



Planning

CARGILL BEEF ABATTOIR WASTEWATER MODIFICATION DA 220-07-2001-i - MOD 4

1. BACKGROUND

The Cargill Beef Abattoir is about 5 kilometres (km) north north-east of the Wagga Wagga township, in the Bomen Industrial Estate, Wagga Wagga LGA (see Figure 1).

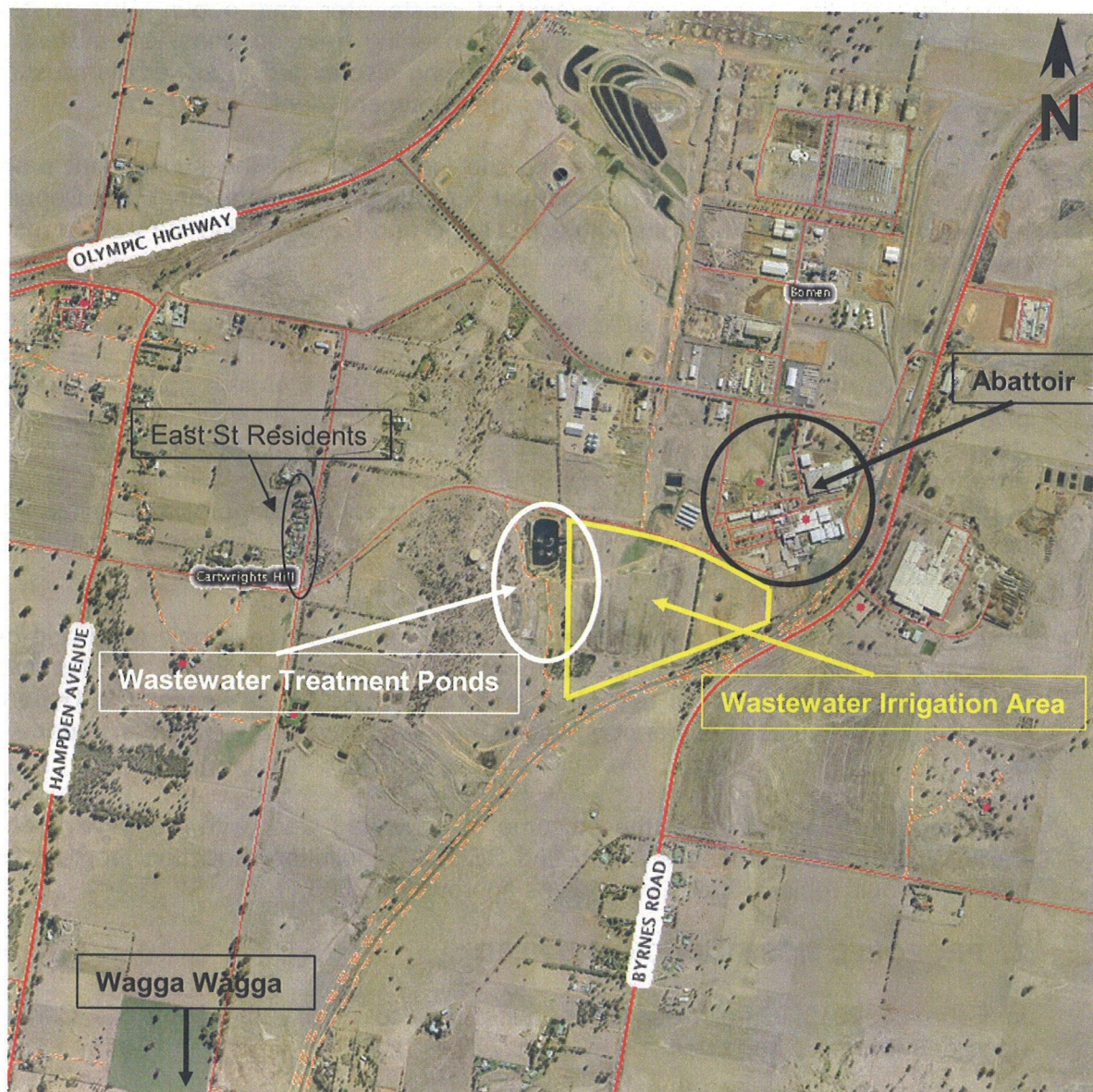


Figure 1: Location of Abattoir, Wastewater Treatment Ponds (in white) and Irrigation Area (in yellow)

The abattoir is surrounded by rural residential and industrial land uses. The nearest residents are approximately 600m from the wastewater treatment ponds, on East St at Cartwright Hill and on Byrnes Road, approximately 500m south of the irrigation area.

