australia Environment Protection Authority, 2019) provides an evaluation distance of 1,000 m for composting operations greater than 200 tonnes/year.

Victoria EPA: Vic EPA have provided specific guidance on composting (EPA Victoria, 2017). This provides examples of appropriate buffer criteria depending on the through-put of the operation, type of material being processed, and the type of composting process being used. It is notable that open air composting system for processing mixed source separated kerbside (Garden waste/food waste – FOGO[5]) is not recommended and no buffer criteria are provided. For an open air, with only green waste operation with a throughput of to 1,200 tonnes per year, a buffer distance of greater than 600 m is recommended and for up to 14,000 tonnes per annum >1,100 m is recommended.

Western Australia EPA: For an open air composting operation with manure, mixed food, putrescible and vegetative waste, WA EPA recommends a buffer distance of 1,000 m.

In summary on the basis that the throughput is maintained close to the current throughput, i.e., limited to 4,200 tonnes/annum and there is a high degree of control in the manufacture of the compost, the leachate management (particularly maintaining both of these in an aerobic state), and given the location of the

[5] Food Organics and Garden Organics

proposed residential area, a buffer distance of 600 m is considered to be reasonable. This is consistent with the distance to the existing dwelling to the north east of the compost operation.

2.3 Tegel's Poultry Operation

Based on that there having been no changes to the Tegel operation, Golder's 2008 recommended buffer distances of 150 m is retained as a recommendation.

3.0 SUMMARY

Table 1 provides a summary of the recommended buffer distances to mitigate odour effects. With respect to pathogen risk from irrigation of treated effluent, an upper estimate of an additional setback distance required given the proposed trees and shelter belt, this setback may be able to be reduced with following a further detailed assessment. Figure 1 and Figure 2 show the recommended buffer distances to mitigate against odour reverse sensitivity for the Holmes and Skellerup blocks respectively.

Table 1: Summary of distances expected to avoid reverse sensitivity due to odour.

Facility	Recommended buffer distance for odour mitigation	Comments
Pines WWTP – treatment	500 m from facility	
Pines WWTP – biosolids production	400 m from drying facility	
Pines WWTP- Irrigation	100 m from land used for treated Wastewater irrigation.	This distance is based on pathogen risk, and may be able to be reduced following a detailed assessment.
Pines WWTP biosolids land spreading	500 m from land disposal area	
PRRP – waste transfer operations	300 m from facility	
PRRP – composting	600 m from compost area	Based on throughput of 4,200 tonnes per annum and good control on leachate and compost.
Tegel Poultry Operation	150 m from sheds	

