

## Permitting Decisions- Variation

---

We have decided to grant the variation for Chelson Meadow Leachate Treatment Plant operated by Plymouth City Council.

The variation number is EPR/CP3731LZ/V005.

The permit was issued on 17/03/2026.

The variation is for authorising the following changes to the permit:

- The amount of leachate that can be accepted for treatment by the LTP has increased from 650,000 to 850,000 tonnes per annum.
- The Water Discharge Activity (WDA) environmental permit SWWA 289 has been consolidated into the Installation Permit EPR/CP3731LZ.
- The permit has formalised the discharging of treated effluent at any state of tide, only during periods of peak leachate production, a scenario referred to as the 'Emergency mode'. Discharging at any state of tide was initially incorporated into the permit in 2011, but no limits were set in Table 1.1 of the permit.
- An improvement condition has been included in Table S1.3, requiring the installation of replacement aeration blowers, which service the treatment tanks at the installation, and introduce further assessments on the surface water discharge.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

### Purpose of this document

This decision document provides a record of the decision-making process. It:

- highlights [key issues](#) in the determination
- summarises the decision making process in the [decision considerations](#) section to show how the main relevant factors have been taken into account
- shows how we have considered the [consultation responses](#)

Unless the decision document specifies otherwise, we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

# Key issues of the decision

## Permit History

A landfill leachate treatment plant (LTP) was constructed in 1996. Leachate is treated biologically by bacteria in one of four sequential batch reactors (SBR).

The LTP began operating under an independent environmental permit from 2007 onwards. The permit restricted the volume of discharge to 488,000 tonnes per annum.

In 2011 a permit variation allowed provision for the discharge of treated effluent, at any state of tide, at times of peak leachate production. This meant that whilst normal discharges would occur in 4-hour window, after 2 high tides per day, there would be allowance to discharge at any tidal state during peak leachate production, attributed to high rainfall. The discharge limit in the permit was also increased to 650,000 tonnes per annum.

Since the increase in discharge limit to 650,000 tonnes in 2011, the site has frequently exceeded this limit, with an average of 655,668 tonnes per annum since 2012, and an average of 675, 542 in the last 5 years. The highest level in discharge was 791,268 in 2023. See Table 1 below. These exceedances of the throughput limit have been attributed by the Operator to increased rainfall.

**Table 1: Historic discharge volume**

Year	Tonnes/m <sup>3</sup> treated and discharged
2025	653,703
2024	736,067
2023	791,268
2022	526,262
2021	670,291
2020	701,130
2019	684,548
2018	632,276
2017	569,110
2016	593,404
2015	608,117
2014	707,759
2013	578,535
2012	771,290

In 2014 the Environment Agency reviewed the permit in accordance with the Industrial Emissions Directive. And in 2017 the Environment Agency reviewed the permit as part of a landfill sector review.

In March 2022 the Operator submitted this variation proposing to increase the throughput treatment capacity limit to 850,000 tonnes per annum. This is not a planned increase in throughput, but to allow for the weather related naturally occurring variance in throughput, which averaged 675,542 in the last 5 years.

### **Surface Water Discharge**

The LTP discharge is located approximately 370 m upstream of Laira Bridge and consists of a single 0.4 m diameter pipeline that discharges treated leachate to the estuary 60 m from the eastern river bank. The discharge is located at approximate National Grid Reference (NGR) SX 50435 54466.

The Operator has carried out a surface water pollution risk assessment to demonstrate that the increased maximum discharge of 850,000 tonnes per annum does not cause significant pollution.

### **Screening Assessment**

In accordance with our guidance: *Surface water pollution risk assessment for your environmental permit*, the Operator had to evaluate and assess any hazardous chemicals and elements they release into surface water. They then must carry out screening tests on the pollutants to check if they're a risk to the environment. This is called a specific substances assessment.

