

# ANNUAL REPORT 2012



**SÚRAO**

RADIOACTIVE  
WASTE REPOSITORY  
AUTHORITY

## **RAWRA'S MISSION**

The Radioactive Waste Repository Authority (RAWRA) is a state organisation established under the provisions of Article 26 of Act 18/1997, on the peaceful uses of nuclear energy and ionising radiation (the Atomic Act) and on amendments to certain other Acts. RAWRA's mission is to ensure the safe disposal of existing and future radioactive waste in compliance with the requirements of nuclear safety and human and environmental protection.

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# MANAGING DIRECTOR'S INTRODUCTION

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**Mr. Jan Prachař**

Dear friends,

Since 1997 the Radioactive Waste Repository Authority (RAWRA) has provided for the safe disposal of radioactive waste in the Czech Republic. We would like to bring you up to date via this Annual Report on our activities and results achieved in 2012.

As in previous years, the operation of the Dukovany, Richard and Bratrství repositories and the disposal of low-level and intermediate-level radioactive waste at these repositories was undertaken in compliance with the relevant legislation and licences granted by the State Office for Nuclear Safety. Nuclear safety, radiation protection, physical protection, emergency preparedness and the maintenance of buildings, machinery and equipment were fully provided for at all times and at all operational repositories.

During the year a new gatehouse was opened at the Richard repository, the testing of waste transport containers continued at the test laboratory, the K2 disposal chamber at the Bratrství repository was stabilised and a licence for the Dukovany repository operation and radioactive waste disposal was granted for a further 5 years.

RAWRA continued to push ahead with the preparation of a deep geological repository for the disposal of high-level radioactive waste and spent nuclear fuel and work continued during the year on the detailed study of the long-term behaviour of the waste disposal system. The updating of RAWRA's reference project for the deep geological repository was completed in 2012; the project provided important information concerning horizontal spent nuclear fuel emplacement.

With regard to the siting of the future deep geological repository, preparatory work commenced on the Authority's first application for the defining of an investigation area for intrusion into the Earth's crust at the Kraví hora locality; applications for a further 6 localities will be prepared during 2013. In addition, 2012 saw the launch of the preparatory stage of a project for an underground experimental facility Bukov.

RAWRA's communications activities continued to target those regions in which candidate repository sites are located. During 2012, public discussions were held at the individual municipalities concerned, as were a round table discussion with the participation of the public in Jihlava on the selection process for a candidate site suitable for repository construction, and an expert seminar at the Senate of the Czech Parliament. Special excursions were organised for inhabitants of selected local communities to the Richard repository and the Josef underground research laboratory. RAWRA also launched the publication of information leaflets and a newsletter named "Zprávy ze Správy" ("News from RAWRA") which is distributed on a quarterly basis to every home at candidate localities.

For the first time ever in the Czech Republic we hosted a Forum on Stakeholder Confidence (FSC) of Nuclear Energy Agency (OECD-NEA). The workshop, entitled "Expectations and Challenges for the Czech Republic in the Process of Deep Geological Repository Siting", consisted of discussions between the various stakeholders involved in radioactive waste management issues. In an atmosphere of mutual understanding, international experts shared their experience with their Czech counterparts and other participants.

Work continued during the year on the updating of the Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic in close cooperation with the Ministry of Industry and Trade and the State Office for Nuclear Safety.

Finally, allow me to say that RAWRA successfully fulfilled its mission in 2012. We continued to operate our radioactive waste repositories safely and in compliance with international standards and, in cooperation with leading Czech experts and foreign colleagues, we continue to closely follow the latest research and development trends in the field of radioactive waste management. It is my pleasure once again to express my thanks to all RAWRA's employees as well as to our various partner organisations for their contributions towards our achieving such highly satisfactory results in 2012.



**Mr. Jan Prachař**  
**Acting Managing Director**

# CURRENT SITUATION IN RADIOACTIVE WASTE MANAGEMENT

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Short-lived low-level and intermediate-level waste makes up the largest category of radioactive waste in terms of volume. This type of waste, liquid or solid, is generated during the operation and decommissioning of nuclear reactors and when dealing with ionising radiation sources and ceases to be radioactive after a few hundred years and, therefore, can be disposed of in near-surface repositories. The technology for the processing and conditioning of such radioactive waste prior to its disposal is well-established and is implemented in the Czech Republic.

Short-lived low-level and intermediate-level waste generated at nuclear plants is stored at a surface disposal facility located at the Dukovany NPP site. The facility's total disposal capacity of 55,000m<sup>3</sup> (about 180,000 drums of 200 litres each) is able to accommodate all the waste that is estimated to be generated at the Dukovany and Temelín NPPs provided that the waste meets acceptability criteria, as well as short-lived low-level and intermediate-level waste to be stored following the decommissioning of both nuclear power plants. In addition, this disposal facility is partly used for the disposal of institutional waste, i.e. short-lived low-level and intermediate-level waste generated by industry, research and medical activities. This waste is also disposed of at the Richard (near Litoměřice) and Bratrství (near Jáchymov) repositories.

The Richard repository was constructed on the site of the former Richard II limestone quarry (underground, beneath the Bídnice hill). Institutional waste has been disposed of at this site since 1964. The total volume of this underground facility exceeds 17,000m<sup>3</sup>, the disposal capacity making up approximately half that volume (the remainder being service corridors).

The Bratrství repository is designed for the disposal of waste containing naturally occurring radionuclides. It was constructed in one of the mined cavities of a former uranium mine and contains five chambers with an overall capacity of approximately 1,200m<sup>3</sup>. The facility was put into operation in 1974.

The operation of all Czech repositories, including the monitoring of the now-closed Hostim repository, is managed by RAWRA in compliance with relevant licences granted by the State Office for Nuclear Safety (SÚJB) and, in the case of mined cavities, in compliance with permits and licences issued in accordance with mining regulations of the Czech Mining Authority (ČBÚ). The overall capacity of Czech repositories provides enough space for waste disposal for the next several decades. Until the time when new repositories for the disposal of low-level and intermediate-level waste need to be constructed, the capacity of existing facilities will be exploited to the optimum level and, if necessary, their enlargement will be considered.

A certain amount of long-lived low-level and intermediate-level waste that cannot be disposed of in existing near-surface facilities is also generated. For this type of waste, special requirements are in place concerning the method and quality of conditioning necessary for its storage and subsequent disposal in a deep geological repository. This waste is currently stored either by waste producers or by RAWRA.

High-level waste and spent nuclear fuel (classed as waste) will be disposed of in the deep geological repository. Until the time the deep geological repository comes into operation, this waste will be stored by its producers who can decide on its potential further use.

### **1.1 OPERATION OF THE DUKOVANY REPOSITORY**

The Dukovany repository is operated by RAWRA through ČEZ, the Czech power company, on a contractual basis (in accordance with the Atomic Act, Article 26). The acceptance of waste to be disposed of at this repository and certain other responsibilities, such as inspections, are carried out directly by RAWRA, in compliance with operating regulation P147j, the Limits and Conditions for the Safe Operation of the Dukovany Repository and other documents issued by RAWRA or ČEZ, the contractor.

Normal repository operation included an inspection of buildings and equipment, the maintenance of buildings, land, machinery and electrical equipment, radiation protection, physical protection, emergency preparedness and nuclear safety.

In 2012, the repository accepted 2,246 radioactive waste disposal packages, of which 2,211 metal 200-litre drums, 20 storage pallets with a capacity of 0.4m<sup>3</sup>, 14 MOZAIK containers and one waste disposal package with a capacity of 1.1m<sup>3</sup>. Waste disposal packages were placed in vaults D09 and D012. The Dukovany nuclear power plant delivered for disposal a total of 1,043 waste disposal packages of bituminised waste, 21 disposal packages of unstabilised waste and 697 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix. The Temelín NPP delivered for disposal 303 waste packages of bituminised waste, 106 waste packages of unstabilised waste (of which 11 storage pallets containing bulky lump waste) and 50 packages of waste solidified into an aluminosilicate matrix. The Nuclear Research Institute Řež (ÚJV Řež) delivered for disposal 26 waste packages. 9 storage pallets containing unstabilised bulky lump waste were placed in vault D09. 14 MOZAIK containers, 2 metal 200-litre drums and one package of solidified waste were placed in vault D12.

The monitoring of the repository and the surrounding areas was performed in accordance with the approved monitoring programme; no breach of the limits and conditions for the safe operation of the Dukovany repository were detected. Four inspections were conducted by the State Office for Nuclear Safety at the Dukovany repository during 2012; no serious breaches were discovered during these inspections.

## **1.2 OPERATION OF THE RICHARD AND BRATRSTVÍ REPOSITORIES**

Both the Richard and Bratrství repositories were operated by RAWRA during 2012 in compliance with the relevant licences issued by the State Office for Nuclear Safety (SÚJB) and the Czech Mining Authority (ČBÚ). Normal operation of both repositories covered the inspection of the mined cavities, the maintenance of buildings and equipment, land, machinery and electrical fittings. RAWRA was also responsible, in accordance with the relevant SÚJB licences, for the physical protection, radiation protection, emergency preparedness and nuclear safety of these repositories.

In 2012, 268 standard waste packages (53.6m<sup>3</sup>) were disposed of at the Richard repository with a total mass of 120t. A further 2 packages of radioactive waste were accepted at this repository with a total mass of 0.673t. 42 waste packages were disposed of at the Bratrství repository with a total capacity of 8.4m<sup>3</sup> and a mass of 13.5t. Chamber K2 was stabilised in the first half of 2012 in compliance with conditions set out in the Bratrství repository operating licence.

