



Atoms for Peace

الوكالة الدولية للطاقة الذرية  
国际原子能机构  
International Atomic Energy Agency  
Agence internationale de l'énergie atomique  
Международное агентство по атомной энергии  
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2015-07-16

**Subject:** Invitation to a Regional Workshop on Use of Engineered Barriers in Environmental Remediation Works, Dushanbe, Tajikistan, 16-20 November 2015

Dear National Liaison Officer,

I am pleased to invite you to send nominations of suitable candidates to participate in the above-mentioned workshop under the framework of TC Project RER/9/121 – Supporting Environmental Remediation Programmes. The purpose of the workshop and related information are outlined in the attached Prospectus.

For candidates who are selected by the IAEA, the IAEA will cover the cost of return international travel from the home country to Dushanbe, Tajikistan and provide Daily Subsistence Allowance (DSA) for the duration of the workshop in line with IAEA rules and procedures.

Please submit nominations to the IAEA online through the Technical Cooperation Department's InTouch system (<http://intouch.iaea.org>). Only if this is not possible, nominations may be submitted on the Nomination Form for Meeting/Workshop available on the IAEA website: <http://www.iaea.org/technicalcooperation/How-to-take-part/In-meetings-WS/index.html>. Completed forms should be endorsed by relevant national authorities and sent to the Programme Management Officer for this project, Mr Andrei Chupov (IAEA Official Fax: +43-1-26007 or E-Mail [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org)), through the official channels, i.e. the designated National Liaison Office for IAEA matters, not later than **18 September 2015**.

Yours sincerely,

Martin Krause  
Director  
Division for Europe  
Department of Technical Cooperation

Enclosure: Prospectus

# International Atomic Energy Agency

## Regional Workshop on Use of Engineered Barriers in Environmental Remediation Works

### PROSPECTUS

- Project Number & Title:** RER/9/121 - Supporting Environmental Remediation
- Place (City, Country):** Dushanbe, Tajikistan
- Dates:** 16-20 November 2015
- Deadline for Nominations:** 18 September 2015
- Organizers:** The International Atomic Energy Agency (IAEA) in cooperation with the Government of Tajikistan through the Nuclear and Radiation Safety Agency under the State Regulatory Authority.
- Host Country Organizer:** Mr Ulmas Mirsaidov  
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ulmas2005@mail.ru
- Language:** The workshop will be conducted in English (simultaneous interpretation to Russian will be provided)
- Purpose:** The purpose of the workshop is to present and discuss technical information pertaining to the use of engineered barriers for containment and management of uranium mill tailings, NORM wastes and waste resulting from the remediation of contaminated sites. The workshop will also address the use of vertical treatment zones (permeable reactive barriers) to manage contaminated groundwater at existing sites. The management of legacy tailings sites in seismic areas will also be dealt with during the event.
- Expected Output(s):** The workshop will enable the participants to understand the basic concepts and technical basis for design and use of engineered barriers and consequently select the appropriate technologies for containment and remediation. Additionally, the workshop will allow for common understanding of the application of these technologies and their limitations.
- Scope and Nature:** The workshop extends over 5 days and will deal with design and application of the following four types of engineered barriers:
1. **Covers** – used in the minimisation of infiltration of precipitation; control of the release of radon and reduction of the diffusion of oxygen into acid generating wastes e.g. sulfidic waste-rock piles and tailings,

2. **Linners** – used to minimise the release of contaminants from beneath impounded waste at new waste disposal facilities.
3. **Vertical barriers** – relevant in the mitigation and/or control of the extent of contaminated groundwater at contaminated sites. They may also be used as secondary (redundant) containment systems at new waste containment facilities.
4. **Vertical treatment zones** – (also known as permeable reactive barriers) – applied in the treatment of contaminated groundwater.

The workshop will discuss these technologies individually and in terms of integrated systems.

