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Radiological characterization, risk assessment and selection of preferred remedial option for the Veselivske legacy trench site in Ukraine

The trench-type Veselivske radioactive material burial site in the Kirovograd Region of Ukraine near Kropyvnytskyy city was created in 1988 in a former clay quarry to store the waste materials originating from the clean-up of an accident involving two disused industrial 137Cs sources. The institutional control over the site has weakened over decades, and as a consequence the burial site suffered from unauthorized intrusion in 2017, which resulted in dispersal of radioactive materials from the trenches. Results are presented from remedial assessments aimed at bringing the Veselivske site into a radiologically safe condition, which were accomplished in 2021-2023 with the support from the Norwegian Regulatory Authority (DSA). The project included historic data collection, radiological characterization, risk assessment and selection of the preferred remedial option using a multicriteria decision analysis framework, including consideration of socio-economic and sustainability factors. The selection of remedial options was carried out in consultation and information exchange with Kropyvnytskyy city authorities and national regulatory bodies. Weighting of radiological risks to public and workers, remedial costs, waste management aspects and other relevant criteria suggests that the preferred remedial option consists in establishing an engineered soil cover above the disturbed trench area with elevated radiation levels. This remedial option allows for certain types of use of the remediated site but with restrictions on soil works (for example, as a solar farm, a storage area for goods, etc.) and ensures safe long-term (estimated time frame of 100 years) in situ storage of radioactive materials in trenches, assuming that the site operator will supervise the site and maintain the integrity of the soil cover.

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