The geotechnical and hydrogeological parameters of the Richard and Bratrství repositories were monitored regularly throughout the year. Both facilities were operated in compliance with the relevant statutory safety requirements and legal regulations. Radiation monitoring of the repositories and surrounding areas was carried out in accordance with approved monitoring programmes. RAWRA's performance was supervised during 2012 by the SÚJB (five inspections at the Richard repository and four inspections at the Bratrství repository) and the relevant mining supervisory bodies. Both repositories were declared to be operating safely according to national legislation.

The test laboratory at the Richard repository is used to test containers designed for the transport, storage and disposal of nuclear material and radioactive emitters (with a mass of up to 3200kg) as well as to test radioactive substances of special form. Two B(U) type transport containers and one A type container were tested during 2012. In addition, a thermal test was carried out and the validity of four certificates extended.

The laboratory also provided consultancy services to container users and manufacturers throughout the year. The laboratory's total income for 2012 amounted to CZK 392.6 thousand.

The Richard repository is currently being used for the temporary management of certain radioactive waste (according to an SÚJB Decision issued in compliance with the Atomic Act, Article 26, paragraphs 3j and 3k and Article 31, paragraph 4).

**Mr. Martin Březina**  
**Head of the Repository Operation Department**

# LICENCING AND RADIATION PROTECTION

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The main aim of activities related to the licensing procedure and radiation protection is to ensure repository operation and radioactive waste management in compliance with the provisions of the Atomic Act and relevant Regulations, primarily SÚJB Regulation 307/2002, on radiation protection.

The licensing procedure for the Richard, Bratrství and Dukovany repositories is carried out every five years unless the SÚJB decides otherwise or unless no changes occur in repository operation or in the properties of waste disposed of which might have an impact on the fulfilment of radiation protection requirements. The basic documentation required for the licensing procedure is prepared in compliance with the Atomic Act. The safety report makes up the basic document which proves the safety of the repository in terms of the staff employed at the facility, the general public and the environment. The scope of the safety report is specified in methodological instructions issued by the SÚJB and based on recommendations from the International Atomic Energy Agency (IAEA) in Vienna. The radiation burden of staff members, the public and the environment is assessed using regularly verified procedures and as part of a number of international programmes. Computing tools and computer programs used for safety analysis purposes have been standardised by an SÚJB commission and are used to determine the consequences of potential radionuclide migration from repositories.

Repository safety is ensured if set limits and criteria for the safe operation of such facilities, based on the results of safety analyses and approved by the SÚJB, are observed. The observance of set limits and criteria for the safe operation of repositories means that requirements relating to the radiation protection of staff members, the public and the environment are fulfilled.

Radiation protection activities make up one element of the system for the protection of persons and the environment against the detrimental impact of ionising radiation,

the main reason behind which is to prevent the release of radionuclides into the environment and the occurrence of emergency situations. A specially-designed system made up of a range of technical and organisational measures is used for this purpose. The risk of danger to human life and health and the environment must be kept as low as possible with reasonable consideration for the economic and social aspects involved. The maximum acceptable level of risk corresponds to dose limits defined by SÚJB Regulation 307/2002, on radiation protection.

RAWRA operates its repositories and performs the relevant support activities in compliance with SÚJB licences issued in accordance with the Atomic Act. Additional relevant documentation required for RAWRA to operate its repositories has been approved (the licence for the Dukovany repository is effective until 15 December 2017, for the Richard repository until 30 October 2013 and for the Bratrství repository until 15 December 2013).

In December 2012, RAWRA obtained a licence for radioactive waste management at the Dukovany repository and a licence for the operation of this repository, a category IV facility. A further licence was obtained for a fixed term during which the stabilisation of chamber K2 at the Bratrství repository will be completed.

The fulfilment of requirements relating to radiation protection (as defined by Regulation 307/2002) has been verified during the monitoring of currently operational repositories as well as at the now-closed Hostim repository. The individual dosimetry of RAWRA's employees was provided, the health, expertise and skills of A and B category repository staff were verified and the inventory of individual doses received by RAWRA's staff members as well as RAWRA-owned radiation sources updated. No radiation protection breach occurred during the year. RAWRA cooperated closely with outside contractors working at its repositories in terms of organising training courses and regular safety inspections.

Concerning statutory requirements for radiation protection, RAWRA co-operated closely with the SÚJB during their facility inspections and supervised the subsequent correction of any identified deficiencies relating to the observance of set limits, criteria for the safe operation of repositories, radioactive waste management and radiation protection. The requirements defined in SÚJB Regulation 318/2002 on emergency preparedness were fully satisfied.

**Ms. Soňa Konopásková**  
**Head of the Safety and Licensing Department**

## 2.1 MINING SAFETY

The operation of the Richard and Bratrství underground repositories is authorised based on licences which allow “specific encroachment into the Earth’s crust” issued in compliance with the Mining Act and certain other licences issued in compliance with the Mining Operations Act.

Both repositories were operated throughout the year in compliance with relevant legal regulations and licences issued by the Czech Mining Administration and the SÚJB as well as various internal operational regulations, limits and conditions.

In compliance with project implementation documentation approved by the Mining and with the technological process employed in the stabilisation of radioactive waste in chamber K2 at the Bratrství repository, work concerning the final stabilisation of this chamber by means of a special concrete mixture and subsequent clay-cement grouting was carried out. A comprehensive inspection of all the machinery and technical equipment involved as required by mining legislation, in particular Regulation 22/1989 on mining health and safety, was performed prior to the commencement of the project. Contractor employees were fully acquainted with all the relevant documentation. The time spent by each worker at individual locations within the repository was monitored and recorded and the impact of the inhalation of radon and long-term alpha activity evaluated by the relevant authorised institution throughout the preparation and concrete casting phases of the project.

### Number of repository inspections conducted by the SÚJB and ČBÚ during 2012

Dukovany	4
Richard	5
Bratrství	4

**Mr. Jozef Harčarik**  
**Mining Operations Manager**

## **2.2 MAINTAINING AN INVENTORY OF ACCEPTED RADIOACTIVE WASTE AND NUCLEAR MATERIAL**

RAWRA is responsible (according to the Atomic Act, Article 26, paragraph 3d) for maintaining an inventory of accepted radioactive waste and its producers. Detailed rules for maintaining such an inventory are set out in Regulation 307/2002. Records of accepted radioactive waste are maintained by RAWRA both in paper and electronic form.

# AN INVENTORY OF NUCLEAR MATERIAL IS MAINTAINED IN COMPLIANCE WITH SÚJB REGULATION 316/2002 AND EU REGULATION 302/2005

RAWRA holds an SÚJB licence for the management of category II nuclear material. An inventory of nuclear material is maintained in compliance with SÚJB Regulation 316/2002 and EU Regulation 302/2005. Nuclear materials are stored at the Richard repository at which the appropriate physical protection level is ensured as required by SÚJB Regulation 144/1997. In connection with the construction and commissioning of a new gatehouse at the Richard repository, the physical protection system was overhauled and, following comprehensive testing, the work was approved by an SÚJB Decision of 23 March 2012. A further two SÚJB inspections confirmed that the system is fully functional and meets the requirements of the relevant Regulation.

RAWRA submits to the European Commission, on a monthly basis, reports on the amount of radioactive materials disposed of and copies of these reports are submitted to the SÚJB. A total of 193 items of nuclear material had been recorded by 31 December 2012.

**Mr. Tomáš Klásek**  
**Safety Director**

## **2.3 ADMINISTRATION OF NUCLEAR ACCOUNT FUNDS**

The administration of Nuclear Account funds was governed in 2012 by the Atomic Act, Article 27, Government Decree 416/2002, on the scale of charges and manner of payment by radioactive waste producers to the Nuclear Account and on annual contributions to local communities, and Act 280/2009 (the Tax Code). Detailed records were kept on individual contributors to the Nuclear Account (in compliance with Government Decree 416/2002, Article 3).

### **Payments by producers of radioactive waste from nuclear reactors**

Pursuant to Government Decree 416/2002, Article 1, ČEZ contributed in 2012 CZK 1,516,209,000 while the yearly contribution made by Research Centre Řež, a ÚJV Řež subsidiary, amounted to CZK 641,000. Both amounts were paid in regular monthly instalments which were made directly to the Nuclear Account. ÚJV Řež also paid CZK 79,600 during the year as the remainder of contributions due for the period prior to 2012.

### **Payments by other producers of radioactive waste**

Other waste producers, as specified in Article 2 of Government Decree 416/2002, paid their charges following acceptance of their waste for disposal by RAWRA. Payment notices were issued to each waste producer (based on a contract between RAWRA and the respective waste producer) on acceptance of the radioactive waste accompanied by the relevant waste acceptance documentation. The total sum paid in 2012 amounted to CZK 8,162,000.

Disposable funds in the Nuclear Account were invested by the Ministry of Finance in the financial market (in compliance with the Atomic Act, Article 27). Revenue received from financial investment totalled CZK 558 million in 2012 against CZK 486.2 million in 2011, which represents an increase of 14.8%. A total of CZK 18.5 billion was deposited in the Nuclear Account as at the end of 2012.

## **2.4 AUDITING LICENSEES' DECOMMISSIONING RESERVES**

RAWRA is responsible (according to the Atomic Act, Article 26, paragraph 3h) for ensuring, by means of an audit, that relevant licence holders honour their obligation (Atomic Act, Article 18, paragraph 1h) to create financial reserves for the future decommissioning of their facilities.

Audits were conducted in 2012 at 13 organisations comprising a total of 31 facilities which met the following conditions:

- the organisation concerned is obliged to accumulate decommissioning reserves in compliance with the amended Atomic Act (Act 13/2002);
- the organisation is in possession of a certificate verifying its decommissioning cost estimate;
- the verified decommissioning cost estimate exceeds CZK 300,000.

