Natural Resources Wales permitting decisions

Variation

We have decided to issue the variation for Fridd Rasus Landfill operated by Gwynedd Council.

The variation number is EPR/GP3330BY/V005

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:

1. explains how the application has been determined
2. provides a record of the decision-making process
3. shows how all relevant factors have been taken into account
4. justifies the specific conditions in the permit other than those in our generic permit template.

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

Structure of this document

- Key issues

Key issues of the decision

Fridd Rasus landfill site ceased accepting waste for disposal on 6th January 2014. Capping was completed on 2nd April 2014. In December 2014 a normal variation application was submitted to move the landfill into aftercare. This variation has created a replacement consolidated permit using conditions that reflect that Fridd Rasus Landfill will now be operated and maintained in accordance with the agreed closure plan during the aftercare phase.

NRW guidance EPR 5.02 '*How to comply with your environmental permit – closing your landfill'* states that for groundwater the minimum requirements for a closure report are evidence to demonstrate that infrastructure and procedures are in place to ensure that the management and monitoring of the site is carried out in accordance with the Landfill Directive. Ffridd Rasus does have an agreed monitoring network in place and has groundwater compliance limits on its permit.

Hydrogeological Risk Assessment

Although a hydrogeological risk assessment (HRA) is not a requirement for definitive closure under the landfill directive, our guidance does state that for sites that have never had one or the previous review was more than 6 years ago we are likely to require one as part of the closure process. The last HRA review for this site was undertaken in 2009. The closure report supplied refers to an update in early 2015.

Compliance limits

Table 5.7 of the closure report referenced the groundwater compliance limits specified in the permit (EPR/PP3294FJ). These are the compliance limits in the permit for Area 2 and not Area 3. The compliance limits for Area 3 are set out in Permit GP3330BY.

Monitored parameters and frequency

We have since 2012 been in discussions with the operator to include Naphthalene as a replacement hazardous substance in the permit. Monitoring has been undertaken but we have yet to agree the compliance limit for this substance and have it incorporated into the permit. The closure report makes no reference to this and does not include naphthalene as a determinand to be measured in aftercare. The closure

report also proposes a reduction in the monitoring frequencies at the site but that this is again subject to the proposed HRA review in early 2015. We did not agree to a reduction in monitoring particular as the monitoring demonstrated that the site is not meeting its compliance limits

We were unable to agree the closure plan initially. As mentioned above the 6 yearly HRA review was due for renewal. Whilst this HRA review was not a barrier to closure it was agreed that it would be appropriate for this review to completed prior to agreeing closure because we wouldn't be able to agree to reduced groundwater compliance limits and monitoring frequencies without having regards to the most up to date information. We therefore requested that the HRA review be carried out so that more appropriate groundwater compliance limits could be derived.

Hydrogeological Risk Assessment (HRA) review

A revised HRA was submitted June 4th 2015. The submitted HRA still proposed changes to compliance limits. We were unable to agree to some of these changes because the effects on groundwater quality due to landfilling at Area 3 are not discernable from those which historically occurred at Area 2 which operated as a 'dilute and disperse' landfill. It was proposed to increase the compliance limit at the downgradient monitoring boreholes to accommodate the effects of the dilute and disperse Area 2 landfill.

These revised compliance limits have been derived on the following basis:
Boreholes showing a downward trend in concentrations: compliance limit has been set as the peak concentration recorded at that boreholes and the control limit as 90% of the compliance limit
Boreholes showing stable concentrations: compliance limit has been set as the peak concentration recorded at that borehole plus 10% and the control limit as 90% of the compliance limit
Boreholes showing an upward trend in concentrations: compliance limit has been set as the peak concentration recorded at BH27 (maximum concentrations near the source) and the control limit as 90% of the compliance limit
We did not agree with the general approach to the setting of the limits.

Chloride concentrations at the site - BH19A, BH19B, BH19C

We did not agree to the proposed compliance limits for BH19A, BH19B and BH19C. The limit for BH19B and BH19C had been set at the peak concentration recorded in up gradient BH27, at 550mg/l. The reports justified this due to the rising trend being experienced in BH19B and 19C which have risen from <50mg/l in 2013 to around 250mg/l in 2015.

The HRA attributed the increased concentration of chloride in these boreholes due to leaching from marine dredging's used as part of the engineered cap in Area 2. These produce a saline runoff during wet periods which collects in the surface water infiltration lagoon and has a consequential effect on groundwater quality. The water quality data in BH18A and BH18B showed a peak in chloride concentrations in 2011-2012 reducing from 2013 onwards. The HRA interprets this as being a 'slug' of saline water migrating westwards and which has now reached BH19A, BH19B and BH19C. Given these increases are not directly linked to the Area 2 landfilling activity, but are as a result of a separate pollution incident from site capping NRW did not consider it as appropriate to revise the compliance limits on this basis.

BH20A, BH20B

The HRA proposed revised compliance limits of 485mg/l at BH20A and 443mg/l and BH20B. This is compared to the current values of 310mg/l (BH20A) and 424 mg/l (BH20B).

