

ENVIRONMENTAL DYNAMICS

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15 October 2018

Tassal Group Limited
GPO Box 1645
Hobart, TAS 7001

Attn: Jessica Widdison

Dear Jessica,

**Re: Wayatinah and Florentine hatcheries
Noise impact assessment of proposed drum filters and sludge plants**

I write to report my assessment of the construction and operational noise impact of the drum filters and associated sludge plants proposed for the Wayatinah and Florentine hatcheries operated by SALTAS Pty Ltd in central Tasmania. I visited the Wayatinah hatchery in February 2018 to familiarise myself with facility and the proposed project.

Location of nearest residences

Figure 1 shows the hatchery is located on the north bank of the River Derwent SW of the Wayatinah village and the terrain between the hatchery and the village is quite dense Eucalypt forest. The hatchery is located at an elevation of 240m and the village is located on flat terrain at an elevation of 280m, so the terrain blocks line of sight between the hatchery and much of the village, although not the nearest residences. The start of the shallow noise shadow is roughly defined by the 280m contour: an observer standing on this contour would have line of sight to the hatchery in the absence of trees, but the line of sight is lost as the observer moves towards the village. The drum filters and sludge plant will be located in the SE part of the hatchery at the inlet to the settlement pond, about 840m SW of the closest residences in the Wayatinah village.

Expected construction noise levels

I understand that construction work to install the drum filters and sludge plant at the Wayatinah hatchery will involve the following noise sources.

- 6-8 cars per day.
- 2 trucks per day moving around on site.
- Earthmoving equipment – standard excavation for period of 3 weeks.
- Rock removal equipment – assume equivalent 3 days total.
- Mobile crane operation – 2 or three days total.
- Possible use of a diesel generator and/or air compressor.

