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Southland Regional Council
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**Memorandum: Technical Review of Assessment of Effects of
Discharges to Air from the Blue Sky Meats Plant,
Morton Mains**

Preliminary

Environment Southland has commissioned Specialist Environmental Services Limited (**SES**) to undertake a technical review of the assessment of effects (**AEE**) of discharges to air from the Blue Sky Meats (**BSM**) processing plant at Morton Mains. This memorandum report reviews the AEE prepared by Beca, the revised dispersion modelling report prepared by Beca dated 29 June 2023, the further information response from Beca dated 24 July 2023 and the updated consent conditions proposed by Mitchell Daish on 18 August 2023.

The technical review has been undertaken by the author, John Iseli, on behalf of SES. I have 30 years of experience in the field of air quality in New Zealand and have undertaken numerous assessments and reviews relating to meat processing plants, wastewater treatments plants, odour discharges and combustion sources. I am experienced in the use of dispersion modelling for such assessments, including the AERMOD model used in this case. I confirm that the findings expressed are my own conclusions and I have not delegated review work to any other party.

As part of the technical review, I have visited the BSM site in Morton Mains in 2022 and viewed the various emission sources. I note that the rendering plant was not operating at the time of my inspection and replacement of the biofilter media was occurring.

BSM operates an existing meat processing and rendering plant at the site. Discharges of odour occur from rendering, meat processing, blood drying and the wastewater treatment plant (**WWTP**). Odour emissions also occur from the application of treated wastewater, stockyard solids, paunch grass, biosolids and waste activated sludge to land around the plant. Emissions of combustion products occur from a 1.9MW Hot Water Boiler (**HWB**, to be decommissioned by August 2024) fired by coal, a 4.3MW Rendering Steam Boiler (**RSB**) also burning coal, and a biogas flare at the WWTP anaerobic pond.

Upgrades to the WWTP at the site occurred between September 2019 and January 2020. The application states that this has resulted in improvement to the quality of wastewater discharged to land.

Key Contaminant Emission Sources

Beca has described the primary emission sources at the plant. I agree that the primary discharges from the site that require assessment are:

- The boilers and flare discharging key contaminants SO₂, PM₁₀ and NO₂;
- Meat processing/rendering/blood drying and wastewater treatment discharging odour;
- Odour from application of treated wastewater, stockyard solids, paunch grass and waste activated sludge to land.

Boiler Discharges

Prior to August 2024, discharges will continue to occur from the 1.9MW HWB and the 4.3MW RSB, both fired by coal. The fuel has recently been changed from Newvale lignite to Takitimu coal to achieve a reduction in particulate matter (**PM**) discharges that have been relatively high (unable to comply with current consent limits). Recent emission testing indicates that the change has been successful in reducing the PM emission concentration.

The HWB discharges to air via an 18.6m high emission stack, while the RSB discharges via a 20m high stack. I have reviewed Beca's contaminant emission rate calculations for the boilers, including the updated values in the further information response, and consider that they now provide a reasonable estimate of expected emissions at peak output. The calculated PM emission rates for the RSB Vekos boiler are based on a proposed consent limit of 400mg/Nm³ (adjusted to standard conditions), reduced from the existing authorised 500mg/Nm³. Vekos boiler PM emissions are high relative to underfeed or chain grate stoker boilers and I consider that the suggested emission limit is reasonable for a boiler of this type, without additional control such as bag filtration being applied.

Beca has calculated emission rates for the primary contaminants PM₁₀, PM_{2.5}, SO₂ and NO₂. I consider that fine PM and SO₂ are the key contaminants in terms of potential effects in this case, and the technical review will focus on these components. The assessment of NO₂ effects is appropriately conservative and predicts concentrations within air quality guidelines. Beca has also assessed mercury emissions associated with coal combustion and I agree that effects of metals are expected to be less than minor.

