Clean Rivers Trust

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Reduction of Chemical Oxygen Demand (COD) in leachate/drainage from landfill drainage; using constructed wetland treatment.

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Overview.

Clean Rivers Trust has recently been asked to consider the use of constructed wetlands to ameliorate historic landfill leachate drainage. The main determinant identified to the Trust being elevated COD.

The treatment method of choice being constructed wetland, as it is low cost and low maintenance; with a soft footprint that can be located within the confines of such sites. The design of each site and its drainage needs would require individual consideration due to each discharge being unique.

COD is an indicator of organic content and as such is a constituent part of historic landfill leachate/drainage; it is an ideal subject for remediation using engineered wetland technologies.

Chemical Oxygen Demand removal by Constructed Wetland; an example.

One site that Clean Rivers Trust has been involved had a concentration of organics in the leachate; discharging a COD of 472 mg/l. After the introduction of wetland treatment the loading at discharge had dropped by 84%, after one year the concentration had been decreased by 93%; after a further 12 months this figure had improved, increasing wetland efficiency to 96%.

At another treatment wetland receiving contaminated landfill drainage with a COD loading of over 500 mg/l; using a different configuration of design and planting showed that in the first year the discharge from site exhibited a 93% reduction in contaminant. This improved to 98% at the end of the second twelve month period.

This increase in efficiency of the wetland system demonstrated (other wetlands data mirror these results) that the uptake of organic contaminants increases over time. The composition of the beds and plants can play a major part in the early reduction of COD in wetland treatments. The composition of sub-straights and flow mechanisms are also of significance.

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Conclusion.

Clean Rivers Trust would recommend constructed wetland remediation for many old waste site leachate and drainage streams. A short analysis will give a good indication as to treatability. If such a scheme is considered it may be able to limit the size of the planting if there was a pre-treatment phase to remove iron and other metals and adjust the pH to optimise the operational efficiency of such a scheme.

Dr Harvey Wood. Clean Rivers Trust.