

Gwynedd Council



CILGWYN LEACHATE TREATMENT PLANT

Permit Number: EPR/PP3539NV

PROPOSED SURRENDER AND CLOSURE PLAN

December 2019

Background

The Leachate Treatment Plant (LTP) in Cilgwyn is located at NGR SH 249941, 353632 on the slopes of a former slate quarry at the closed Cilgwyn Landfill site in Gwynedd.

The landfill was operated by the Council's Waste Treatment Service and received non-hazardous waste for a period of approximately 30 years; the landfill closed in December 2008, with capping of the site completed in 2012.

The purpose of the installation, the LTP, is to treat discharge waters (leachate), from the closed landfill, the leachate produced at the site is dilute and non-hazardous.

Cilgwyn Closed Landfill

Following capping and the subsequent reduction of groundwater into the body of the waste, modelling of the leachate concentration predicted an increase in concentration of the ammoniacal nitrogen at the Adit, potentially breaching the 50mg/l consent value.

Reducing the predicted ammoniacal nitrogen levels to below the 50mg/l consent required some means of treatment to the leachate prior to discharge. Installing a Leachate Treatment Plant at the site was considered the The Best Available Technique at the time, for dealing with potential peaks in ammoniacal nitrogen concentrations.

Leachate Treatment Plant.

The permit for the Leachate Treatment Plant, No. EPR/PP3539NV, was issued by NRW to Gwynedd Council on the 12/09/13.

The LTP consent levels were adopted from the Cilgwyn Closed Landfill Permit No: EPR/KP3094FZ when definitive closure approval was issued by NRW in March 2015.

In total 3 samples are taken at the site, these are taken on the same date to be comparable.

1. LTP Influent
A sample taken 'upstream' of the LTP, a pre – treatment sample.
2. LTP Effluent
A sample of treated leachate at the LTP.
3. Adit Consent Point
An emission point to a tributary of the River Llyfni (NGR SH 250100, 353651).

The following parameters and limits have been set for this location

| Parameter | Limit |
|---------------------------------|---------|
| Biochemical Oxygen Demand (BOD) | 40 mg/l |
| Ammoniacal Nitrogen | 50 mg/l |
| Total Suspended Solids | 60 mg/l |
| pH | 6 - 9 |

The LTP at Cilgwyn is comprised of a SAF (Submerged Aerated Filter) system, the SAF removes ammoniacal nitrogen through nitrification in a biological treatment process where naturally occurring bacteria (known as nitrifiers) convert ammoniacal nitrogen into nitrites and nitrates.

The LTP has been designed to treat the base flow of leachate from the landfill, which is approximately 800m³/day. Any excess leachate above this quantity will continue to be drained from an existing adit which exists to the south of the landfill. The whole process is automated and operates continuously.

After passing through the LTP, the treated leachate (base flow), combines with surface water redirected from the capped landfill along with any excess leachate from the adit before being discharged to a tributary of the Afon Llynfi, at the installations only emission point, the Adit Consent Point.

Based on a range between 148-186 sampling occasions, over a 5 year period (October 2014 to September 2019) concentrations of the parameters sampled at all three sampling locations (influent – Effluent - Adit Consent Point) were all found to be well within the compliance limits.

The 'influent' sampling results were well within the final discharge compliance limits, and would have required no treatment to meet the parameters, effectively rendering the LTP function unnecessary.

Summary of results (October 2014 – September 2019)

| | Ammoniacal nitrogen (mg/l) | | | pH | | | Suspended Solids (mg/l) | | | BOD (mg/l) | | |
|---------------|----------------------------|--------------|--------------------|--------------|--------------|--------------------|-------------------------|--------------|--------------------|--------------|--------------|--------------------|
| | LTP influent | LTP effluent | Adit Consent Point | LTP influent | LTP effluent | Adit Consent Point | LTP influent | LTP effluent | Adit Consent Point | LTP influent | LTP effluent | Adit Consent Point |
| LIMIT | / | / | 50 | / | / | 6 - 9 | / | / | 60 | / | / | 40 |
| Min | <0.06 | <0.06 | <0.06 | 4.8* | 7.2 | 7.1 | <1 | <1 | <1 | 1 | 1 | 1 |
| Max | 2.89 | 0.96 | 1.67 | 9.0 | 8.6 | 8.8 | 11 | 14 | 49 | 8 | 7 | 12 |
| No of samples | 149 | 186 | 186 | 149 | 186 | 186 | 149 | 186 | 186 | 148 | 186 | 185 |
| | | | | | | | | | | | | |

* the pH of 4.8 appears as an isolated occurrence

A summary of the data for all three sampling locations is presented in Appendix A

The sampling requirements for the LTP was reduced from weekly to quarterly, agreed following a Minor Technical Variation application in August 2018.

Environmental monitoring

Volumes of up to 800m³/day are currently treated at the plant. During the LTP operational period, the system has remained contained and there have been no incidences of leakages or spills from the system. There has been no additional need to monitor the local vicinity within the permit boundary as the plant has had no effect on its surroundings.

Following decommissioning of the plant, any potential impact to land from the plant will cease. Therefore, there will be no requirement for any environmental assessments.

Post Closure of LTP

We acknowledge the likely need as part of the LTP permit surrender, to make a Minor Technical Variation, in order for the consent levels to revert back to the closed landfill permit.

The LTP can effectively be 'switched off' and put into a state of hibernation, the tanks will be drained and covered to ensure no unauthorised entry is possible. The control kiosks will remain locked and guarded by a telemetry enabled alarm system.

Regular checks will be undertaken at the site by competently qualified staff.