The abattoir was established in the late 1940s and is currently operated by Cargill Beef Australia (Cargill). Odour emissions from the abattoir are a significant, ongoing issue. In

2003 the then Minister for Planning approved a development application (DA 220-07-2002-i) to upgrade and expand the facilities, to:

- increase the processing capacity from 850 to 2000 cattle per day; and
- improve odour and effluent management practices.

The consent has since been modified three times, initially to amend the footprint and layout of the facility and then to modify the remediation works. The most recent modification, approved in 2009, was to address the ongoing odour issues from the site, by providing for the replacement of certain wastewater ponds with a new covered anaerobic pond and flare system for the gas captured from the pond.

During the Department of Planning's (the Department's) assessment of this recent modification, the Department identified a number of breaches to the Minister's consent, particularly relating to the management of wastewater and odour. The wastewater treatment system then failed, with pond 3 converting from an anaerobic system to an aerobic system. The increased nutrient load being discharged to sewer then resulted in downstream impacts on the Bomen Sewerage Treatment Plant.

Due to the findings of the Department's site inspection and the subsequent problems experienced at the abattoir and the Bomen Sewerage Treatment Plant, the Department has been in detailed discussions with both Cargill and DECCW with the view to resolving these issues.

As a result, the Department of Environment, Climate Change and Water (DECCW) imposed a pollution reduction program requirement on the licence for the facility to manage odour and effluent. The Department also issued Cargill a notice of intention to give an order on 4 June 2009 under section 121B of the *Environmental Planning and Assessment Act 1979* (the EP&A Act). The Department issued the order as a means of ensuring Cargill commits to a process of bringing the facility into compliance, particularly in regards to odour generation, wastewater management and general compliance with the development consent. The order is consistent with the PRP process being undertaken with DECCW.

In the interim, the Department also approved the proposed anaerobic pond and biogas collection system, and decommissioning of existing ponds 1 and 2, as this had the potential to alleviate some of the odour and wastewater issues onsite. The Department understands the upgrade works approved in the modification have not been undertaken to date.

The proposed modification is the outcome of continued work with the Department and DECCW on the Department's order, and DECCW's pollution reduction program for the site, and would replace the upgrade plans approved in 2009.

2. PROPOSED MODIFICATION AND NEED

In February 2010, Cargill lodged an application to modify the Minister's Consent to upgrade the wastewater treatment system.

As shown in Figure 2 and Figure 3, the modification application involves:

- replacing ponds 1 and 2 with two new covered anaerobic ponds, each with a working capacity of 29ML;
- a biogas collection and enclosed gas flare system;
- refurbishment of pond 3 to install a Biological Nutrient Removal System;
- installation of a dewatering system to process the waste activated sludge from the Biological Nutrient Removal System; and
- reducing the kill capacity of the abattoir (from 2000 to 1600 cattle a day), to reflect the capacity of the new wastewater treatment system.

