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ABSTRACT:

The works done in WP4 had as an objective to be more responsive to the needs of waste management organizations and stakeholders in large, to bring inputs and to get support from the IGD-TP platform through CMET WG and to ensure more efficient and permanent coordination of the PETRUS initiative in order to facilitate its sustainability. Creating the link between PETRUS III project and IGD-TP's CMET WG appears as a natural process since many of the consortium participants are already member of the IGD-TP and have expressed their interest in the CMET Working Group membership. Created link supported CMET SecLGD2 project and helping exchange the results between CMET WG and PETRUS consortium.

RESPONSIBLE:

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INTERNAL REFERENCES:

1. PPT presentation: PETRUS III WP4 Think-tank activities and link with CMET, IGD-TP, IGD-TP CMET WORKING GROUP MEETING No. 2; Madrid, Spain, Universidad Politecnica de Madrid, 20-21 November 2013
2. D4.21: Minutes of PETRUS CMET exchange workshop M6
3. D4.22: Minutes of PETRUS CMET exchange workshop M12
4. D4.23: Minutes of PETRUS CMET exchange workshop M18
5. D4.24: Minutes of PETRUS CMET exchange workshop M24
6. D4.25: Minutes of PETRUS CMET exchange workshop M30
7. D4.26: Minutes of PETRUS CMET exchange workshop M36
8. D4.461: End-user Council meeting No. 1
9. D4.462: End-user Council meeting No. 2
10. D4.463: End-user Council meeting No. 3

Signatures

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Identifier	Date	Short description
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Abbreviations

E&T	Education and Training
IGD-TP	Implementing Geological Disposal of Radioactive Waste Technology Platform
CMET WG	Competence Maintenance, Education and Training Working Group
TOR	Terms of Reference
WMO	Waste Management Organisation
ENEN	European Nuclear Education Network Association
EUC	End-user council meeting
EEUCM	Extended end-user council meeting
SRA	Strategic Research Agenda
EF	Exchange forum

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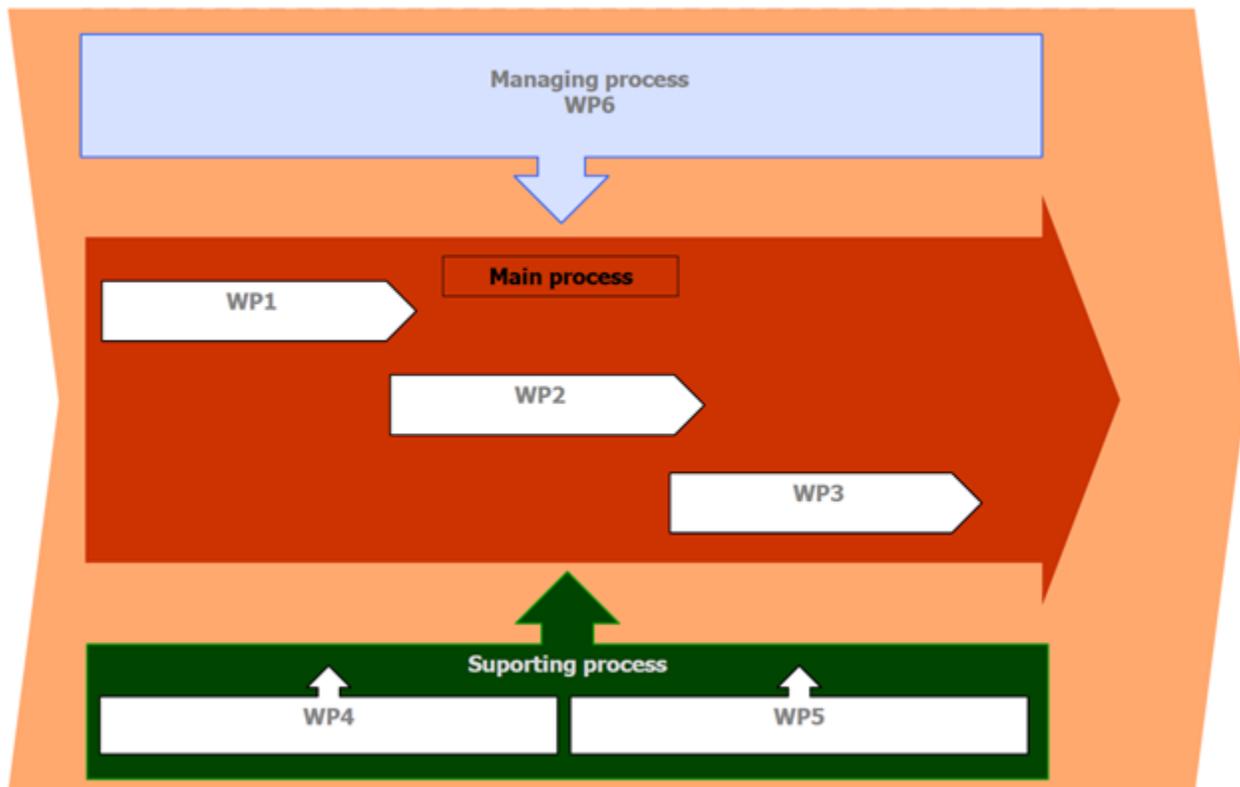
1) Background