The flare will burn biogas from the covered anaerobic pond. When combustion does not occur in the flare, the biogas discharge will be directed to the biofilter for treatment. The biogas contains H₂S, resulting in SO₂ emissions when burned in the flare. In response to the request for further information, Beca has assessed the SO₂ emission rate from the flare based on an assumed H₂S concentration of 4000ppm. I consider this value to be appropriate, based on monitoring data from similar anaerobic ponds at other plants. There will be variance in H₂S emission concentrations from approximately 500 to 5000ppm, with peak concentrations typically occurring for relatively brief periods. I consider that the 4000ppm assumption in the assessment is likely to result in conservative predictions of 24-hour average SO₂ concentrations and realistic predictions of peak short-term (1-hour average) SO₂ concentrations.

Odour Emissions

The odour emission rates from the stockyards, rendering and wastewater treatment have not been quantified. Rather, the applicant has relied on a qualitative assessment of odour effects based on the performance of the current plant. This is a common approach for this type of existing activity and is appropriate in the circumstances.

The rendering plant is a key odour source and emissions are directed to the biofilter. It is important that fugitive emissions from the rendering plant are minimised and that the odour removal performance of the biofilter is maintained.

Odour discharges from the application of treated wastewater and solids to land have also been considered. However, I note that the applicant's assessment of odour effects of solids application is very limited and essentially relies on the mitigation (including setbacks) required by the proposed consent conditions for the discharge to land.

The Receiving Environment and Meteorological Conditions

Beca has presented wind roses of meteorological data generated for the site using the models AERMET and TAPM. This approach is acceptable given the distance to meteorological stations at Invercargill and Gore. I consider that the presented information is adequately representative of wind conditions at Morton Mains. The wind roses show the strong prevalence of north-westerly and westerly winds in the local area. This is consistent with typical wind patterns observed in the wider area.

The Beca AEE has identified sensitive receptors (dwellings) in proximity to the BSM plant, as shown in Figure 4-1 of that report. The nearest dwelling is approximately 470m

south-east of the site, downwind of the prevalent north-westerly winds. Other dwellings are shown as being at least 900m from the BSM plant.

Rural dwellings in the local area also have potential to be affected by odour from the application of wastewater, stockyard solids, paunch grass, waste activated sludge and biosolids to land. The application proposes to avoid this by maintaining a setback distance of at least 100m from dwellings.

Assessment of Boiler Discharges

Dispersion Modelling

Beca used the AERMOD dispersion model to predict contaminant ground level concentrations (**GLCs**) caused by the boiler and flare discharges. AERMOD is a Gaussian plume dispersion model commonly used for this type of assessment and I consider it to be an appropriate choice in this case. An AERMET meteorological data file was developed for modelling using prognostic data for the site from the TAPM model.

Three scenarios have been modelled:

- Existing consented emissions (both boilers at 500mg/Nm³ PM)
- High PM (RSB 500mg/Nm³, HWB 1000mg/Nm³ PM)
- Future (RSB only 400mg/Nm³ PM) – applies from August 2024.

In response to the further information request, continuous SO₂ emissions from the flare have been included in the revised modelling.

The predictions for the “future” scenario indicate a reduction in off-site SO₂ and fine PM concentrations after August 2024. This is expected given the planned replacement of the HWB with a heat pump and the reduction in RSB PM emissions due to a change of coal type.

I have examined the model inputs and assumptions selected by Beca, including for the updated 2023 modelling. I consider that these inputs are appropriate and are expected to result in generally conservative predictions of peak contaminant concentrations.

Effects of SO₂

The dispersion modelling of the future scenario (post August 2024) predicts maximum off-site SO₂ concentrations of 85µg/m³ (1-hour average) and 50µg/m³ (24-hour average), dominated by flare emissions in close proximity to the plant. Predicted SO₂ 1-hour average concentrations at the most affected dwelling are lower at 55µg/m³ (62µg/m³ existing) and 28µg/m³ (34µg/m³ existing) for 24-hour averages. These values are well within the relevant NZ Ambient Air Quality Guideline (AAQG) of 120µg/m³ (24-hour average) and the National Environmental Standard for Air Quality (NESAQ) of 350µg/m³ (1-hour average).

