

## ADVANCES IN THE SPANISH USE OF INDUSTRIAL WASTE LANDFILLS FOR THE MANAGEMENT OF NORM WASTE

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### **Abstract**

Naturally Occurring Radioactive Materials (NORM) wastes are generated since decades ago in huge quantities in several industries, been traditionally managed under considerations of industrial non-radioactive wastes in Spain, as was also done in European countries.

The management of such conventional wastes is carried out according to the national legislation and European Directives. In that regulation the minimum characteristics for the different natural and engineered layers of isolation in conventional wastes landfills are defined. These layers are designed to prevent a possible impact of the toxic materials included in the wastes, to the people and to the environment, in present and in future conditions.

After the publication of the Spanish Royal Decree 1439/2010, which amended the Title VII of the Royal Decree 783/2001 approving the 'Regulation on Health Protection against Ionizing Radiations', the holders of activities where natural radiation sources exist should undertake the necessary studies, to determine whether a significant increase in the exposure to the workers or to the members of the public could be disregarded or not, from the point of view of radiation protection. These 'NORM activities' are listed in the CSN Safety Instruction IS-33, 'on the criteria for protection against exposure to natural radiation', and clearance levels for bulk amounts of NORM materials were published in the CSN Safety Guidance GS11.2 and in the Ministerial Order (MO) IET/1946/2013.

That MO IET/1946/2013 established clearance levels for NORM residues or by-products, and also established that, if the activity concentrations of the natural radionuclides is higher than the clearance levels, but a radiological impact study demonstrates that the effective dose for the public is lower than 1 mSv a<sup>-1</sup> and lower than 6 mSv a<sup>-1</sup> for the workers, conventional management could be used, otherwise the material would be classified as radioactive waste and managed accordingly. That conventional management could be carried out, for instance, in conventional (non-hazardous or hazardous) waste landfills.

A generic assessment was performed using very conservative assumptions which could be used as an envelope of any other situation [see 1] giving values very similar to the obtained in other studies, but refinements are desirable. Possible refinements will imply deepening in the knowledge about the Spanish NORM companies [see 2 and Figure 1] and the peculiarities of the national landfills [see 3 and Figure 2]. Preliminary studies have been already carried out which would allow several future advances in the field in a national level.