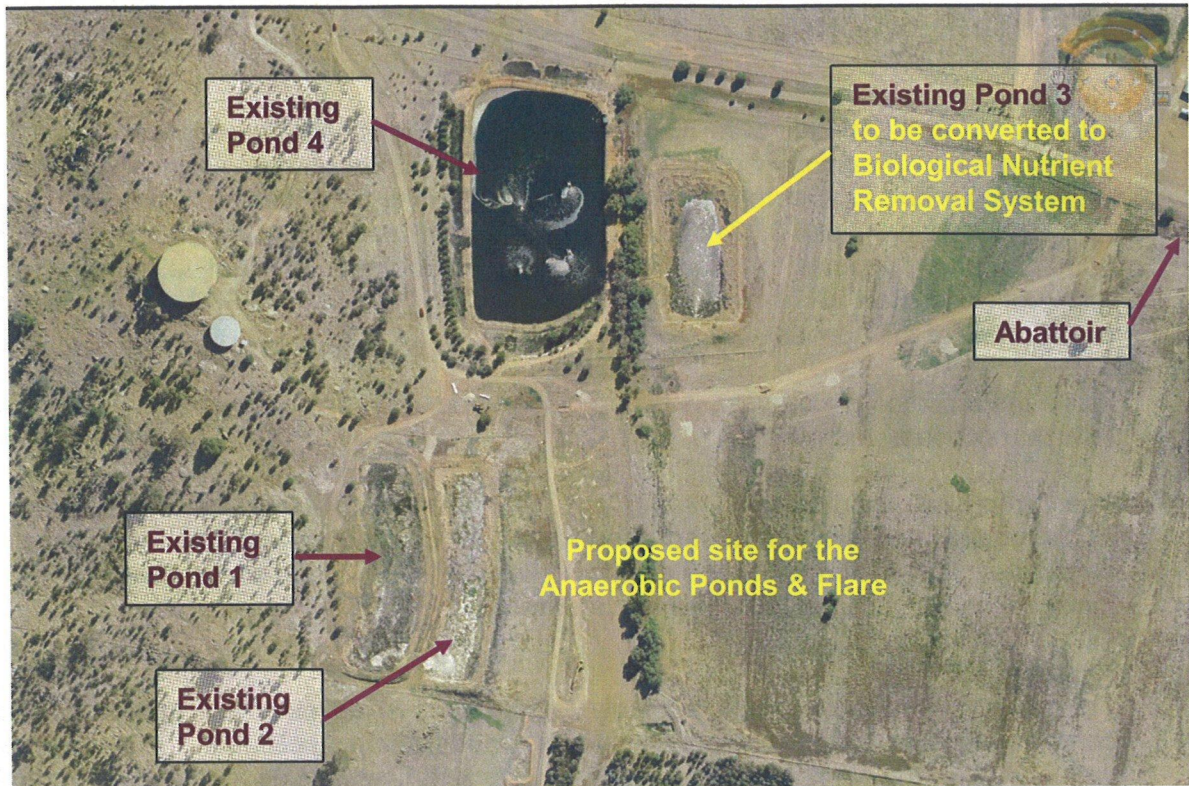


Figure 2: Existing Pond System (and proposed works described in yellow)