Audits aimed at verifying the accumulation of financial reserves were conducted under the same rules as in the previous year. Audits were performed in cooperation with the respective licence holders and requests by RAWRA for supplementary documentation were duly met. Records of audits performed of individual licence holders were drawn up containing audit results, the amount of accounting reserves and the amount of funds deposited in special escrow bank accounts including a review of the development of the accumulation of financial reserves.

A report on audits performed in 2012 to verify the creation of financial reserves for the future decommissioning of nuclear plants and other nuclear facilities was duly prepared and presented to RAWRA's Board and subsequently to the SÚJB in accordance with RAWRA Statutes.

**Ms. Jaroslava Liehneová**  
**Personnel and Internal Audit Manager**

# DEVELOPMENT OF A DEEP 3 GEOLOGICAL REPOSITORY

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The “Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic” stipulates that radioactive waste and spent nuclear fuel classed as waste be finally disposed of in a deep geological repository. The construction of such a repository in the Czech Republic is envisaged. The safety of the repository will be ensured by a system of both engineered and natural (geological) barriers which can isolate radionuclides contained in the waste from the environment until their concentration is reduced to a level which does not pose any risk to any component of the biosphere. Various potential options for the design of the repository are set out in the reference project for a deep geological repository available on RAWRA’s website ([www.surao.cz](http://www.surao.cz)).

## **3.1 SITE SELECTION**

Following the completion of a survey and subsequent assessment of the whole of the Czech Republic, geological research at six potentially suitable sites was carried out in the second half of 2003 with the aim of collecting more detailed geological data in order to reduce the surface area of each candidate site. Work carried out before 2004 was considered geological research (in terms of Act 62/1988, on geological work practices). An evaluation of the work performed was completed in 2005. However, in view of the overwhelmingly negative public attitude to the project, RAWRA, following an agreement with the Ministry of Industry and Trade (MPO), suspended all geological work at the sites until 2009 (the Government, by means of Decision No. 550 of 2 June 2004, accepted the suspension).

Due to the suspension of the repository site selection process until 2009, the gaining of final approval for motivational tools for the communities concerned as late as in 2011 and difficulties in finding consensus with the communities concerning their involvement in the site selection process, the date for the selection of two candidate localities was postponed until 2018. The delay, however, will not affect

the selection of a final locality by 2025 and the commencement of deep geological repository operation post 2065.

Negotiations on the involvement of the communities concerned in the site selection process in compliance with the land-use development plan, which requires that candidate sites be selected only following agreement from these communities, have been most successful to date at the Kraví hora locality. At the end of 2012, RAWRA, with the agreement of the MPO, decided to make use of the experience and local knowledge of DIAMO, a state-owned company active at this locality, by means of concluding a mandate agreement with the company on the preparation and submission of an application for the definition of the investigation area to be investigated at the locality.

The current procedure involved in seeking consensus with local communities, which is based on their voluntary participation in the site selection process from the very beginning, has encountered the following main problems:

- due to the large number of communities whose consensus needs to be obtained it is difficult to find common agreement;
- the future selection of 4 localities at which to carry out characterisation work involving geological investigation using deep drilling techniques could be more affected by the decision of local communities than by a decision based on objectively collected data.

The approach outlined above (based on the approach and experience of other European countries) has not succeeded in eliminating the distrust felt by communities towards RAWRA and the Government; moreover, the implementation of motivating tools relating to the definition of areas of investigation has been delayed.

The results of the relevant stage of the survey of the whole geographical area of the Czech Republic were published in RAWRA's Annual Report 2002 which was approved by Government Decision 642 of 30 June 2003.

Stages of work	Objective of work	Anticipated number of sites in the stage	Realisation
Reducing the number of sites	Detailed exploration of geological conditions in the near-surface parts of the sites employing non-invasive methods; performed at all sites following the determination of investigation areas. Technical and safety assessment of the future potential of each site, comparison with other sites, proposal of specific sites for the next stage (4 sites).	7	2013–2015
Selection of candidate sites	Detailed exploration of geological conditions beneath the sites by means of drilling, compilation of a DGR feasibility study, compilation of a study to support the DGR safety report. Selection of 2 candidate sites which includes the opinions of the communities concerned.	4 potentially suitable sites	2016–2018 (following completion of the previous stage)
Selection of the final site	Detailed exploration of geological conditions in the deep sections of each site. Development of a DGR design solution at the site, compilation of the DGR safety report and facility environmental impact assessment documentation. Gaining consent from the communities concerned for the selection of the final site. Selection of a final site approved by the Government.	2 candidate sites	2019–2025 (following completion of the previous stage)

In addition to preparing for investigation work at the six existing locations, geological research continued during the year aimed at assessing the suitability of the Boletice former military area in terms of its suitability for deep repository construction and a preliminary feasibility study was prepared for the siting of the deep repository in the northern part of this location. A decision on the possible inclusion of the Boletice former military area in the list of locations which was compiled in accordance with the Land-Use Development Plan 2008 will be made by RAWRA in the first half of 2013.

Rock environment monitoring was carried out in 2012 relating to an assessment of candidate localities in terms of their suitability for deep repository construction and subsequent related work. The first stage involved an assessment of the behaviour of the rock environment with concern to processes which have an impact on long-term waste disposal safety. Rock masses are monitored in a number of underground facilities situated in host rock similar to that at candidate localities involving the monitoring of geodynamic, seismic, hydrogeological and hydrodynamic events. The results are used in the first stage of development in order to set the criteria for repository siting primarily in terms of specific processes at work within the rock mass. Subsequently, during the assessment stage, the results of the monitoring will be used for the assessment of individual processes underway at candidate localities.

### **3.2 DESIGN ACTIVITIES**

The reference project for a deep geological repository (DGR) plays an important role in the decision-making process relating to the selection of the technical design of the repository and the costs to be incurred at individual potential localities. The updating of the reference project was completed in 2012 and it has provided significant information on horizontal spent nuclear fuel (SNF) emplacement. In accordance with the results of the project and subsequent international assessment, preparations are underway for the optimisation of the reference project to be conducted by an external contractor managed directly by RAWRA.

Preparatory work was carried out in 2012 for a project concerned with the development of an underground facility Bukov within the Rožná uranium mine; the objective of the research project is to verify the suitability of the rock mass for underground radioactive waste disposal in the future deep geological repository. Such research projects have previously been conducted only outside the Czech Republic – in Switzerland (Grimsel) and Sweden (Äspö). The main advantages of the Rožná mine consist of its accessibility and proximity to the Kraví hora candidate locality. The facility will be operated jointly by RAWRA and DIAMO once the necessary rights and mining operation licensing documentation, including a licence for dealing with ionising radiation sources, have been obtained. According to the latest data provided by DIAMO, it will be possible to operate the facility up to at least the end of 2018 which will provide sufficient time for a thorough study of the rock mass to be conducted and the monitoring of individual events and processes therein for a time period which will allow the selection of a suitable final locality. It is important to note that, according to international recommendations concerning site selection, the construction of a dedicated underground laboratory is considered a necessary precondition for the success of the programme.

A project entitled “Verification of the Area and Space Localisation of Deep Repositories” was completed in 2012. The project was concerned with the use of the aforementioned reference project for individual localities. The project summary proposed that all 7 localities under consideration are suitable for eventual deep repository construction. The results of the project will be used primarily for public presentation purposes.

### **3.3 RESEARCH AND DEVELOPMENT RELATING TO ENGINEERED BARRIERS AND NEAR- AND FAR-FIELD PROCESSES**

With regard to engineered barriers, the DOPAS international pilot project was launched in 2012 designed by the IGD-TP platform and undertaken by a consortium of radioactive waste management agencies: ANDRA (France), Nagra (Switzerland), Posiva (Finland), SKB (Sweden), RAWRA/ČVUT (Czech Republic), NDA (Great Britain) and GRS/DBE (Germany) and coordinated by Posiva. The project is concerned with the research of plugs to be used in deep geological repositories. The Centre for Experimental Geotechnics at the Czech Technical University in Prague (CEG ČVUT) and ÚJV Řež, which have conducted experiments at the Josef underground facility and in the laboratories of ÚJV Řež respectively, are actively involved in the Czech part of the project which is concerned with the study of a wide range of processes which are expected to take place within the engineered barriers following the disposal of SNF and the closure of sections of the DGR by means of sealing plugs. It is anticipated that the project will provide data to be used in the subsequent assessment and confirmation of DGR safety and will demonstrate the feasibility of designing a repository employing materials available in the Czech Republic (B75 type bentonites). The project was launched in mid-2012 and will reach completion by mid-2016.

The “Research of the Possible Use of Shotcrete Bentonite for the Construction of a Sealing Layer in a Deep Geological Repository” project, which focused on modern technologies employing shotcrete materials (bentonites) and their practical use in DGRs, was completed in 2012. The project was conducted by CEG ČVUT. The “Construction, Operation and Assessment of the MOCK-UP-JOSEF Demonstration Experiment” project relating to engineered barriers is currently underway at the Josef Underground Research Centre and consists of a model of an SNF supercontainer which has been placed in a disposal well sunk in a real granitic rock environment. The objective of the project, which will continue until 2015, is to research in detail the behaviour of engineered barriers exposed to a temperature of 90°C over a long period of time.

The “Thermal Analysis in the Reference Project for a Spent Nuclear Fuel Repository” project, conducted by the Institute of Geonics of the Czech Academy of Sciences

(AV ČR), concerned the long-term behaviour of the rock mass in the surroundings of DGRs. The project involved the mathematical modelling of heat transfer in the surroundings of containers disposed of in a DGR and the optimisation of the distance between individual containers in the DGR system.

