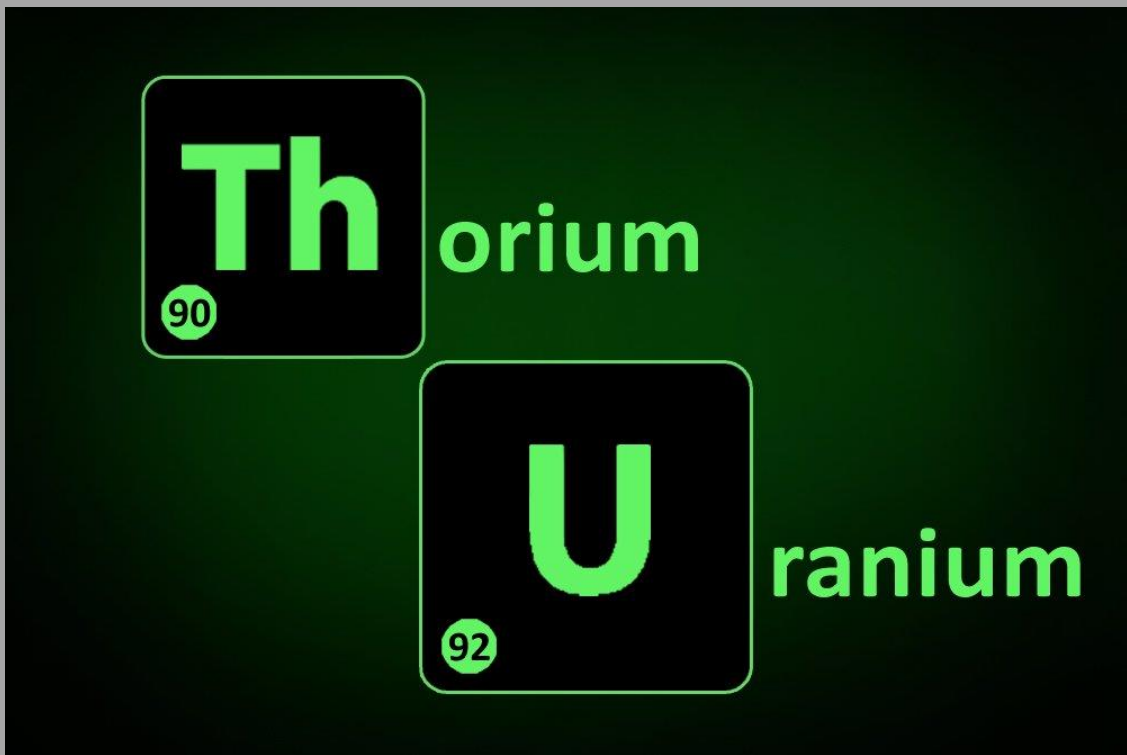


# An In-Field Evaluation of a Geotextile Filter to Capture Radioactively Contaminated Corrosion Scale Removed from Disused Mining Equipment by High-Pressure Water-Cleaning (HPWC)