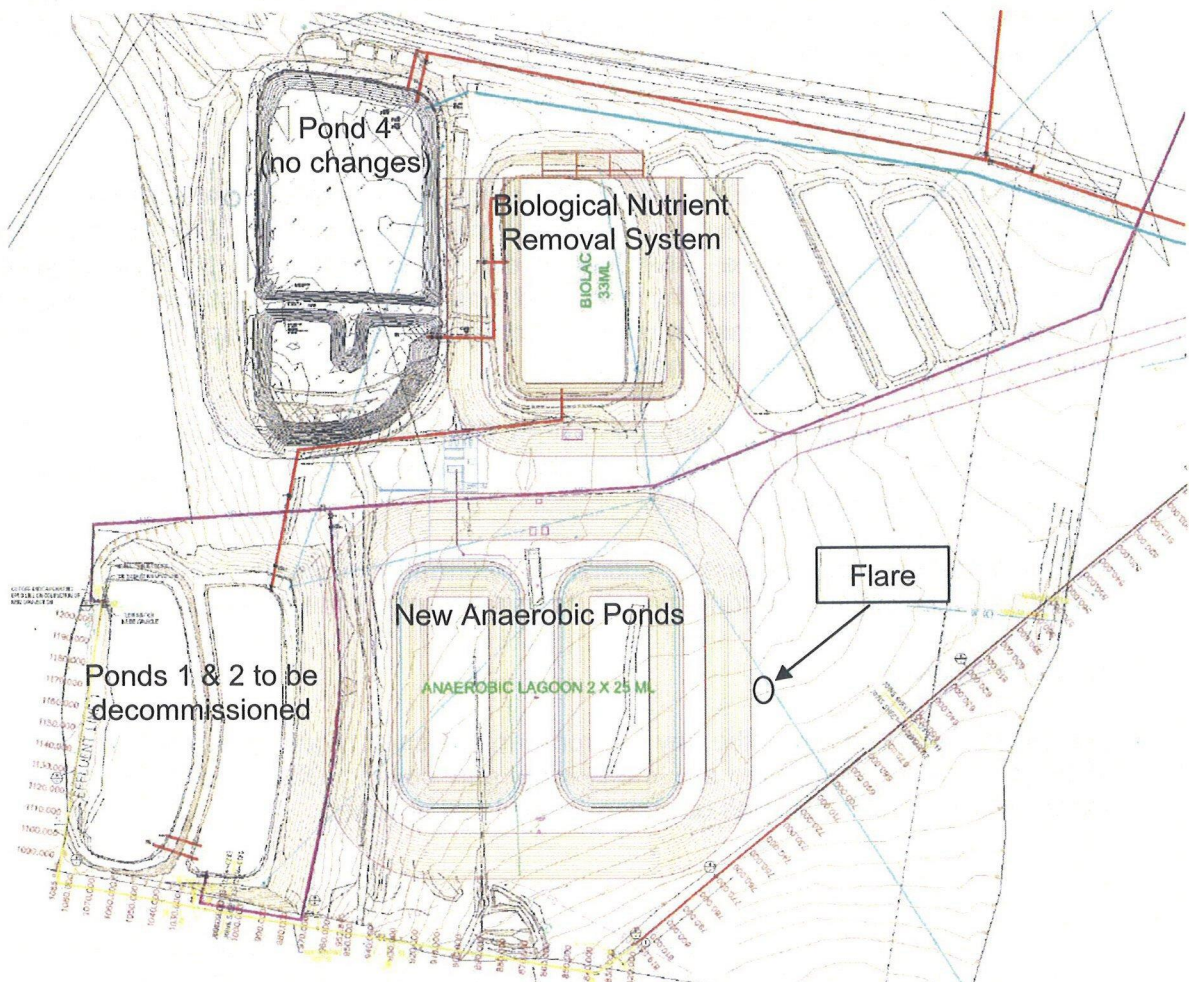


Figure 3: Proposed Pond System

3. STATUTORY CONTEXT

Modification

The Cargill Beef Abattoir was classified as State Significant Development under *State Environmental Planning Policy No.34 – Major Employment Generating Industrial Development* and was determined by the then Minister for Planning under Part 4 of the EP&A Act. Under clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000*, for the purposes of modification, the development consent is taken to be an approval under Part 3A of the EP&A Act and section 75W of the EP&A Act applies to any modification of the consent.

While the modification process is taking place under Part 3A, the modified consent would remain a consent under Part 4.

The proposed modification relates to the wastewater treatment processes and infrastructure, and involves a reduction in the processing capacity of the abattoir. It is considered that the modification request falls within the scope of section 75W and the modification request can therefore be determined.

Approval Authority

The Minister was the consent authority for the original development application, and is consequently the approval authority for this modification application. However, on 25 January 2010, the Minister delegated his powers and functions as an approval authority to modify certain project approvals under section 75W of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) to the Executive Director. This modification application meets the terms of this delegation and the Executive Director may therefore determine the application under delegated authority.

4. CONSULTATION

Under section 75W of the EP&A Act the Department is not required to notify or exhibit the modification application. However, the Department consulted DECCW on the proposed modification. Wagga Wagga City Council did not comment on the last modification application, considered 12 months ago, and was not formally consulted on the current modification. Nonetheless, the Department briefly discussed the modification with Council officers, who did not raise any concerns.

The Department received a submission from DECCW with recommended conditions of approval. These conditions relate to irrigation of wastewater and odour management from gas flaring and wastewater irrigation.

The Department also requested additional information from the Proponent, and has considered this additional information, in its assessment of the proposed modification.

5. ASSESSMENT

The Department considers the key environmental issues requiring assessment in respect of the proposed modification are wastewater and odour. Other issues include soil and water, waste, greenhouse gas emissions and visual amenity.