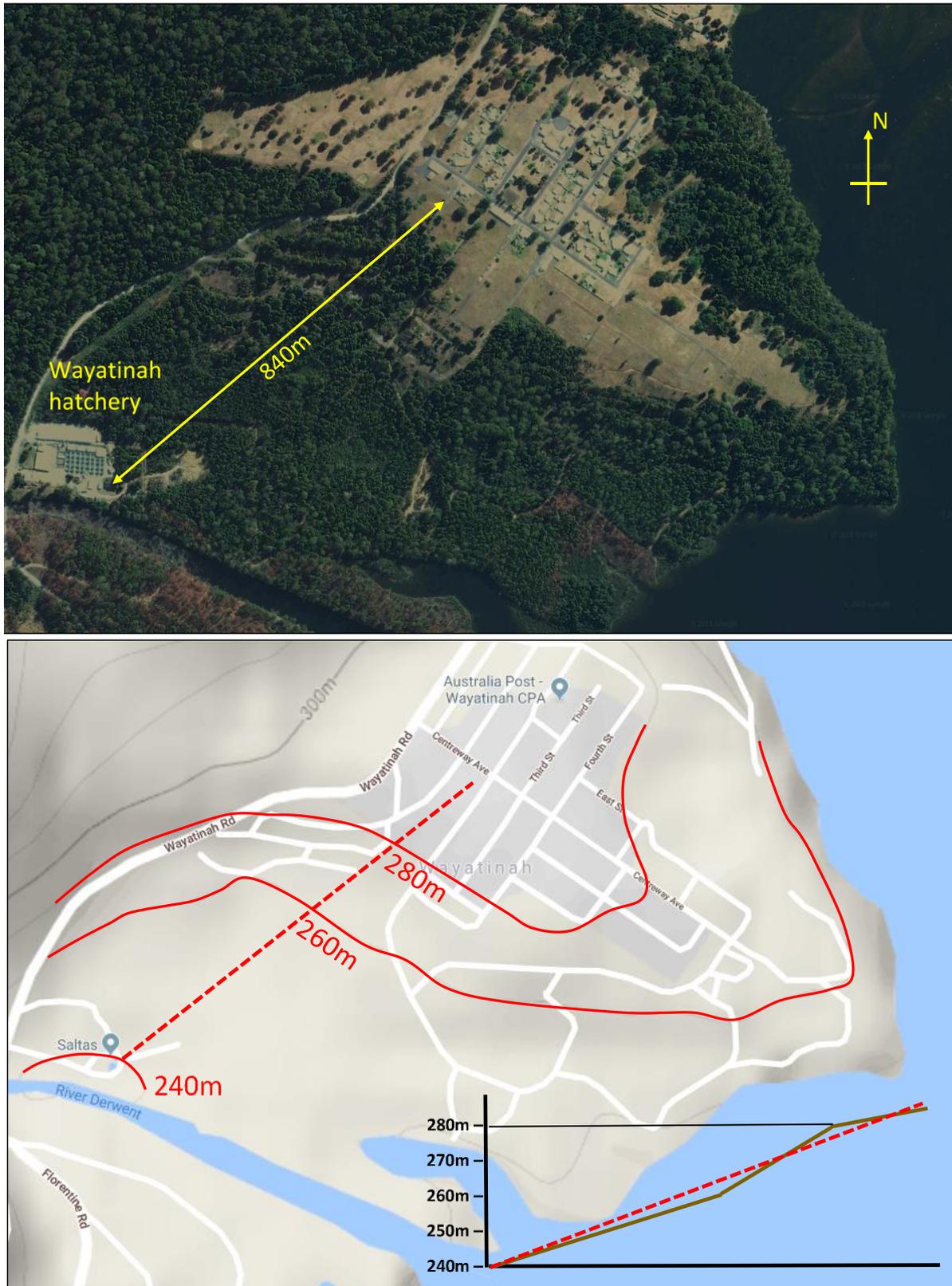


Figure 1. The nearest residence in Wayatinah is 840m NE of the location of the proposed drum filter at the Wayatinah hatchery. The terrain is densely wooded and blocks line of sight to Wayatinah residences. Much of the Wayatinah villages lies on flat land in the shallow noise shadow due to the terrain that is roughly defined by the 280m contour.

AS 2436-2010 *Guide to noise and vibration control on construction sites* provides typical noise levels from construction equipment. Unsurprisingly, use of a rock breaker generates the highest civil works noise levels, with a sound pressure level (“noise level”) of 90 dBA at 10m. This is a very high noise level and can be considered worst-case, although a rock breaker will likely only be needed for a few days at most, and noise levels will be lower during the rest of the construction work, which is expected to take about a month.

Comparison to construction noise level limits

I recommend that noise emissions from construction work aim to comply with the *Interim Construction Noise Guidelines* (NSW Dept of Environment & Climate Change, 2009), which is recognised by the Environment Protection Authority (EPA), and also by the Resource Management and Planning Appeals Tribunal (RMPAT).

The guidelines recommend day time construction work hours of Monday to Friday 7 am to 6 pm; and Saturday 8 am to 1 pm. They set a project-specific noise management level using the Rating Background Level (RBL) method. An RBL is the median background noise level, usually calculated from noise logger data. I would expect the day time RBL in the Wayatinah village to be about 45 dBA, which gives a noise level target of $45 + 10 = 55$ dBA (see Table 2 of the guidelines). In other words, if construction work noise in the Wayatinah village is found to be higher than 55 dBA, noise mitigation measures should be implemented.

Considering the worst case situation, sound wave spreading with distance will reduce the rock breaker’s noise level from 90 dBA at 10m to 52 dBA at 840m. This is just under the 55 dBA target noise level, but the actual situation will be greater compliance because 30m of dense vegetation will reduce noise levels by about 5 dB, and here there is over 500m of vegetation between the hatchery and the Wayatinah village. I have not estimated what the reduction will be, but I am confident that so much vegetation will reduce the worst case construction noise at the nearest residences to well under the 55 dBA target noise level. There will also be small reduction due to sound energy absorption by the atmosphere.

For the rest of the village, the noise levels decrease further as residences benefit from being in the shallow noise shadow that starts at about the 280m contour.

