

## What Happens When The Mines Close? Stainless Steel Plays Its Part

When a coal mine closes, it is obviously a blow to the local community. However, if the mine is left to its own devices, then the consequences are even worse.

Andrew Morrith of the Coal Authority explains how they ensure that the local drinking water is kept free from pollution:

“The Coal Authority is responsible for the remediation of pollution arising from many generations of coal extraction. As part of these activities the Coal Authority pumps and treats significant quantities of iron rich minewater. One such scheme is the Minewater Treatment Plant located on the site of the former Horden Colliery nr Peterlee in County Durham. The plant is a key part of the Coal Authority’s infrastructure preventing pollution of the aquifer that overlays the mine workings. Once mining has ceased water enters the mine workings and becomes contaminated with dissolved iron from the surrounding strata. If allowed to continue, the polluted minewater would come into contact with aquifer. At 8million gallons a day the aquifer provides approximately 20% of the local water supply. The plant is capable of treating a flow of 150L/sec. A solution of 47% Sodium Hydroxide is added to the minewater to raise the pH to around 7.8, thereby allowing the iron to be precipitated out. The sludge formed by the precipitation

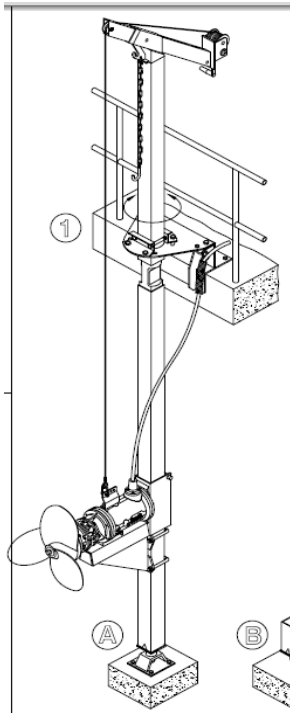


process is separated from the minewater as it passes through a lamella clarifier. The treated water is then discharged into the North Sea. The sludge is transferred to a holding tank prior to being dewater and disposed of. The incoming minewater contains around 100mg/litre of iron, by the time the sludge has entered the holding tank the iron content has

been increased to around 150grams /litre. As a result if not kept in suspension the stored sludge soon separates leaving a dense mass in the holding tank that is too thick to be pumped to the dewatering plant. To prevent this from happening **Landia** mixers are installed in the reactor tank and the sludge holding tank to ensure the dense iron sludge is kept in suspension until dewatered. The iron content, especially in the sludge holding tank is particularly abrasive due to the physical nature of the sludge and tings are further complicated as chloride levels can be as high as 30,000mg/litre, approximately twice as salty as sea water”.

The reference to **Landia** mixers is where stainless steel comes in. A typical mixer is made of 316 (1.4401) stainless steel.





The mixer is mounted on a stainless steel post within the tank and is moved up and down to the optimum operation position by a stainless steel wire.

The stainless steel mixer has to endure arduous conditions as can be imagined from the picture below taken after several months of operation. The deposits are cleaned off before reuse.



This is another good example of how stainless steel is working in the background to ensure that the environment is kept in good order.

Photos and story are courtesy of Landia <http://www.landia.co.uk/> and the Coal Authority <http://www.coal.gov.uk/>