I note that the modelled SO₂ predictions do not include background concentrations. However, I agree with Beca that these are likely to be negligible due to the lack of other significant industrial emitters in the local area.

The model predictions conservatively assume continuous emissions at peak output. Overall, I consider that any adverse effects of SO₂ emissions from the BSM plant are expected to be less than minor. The proposal will result in an improvement by eliminating emissions from the HWB from August 2024.

Effects of PM₁₀ and PM_{2.5}

The dispersion modelling of the future scenario (post August 2024) predicts maximum cumulative PM₁₀ concentrations at dwellings of 23µg/m³ (24-hour average) and less than 7µg/m³ (annual average). The predicted 24-hour average contribution from BSM at the most affected dwelling is relatively small at 3.2µg/m³ (4.5µg/m³ existing) and 0.49µg/m³ (0.7µg/m³ existing) for the annual average. The predicted cumulative concentrations are well within the NESAQ of 50µg/m³ (24-hour average) and AAQG of 20µg/m³ (annual average).

The biogas flare is assessed as having negligible PM emissions. I accept that fine PM emissions from this source will be small relative to the coal-fired boilers. Elimination of the HWB and improvements to PM control for the RSB contribute to the reduction in predicted concentrations.

Beca has also modelled PM_{2.5} discharges from the boilers. The dispersion modelling of the future scenario (post August 2024) predicts maximum cumulative PM_{2.5} concentrations at dwellings of 16µg/m³ (24-hour average) and 4.4µg/m³ (annual average). The predicted 24-hour average contribution from BSM at the most affected dwelling is 2.6µg/m³ (2.8µg/m³ existing) and 0.4µg/m³ (0.46µg/m³ existing) for the annual average. The predicted cumulative concentrations are within the proposed NESAQ of 25µg/m³ (24-hour average) and 10µg/m³ (annual average).

I consider that the PM₁₀ and PM_{2.5} assessment approach adopted by Beca is reasonable and that effects of fine particulate matter discharged from the BSM site are likely to continue to be minor. The proposed changes are expected to result in a reduction in off-site impacts.

I note that the NES for Greenhouse Gas Emissions from Process Heat now limits the consent term for the RSB discharge to 10 years and prohibits the discharge from coal combustion in the boiler from 2037.

Assessment of Odour Discharges

Rendering Plant

The rendering plant is a key source of odour from the site. The plant is of relatively modern design, with point source and building air extraction from the wet areas to a bark/soil biofilter. The further information response has addressed some matters raised regarding the rate of air extraction to the biofilter, contingency measures and minimisation of fugitive odour emissions.

The rendering plant was originally designed to achieve 12 air changes per hour, extracted to the biofilter (as specified in the existing consent conditions). However, recent testing has indicated that the extracted air flow rate to the biofilter is substantially less than originally anticipated. Testing in February 2023 indicated a flow rate of only 5.1m³/s at the biofilter inlet, and 8m³/s was measured in May 2023. Based on the measured flow in May, the loading rate on the biofilter equates to approximately 28m³ air/m³ media/hour. This value is well within guidelines for odour control performance of biofilters. For example, the Auckland Council recommends a rate of less than 50m³ air/m³ media/hour. Biofilter moisture and temperature measurements were within the accepted range, but the pressure drop measured in recent testing was relatively high.

The updated biofilter information, following recent measurements, indicates that there will likely be scope to improve the air flow rate to the biofilter. Beca states that the May 2023 measured flow rate equates to only 4.6 air changes per hour, well below typical design values of 10-12 air changes per hour. It is important that the extraction rate to the biofilter is optimised so that the rendering building can be reliably maintained under negative pressure and fugitive odour emissions are minimised. The applicant proposes to address this issue via the procedures in the Air Discharge Management Plan (**ADMP**) and to monitor the pressure in key extraction ducts quarterly.