Overall, the vegetation and noise shadow effects will result in a significant reduction in construction work noise levels in the Wayatinah village in addition to the reduction due to sound wave spreading with distance.

Operational noise sources

I understand that the noise sources associated with the proposed drum filters and sludge plant are as follows.

- Drum filter spray bars.
- Sludge pump and water pump.
- Auxiliary blower and diffuser systems.
- Sludge equipment including a lamella plate clarifier, a screw press and a polymer dosing system.

Unfortunately noise specifications are not available, but the spray bars will be the dominant noise source associated with the drum filters and will operate continuously. The auxiliary blowers and diffuser systems will be the dominant noise sources for the sludge plant, and will also operate continuously. I understand that the rest of the sludge equipment is fairly quiet.

Operational noise impact in Wayatinah

The drum filters and sludge plant are similar to equipment in service at Tassal's Rookwood and Russell Falls hatcheries, both of which have residences and visitor accommodation (in the case of the Russell Falls hatchery) that are closer than the distance from the Wayatinah hatchery to the village. There is also similar equipment already operating at the Wayatinah hatchery.

In late February 2018 I measured noise from the existing equipment at the Wayatinah hatchery. My noise level measurements were first-pass and the existing equipment is housed in a building whereas the new equipment will be located outdoors, but I expect that noise levels from the new equipment will be about 75 dBA at 10m.

The calculation of the corresponding noise level in the Wayatinah village is the same as for construction noise (the rock breaker. The flat terrain prediction is 37 dBA at 840m at the nearest residences, and there will be an unknown but large additional reduction due to the dense vegetation that covers much of the ground between the hatchery and the village. Residences a little further away increasingly benefit from lying in the slight noise shadow that lies on the village side of the 280m contour.

The measured 1/3rd octave band noise levels of the existing equipment were well behaved with no penalty adjustment for tonalities, and there was also a substantial amount of high frequency noise, which will result in an additional noise level reduction of several decibels due to sound energy absorption by the atmosphere.

The EPA's standard night time noise level limit is 35 dBA for a plant operating in a rural area, and this limit refers to noise from the entire plant. As with the construction noise, I have not estimated what the reduction will be, but I am confident that so much vegetation will reduce the operational noise of the new plant at the nearest residences to well under the 35 dBA night time noise level limit. It should be completely inaudible even on very calm and quiet nights.

It is almost certain that the hatchery's current day and night time noise levels at the nearest residences of the village are less than the EPA's standard 45 dBA day time and 35 dBA night time noise level limits. SALTAS advises that the hatchery has been operating for over 30 years without receiving complaints of noise nuisance from residents of the Wayatinah village, at least to the knowledge of present staff. If this assumption of compliance is correct, then the new drum filters and sludge plant will not change the situation.

Operational noise impact on staff building

There is some concern about the noise impact of the new plant on a nearby on-site building that is used by night watch staff who sleep there – their job is to respond to any night time alarms.

In February 2018 I inspected the hatchery layout in the vicinity of the sediment pond and staff accommodation building, finding that terrain and sheds partly block line of sight between the proposed location of the drum filters and the building, a distance of about 50m. The first-pass noise level measurements of the existing equipment at the Wayatinah hatchery leads me to expect that noise at the façade of the bedroom in the staff accommodation building will likely be a little over 60 dBA.

AS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors, specifies satisfactory and maximum noise levels of 30 and 35 dBA respectively for bedrooms. I have not measured the noise reduction provided by the façade of the staff accommodation building, but it is likely to be less than 25 dBA, so the new plant may produce noise levels inside the bedroom of the building that are sufficiently elevated to cause nuisance.

The obvious strategy is to wait until the new plant is commissioned and apply mitigation measures if need be. Such measures should be quite effective given a lot of the drum filter noise is quite high frequency.

