

CRoW Act 2000: Natural Resources Wales application for permission - Formal Notice

Natural Resources Wales Formal Notice.

Requirements of Section 28I of the Wildlife & Countryside Act 1981 as amended by the Countryside and Rights of Way Act (CRoW) 2000.

Duty in relation to granting any consent, licence or permit for activities likely to damage Sites of Special Scientific Interest (SSSI).

Guide to filling in this form for Natural Resources Wales staff:

To be completed by Permitting Officers for any applications for a permission which the Natural Resources Wales has considered under S28G duties to protect and enhance SSSIs. This applies to all proposed permissions within a SSSI, and to operations outside the SSSI boundary which are likely to damage its special features.

Refer to OI 140_10 'Applying the Countryside and Rights of Way (CRoW) Act 2000 to applications for permits with potential for impact on Sites of Special Scientific Interest (SSSI)', including the flowchart in Appendix 2.

Pink italic text – drafting notes, to be deleted before completion/consultation.

Blue text – examples, to be replaced with permission-specific information.

Ensure you have completed all sections.

1. Natural Resources Wales area/region/NPS hub:	Carmarthenshire Environment Team
2. Name of SSSI:	SSSI Afon Teifi 32WLU SSSI Old Cilgwyn and Cae Heslop 32 WGK
3. Type of permission:	Environmental Permit Application – normal variation to existing EPR permit (EPR/WP3231NB). Normal variation to upgrade the effluent treatment plant.
4. Date for Natural Resources Wales permit determination:	03/02/2022
5. Predicted 28 day date for response from NRW conservation/ecology (under S28 I(4)):	N/A – filed for audit
6. Natural Resources Wales reference no:	PAN-017188 Application documents on DMS

7. National grid reference:

Installation central NGR: SN 31541 40205

Water discharge location: NGR: SN 31356 40462



8. Description of proposal:

This is a normal variation application to an existing EPR permit (EPR/WP3231NB) for The Creamery, Aberarad, Newcastle Emlyn, Carmarthenshire, SA38 9DQ operated by Dairy Partners (Cymru Wales) Limited. The variation is to upgrade and replace their existing effluent treatment plant (ETP) at the installation with a new effluent treatment plant. All process and cleaning waters are treated in the ETP and process effluent introduced into the ETP has not changed in composition or volume as part of this variation. Treated effluent is discharged via a pipeline from the installation to the Afon Teifi / River Teifi, the discharge point and monitoring points have not changed as part of this variation and the maximum permitted discharge volume is decreasing from 1050 m³/day to 900 m³/day. The treatment process has changed as part of this variation although the EPR Schedule 5.4 activity remains the same as biological treatment of non-hazardous waste. A number of new parameters and limits will be added to the permit reflected by the change in the composition of the treated effluent, in addition a number of existing limits on the permit will be reduced.

Current parameters and limits on the existing EPR permit:

Maximum daily discharge volume: 1050 m³/day
Ammonia as N: 22 mg/L
Nitrite as N: 3 mg/L
Mercury: 0.5 µg/L
Cadmium: 0.01 mg/L
Chemical oxygen demand (COD): 120 mg/L
Total suspended solids: 50 mg/L
Temperature: 21 °C

Proposed parameters and limits following the variation:

Maximum daily discharge volume: 900 m³/day
Ammonia as N: 10 mg/L
Nitrite as N: 1.0 mg/L
Mercury: 0.5 µg/L
Cadmium: 0.525 µg/L
Chemical oxygen demand (COD): 110 mg/L
Total suspended solids (TSS): 30 mg/L
Temperature: 21 °C
pH: minimum 6 - maximum 9
Total phosphate as P: 1.0 mg/L
Aluminium: 1.0 mg/L
Total nitrogen as N: 20 mg/L
Biological oxygen demand (BOD): 20 mg/L

The only emission changing as part of this variation is:

Emission to surface water from discharge of treated effluent into River Teifi. There are no emissions to sewer or to ground of process effluent. There are no other changes to emissions from the permitted installation.

As the treatment process is changing the composition of the treated effluent has changed a complete Water Framework Directive (WFD) assessment has been completed on the new composition (see here: [PAN-01788 WFD Compliance Assessment](#)). This assessment has concluded that there no potential to cause deterioration of any water body or prevent a water body or WFD Protected Area from meeting its objectives.

