

EURAD-2 2nd wave Template #2

By submitting this proposal, you agree to the collection, storage and protection of your personal data submitted through this form. Information collected on this form is used solely for the purpose of preparing the EURAD-2 2nd wave programme. Information provided will only be accessible on a need-to-know basis. You can access your personal data, rectify it, request its deletion or exercise your right to limit the processing of your data at the following address dpd@andra.fr.

Short Acronym and full Title	TOSCA - TO xic Substances& Chemicals behaviour A ssessment		
Type of activity	<input type="checkbox"/> R&D	<input checked="" type="checkbox"/> Strategic Study	
Budget estimation (total budget in M€, i.e ~ 1.5 M€)	1 M€	Duration of the WP (in months)	24
Links with EURAD SRA / Roadmap Themes (if multiple choices, indicate the primary link in bold – maximum 3)	<input type="checkbox"/> Programme Management (Theme 1) <input checked="" type="checkbox"/> Pre-disposal (Theme 2) <input type="checkbox"/> Engineered Barrier Systems (Theme 3) <input checked="" type="checkbox"/> Geoscience (Theme 4) <input type="checkbox"/> Disposal facility design and optimisation (Theme 5) <input type="checkbox"/> Siting and Licensing (Theme 6) <input checked="" type="checkbox"/> Safety Case (Theme 7)		
Links with EURAD SRA topics (if multiple choices, indicate the primary link in bold – maximum 3)	<ul style="list-style-type: none"> - 2.1.1 Evaluate waste inventory from generators and existing storage, accounting for future waste generation and evolution (Inventory) - 2.1.2 Identify parameters and metrics for waste acceptance criteria through whole life cycle (Waste Acceptance Criteria) - 1.2.4 Implement a system of appropriate oversight, a management system, regulatory inspections, documentation, and reporting obligations for radioactive waste and spent fuel management activities (Waste Management System) 		
SRA drivers (maximum 3)	<input checked="" type="checkbox"/> Implementation Safety	<input type="checkbox"/> Tailored Solutions	<input checked="" type="checkbox"/> Scientific Insight
	<input type="checkbox"/> Innovation for Optimisation	<input checked="" type="checkbox"/> Societal Engagement	<input type="checkbox"/> Knowledge Management
Objective (What) – 1 sentence	Analyse the current knowledge and identify relevant gaps on toxic substances and chemicals in the areas of their inventories, sources terms, their behaviour in engineered barriers and the geosphere, and their interactions with the biosphere, to propose an evidence-based approach for integrating non-radiological toxicity into the safety assessment of the repositories and contribute to strengthen trust from all stakeholders.		

<p>Justification: impact / innovation / added-value (Why) – bullet points or short paragraph (maximum quarter of a page)</p>	<ul style="list-style-type: none"> - The assessment of the impact of toxic chemicals is a major topic of safety assessments for repositories (surface, near surface and deep geological repository) especially considering the hazardousness and the potential persistency of these substances. Whilst repositories are primarily intended to afford protection against radiological hazards, it is critical that the Safety Case also demonstrates the safe disposal of any associated toxic substances. - The evolution of environmental regulations, including increasing focus on emerging contaminants such as PFAS and BPA, has highlighted the need for greater confidence in the inventory of legacy waste streams. - Additionally, future waste streams, including those from Gen IV reactors, may contain significant amounts of toxic chemicals (e.g. Pb), which must be accounted for in safety assessments and disposal strategies. - Development of international best practice would help to ensure robust approaches in these areas and build regulatory confidence and strengthen the trust of all stakeholders, including civil society.
<p>List of planned tasks / subtasks with % of effort per task (5% increments) (Maximum 10 bullets)</p>	<ul style="list-style-type: none"> - Task 1 (10%): Management/coordination of the WP. - Task 2 (15%): Knowledge Management. - Task 3 (25%): Review of knowledge about the determination of the source term of toxic chemicals from different wastes, including packaging and matrices: <ul style="list-style-type: none"> o 3.1 Identify the organic and inorganic toxic chemicals subject to environmental regulations and potentially present in the different types of waste by distinguishing classical toxic substances (As, Hg, U, Pb, nitrate...) and substances of emerging concern (PFAS, phthalates, oil...) o 3.2 Identify the available characterization technologies for assessing the inventory of toxic chemicals present in the different wastes (already conditioned waste or future waste) whilst keeping in mind that the toxic chemicals can be directly present in the waste or can be degradation product(s) of the waste (e.g., phthalate) - Task 4 (20%): Review of knowledge about the toxicity of substances as individual substance or mixtures in the biosphere (impact on human and non-human biota) and identification of knowledge gaps. <ul style="list-style-type: none"> o 4-1 Impact on human health o 4-2 Impact on environmental health - Task 5 (30%): Review of knowledge about the behaviour of toxic substances in the geosphere and engineered materials, and identification of knowledge gaps. <ul style="list-style-type: none"> o 5.1 Chemical behaviour of toxic chemicals (including solubility, speciation, complexation and transformation reactions)