5.1. Wastewater

Although the facility has consent to slaughter and process up to 2000 head of cattle a day, it currently only slaughters 1200. At this processing rate the facility has a peak wastewater flow of 4.7ML a day. The new wastewater treatment system would have capacity to handle

a peak flow rate of 6ML of wastewater a day and consequently, the Proponent is seeking a maximum processing capacity of 1600 head of cattle (400 less than the 2000 currently approved).

Wastewater is separated into 3 streams. The red stream (stream 1) receives wastewater from the kill floor, boning room, hide wash sheds and rendering plant. This wastewater stream is high in oil & grease and chemical oxygen demand (COD), has moderate nutrient & total suspended solid levels (TSS) and has variable contaminant levels, which generally come from the rendering plant.

The green stream (stream 2) consists of wastewater from the offal and paunch removal processes, while the cattle yard stream (stream 3) is comprised of recycled and fresh water from the cattle yards. Streams 2 and 3 are characterised by high levels of TSS, with significant quantities of foreign material (from stomach contents), such as stones and boluses. High levels of oil & grease and sand & grit are also present in these two wastewater streams.

The existing pre-treatment of these wastewater streams would not change significantly, although some old and ineffective equipment would be replaced and/or decommissioned. Processing would then be undertaken in the covered anaerobic ponds before being directed to the biological nutrient removal system followed by the equalisation pond. The treated wastewater would then be irrigated onsite, or directed to Council's sewer under a trade waste agreement with Council (a small portion would also be reused for wash down purposes).

The existing anaerobic system is struggling to treat the organic load, especially during winter, with flow on effects on the wastewater discharged to sewer and impacts on Council's sewerage treatment system.

The new anaerobic ponds are expected to provide a more consistent biological treatment of the wastewater.

The new Biological Nutrient Removal System would consist of an activated sludge system, capable of nutrient reduction. The system is particularly effective at removing nitrogen and chemical dosing would also be used to ensure phosphorus levels would meet Council's trade waste limit of 10mg/L.

The system has been designed in response to the inadequacies of the current plant and to achieve the trade waste limits imposed on discharges to Council's Sewerage Treatment Plant.

DECCW agree that the proposed wastewater treatment plant should achieve an improvement in effluent quality.

Under the Minister's consent, the Proponent also has approval to irrigate up to 40ML of treated wastewater a year. The Proponent is not currently undertaking any irrigation, but has indicated it now intends to pursue this option. Consequently, the suitability of the treated wastewater for irrigation must be considered.

During the Department's assessment of the proposal Cargill requested permission to expand the irrigation scheme to cover additional areas of the site and also neighbouring properties. The potential impacts of an expanded irrigation scheme were not considered in Cargill's Statement of Environmental Effects and consequently, the Department has not provided for additional irrigation under the current modification.

The upgrade works are expected to take about a year, and once the upgrade of the wastewater treatment system is completed, the wastewater is expected to achieve or improve on the water quality criteria set out in the original application. In the interim, until the upgrade has been commissioned, the Proponent has indicated that the wastewater would exceed some of the concentrations originally predicted in the Environmental Impact Statement prepared in 2002 (see Table 1).

Table 1: Approved and proposed wastewater quality for irrigation

Analyte	Originally Predicted Concentration (mg/L)	Proposed 2010 Wastewater Quality	
		Concentration (mg/L)	DECCW's Use of Effluent by Irrigation (classification)
Total Suspended Solids (TSS)	170	455	-
pH	-	7.8	-
BOD ₅	200	91.5	Strength: Medium (40-1,500)
Nitrogen (Total)	250	256 (TKN)	Strength: High (>100)
Phosphorus (Total)	30	38.9	Strength: High (>20)
Total Dissolved Solids (TDS)	~1500	904.8	Strength: Medium (600-1000)
Conductivity (µS/cm)	2500	2755	Strength: Medium (1,300-2,900)
Sulfate	-	29.4	-
Sulfide	-	9.7	-

Despite exceeding some of the originally predicted concentrations, the proposed levels would generally meet the medium to high strength nutrient values described in DECCW's "Environmental Guideline Use of Effluent by Irrigation".

