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Characterisation of Radioactive Scales (NORM) Produced by the Onshore Oil and Gas Industry in the UK

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The occurrence of radioactive scales in oil & gas production facilities is a major concern for the petroleum industry. Activities exceeding 1KBq/g radium-226 and 30KBq/g lead-210 have been reported in solid scales from the UK sector. When progeny are taken into account, total activities levels may exceed the UK threshold for Low Level Radioactive Waste (LLW) disposal. Increased radiation risks to operators and general public are now being addressed by revised legislation; however the additional costs of waste management are yet to be fully assessed. Much of the work carried out to date has focussed on offshore NORM where the majority of arisings are disposed to sea. However, onshore treatment, where sea disposal is not an option, poses a serious challenge.

The aim of this project is to establish the nature, extent and distribution of NORM in UK onshore oil and gas fields and to devise an effective NORM inhibition methodology for minimising future health, environmental and economic impacts. Radiological surveys of production equipments are being undertaken and radiometric and isotopic analysis are used to characterise radioactive scale deposits in representative UK onshore oil & gas fields. Methods for inhibiting radium isotope co-precipitation with common mineral phases such as barite and celestite, are being investigated by nucleating crystals in a counter diffusion system. Preliminary results are described.

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