PETRUS III project is the one of ECVET BASED EFTS ("EURATOM FISSION TRAINING SCHEMES") implementing sustainable E&T programme in the field of Radioactive Waste Disposal towards geological disposal E&T goals.

Its objectives are:

- Practical implementation of the PETRUS training programme following ECVET principles. Learning outcomes will be defined in a "Competency-Based Curriculum", using the "Designing a Curriculum" (DACUM) process, established by British Columbia University.
- Elaboration of a multidisciplinary training framework for PhD students. The objectives are 1) to fast-track research activities in geological disposal by proposing customised training programmes, 2) organizing periodic PhD workshops and 3) favouring the emergence of multidisciplinary research.

Trough process approach to the project (**Picture 1**), the End-User Council represents important cross road between end users, program providers and strategic interests (IGD-TP's CMET WG).



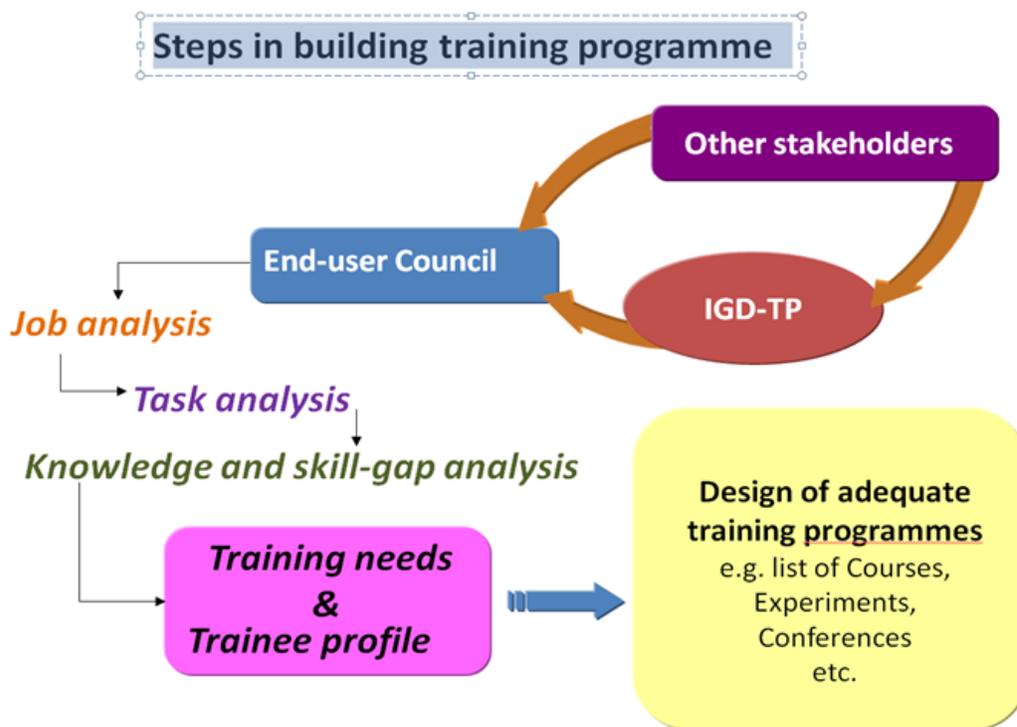
Picture 1: Process approach to PETRUS III project

2) PETRUS End-user council and link with IGD-TP's CMET working group

The works done in **WP4** had as an objective to be more responsive to the needs of waste management organizations and stakeholders in large, to bring inputs and to get support from the platform, and to ensure more efficient and permanent coordination of the PETRUS initiative in order to facilitate its sustainability.