### **3.4 RESEARCH RELATING TO ROCK MASS PROPERTIES**

A long-term project entitled the “Experimental Study of Radionuclide Diffusion in Granitoid Rock” continued during the year as part of the research of deep repository far-field processes. The project is being undertaken by ÚJV Řež based on the international project LTD (Long Term Diffusion). The project consists of the evaluation of the migration properties of granitoid rocks relevant to the safety assessment of deep repositories in the Czech Republic and focuses on a selection of diffusion and sorption processes which have already been studied both under laboratory conditions and at the Grimsel underground laboratory in Switzerland operated by Nagra in order to ensure as far as is possible that conditions match those of the host rock environment of the future deep repository. The outcomes of the experiment will be used to verify models describing diffusion into the rock matrix of granitic rock which will allow the prediction of the distance radionuclides are able to migrate from their source.

A further project concerned with the study of processes which are expected to take place in the host rock of the future deep repository focusing on research in the Ruprechtov natural analogue area and entitled the “Experimental Study of Radionuclide Diffusion in Granitoid Rock” was concluded during the year with a final peer review. The project was conducted by ÚJV Řež in cooperation with a research team from the ČVUT Faculty of Nuclear Sciences and Physical Engineering and partners from GRS (Germany) and the University of Helsinki (Finland). With a view to the geological structure of the area concerned and the presence of uranium mineralisation at the locality, the natural analogue was used for the study of the potential transport of radionuclides in the overlying host rock of a deep repository. The objective of the project was to determine the impact of redox condition changes on possible uranium migration in a natural environment in order to demonstrate deep repository safety. The research of redox processes carried out

in the Ruprechtov natural analogue area provided valuable information concerning the impact of redox condition changes on uranium stability. Methodologies for working with samples in an anaerobic environment were tested, including sample collection under conditions which can be used for the study of crystalline rocks. The results can also be used for area characterisation purposes in the deep repository site selection process and for the evaluation of the functionality of engineered barriers in a deep repository in which the utilisation of the sealing properties of clay materials is envisaged for addressing issues surrounding the prevention of radionuclide release into the biosphere.

## THE **RESEARCH CARRIED** OUT IN THE **RUPRECHTOV** NATURAL ANALOGUE

A new research project was launched in 2012 entitled the “Study of the Retention Properties of the Rock Environment of the Deep Repository Far Field”. The objective of the project, conducted by ÚJV Řež, is the quantification of the retention properties of granitoid rock relevant to deep repository safety assessment with a focus on sorption on rock material under conditions which are similar to those in rock massifs considered for the construction of a deep repository. Research work will be based on the results of the CROCK (Crystalline Rock Retention Processes) project developed as part of the 7th Euroatom Framework Programme, particularly with regard to sample collection, the selection of the set of tracers and the evaluation of the results.

The “Summary and Analysis of Reduction Phenomena in Radioactive Waste Repositories” project is based on the RECOSY (Redox Phenomena Controlling Systems) EU project which also formed part of the 7th Euroatom Framework Programme. The project, conducted by ÚJV Řež, will summarise the results of the analysis of reduction phenomena in the vicinity of deep repositories performed

as part of the RECOSY project and assess these results in terms of deep repository development in the Czech Republic. The objective of the project also consists of summarising the experiments concerned with an evaluation of the impact of carbon steel corrosion on reduction potential; carbon steel is one of a number of possible materials being considered for the manufacture of containers for high-level waste (HLW)

Research work connected with the “Tunnel 2011” project, which is concerned with the study of host rock behaviour, continued during the year. The project, conducted by the Technical University in Liberec, focused on the monitoring of selected properties of rock masses. Monitoring was performed in the Bedřichov water supply tunnel constructed in granitic rock which, it is assumed, will form the host environment for the Czech deep repository. The tunnel, which was constructed more than 20 years ago, provides an ideal anthropogenic analogue which allows the monitoring over time of the development of selected parameters. The current research stage is concerned with the monitoring of migration along fractures, seismicity, temperature and hydrogeological and geochemical conditions, as well as with the development of automated data collection in mine workings and the optimisation of selected geophysical methods. The database of information gathered to date, along with other relevant information and a number of presentations, have been published on the recently opened <http://bedrichov.tul.cz> web portal which is open to the public. Data collected at three selected flow measurement points has been transferred to the database and the routine operation thereof verified; data from measurements of infiltration on the surface was subsequently added. Development of measurement units according to a newly-introduced concept is underway; these units will be introduced next year together with a number of other planned infrastructure elements (wireless transmission and new sensors). The Bedřichov portal has been used as a pilot project for the potential provision of on-line information on other ongoing research projects.

**Mr. Jiří Slovák**  
**Head of the Geological Repository**  
**Development Department**

# PUBLIC RELATIONS

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## 4

Direct communication with the public in areas potentially eligible for the construction of a deep geological repository continued to be RAWRA's priority in terms of public relations in 2012. Communication focused on the presentation of RAWRA's plans to carry out geological investigation work in those areas in which local people provide their consent.

Information via professional presentations on RAWRA's full range of activities (on all types of radioactive waste, its generation, treatment and disposal as well as on currently operational or closed repositories, the project for the deep geological repository and radioactivity in general) is available at its main information centre at Prague 1, Dlážděná 6, where RAWRA's head office is located, and at the Richard repository information centre near Litoměřice. In addition to these information centres, RAWRA has information stands in Lubenec and Rohozná, at municipal offices in Dukovany and Rouchovany, and at its information "corner" in Dolní Cerekev. A total of 1,100 students from Prague and the surrounding area visited the main information centre in Prague in 2012.

At the beginning of the year, RAWRA commenced the publication and distribution of its "News from RAWRA" quarterly newsletter to individual households at all the deep repository candidate localities. For people in the Čertovka locality, particularly in the towns of Lubenec, Blatno and Žihle, RAWRA regularly publishes information on its activities in local newspapers.

There was a high public turnout for a round table open forum held in the town of Jihlava in February. The objective of this meeting, involving representatives of the state administration, NGOs, specialists and representatives of the communities concerned, was to provide up-to-date information relating to the selection process for a candidate site suitable for repository construction. The meeting was followed by public discussion sessions in a total of 14 local communities in candidate localities.

The first public opinion survey in more than 5 years was organised during the year the aim of which was to identify public attitudes in the localities concerned towards planned investigation work, primarily changes in attitude towards individual stages of the DGR

development project and general knowledge of radioactive waste issues.

In order to improve awareness of radioactive waste management, RAWRA organised a technical excursion to the Richard repository for representatives of the Čihadlo locality and a visit to the Josef Underground Research Centre for representatives of the Kraví hora locality. Annual excursions abroad provide community representatives with the opportunity to visit facilities concerned with nuclear waste issues. In 2012 visits were made to 4 French destinations: ANDRA (the equivalent of RAWRA), the low-level and intermediate-level waste repository at the Centre de l'Aube, the Bure underground test laboratory and a technological park in the town of Saudron (near Bure) where the RAWRA group attended an exhibition of technological equipment for waste disposal packages and handling robots.

An international workshop – Forum on Stakeholder Confidence (FSC) – supported by the OECD/NEA was held in the Czech Republic in October. More than 50 foreign guests and 60 Czech participants (representatives of potential DGR localities, NGOs and the state administration) discussed the Czech site selection process at a specially-organised meeting held at the Čertovka candidate locality. FSC consists primarily of a forum for the acquisition of new information on topical issues; it seeks to initiate dialogue between stakeholders and help to build long-lasting confidence in issues surrounding radioactive waste management.

Two local referenda were held during 2012, one at Lubenec (Čertovka locality) and another at Bukov (Kraví hora locality). Both resulted in a negative position statement on geological investigation work for deep repository siting purposes.

RAWRA has a statutory obligation to provide information according to Act 109/1999, on free access to information. Two applications for information under the Act were received during 2012.

Provision of information to the public during 2012 according to Act 109/1999 on free access to information

Number of applications for information under the Act	2
Number of appeals against a ruling	1
Conclusions of proceedings on sanctions for infringement of the Act	0
Other information concerning the implementation of Act 106/1999	-

#### **4.1 INVOLVEMENT OF THE GENERAL PUBLIC – ACTIVITIES OF THE WORKING GROUP**

The “Dialogue on the Deep Geological Repository” working group was established in 2010 at the instigation of RAWRA, supported by the Ministries of Industry and Trade and the Environment. The group, consisting of representatives of the various communities concerned, environmental organisations, the state, Parliament, academic institutions etc., is concerned both with coming up with ways in which to improve the transparency of the decision-making process regarding deep geological repository siting whilst fully respecting the interests of the general public and with strengthening the active involvement of the public and, specifically, the communities involved in the process. The group’s activities are based, in terms of methodology, on the results and experience gained from the EC ARGONA project conducted as part of the 6th Framework Programme for Research and Training. The main priority of the Dialogue working group is to strengthen the role of the communities concerned through legislative means in connection with which the group prepared a proposal for draft legislation relating to the involvement of such communities in the decision-making process regarding deep geological repository siting. RAWRA has a representative in the Dialogue working group and takes an active part in the activities of the secretariat and the preparation of documentation on issues to be discussed at the group’s meetings.

#### **4.2 INTERNATIONAL COOPERATION**

RAWRA is involved in the activities of a number of international organisations as are similar organisations in other countries which are committed to tackling radioactive waste issues in a responsible manner. Mutual cooperation, consisting of the exchange of information and direct participation in both practical scientific experiments and the activities of a number of international institutions, forms an integral part of what RAWRA considers a serious approach to issues surrounding radioactive waste and the nuclear programme in general.