DECCW has indicated that it considers wastewater to be a resource available for utilisation, rather than a waste requiring disposal and that it is satisfied with the proposal to irrigate treated wastewater, as long as it is undertaken in accordance with DECCW's "Environmental Guideline Use of Effluent by Irrigation". DECCW also recommended conditions to ensure the proposed irrigation would be appropriately monitored and managed.

The proposed wastewater to be irrigated would only have high nutrient levels during the installation and commissioning of the upgrade system (which is expected to take approximately 12 months). Consequently, the Department considers that subject to appropriate monitoring and management, temporary irrigation of this wastewater would be acceptable.

The Department has recommended conditions requiring preparation of a revised and comprehensive Effluent Wastewater Management Plan to be approved, prior to undertaking any irrigation of wastewater (or the operations of the Effluent System Upgrade, whichever is sooner). The plan would:

- ensure effluent would be treated and managed in accordance with DECCW's guidelines;
- identify the irrigation area and include detailed baseline data on the existing soil, surface and groundwater conditions;
- provide a detailed description of the irrigation system;
- identify the impact assessment criteria and monitoring strategy to be implemented; and

- identify the contingency measures that would be implemented should impacts occur.

The Department is satisfied that the relatively high nutrient levels in the wastewater would be acceptable, in the short term. The Department notes that the majority of the wastewater would still be directed to the sewerage treatment plant under the trade waste agreement. Should any issues arise from the irrigation of wastewater, then this wastewater could also be discharged to sewer under the trade waste agreement.

Consequently, the Department is satisfied that the treatment and irrigation of wastewater would be appropriately monitored and managed, with suitably contingencies in place through the recommended conditions. Should the upgraded wastewater treatment system and irrigation scheme prove effective, then the Department would consider expansion of the irrigation scheme at that time.

5.2. Odour

Odour has been an ongoing issue for the facility. The main odour sources on site are the rendering plant and the wastewater treatment ponds. The proposed modification has been designed directly in response to issues associated with the existing wastewater treatment system, including odour impacts. The main sources of odour from the existing wastewater management system are fugitive emissions from ponds 3 and 4.

The wastewater system upgrade includes a number of measures to improve odour management, such as the capture and flaring of gas from the anaerobic ponds. Nonetheless, the modified facility would still generate some odour.

The potential odour sources from the proposed wastewater management system include:

- the biogas handling system for the 2 covered anaerobic ponds;
- the waste activated sludge management system for the Biological Nutrient Removal System;
- irrigation of wastewater;
- periodic impacts, from sludge removal from the new anaerobic ponds; and
- temporary impacts, from fugitive emissions from the decommissioning of ponds 1 and 2.

Odour modelling provided by the Proponent indicates that odour from the proposed wastewater treatment plant is predicted to comply with the ground level odour criteria (4 OU) within 400m of the site boundary and would be within the criteria at the nearest residential receivers. This modelling assumes that odour from the wastewater treatment plant would be noticeably different, ie would not mix with other odour emissions from the facility, such as odour from the rendering plant and cattle lairage.

DECCW considers that the odour modelling has limitations:

- potential odour from the irrigation of wastewater and the flaring of gases has not been included in the modelling; and
- DECCW considers that the odours from the various sources on site may mix to produce a cumulative affect.

Nonetheless, DECCW support the modification application as it considers the upgrade would lead to considerable reductions in odour generated onsite, such as through the capture and flaring of methane. DECCW has also advised they consider it is unlikely that more detailed modelling would provide an accurate estimate of the odour levels to be achieved.

DECCW noted that additional control options are available (such as scrubbing units to remove sulfides), should offensive odour continue to be generated onsite. Consequently, DECCW has recommended conditions requiring additional management practices and controls to be implemented, should offensive odours continue to be produced onsite.

The Department agrees that the proposed upgrade is expected to reduce the odour impacts from the facility and has recommended conditions to ensure that:

- a comprehensive odour audit is undertaken, once the wastewater treatment upgrade is operating, to identify if the facility is achieving the ground level odour criteria for the site; and
- additional control measures would be implemented should offensive odour continue to be generated onsite.