The screening must compare the measurements of pollutants from the proposed discharge to the following:

- environmental quality standards (EQS) maximum allowable concentrations (MAC) - to evaluate the short-term environmental impacts that your emissions can cause.
- environmental quality standards (EQS) annual average (AA) - to evaluate the long-term environmental impacts that your emissions can cause.

For the tests, metals have been assessed using both total and dissolved metal data. This will give a fairer assessment of the impact on receiving water quality, as not all total metals will exist in the dissolved form (most metal EQSs are for dissolved metals).

In modelling, the risk to EQS is assessed using total metal data. Although this may still be precautionary, this ensures that the EQS will be met downstream (as it is rarely possible to predict how much total metal will partition to the dissolved phase in the receiving environment with time) and also controls the total load discharged to the catchment.

## Test 1

The Operator provided an initial assessment to check whether the level of pollutants in the discharge is more than the EQS limits. The results for both the annual average limits and maximum allowable concentration are shown in Table 2 and 3 below.

**Table 2: Assessment of annual average levels in the discharge, against environmental quality standards (EQS) annual average**

<b>Pollutants</b>	<b>environmental quality standards (EQS) annual average</b>	<b>annual average concentration (given as total levels)</b>
Iron (mg/l)	1.0 dissolved	5.95
Copper (µg/l)	3.76 dissolved	<1.51
Zinc (µg/l)	7.9 dissolved	<8.47
Lead (µg/l)	1.3 dissolved	<1.03
Cadmium (µg/l)	0.2 dissolved	<0.5
Chromium (µg/l)	0.6 dissolved	<3.01
Nickel (µg/l)	8.6 dissolved	7.87
Hexachlorocyclohexane (µg/l)	0.002	0.0036
Bentazone (µg/l)	500	0.07
Mecoprop (µg/l)	18	0.14
Dibutyl phthalate (µg/l)	8	4.1
Fluoride (µg/l)	5,000 dissolved	248
Boron (µg/l)	7,000	608
Vanadium (µg/l)	100	2.46
Cobalt (µg/l)	3 dissolved	2.63
Arsenic (µg/l)	25	6.8
Tin (µg/l)	10 dissolved	4.3
Un-ionised ammonia (mg/l)	0.021	<0.007
Dissolved Inorganic Nitrogen (micromoles/l)	70 micromoles/l	2,771

**Table 3: Assessment of maximum levels in the discharge, against environmental quality standards (EQS) maximum allowable concentrations (MAC)**

<b>Pollutants</b>	<b>environmental quality standards (EQS) annual average</b>	<b>maximum concentration (given as total levels)</b>
Lead (µg/l)	14.0 dissolved	1.37
Nickel (µg/l)	34.0 dissolved	10.4
Mercury (µg/l)	0.07 dissolved	0.2
Hexachlorocyclohexane (µg/l)	0.02	0.004
Mecoprop (µg/l)	187	0.21
Dibutyl phthalate (µg/l)	40	13.3
Fluoride (µg/l)	15,000 dissolved	300
Cobalt (µg/l)	100 dissolved	3

The following substances did not screen out as being lower than the relevant EQS, and required further assessment:

- Iron - annual average
- Zinc - annual average
- Cadmium - annual average
- Chromium - annual average
- Hexachlorocyclohexane - annual average
- Mercury - maximum
- Dissolved Inorganic Nitrogen

The remaining screening tests for estuaries and coastal waters could not be applied as the discharge is not to the low water channel and the outfall point is not offshore from where the estuary bed is at chart datum. Therefore, the Operator submitted simple modelling to assess the potential impact of the LTP discharge for the pollutants that didn't screen out in Test 1.

### **Simple Modelling**

The Operator submitted simple modelling (reference: 103026972-ARC-XX-XX-RP-DH-0001, dated 10/09/2024) to assess the potential impact of the LTP discharge.

Initial dilution (ID) for a buoyant discharge is the dilution afforded to it as it rises to the surface, and determines the concentration of substances at the surface above

the discharge. For example, if the ID is 10, then the concentration of pollutants at the surface would be reduced by a factor of 10.