The European Commission (Euratom), the IAEA (the International Atomic Energy Agency) and OECD/NEA (the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development) represent the main sources of information, instigate legislative and regulatory change and coordinate the majority of events in the field

of radioactive waste management internationally. The Czech Republic is a signatory to the IAEA Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. RAWRA, together with the SÚJB, is responsible for the fulfilment of requirements deriving from the Convention. In addition to cooperation with the IAEA, RAWRA is a full member of DISPONET, a network of operators of low-level and intermediate-level waste repositories. Radioactive waste management issues are also handled by the OECD/NEA, specifically by the RWMC, its Radioactive Waste Management Committee. This committee is organised in the form of internal and external working groups. RAWRA specialists represent the Czech Republic in the IGSC (the Integration Group for Safety Case) and the FSC (Forum on Stakeholder Confidence) working groups.

RAWRA is active in a number of research and development projects financed by the European Commission both as a mediator and provider of support for the participation of Czech firms and research institutions in such projects and covers around half of the financial costs involved.

Since 1998 RAWRA has been involved in the activities of the „Club of Agencies“ which, under the patronage of the European Commission, forms a voluntary platform for the informal exchange of information concerning radioactive waste management.

The most significant area of cooperation at the international level is the development and verification of methods for the assessment of repository safety and the demonstration of deep geological repository feasibility. Thus RAWRA experts are able to take advantage of proven, technically reliable and widely-recognised methods and tools for the long-term forecasting of repository system behaviour.

Bilateral cooperation with partner organisations in other countries is very beneficial for RAWRA, particularly participation in specific subprojects conducted at foreign research facilities. RAWRA has signed a number of international framework agreements e.g. with Nagra (Switzerland) and Posiva (Finland) and also cooperates on a number of subprojects with SKB (Sweden).

**Ms. Tereza Bečvařiková**  
**Head of the Communications Department**

# MANAGERIAL, TECHNICAL AND ADMINISTRATIVE MATTERS

## 5

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In addition to those outlined above, RAWRA is involved in a whole range of additional activities either in connection with its main area of business or as required by relevant legislation.

### **5.1 INTERNAL CONTROL SYSTEM**

RAWRA's internal control system was adopted in compliance with Act 320/2001, on financial control in the public administration sector, and implementing Regulation 416/2004. The structure of the internal control system respects RAWRA's specific subject matter of activities, its organisational structure in relation to activities performed and the approved number of work positions.

The internal control system is defined in the basic management directives; the most important document consists of the Handbook on RAWRA's Quality Assurance System and the defined map of processes which forms an Appendix to the Handbook. Basic related management directives consist of the standing orders, staff regulations, the internal auditing system (in compliance with the Financial Control Act), decisions of the Managing Director and authorising documentation. These documents set out the responsibilities of individual departments, the competences and responsibilities of the management and executive officers, as well as the main audit principles and methods to be adopted by RAWRA's management. Economic management is defined in documents relating to the preparation of the yearly plan and budget, contract management, asset management, budgetary management, the circulation of accounting documents and accounting processing. Based upon these management directives, a number of in-house regulations have been drawn up which set out the rules governing individual activities and complement the internal control process. Internal

regulations define the functions and responsibilities of the Authority's financial officers, including the Chief Accountant, as well as the procedures to be applied should the required criteria not be met and procedures for individual operations.

## THE INTERNAL CONTROL SYSTEM IS DEFINED IN THE BASIC MANAGEMENT DIRECTIVES

Other management directives define the requirements for the implementation of the basic processes in radioactive waste management and repository operation in terms of nuclear safety, radiation protection, physical protection, emergency preparedness, quality assurance and environmental protection and their fulfilment by RAWRA. These requirements are based on the provisions of the Atomic Act and implementing Regulations as well as SÚJB Regulations. In addition, RAWRA adheres to generally binding regulations applicable to the public administration sector as well as Act 218/2000, on budgeting rules, Act 219/2000, on state property and Act 137/2006, on public contracts. RAWRA operates its quality assurance system according to, and employs the methods and procedures set out in, the EN ISO 9001/2008 standard, as amended.

Internal audits are managed and performed, as stipulated in Articles 28 and 29 of Act 320/2001, on internal control, by the internal auditor who is directly responsible to the Authority's Managing Director. Due to restrictions on the number of approved work positions, the internal auditor is also responsible for the verification of the creation of financial reserves for the future decommissioning of nuclear plants and other nuclear facilities. Internal auditing is increasingly focusing on current requirements, consultation relating to internal processes, commenting on relevant documentation and reviewing particular areas of the Authority's activities.

## **5.2 HUMAN RESOURCES**

The plan of activities for 2012 contained 46 approved work positions. The average registered number of physical employees during the year was 46. As regards the staff educational profile, 57% of the staff were university-educated employees and 26.5% have completed full secondary school education.

When necessary, certain work for RAWRA is supplied for the fulfilment of specific tasks or in the form of one-off or fixed-term employment contracts. In 2012, RAWRA had 6 employees working under fixed-term employment contracts and 15 employees working under one-off contracts.

RAWRA's staff attended various training courses in compliance with legislative requirements; these courses related to obligatory professional training, the further improvement of qualifications and language training. RAWRA's statutory obligations concerning occupational health and safety and fire protection (set out by the Labour Code and the Fire Protection Act) were met by employing a specially qualified person.

RAWRA fulfilled its obligation as set out in Act 435/2004 (the Employment Act) specifying the proportion of handicapped persons in the total number of employees. The Authority employed one handicapped person and, in place of employing a second handicapped person, RAWRA purchased goods from a company the workforce of which is made up of more than 50% of handicapped persons.

**Ms. Jaroslava Liehneová**  
**Personnel and Internal Audit Manager**

### **5.3 QUALITY ASSURANCE AND CONTROL**

RAWRA has implemented and constantly updates a documented quality assurance system complying with the EN ISO 9001/2008 standard. The system is concerned with activities as set out by the Atomic Act, Article 26 (Act 18/1997) and the full range of support processes relating to the operation of the Authority. Quality assurance requirements are principally applied to those processes which relate to research and development in the field of radioactive waste management, the construction, operation and closure of repositories and RAWRA's obligations towards radioactive waste producers, state authorities and the public.

Specific quality control objectives for 2012 were set out in a Decision issued by the Managing Director. The fulfilment of the said objectives was subsequently assessed and the results used in the setting of quality control objectives for the following year.

7 audits were planned and conducted during the year, of which 3 at radioactive waste producers (ČEZ, ISOTREND and ZAM-SERVIS). In addition, 4 internal audits relating to the test laboratory for radioactive waste disposal package testing and contract management were performed. The audits were carried out according to set procedures and no serious deficiencies were detected.

12 external inspections of RAWRA's performance were conducted by the SÚJB during 2012. In addition, the Regional Mining Authority in Most, the Fire Rescue Service of the Ústí-nad-Labem region and the Principal Mining First-Aid Station in Most performed one inspection each. No serious deficiencies were detected during these inspections and a small number of minor issues were cleared up quickly to the full satisfaction of the parties concerned.

The objectives of the quality assurance system as well as safety requirements and the duty to comply with established work processes in all aspects of RAWRA's activities were fulfilled in 2012.

**Mr. Radomír Šenkýř**  
**Quality Manager**

# FINANCIAL MANAGEMENT 6

RAWRA's activities are financed primarily from the Nuclear Account and the state budget in compliance with the Atomic Act, Article 28, paragraph 1 which sets out rules for the management of radioactive waste disposed of prior to the Act coming into force.

RAWRA is authorised to manage state property and consequently maintains the relevant accounts in pursuance of Act 563/1991, on accounting; Act 218/2000, on budgeting rules; and implementing Regulation 410/2009. RAWRA's budget is determined according to a budget structure defined by Ministry of Finance Regulation 323/2002, as amended.

RAWRA creates no reserves and all its revenues from services provided to radioactive waste producers as well as unused budget funding (provided as transfers) are returned to the Nuclear Account at the year end.

## 6.1 UTILISATION OF BUDGET FUNDING IN 2012

Item No.	Item	CZK thousand	Approved budget	Adjusted budget	Budget utilisation	Utilisation percentage
	EXPENSES					
5	Current expenses		105,777	105,647	84,773	80.2
501	Wages and salaries		16,542	16,542	16,542	100.0
502	Other remuneration		1,019	1,019	798	78.3
503	Employer's statutory insurance contributions		5,971	5,971	5,147	86.2
5342	Transfer to fringe benefits fund		166	166	165	99.6
6	Capital expenses		73,287	73,287	33,991	46.4
61	Asset acquisitions and related expenses		73,287	73,287	33,991	46.4
	<b>Total expenses</b>		<b>179,064</b>	<b>178,934</b>	<b>118,764</b>	<b>66.4</b>
	REVENUES					
2	Tax-free revenues				1,114	
411	Non-investment transfers from the central budget		99,777	99,777	71,970	72.1
421	Investment transfers from the central budget		73,287	73,287	29,811	40.7
	Funding through chapter 322 of the Ministry of Industry and Trade		6,000	5,870	5,859	99.8
	<b>Total revenues</b>		<b>179,064</b>	<b>178,934</b>	<b>108,754</b>	<b>57.5</b>

Note: Items 411 and 421 consist of transfers from the Nuclear Account; CZK 5,859,000 was received as a transfer from the budget of the Ministry of Industry and Trade. In transfers received, returned unspent funds from 2011 have been deducted.

Expenses are subdivided into current expenses and capital expenses. Expenses relating to technical development projects, materials purchased and utilised, telecommunications services, rental payment services, education and training, consultancy services, travel expenses and the purchase of external services are included in current expenses. Expenses relating to the DGR programme, the reconstruction of existing repositories, the purchase of information technology and so on are included in capital expenses. A detailed review of the utilisation of budget funding by individual item, accompanied by a commentary, has been submitted to RAWRA's Board.