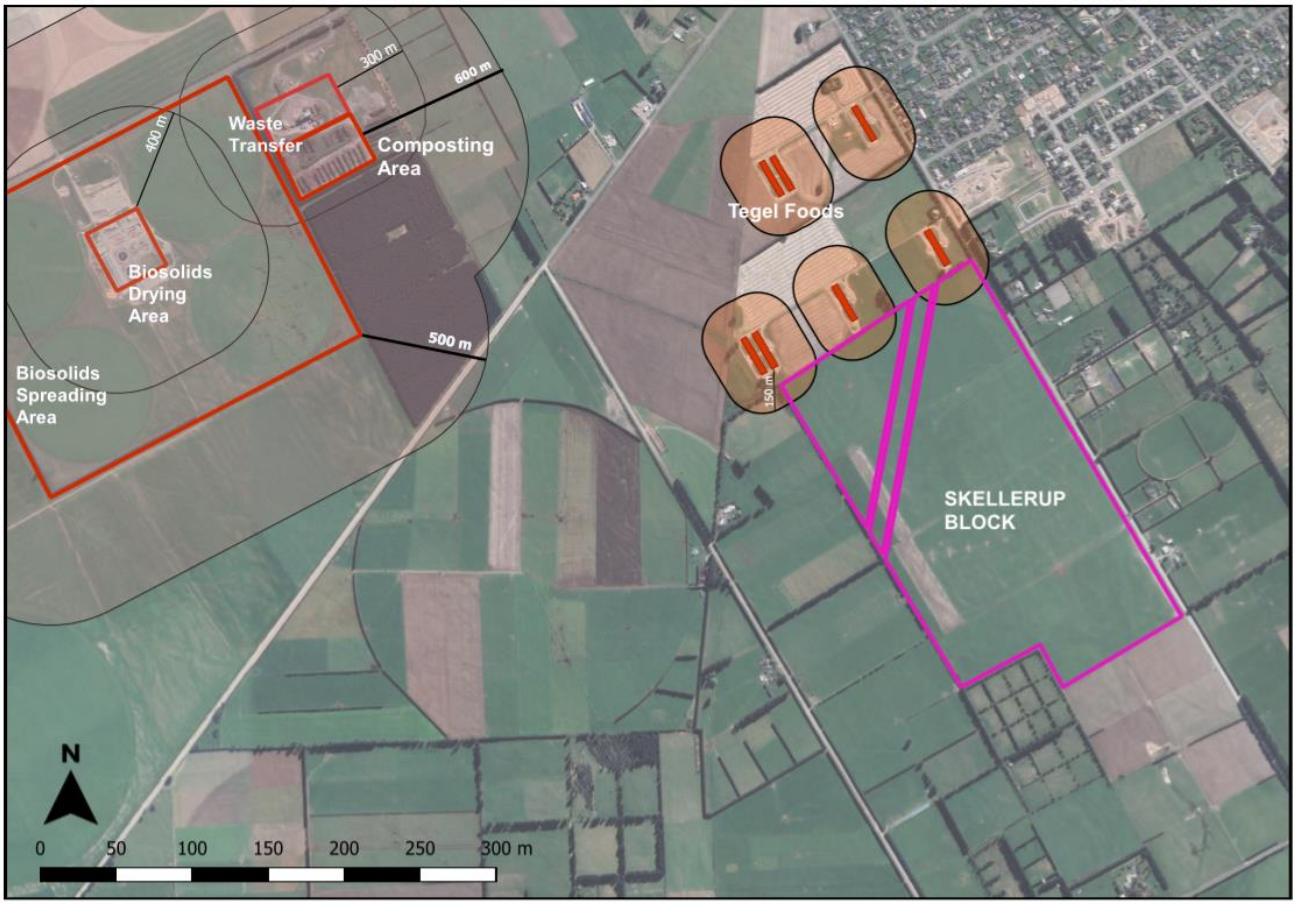


Figure 1: Recommended buffer distance for Skellerup block.