APPENDIX A

Laboratory Results

| Date | Ammoniacal nitrogen (mg/l) | | | pH | | | suspended solids (mg/l) | | | Biochemical Oxygen Demand (BOD) (mg/l) | | |
|------------|----------------------------|--------------|--------------|--------------|--------------|------------|-------------------------|--------------|---------------|--|--------------|---------------|
| | LPT Influent | LTP effluent | limit 50mg/l | LPT Influent | LTP effluent | limit 8- 9 | LPT Influent | LTP effluent | limit 60 mg/l | LPT Influent | LTP effluent | limit 40 mg/l |
| | | | | | | | | | | | | |
| 7/10/2014 | 0.96 | 0.66 | 0.66 | 7.7 | 7.7 | 8.1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 14/10/2014 | 0.27 | 0.27 | 0.27 | 7.7 | 7.8 | 7.8 | 4 | 3 | 3 | 1 | 1 | 1 |
| 22/10/2014 | 0.27 | 0.35 | 0.35 | 7.9 | 7.8 | 7.8 | 2 | 2 | 2 | 1 | 1 | 1 |
| 28/10/2014 | 0.27 | 0.27 | 0.27 | 7.8 | 7.8 | 7.8 | 2 | 2 | 2 | 1 | 1 | 1 |
| 4/11/2014 | 0.27 | 1.03 | 1.03 | 7.7 | 7.7 | 7.7 | 2 | 2 | 2 | 1 | 1 | 2 |
| 11/11/2014 | 0.27 | 0.27 | 0.27 | 7.2 | 7.2 | 7.2 | 1 | 2 | 2 | 3 | 1 | 1 |
| 18/11/2014 | 0.27 | 0.27 | 0.27 | 7.2 | 7.1 | 7.1 | 1 | 2 | 2 | 1 | 1 | 1 |
| 25/11/2014 | 0.27 | 0.27 | 0.27 | 7.8 | 7.8 | 7.8 | 1 | 2 | 2 | 1 | 1 | 1 |
| 2/12/2014 | 0.27 | 0.37 | 0.37 | 7.8 | 7.8 | 7.8 | 2 | 2 | 2 | 1 | 1 | 1 |
| 9/12/2014 | 0.27 | 0.27 | 0.27 | 7.9 | 8.1 | 8.1 | 2 | 8 | 8 | 1 | 1 | 1 |
| 16/12/2014 | 0.27 | 0.27 | 0.27 | 7.9 | 8.1 | 8.1 | 1 | 6 | 6 | 1 | 1 | 1 |
| 22/12/2014 | 0.27 | 0.27 | 0.27 | 7.8 | 7.7 | 7.7 | 2 | 5 | 5 | 1 | 1 | 1 |
| 30/12/2014 | 0.27 | 0.27 | 0.27 | 7.9 | 7.9 | 7.9 | 1 | 6 | 6 | 1 | 1 | 1 |
| 6/1/2015 | 0.27 | 0.27 | 0.27 | 7.6 | 7.5 | 7.5 | 2 | 2 | 2 | 1 | 1 | 1 |
| 14/1/2015 | 0.27 | 0.27 | 0.27 | 7.7 | 7.6 | 7.6 | 1 | 2 | 2 | 1 | 1 | 1 |
| 21/1/2015 | 0.27 | 0.27 | 0.27 | 7.8 | 7.8 | 7.8 | 2 | 4 | 4 | 1 | 1 | 1 |
| 28/1/2015 | 0.27 | 0.27 | 0.27 | 7.8 | 7.8 | 7.8 | 4 | 4 | 4 | 1 | 1 | 2 |
| 3/2/2015 | 0.27 | 0.27 | 0.27 | 8.0 | 7.9 | 7.9 | 2 | 10 | 10 | 1 | 1 | 1 |
| 18/2/2015 | 0.27 | 0.27 | 0.27 | 7.9 | 7.9 | 7.9 | 2 | 2 | 2 | 1 | 1 | 1 |
| 24/2/2015 | 0.27 | 0.27 | 0.27 | 7.7 | 7.7 | 7.7 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3/3/2015 | 0.27 | 0.27 | 0.27 | 7.8 | 7.7 | 7.7 | 2 | 2 | 2 | 1 | 1 | 1 |
| 10/3/2015 | 0.27 | 0.27 | 0.27 | 7.9 | 7.9 | 7.9 | 2 | 2 | 2 | 1 | 1 | 1 |
| 17/3/2015 | 0.27 | 0.27 | 0.27 | 7.7 | 7.6 | 7.6 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15/4/2015 | 0.27 | 0.27 | 0.27 | 7.9 | 7.9 | 7.9 | 1 | 7 | 7 | 1 | 1 | 1 |
| 23/4/2015 | 0.27 | 0.27 | 0.27 | 7.9 | 7.8 | 7.8 | 2 | 2 | 2 | 1 | 1 | 1 |
| 5/5/2015 | 0.06 | 0.06 | 0.06 | 8.0 | 7.9 | 7.9 | 5 | 10 | 10 | 2 | 1 | 1 |
| 19/5/2015 | 0.06 | 0.06 | 0.06 | 7.8 | 7.8 | 7.8 | 5 | 4 | 4 | 1 | 1 | 1 |
| 26/5/2015 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 2 | 6 | 6 | 1 | 1 | 1 |
| 2/6/2015 | 0.06 | 0.25 | 0.25 | 7.8 | 7.7 | 7.7 | 3 | 6 | 6 | 1 | 1 | 1 |
| 9/6/2015 | 0.06 | 0.06 | 0.06 | 7.7 | 7.7 | 7.7 | 2 | 4 | 4 | 1 | 1 | 1 |
| 16/6/2015 | 0.06 | 0.06 | 0.06 | 7.9 | 7.9 | 7.9 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24/6/2015 | 0.06 | 0.06 | 0.06 | | | | | | | | | |