I recommend changes to consent conditions that address this matter, including a maintaining a minimum of 8 air changes per hour in the rendering building and a biofilter loading rate of not more than 50m³ air/m³ media/hour. Compliance with these minimum requirements is likely to require (at a minimum) cleaning of extraction ducts to improve the air flow rate and modifications to the biofilter/inlet to reduce the currently high pressure. I recommend that within 6 months of the commencement of any new consent a suitably qualified air quality expert should provide a report to the consent authority for approval, certifying that adequate building air and point source extraction is achieved to prevent fugitive odour emissions and that the biofilter is designed and operated to achieve effective ongoing odour control and comply with the conditions of this consent, including being suitably sized to treat the upgraded combined building and point source air extraction rate from the rendering plant.

With regard to fugitive emissions, BSM proposes that the rendering building will be maintained under negative pressure with external doors remaining closed when not in use. A rapid roller door is installed for raw material receipt, opening automatically to allow forklift access. Beca states that Rendertech undertook a review of building tightness in 2018 and identified issues were rectified. I consider that such a review should occur on a regular basis.

An updated ADMP has been provided that is generally appropriate and addresses key matters relevant to odour control. I recommend some additional matters for specific inclusion in the ADMP required by consent conditions. I consider that the management plan should be updated at least once every two years and certified by Environment Southland.

There is potential for increased odour emissions to occur in the event of a power failure. The record submitted indicates that power outages are common but are typically brief (mostly less than 2 hours). The applicant states that there are two separate power supplies to the site and it is often sufficient to redistribute power in the event of failure of one connection. During a major prolonged outage extraction to the biofilter could not occur and the key contingency would be to remove rendering material from the site for processing elsewhere.

The complaints record held for the site indicates that there have been few odour complaints recorded since upgrades to the plant were completed in late 2019 to early 2020. An incident was reported in April 2020 concerning “rendering meal odour” and BSM concluded that biofilter maintenance was required. In January 2023 a complainant reported rendering odour (strength 2/10) and noted that such odour is experienced occasionally on still nights. I recognise that this information is limited in detail, but it does support the conclusion that the extraction rate to the biofilter or the odour treatment achieved in the biofilter (or both) are not optimal at present.

Several odour complaints relating to effluent application and rendering odour had been made during 2018. The record indicates a significant improvement in recent years, but also supports the need for ongoing maintenance requirements to ensure that rendering odour control is optimised.

This compliance information indicates that in recent years the BSM plant has generally operated in a manner that does not cause objectionable or offensive odour effects. It should nevertheless be noted that complaint records alone are not always a reliable source of information, particularly in such rural areas with a relatively small number of receptors. The plant has good separation from most neighbouring dwellings. However, I note that one dwelling is only 470m SE of the site and an ongoing high standard of odour control will be required to prevent adverse effects at this location, downwind during prevailing north-westerly conditions.

The compliance record for the existing discharge does suggest that adequate odour control is likely being achieved at most times, with some scope to improve rendering

odour control to prevent odour being detected during light wind conditions. Provided rendering extraction is improved to minimise fugitive emissions, odour controls and monitoring are regularly reviewed and certified in the management plan and the biofilter is well maintained, I am satisfied that adequate odour control could be achieved at the rendering plant to prevent any significant adverse effects.

Wastewater Treatment

The primary odour emission sources from the WWTP are the anaerobic pond, the SBR lagoon and the irrigation lagoon. Covering of the anaerobic pond with flaring of captured biogas effectively mitigates odour from this source. I note that it is important that a tight seal on the anaerobic pond cover is maintained. Biogas that is not combusted is ducted to the biofilter.

The SBR and irrigation lagoons are not expected to result in significant off-site odour, provided adequate aeration is achieved. Beca have stated that there is sufficient aerator redundancy and contingencies in place to ensure that dissolved oxygen levels in the lagoon can be maintained.

Taking into account the complaints history for the site discussed above, I expect that the WWTP could continue to be operated in a manner that does not cause offensive or objectionable odour at neighbouring rural dwellings.