The content of the workshop is designed to enhance the knowledge and understanding of applications of these types of barriers for managing environmental remediation and containment programmes. It will provide an understanding of engineering concepts, methods of design, construction and monitoring of these systems for minimizing risk to human health and environment.

The workshop will provide a thorough discussion of background information on basic concepts and theories of the principles of geotechnical engineering and hydrology upon which the technologies are based. The workshop will include methodologies for material selection, property testing, construction specification and quality assurance/quality control, performance evaluation, and monitoring. Examples and case studies will demonstrate use of engineered barriers as components in effective containment and remediation systems.

The format is lectures, followed by table exercises questions and answers and topical discussions in the context of various national situations. The participants will also be involved in the preparation of an end-of-workshop project, when they will be working in groups.

The agenda will be distributed approximately one month prior to the workshop.

**Background Information:**

Engineered barriers can be defined as any material or structure that prevents or substantially delays movement of water or radionuclides toward the accessible environment. They are widely used in environmental remediation projects as they can play different roles as for example physically contain a waste material, avoid diffusion of radon to the atmosphere, or inversely avoid the diffusion of oxygen into the waste material that may be rich in sulphide minerals, serve as a shield to gamma radiation and also reduce the infiltration of water. Engineered barriers can also be used as a passive in situ treatment zone of reactive material that immobilizes contaminants as groundwater flows through it. In these cases the barriers can be installed as permanent, semi-permanent, or replaceable units across the path of a contaminant plume.

Experience has shown that due to a lack of good design these barriers tend to have their long term performance affected prematurely calling for the need of repair or in a more drastic situation the overall reconfiguration of the barrier. These of course can lead to undue releases of contaminants to the environment and expenditure of financial resources to rebuild the overall structure.

Therefore this workshop will disseminate the relevant aspects regarding the design and construction of engineered barriers so that remediation project designers and implementers as well as regulators can be better prepared to make decisions about the use of these structures in remediation projects.

**Participation and target countries:** The workshop is open to up to 30 participants engaged in remediation activities. The target countries are: Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Greece, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, The former Yugoslav Republic of Macedonia, Poland, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Tajikistan, Ukraine and Uzbekistan.

**Participants' Qualifications:** The participants should be regulators, project managers, planners and other staff involved in planning and managing decision-making in organizations working on, or eventually to be designated as responsible for, remediation projects (e.g., state or national resource management agencies, operators of facilities or sites needing or undergoing large scale clean-up actions, regulatory bodies and national research organizations). Participants should have the appropriate scientific and/or technical background that will allow them to absorb the various elements that compose the workshop.

Participants shall be nominated by the competent national authority of the Member State and, most specifically, by the Member States' official counterpart for the project.

**Nomination Procedure:** Nominations for the workshop should be submitted to the IAEA online through the Technical Cooperation Department's In Touch system (<http://intouch.iaea.org>). Should this not be possible, nominations should be submitted on the standard IAEA Application Form for Meeting/Workshop and National Consultant (available on the IAEA website: <http://www.iaea.org/>). Completed forms should be endorsed by relevant national authorities and returned to the Agency through the official channels, i.e. the designated National Liaison Office for IAEA matters.

The completed nomination forms should be sent to the Programme Management Officer for this project, Mr. Andrei Chupov, through IAEA Official Fax (+43-1-26007) or E-Mail ([Official.Mail@iaea.org](mailto:Official.Mail@iaea.org)), not later than **18 September 2015**. Nominations received after this date or which have not been routed through the established official channels cannot be considered.

**Administrative and Financial Arrangements:** Nominating Governments will be informed in due course of the names of the candidates who have been selected and will, at that time, be given full details of the procedures to be followed with regard to administrative and financial matters.

Selected participants from countries eligible to receive technical assistance will be provided with a round trip economy class air ticket from their home countries to Dushanbe, Tajikistan and a Daily Subsistence Allowance (DSA) at the prevailing UN rate. Shipment of accumulated workshop materials to the participants' home countries is not the responsibility of the IAEA.

The organizers of the workshop do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the workshop, and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.