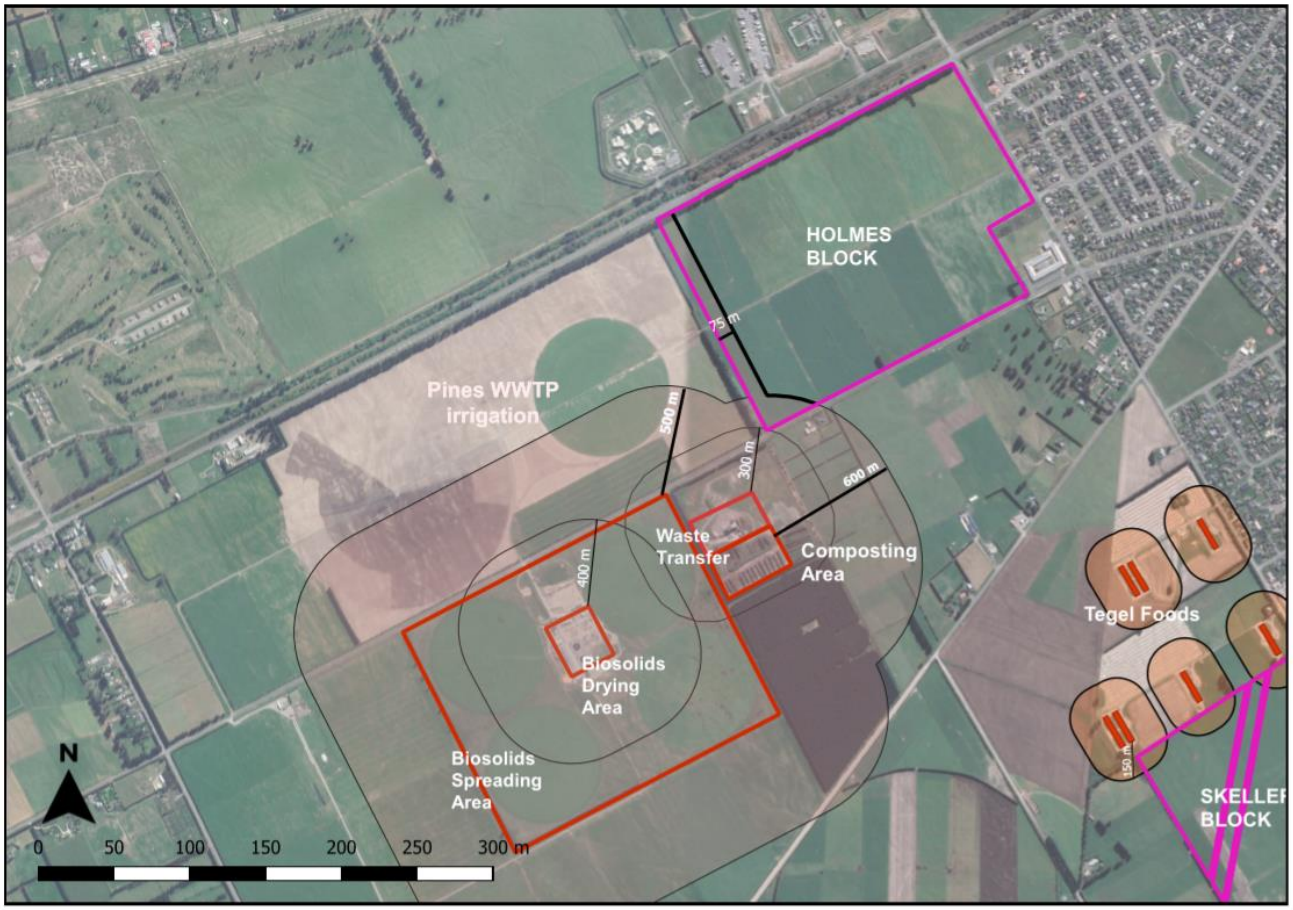


Figure 2: Recommended buffer distance for Holmes block.

4.0 CONCLUSION

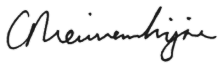
Based on our assessment above and subject to the recommended mitigation measures/buffers shown in Section 3.0, we consider that rezoning from rural-residential to residential would not result in reverse sensitivity to odour effects.

5.0 CLOSING

We trust the above information will assist RWRL in understanding the potential odour impacts on the Holmes and Skellerup blocks if developed into residential areas. If you have any queries regarding this letter, please contact the undersigned by email at cnieuwenhuijsen@golder.co.nz or by phone at (03) 903 2450.

Yours sincerely,

Golder Associates (NZ) Limited



Cathy Nieuwenhuijsen
Senior Air Quality Consultant

CN/RC/MU/mt

Attachment: Report Limitations.

https://golderassociates.sharepoint.com/sites/137296/project files/6 deliverables/002 l/20438027_7403-002-l-rev0.docx

6.0 REFERENCES

Golder, 2008. Rolleston Odour Assessment prepared by Golder Associates (NZ) for Selwyn Plantation Board Limited. Golder report reference number: SELPL-CHC-004

Environmental Protection Authority Victoria, 2012. Draft guidelines for separation distances for composting facilities, EPA Victoria Publication 1445, 2012.

Environmental Protection Authority Victoria, 2017. Designing, Constructing and Operating Composting Facilities: Guideline. Publication 1588.1, June 2017.

Environmental Protection Authority South Australia, 2019, Evaluation Distances for Effective Air Quality and Noise Management. Issued August 2016, Updated March 2019.

Australian Capital Territory, 2018. Separation Distance Guidelines for Air Emissions. November 2018.

ATTACHMENT 1

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1 February 2021 Project No. 20438027_7403-003-L-Rev0

Jocelyn Lewes
Selwyn District Council
2 Norman Kirk Drive,
Rolleston 7614,
Selwyn

RESPONSE TO REQUEST FOR FURTHER INFORMATION – PC200073 – PRIVATE PLAN CHANGE REQUEST TO THE OPERATIVE SELWYN DISTRICT PLAN FROM ROLLESTON WEST RESIDENTIAL LIMITED IN ROLLESTON

Dear Jocelyn,

Thank you for your request for further information in respect of the above application.

This letter[1] provides responses to questions in paragraphs 5 - 9, and 39 on behalf of Rolleston West Residential Limited (RWRL). The responses are structured according to the order of the requests for further information as set out in the Selwyn District Council (SDC) letter dated 22 December 2020. The SDC requests are repeated in italic text followed by Golder's response.

SDC Paragraph 5. *The Pines Waste Water Treatment Plant (WWTP) (Designations D411 & D416) and The Pines Resource Recovery Park (RRP) (Designation D412) are designated strategic infrastructure for Council. It is considered that the operation of these facilities could potentially give rise to reverse sensitivity concerns including odour and dust emissions, traffic, noise and vibration from truck movements.*

SDC Paragraph 6. *While the various assessment included in the plan change request acknowledge the current operations of these facilities, and propose measures to address reverse sensitivity effects, these measures appear to only take account of the existing operating conditions/environment. Given the potential growth in the district in light of the various plan change requests currently before Council, the expansion of these facilities is anticipated by Council. Therefore the various assessments, including odour and acoustic, are to be amended to acknowledge the future capacity of these facilities. In this regard, it is strongly advised that the applicant liaise with the relevant Council staff to fully understand the planned development of these designated strategic infrastructure sites.*

SDC Paragraph 7. *In relation to the WWTP, Council is moving towards increasing the ultimate capacity of Pines WWTP to 120,000 population equivalents (PE) and beyond, to provide for continuing growth including the potential for this plan change request. Section 2.1.1 of the Odour Assessment assumes 80,000 PE which is considered to understate the capacity of the WWTP going forward. The bio-solids spreading area will also*

[1] This letter is subject to the limitations in Attachment A.

