

Jniversity of the Highlands and Islands Oilthigh na Gàidhealtachd agus nan Eilean

#### Scottish Whisky Industry



# **Reed Bed Use Within Scotch Whisky Distilleries to Treat** Wastewater: A New Toolkit to Help Maximise Performance

## Ilgaz Çakın

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#### Reed Bed Wastewater Treatment Systems



Horizontal Subsurface Flow Constructed Wetlands, image from Stefanakis, A. (2018)

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# **Objective and Proposed Research Approach**

#### **Objective: To understand why reed beds fail or succeed**

STEP

Characterise microbiome diversity in selected reed beds using metagenomic barcoding





Geochemical analysis of water samples from sites to fully understand likely abiotic processes at play



Ammonium, Phosphate, Total Oxidised Nitrogen



Metals





Conductivity



Establish associations between reed bed performance, microbiome diversity, water quality, and reed bed environment.



Define a standardized, minimum cost sampling and analysis protocol to detect the extent and cause of reed bed underperformance



## Hydro Nation Scholars Programme

#### Distilleries using reed bed wastewater treatment in Scotland

#### References

Duncan et al. (1994) The Scotch Whisky Industry Record. Pass, B. and Lambert, I. (2003) 'Co-products', in Whisky, pp. 243–272. Stefanakis, A. (2018) 'Introduction to Constructed Wetland Technology', in, pp. 1–21. **Choudhary et al.(2011)** 'Constructed wetlands : an approach for wastewater treatment', Pollution. SEPA (2019) 'The Scotch Whisky Sector Plan' Facts and Figures (2019). Edinburgh.

Map of Scotch Whisky Distilleries (2019). Edinburgh.