Note that a variation application for this proposal was previously submitted and was subsequently refused on 28/06/2021 (application reference PAN-010733). Refusal reasons were primarily related to the ETP's containment measures and assessment of odour, please see [PAN-010733 Dairy Partners Refusal Decision Document.pdf](#) for more information). An Appendix 4 at that time was undertaken. This concluded the proposal was not likely to damage any of the flora, fauna or geological or physiological features which are of special interest. See previous assessment here: [PAN-010733 Dairy Partners CRoW Act Appendix 4 Form](#).

The applicant is now re-applying for the variation. There are no changes to the proposed ETP process, discharge rate or the composition of the treated effluent.

<p>9. Is the proposed activity within (wholly or partially) the SSSI boundary?</p>	<p>NO</p>
<p>10. Has there been any pre-application discussion or correspondence with NRW conservation/ecology</p>	<p>NO</p>
<p>11. What aspect(s) of the proposed permission may damage the features which are of special interest for the SSSI?</p> <p>The following 'Operations Requiring Consent' (or other activities associated with the permission) that may cause damage) are relevant to the proposed permission.</p> <p>1. Water emissions to River Teifi of treated process effluent. Toxic contamination from aluminium, mercury, cadmium and dosing chemicals. Nutrient enrichment (ammonia, BOD and phosphorus). Acidification. Changes in thermal regime. Turbidity and siltation (suspended solids).</p> <p>The following SSSI features, and mechanisms of impact have been considered to assess the likelihood of damage:</p> <p>This form has been completed using the following documents as reference:</p> <ul style="list-style-type: none"> • Afon Teifi Site of Special Scientific Interest Your Special Site and Its Future • Old Cilgwyn and Cae Heslop Site of Special Scientific Interest Your Special Site and Its Future <p>SSSI Features:</p> <p>Afon Teifi SSSI Special Features</p> <ul style="list-style-type: none"> • A range of river plant communities including those characterised by water crowfoot • Associated riverside habitats, including marshy grassland, swamp, saltmarsh and broadleaved woodland • Nutrient-poor, mildly acidic upland lakes (Teifi Pools) • Fish, including Atlantic salmon, bullhead and three species of lamprey • Otters • A range of unusual flowering plants and mosses, including floating water-plantain, northern yellow-cress and multi-fruited river moss • A range of rare and scarce insects and other invertebrates, including club-tailed dragonfly and freshwater pearl mussel • Breeding river and wetland birds • Bottle-nosed dolphins (lower estuary) • Fluvial landform assemblage at Cenarth Gorge • Fluvial landform assemblage at Cors Caron <p>Old Cilgwyn and Cae Heslop SSSI Special Features</p> <ul style="list-style-type: none"> • Species-rich neutral grassland • The Hornet Robberfly • Invertebrate Assemblages <p>Mechanisms of Impact: Water emissions only</p> <p>Toxic Contamination –Water emissions: direct and indirect impacts from addition of pollutants into river due to surface water discharge.</p> <p>Nutrient enrichment –Water emissions: addition of nutrients (nitrogen and phosphorus) due to surface water discharge and dissolved oxygen.</p> <p>Acidification –Water emissions: acidification of receiving watercourse.</p> <p>Changes in thermal regime – Water emissions: changes in temperature due to surface water discharge.</p> <p>Siltation – Water emissions: deposit of suspended solids due to surface water discharge.</p> <p>Turbidity – Water emissions: release of suspended solids due to surface water discharge.</p> <p>Failure of the Effluent Treatment Plant (ETP) primary containment, leaks or spills – Water emissions: toxic contamination, nutrient enrichment, acidification, changes in thermal regime or turbidity in the event untreated effluent or chemicals are discharged to the Afon Arad / River Arad (tributary of the Afon Teifi / River Teifi) in the event of catastrophic failure of primary containment, leaks or spills.</p>	

Changes in salinity regime – No impact pathway as there will be no saline content within the effluent

Habitat Loss – No impact pathway as there is no destructive work occurring at the SAC as part of this proposal. The installation is approximately 300 m from the SAC.

Entrapment – No impact pathway as there is no water abstraction activity.

Physical damage – No impact pathway as there is no physical work occurring at the SAC as part of this proposal. The discharge pipe is already in situ. The installation is approximately 300 m from the SAC.