Golder Associates (NZ) Limited
Level 1, 214 Durham Street, Christchurch 8011, New Zealand T: +64 3 377 5696 F: +64 3 377 9944

need to increase, to include all of Council's irrigation area (covered by designation D416) to allow growth, beyond that shown in Fig 1. and Fig 2 in the Odour Assessment. While the current method of processing bio solids is solar drying in glasshouses, the blending of bio solids and green waste is still a potential option being considered by Council.

***SDC Paragraph 8**. In relation to the RRP, the Odour Assessment recommends a buffer distance of 600m from the composting operation, based on the volume of compost throughput at the site in 2018, while acknowledging that the scale of the operation is not constrained. Given that the scale of composting at the RRP is expected to increase given the population growth in Selwyn, how will this affect the recommended buffer distance in order to prevent reverse sensitivity effects? Additionally the reference to an existing dwelling located 600m from the composting operation is noted. This is a rural dwelling on 20ha zoned Rural (Outer Plains). Clarification is sought about the potential difference in sensitivity of a rural dwelling vs a suburban dwelling of a scale and character proposed by the plan change request.*

Golder Response

With regard to the scale of operation of the WWTP and RRP (including composting) (paragraph 5, 6, 7 and 8), the lawfully existing environment[2] was considered for the assessment of odour effects. RWRL's counsel have advised that this is appropriate and they note it would be speculative to do otherwise and that any further expansion of the WWTP and RRP would be subject to further assessment, management and potential mitigation through an application for an air discharge consent as a minimum.

With regard to the scale of the composting operation (Point 8), the Golder Odour Assessment provided with the plan change application noted that the application documents, assessment of effects, and decision for the current consent (CRC190492) authorising activity at the RRP relate to an expected throughput of 4,200 tonnes per annum of compost. Based on this throughput, the buffer distance of 600m was developed as being appropriate to avoid reverse sensitivity effects.

Notwithstanding the conclusion above, it is noted that the throughput of compost at the RRP is currently the subject of a consent application (CRC211594). The draft Section 42A report associated with this application refers to discussion with the applicant and agreement regarding an advice note on Condition 1 which states:

> *"The volume of compost that can be processed at the site is not limited, but the location and layout of the composting area are to be consistent with the plans in the application documents and the Odour and Dust Management Plan required by this resource consent."*

Therefore, while a limit on mass throughput is not proposed, the location and layout are expected to be defined. Based on review of aerial photographs it is considered unlikely that the throughput will be able to substantially increase beyond what is currently being undertaken within the footprint defined in the current consent application, i.e., the area defined appears currently to be close to full utilisation. Accordingly, the conclusions reached by Golder in respect of reverse sensitivity effects associated with this activity and its location are considered to be robust.

Therefore, if the scale of the composting needed to increase in the future, we would expect that this would require a new consent to expand the existing operations. In Golder's view, alternative options would be available to facilitate increased operations, including westward expansion or the use of improved methods of composting such as forced aeration.

[2] Accounting for the designation applying to the land and any applicable resource consent approvals, and in particular air discharge consents.

Regarding the potential difference in sensitivity of a rural dwelling vs a suburban dwelling of a scale and character proposed by the plan change request. Golder considers that while rural dwellings may be generally less sensitive to rural odours, the potential odours effects from the composting operations and WWTP are not consistent with what would be considered rural odours. MfE (2016)[3] also refers to rural residential having a high sensitivity to non-rural activities. The Rural Section of the Plan (under B3.4) identifies that rural *"..residents should not expect an environment which is as conducive to residential activities as Living zones*". Therefore, on balance, the amenity expectations for the rural property are considered to be slightly lower than properties in living zones.

The operative plan allows for four dwellings to be built within 600 m of the composting operation in a large block living zone (see attached Figure 2). We consider additional houses within 600m of the composting operation is likely, from a probability perspective, to increase the likelihood of reverse sensitivity odour effects. Therefore, our recommendation is that no additional dwellings are built within 600 m of the composting operation to avoid reverse sensitivity effects. We note that this outcome would avoid reverse sensitivity effects to a greater degree than the status quo, insofar that the proposed change would result in four fewer houses being located within the 600m buffer distance from the composting operation.

SDC Paragraph 9. *The odour assessment also recommends a buffer distance of 300m from the waste transfer operation on the basis that nothing has changed since 2008. The quantity of waste handled has increased and will increase further as the District experiences population growth. How will this affect the recommended buffer distance in order to prevent reverse sensitivity effects?*

Golder Response

The Golder assessment considered that as the consented operation has not changed since 2008 and the distances recommended in the various buffer distance guidelines has not changed, the previously recommended 300 m buffer was still appropriate.

When considering the quantity of waste, it is noted that the Australian EPA guidance documents do not define the separation distance based on throughput waste throughput.

We anticipate that these guidance documents were developed for transfer stations which service much larger urban populations than the current or future population that is served by this facility. Therefore, Golder considers the scale of the Rolleston waste transfer station is consistent with those anticipated by the guidance documents.

