Survey on naturally occurring radioactive materials (NORM) to gather data and information for activities within the RadoNorm project

Information to participant

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NORM Survey

According to the European Basic Safety Standards Directive 2013/59/Euratom (EU BSSD), laying down requirements for protection from natural radiation sources, all NORM involving activities have to be managed within the same regulatory framework as other practices causing exposure to ionising radiation. To achieve this, European member states had to transpose and implement EU BSSD requirements into national legislations.

Regulators as well as stakeholders working with NORM involving industries and NORM at all need to find their way into the practical and optimal implementation of new requirements for dealing with NORM. For example, lists of NORM involving industries and NORM inventories need to be updated, existing exposure situations need to be re-assessed and circular economy concepts that play a stronger role need to be acknowledged.

Information from stakeholders and colleagues involved with practical NORM situations are of high importance for the following work packages and tasks in the RadoNorm project:

WP 2 Exposure

Task 2.5. Overview of NORM sites and exposure scenarios in Europe and their characteristics.

Task 2.8. Updating approaches for modelling long-term prediction of NORM transfer in the Environment.

WP 5 Mitigation

Task 5.5. Radiation risk mitigation measures applied in NORM involving industries and remediation of legacy sites.

In particular, new and/or updated data and information are needed to:

- *make a systematic overview of different NORM exposure sites in Europe,*
- *improve characterization of NORM exposure scenarios, especially with respect to NORM in multiple hazard context, different exposure pathways, resulting environmental effects, applied mitigation and remediation measures, associated challenges,*
- *select sites to carry out modelling studies and improve understanding of processes and factors causing transfer of radionuclides in the environment in the context of NORM, for example at conventional waste landfills, at NORM affected legacy sites, in the context of reuse of sludge in agriculture,*
- *apply water flow and solute transport models (e.g., models like HYDRUS, MELODIE, HYTEC) that can be used to learn more in detail about mechanisms involved in water flow and solute transport processes given soil and solute characteristics at a site location,*
- *develop further existing radioecological models also in view of their use for remediation activities, and*
- *develop new prevention and mitigation methods or improve already existing ones.*

This NORM survey has been formulated with the main objective of gathering specific valuable information on already mentioned topics from (national, regional, local) regulators, various industry operators and potentially other target stakeholders across Europe. Strong interactions with wide group of stakeholders interested in these problems is necessary to develop scientific rationales for improving relevant methodologies as well as regulatory approaches of NORM treatment and management.

This survey is especially an opportunity to gather experiences with dealing with NORM from regulators, operators of industries, and other stakeholders from all over Europe!

We would like to emphasize that we will properly inform you about results of this survey. A written document will summarise the findings and will be sent to you electronically.

Who are we?

This study is being undertaken by a team of scientists led by Jelena Mrdakovic Popic, Laura Urso and Bogusław Michalik, from DSA (Norwegian Radiation and Nuclear Safety Authority), BfS (German Federal Office for Radiation Protection) and GIG (Polish Central Mining institute), respectively, involved in tasks 2.5, 2.8 and 5.5 of the RadoNorm project.

The study is supported by the European project RadoNorm, which has received funding from the Euratom research and training programme. More details about RadoNorm, WP2 and WP5 can be found here: https://www.radonorm.eu/workpackages/.

Participating in this study

Your involvement entails participation in an initial survey. Survey is made available electronically, online on EU Survey platform. In order to best adapt given questions to identified audience (target groups), different parts of survey have been developed and provided links will lead you to the right survey part depending on which target group you may represent. Survey contains both closed and open questions and covers for a broad range of NORM involving industries.

Eventually, in particular cases, we would like to ask you certain open questions in an individual short interview (questions would be sent to you beforehand).

As a participant, you were selected based on the following target groups, which could answer our questions:

- ➔ Local/regional/national regulators in the field of Radiation Protection and/or NORM,
- ➔ Industry operators,
- ➔ Operators of an organisation involved in waste management considering all type of actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment, and disposal of any kind of waste including landfilling, incineration and recycling,
- ➔ Experts (e.g. consultants, scientists) working on various NORM related issues.

Your participation entails

For the survey: Answering a series of questions (30 for regulators, 31 for operators and 21 for waste managers, some additional questions are present if the respondent is involved/ specialised in activities related to water production facilities or facilities that make use of purified groundwater and/or if they have information on use of NORM sludge in agriculture). The data will be anonymized, and the answers will be analysed together with those of other respondents. Your participation in the survey is voluntary. You are free to choose which questions you want to answer, and you can stop your participation at any time without any justification. The survey is implemented with EU Survey. **You may save the survey progress and go back at different times to fill in further with information.** The survey will be **available online from 10 January to 15 April 2022**.

For an individual interview: Participating in an interview conducted by a researcher from BfS/ DSA/GIG. Questions would be sent beforehand, and the interview will last approximately 30 minutes. The interviewer will take written notes during the interview. Your participation is entirely voluntary, and you are free to choose which questions you want to answer. You can also stop your participation at any time without any justification. The individual interviews will be planned between May and July 2022.

For quantitative data provision: After the interview, you may be asked to fill out a template form with numerical data useful for quantitative, site specific analysis of existing situation in terms of radiation protection. This is subject to previous agreement. Data identifying particular site or having commercial value will be classified and available only for RadoNorm scientists and used for statistical purposes. Data concerning details (e.g. activity concentration, total activity, dose rate, etc.) will be available for public to characterise scale of the problem, in particular either industry or country, but given in general.

Risks and benefits

We would like to strongly emphasize that your consent to take part in this study will be very useful for project's further work on better understanding and improvement of NORM exposure and mitigation.

The results and information obtained from this study are expected to contribute to a better knowledge of both general aspects of a wide range of NORM exposure sites and more specific aspects of NORM mobilization, transport, behaviour and final fate. The foreseen new information and knowledge is then expected to contribute to improvement of methods and tools for assessments needed for ensuring the proper radiation protection. A well-documented exchange of knowledge and experiences among target groups and involved institutions will also increase acceptance of NORM and radiation protection in the society.

No risks are foreseen for this survey as data will be collected, analysed and processed according to the international and RadoNorm project data protection standards. Neither site specific information nor data enabling information source identification will be published.