



The Coal
Authority

Ynysarwed Refurbishment – Permit Variations

Introduction:

The Coal Authority holds two permits for Ynysarwed- BP0267801 (1998, Canal discharge) and BP0275801 (1999, Reed bed discharge). As part of ongoing refurbishment works the Coal Authority wishes to vary these permits, in addition to bringing them into a modern format.

Refurbishment Work:

The existing treatment scheme at Ynysarwed has reached the end of its design life. It now costs considerable amounts of money to continue to operate and maintain the scheme. Following internal discussions, the Coal Authority have now decided to completely refurbish the site.

Investigation of the mine water chemistry demonstrated that a purely passive treatment scheme is not a viable option due to the acidic nature of the water. Therefore, it was decided that a new HDS plant would be the preferred approach to ensure the mine water is treated to a good standard. The new plant has been designed to treat the mine water to below 3mg/l with the potential to treat as low as 1mg/l. In addition to this, the upgraded HDS plant will reduce the risk of scheme failure and reduce the need for frequent maintenance works. The improved plant efficiency will also reduce chemical/ sludge production.

In order to progress with the new scheme build and commissioning, the Coal Authority will be required to update their permits for the site. This note details the variations we wish to make to both of our permits.

Permit Variations:

- **BP0267801 and BP0275801; Combine permits:-**
 - We wish to keep permit BP0275801 (1999) but add permit BP026780 (1998) as an emergency discharge point. This would only be used in an emergency situation if there were ever an occasion where water could not be transferred to the Afon Neath. The discharge would consist of mine water treated by the HDS plant.
- **BP0267801, Condition 2; Change ‘Nature’ of discharge description**
 - The mine water will now be treated using a High Density Sludge (HDS) Plant and so the ‘Nature’ of the discharge described in BP0267801 (Condition 2) will need rewording to describe this process.

The new HDS will treat the water to below 3mg/l iron, with the potential to treat down to 1mg/l of iron.

- **BP0267801, Condition 15; Removal of emergency storage**

- In order to ensure there is minimum disruption at the site, the new HDS plant will be constructed alongside the older scheme. The older scheme will remain operational until the new HDS plant commissioning is complete. As a result of this, the new scheme will be built over the area that currently houses the 'emergency storage' for the active scheme, required under BP0267801.
- The emergency storage facility is a requirement of permit BP0267801, Condition 15 which requires the equivalent of a total of 170 cubic metres. The storage would provide 4 hours of capacity under the current mean flow regime (12l/s) and 1.3hours under the maximum design capacity (36l/s).
- The Coal Authority have assessed the risk of removing the emergency storage and have found it to be low risk for the following reasons:
 - Since the Coal Authority took control of the Ynysarwed site in 2008 there have been no recorded uses of the emergency storage. Our understanding is that the emergency storage was required prior to the commissioning of the reed-beds in 1999.
 - The existing storage facility is relatively small and not connected to the active treatment scheme. Under the current scheme design, pumps would need to be brought to site to over pump water into the emergency ponds- the ponds therefore provide limited benefit if the scheme were to go offline while the site is un-manned.
 - The new HDS plant will have two streams allowing for one stream to be treating the mine water while the second is offline for maintenance. This significantly reduces the risk of the active scheme ever being completely offline.
 - However, under current and future scheme operation, if the active scheme ever is offline, in an emergency or for planned maintenance, the mine water is/will be transferred to the reed-bed. The reed-beds have a retention time of greater than four hours and also provide some buffering and treatment of the mine water. In 2015 the reed beds were able to provide treatment for the mine water between April and November while the active scheme was temporarily offline.
 - Going forwards, if there is ever a period where the active scheme is temporarily offline, the Coal Authority's Operations team have access to a transportable chemical dosing plant that can be brought in to assist the reed bed treatment.
 - Consideration was given to constructing the emergency ponds within a wooden area to the north of the active site however ecological assessments have classified the area as priority habitat type 'wet woodland' and so the Coal Authority are reluctant to build within this area.

- **BP0275801, Reed-bed bypass**

- The reed beds at Ynysarwed require a complete refurbishment due to the large build-up of ochre and detritus. In order to undertake this maintenance work, the Coal Authority will need to build a bypass so water can be directed around the reed beds while works are ongoing.
- Without a bypass, there is the risk of ochre and sediment being entrained within the water when maintenance is taking place.

- The bypass work will occur following the commissioning of the new HDS plant and will only become operational once we are satisfied with the quality of the water leaving the HDS plant.
- Due to the improved treatment by the HDS plant, there is the potential that the reed-beds will no longer be required to 'polish' the mine water. Therefore following the reed-bed refurbishment, the Coal Authority are considering an option of using the by-pass on a more permanent basis and using the reed-beds purely as a wildlife habitat.