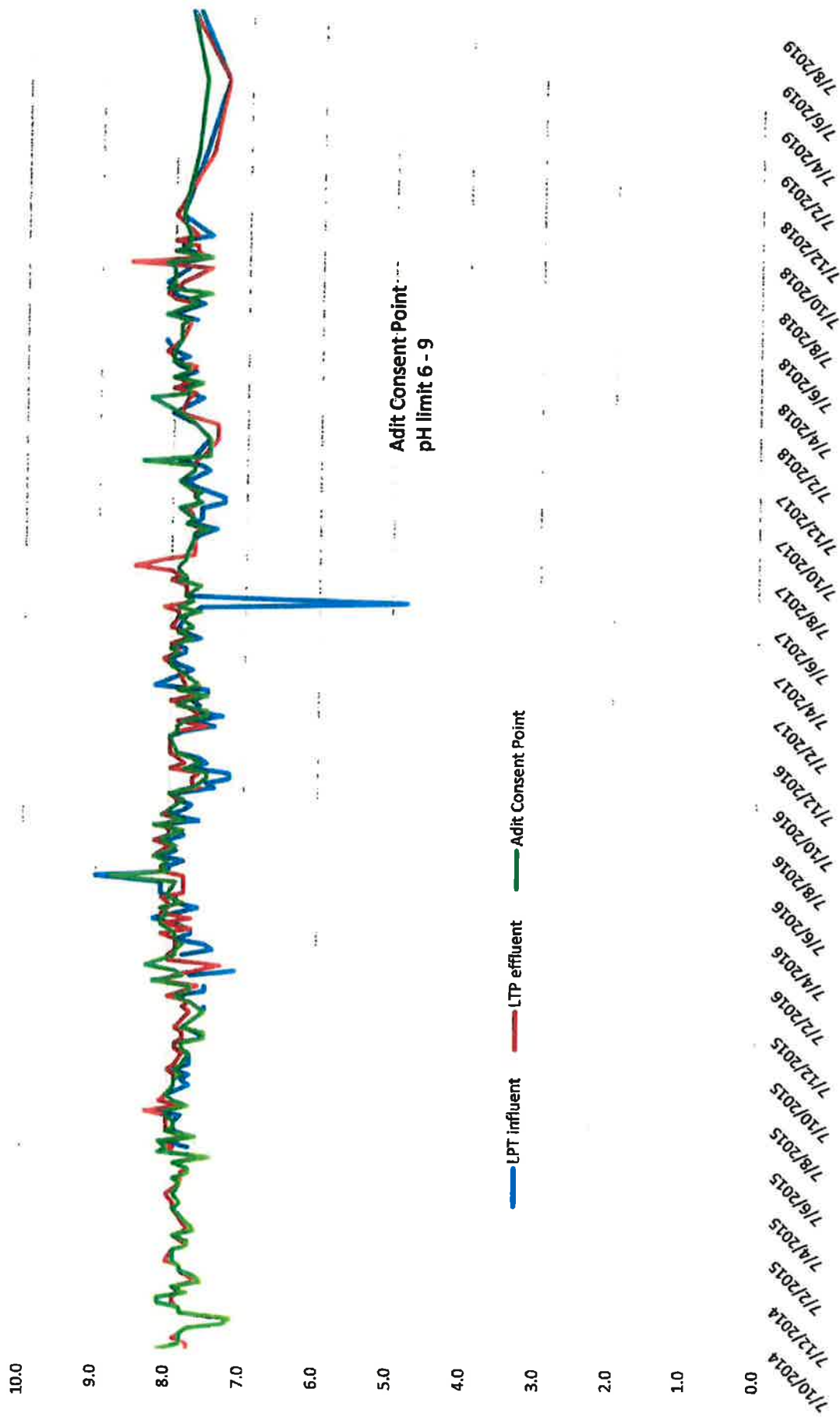
| Date | Ammoniacal nitrogen (mg/l) | | | pH | | | suspended solids (mg/l) | | | Biochemical Oxygen Demand (BOD) (mg/l) | | |
|------------|----------------------------|--------------|------------|--------------------|--------------|------|-------------------------|--------------------|------|--|--------------|--------------------|
| | limit 50mg/l | | Date | limit 6- 9 | | Date | limit 60 mg/l | | Date | 40 mg/l | | |
| | LTP Influent | LTP effluent | | Adit Consent Point | LTP Influent | | LTP effluent | Adit Consent Point | | LTP Influent | LTP effluent | Adit Consent Point |
| 8/10/2015 | 0.08 | 0.06 | 6/10/2015 | 7.8 | 7.9 | 7.9 | 2 | 2 | 13 | 6/10/2015 | 1 | 1 |
| 13/10/2015 | 0.15 | 0.06 | 13/10/2015 | 7.7 | 7.9 | 7.8 | 2 | 2 | 18 | 13/10/2015 | 1 | 1 |
| 20/10/2015 | 0.1 | 0.06 | 20/10/2015 | 7.9 | 8.0 | 7.9 | 2 | 1 | 14 | 20/10/2015 | 1 | 1 |
| 27/10/2015 | 1.08 | 0.06 | 27/10/2015 | 7.7 | 7.9 | 7.8 | 2 | 1 | 4 | 27/10/2015 | 1 | 1 |
| 11/11/2015 | 2.89 | 0.25 | 11/11/2015 | 7.7 | 7.8 | 7.7 | 3 | 2 | 2 | 11/11/2015 | 1 | 1 |
| 18/11/2015 | 1.71 | 0.06 | 18/11/2015 | 7.9 | 7.9 | 7.8 | 2 | 1 | 4 | 18/11/2015 | 1 | 1 |
| 25/11/2015 | 0.54 | 0.06 | 25/11/2015 | 7.9 | 7.9 | 7.8 | 2 | 2 | 3 | 25/11/2015 | 5 | 5 |
| 1/12/2015 | 0.24 | 0.06 | 1/12/2015 | 7.5 | 7.8 | 7.5 | 1 | 2 | 1 | 1/12/2015 | 2 | 2 |
| 9/12/2015 | 1.19 | 0.06 | 9/12/2015 | 7.8 | 7.8 | 7.5 | 1 | 1 | 1 | 9/12/2015 | 1 | 1 |
| 16/12/2015 | 0.09 | 0.06 | 16/12/2015 | 7.8 | 7.9 | 7.8 | 1 | 1 | 3 | 16/12/2015 | 1 | 1 |
| 8/1/2016 | 0.06 | 0.06 | 6/1/2016 | 7.5 | 7.7 | 7.5 | 4 | 1 | 2 | 6/1/2016 | 1 | 1 |
| 13/1/2016 | 0.06 | 0.06 | 13/1/2016 | 7.5 | 7.8 | 7.6 | 4 | 1 | 2 | 13/1/2016 | 1 | 1 |
| 20/1/2016 | 0.06 | 0.06 | 20/1/2016 | 7.7 | 7.7 | 7.7 | 1 | 8 | 2 | 20/1/2016 | 1 | 1 |
| 27/1/2016 | 0.06 | 0.06 | 27/1/2016 | 7.9 | 8.0 | 7.9 | 1 | 1 | 6 | 27/1/2016 | 1 | 1 |
| 3/2/2016 | 0.06 | 0.06 | 3/2/2016 | 7.5 | 7.8 | 7.7 | 1 | 1 | 3 | 3/2/2016 | 1 | 1 |
| 10/2/2016 | 0.06 | 0.06 | 10/2/2016 | 7.5 | 7.8 | 7.7 | 2 | 1 | 2 | 10/2/2016 | 1 | 2 |
| 17/2/2016 | 0.06 | 0.06 | 17/2/2016 | 8.1 | 8.2 | 8.2 | - | 4 | 4 | 17/2/2016 | 1 | 1 |
| 24/2/2016 | 0.06 | 0.06 | 24/2/2016 | 7.7 | 7.9 | 7.8 | 2 | 3 | 4 | 24/2/2016 | 1 | 1 |
| 2/3/2016 | 0.06 | 0.06 | 2/3/2016 | 7.1 | 7.6 | 7.9 | 1 | 1 | 2 | 2/3/2016 | 1 | 2 |
| 9/3/2016 | 0.06 | 0.06 | 9/3/2016 | 7.3 | 7.3 | 8.3 | 2 | 2 | 2 | 9/3/2016 | 1 | 1 |