The objective of ID modelling would be to check if the EQS is met after ID, taking into account the background concentrations. If it is met then the substance is not liable to cause pollution, and needs no further assessment.

The LTP discharge contained some parameters that could not be screened out in Test 1, therefore the Environment Agency modelling guidance was followed to assess the potential impact on the receiving waters.

The Environment Agency initial dilution spreadsheet tool was used to determine the degree of dilution that the LTP discharge would undergo at the outfall point when discharging at an average flow rate of 0.027m<sup>3</sup>/s. To define the water levels and velocities at the outfall point for a range of tidal conditions, the Environment Agency hydrodynamic flood model was run for typical spring and neap tidal conditions.

The predicted ID was estimated as a maximum of 12 and a minimum of 4. We concluded that whilst the remaining pollutants screened out using this simple modelling, the following substances required complex hydrodynamic modelling to provide further confidence:

- Iron - annual average
- Chromium - annual average
- Dissolved Inorganic Nitrogen

### **Complex Hydrodynamic Modelling**

A detailed dispersion modelling study was undertaken to determine the effects of the proposed increased LTP discharge volume on water quality in the receiving Plym Estuary. A detailed 2D hydrodynamic and dispersion model was constructed using Delft3D-FLOW Flexible Mesh modelling software.

The hydrodynamic model was used to drive the water quality model to assess the dispersion of substances contained within the LTP discharge.

The three substances assessed were Dissolved Inorganic Nitrogen (DIN), iron and chromium.

### **Precautionary approach**

The following approaches were taken in the modelling as a precautionary approach:

- The model was used to represent the impact of the LTP discharge when operating in both normal and emergency mode (at any tidal state).

- Measured LTP flow data over the period 2013 to 2024 was reviewed in order to determine appropriate worst case flow conditions to apply in the model for both normal and emergency mode scenarios. November 2022 was chosen as the total monthly discharge volume was one of the highest in the data recorded and covered spring and neap tidal conditions. It also included the highest recorded peak flow.
- The total level concentrations of iron and chromium were used for the modelling, whereas the relevant EQS are based on the dissolved levels.
- While assessing against annual average limits for iron and chromium, the modelling is showing how the annual average limits may be exceeded for limited periods, during shorter term, worst case scenarios for periods of emergency discharge.
- There was only one chromium result in the historical water quality dataset where the measurement was above the laboratory limit of detection. The chromium concentration applied in the model is therefore also considered a worst case scenario.

### **Dissolved Inorganic Nitrogen:**

The current Water Framework Directive (WFD) status of the Plym Estuary for DIN is 'Moderate'.

The modelling shows that in a realistic worst case scenario, both the 'normal' and 'emergency' scenarios, exceedances of WFD 'moderate' status occurred in the immediate proximity of the discharge point, but are rapidly diluted, though the distance in which dilution occurs differs depending on the tidal state.

This is the case for the worst case day, rather than the average condition for the year.

The concentration of DIN in the discharges is also expected to largely reduce during wet weather, emergency mode conditions. This is due to a larger volume of clean surface water from the wider Chelson Meadows site being processed through the leachate treatment plant during periods of wet weather.

We have determined that there would be no significant effect on statutory designated habitats, and it is unlikely that any migratory fish associated with the Dartmoor SAC would be impacted given the relatively small area where exceedances occur.

Increasing the annual throughput for the leachate treatment plant is not likely to change the moderate DIN status for the Plym Estuary.

### **Iron and Chromium:**

In emergency mode, during low water, neap tide, when there is minimum dilution, and during a short term, worst case scenario weather period, there is a very localised area in the vicinity of the LTP outfall where the iron and chromium annual

average EQS is exceeded. The plume is then pushed upstream with the incoming tide, with the area where the annual average EQS is exceeded extending upstream within the shallow nearshore area. See Figure 1 and 2 below. During the other stages of the tide, there is sufficient dilution that the LTP discharge is not predicted to result in EQS exceedances for iron. A similar situation, though with a slightly reduced area of impact, is predicted during spring tides.