Wedge-tailed eagles and the Florentine hatchery

The drum filters and sludge plant proposed for the Florentine hatchery are the same as for the Wayatinah hatchery. However, the Florentine hatchery is located about 6 km further from the Wayatinah village, so the only noise impact concern is to ensure wedge-tailed eagles are not disturbed by the construction work noise.

Fauna Technical Note No. 6 *Wedge-tailed eagle nesting habitat model* (Tasmanian Forest Practices Authority, July 2014) advises that wedge-tailed eagles are sensitive to disturbance, particularly during the breeding season. They usually nest in very large eucalypts sheltered from the wind and will often desert their nests if disturbed by land clearing, particularly early on in the breeding season, which is August to January.

My personal opinion is that the sensitivity of wedge-tailed eagles to disturbance by noise is a matter of debate. I measured noise from a quarry operation near Smithton while a wedge-tailed eagle sat in a nearby tree and seemed undisturbed by noise from the bulldozer and rock crusher. However it is better to err on the side of caution and assume they are sensitive to noise.

A search of the Tasmanian Natural Values Atlas has been carried out as part of the overall approvals process for this project, and the nest nearest to the Wayatinah hatchery was last surveyed as active in 2013 and is about 2.5 km from the hatchery, as shown in Figure 2. The nearest nest to the Florentine hatchery is about 1.5 km from the hatchery. This nesting site has been observed eight times between 2003 and 2015 but notes state that it is not active.

The worst-case construction noise level of 90 dBA will be reduced by sound wave spreading with distance to 46 dBA at 1.5 km and 42 dBA at 2.5 km. However, there will be significant additional noise level reduction due to vegetation, terrain blocking and sound energy absorption by the atmosphere. I am unable to estimate what the final worst-case construction noise levels will be at the nesting sites, but they will certainly be less than 30 dBA.