Smothering – No impact pathway as no change to air emissions as part of this variation.

Disturbance (Noise) - No impact pathway as noise is not expected to be significant at the SAC. The installation is located approximately 300 m from the SAC. Noise levels are predicted to reduce as part of this variation and replacement of the existing ETP with new ETP.

12. Decision

(i) Water Emissions

1. Afon Teifi SSSI

Toxic Contamination

1. Aluminium

Aluminium is acutely toxic to fish in its active form. Aluminium is present in polyaluminium chloride which is used as part of the effluent treatment process. NRW has completed a surface water risk assessment that has followed the recognised H1 methodology in line with .gov guidance. There are four initial screening tests and if the aluminium does not screen out further modelling is required. The H1 assessment completed by us has been attached to this Form 1 within the full WFD assessment. The aluminium screened out in the second screening test and therefore no further assessment is required. A limit will be placed in the permit of 1000 µg/L. Please see the attached full WFD assessment for full details.

2. Mercury

Mercury is a priority hazardous substance. The applicant has completed a surface water risk assessment that has followed the recognised H1 methodology in line with .gov guidance. There are four initial screening tests and if the mercury does not screen out further modelling is required. The H1 assessment completed by the applicant has been audited by us and is attached to this Form 1 within the full WFD assessment. The mercury screened out in the second screening test and therefore no further assessment is required. The limit will remain in the permit as 0.5 µg/L. Please see the attached full WFD assessment for full details.

3. Cadmium

Cadmium is a priority hazardous substance. The applicant has completed a surface water risk assessment that has followed the recognised H1 methodology in line with .gov guidance. There are four initial screening tests and if the cadmium does not screen out further modelling is required. The H1 assessment completed by the applicant has been audited by us and is attached to this Form 1 within the full WFD assessment. The cadmium screened out in the second screening test and therefore no further assessment is required. The limit will be reduced in the permit from 0.01 mg/L to 0.525 µg/L based on the treatment specifications of the new ETP. Please see the attached full WFD assessment for full details.

4. Dosing chemicals

There are a number of dosing chemicals used in the new ETP process: Anionic and cationic emulsion polymers, urea, phosphoric acid, sulphuric acid and sodium hydroxide. Each dosing chemical has been assessed using H1 methodology assuming that 100 % of the dosing chemical used at the plant is present in the final treated effluent, this is an extremely conservative assumption.

Anionic and Cationic emulsion polymers

Non-ionic polyacrylamides are considered to be low toxicity and have no hazard ratings, are therefore are not considered any further in this surface water risk assessment. We will limit the substances at concentrations well below the EQS by operational control through the Environment Management System and will not set a numerical limit in the permit.

Urea (CH₄N₂O)

There is no agreed EQS to use for urea therefore a Predicted No Effect Concentration (PNEC) of 0.47 mg/L has been used as a surrogate EQS. We have completed a surface water risk assessment that has followed the recognised H1 methodology in line with .gov guidance. Urea did not screen out as requiring further assessment. However, the modelling completed was highly conservative assuming 100% of the urea dosed is present in the treated effluent whereas in reality, this figure will be much lower where the urea will be utilised in the process. Notwithstanding this, the Applicant has proposed a pH limit range (6-9) which will be listed on the permit which provides sufficient control against a large volume of urea being present in the treated effluent by ensuring it remains within a neutral pH range. This is because a large volume of urea, which has pH value of 9.8-10, will result in the upper end of the range being exceeded. The use of urea will also be controlled by an automated system, only being used when required to achieve the current nutrient balances within the activated sludge process. Therefore, we consider further assessment is not required and no further limits are required on the permit.

Phosphoric acid (H₃PO₄)

There is no agreed EQS to use for phosphoric acid therefore a Predicted No Effect Concentration (PNEC) of 0.49 mg/L has been used as a surrogate EQS. We have completed a surface water risk assessment that has followed the recognised H1 methodology in line with .gov guidance. Phosphoric acid did not screen out as requiring further assessment. However, it is noted that the modelling completed was highly conservative assuming 100% of the phosphoric acid dosed is present in the treated effluent whereas in reality, this figure will much lower where the phosphoric acid will be utilised in the process. Notwithstanding this, the Applicant has proposed a pH limit range (6-9) which will be listed on the permit which provides sufficient control against a large volume of phosphoric acid being present in the treated effluent by ensuring it remains within the neutral pH range. This is because a large volume of phosphoric acid, which has pH value of <1, will result in the lower end of the range being exceeded. The use of phosphoric acid will also be controlled by an automated system, only being used when required to achieve the current nutrient balances within the activated sludge process. Therefore, we consider detailed modelling is not required.