Further, our own experience with well managed waste transfer stations is that a 300 m buffer is likely to be adequate to reduce offsite odour and dust effects to an acceptable level.

Therefore, the buffer distance of 300 m recommended is considered appropriate to mitigate against reverse sensitive effects even when considering an increase in population and therefore throughput of the waste transfer station.

[3] Ministry for the Environment. 2016. Good Practice Guide for Assessing Discharges to Air from Industry. Wellington: Ministry for the Environment.

SDC - Odour Assessment

SDC Paragraph 39. *It is requested that the following further matters be addressed to provide a more robust assessment of potential reverse sensitivity effects which might result from the rezoning of the two blocks.*

SDC request 39, Bullet 1: *The recommended buffer distances are provided in Table 1 and illustrated in the maps in Figures 1 and 2 of the Golder report dated 11 November 2020. It is noted that the distances of the buffers zones from the boundaries of the individual odour sources as drawn on the maps appear to be less than the actual distances when measured in Google Earth (i.e. the buffers as drawn are smaller than what is measured in Google Earth). In addition, the scale bars on the maps do not agree with the actual spatial scale of the maps. It is recommended that the buffer distances in the maps be re-examined and the assessment updated as required.*

Golder Response

It is agreed the maps were incorrect and an updated map is attached to this letter (Figure 1). The tabulated values presented have been maintained.

SDC request 39, Bullet 2: *The buffer distance for the chicken sheds recommended in the Golder report is 150 metres. However a review of the report upon which this recommendation is based has been undertaken by Beca in 2011 and is included in the Section 42A report for the original plan change application for the two blocks[4]. The Beca report has suggested that the dispersion modelling undertaken for the chicken sheds is not considered reliable, and recommends a more conservative buffer distance of 300 metres from the sheds. The reviewer in general agrees with Beca's review of the modelling of the chicken farms and recommends that the more conservative buffer distance of 300 metres be adopted unless an additional assessment which takes into account the recommendations outlined in the Beca report can demonstrate that 150 metres is an acceptable buffer distance. [It is noted that Rule C3.13.1.5 of the Rural Volume of the Operative District Plan requires that any sensitive activity is setback a minimum of 300m from any existing lawfully established intensive farming activity.]*

Golder Response

We have reviewed the Beca report and critiques of the Golder (2008) modelling approach. The modelling approach and criteria were set based on a set modelling approach and the criteria was developed based on feedback from neighbours. The approach has been used for a number of assessments in Canterbury and accepted in Environment Court[5]. The modelling approach was adapted to account for the birds being breeder birds compared to broiler birds, by adjusting the odour emission rate to be based on fully grown broiler birds. This is considered appropriate and we consider that it is a robust and conservative approach for determining reverse sensitivity effects. Regarding the concerns raised by Beca of the limitations of the Ausplume model versus the Calpuff model, for flat ground we consider the Ausplume model appropriate and as the odour criteria was developed using the Ausplume model it is considered appropriate.

With regard to Rule C3.13.1.5 of the Rural Volume of the Operative District Plan, we understand from Novo Group, that this does not apply in Living Zones and therefore does not apply to the Skellerup block.

[4] https://www.selwyn.govt.nz/__data/assets/pdf_file/0013/51430/S42a-Report.pdf

[5] M & D Rickerby [RMA 368/02, 743/03 & 744/03].

SDC request 39, Bullet 3: *The separation distance for composting operations of 600 metres is stated as being based on the current throughput of 4,200 tonnes per year of compost. As discussed elsewhere in this letter the composting operations at the RRP have increased in scale since the granting of the last consent, and will continue to increase in scale over time. Furthermore, the current throughput of 4,200 tonnes per year as stated in the Golder report refers to the end product, whereas the equivalent mass of raw compost accepted at the composting facility will be 6,500-7,000 per year. It is recommended that future growth of the composting facility be taken into account when considering an appropriate separation distance from the composting activities.*

Golder Response

As discussed in response to Point 8, it is considered that the scale of the operation is effectively constrained via the current consent CRC190492. With regard to the increase in scale, as discussed, any increase in operation would require changes to the consent and additional mitigation may need to be considered. On this basis, the 600 metre separation distance adopted by the Plan Change is considered appropriate in order to avoid reverse sensitivity effects.

