



Abbott Ireland Nutritional Division, Cootehill Dispersion Modelling & Feasibility Assessment of Diffuser System

AWN Consulting conducted a feasibility assessment of a proposed diffuser system in the Dromore River, adjacent to Abbott Ireland facility, Cootehill, Co. Cavan.

As part of their current Environmental Protection Agency (EPA) Integrated Pollution Prevention Control (IPPC) licence (Reg. No. P0687-02), Abbott currently is licenced to discharge Final Treated Effluent (FTE) to the Dromore River.

AWN proposed an alternative approach whereby the focus is on the environmental impact of the discharge as opposed to the mass loading figure. As a result of this it was agreed that the FTE discharge point be extended to the centre of the river, downstream of the weir and to install a diffuser system which will effect an immediate and efficient mixing of the effluent plume with the river water. Taken together, these measures will have the effect of substantially increasing effluent dispersion, with subsequent positive impacts on water quality, while also increasing water flow across the fish pass.

The FTE from Abbott is required to assimilate into the receiving water course (Dromore River) within a reasonable distance downstream of the discharge. Diffusers are currently the most common device employed to achieve this assimilation.

AWN used the DHI Water and Environment MIKE Hydrological Modeling Software to model effluent dispersion and assimilation in the Dromore River. MIKE 11 models One-Dimensional hydrodynamic river flows in linear channels.

The model predicts single event and continuous hydrological events to show the water levels, discharge rates and velocity.

In addition to the above an Advection Dispersion (AD) module was incorporated into the model to simulate the effects of the wastewater discharge into the Dromore River. This module is able to simulated the dispersion of any inflow into the Dromore River and produces a concentration gradient along the river channel.

The model results show that through the use of the proposed diffuser system the Dromore River has sufficient hydraulic capacity to cater for the FTE from the facility. The long-term effectiveness of a diffuser system will be governed by the morphology of the Dromore River at the point of discharge.