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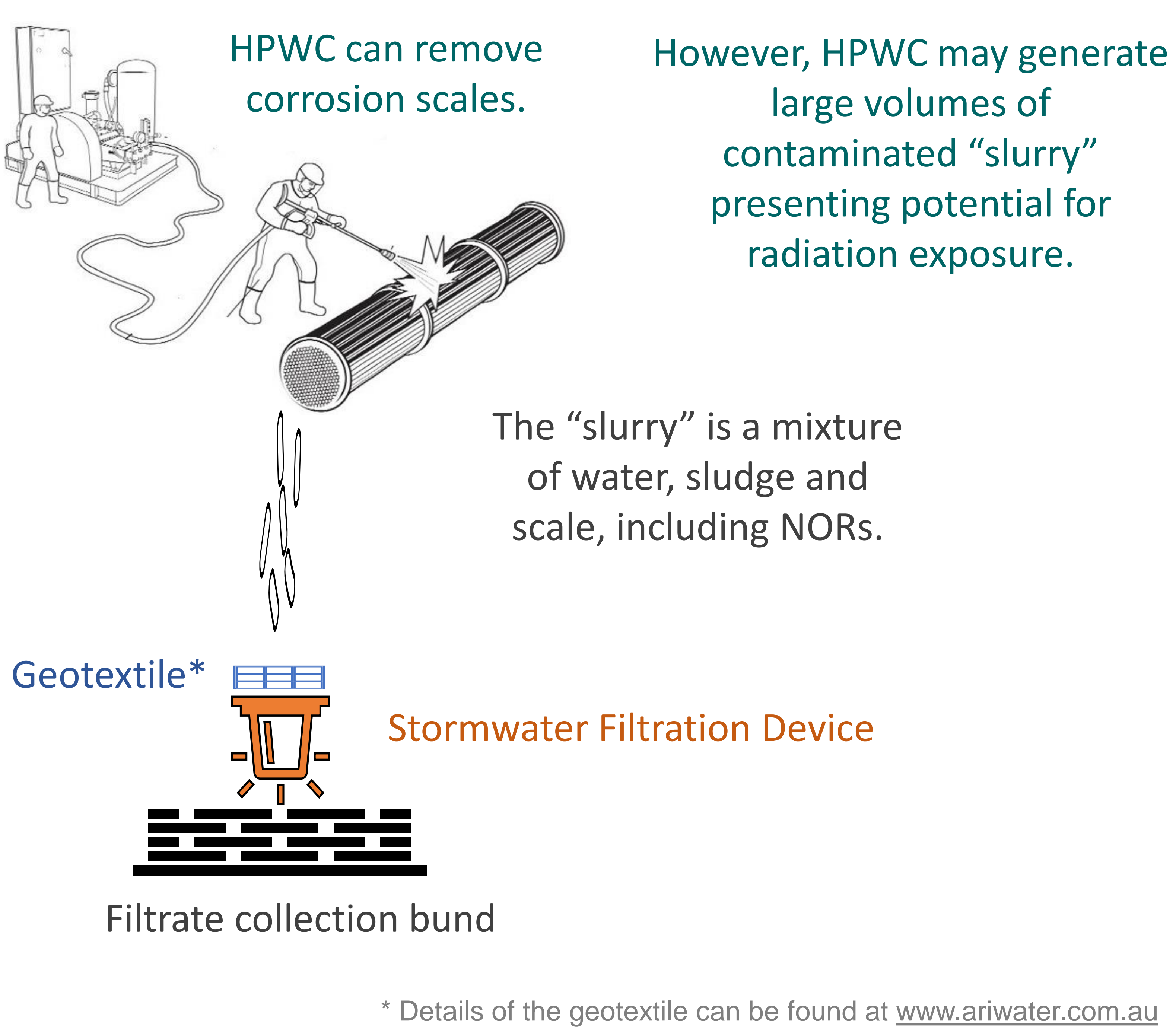


WA’s lithology is replete with the naturally occurring radionuclides (NORs) thorium-232 and uranium-238 and their radioactive decay products.

Mineral processing release the NORs. As steel plant and equipment corrodes, scale is formed on the inner surfaces. The volatile radioactive decay products of the NORs, particularly isotopes of radium, polonium and lead concentrate in the corrosion scale.....resulting in significant volumes of radioactively contaminated disused plant & equipment.



A worker/community hazard with a significant environmental footprint which presents long term management challenges.



Scale captured in geotextile.