NRW did not agree to the concentration at BH20A being set at the maximum recorded. The report showed concentrations are stable and most of the data is less than 450mg/l, with a single data point at 485mg/l. At BH20B the values since 2011 have consistently been below 400mg/l. Therefore NRW expect any revised compliance limit to reflect that fact.

BH21A and BH21B

A compliance limit of 350mg/l was proposed for both BH21A and BH21B. This was on the basis of the peak concentration recorded at the boreholes. NRW did not agree to these values.

BH21A has shown a reducing trend in Chloride concentrations since 2010 onwards, with the exception of an isolated peak in late 2014. NRW suggested that a figure of 300mg/l would be more appropriate for this borehole.

The value for BH21B should also be revised. We acknowledge a single peak in concentration shown on the graph as with BH21A however discounting this one-off peak, concentrations have consistently been below 250mg/l and most recently below 150mg/l.

BH30 and BH31

At BH30 and 31 where there is a clear downward trend in concentrations. The compliance limit for Chloride has been set at the maximum observed concentration at both (450mg/l for BH30 and 150mg/l for BH31). For BH30 current concentrations are just below 300 mg/l having been reducing from a peak in 2011. At BH31 concentrations are just below 50mg/l having fallen from a peak in 2009.

Given that concentrations in the boreholes up gradient of Area 3 and downgradient of Area 2 also show a clear downward trend in Chloride concentrations this suggests the plume of contamination has passed.

We would therefore not expect to see further increasing trend in Chloride concentrations at Boreholes 30 and 31 which are attributed to the older dilute and disperse Area 2. On this basis NRW requested that the proposed compliance limits should be revised to more accurately reflect the current concentrations being observed in both boreholes.

Ammoniacal nitrogen concentrations at the site - BH19A, BH19B, BH19C

There is variability in the monitoring data but no upward trend recorded. The compliance limit for BH19B was proposed as 1.5mg/l which is a reduction from the current permit. We support this and agreed to change the compliance limits.

At BH19A and BH19C it is proposed to increase the compliance limit to 5.5mg/l. On the basis of the monitoring data we did not feel this is justified and the limit should remain as it is (currently 3.6mgl in BH19A and 3mg/l in BH19C)

BH20A, BH20B

It was proposed to increase the compliance limit for BH20A for the current permit value of 5mg/l to 85mg/l. This was in response to the rising concentration experience from 2013 onwards which is a consequence of the leachate plume from Area 2 migrating beneath Area 3. Concentrations appear to have stabilised and we would expect reductions in future. We accept the revised compliance point but expect a revision

following the 2016 annual monitoring report if concentrations are shown to be reducing.

The current compliance limit in the permit for BH20B is 230mg/l and it is proposed to increase this to 259mg/l. Based on the data present we do not accept this proposed value. Concentrations are stable and we expect to see them reducing in future as the leachate plume from Area 2 passes. We would seek to keep the compliance limit as it is and revised if required based on the data in the next annual monitoring report.

BH21A and BH21B

At BH21A a revised compliance limit of 150mg/l was proposed. Concentrations at this borehole appear to have peaked in 2012 and are now around 50mg/l. Therefore the compliance limit should be set to more accurately reflect this.

At BH21B a limit of 80mg/l was proposed. The current permit value is 69.7 mg/l and the monitoring data provided suggests a downward trend in concentrations is occurring. On that basis we do not agree that the limit should be revised.

BH30 and BH31

The compliance limit has been set for these at the peak concentration recorded. At BH30 a compliance limit of 240mg/l is proposed. Concentrations are reducing at this location from a peak in 2011. This reflects the decreasing trend also being observed between Areas 2 and 3, where concentrations in those boreholes are reducing from a peak in 2010 (from around 300mg/l to 150mg/l in 2015) representing the migration of the leachate plume from Area 2.

On this basis the compliance limit at BH30 should more accurately reflect this and not be set at the maximum observed concentration. A limit of 200mgl would be more accurate, but should be revised in the context of the most recent water quality available since January 2015.

At BH31 the proposed compliance limit is set at 110mg/l. As with BH30 we do not agree that the maximum observed concentration is appropriate given the downward trends in concentration being noted elsewhere. The limit should more accurately reflect the current water quality data.

Cadmium

Cadmium has consistently been detected below the compliance limit (5.5ug/l) at all monitoring points. As concentrations up gradient of Area 3 and downgradient of Area 2 are now consistently below 3ug/l we would advise a lower compliance limit at all the boreholes downgradient of Area 3 should be implemented.

Naphthalene

We do not agree with the proposal to use EQS as the compliance limit for Naphthalene. As a hazardous substance the minimum reporting value (MRV) would be a more appropriate value for this substance.

Monitoring frequencies

It was proposed as part of the closure process to reduce the monitoring frequencies, removing the monthly monitoring and reducing the frequency of other monitoring.

Given the need to accurately monitor the effects of the dilute and disperse Area 2 landfill so that compliance limits can be reviewed and revised downward as the leachate plume migrates we do not agree to a reduced monitoring frequency for the parameters used for compliance purposes.

