Annual Environmental Management Review
2018

In relation to Environmental Licence No.9954/1

Meadowbank Hatchery
HUON AQUACULTURE Group
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The purpose of this document is to meet the Schedule 2: Conditions of the Environmental Licence (EL) 9954/1, specifically condition G7:

**G7 Annual Environmental Review (EL 9954/1)**

1: Unless otherwise specified in writing by the Director, a publicly available Annual Environmental Review for the activity must be submitted to the Director each year within three months of the end of the reporting period.

1 **Acknowledgement of AEMR (EL9954/1 sec 1)**

I David Mitchell General Manager of Freshwater Operations for Huon Aquaculture acknowledge the contents of this environmental review;

Dave Mitchell GM freshwater ..................................................

2 **Complaints (EL9954/1 sec 1)**

No complaints were received throughout 2018 in relation to the Meadowbank Site

3 **Environmental related process changes implemented**

Flow meters were installed on all intake pumps

4 **summary of the amounts of both solid and liquid wastes produced**

166,000 litres of sludge were removed from the site sludge digesters. This sludge was delivered to Interlaken compost facility via Spectran.

There are no initiatives and or programs planned to change this method of sludge disposal during the next reporting period.

5 **Details of all non-trivial environmental incidents**

No environmental incidents occurred throughout the period.

The site maximum biomass was exceeded – see 7 (page 13).
6 A summary of the monitoring data and record keeping required by these conditions.

Summary of Monitoring Results
Sampling was conducted 12 times (monthly) as per condition M2 of the EL at site (IN) and 10 times at the site (O1). Discharge only occurred for 10 months of the year, however the River Derwent sample was collected for monitoring of water quality. Sampling was conducted as required under condition M2, section 3, table 1.

**Table 2: Summary of sampling site Inlet (IN) 2018**

<table>
<thead>
<tr>
<th>Site: Meadowbank Inlet</th>
<th>Max 80th Percentile</th>
<th>Median 20th Percentile</th>
<th>Min Sample Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia and Ammonium as N mg/L</td>
<td>0.011 0.0088</td>
<td>0.006 0.005</td>
<td>0.005 12</td>
</tr>
<tr>
<td>Conductivity Lab uS/cm uS/cm</td>
<td>74 57</td>
<td>55.5 51.4</td>
<td>50 12</td>
</tr>
<tr>
<td>Enterococci (MPN) CFU/100ml</td>
<td>86 10</td>
<td>10 10</td>
<td>10 9</td>
</tr>
<tr>
<td>Nitrite and Nitrate as N mg/L</td>
<td>0.043 0.0282</td>
<td>0.019 0.0104</td>
<td>0.003 12</td>
</tr>
<tr>
<td>Nitrogen (Total Kjeldahl) as N mg/L</td>
<td>0.25 0.208</td>
<td>0.17 0.142</td>
<td>0.12 12</td>
</tr>
<tr>
<td>Nitrogen (Total) as N mg/L</td>
<td>0.29 0.228</td>
<td>0.195 0.16</td>
<td>0.13 12</td>
</tr>
<tr>
<td>pH Lab Units</td>
<td>7.7 7.5</td>
<td>7.35 7.22</td>
<td>7.1 12</td>
</tr>
<tr>
<td>Phosphate as P (Filt) mg/L</td>
<td>0.006 0.0038</td>
<td>0.003 0.003</td>
<td>0.003 12</td>
</tr>
<tr>
<td>Phosphorus (Total) as P mg/L</td>
<td>0.01 0.01</td>
<td>0.01 0.01</td>
<td>0.01 12</td>
</tr>
<tr>
<td>Total suspended solids mg/L</td>
<td>5 2</td>
<td>2 2</td>
<td>2 12</td>
</tr>
</tbody>
</table>

**Table 3: Summary of sampling site outlet (O1) 2018**

<table>
<thead>
<tr>
<th>Site: Meadowbank Outlet</th>
<th>Max 80th Percentile</th>
<th>Median 20th Percentile</th>
<th>Min Sample Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia and Ammonium as N mg/L</td>
<td>0.71 0.392</td>
<td>0.215 0.184</td>
<td>0.14 10</td>
</tr>
<tr>
<td>Conductivity Lab uS/cm uS/cm</td>
<td>75 64.2</td>
<td>61 55.6</td>
<td>33 10</td>
</tr>
<tr>
<td>Enterococci (MPN) CFU/100ml</td>
<td>388 28.6</td>
<td>10 10</td>
<td>10 8</td>
</tr>
<tr>
<td>Nitrite and Nitrate as N mg/L</td>
<td>0.4 0.324</td>
<td>0.225 0.206</td>
<td>0.16 10</td>
</tr>
<tr>
<td>Nitrogen (Total Kjeldahl) as N mg/L</td>
<td>1.2 0.844</td>
<td>0.555 0.484</td>
<td>0.45 10</td>
</tr>
<tr>
<td>Nitrogen (Total) as N mg/L</td>
<td>1.6 1.06</td>
<td>0.81 0.712</td>
<td>0.64 10</td>
</tr>
<tr>
<td>pH Lab units</td>
<td>7 6.74</td>
<td>6.65 6.5</td>
<td>6.5 10</td>
</tr>
<tr>
<td>Phosphate as P (Filt) mg/L</td>
<td>0.21 0.118</td>
<td>0.099 0.082</td>
<td>0.057 10</td>
</tr>
<tr>
<td>Phosphorus (Total) as P mg/L</td>
<td>0.26 0.164</td>
<td>0.13 0.114</td>
<td>0.08 10</td>
</tr>
<tr>
<td>Total suspended solids mg/L</td>
<td>5 4</td>
<td>3 2</td>
<td>2 10</td>
</tr>
</tbody>
</table>
Table 4: comparison of laboratory results with the preceding report period (2017 v 2018)
Median results shown from Site Outlet