Consequently, the Department is satisfied that the proposal would reduce the odour impacts of the facility and that the recommended conditions would ensure the facility becomes compliant with the ground level odour criteria for the site (4 OU).

5.3. Other Impacts

Other impacts associated with the project are discussed in Table 2.

Table 2: Other Impacts

Issue	Assessment	Recommendation
Soil and Water	- The Project has the potential to impact on soil, surface and groundwater through the irrigation of wastewater and in the event of a spill or leak from the new wastewater treatment system. - As discussed in section 5.1 above, the Department is satisfied that impacts on soil and water can be minimised and managed through standard maintenance procedures and regular monitoring, already required in the conditions of consent.	No additional conditions have been recommended relating to soil and water, except those previously discussed in section 5.1 above.
Waste	- The upgraded wastewater treatment system would generate 2 additional waste streams, biological solids from the Biological Nutrient Removal System and digested anaerobic pond sludge. - Both waste streams would be suitable for composting and existing conditions require all waste to be suitably treated, managed and disposed of.	No additional conditions have been recommended relating to waste.
Greenhouse Gas (GHG) Emissions	- The capture and flaring of gases from the anaerobic ponds would reduce methane emissions from the project as the flaring would convert these to less harmful carbon dioxide emissions. - Consequently, the Department is satisfied the proposal would improve the performance of the facility in relation to management of greenhouse gas emissions.	No additional conditions have been recommended relating to GHG emissions.
Visual	- The proposal mainly relates to the upgrade and extension of existing wastewater ponds with minimal building works, aside from the flare. - The proposed flare would have a height of approximately 8m (2m higher than the approved flare). - The flare would be below the level of the ridgeline and due to the isolated location of the site, and the industrial and rural character of the area, the Department is satisfied that the views and visual impacts of the flare would be minimal.	No additional conditions have been recommended relating to visual amenity.

6. RECOMMENDED CONDITIONS

The Department has drafted recommended conditions for the modification. Cargill has reviewed and generally accepted these conditions.

On reviewing the conditions Cargill advised it would like to increase the quantity of wastewater it can irrigate on site and requested that the limit on the quantity of wastewater to be irrigated be removed. This proposed expansion of the irrigation scheme has not been assessed in the documents by the Proponent and consequently the Department considers that this should not be included in this modification. The Department has recommended that Cargill could submit a request to expand the wastewater irrigation scheme at a later date, once the wastewater system upgrade is proven to be effective and consistent in managing wastewater from the abattoir.

7. CONCLUSION

The Department has assessed the proposed modification in accordance with the relevant requirements and objectives of the EP&A Act, including the principles of ecologically sustainable development.

The Department is satisfied that the proposal adequately addresses the requirements of the order and the pollution reduction program to become compliant with the Minister's Consent and the Environmental Protection Licence for the facility.

The Department considers that, by reducing the processing capacity of the facility and implementing the proposed wastewater treatment system upgrade, the facility would be able to produce a more consistent wastewater stream. This in turn should prevent further downstream impacts on the Bomen Sewerage Treatment Plant and allow for alternative management practices such as irrigation.

The proposed upgrade should also facilitate substantial improvements in the odour impacts of the project, through better wastewater treatment and management practices, and by capturing and flaring methane from the treatment ponds. Although the irrigation of wastewater has the potential to generate additional odour impacts, the Department notes that the facility already has approval for this activity. To ensure odour from the irrigation of wastewater is managed, the recommended conditions provide that irrigation must cease if requested by the Department or DECCW, in the event of offensive odour being emitted from the site.

Consequently, the Department is confident that the modification can be carried out with minimal environmental impacts and would represent an improvement for surrounding land users and the local environment.

The Department is satisfied that the benefits of the proposal outweigh any residual costs, and that it is in the public interest and should be approved, subject to conditions.

8. RECOMMENDATION

It is RECOMMENDED that the Executive Director, as delegate of the Minister:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modification is within the scope of section 75W of the EP&A Act;
- **approve** the application to modify the development consent under section 75W of the EP&A Act, subject to conditions; and
- **sign** the attached instrument of modification to the development consent.


Chris Ritchie
Manager, Industry 2/8/10.


Chris Wilson
Executive Director
Major Projects Assessment