LandSim Model

The updated model predicts that for hazardous substances, Cadmium, Naphthalene and Mecroprop (modelled as both hazardous and non-hazardous) remain within their water quality standards at the base of the unsaturated zone.

For non-hazardous contaminants the model predicts that Ammoniacal Nitrogen, Chloride, Zinc and Mecoprop (modelled as both hazardous and non-hazardous) concentrations at the downgradient compliance point are below their respective drinking water standard.

Having reviewed the model and the input parameters used we agree with the results presented and that Area 3 remains will remain compliant with its current Environmental Permit.

Having regard to the information provided in the HRA review a Schedule 5 Notice was sent to the operator on 26th October 2015 with regards to the compliance limits that we disagreed with.

Schedule 5 Notice requesting further information

The operators Schedule 5 response was received 26th November 2015. We still did not agree to all revised compliance limit proposals.

Chloride - We still did not agree to the proposed revision to chloride limits at BH19A, BH19B and BH19C.

The increasing concentrations recorded at this location are thought to relate to contaminated surface water soaking to ground as a result of the capping works at Area 2. They are not attributable to landfilling activity in Area 3, or to the dilute and disperse landfilling in Area 2. It is not appropriate to revise the compliance limits at these monitoring points to account for this.

We accepted the revised values for the other boreholes BH20A, BH20B, BH21A, BH21B, BH30 and BH31. We proposed revised compliance limits for Chloride as follows (highlighted in blue):

	Chloride (mg/l)			
	Current permit	**Proposed by Amec for Area 3**	**Area 2 permit**	**Geoscience comment**
BH19A	29	55	250	Not accepted
BH19B	28	350	34	Not accepted
BH19C	30	350	34	Not accepted
BH20A	310	**450**	504	Revision accepted
BH20B	230	**400**	504	Revision accepted
BH21A	270	**320**	387	Revision accepted
BH21B	411	**250**	215	Revision accepted
BH30		**340**	504	Revision accepted
BH31		**130**	179	Revision accepted

Because BH19A, B and C were affected by the plume of contaminated groundwater caused by the use of marine dredging's as capping material, it was agreed that compliance limits for Chloride would be suspended until the saline plume of groundwater has passed downgradient. Monitoring of groundwater will however continue and when the plume has passed, compliance limits will resume.

Ammoniacal Nitrogen – We accept the revised values for BH30 and 31. We did not agree to the proposed revision of values at BH19A, BH19C, BH20B and BH21B. Following further discussion Amec accepted that the existing compliance limits were suitable at BH19A and BH19C. For BH20B and BH21B additional water quality data for 2015 was provided to justify the limits proposed. We have accepted those justification and Revised compliance limits for Ammonaical nitrogen should be as follows (highlighted in blue):

	Ammoniacal Nitrogen (mg/l)			
	Current permit	**Proposed by Amec for Area 3**	**Area 2 permit**	**Geoscience Comment**
BH19A	**3.6**	5.5	3.6	Maintain current permit limit
BH19B	3	**1.5**	3	Revision accepted
BH19C	**3**	5.5	3	Maintain current permit limit
BH20A	5	**85**	5	Revision accepted
BH20B	230	**259**	230	Maintain current permit limit
BH21A	5.1	**150**	266	Revision accepted
BH21B	69.7	**80**	69.7	Maintain current permit limit
BH30		**190**	266	Revision accepted
BH31		**100**	102	Revision accepted

Cadmium - We accepted the proposed value of 3ug/l for Cadmium at all compliance points

Naphthalene - We accepted the proposed limit of 2ug/l for Naphthalene at all compliance points

Future revisions of compliance limits

As the plume of leachate contaminated groundwater from the Area 2 dilute and disperse landfill migrates we expect groundwater quality to improve over time at these compliance points. On this basis the compliance limits for the Area 3 permit need to be kept under continual review. It was requested that this be achieved through an Improvement Condition. A bespoke condition was included in the reporting conditions details of which are included in the section entitled “Changes we have made” below.

Changes we have made

All conditions related to the acceptance of waste have been removed from the permit. The permit has been completely revised and a replacement consolidated permit has been issued to the Operator. Compliance limits relating to groundwater and landfill gas have been revised in accordance with the submitted closure report and the revised HRA and Schedule 5 Notice response. Further information was provided by the Operator in support of their request to suspend monitoring of Chloride in Boreholes 19 A, B and C following additional information supplied by the Operator. Information was also supplied to support a request to revise the Ammoniacal Nitrate limits for Boreholes 20B and 21B. This request was accepted and the revisions were incorporated into the permit.

Monitoring frequencies have also been reduced in accordance with those proposed in the Closure Report and Annex 3 of the Landfill Directive.

In order to accommodate the requirement for ongoing review of compliance limits affected by the plume of contaminated groundwater we added an additional condition in Schedule 4.2 – Reporting. We added a bespoke condition to condition 4.2.1. Condition 4.2.1 (b) was added which requires “a review and where appropriate, revision of the groundwater compliance limits set in Table S3.4 shall be carried out as part of the annual monitoring report”. Due to the ongoing nature of the improvements, it was decided that securing this improvement through this condition was more suitable than through an improvement condition.