<table>
<thead>
<tr>
<th></th>
<th>Median 2017 Site Outlet</th>
<th>Median 2018 Site Outlet</th>
<th>Difference % 2018 - 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Nitrogen as N mg/L</td>
<td>0.84</td>
<td>0.81</td>
<td>-3.57</td>
</tr>
<tr>
<td>Nitrite and Nitrate as N mg/L</td>
<td>0.205</td>
<td>0.225</td>
<td>9.75</td>
</tr>
<tr>
<td>Ammonia and Ammonium as N mg/L</td>
<td>0.205</td>
<td>0.215</td>
<td>4.88</td>
</tr>
<tr>
<td>Total Phosphorous</td>
<td>0.115</td>
<td>0.13</td>
<td>13.04</td>
</tr>
<tr>
<td>Dissolved Reactive Phosphate</td>
<td>0.0785</td>
<td>0.099</td>
<td>26</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Enterococci</td>
<td>25.5</td>
<td>10</td>
<td>-60</td>
</tr>
</tbody>
</table>

6.1 Summary table 4

Please note that only 10 samples are included in the 2018 emission data as the site was not operating for two months of the year.

Median Results are similar to results achieved in 2017 (<10% difference) for Total Nitrogen, NOX, Ammonia and Total Suspended solids.

Phosphorous levels were elevated compared to 2017 due to increase feed in 2018.

Enterococci levels decreased.
6.2 Total Nitrogen within site emissions 2018

Total Nitrogen discharge has reduced across the past 2 years. March, April and May 2018 saw the highest level of concentration within the discharge for the reporting period.

*Figure 2: Total Nitrogen Meadowbank Hatchery discharge 2018*

*Figure 3: Total Nitrogen Meadowbank Hatchery discharge 2017 – 2018 (trend line in red)*
6.3 Nitrate and Nitrite Nitrogen (NOX) within site emissions 2018

Overall the site’s trend for NOX is stable when viewed across 2017 – 2018 as highlighted in figure 5 below.

Figure 4: Nitrite and Nitrate Nitrogen Meadowbank Hatchery discharge 2018

Figure 5: Nitrite and Nitrate Nitrogen Meadowbank Hatchery 2017 – 2018 (trend line in red)
6.4 Total Ammonia within site emissions 2018
Ammonia was elevated in March, April and May. The site trend line is showing a marginally reducing trend (figure 7), when viewed over a 2-year period.

Figure 6: Total Ammonia Meadowbank Outlet discharge 2018

Figure 7: Total Ammonia Meadowbank Outlet 2017 – 2018 discharge (trend line in red)
6.5 Total Phosphorous within site emissions 2018
Total Phosphorous increased by 10% within the site discharge between 2017 and 2018. The 2-year trend (figure 9) is stable.

Figure 8: Total P Meadowbank Hatchery Outlet 2018

![Figure 8: Total P Meadowbank Hatchery Outlet 2018](image)

Figure 9: Total Phosphorous Meadowbank Hatchery Outlet 2017 – 2018 (trend line in red)

![Figure 9: Total Phosphorous Meadowbank Hatchery Outlet 2017 – 2018 (trend line in red)](image)
6.6 Dissolved Reactive Phosphorous (DRP) within site emissions 2018

Dissolved Reactive Phosphorous peaked in April and then followed a reducing trend across the remainder of 2018. Overall this parameter shows a decreasing trend across a two-year period (figure 11).

Figure 10: Dissolved Reactive Phosphorous Meadowbank Hatchery Outlet discharge 2018

Figure 11: DRP Meadowbank Hatchery Outlet discharge 2017 – 2018 (trend line in red)
6.7 Total Suspended Solids within site emissions 2018

The level of suspended solids potentially related to site influence peaked in August. Overall the level of solids remains at 3mg/L across the past two years (figure 13). To clarify the above comment, total suspended solids were 5mg/L at the site inlet in July 2018 (see figure 14), therefore August was the peak sample that could be potentially related to the site operations. However, in August, Meadowbank Creek was running high and discoloured and as it enters the Settling Dam and as the hatchery stocking levels were low at the time, there is potential this source influenced the result.