The budget for 2012 contained a reserve for contributions to local communities in areas in which investigation work takes place. Since a number of changes were made to the preparation period required prior to the commencement of investigation work, the reserve, amounting to CZK 17.847 million, was not in fact used; since investigation work did not commence in 2012, this capital expenses item was not fully utilised.

The balance sheet is shown in Annex A, the profit and loss account in Annex B.

## **6.2 EVALUATION OF RAWRA'S PERFORMANCE**

RAWRA met its responsibilities for the safe and reliable operation of Czech radioactive waste repositories during 2012 as defined in the Atomic Act. Preparations continued for the development of a deep geological repository in which high-level radioactive waste and spent nuclear fuel will be disposed of in the future. Concerning the efficient utilisation of budget funds for external subcontractors, RAWRA complied with the provisions of Act 137/2006, on public contracts. Funds were employed efficiently and in compliance with the budget in order to fully meet the targets set out in the yearly plan of activities.

**Mr. Vítězslav Duda, MBA**  
**Head of the Economics and Administration Department**

## BALANCE SHEET AS AT 31 DECEMBER 2012 (CZK 000)

		Account No.	Gross	Current period Correction	Net	Previous period
<b>ASSETS</b>			<b>788,900</b>	<b>286,602</b>	<b>502,298</b>	<b>508,867</b>
A.	Fixed assets		783,565	286,602	496,963	493,443
I.	Intangible fixed assets		412,000	172,113	239,888	229,284
	1. Research and development	012	368,671	159,838	208,833	156,426
	2. Software	013	11,828	10,459	1,369	1,510
	5. Low-value intangible fixed assets	018	1,815	1,815	0	0
	7. Intangible fixed assets under construction	041	29,686	0	29,686	71,348
II.	Tangible fixed assets		371,564	114,489	257,075	264,159
	1. Land	031	3,924	0	3,924	3,924
	3. Buildings	021	288,125	62,093	226,032	221,182
	4. Machinery, equipment, vehicles, furniture and fixtures	022	65,025	38,626	26,399	26,446
	6. Low-value tangible fixed assets	028	13,770	13,770	0	0
	8. Tangible fixed assets under construction	042	721	0	721	12,607
III.	Long-term financial assets		0	0	0	0
IV.	Long-term receivables		0	0	0	0
B.	Current assets		5,335		5,335	15,424
I.	Stocks		0	0	0	0
II.	Short-term receivables		1,142	0	1,142	1,331
	4. Advance payments made	314	30	0	30	593
	5. Other receivables from main activity	315	838	0	838	671
	10. Receivables from employees	335	106	0	106	30
	25. Deferred expenses	381	136	0	136	0
	28. Other short-term receivables	377	32	0	32	38
III.	Short-term financial assets		4,193	0	4,193	14,093
	5. Other current accounts	245	2,000	0	2,000	1,902
	9. Current account	241	2,155	0	2,155	12,165
	10. Current account of the cultural and social needs fund	243	38	0	38	25
	15. Cash equivalents	263		0		11
	17. Petty cash	261		0		11
<b>LIABILITIES</b>					<b>502,298</b>	<b>508,867</b>
C.	Equity capital				492,228	494,754
I.	Owned capital and adjustments				526,869	493,497
	1. Owned capital	401			776,184	742,812
	5. Gains and losses due to change of method	406			-249,315	-249,315
II.	Financial funds				38	25
	2. Cultural and social needs fund	412			38	25
III.	Profit/Loss account				-54,599	-12,830
	1. Profit/Loss account for current period	493			-41,769	-4,410
	3. Returned earnings, accumulated losses	432			-12,830	-8,414
IV.	Budget management income and expenditure account				19,920	14,061
	2. Special expenditure account	223			5,852	4,310
	4. Aggregated revenue and expenses from previous years	404			14,061	9,752
D.	Other sources				10,070	14,113
I.	Reserves				0	0
II.	Long-term payables				0	0
III.	Short-term payables				10,070	14,133
	5. Suppliers	321			5,200	362
	15. Institutions	336			910	612
	17. Other direct taxes	342			309	193
	21. Payables to selected government institutions	347			95	3,005
	33. Brokerage payables	389			20	0
	34. Other short-term payables	378			3,535	9,041

# PROFIT AND LOSS ACCOUNT AS AT 31 DECEMBER 2012 (CZK 000)

	Account No.	Current period		Previous period	
		Main activity	Business activity	Main activity	Business activity
<b>A. Total expenses</b>		<b>122,020</b>		<b>64,042</b>	
I. Expenses from activities		112,472		55,005	
1. Material used	501	1,549		2,212	
2. Energy used	502	2,099		1,295	
8. Repair and maintenance	511	3,016		2,769	
9. Travel expenses	512	1,662		1,074	
10. Entertainment expenses	513	938		350	
12. Other services	518	44,345		26,466	
13. Payroll costs	521	17,410		15,343	
14. Mandatory social insurance	524	5,834		5,099	
16. Mandatory social costs	527	146		144	
17. Other social costs	528	68		95	
20. Other taxes and charges	538	12		9	
24. Donations	543	0		4	
28. Depreciation of fixed assets	551	32,342		0	
35. Expenses from low-value fixed assets	558	2,348		0	
36. Other expenses from activities	549	703		146	
II. Financial expenses		72		9,037	
3. Exchange rate losses	563	72		37	
5. Other financial expenses	569			9,000	
III. Transfer expenses		9,476		0	
1. Expenses from transfers from selected government institutions	571	9,476		0	
IV. Shared tax expenses					
<b>B. Total revenues</b>		<b>80,251</b>		<b>59,626</b>	
I. Revenue from activities		1,251		0	
2. Revenue from sale of services	602	391		0	
3. Revenue from rents	603	2		0	
8. Other revenue from own production	609	838		0	
17. Other revenue from activities	649	21		0	
II. Financial revenue		0		-28	
2. Interest revenue	662	0		0	
6. Other financial revenue	669	0		-28	
III. Revenue from taxes and charges					
IV. Transfer revenue		79,000		59,654	
1. Revenue from transfers from selected government institutions	671	79,000		59,654	
V. Revenue from shared taxes					
VI. SURPLUS / DEFICIT					
1. Surplus / deficit before tax	-	-41,769		-4,416	
2. Surplus / deficit after tax	-	-41,769		-4,416	

# AUDITORS' REPORT INCLUDING AUDITORS' OPINION

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We have audited the financial statements of the Radioactive Waste Repository Authority comprising the balance sheet and the profit and loss account as at 31 December 2012, and an annex to the financial statements.

## **Management's responsibility for the financial statements**

RAWRA's management is responsible for the preparation and fair representation of the financial statements in accordance with Czech accounting regulations and for an internal control system relevant to the preparation and fair representation of financial statements that are free from material misstatement, whether due to fraud or error.

## **Auditors' responsibility**

Our responsibility is to report our opinion on the financial statements audited. The audit has been conducted in accordance with the Czech Auditor Act, International Standards on Auditing and relevant implementing regulations issued by the Czech Chamber of Auditors. Under these legal regulations and in adherence to relevant ethical standards each audit is planned and performed in such a way as to provide the auditors with sufficient evidence to give reasonable assurance that the financial statements are free from apparent misstatements.

The audit includes audit procedures aimed at obtaining conclusive evidence relevant to the amounts and disclosures given in the financial statements. The audit procedures employed depend on the auditor's judgement, including his assessment of the potential risk that the financial statements might contain considerable irregularities due to fraud or mistake. Risk assessment considers the results of internal audits relevant to the preparation and presentation of the financial statements. The aim of internal audit assessment is to recommend adequate audit procedures without expressing the auditor's view of the efficiency of the internal audit procedures. The audit also includes an assessment of the adequacy of the accounting methods employed and estimates made by the management of the accounting entity, as well as an evaluation of the overall adequacy of the presentation of information in the financial statements.

We are confident that the probative information obtained gives an adequate basis for forming our opinion.

## **Auditors' opinion**

In our opinion, the financial statements attached herein give a true and fair view of the assets and liabilities of the accounting entity as at 31 December 2012 as well as the costs, revenue and profit/loss for 2012 in compliance with the accounting regulations effective in the Czech Republic.

Prague, 14 March 2013

**Vít Dobiáš**  
**Licence No. 1593**

# RAWRA'S BOARD

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RAWRA's activities are supervised by its Board, the membership of which comprises representatives of the MPO, MF, MŽP, major radioactive waste producers and the public. RAWRA's Board, by its decisions and recommendations, takes an active part in RAWRA's activities.