The WP4 activities were organised through PETRUS III steering board, PETRUS III End-user Council and as collaboration with IGD-TP's CMET WG.

Links between the **PETRUS III** project and **IGD-TP's CMET WG** was established to continue the E&T initiatives and their deployment relying on the support of the radioactive waste community. This involves setting-up of a strategic policy to match E&T supply with demand and to find a continuing framework for the Professional Development scheme and its coordination (**Picture 2**).



Picture 2: End-user Council relations in the project toward IGD-TP's CMET WG

The role End-User Council was to provide advice, insight, input and vision for the strategic development of the project. Dialogue with the IGD-TP's Competence Maintenance Education and Training (CMET) Working Group with the aim of continuing the development of Professionals'

training scheme and its coordination has been concretised in one hand by the interaction with PETRUS End-users Council and by the other hand with the organisation of common meetings.

The fact that information flow is crucial was emphasized (D6.43).

3) PETRUS III – CMET IGD-TP activities

The IGD-TP has initiated as part of the deployment of its SRA a working group on Competence Maintenance, Education and Training (CMET). The PETRUS III consortium was complement the work of this CMET group from the E&T provider side participating following meetings:

- IGD-TP CMET Meeting No. 1, April 9, 2013 (Berlin Spandau, Germany, BGR facilities, Wilhelmstrasse 25-30)
- IGD-TP CMET Meeting No. 2, November 20-21, 2013 (Universidad Politecnica de Madrid, Madrid, Spain Foundation Gómez Pardoín the School of Mines. Address c/ Alenza, 1. 28003 Madrid, Spain)
- IGD-TP CMET Meeting No. 3 – Part 3A, March 12, 2014 (Cardiff University, Cardiff School of Engineering Graduate Centre, Cardiff University Union Building, Third Floor, Park Place, Cardiff, CF10 3AT. Room 3.19)
- IGD-TP CMET Meeting No. 3 – Part 3B, April 9, 2014 (TU Delft, Civil Engineering and Geosciences Building, Stevinweg 1, Room 2.52. 2628 CN Delft, The Netherlands)
- IGD-TP CMET Meeting No. 4, November 26, 2014 (Institut finlandais, 60, rue des Écoles/ 33, rue de Sommerard, 75005 Paris, auditorium)
- IGD-TP CMET Meeting No. 5, April 21, 2015 (Sala 02.1 - IST Alameda Campus, main building, Lisbon, Portugal)
- IGD-TP CMET Social Media Training Session for CMET/PETRUS team, April 22, 2015 (Sala 02.1 - IST Alameda Campus, main building, Lisbon, Portugal)
- IGD-TP CMET Meeting No. 6, December 7-8, 2015 (B168 CTU, Thákurova 7, 16629 Prague 6, Czech Republic)
- IGD-TP CMET Meeting No. 7, April 12, 2016 (M hotel, Derčeva ulica 4, 1000 Ljubljana, Slovenia)

Documentation was published on IGD-TP Intranet (webb: <https://service.projectplace.com>) in folder [CMET meetings No 1-6 and EF5 materials](#).

Resultes important for Consortium were presented during regular regular PETRUS III project meetings and addreeseed on End-user council meetings. Two Extended end-user council meetings were organised in Lisbon (D4.462) and in Ljubljana (D4.463) by PETRUS III WP4 leader with CMET WG and different stakeholders of EFTS to present their view and suggestions as additional inputs for PETRUS E&T program (D4.24 and D4.26).

4) PETRUS III – CMET IGD-TP results

First time PETRUS III initiative, main objectives and plan of PETRUS III WP4 Think-tank activities and link with CMET, IGD-TP was presented in IGD-TP CMET working group meeting No. 2 in Madrid (D4.21).