It is concluded there would be no effect at all on statutory designated habitats, and it is unlikely that any migratory fish associated with the Dartmoor SAC would be impacted given the relatively small area where temporary exceedances occur.

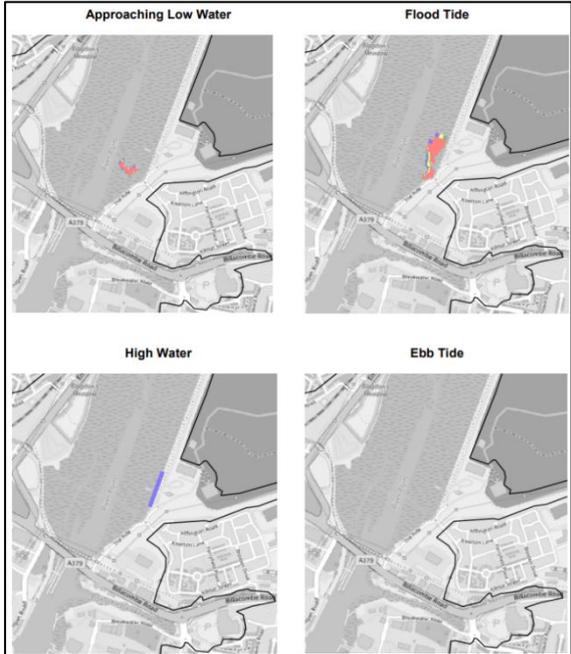


Figure 1: Spatial Map Plots for Iron During Emergency Mode (Neap Tide)

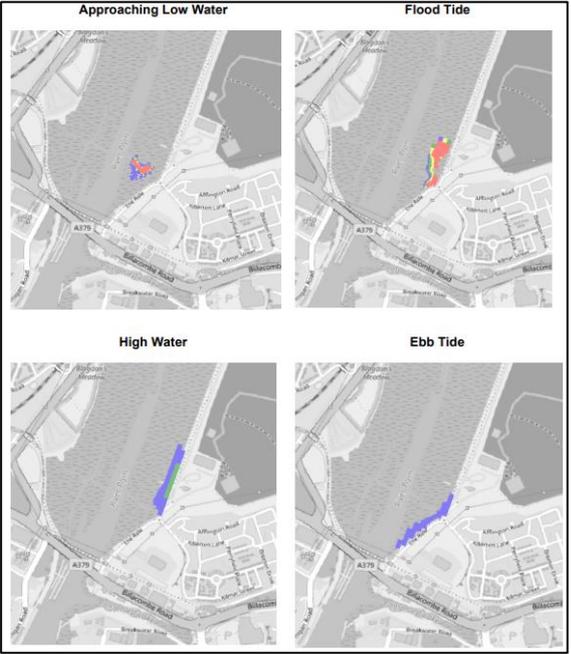


Figure 2: Spatial Map Plots for Chromium During Emergency Mode (Neap Tide)

**Conclusion**

We are satisfied that the modelling covers the worst case scenarios for operating under ‘emergency mode’, and is a conservative assessment using the total concentrations emitted over short term periods, against the annual average EQS limits for dissolved substances.

Whilst the annual total of leachate treatment is increased as a result of this variation, the annual average concentrations should not change, and there has not previously been limits with the permit on daily or monthly discharges to reduce the periods of peak emissions.

We have introduced a total daily volume of discharge limit into Table S3.1 of the permit. We have also introduced three Improvement Conditions into the permit to:

- Verify the assumptions made in this Application, using further monitoring.
- Review the leachate storage capacity to prevent or reduce the discharge of effluent during the 'emergency mode'.
- Carry out an assessment on the mudflat habitats, with Environment Agency approval.