*Figure 12: Total Suspended Solids within discharge Meadowbank Outlet*

![Graph showing total suspended solids mg/L, Meadowbank Outlet from 01/01/18 to 17/12/18]

*Figure 13: Total Suspended Solids 2017-2018 within discharge Meadowbank Outlet*

![Graph showing total suspended solids mg/L, Meadowbank Outlet from 01/01/17 to 02/12/18]
Huon Aquaculture have engaged Aquatic Science to conduct flow monitoring of Meadowbank Creek to assess its potential impact in regards to Nutrients and Total Suspended solids.

Once this assessment is conducted Huon will have a better understanding of this creek's water quality and its impact on the sites winter discharge.
6.8 **Enterococci within site emissions 2018**

The highest level of *Enterococci* was recorded in March, however when viewed across the two-year timeline seen in figure 16 this result would be considered an anomaly. Overall this parameter remains stable at low levels.

Please note that March 2018 also recorded a result for *Enterococci* within the site Inlet water ex River Derwent (see figure 17).

There are considerable limitations to the sampling of Bacterial Colonies at the Meadowbank site Outlet from what is in all essence an uncovered earthen dam reporting to an earthen stream like sampling site which is surrounded by reeds and vegetation. The results could be influenced by warm blooded animals such as Platypus, Wallabies and the wide array of water birds that reside in the Settlement Dam. *Enterococci* are bacteria that live in the intestinal tracts of warm-blooded animals, including humans, and therefore indicate possible contamination of streams and rivers by faecal waste.

Sources of faecal indicator bacteria such as *Enterococci* include wastewater treatment plant effluent, leaking septic systems, stormwater runoff, sewage discharged or dumped from recreational boats, domestic animal and wildlife waste, improper land application of manure or sewage, and runoff from manure storage areas, pastures, rangelands, and feedlots.

Results below indicate that despite these potential influences results for *Enterococci* remain low and for the majority if the time at or near LOR.

*Figure 15: Enterococci 2018 within Meadowbank site discharge*
Figure 16: Enterococci 2017-2018 Meadowbank site discharge

Enterococci (MPN) CFU/100ml, Meadowbank Outlet

Figure 17: Enterococci Meadowbank site Inlet 2018 (River Derwent)

Enterococci (MPN) CFU/100ml, Meadowbank Inlet
7 Identification of breaches of limits specified in these conditions

The site exceeded its biomass capacity limit of 160 tonnes – As per EPN conditions council were notified.

Noting this exceedance was allowable under the EPN conditions. See email below.

From: Adam Chapman  
Sent: Thursday, 12 April 2018 8:28 AM  
To: Bev Armstrong  
Cc: Mike Lynch; David Mitchell  
Subject: exceedance of 160 tonne site capacity

Hi Beverley
As per condition 2 (No Changes without approval) of the Meadowbank Hatcheries EPN 2016/1.
I am notifying council that the site has exceeded its maximum biomass of 160 tonnes and currently has a site Biomass of 168 tonnes.
This exceedance of Biomass will continue until the 19/20th of April when 40 tonne of fish have been scheduled for transport. In addition, another 40 tonne of fish are also scheduled for transport on the 24/25th of April as part of the sites normal Autumn site Smolt transfers.
I will attend the site before the 19th of April and collect the monthly samples at the inlet and outlet which will capture the emission at this peak capacity and these will be recorded and submitted to council in the site April Monthly report.

Regards
Adam

Adam Chapman | Freshwater Environment Manager  
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PO BOX 42, Dover | TAS 7117  
T 03 6295 8111 | M 0497 042 809  
E achapman@huonaqua.com.au | W www.huonaqua.com.au

7.1 Councils response to this notification below

Bev Armstrong <BArmstrong@centralhighlands.tas.gov.au>  
RE: exceedance of 160 tonne site capacity

Thanks Adam

7.2 Reason for exceedance
Fish growth on site over the summer of 2017/2018 was exceptional. Site improvements, experienced staff and favourable temperatures all culminated in better than predicted fish performance. Unfortunately, it is detrimental to fish welfare to hold fish back in freshwater and for these reasons we were left with no choice but continue to feed the fish. The site stocking profile also had a larger fish on site and we have used this experience to better plan site
stocking in the 2018/2019 season by spreading out fish production more evenly across the year. In the 2017/18 season the site was stocked with all early fish but in the 2018/2019 season we have stocked with 2 fish cohorts, one early and one later in an attempt to ameliorate the seasonal peak in biomass experienced in April before the early fish are transferred to sea.

8 A list of any issues, not discussed elsewhere in the report
No other issues identified

9 A summary of fulfilment of environmental commitments made for the reporting period.
No commitments were made for the reporting period

10 A summary of any community consultation and communication undertaken during the reporting period.
No community engagement was conducted in 2018

11 Additional site information
For additional information please contact;

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