First PETRUS III End-user council meeting was organised in Kalmar. The members to EUC were came from WMO representatives and other interested organisations (SKB, IGD-TP and CMET). During the meeting the members agreed on the Terms of Reference for EUC work with the aims and objectives, scope of the group, members, working methodology, communication procedures and decision making. At the meeting already approach to the first job description “Performance and safety analysis engineer” was agreed and comments sent to WP1 (D4.461).

The contribution of the PETRUS III project partners formed a direct link between the PETRUS III and the CMET by participating in the CMET activities as part of the PETRUS III work. (D4.22).

PETRUS III – CMET IGD-TP activities followed two objective:

Objective 1: The IGD-TP has initiated as part of the deployment of its SRA a working group on Competence Maintenance, Education and Training (CMET). The PETRUS III consortium will complement the work of this CMET group from the E&T provider side. Creating the link between PETRUS III project and IGD-TP's CMET appears as a natural process since many of the consortium participants are already member of the IGD-TP and have expressed their interest in the CMET Working Group membership.

Posiva as a partner in the SecIGD2 project and as a chair of the CMET working group has with the SecIGD2 resources provided and facilitated the opportunity for the PETRUS III partners to link with the IGD-TP's CMET working group. The PETRUS III grant resources have not been used by Posiva for this task, but Posiva has received special assistance from PETRUS III members, especially UPM Madrid (CMET No. 2), Cardiff University (CMET No. 3A) and TU Delft (CMET No. 3B) for making the participation of the PETRUS III members and their inputs to the CMET meetings possible during the first period. Related input has been provided to the WP4 leader on the expectations of the IGD-TP CMET on PETRUS III, the job profiles developed in WP1 following the ECVET principles are the most import inputs. They have been reviewed from the end-user perspective.

Objective 2: IGD-TP prioritizes the strategic research, development, and demonstration areas in geological disposal in its SRA 2011 where new competence and education and training are jointly needed. The PETRUS III consortium will provide inputs to and take benefit from the activities of IGD-TP's CMET working group under the guidance of the IGD-TP's Executive Group and in interaction with the IGD-TP's Exchange Forum. The continuation and improvement of the Professional development scheme and mutual recognition of the training programmes will be of the common interest of such collaboration. Furthermore, this link has been also recommended by PETRUS End-users council as a key element for the sustainability of the PETRUS initiative.

Posiva as a part of the SecIGD2 project organized a special session at the IGD-TP's Exchange Forum No. 5 at the end of October 2014. For this walkabout session, Posiva chaired the CMET meetings that lead to the formulation of the walkabout questions including the inputs from the PETRUS III partners especially at the Cardiff CMET 3A meeting. Further the PETRUS III project provided for 8 walkabout station hosts out of the 13 hosts in total at the EF5.

The special introduction to the PETRUS III project meeting No. 3 in Kalmar, Sweden about the IGD-TP's EF5 walkabout is one of the main direct contributions for the linking of the activities of the PETRUS III and the CMET working group. The walkabout outcomes themselves also served directly also the PETRUS III objectives, especially the outcomes of the station 2, reported by Jussi Leveinen, Aalto and Walter Ambrosini, ENEN (**Picture 3**). Further discussions took place in CMET No. 5, April 2015 in Lisbon back-to-back with PETRUS III (D4.23). In Lisbon the CMET social media training workshop took place also for PETRUS members where CMET PETRUS team seemed excited to take some practical ideas and learnings back to their home countries. The team enjoyed the sessions and were open to learning both well-known and cutting edge techniques in online learning & community building.

To intensify the collaboration with IGD-TP CMET WG Extended end-user Council meeting was organised by PETRUS III WP4 leader in Lisbon addressing following questions: What kind of profiles are needed addressing the knowledge, skills and competences? How to create, maintain, transfer and manage the knowledge needed? How to assure skills and competences related to required safety culture? CMET members, PETRUS III members and IAEA representatives were participated (D4.24). Revision of job profile was presented and discussed. Comments were sent to WP1 (D4.462), **picture 4**.

During IGD-TP CMET working group meeting No. 6 long round table discussion took place around the participants' perspectives to the CMET activities. The starting point was the CMET activity itself which was discontinuing under the IGD-TP at the decision of the IGD-TP EG No. 17. The future of the activity was discussed: Whether to maintain the networking, in which form and under which umbrella, if any. The participants agreed that there is a need for the activity (as a network or umbrella). Based on the decision of the IGD-TP EG 17 and further confirmed by the EG 18 meeting, the last CMET meeting of the IGD-TP JA 14 will be the CMET No. 7 meeting that will take place under the umbrella of PETRUS III project in Ljubljana, Slovenia on 12 of April 2016 (D4.25).