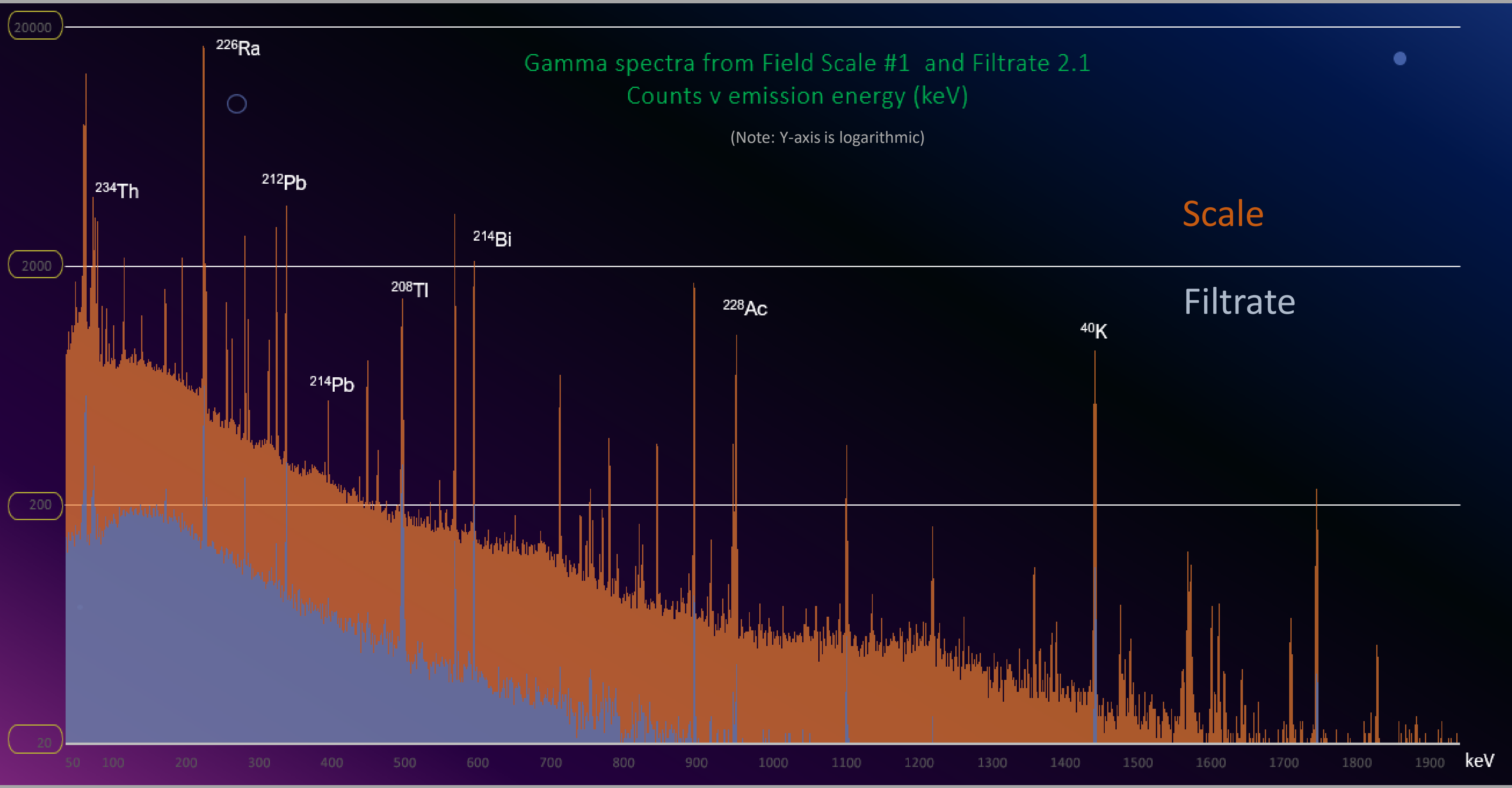
Filtrate passed through the geotextile and captured in the bund.



Activity concentration in scale and filtrate assessed via gamma (γ) spectrometry.



This research evaluated the capacity of a geotextile to capture NOR-contaminated corrosion scale. The capacity of the geotextile to capture NORs is a ratio of the activity concentration in the scale to that in the filtrate



Total Activity	Bq per kg	Removal Effectiveness (%)
in Scale	25,459	
in Filtrate (mean)	1,666	93.9
in Filtrate Top 80%	214	99.2
in Filtrate Bottom 20%	3117	89.1
Environmental Release Criteria	1,000	

Capture in a settling tank will allow 80% of the filtrate to be discharged to the environment – without conditions.

- Filtration efficiency of the radioactive contamination by the geotextile as evaluated via activity concentration, demonstrated efficiencies for the radionuclides <sup>228</sup>Ac, <sup>228</sup>Tl, <sup>234</sup>Th and <sup>214</sup>Pb exceeding 98%; and 92.7 % for <sup>210</sup>Pb.
- The overall efficiency of removal of activity concentration by the geotextile filter was **93.9 %**.
- Scale residue is <2% of the original mass of contaminated steel - significant cost savings and potential for recycling.