

13. Study of Efficient Reuse Technologies for Removed Soil with Swelling Inhibitors (Part 2)

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Some 14,000,000 m³ of soil contaminated by the nuclear accident at Fukushima Daiichi Nuclear Power Plant has been removed and is currently being transported to interim storage facilities. The governmental study panel and other organizations involved in these efforts are considering wet sieving as a volume reduction process to treat 1,320,000 m³ of removed soil.

At the interim storage facility, during acceptance and sorting, the removed soil is often mixed with a modifier containing several percent Super Absorbent Polymer (SAP) to remove foreign substances. Due to SAP's capacity to absorb water and swell several hundred times in volume, even trace amounts of SAP in the soil can affect soil quality if soil recycled by wet sieving is used as ground fill or for other purposes.

To confirm the effects of SAP on wet-sieved soil and to improve soil quality where such effects are present, we used swelling inhibitor to reduce SAP swelling and evaluated the characteristics of coarse-grained soil collected by improved wet sieving. We also performed a test of embankments built using the collected soil. These tests confirmed that adding swelling inhibitor reduced settling, improved various soil characteristics, including permeability, and created no adverse impacts on the surrounding environment.

Key words: removed soil, volume reduction, wet sieving treatment, super absorbent polymer, swelling inhibitor