	<ul style="list-style-type: none"> ○ 5.2 Chemical interactions with natural and/or engineered barriers (including retention, transport processes, interactions that could lead to barrier degradation)
<p>List of expected outcomes linked to the identified SRA drivers</p> <p>(Maximum 6 bullets)</p>	<ul style="list-style-type: none"> - Implementation for safety: While repositories are primarily designed to protect against radiological hazards, incorporating toxic substances into the safety case will further strengthen the case for the overall safety of disposal. - Scientific Insight: A review of current knowledge about toxic chemicals and substances will help to identify the next R&D steps needed to address their behaviour and potential impacts within the repository. - Societal Engagement: This work package aims to address the emerging issue of non-radiological toxicity in the light of evolving environmental regulations, including an increasing focus on persistent (chemical) pollutants notably thanks to the direct involvement of civil society representative from the TSO college.
<p>Deliverables</p> <p>(Maximum 6 – including the prescribed deliverables)</p>	<ul style="list-style-type: none"> ● D1. Green Paper - position paper on the shared understanding among the three colleges regarding the issue of toxic chemicals in radioactive waste repositories ● D2. White Paper - Identification of knowledge gaps for future R&D activities ● D3. Outcome/impacts report to Member States and End Users
<p>Critical input requirements & identified risks</p>	<ul style="list-style-type: none"> ● Limited feedback from EURAD community on the inventory data ● Existence of data about emerging contaminants in the source term inventory ● Confidentiality of the source term data ● Tasks not working in a complementary way
<p>(Optional - Explain what is out of the scope?)</p>	
<p>List of preliminary interested organisations as partners in the WP contributing effort; % of effort (person months, by College)</p>	<p>WMO: (30-35%) Andra, BGE, NWS, Nagra, NES, Ondraf/Niras, PURAM, SOGIN, SURAO</p> <p>TSO: (25-30%) AGES, ASNR, CIEMAT, FTMC, SSTC NRS, NTW, VTT</p> <p>RE: (35-40%) AMPHOS21, AtkinsRealis, CEPN, EGIS, GSL, GTK, HZDR, KIT, LEI, POLIMI, PSI, SCK-CEN, UFZ,</p>

If applicable - links with previous projects / work packages	Ongoing projects (EURAD II): RAMPEC, DITUSC, L'OPERA, ICARUS and STREAM Previous project: CORI (EURAD I), CEBAMA
WP Preparation Team (1 member per College) contact (organisation + person, email)	WMO: Benjamin FRASCA - Benjamin.frasca@andra.fr - +33.1.46.11.83.45 TSO: Frederic COPPIN- frederic.coppin@asn.fr - +33.4.42.19.96.21 RE: Anke NEUMANN - anke.neumann-jenal@psi.ch - +41.56.310.38.13