| 16/3/2016 | 0.06 | 0.06 | 16/3/2016 | 8.0 | 8.0 | 8.1 | 4 | 1 | 5 | 16/3/2016 | 1 | 2 |
| 23/3/2016 | 0.06 | 0.06 | 23/3/2016 | 7.8 | 8.0 | 7.9 | 2 | 1 | 1 | 23/3/2016 | 1 | 1 |
| 30/3/2016 | 0.06 | 0.06 | 30/3/2016 | 7.4 | 7.9 | 7.9 | 2 | 1 | 1 | 30/3/2016 | 1 | 1 |
| 6/4/2016 | 0.23 | 0.06 | 6/4/2016 | 7.5 | 7.9 | 7.8 | 2 | 1 | 8 | 6/4/2016 | 1 | 3 |
| 13/4/2016 | 0.06 | 0.06 | 13/4/2016 | 7.9 | 7.9 | 7.8 | 2 | 1 | 1 | 13/4/2016 | 1 | 1 |
| 20/4/2016 | 0.06 | 0.06 | 20/4/2016 | 7.7 | 8.1 | 7.9 | 4 | 1 | 4 | 20/4/2016 | 1 | 1 |
| 27/4/2016 | 0.06 | 0.06 | 27/4/2016 | 7.7 | 7.7 | 8.0 | 1 | 1 | 1 | 27/4/2016 | 1 | 1 |
| 4/5/2016 | 0.06 | 0.06 | 4/5/2016 | 7.9 | 8.1 | 8.1 | 1 | 1 | 2 | 4/5/2016 | 1 | 1 |
| 11/5/2016 | 0.06 | 0.06 | 11/5/2016 | 8.2 | 7.7 | 8.1 | 8 | 1 | 4 | 11/5/2016 | 1 | 1 |
| 18/5/2016 | 0.06 | 0.06 | 18/5/2016 | 7.9 | 8.1 | 8.0 | 2 | 2 | 2 | 18/5/2016 | 1 | 1 |
| 25/5/2016 | 0.06 | 0.06 | 25/5/2016 | 7.6 | 8.0 | 8.1 | 4 | 1 | 5 | 25/5/2016 | 1 | 1 |
| 1/6/2016 | 0.06 | 0.06 | 1/6/2016 | 7.9 | 8.0 | 7.8 | 1 | 1 | 2 | 1/6/2016 | 1 | 1 |
| 8/6/2016 | 0.06 | 0.06 | 8/6/2016 | 7.9 | 8.1 | 8.0 | 3 | 1 | 4 | 8/6/2016 | 3 | 2 |
| 14/6/2016 | 0.06 | 0.06 | 14/6/2016 | 8.1 | 7.8 | 8.0 | 2 | 2 | 2 | 14/6/2016 | 1 | 2 |
| 29/6/2016 | 0.06 | 0.06 | 29/6/2016 | 8.1 | 7.8 | 7.9 | 4 | 3 | 4 | 29/6/2016 | 1 | 3 |
| 7/7/2016 | 0.06 | 0.06 | 7/7/2016 | 9.0 | 7.8 | 8.8 | 2 | 3 | 1 | 7/7/2016 | 1 | 1 |
| 13/7/2016 | 0.14 | 0.06 | 13/7/2016 | 8.0 | 8.1 | 8.0 | 3 | 3 | 3 | 13/7/2016 | 1 | 1 |
| 20/7/2016 | 0.06 | 0.06 | 20/7/2016 | 8.0 | 8.1 | 8.1 | 2 | 1 | 1 | 20/7/2016 | 2 | 2 |
| 27/7/2016 | 0.06 | 0.06 | 27/7/2016 | 7.8 | 8.0 | 8.0 | 1 | 1 | 2 | 27/7/2016 | 2 | 2 |
| 3/8/2016 | 0.06 | 0.06 | 3/8/2016 | 8.1 | 8.2 | 8.2 | 2 | 1 | 2 | 3/8/2016 | 1 | 1 |
| 10/8/2016 | 0.06 | 0.1 | 10/8/2016 | 7.9 | 8.1 | 8.0 | 4 | 1 | 2 | 10/8/2016 | 2 | 3 |
| 17/8/2016 | 0.06 | 0.06 | 17/8/2016 | 8.0 | 8.0 | 7.9 | 1 | 1 | 5 | 17/8/2016 | 1 | 2 |
| 24/8/2016 | 0.06 | 0.07 | 24/8/2016 | 8.0 | 8.2 | 8.1 | 1 | 2 | 4 | 24/8/2016 | 3 | 2 |
| 31/8/2016 | 0.06 | 0.06 | 31/8/2016 | 7.8 | 8.0 | 8.0 | 2 | 4 | 5 | 31/8/2016 | 8 | 2 |
| 7/9/2016 | 0.06 | 0.06 | 7/9/2016 | 7.9 | 8.0 | 7.8 | 3 | 2 | 1 | 7/9/2016 | 2 | 1 |
| 14/9/2016 | 0.06 | 0.06 | 14/9/2016 | 8.1 | 8.1 | 8.2 | 2 | 2 | 4 | 14/9/2016 | 1 | 1 |
| 20/9/2016 | 0.06 | 0.06 | 20/9/2016 | 7.6 | 7.8 | 7.8 | 1 | 4 | 2 | 20/9/2016 | 1 | 1 |
| 28/9/2016 | 0.06 | 0.06 | 28/9/2016 | 8.0 | 8.1 | 8.0 | 2 | 1 | 1 | 28/9/2016 | 1 | 2 |