SDC request 39, Bullet 4: *The separation distance of 600 metres from the composting operations illustrated in the maps are drawn from the rows of active compost at the site. However it is understood that the location of the composting activity is not restricted to a particular area within the site, and so may change locations over time. It is therefore considered that the buffer zone should be drawn from the site boundary rather than the current locations of the rows of active compost. Likewise, it is recommended that the buffer distance of 300 metres from the waste transfer operations be applied to the entire site boundary to provide for potential operational changes at the site in future.*

Golder Response

The guidance provided in the Victoria EPA[6] publications on buffer criteria state that the separation distances should be measured from the bounds of the activity rather than the property boundary. Therefore, it is considered appropriate to use the activity location. For the composting operation, as outlined above, it is considered that the location of the active composting is defined by CRC190492 therefore it is appropriate to measure the distance from the source. Likewise, for the waste transfer operation, it is considered reasonable to use the plant buildings as the distance to take the measurement from. It is considered that the activity is authorised (and constrained) to this location and we are unaware of any public plans to change the site layout. If it were to change, it would again be subject to a new or altered consent.

SDC request 39, Bullet 5: *Golder (2008) originally recommended a buffer distance of 1000m surrounding the bio solids processing facilities based on the level of uncertainty regarding the potential treatment method to be used and the fact that the WWTP is located upwind of the Holmes Block during southwesterly winds. This distance was reduced to 400m in the 2020 report based on the method of drying being in an enclosed glasshouse as opposed to composting or other methods. It is recommended that the applicant provide justification for why they think solar drying is in fact less odorous (and in particular the solar drying operation at the Pines WWTP).*

[6]EPA Victoria Recommended Separation Distances for Industrial Residual Emissions. March 2013.

Golder Response

The Golder (2008) recommended buffer of 1,000m was based on a lack of information relating to any of the aspects of the biosolids treatment (i.e. treatment of biosolids following the aerobic digestion process). There was no set processing method, design parameters or monitoring of factors that affect odour generation. Therefore, a conservative separation distance was recommended at that time. Now it is known that there is consented solar drying operation at Pines WWTP (described in CRC210644) and that it has high level of control of the various parameters that are likely to influence odour generation.

MWH and Scion (2011)[7] set out the operational experience and design of the solar drying plant. The solar drying operation has PLC controlled ventilation fans, and feed-rate and automated solids and therefore it has a high degree of process control. We consider that this operation is likely to be less odorous than what could be assumed previously due to the high level of control and management of the solids as they are dried.

Following conversations with Chris Bender (26/1/21, SDC reviewer) Golder understands that there have been recent concerns regarding the odour from the solar drying operation. Following discussion with Murray England[8] (Asset Manager Water Services, Selwyn District Council) we understand that the current solar drying operation is at and occasionally beyond the upper limits of its capacity and this is what is causing the odour concerns. The site is in the process of increasing capacity to be able to treat 60,000 PE of Wastewater compared to the current design capacity of 30,000 PE. Golder assumed a capacity of 80,000 PE for its assessment based on our understanding of the plant's future capacity. Therefore, the capacity will still be lower than what was evaluated in the separation distance assessment.

Notwithstanding any current operational difficulties, for a well-managed operation with the control and monitoring measures a 400 m separation distance is considered to be appropriate. Due to the 900 m distance to the Holmes block, odour related reverse sensitivity effects will be adequately avoided at the Holmes block.

SDC request 39, Bullet 6: *Notwithstanding the above, it is noted that separation distances do not have any clearly defined regulatory standing in New Zealand, and the reviewer considers a quantitative or semi-quantitative assessment specific to the area in question will provide a more robust assessment of potential reverse sensitivity effects on residences in the Holmes and Skellerup blocks. This should include at a minimum a FIDOL assessment of the activities and a review of any odour complaints for the area within the most recent 10-year period. This may be undertaken as a desktop review of the air discharge consents and associated applications with supporting documentation for the various odour-generating activities in the area.*

Golder Response

The use of separation distances is considered to be appropriate for reverse sensitivity assessments. They are explicitly referred to in MfE (2016) as useful tools for managing reverse sensitivity. Golder considers recommended separation distances to be a screening assessment and if these distances can be maintained then further assessment is not required in most circumstances. In this case we have recommended separation distances that are expected to be sufficient to avoid reverse sensitivity effects.

We have reviewed all consent applications and odour assessments available for the activities identified along with previous separation distance assessments. The information in these have been considered in this assessment and there is sufficient information to complete a separation distance-based assessment.

[7] https://www.waternz.org.nz/Attachment?Action=Download&Attachment_id=546. Accessed 27/1/2020

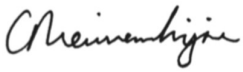
[8] *Pers Comms* C Nieuwenhuijsen, M England (28/1/21)

Regarding complaints, we understand based on CRC211594 application there has only been one complaint in the last 10 years. Given the current low population, it is difficult to make any sound conclusions regarding odour effects from complaint data.

Closing

We trust the above information fulfils SDC's requirements. If you have any queries regarding this letter, please contact the undersigned by email at cnieuwenhuijsen@golder.co.nz or phone at (03) 377 5696.