## Decision considerations

### Confidential information

A claim for commercial or industrial confidentiality has not been made.

### Identifying confidential information

We have not identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on confidentiality.

### Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- The UK Health Security Agency (UKHSA) and the relevant Director of Public Health
- The Port Authority
- Plymouth City Council
- Devon & Severn Inshore Fisheries and Conservation Authority
- Centre for Environment, Fisheries and Aquaculture Science
- Food Standards Agency

The comments and our responses are summarised in the [consultation responses](#) section.

### The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2

'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1'.

## **The site**

The operator has provided a plan which we consider to be satisfactory. The plan is included in the permit.

## **Nature conservation, landscape, heritage and protected species and habitat designations**

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England. The decision was taken in accordance with our guidance.

## **Environmental risk**

We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory.

## **General operating techniques**

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

## **Noise and vibration management**

We have reviewed the noise and vibration management plan in accordance with our guidance on noise assessment and control.

We consider that the noise and vibration management plan is satisfactory and we approve this plan.

We have approved the noise and vibration management plan as we consider it to be appropriate measures based on information available to us at the current time. The applicant should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The applicant should keep the plans under constant review and revise them annually or if necessary sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

## **Updating permit conditions during consolidation**

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permits.

## **Improvement programme**

Based on the information on the application, we consider that we need to include an improvement programme.

We have included an improvement programme to ensure that:

- The Operator replaces the aeration blowers, in accordance with the Noise Impact Assessment.
- The Operator verifies the assumptions made in the surface water discharge modelling.
- The Operator submits to the Environment Agency for approval a review of the leachate storage capacity.
- The Operator submits a written plan to the Environment Agency for approval, for the assessment of impacts of the surface water discharge on the mudflat habitats.

## **Emission limits**

We have included a limit on the volume of the discharge, to total daily volume of discharge of 7,105 m<sup>3</sup>/day. This is based on the modelled worst case scenario for emergency mode.

## **Monitoring**

We have decided that monitoring should be added for the total daily volume of discharge.

## **Growth duty**

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit variation.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

## **Consultation Responses**

The following summarises the responses to consultation with other organisations, and the way in which we have considered these in the determination process.

### **Responses from organisations listed in the consultation section**

Response received from UK Health Security Agency, dated 16/11/2023

Brief summary of issues raised: Odour emissions

Summary of actions taken: We are satisfied that the variation will have no significant impact on the emissions of odour.

Response received from Devon & Severn Inshore Fisheries and Conservation Authority, dated 22/11/2023

Brief summary of issues raised: Several issues raised over the surface water discharge including:

- Questions whether the site has a sufficient treatment process capacity.
- Concerns regarding the accumulation of metals, heavy metals and other determinands into the mudflats around the discharge point.
- Would like to understand what control measures will be in place to assess and reduce the risk of toxicity effects on migratory fish and overwintering birds.

Summary of actions taken:

Please see the key issues section of this decision document for how we have considered the potential impact of the increased annual discharge against the Environmental Quality Standards (EQS).

EQSs for surface waters are regulatory thresholds which intend to protect surface water ecosystems. We need to assess and regulate discharges using these thresholds to make sure the surface water environment is protected.

This variation will not change when the discharges can occur as discharging at any state of tide was initially incorporated into the permit in 2011. The annual average for pollutants will also not increase as a result of this variation.

We have introduced limits to have a maximum daily discharge in the permit.

We have also introduced 3 improvement conditions which are to ensure:

- The Operator verifies the assumptions made in the surface water discharge modelling.
- The Operator submits to the Environment Agency for approval a review of the leachate storage capacity. The review shall examine site arrangements for leachate storage during extreme weather conditions, and written proposals, including a timetable, for measures to prevent or reduce discharge of effluent during the emergency.
- The Operator submits a written plan to the Environment Agency for approval, for the assessment of impacts of the surface water discharge on the mudflat habitats.