

ARBIKIE DISTILLERY GREEN HYDROGEN LIMITED

Application for PPC Permit to cover the small-scale production of hydrogen by electrolysis of water

Non-Technical Summary

The current application is for a Low Impact Installation Status permit covering the small-scale production of hydrogen under the Arbikie Distillery Green Hydrogen Project. This project is a first-of-its-kind innovation project and will make Arbikie Highland Estate Distillery a world leader in distillery sustainability.

The hydrogen plant is to be sited on land adjacent to Arbikie Highland Estate Distillery to the South of Montrose. It will comprise an electrolyser, compressor and hydrogen storage with the principal inputs being water, initially drawn from the pre-existing borehole. Moving forward the site has plans to use a mix of spent lees from the distillation process at the distillery mixed with rainwater collected at the site. This will lead to a better use of wastewater and reduce abstraction pressure on the aquifer. The electricity required for the electrolysis process is supplied primarily from the onsite wind turbine, with energy from the grid electricity only being used to supply baseload power requirements during periods when there is no production from the wind turbine.

The hydrogen produced will be used as fuel in the distillery boilers replacing about 50% of the gas oil currently used and is expected to generate $\frac{1}{2}$ the thermal energy demand required for the distillation process. As the combustion of hydrogen produces no Carbon Dioxide this reduction in the burning of Gas Oil, is estimated to reduce CO₂ emissions from the site from 700 tonnes per year to 350 tonnes per year. The incorporation of abatement measures such as Flue gas recirculation and modern burners is such that it minimises the amount of Nitrous Oxides produced when hydrogen is combusted to well below acceptable levels and constitutes an overall reduction in what is currently emitted on site.

The only other waste gases produced in the process (considered a potential by-product at larger sites) are Oxygen, which is vented to atmosphere, and Nitrogen, which may be emitted upon system start-up and during any purging events.

All three gasses are major components of air and pose no significant risk to the environment or human health.

The current application uses groundwater from the boreholes at the distillery which is subject to a process known as Reverse Osmosis (RO). This produces a reject water which has an increased concentration of pollutants, this is solely due to the removal of water (nothing is added to the rejected fraction). This reject water is to be discharged to an appropriately sized and constructed soakaway. The low flow rate and volume of effluent produced combined with the composition of both feedwater and effluent, make the use of an appropriately designed soakaway and appropriate form of treatment for the protection of groundwater.

The operator recognises that further treatment may be required before spent lees can be utilised as a feedwater in the process.

SEPA has assessed the application and considers that the assessments made and the supporting information provided demonstrate that the proposal meets the requirements for a Part A permit under the Pollution Prevention and Control (Scotland) Regulations 2012 and that the Part A permit should be granted Low Impact Installation Status under the PPC guidance relevant at the time of issue.