Golder Associates (NZ) Limited



Cathy Nieuwenhuijsen
Senior Air Quality Consultant

CN/RSC/mt

Attachments: A: Report Limitations
B - Figures

https://golderassociates.sharepoint.com/sites/137296/project files/6 deliverables/003-rfi response/20438027_7403-003-l-rev0_final.docx

ATTACHMENT A

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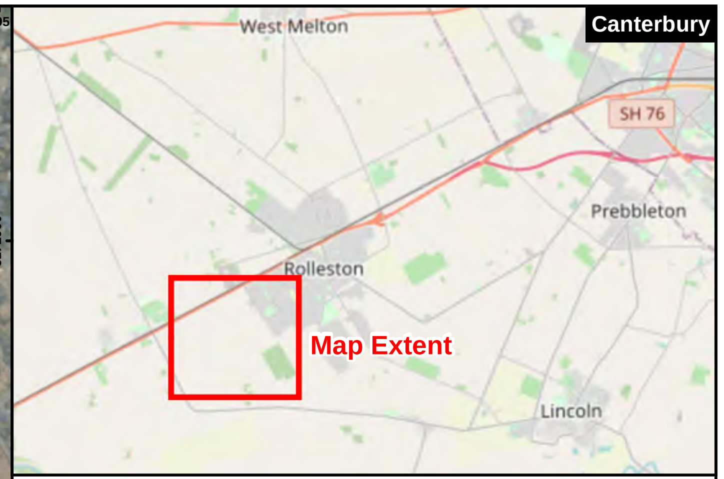
ATTACHMENT B

Figures



LEGEND

- Blocks
- Recommended Odour Control Area
- Individual buffers
- Tegel Farms
- Pines Waste Transfer Area
- Pines Composting Area
- Pines Biosolids Drying Area
- Pines Biosolids Spreading Area
- Irrigation Boundary
- Buffer distances

NOTES

1. Aerial image: LINZ and Eagle Technology, CC-BY-3.0-NZ.
2. Map image: © OpenStreetMap (and) contributors, CC-BY-SA Sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 4.0 New Zealand licence
3. Schematic only, not to be interpreted as an engineering design or construction drawing.

0 500 1,000 METRES

REFERENCE SCALE: 1:14,000 (at A3)

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

CLIENT
SELWYN DISTRICT COUNCIL

PROJECT
ROLLESTON CARTER GROUP PRIVATE PLAN CHANGE

TITLE
SITE PLAN

CONSULTANT	YYYY-MM-DD	2021-01-29
GOLDER	PREPARED	AE
	REVIEW	AK
	APPROVED	CN

PROJECT NO.	REPORT	REV.	FIGURE
20438027	003	0	01

LEGEND

- Holmes Block - Current Operative Plan
- Recommended Odour Control Area
- Operative Plan Odour Control Setback Area
- Operative Plan Potential House Locations

Selwyn District Council Operative Plan Legend:

- 4000m² to 5000m² Lots Permitted
- Lower Density Area (minimum 4ha lots)
- Countryside Area
- Community Focal Point / Reserve
- State Highway Buffer Planting Treatment Required
- Shelter Belt Treatment Required
- Street Tree Planting
- Public Walkway
- Local Road (refer to diagram overleaf)
- Odour Control Setback Area
- State Highway Building Setback

NOTES

1. Aerial image: Nearmaps WMS.
2. Map image: © OpenStreetMap (and) contributors, CC-BY-SA
3. Schematic only, not to be interpreted as an engineering design or construction drawing.
4. Site layout courtesy of Selwyn District Council, Appendix 39.

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0 200 400 METRES

REFERENCE SCALE: 1:5,000 (at A3)

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

CLIENT
SELWYN DISTRICT COUNCIL

PROJECT
ROLLESTON CARTER GROUP PRIVATE PLAN CHANGE

TITLE
SITE PLAN - CURRENT AND PROPOSED ACTIVITIES

CONSULTANT
GOLDER

YYYY-MM-DD	2021-01-29
PREPARED	AE
REVIEW	CN
APPROVED	CN

PROJECT NO.	REPORT	REV.	FIGURE
20438027	003	0	**02**

25 February 2021 Project No. 20438027_7403-005-L-Rev0

Jocelyn Lewes
Selwyn District Council
2 Norman Kirk Drive,
Rolleston 7614,
Selwyn

RESPONSE TO REQUEST FOR FURTHER INFORMATION – PC2000073 -PRIVATE PLAN CHANGE REQUEST TO THE OPERATIVE SELWYN DISTRICT PLAN FROM ROLLESTON WEST RESIDENTIAL LIMITED IN ROLLESTON

Dear Jocelyn

Following our discussion on 24 February 2021, we understand that the Selwyn District Council (SDC) is wanting to understand the reverse sensitivity effects of the Holmes Block plan change area on the Pines Wastewater Treatment Plant (WWTP) if this was expanded to a treatment capacity of 120,000 population equivalent (PE). This is with regard to the Wastewater treatment facility, the biosolids processing and spreading area as well as the treated wastewater irrigation zone, these operations were previously assessed in Golder (2020)[1].

