BAT Conclusion 12 – Clean Trade Total Phosphorus

Introduction

Vivergo Fuels has an effluent monitoring schedule that was fully aligned with the monitoring requirements of the Environment Permit for the facility. Within our clean trade emissions to water total phosphorus is measured prior to discharge to Aquarius and thereafter the Humber Estuary.

BAT Conclusion 12

To reduce emissions to water, BAT is to use an appropriate combination of final wastewater treatment techniques.

Final wastewater treatment is carried out as part of an integrated wastewater management and treatment strategy (see BAT 10).

Appropriate final wastewater treatment techniques, depending on the pollutant, include those listed below.

Table 4.2: BAT-AELs for direct emissions of nutrients to a receiving water body

Parameter	BAT-AEL (yearly average)	Conditions
Total nitrogen (TN) ([1])	5.0–25 mg/l ([2]) ([3])	The BAT-AEL applies if the emission exceeds 2.5 t/yr.
Total inorganic nitrogen (N_{inorg}) ([1])	5.0–20 mg/l ([2]) ([3])	The BAT-AEL applies if the emission exceeds 2.0 t/yr.
Total phosphorus (TP)	0.50–3.0 mg/l ([4])	The BAT-AEL applies if the emission exceeds 300 kg/yr.

([1]) Either the BAT-AEL for total nitrogen or the BAT-AEL for total inorganic nitrogen applies.
([2]) The BAT-AELs for TN and N_{inorg} do not apply to installations without biological waste water treatment. The lower end of the range is typically achieved when the influent to the biological waste water treatment plant contains low levels of nitrogen and/or when nitrification/denitrification can be operated under optimum conditions.
([3]) The upper end of the range may be higher and up to 40 mg/l for TN or 35 mg/l for N_{inorg}, both as yearly averages, if the abatement efficiency is ≥ 70 % as a yearly average (including both pretreatment and final treatment).
([4]) The lower end of the range is typically achieved when phosphorus is added for the proper operation of the biological waste water treatment plant or when phosphorus mainly originates from heating or cooling systems. The upper end of the range is typically achieved when phosphorus-containing compounds are produced by the installation.

Total Phosphorus is measured daily via 24-hour flow proportional composite sample. The total phosphorus comes mainly via towns water make up approx. 1mg/l and dosing of Gengard GN7300 (Phosphoric acid - MSDS supplied) which acts as a corrosion inhibitor for the cooling tower.

A means to control the total phosphorus seen in the clean trade is the controls around the dosing of the above chemical. For the control of the phosphate, we use our True Sense ICC (Integrated Control Centre) which performs analysis of the system every hour. The initial dose rate is set by proportional flow, so x ppm of the phosphate product (Gengard GN7300) / m3 make up water to achieve the target required for corrosion inhibition. The controller can trim this dosing based on the analysis e.g., turn off the dosing pump if the level is too high.

Within the PO4 summary I sent Column F and G are looking at the distribution of the total phosphate measured, column F represents the % phosphate contribution expected due to the makeup level cycled up in the system while column G is the % phosphate due to the Gengard dosing.