| Date | Ammoniacal nitrogen (mg/l) | | | pH | | | suspended solids (mg/l) | | | Biochemical Oxygen Demand (BOD) (mg/l) | | |
|------------|----------------------------|--------------|-------------------|--------------|--------------|-------------------|-------------------------|--------------|-------------------|--|--------------|-------------------|
| | LTP Influent | LTP effluent | Adt Consent Point | LTP Influent | LTP effluent | Adt Consent Point | LTP Influent | LTP effluent | Adt Consent Point | LTP Influent | LTP effluent | Adt Consent Point |
| | | | | | | | | | | | | |
| Date | LTP Influent | LTP effluent | Adt Consent Point | LTP Influent | LTP effluent | Adt Consent Point | LTP Influent | LTP effluent | Adt Consent Point | LTP Influent | LTP effluent | Adt Consent Point |
| 4/10/2016 | 0.06 | 0.06 | 0.06 | 7.8 | 8.0 | 8.0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11/10/2016 | 0.06 | 0.06 | 0.06 | 7.7 | 7.9 | 7.9 | 3 | 1 | 2 | 1 | 1 | 1 |
| 18/10/2016 | 0.06 | 0.06 | 0.06 | 7.9 | 7.9 | 7.8 | 1 | 2 | 2 | 1 | 1 | 1 |
| 26/10/2016 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 8.0 | 4 | 1 | 3 | 1 | 1 | 1 |
| 3/11/2016 | 0.06 | 0.06 | 0.06 | 7.4 | 7.6 | 7.7 | 4 | 2 | 2 | 1 | 1 | 1 |
| 9/11/2016 | 0.06 | 0.06 | 0.06 | 7.5 | 7.7 | 7.8 | 1 | 1 | 1 | 1 | 1 | 1 |
| 16/11/2016 | 0.06 | 0.06 | 0.06 | 7.2 | 7.7 | 7.5 | 1 | 1 | 4 | 1 | 1 | 1 |
| 23/11/2016 | 0.07 | 0.06 | 0.06 | 7.2 | 7.6 | 7.5 | 4 | 3 | 3 | 1 | 1 | 1 |
| 29/11/2016 | 0.06 | 0.06 | 0.06 | 7.7 | 8.0 | 7.8 | 1 | 2 | 1 | 1 | 1 | 1 |
| 6/12/2016 | 0.06 | 0.06 | 0.06 | 7.5 | 7.8 | 7.6 | 2 | 1 | 1 | 1 | 1 | 1 |
| 13/12/2016 | 0.06 | 0.06 | 0.06 | 7.6 | 7.9 | 7.7 | 1 | 1 | 10 | 2 | 7 | 1 |
| 20/12/2016 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 7.9 | 2 | 2 | 5 | 1 | 1 | 1 |
| 27/12/2016 | 0.06 | 0.06 | 0.06 | 8.0 | 8.0 | 8.0 | 1 | 4 | 4 | 1 | 1 | 1 |
| 3/1/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 2 | 2 | 4 | 1 | 1 | 1 |
| 10/1/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.5 | 7.9 | 1 | 3 | 2 | 1 | 1 | 1 |
| 17/1/2017 | 0.06 | 0.06 | 0.06 | 7.7 | 7.9 | 7.8 | 2 | 2 | 2 | 1 | 1 | 1 |
| 24/1/2017 | 0.06 | 0.06 | 0.06 | 7.3 | 7.6 | 7.5 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31/1/2017 | 0.06 | 0.06 | 0.06 | 7.7 | 7.7 | 7.5 | 2 | 2 | 4 | 1 | 1 | 1 |
| 7/2/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.8 | 7.9 | 3 | 1 | 4 | 2 | 1 | 1 |
| 14/2/2017 | 0.06 | 0.06 | 0.06 | 7.5 | 7.8 | 7.9 | 2 | 2 | 2 | 2 | 1 | 1 |
| 21/2/2017 | 0.06 | 0.06 | 0.06 | 8.2 | 7.8 | 7.6 | 2 | 2 | 1 | 1 | 1 | 1 |
| 28/2/2017 | 0.06 | 0.06 | 0.06 | 7.7 | 7.9 | 7.9 | 3 | 1 | 6 | 1 | 1 | 1 |
| 5/3/2017 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 8.0 | 1 | 1 | 4 | 1 | 1 | 1 |
| 12/3/2017 | 0.06 | 0.06 | 0.06 | 8.0 | 8.1 | 8.0 | 3 | 1 | 1 | 1 | 1 | 1 |
| 19/3/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 26/3/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 2/4/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 9/4/2017 | 0.06 | 0.06 | 0.06 | 8.0 | 8.0 | 8.0 | 3 | 1 | 4 | 1 | 1 | 1 |
| 16/4/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 23/4/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 30/4/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 7/5/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 14/5/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 21/5/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 28/5/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 4/6/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 11/6/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 18/6/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 25/6/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 2/7/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 9/7/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 16/7/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 23/7/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 30/7/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 6/8/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 13/8/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 20/8/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 27/8/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 3/9/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 10/9/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 17/9/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 24/9/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 1/10/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 8/10/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 15/10/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 22/10/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 29/10/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 5/11/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 12/11/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 19/11/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 26/11/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 3/12/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 10/12/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 17/12/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |
| 24/12/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 3 | 1 | 4 | 1 | 1 | 1 |