## **IN 2012 RAWRA'S BOARD CONSISTED OF THE FOLLOWING MEMBERS:**

**Mr. Roman Portužák**, Chairman of the Board (to the 72nd meeting of the Board),  
Head of the Electrical Energy Department at the Ministry of Industry and Trade

**Mr. Pavel Gebauer** (from the 74th meeting of the Board),  
Head of the Electrical Energy Department at the Ministry of Industry and Trade

### REPRESENTATIVES OF THE STATE:

**Ms. Zdeňka Vojtíšková**, Economist at the Ministry of Finance

**Mr. Martin Holý**, Head of the Geology Department at the Ministry of the Environment

### REPRESENTATIVES OF THE PUBLIC:

**Mr. Bronislav Grulich**, Mayor of Jáchymov, Represents communities in regions with existing radioactive waste repositories

**Mr. Pavel Gryndler**, Environment Department of the Litoměřice town council, Represents communities in regions with existing radioactive waste repositories

**Mr. Miloš Kudera**, Chairman of the Dukovany local council (to the 72nd meeting of the Board), Represents communities in regions with existing radioactive waste repositories

**Mr. Vítězslav Jonáš**, Senator, Member of the Dukovany local council (from the 74th meeting of the Board), Represents communities in regions with existing radioactive waste repositories

**Mr. Jan Horník**, Senator, Vice-Chairman of the Senate Committee on Regional Development, Public Administration and the Environment and Mayor of Boží Dar, Represents the general public

### REPRESENTATIVES OF RADIOACTIVE WASTE PRODUCERS:

**Mr. Ladislav Štěpánek** (Vice-Chairman of the Board), Director of the Fuel Cycle Section at ČEZ, Represents radioactive waste producers in the nuclear power sector

**Mr. Vladimír Hlavinka**, Director of the Generation Division at ČEZ, Represents radioactive waste producers in the nuclear power sector

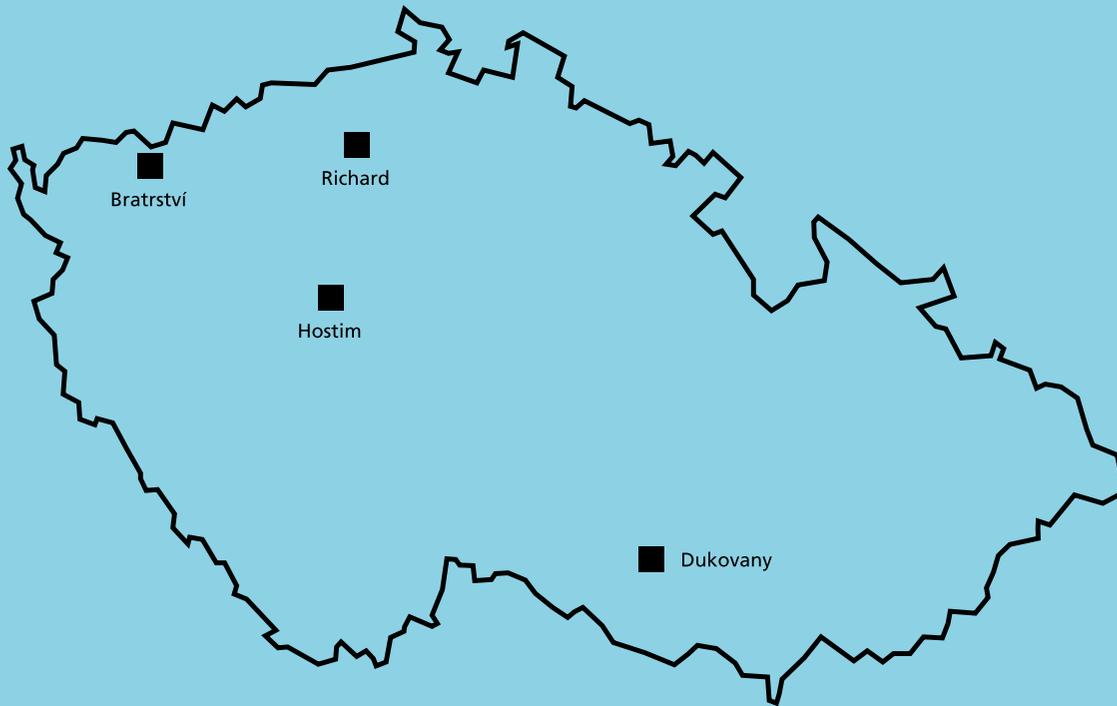
**Mr. Aleš John**, Director General of the Nuclear Research Institute Řež, Represents radioactive waste producers outside the nuclear power sector

**Mr. Štěpán Svoboda** (from the 71st meeting of the Board), Head of the Research & Development Centre at Chemcomex Praha, Represents radioactive waste producers outside the nuclear power sector

## **RAWRA's Board Statement**

RAWRA's Board reviewed the RAWRA Annual Report for 2012 at its 76th meeting on 22 March 2013 and recommended for the Annual Report to be submitted to the Ministry of Industry and Trade.

# REPOSITORIES



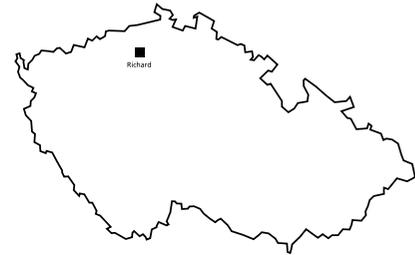
Radioactive waste is classified into categories according to its activity level (and the threat it poses to the surrounding environment), i.e. low-level, intermediate-level and high-level waste. To date, repositories exist in the Czech Republic for the disposal of low-level and intermediate-level radioactive waste only, three of which are operated by RAWRA, while Hostim is monitored following closure.

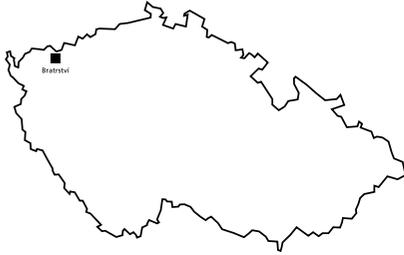


# RICHARD

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The Richard repository near Litoměřice is situated in the former Richard II limestone quarry complex. Institutional low-level and intermediate-level waste from the research and medical sectors has been disposed of at the repository since 1964. The repository covers just a small part of the abandoned mine complex which comprises over 40km of galleries and crosscuts. The total disposal capacity is 8,500m<sup>3</sup>. The repository site includes an accredited laboratory for the testing of waste containers and radioactive substances of special form. The information centre located there offers a wide range of information to both professionals and members of the general public who visit the site.

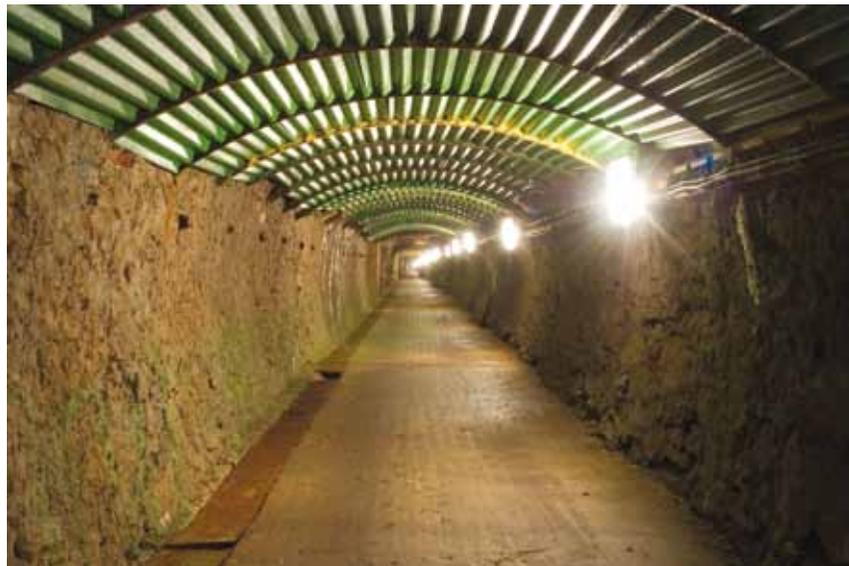




# BRATRSTVÍ

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The Bratrství repository near Jáchymov was designed exclusively for the disposal of waste containing natural radionuclides. It was constructed in the former Bratrství uranium mine complex in 1974. The total volume of the disposal capacity is approximately 1,200m<sup>3</sup>. It was constructed by means of the adaptation of a mining gallery and adjoining chambers so as to suit radioactive waste disposal purposes. The gallery, which is 385 metres long, is used as a haulageway. The walls and roofs of the emplacement chambers have also been specially adapted for disposal purposes. More than 80% of the Bratrství repository storage capacity has been utilised and the final date and method of repository closure depend on the volume of radioactive waste to be disposed of at the facility in the future.

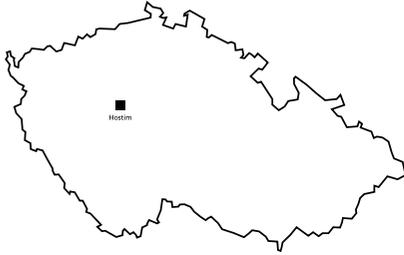


# DUKOVANY

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The Dukovany repository was specially designed for the management of low-level and intermediate-level radioactive waste generated by nuclear power plants. The repository, which covers an area of 1.3 hectares, is situated within the Dukovany nuclear power plant complex in the Rouchovany municipality, a part of the Třebíč district. The construction of the Dukovany repository by ČEZ, the state-owned Czech Power Company, commenced in 1987 and it has been in continuous operation since 1995. At present, drums containing operational radioactive waste principally from the Dukovany and Temelín NPPs are stored at this repository. The 55,000m<sup>3</sup> storage space (which is able to accommodate approximately 180,000 drums) provides enough capacity for all the operational waste generated at both Czech nuclear power plants even if their design life were to be extended to 40 years.