PETRUS III plans for continuation aim to address a PhD school with industry relations were also discussed. Update on the PETRUS III activities were presented (WP4). Additionally on PETRUS III WP5 a new draft deliverable D5.2 "Integration of European Label" was presented. The document introduced the various workable alternatives for the PETRUS III certification.

Based on Steering board decision three events were organized synchronously by ARAO in Ljubljana, Slovenia (April, 2016) (D4.35):

- under umbrella of PETRUS III the IGD-TP CMET WG meeting No. 7
- PETRUS III Extended End-User Council meeting No. 2 and
- PETRUS III project meeting No. 6.

Taking the CMET group under PETRUS umbrella in the beginning of 2016 the PETRUS group (ARAO) hosted the first CMET meeting (No. 7) without the IGD-TP Executive Group's support. This CMET meeting under Posiva chair evaluated the work and deliverables done under the CMET Joint Activity with the support of the SecIGD2 Project (FP7 EC-GA 323 260). In addition, the group identified the main areas for the CMET and the PETRUS groups' needs including:

- Creation of eLearning/blended learning training courses and educational modules that could be implemented to the Europe wide audiences by using e.g. the tools introduced in the CMET social media training workshop that took place in Lisbon in April 2015.
- Providing access to and make more use of existing underground laboratories and facilities in education and training of geological disposal. A similar joint training model exists at the IAEA and funding is required to ensure that the facilities remain open and operating for the universities and research communities and for professionals.
- Addressing decommissioning competence needs. Decommissioning has become topical and included several cross-cutting needs including radiation protection, waste classification, demolition of structure and waste handling of both solid and liquid waste and the planning, construction and operation of suitable waste facilities and repositories. Extensive work has been carried out by JRC Petten and EHRO-N in defining the decommissioning qualifications using the ECVET principles and work is needed to ensure that the qualifications can be acquired e.g. by appropriate training.
- Preparing a communication plan for and about the CMET activities.

The outcomes of the CMET meeting were reported in the minutes of the CMET No. 7 (D4.26) and published on the ENEN website under the PETRUS III project website. In addition, the CMET group revised its Terms of Reference to take into account the discontinuation of the CMET Joint Activity under the IGD-TP Executive Group's Deployment plan. The new Terms of Reference are also published on the PETRUS III website.

Main outcomes are also included in discussion during PETRUS III Extended end-user council meeting No. 2 (D4.463).

5) Conclusion and Recommendations

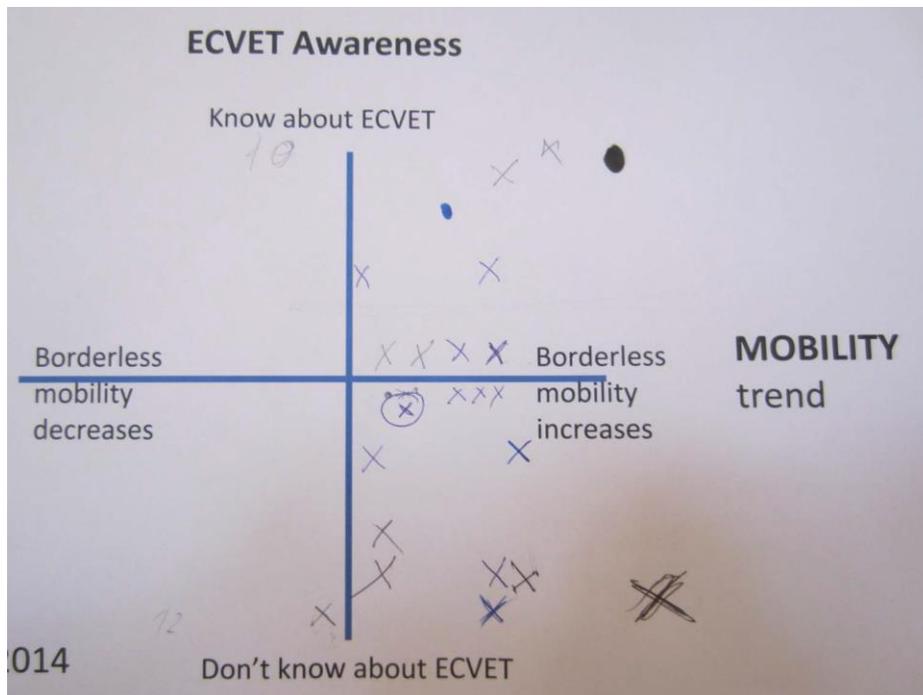
In Task 4.1 Link with the IGD-TP the PETRUS group has been an active contributor to the initiation of the IGD-TP and its exchange forum since its beginning. The Work package 4 activities stemmed from the desire of the PETRUS group and PETRUS III consortium to support the deployment of the IGD-TP's cross-cutting activity Competence maintenance, education and training (CMET). PETRUS group was also mentioned in the IGD-TP SRA as an active provider in the field of E&T in geological disposal in this plan. The IGD-TP initiated in 2011 as part of the deployment of its SRA a working group on Competence Maintenance, Education and Training