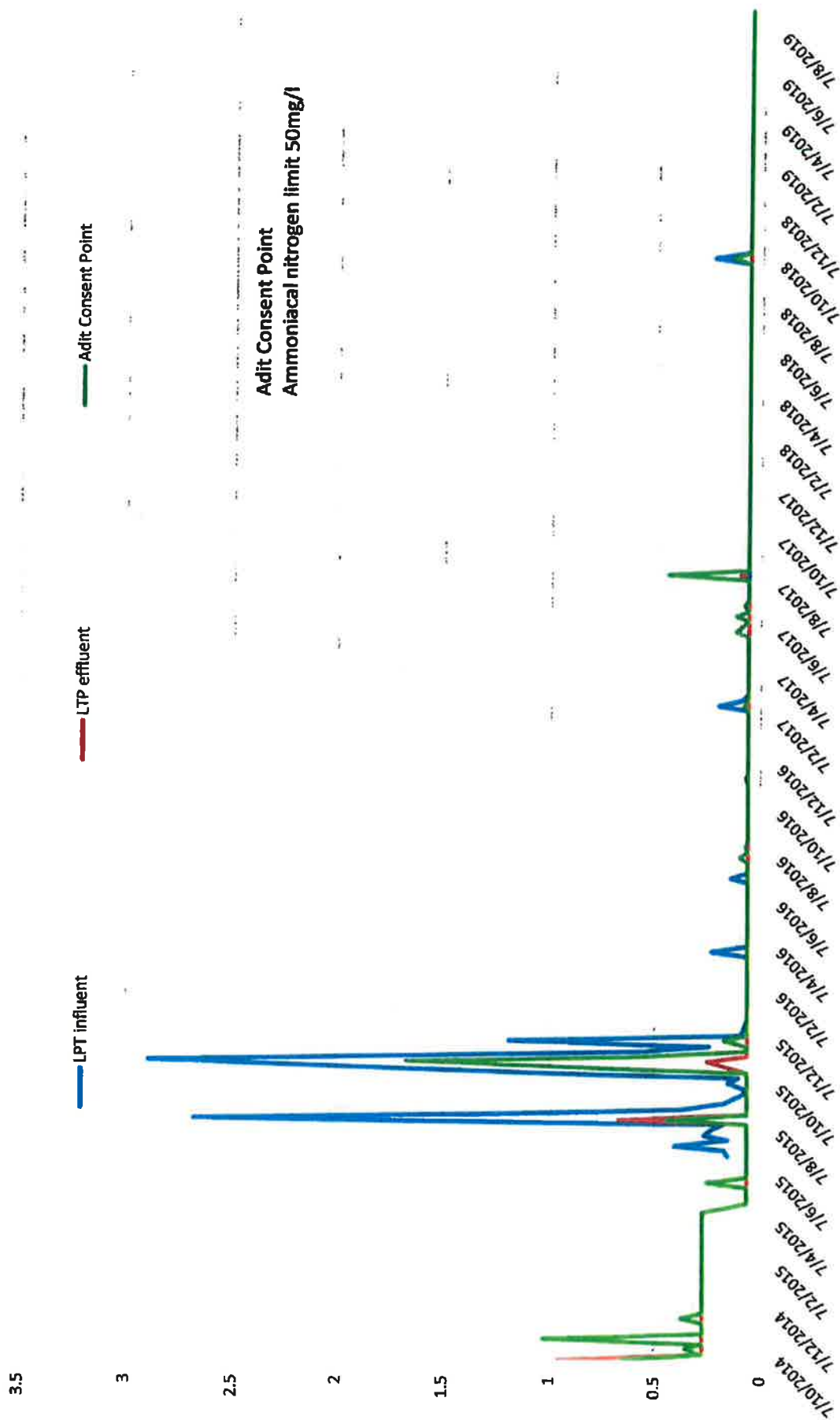
| Date | Ammoniacal nitrogen (mg/l) | | | pH | | | suspended solids (mg/l) | | | Biochemical Oxygen Demand (BOD) (mg/l) | | | | |
|------------|----------------------------|--------------|--------------------|--------------|--------------|--------------------|-------------------------|--------------|--------------------|--|--------------|--------------------|---|---|
| | limit 50mg/l | | Adit Consent Point | limit 6- 9 | | Adit Consent Point | limit 60 mg/l | | Adit Consent Point | 40 mg/l | | | | |
| | LPT Influent | LTP effluent | | LPT Influent | LTP effluent | | LPT Influent | LTP effluent | | LPT Influent | LTP effluent | Adit Consent Point | | |
| 31/10/2017 | 0.06 | 0.06 | 0.06 | 7.6 | 7.7 | 7.7 | 31/10/2017 | 1 | 1 | 1 | 31/10/2017 | 1 | 2 | 2 |
| 14/11/2017 | 0.06 | 0.06 | 0.06 | 7.6 | 7.8 | 7.9 | 14/11/2017 | 1 | 1 | 1 | 14/11/2017 | 2 | 1 | 1 |
| 22/11/2017 | 0.06 | 0.06 | 0.06 | 7.3 | 7.6 | 7.6 | 22/11/2017 | 2 | 1 | 2 | 22/11/2017 | 1 | 1 | 1 |
| 29/11/2017 | 0.06 | 0.06 | 0.06 | 7.3 | 7.7 | 7.7 | 29/11/2017 | 3 | 1 | 6 | 29/11/2017 | 1 | 1 | 1 |
| 6/12/2017 | 0.06 | 0.06 | 0.06 | 7.5 | 7.7 | 7.6 | 6/12/2017 | 3 | 1 | 2 | 6/12/2017 | 1 | 1 | 1 |
| 13/12/2017 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.8 | 13/12/2017 | 2 | 2 | 2 | 13/12/2017 | 1 | 1 | 1 |
| 20/12/2017 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 20/12/2017 | 1 | 1 | 1 | 20/12/2017 | 1 | 1 | 1 |
| 4/1/2018 | 0.06 | 0.06 | 0.06 | 7.5 | 7.7 | 7.7 | 4/1/2018 | 4 | 1 | 4 | 4/1/2018 | 1 | 1 | 1 |
| 10/1/2018 | 0.06 | 0.06 | 0.06 | 7.6 | 7.7 | 7.7 | 10/1/2018 | 2 | 5 | 4 | 10/1/2018 | 1 | 1 | 1 |
| 16/1/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 7.7 | 8.4 | 16/1/2018 | 1 | 1 | 1 | 16/1/2018 | 1 | 1 | 1 |
| 23/1/2018 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.5 | 23/1/2018 | 1 | 2 | 2 | 23/1/2018 | 1 | 1 | 1 |
| 15/2/2018 | 0.06 | 0.06 | 0.06 | 7.5 | 7.4 | 7.5 | 15/2/2018 | 4 | 6 | 3 | 15/2/2018 | 1 | 1 | 1 |
| 7/3/2018 | 0.06 | 0.06 | 0.06 | 7.7 | 7.4 | 7.7 | 7/3/2018 | 2 | 2 | 2 | 7/3/2018 | 1 | 1 | 1 |
| 21/3/2018 | 0.06 | 0.06 | 0.06 | 8.0 | 7.9 | 7.9 | 21/3/2018 | 1 | 1 | 4 | 21/3/2018 | 1 | 1 | 1 |
| 11/4/2018 | 0.06 | 0.06 | 0.06 | 7.6 | 7.8 | 8.3 | 11/4/2018 | 2 | 2 | 4 | 11/4/2018 | 2 | 1 | 1 |
| 17/4/2018 | 0.06 | 0.06 | 0.06 | 7.8 | 7.7 | 7.8 | 17/4/2018 | 2 | 1 | 7 | 17/4/2018 | 1 | 1 | 1 |
| 24/4/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 7.8 | 24/4/2018 | 2 | 2 | 5 | 24/4/2018 | 1 | 1 | 1 |
| 1/5/2018 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.6 | 1/5/2018 | 1 | 2 | 3 | 1/5/2018 | 1 | 1 | 1 |
| 8/5/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 8.0 | 8/5/2018 | 1 | 2 | 1 | 8/5/2018 | 1 | 1 | 1 |