Sulphuric acid (H₂SO₄)

From reviewing literature, the hazards to freshwaters associated with sulphuric acid is change in pH and also formation of sulphate. There will be a limit on the permit for pH (minimum 6 and maximum 9), this is considered an appropriate control for sulphuric acid. The formation of sulphate has been assessed, sulphate is considered an 'other pollutant' and has an EQS of 400 mg/L. We have completed a surface water risk assessment that has followed the recognised H1 methodology in line with .gov guidance. There are four initial screening tests and if the sulphate does not screen out further modelling is required. The sulphate screened out in the second screening test and therefore no further assessment is required.

Sodium Hydroxide (NaOH)

Sodium hydroxide does not fill the criteria for persistency, bioaccumulation and toxicity therefore in the absence of a generic PNEC available, no further assessment has been undertaken for this substance. Minimum and maximum pH limits will be placed in the permit

Nutrient Enrichment

Elevated levels of ammonia and phosphorus can cause excess algae growth which can in turn reduce dissolved oxygen levels within the receiving watercourse. A review of current and proposed water quality in the receiving watercourse has been undertaken to ensure the proposed emission limits are acceptable in terms of the Habs Directive and WFD. The compliance targets in the receiving watercourse were set at the 'Common Standards Monitoring Guidance for Rivers', which applies to all riverine SACS:

Table 4. Organic pollution targets

Attribute	Target
10%ile DO (% saturation)	85
Mean BOD (mg L ⁻¹)	1.5
90%ile total ammonia (NH ₃ -N, mg L ⁻¹)	0.25
95%ile un-ionised ammonia (NH ₃ -N, mg L ⁻¹)	0.025

Ammonia and BOD targets as above

Table 5. Proposed phosphorus targets (µg L⁻¹ SRP) for near-natural examples of SSSI/SAC river habitat.

River type		Headwater	River	Large river	
High altitude (>80 metres)	Low alkalinity (<50 mg L ⁻¹ CaCO ₃)	5	10	20	
	High alkalinity (>50 mg L ⁻¹ CaCO ₃)	7	15	25	
Low altitude (<80 metres)	Low alkalinity (<50 mg L ⁻¹ CaCO ₃)	15	20	30	
	High alkalinity (>50 mg L ⁻¹ CaCO ₃)	Chalk	20	30	40
		Clay	20	30	40

The Afon Teifi at the discharge point is classified as 'low alkalinity, low altitude, river', therefore the phosphorus target to maintain a 'near natural river at the point of discharge is 20 µg/L. An orthophosphate target of 0.02 mg/L (mean) is contained within the Afon Teifi SAC Core Management Plan.

1. Ammonia

The 90%ile total ammonia must be below the 0.25 mg/L stated in table 4 above. Modelling has been completed to predict the current impact from the existing ETP and predicted impact from the new ETP. The current downstream 90%ile concentration is 0.130 mg/L and predicted downstream concentration is 0.0854 mg/L, both existing and predicted meet the target. The reduction in discharged load will result in more compliance headroom to meet the Habitats Directive ammonia target. The reduction in permitted daily discharge volume and tightening of the ammonia concentration will reduce the daily load discharged from 0.0231 kg/day to 0.009 kg/day, reduction of 0.0141 kg/day.

2. BOD

The mean BOD must be below the 1.5 mg/L stated in table 4 above. Modelling has been completed to predict the current impact from the existing ETP and predicted impact from the new ETP. The current downstream mean concentration is estimated to be 1.34 mg/L predicted downstream mean concentration is 1.32 mg/L, both existing and predicted meet the target with ample compliance headroom remaining.