(CMET). The PETRUS III consortium contributed significantly the work and to the deliverables of the SecIGD2 WP 3 of this CMET group from the E&T provider side. The interaction was seen as an important element and the link between PETRUS III project and IGD-TP's CMET appeared as a natural process since many of the consortium membership were participants to the IGD-TP. Furthermore, this link has been also recommended by PETRUS End-users council as a key element for the sustainability of the PETRUS initiative.

A major input by the consortium members was made for the Kalmar Exchange Forum No. 5 (EF5) with the implementation of a walkabout to study the sentiments of the Exchange Forum participants towards a voluntary accreditation scheme. The response of the audience was cautious, but favourable. However, the IGD-TP Executive Group (EG) not being present at the walk-about session of the EF renounced itself from the outcomes of the Exchange Forum and from the deliverable on the feasibility of the voluntary accreditation body. Furthermore, the deliverables of the CMET group were not published on the IGD-TP's website with the exception of the EF5 presentations and the CMET Strategy and action plan. The work has contributed to increased awareness of the European developments on mutual recognition of professional qualifications and on their assessment using the ECVET approach.

The PETRUS III project with the assistance of ENEN association published all the CMET deliverables under the SecIGD2 project on the ENEN website under PETRUS deliverables to ensure that the work carried out and including the contributions from the PETRUS consortium members would be publicly available for the interested parties. Also the CMET social media training workshop materials are published. Posiva has acted as the CMET group chair during the PETRUS III project and presented the activities of the group to the PETRUS III Extended end-user councils and documented the CMET activities under the PETRUS III project since the beginning of 2016.

Majority of the CMET group members acknowledged the value of this type of unique professional discussion and exchange forum on educational and training developments in geological disposal and desired to continue this activity despite of the financial limitations. The group will continue its collaboration currently under Posiva's chair and with the help of an electronic extranet forum provided by the CTU. The current CMET group has over 20 voluntary members from 19 different organisations and 12 different European countries. The continuation of the work in the future under ENEN umbrella was recommended by PETRUS III consortium.



Picture 3: Outcome example of station No. 2 (EF5).

Ref.	Job Title	Occupational Category
PETRUS3	Safety Engineer – Assessment and Performance Analysis for construction license of a selected site	<i>Professional (Engineer/Expert)</i>
Phase / Area	Alternate job title(s) – specialisations	Functional Category
Radioactive Waste Disposal	<i>Safety analysis coordinator for transport modelling</i>	<i>Specialist in hydrogeological modelling</i>
Role / Functions		
<p><i>The safety engineer specialised in integrating and analysing site specific geochemical and hydrogeological data as an input data for carrying out numerical modelling and calculations for dose estimation under various likely scenarios for the [future] repository.</i></p>		
<ul style="list-style-type: none"> To produce scoping models and perform numerical simulations to provide phenomenological and conceptual description of the behaviour of the repository system and of each repository and geological component during the (evolution of the repository) operating and post-closure periods, in space and time (thermal, hydraulic, chemical, mechanical, gas, radiation and biological processes and the potential release and transfer of radionuclide/toxic substances into biosphere), including related uncertainty analyses. 		

Picture 4: Part of job profile description prepared by PETRUS III WP1 leader