| 16/5/2018 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.8 | 16/5/2018 | 2 | 1 | 22 | 16/5/2018 | 1 | 1 | 1 |
| 23/5/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 7.7 | 7.8 | 23/5/2018 | 2 | 2 | 1 | 23/5/2018 | 1 | 1 | 1 |
| 29/5/2018 | 0.06 | 0.06 | 0.06 | 8.0 | 8.0 | 8.0 | 29/5/2018 | 2 | 2 | 3 | 29/5/2018 | 1 | 2 | 1 |
| 5/6/2018 | 0.06 | 0.06 | 0.06 | 7.8 | 8.0 | 8.0 | 5/6/2018 | 1 | 2 | 1 | 5/6/2018 | 5 | 1 | 2 |
| 12/6/2018 | 0.06 | 0.06 | 0.06 | 8.0 | 8.1 | 8.0 | 12/6/2018 | 1 | 4 | 8 | 12/6/2018 | 1 | 1 | 3 |
| 27/6/2018 | 0.06 | 0.06 | 0.06 | 8.1 | 7.9 | 7.9 | 27/6/2018 | 2 | 1 | 2 | 27/6/2018 | 1 | 1 | 4 |
| 18/7/2018 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.9 | 18/7/2018 | 1 | 1 | 2 | 18/7/2018 | - | 2 | 2 |
| 24/7/2018 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.8 | 24/7/2018 | 1 | 1 | 10 | 24/7/2018 | 1 | 1 | 1 |
| 31/7/2018 | 0.06 | 0.06 | 0.06 | 8.0 | 8.1 | 8.1 | 31/7/2018 | 1 | 1 | 12 | 31/7/2018 | 1 | 1 | 1 |
| 8/8/2018 | 0.06 | 0.06 | 0.06 | 7.8 | 7.9 | 7.9 | 8/8/2018 | 1 | 1 | 49 | 8/8/2018 | 3 | 1 | 1 |
| 15/8/2018 | 0.06 | 0.06 | 0.06 | 7.6 | 7.7 | 7.7 | 15/8/2018 | 1 | 1 | 24 | 15/8/2018 | 1 | 1 | 1 |
| 21/8/2018 | 0.06 | 0.06 | 0.06 | 7.8 | 8.0 | 7.8 | 21/8/2018 | 2 | 2 | 5 | 21/8/2018 | 2 | 3 | 2 |
| 29/8/2018 | 0.06 | 0.06 | 0.06 | 8.1 | 8.1 | 7.5 | 29/8/2018 | 1 | 1 | 43 | 29/8/2018 | 1 | 1 | 1 |
| 4/9/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 8.1 | 4/9/2018 | 6 | 1 | 32 | 4/9/2018 | 1 | 1 | 1 |
| 12/9/2018 | 0.06 | 0.06 | 0.06 | 8.1 | 7.9 | 8.0 | 12/9/2018 | 2 | 7 | 12 | 12/9/2018 | 1 | 1 | 1 |
| 2/10/2018 | 0.06 | 0.06 | 0.06 | 7.8 | 7.5 | 8.0 | 2/10/2018 | 2 | 14 | 6 | 2/10/2018 | 2 | 2 | 2 |
| 9/10/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 8.6 | 8.1 | 9/10/2018 | 4 | 8 | 1 | 9/10/2018 | 2 | 1 | 1 |
| 16/10/2018 | 0.23 | 0.06 | 0.14 | 7.5 | 7.6 | 7.5 | 16/10/2018 | 1 | 2 | 1 | 16/10/2018 | 1 | 1 | 1 |
| 24/10/2018 | 0.06 | 0.06 | 0.06 | 7.8 | 7.7 | 8.0 | 24/10/2018 | 1 | 14 | 1 | 24/10/2018 | 1 | 1 | 1 |
| 31/10/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 7.7 | 7.8 | 31/10/2018 | 2 | 1 | 2 | 31/10/2018 | 1 | 1 | 1 |
| 7/11/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 7.8 | 7/11/2018 | 2 | 1 | 2 | 7/11/2018 | 1 | 1 | 1 |
| 14/11/2018 | 0.06 | 0.06 | 0.06 | 7.5 | 7.7 | 7.8 | 14/11/2018 | 1 | 2 | 1 | 14/11/2018 | 1 | 1 | 1 |
| 11/12/2018 | 0.06 | 0.06 | 0.06 | 7.9 | 8.0 | 7.9 | 11/12/2018 | 1 | 2 | 6 | 11/12/2018 | 1 | 1 | 1 |
| 5/3/2019 | 0.06 | 0.06 | 0.06 | 7.6 | 7.5 | 7.7 | 5/3/2019 | 1 | 2 | 2 | 5/3/2019 | 1 | 1 | 1 |
| 11/6/2019 | 0.06 | 0.06 | 0.06 | 7.3 | 7.3 | 7.6 | 11/6/2019 | 2 | 1 | 3 | 11/6/2019 | 1 | 1 | 1 |
| 10/9/2019 | 0.06 | 0.06 | 0.06 | 7.7 | 7.8 | 7.8 | 10/9/2019 | 1 | 2 | 1 | 10/9/2019 | 1 | 1 | 1 |