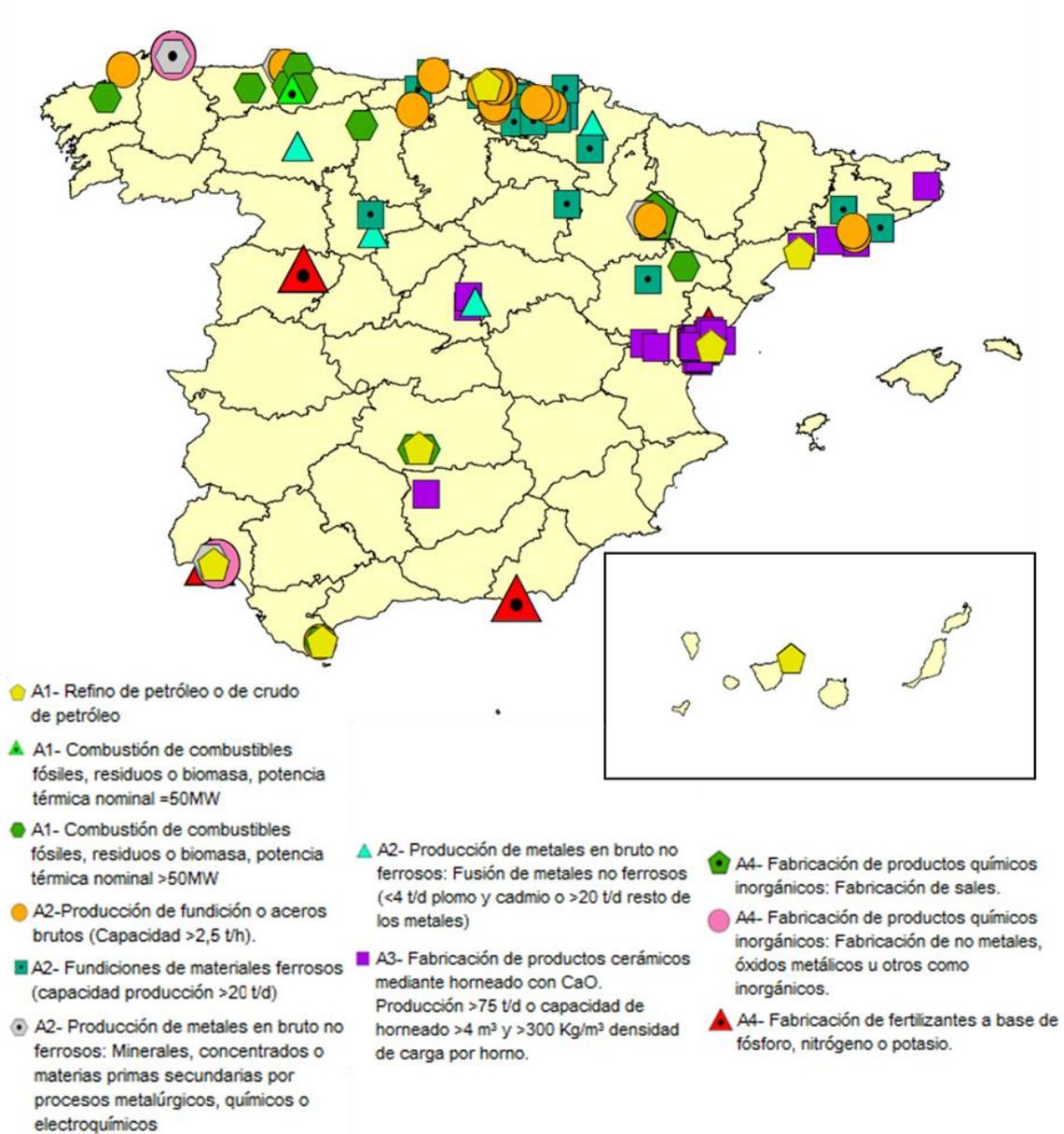


Figure 1.- Map with the companies which corresponds to the different NORM activities. Developed from the PRTR Spanish registry and the CSN Safety Instruction IS-33.

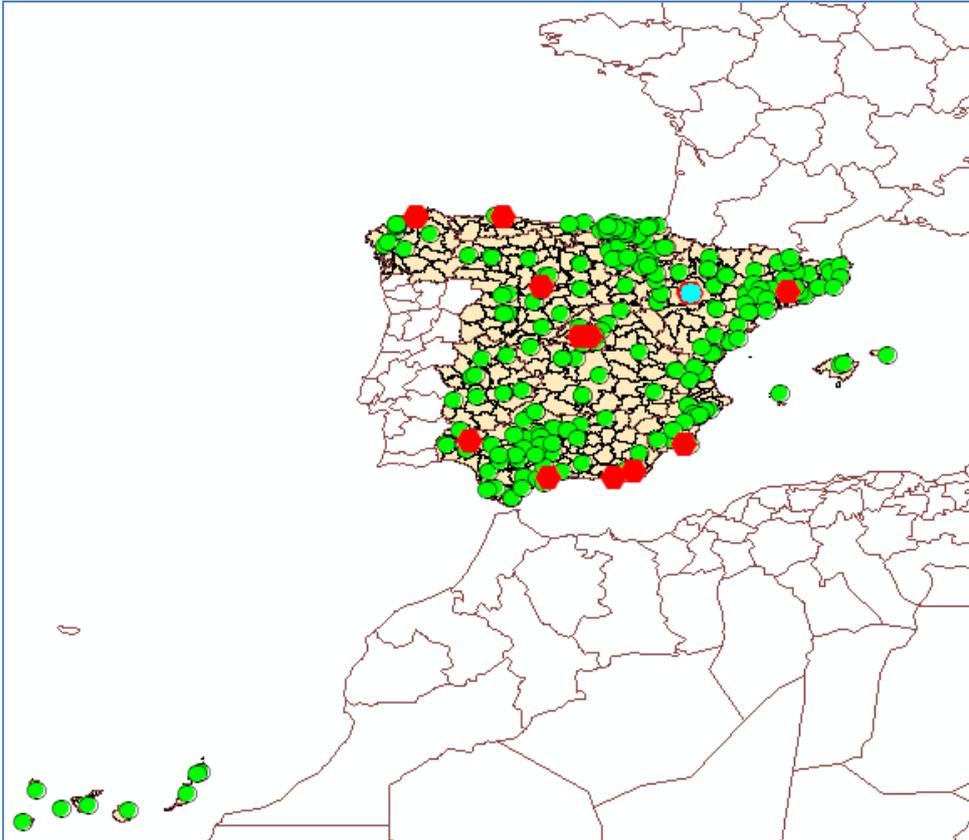


Figure 2.- Map of Spain with the non-hazardous (green) and hazardous (red) landfills. Developed from the PRTR Spanish registry.

### **References**

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