Wastewater and Solids Application to Land

The upgrades to the WWTP have resulted in improved wastewater quality. The AEE states that wastewater irrigated from the storage lagoon is in aerobic condition and has low BOD and suspended solids. I agree with Beca that the improvement in wastewater quality reduces the potential for odour associated with irrigation of wastewater to land.

BSM proposes to continue the standard mitigation measures employed under the existing consent to control odour effects of discharges to land. Wastewater will be irrigated by K-line pods and it is proposed that there be no spray drift within 20m of external property boundaries and 100m of neighbouring dwellings. In response to the request for further information, the applicant proposes that if wastewater is held in the irrigation lines for more than 48 hours, these setback distances will be doubled on the first day of irrigation. I agree that this measure is likely to be sufficient to address potential odour impacts from irrigation of stagnant wastewater in the pipes.

A draft Wastewater Farm Environmental Management Plan has been provided. Prevailing wind direction relevant to receptors (dwellings) is taken into account at the time of irrigation. I consider that the mitigation measures proposed for wastewater discharge, including setbacks, are generally appropriate. However, I recommend the following additional conditions:

- No offensive or objectional odour shall occur beyond the boundary of the land where the wastewater or solids are applied; and
- Wastewater, sludge or solids applied to land shall not be in anaerobic condition at the time of discharge.

The applicant has not provided a specific assessment of odour effects of the discharge of stockyard solids, paunch grass and waste activated sludge to land. I consider that the Farm Environmental Management Plan should be updated to include these discharges. Subject to the additional conditions recommended above, and the imposition of a 150m setback distance to dwellings from these materials, I conclude that the activity could continue to be undertaken so that odour effects are no more than minor. In reaching this conclusion, I have taken into account the lack of confirmed odour complaints relating to effluent irrigation and discharges to land since 2018.

Alternatives

The upgrades to the WWTP completed in 2019-2020 appear to have been effective in reducing odour emissions from this source and from the discharge of wastewater to land. Biogas from the covered anaerobic pond is collected and flared or treated in the biofilter. Consideration could be given to burning the biogas to obtain energy in future, as occurs at the South Pacific Meats plant in Awarua.

The applicant has obtained funding to replace the HWB serving the processing plant with a heat recovery system. The HWB has relatively high PM emissions and low thermal efficiency. I agree with Beca that the proposal will result in a substantial reduction in PM, SO₂, NO₂ and CO₂ discharges from the BSM site.

The NES for Greenhouse Gas Emissions from Process Heat now limits the consent term for the RSB discharge to 10 years and prohibits the discharge from coal combustion in the boiler from 2037. I understand that the NES requires BSM to prepare an Emissions Plan for the site that considers energy efficiency improvements. This matter is outside my expertise and beyond the scope of this technical review.

The rendering plant employs standard modern odour control measures, with extraction of building and point source air to a biofilter for treatment. This mitigation is expected to continue to be effective, following improvements to building air extraction, provided adequate negative pressure is maintained in the building to prevent fugitive discharges and the biofilter is appropriately maintained. Overall, I consider that the proposed discharges are consistent with the best practicable option (BPO) for activities at the BSM site.

Affected Parties

The key potential effect on neighbouring rural properties is odour from the rendering plant and from application to land of wastewater, sludge and solids. Based on the available information and my experience of similar discharges, I consider that there is potential for dwellings within 1000m of the site to experience rendering odour on occasion. Provided the conditions recommended in this report are adopted, it is my opinion that these odour effects are likely to be minor but would not be regarded as “less than minor” in terms of section 95E of the RMA.

The dispersion modelling indicates that cumulative concentrations of PM₁₀ and PM_{2.5} will be within the current and proposed NESAQs. I note that the World Health Organisation in 2021 issued more stringent guidelines, which have not yet been formally adopted in New Zealand. Such standards and guidelines for fine particulate matter are not set at a “no effects level” and I consider the contribution from the RSB has potential to cause a minor adverse effect at the most affected dwelling, 470m from the discharge. I note that this dwelling is also an affected party with regard to odour.