This letter[2] provides an update of the odour assessment when considering the Pines WWTP operating at a 120,000 PE capacity.

In addition, this letter provides further comment generally on the potential for reverse sensitivity effects if the Resource Recovery Plant (RRP) were to increase its operations over time in response to population growth.

Wastewater Treatment Facility

To assist in evaluating a separation distance for a 120,000 PE WWTP, the same published separation distances that were considered in the Golder (2020)[1] assessment were considered. Victoria (Vic) EPA provides an equation to calculate the buffer distance for a mechanical/biological treatment plant and based on this, a 493 m buffer is calculated for the 120,000 PE (this is an increase of 63 m from the 430 m calculated for an 80,000 PE operation). This is within the recommended buffer distance of 500 m (Golder 2020)[1] based on experience with similar operation in New Zealand. Therefore, we consider the recommended buffer distance of 500 m is still appropriate and protective for the potential WWTP expansion. Note, that Golder has identified that the minimum distance from the WWTP facility to the proposed residential areas on the Holmes block is 900 m.

[1] Golder 2020. Review of Odour Effects Relating to Holmes and Skellerup Block – Rolleston West Plan Change. Golder report reference number: 20438027_7403-002-L-Rev0.

[2] This letter is subject to the limitations provided in Attachment 1.

Spray Irrigation

When considering the wastewater irrigation, our recommended separation distance of 100 m is based on pathogen risk and our understanding of the quality of the treated wastewater. It is noted that the amount of wastewater that can be irrigated is effectively limited by the current consent limits (i.e groundwater nitrate/nitrogen concentrations, soil metal content, and hydrology loading limits). These quantity and quality factors were considered when recommending a setback distance and maximum loading rates were assumed.

On the basis that any increase in WWTP facility capacity does not change the quality of treated wastewater irrigated, it is expected that any increase in the quantity of treated wastewater would be on additional land that is further from the Holmes Block than the current irrigation, noting that the current irrigation is presently 25m from the boundary with the Holmes block and has little practical scope to occur any closer. Therefore, there would be no additional reverse sensitivity effects associated with spray irrigation from the WWTP if it were expanded to a treatment capacity of 120,000 PE.

Biosolids Processing and Spreading Area

For the land spreading of biosolids, any expansion in WWTP capacity would increase the amount of biosolids generated from the WWTP. Currently the biosolids are spread on the block immediately surrounding Pines facility. Re-zoning of the Holmes block is not likely to materially limit the spreading of biosolids beyond the restrictions that would be applied due to the current Residential 3 zoning and permitted rural-residential activity on the Holmes block.

Furthermore, the area of land between the Holmes block and where biosolids are currently spread is a relatively small percentage of the SDC land in the vicinity of the Pines WWTP, and it is considered that biosolids could be spread on SDC land to the west or south of the Pines WWTP. Additionally, as the biosolids are meet Aa or Ab classification it is expected that they are likely to have commercial value as a fertiliser for use/application elsewhere in the District.

Accounting for the above, it is considered that reverse sensitivity effects associated with the spreading of biosolids from the WWTP, if it were expanded to a treatment capacity of 120,000 PE, could be readily avoided.

Resource Recovery Park

With regard to the expansion on the resource recovery park, for the waste transfer operations, as stated in RFI response (Golder 20213), the recommended 300 m buffer is considered to be protective for the scale anticipated for the future operation of the waste transfer operation accounting for potential growth in volumes associated with a growing population in the District.

With regard to the composting operation, as outlined in the RFI response (page 2), we have recommended further setback to new dwellings than what is currently allowed for by the operative plan.

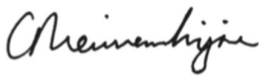
It is considered any substantial expansion of composting operations beyond what is currently consented, may need to adopt alternative methods of composting, increased monitoring/control, or westward expansion irrespective of the change of the Holmes block zoning from Residential 3 to Living Z. This is due to vicinity of the current potential house locations and potential odour effects of any substantially increased operation.

[3] Golder letter C Nieuwenhuijsen to J Lewes 1 February 2021 20438027_7403-003-L-Rev0.

Conclusion

The above assessment confirms that even for an expanded WWTP facility (up to and potentially beyond 120,000 PE) and Resource Recovery Park, the Holmes block zoning change (when including the proposed setbacks) is unlikely to result in reverse sensitivity effects on the either of the facilities. With regard to the composting operation, it is considered that there are mitigation options available to allow expansion without resulting in offsite odour effects on the proposed Living Z zoned Holmes block.

Golder Associates (NZ) Limited



Cathy Nieuwenhuijsen
Senior Air Quality Consultant

Attachments: Report Limitations

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