| Date | Ammoniacal nitrogen (mg/l) | | | Date | pH | | | Date | suspended solids (mg/l) | | | Date | Biochemical Oxygen Demand (BOD) (mg/l) | | | | | |
|----------------------|----------------------------|--------------|--------------------|------|--------------|--------------|--------------|------|-------------------------|------------|--------------|------|--|--------------------|---------------|--------------|--------------|--------------------|
| | LPT influent | LTP effluent | Adit Consent Point | | limit 50mg/l | LPT influent | LTP effluent | | Adit Consent Point | limit 6- 9 | LPT influent | | LTP effluent | Adit Consent Point | limit 60 mg/l | LPT influent | LTP effluent | Adit Consent Point |
| | | | | | | | | | | | | | | | | | | |
| min max number | 0.06 | 0.06 | 0.06 | | 4.8 | 7.2 | 7.1 | | 1 | 1 | 1 | | 1 | 1 | 1 | | | |
| | 2.89 | 0.96 | 1.67 | | 9 | 8.6 | 8.8 | | 11 | 14 | 49 | | 8 | 7 | 12 | | | |
| | 149 | 186 | 186 | | 149 | 186 | 186 | | 149 | 186 | 186 | | 148 | 186 | 185 | | | |

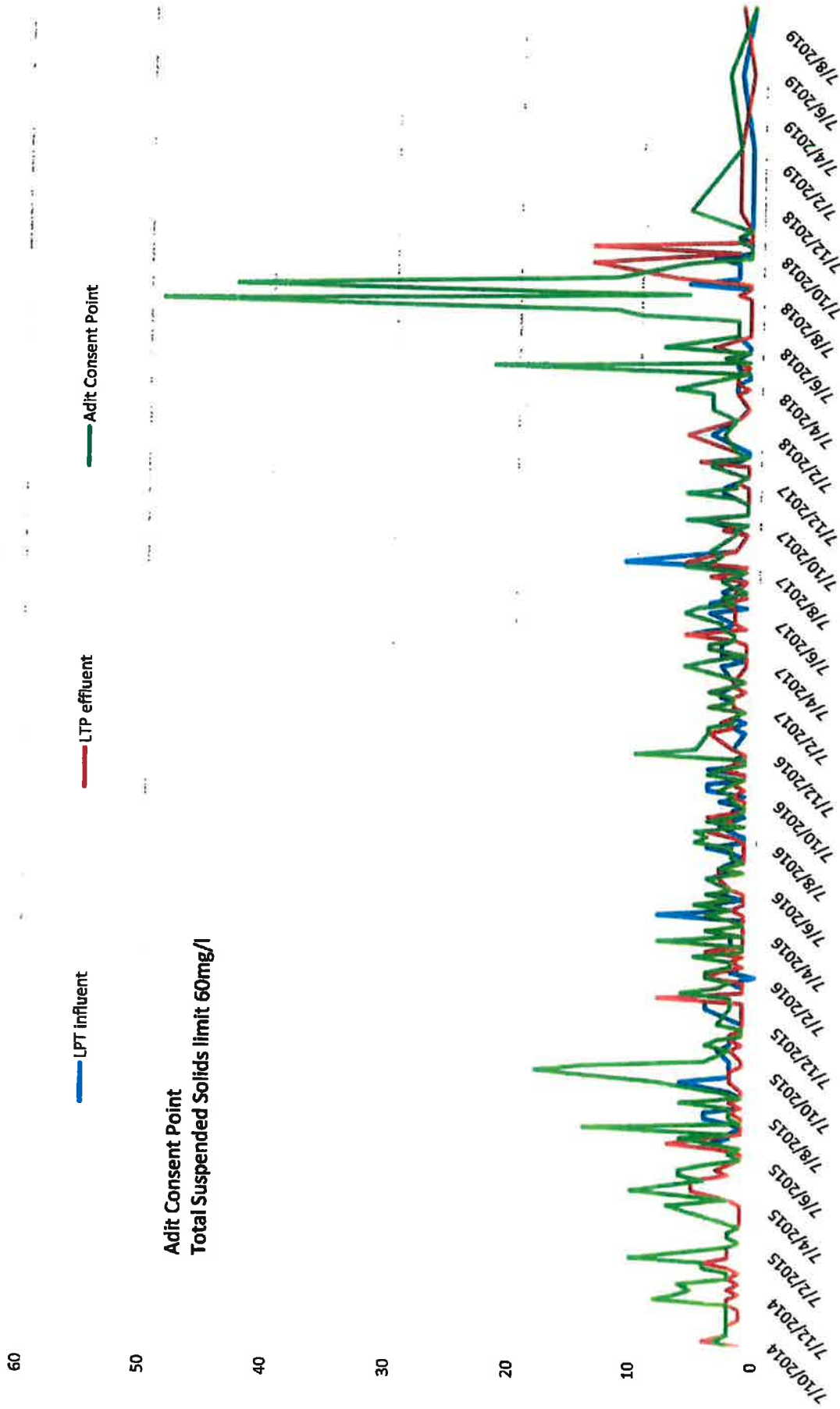
pH



Ammoniacal nitrogen (mg/l)



Total Suspended Solids (mg/l)



Biochemical Oxygen Demand (mg/l)

14

12

10

8

6

4

2

0

— LPT influent — LPT effluent — Adit Consent Point

Adit Discharge Point

Biochemical Oxygen Demand limit 40 mg/l