Conclusion

BSM proposes to continue to discharge to air from various activities occurring at the existing meat processing plant at Morton Mains. The WWTP has recently been upgraded and the HWB serving the processing plant is scheduled to be replaced with a heat recovery system by August 2024. SES has reviewed the assessment of effects of discharges to air submitted with the application.

The key contaminants in terms of potential adverse effects are SO₂, PM₁₀ and PM_{2.5} from the boiler discharges and biogas flare, and odour from the rendering plant and wastewater treatment/land application.

The technical review concludes that effects of SO₂ are likely to be less than minor and any effects of PM₁₀/PM_{2.5} are expected to be no more than minor. The plant is located in a rural area and the nearest neighbouring dwelling is approximately 470m from the site. The proposed change is predicted to result in a reduction to consented PM emissions and a reduction to off-site ground level concentrations of all key combustion source contaminants.

The existing site has a relatively good compliance record with few complaints regarding odour from the site and associated discharges to land recorded in recent years. However, there is a dwelling within 500m south-east of the site and other dwellings located within 1km and therefore regular ongoing maintenance will be required to ensure that rendering and WWTP odour control continues to meet good practice standards. Some additional consent conditions have been recommended accordingly. Subject to these additional controls, it is concluded that adverse effects of odour discharged from the site are likely to be no more than minor and are expected to be less than minor beyond 1000m from the site.

Conditions of Consent

Mitchell Daysh has proposed revised consent conditions in the further information response dated 18th August 2023. I consider that these conditions are generally appropriate and reflect the updated assessment provided. However, as discussed above, I recommend some changes and additions (indicated by ~~striketrough~~ and underlining) as follows.

Discharge of Contaminants to Air

... 2. a. The maximum coal burning rate in the rendering steam boiler shall not exceed ~~1,400~~ 1000 kilograms of coal per hour, based on combustion of coal with a gross calorific value of at least 20MJ/kg; and
b. The maximum coal burning rate in the hot water boiler shall not exceed ~~630~~ 450 kilograms of coal per hour, based on combustion of coal with a gross calorific value of at least 20MJ/kg...

... 6.

a. The mass emission rate of total particulate matter discharged from the rendering steam boiler shall not exceed 2.30 kg/hr; and

b. The concentration of particulate matter in combustion gas discharged from the rendering steam boiler chimney stack shall not exceed 400 milligrams per cubic metre adjusted to 0 degrees Celsius, dry gas basis, 101.3 kilopascals, and 8 percent oxygen or 12 percent carbon dioxide; and

~~b-c.~~ the mass emission rate of total particulate matter discharged from the hot water boiler shall not exceed 2.30 kg/hr...

...8.

a. The rendering steam boiler identified in Condition 1(f) shall be tested annually to confirm compliance with Condition 6(a) and 6(b) prior to the first, second and third anniversaries of the date of the commencement of this consent.

b. Testing of the rendering steam boiler can reduce to once every ~~three~~ two years if compliance with Condition 6(a) and 6(b) has always been achieved during the testing undertaken in accordance with Condition 8(a).

c. If compliance with Condition 6(a) and 6(b) has not always been achieved during testing undertaken under Condition 8(a) then annual testing shall be undertaken until compliance with Condition 6(a) and 6(b) over three consecutive years of monitoring has been achieved...

...10. Testing to confirm compliance with the particulate mass emission limit and concentration limit shall occur when the tested boiler is operating at greater than 75

percent of the boiler heat output stated in Condition 1(f) for the rendering steam boiler and Condition 1(g) for the hot water boiler. The method of sampling and analysis shall be to stack testing industry standards such as USEPA, ASTM or ISO testing methods. All analyses shall be performed by an International Accreditation New Zealand (IANZ) registered laboratory or otherwise as specifically approved by the Environment Southland Compliance Manager...