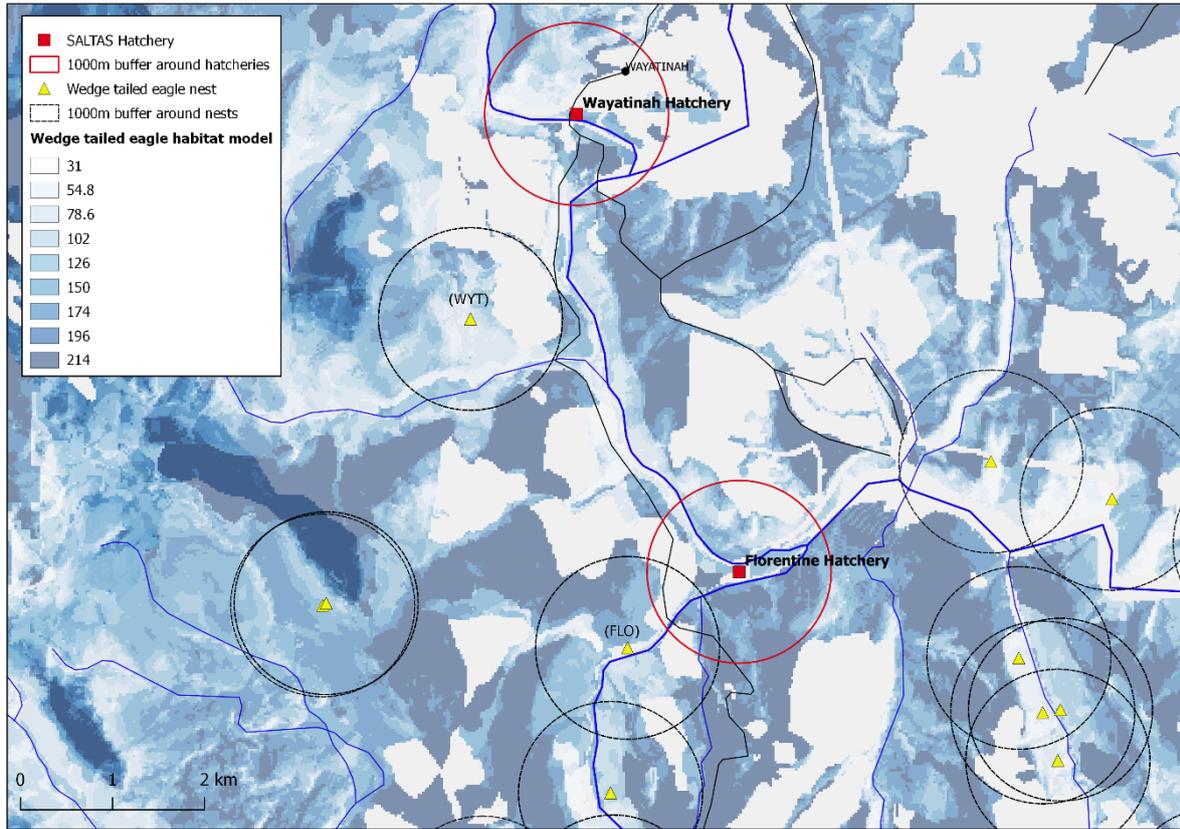


Figure 2. The closest wedge-tailed eagle nesting sites to the Wayatinah and Florentine hatcheries.

I don't know what noise levels would cause an eagle to be sufficiently disturbed to abandon a nest, but day time background noise levels in the vicinity of the nesting sites will usually be above 30 dBA.

If worst-case construction noise levels are less than 30 dBA then they should be inaudible on days when there is a little wind – it doesn't take much wind to cause leaves to rustle in a eucalypt forest and background noise levels to rise to 40 dBA. I therefore recommend that use of a rock breaker be scheduled for days when the wind forecast is favourable, at least 5 to 10 kts would be ideal.

I am fairly confident that worst-case construction noise levels won't disturb nesting eagles for other reasons. First, both hatcheries have alarms that are sounded from time to time in response to a process issue, so eagles are presumably used to the hatcheries producing occasional loud noise. Second, it is already mid-October, so the work can't start until close to the end of the breeding season. Third, the nearest nest to the Florentine hatchery is reported to no longer be used and the next nearest nest is about 2.5 km from the hatchery, similar to the Wayatinah hatchery's situation.

A-weighted decibels probably shouldn't be used to assess noise impact on eagles, since A-weighting adjusts the noise levels to take into account human hearing ability, but if unweighted decibels are used instead then all of the above arguments hold. The predicted noise levels will be higher if they are not A-weighted, but so will the background noise levels.

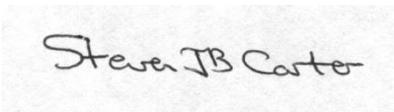
Summary

The worst-case noise impact of construction work to install the drum filters and sludge plant proposed for the Wayatinah hatchery is predicted to be well under the estimated noise level target of 55 dBA at the nearest residences of the Wayatinah village. However, the village community should be advised of the construction work ahead of time, with the key messages being that it will only be day time work for the purpose of improving the environmental performance of the hatchery, the work is expected to take about a month, and the worst case noise levels due to the possible use of a rock breaker will only last a few days and should not cause nuisance in the village.

The subsequent noise from the continuous use of the new equipment is predicted to be well under the EPA's standard night time noise level limit of 35 dBA, with night time being the worst case period. However, the noise levels in the bedroom of a nearby on-site staff accommodation building may be sufficiently elevated to cause nuisance. On the other hand, the blocking effect of sheds and the terrain may reduce the noise to an acceptable level, so I recommend assessing the situation after the plant is commissioned and applying noise mitigation measures if need be. That should be quite straightforward.

The Florentine hatchery is located about 6 km further from the Wayatinah village, so the only noise impact concern of the proposal to also install and operate drum filters and a sludge plant at the Florentine hatchery is to ensure wedge-tailed eagles are not disturbed by the construction work noise. The worst case construction noise, due to use of rock breakers, is predicted to be at least 10 dB less than the background noise at the nearest nest sites on days when there is a little wind, so use of rock breakers should be scheduled for such days.

Yours sincerely,



Dr Steve Carter, FIEAust, CPEng
Environmental Engineer