3. Orthophosphate

An orthophosphate target of 0.02 mg/L (mean) is contained within the Afon Teifi SAC Core Management Plan. From reviewing historical documents a H1 risk assessment supporting the original permit application (2005) demonstrated that the existing ETP is capable of treating to a mean of 12.5 mg/L orthophosphate, more recent data is not available and there is currently no limit on the permit. Modelling the impact of the discharge assuming it still contains 12.15

mg/L orthophosphate shows that concentrations just downstream of the discharge point are currently estimated to be around 0.044 mg/L, which is in excess of the target within the SAC Core Management Plan.

Should the volume and load be reduced in line with the applicants proposals then the mean concentration of orthophosphate downstream of the discharge point would reduce to 0.026 mg/L. Whilst this value is still in excess of the proposed target of 0.02 mg/L, there is a daily reduction in load of 11.8575 kg/day of orthophosphate being discharged (92.95 %), furthermore, placing a 1.0 mg/L orthophosphate limit on the permit will ensure the concentrations are closely regulated through regular monitoring and reporting. Therefore, the proposal will not cause deterioration in the watercourse with respect to orthophosphate.

This decision is in line with NRW guidance '[Advice to planning authorities for planning applications affecting phosphorous sensitive river Special Areas of Conservation](#)' (version 3 July 2022, accessed on 18/01/2023) which says developments which improve water quality discharges by reducing the phosphorous concentration can be screened out as not likely to have a significant effect on a river SAC as there is unlikely to be a source of additional phosphorus or pathway for impacts.

Acidification

It is proposed the limit of >6 and <9 pH is added to the permit. This is in line with the WFD targets for a 'High' and 'Good' watercourse shown below, therefore deemed appropriate.

Table 3

Acid conditions standards in rivers			
pH – all river types in England and Wales			
High	Good	Moderate	Poor
5 and 95 percentile		10 percentile	10 percentile
>=6 to <=9		4.7	4.2

Changes in thermal regime

As per the 2015 Water Framework Directive 'Temperature Standards for Rivers', the 98%ile annual river temp for 'High' class in salmonid rivers should be 20 degrees Celsius, there should also be no increase/decrease in river temperature above 2 degrees Celsius. The current limit on the permit is 21 degrees Celsius. The receiving watercourse 'GB110062043564 Teifi (Afon Clettwr to Afon Ceri) is designated 'High' for temperature with the annual 95 %ile being 17.7 degrees Celsius, this is in line with the standards as published within the WFD. Although there is no data available to show the impact of the discharge is having immediately downstream considering the temperature of the effluent itself lies within good status it is anticipated there will be negligible effect on the temperature of the receiving watercourse.

Turbidity and Siltation

There is currently a limit of 50 mg/L for suspended solids (SS) on the discharge consent. It is proposed the maximum limit set on the permit is reduced to 30 mg/L in line with the treatment specifications of the new ETP.

Failure of the Effluent Treatment Plant (ETP) primary containment, leaks or spills

The Applicant has proposed a 'Secondary Containment Lagoon' which will act as a bund to all ETP tanks (including chemical storage tanks). The capacity of the bund confirms to CIRIA736 'Containment systems for the prevention of pollution' by providing 110% capacity of the largest tank within the bund. This will protect the Afon Arad / River Arad (and hence the Afon Teifi / River Teifi) in the event of catastrophic failure of a tank. Drainage within the Secondary Containment Lagoon is completely contained with run-off being pumped to the ETP for treatment before being discharged. This will ensure any leaks or spills are treated before being discharged.

The proposed permission is **not likely to damage** any of the flora, fauna or geological or physiological features which are of special interest for SSSI Afon Teifi.

2. SSSI Old Cilgwyn and Cae Heslop

The proposed permission is **not likely to damage** any of the flora, fauna or geological or physiological features which are of special interest for SSSI Old Cilgwyn and Cae Heslop.

There is no impact pathway to SSSI Old Cilgwyn and Cae Heslop for the water emissions.

Natural Resources Wales is minded to: Issue the permission

13.Name and job title of Natural Resources Wales officer:	Jennifer Pocock Senior Permitting Officer, Installations & RSR
14.Date form sent to NRW conservation/ecology	18/01/2023
For Natural Resources Wales use only, once NRW conservation/ecology response received	
15.NRW conservation/ecology comment on assessment:	N/A – filed for audit
16.Name and job title of NRW conservation/ecology officer:	
17.Date of receipt of NRW conservation/ecology response:	