...12. The boilers shall be serviced and maintained at least once every year, by a person competent in the servicing of such appliances, to ensure compliance with Conditions 3 and 6 at all times. This servicing shall include: ash removal; adjustment if necessary of the fuel to air ratio; and measurement of the percentage of carbon monoxide, carbon dioxide and oxygen in the flue gases discharged. Service reports shall be prepared and retained for at least 7 years, and copies shall be provided to the Environment Southland Compliance Manager on request...

...17.

a. The Consent Holder shall ensure that the ventilation system draws adequate negative pressure to ensure the effective capture of contaminants from the rendering plant building and all other areas from which air is extracted to minimise fugitive emissions. The ventilation air shall be discharged via the rendering plant biofilter, as described in Condition 18. ~~The Consent Holder shall undertake an inspection of the ventilation and pre-treatment (condensers etc) equipment every 5 years from the commencement of this consent. A record of these inspections must be retained and be available to the Environment Southland Compliance Manager on request.~~

b. Inspections shall occur at least 12-monthly for building tightness and all identified holes and openings in the building exterior shall be repaired to prevent fugitive odour emissions. The annual inspection shall include examination of the air extraction rate from individual sources and the total air flow rate and pressure at the inlet to the biofilter, including comparison to the results of previous measurements to identify any trends. An annual inspection report shall be prepared and retained and shall be made available to the Environment Southland Compliance Manager on request.

c. All external doors to the rendering building shall remain closed to the greatest extent practicable to minimise fugitive odour emissions from the building.

18.

a. The rendering plant biofilter shall be capable of treating ~~at~~ an air volume of at least 8 air changes per hour from the rendering building and the air volume from point sources within the rendering plant. The biofilter shall contain filter media to a depth of at least 1 metre over an area of at least 1024m² and shall have a design loading of not more than 50 m³ air/m³ media/hour. If necessary, the biofilter shall be expanded to comply with this maximum loading rate while achieving the minimum building air extraction rate.

b. Within 6 months of the commencement of consent a suitably qualified air quality expert shall provide a report to the consent authority for approval, certifying that

adequate building air and point source extraction is achieved to prevent fugitive odour emissions and that the biofilter is designed and operated to achieve effective ongoing odour control and comply with the conditions of this consent, including being suitably sized to treat the upgraded combined building and point source air extraction rate from the rendering plant.

...21. The Consent Holder shall maintain at least ~~12 months~~ 5 years of records of all measurements undertaken in accordance with Condition 19. This record shall be provided to an Environment Southland Compliance Manager on request.

...23B. The biogas flare serving the anaerobic pond shall be fitted with a continuous ignition system including spark igniter and backup power supply and shall be operated to achieve a minimum combustion efficiency of 98%...

...24B. A gas-tight cover shall be fitted to the anaerobic lagoon such that all gases are discharged to either the flare or biofilter. The cover shall be maintained at all times to ensure that no gas leakage occurs.

25. The Consent Holder shall maintain treated wastewater in an aerobic condition using mechanical floating aerators to minimise odour in the irrigation lagoon. A positive dissolved oxygen concentration shall be maintained at all times. If irrigation of treated wastewater does not occur for than more than two days, the irrigation lagoon shall be aerated to avoid the onset of anaerobic conditions.

26.

a. Wastewater shall not be irrigated onto land within 20 metres of any property boundary and 100m of any dwelling on a neighbouring property. There shall be no spray drift of wastewater beyond that property boundary.

b. If treated wastewater irrigation has not occurred for more than 48 hours, wastewater shall not be irrigated onto land within 40 metres of any property boundary and 200m of any dwelling on a neighbouring property on the first day that wastewater irrigation resumes.

c. Stockyard solids, paunch grass and waste activated sludge shall not be applied to land within 20 metres of any property boundary and 150m of any dwelling on a neighbouring property.

26B.

All waste activated sludge generated by the treatment system, that is to be removed from the site, shall be pumped directly to fully enclosed tankers for transport to disposal. If sludge is further processed on-site it shall be treated and transferred to processing in a manner that ensures there will be no odour detected from this source beyond the site boundary.