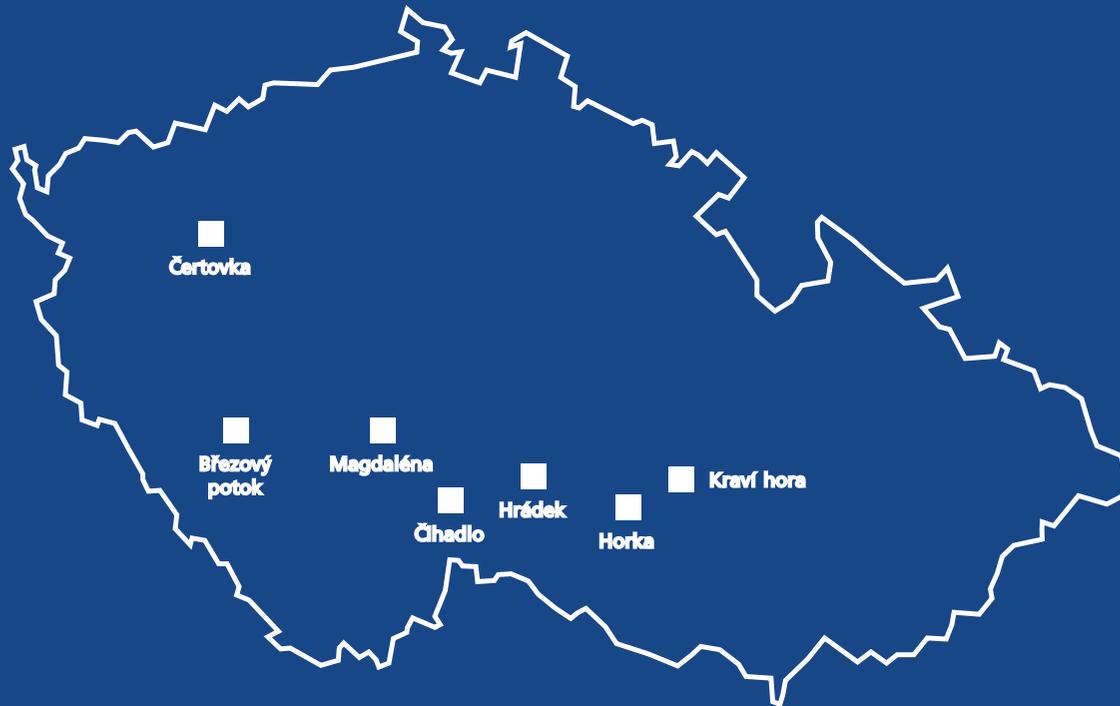
# HOSTIM

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The Hostim repository was opened in 1959 based on Government Decision No.231/1959 and was in operation up to 1965. It is situated in the abandoned Hostim I (Alcazar) limestone mine 3km east of the town of Beroun. Only low-level and intermediate-level waste from research activities was disposed of at this repository. From 1991 to 1994 a complete waste inventory and radiation and mining survey were conducted at the facility. In 1997 the remaining empty chambers and the shaft were filled with concrete and the repository was finally closed. Since this time RAWRA has continued to monitor the facility on a regular basis.



# SITES



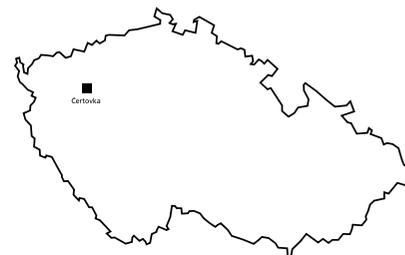
Geological investigation consists of the collection of basic information in order to efficiently assess the suitability of individual locations for the construction of a deep geological repository. For this and other reasons it is important to perform such investigation work at a minimum of four candidate locations. The investigation work, however, cannot be carried out without the consent of the communities involved.



# ČERTOVKA

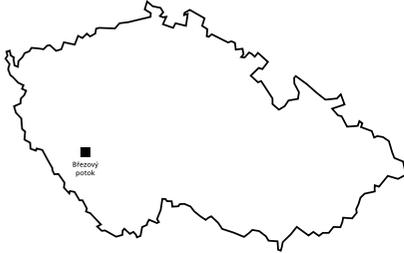
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The Čertovka location extends across the communities of Blatno and Lubenec in the Ústí Region and Tis u Blatna and Žihle in the Plzeň region. It is situated upon the 450 million to 505 million-year-old Tis granite massif which forms part of the Čistá-Jesenice granite massif. The results of work carried out so far at the location have revealed the existence of high-quality granite which is essentially free of extraneous elements and has only a low degree of cracking at depth. It is anticipated that planned geological exploration work will significantly refine existing data regarding the characteristics of the rock at the location and provide information concerning the depth and extent of the massif.



## *Žihle*





# BŘEZOVÝ POTOK

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The Březový potok location extends across the municipalities of Pačejov, Kvášňovice, Olšany, Maňovice, Chanovice and Velký Bor. The site is situated in the Central Bohemia granite zone (Central Bohemia pluton) upon Blatno granite rock which is one of the most widespread rock types found within the formation. The age of the rock varies between 331 million and 346 million years according to different sources. Planned investigation work will broaden existing knowledge of the rock environment at the location and, consequently, of its suitability for the construction of a deep geological repository.

*Velký Bor*



# MAGDALÉNA

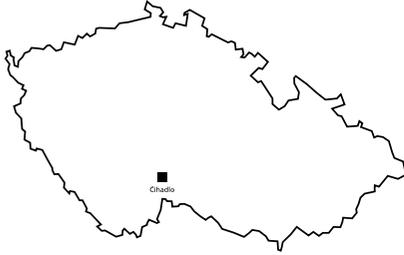
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The Magdaléna location is situated in the Central Bohemia granite zone (Central Bohemia pluton) and extends across the municipalities of Jistebnice, Nadějkov and Božetice. The area is known as the “Devil’s Burden” which is the name of one of the local hills. The whole of the area consists of dark granite rocks known as durbachits estimated at 336 million years old. Investigation work carried out so far has revealed that the rock at this location is only slightly impaired and relatively homogenous. It is anticipated that planned investigation work will provide further information on the rock environment at the location.



## *Božetice*





# ČIHADLO

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The Čihadlo location extends across the municipalities of Deštná, Světce, Lodhěřov and Pluhův Žďár. It is situated in the Klenová massif and forms part of a large granite area within the Bohemian massif which forms the backbone of the Czech-Moravian Highlands. The age of the granite varies between 298 million and 398 million years. The Klenová massif features a significant fault line running from just outside the village of Lodhěřov northwards towards Deštná and consists of two parts, both of which are, according to the results of work carried out so far, homogenous and only slightly impaired. Further investigation work will refine current information regarding the overall composition of the rock, rock development at depth and rock mass fracturing.

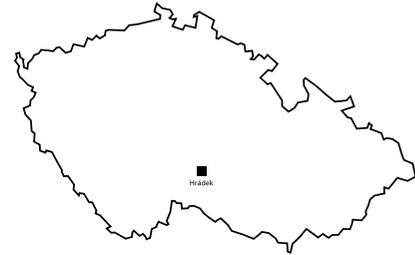
*Pluhův Žďár*



# HRÁDEK

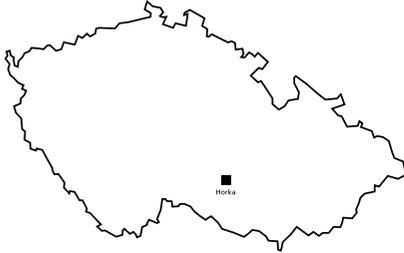
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The Hrádek location is situated in the central part of the largest granite area of the Bohemian massif known as the Moldanubicum pluton. It extends across the municipalities of Rohozná, Dolní Cerekev, Cejle, Hojkov, Milíčov and Nový Rychnov in the Vysočina Region. The age of the granite rock is estimated at between 303 million and 327 million years. The location features two fault lines, one of which runs along the Rohozná valley and the other between the villages of Rohozná and Hojkov. The famous Hojkov peat bog lies upon this fault line, the presence of which indicates that the rock at depth is dry and only insignificantly impaired.



*Nový Rychnov*





# HORKA

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The Horka location extends across the municipalities of Hodov, Rohy, Oslavička, Budišov, Nárámeč, Vlčatín, Osové, Rudíkov and Oslavice in the Vysočina Region. It is situated in the Třebíč massif which has a triangular shape and covers an area of nearly 600km<sup>2</sup>. The dark, potassium-rich granite rocks known as durbachits at this location are particularly suitable for the construction of a deep geological repository. No extensive occurrence of extraneous rock or significant rock faults have been found at this site to date. The results of investigation work carried out so far are favourable; however, the suitability of the rock mass must be confirmed both by further investigation work and laboratory testing.

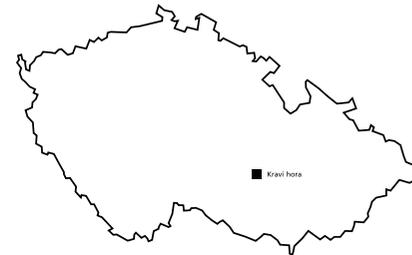
*Budišov*



# KRAVÍ HORA

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The Kraví hora location extends across the municipalities of Bukov, Věžná, Střítež, Milasín, Moravecké Pavlovice, Drahonín, Olší and Sejšku in the South-Moravia and Vysočina regions. It is situated in an area lying between two fault lines running from north to south and contains significant uranium veins. The Rožínka uranium mine is situated on the western line whilst the abandoned Olší mine is situated on the eastern line. The location consists of metamorphosed rocks – granulites, the chemical composition of which is similar to that of granite. Work performed to date indicates a relatively homogenous and only slightly impaired rock environment. Its suitability for the construction of a deep geological repository will have to be confirmed by further geological investigation work.



*Bukov*





# CONTACTS

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## **ABBREVIATIONS USED:**

CEG Centre for Experimental Geotechnics

ČBÚ Czech Mining Authority

ČVUT Czech Technical University in Prague

DGR deep geological repository

HLW high-level waste

IGD-TP Implementing Geological Disposal of Radioactive Waste Technology Platform

MF Ministry of Finance

MPO Ministry of Industry and Trade

MŽP Ministry of the Environment

NEA Nuclear Energy Agency of the Organisation for Economic Co-operation and Development

NGOs non-governmental organisations

NPP nuclear power plant

OECD Organisation for Economic Co-operation and Development

RAWRA Radioactive Waste Repository Authority

SNF spent nuclear fuel

SÚJB State Office for Nuclear Safety

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