...31. No later than three months from this consent commencing the Consent Holder shall prepare and submit to the Environment Southland Compliance Manager an Air Discharge Management Plan for certification that it is in accordance with this condition.

The objective of the Air Discharge Management Plan shall be to detail all actions to be taken to minimise odour and particulate matter emissions from the plant and to ensure compliance with the conditions of this consent.

The Air Discharge Management Plan shall include:

- a. a description of the contents and purpose of the Air Discharge Management Plan in accordance with this condition;
- b. a summary of the plant purpose, location, layout, and production equipment with specific reference to contaminant discharge, extraction and treatment equipment, discharge stacks and processes;
- c. responsibilities and contact details of key personnel;
- d. operation, inspection and maintenance of the rendering plant equipment, boilers, WWTP (including wastewater irrigation procedures and set back distances) and the biofilter including the extraction and treatment equipment;
- e. procedures adopted to ensure that the odour extraction equipment in the rendering plant is fully functional before operations commence;
- f. procedures adopted to ensure that the plant complies with the conditions of this consent at all times;
- g. measures to be implemented in the event that the trigger levels in Condition 20 are not met;
- h. procedures for monitoring air pressure and air flow rates within the rendering building and air extraction ducts;
- ~~i. h. details of how emissions will be contained within the rendering building to minimise the potential for fugitive emissions. procedures and monitoring to maintain building tightness and negative pressure to prevent fugitive odour emissions from the rendering building;~~
- j. contingency measures and spare parts in the event of a breakdown of key equipment for odour control, including rendering air extraction, biofilter and wastewater pond aerators;

...33. The Air Discharge Management shall be reviewed by the Consent Holder every ~~three~~ two years. The purpose of this review shall be to confirm that the Air Discharge Management Plan accurately reflects current on-site activities and operations and to identify if changes to procedures contained within the Air Discharge Management Plan are required to achieve the objective of this condition. A written report detailing the results of the review shall be submitted to the Environment Southland Compliance

Manager within 30 working days of the review being undertaken. If the review results in amendments to the Air Discharge Management Plan, the amended sections shall be provided to the Environment Southland Compliance Manager for certification at this time.

Discharge of treated wastewater, stormwater, stockyard solids, paunch and waste activated sludge to land

...5. The treated wastewater, waste activated sludge, stormwater from the covered anaerobic lagoon, stockyard solids and paunch authorised to be applied to land under this consent shall be applied no closer than:

- a. 10 metres to any watercourse or open drain, whether flowing continuously or intermittently;
- b. 20 metres to any external property boundary or public road. The distance to a property boundary may be reduced with the written agreement of the adjacent property owner and occupier. A copy of this written agreement shall be provided to the Environment Southland Compliance Manager prior to disposal of treated wastewater, stockyard solids, paunch or waste activated sludge occurring;
- c. for wastewater and stormwater: 100 metres to any residential dwelling, school, or marae (excluding any dwellings owned by the Consent Holder) unless the written agreement of the owner and occupier has been obtained. A copy of this written agreement shall be provided to the Environment Southland Compliance Manager prior disposal of wastewater, stockyard solids, paunch or waste activated sludge occurring;
- d. for waste activated sludge, stockyard solids and paunch grass: 150 metres to any residential dwelling, school, or marae (excluding any dwellings owned by the Consent Holder) unless the written agreement of the owner and occupier has been obtained. A copy of this written agreement shall be provided to the Environment Southland Compliance Manager prior disposal of wastewater, stockyard solids, paunch or waste activated sludge occurring; and
- d.e. 100 metres from any potable water abstraction point.

5B. No wastewater, waste activated sludge, stormwater, stockyard solids or paunch grass shall be applied to land in anaerobic condition such that it may cause breach of Condition 6A.

6A. The discharge shall not cause offensive or objectionable odour beyond the boundary of the land where the discharge occurs.

A handwritten signature in black ink, appearing to read "John Iseli". The signature is written in a cursive style with a large, sweeping initial "J".

John Iseli
Principal Air Quality Consultant

11th September 2023