IAEA
International Atomic Energy Agency

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PROPOSAL FOR RESEARCH CONTRACT

Please submit in duplicate

1. NAME AND ADDRESS OF CONTRACTING INSTITUTE:	CONTACT DETAILS:
ISTITUTO DI METODOLOGIE CHIMICHE – CNR **Area della Ricerca di Roma 1** **Via Salaria km. 29,300 – CP10 Monterotondo (Roma), Italia**	
2. DEPARTMENT WHERE RESEARCH IS TO BE PERFORMED: **ISTITUTO DI METODOLOGIE CHIMICHE - CNR**	Further information on the IAEA's Coordinated Research Activities can be found on the following website: **http://cra.iaea.org**

3. TITLE OF RESEARCH CONTRACT PROPOSAL:

Radon content in Qanats of Shahrood County in Iran.

A. Part of the IAEA's Coordinated Research Project (CRP)/ if applicable:

PROJECT 2.4.5.1 Terrestrial radioecology
CRT Title Development of Methodologies for Radon Surveys (Activity 4)

4. SUMMARY OF PROPOSED RESEARCH:

This Project takes into account the previous work carried out by this Institute in order to assess the content of radon and thoron inside many buildings of Rome due to the construction materials used in the past centuries. Particularly, important Palaces of the center of Rome suffer this problem.
Starting from the most recent techniques developed inside this Institute and the proposed research will examine and monitor the radon content inside a certain number of Qanats (ancient management systems used to provide a reliable supply of water to human settlements in arid and semi-arid climates, which are still in function in many semi-arid areas in Iran) and in particularly the Qanats of Shahrood, Torud and Biarjomand. This project will be carried out in collaboration with the University of Technology of Shahrood, Department of Earth Sciences, Iran, according to the alleged Memorandum of Understanding signed on June 16, 2008.

5. RESEARCH PERSONNEL (if space provided below is insufficient, please attach additional sheets):

A. Chief Scientific Investigator:

First Name	Family Name	Date of birth	Nationality	Position held	Sex M/F
Giancarlo	**Angelini**				

Academic degrees held:
Chemistry

Previous related scientific experience:
Nuclear Chemistry, Radiochemistry, Organic Chemistry
Recent publications related to the project (within the past 2 - 3 years):

B. Main Additional Scientific Staff:

First Name	Family Name	Date of birth	Nationality	Sex M/F
Angelo	**Ferrari**		**Italy**	

Academic degrees held:
Humanities

Previous related scientific experience:
Informatics, Database organizer, webmaster

First Name	Family Name	Date of birth	Nationality	Sex M/F
Pietro	**Ragni**		**Italy**	

Academic degrees held:
Physics

Previous related scientific experience:
Nuclear Chemistry, Radiation Chemistry, Radiochemistry

First Name	Family Name	Date of birth	Nationality	Sex M/F
Elvira	**Possagno**		**Italy**	

Academic degrees held:
Chemistry

Previous related scientific experience:
Nuclear Chemistry, Radiation Chemistry, Radiochemistry

First Name	Family Name	Date of birth	Nationality	Sex M/F
Stefano	**Tardiola**		**Italy**	

Previous related scientific experience:
Informatics

6. PROPOSED RESEARCH PROJECT (if space provided below is insufficient, please attach additional sheets):

6.1 Scientific Background:

The Staff members of the present Proposal worked for many years with many different radio nuclides both for synthesis purposes and for analytical purposes.
Specifically, analysis and validation of presence of radon and radiological doses has had a major achievement in this area of research carried out by this CNR Institute, as internationally recognized.

6.2 Scientific Scope of the Project (Scientific problems to be addressed with overall and specific objectives):

There are many different problems to be concerned with and to be solved:

- A simple standard procedure to analyze the radon content inside Qanats and water systems.
- Local Authorities must be able to reproduce in a consistent way these analyses in different Qanats.
- To prepare a common database where to save all the data and compare them coming from different Qanats.
- To measure the radiological doses and compare them.

6.3 Detailed Work Plan, including proposed methods or techniques:

This research proposal will be completed in one year.
According to the scientific problems expressed in the previous section, the following methods and techniques will be employed:

6.4 Expected Outputs:

The expected output is to provide Iranian Public Administrations of simple clear cut methodologies consistent wherever they are carried out to determine the radon content in Qanats.

9. BUDGET. Estimate for first year of project (please show all amounts in EUR €):

A. Institute's Staff Contribution

Research personnel and estimated percentage of total working time to be devoted to project:		Estimated project costs in €
Personnel	Time (%)	
G. Angelini	14	3,000.00
A. Ferrari	48	10,000,00
P. Ragni	20	5,000.00
E. Possagno	8	3,000.00
Tardiola	10	3,000.00
	Sub-total:	**€ 24,000.00**

B. Equipment

Item	Estimated project costs in €
	11,000.00
Sub-total:	**€ 11,000.00**

Do you require the Agency to purchase any of the above equipment?

☐ Yes X☐ No

C. Miscellaneous (including transport*):

Item	Estimated project costs in €
Travel and Transportation costs are due to the fact that mobile equipments must be transferred from the Institute to the various sites where the analyses must be performed.	**6,000.00**
Sub-total:	**€ 6,000.00**

* If funds for travel/transportation have been included in the budget, please indicate specific purpose:

THE IAEA REQUIRES THAT ITS RELEVANT HEALTH AND SAFETY STANDARDS ARE OBSERVED. IF A CONTRACT IS AWARDED, YOU WILL BE NOTIFIED OF THE STANDARDS THAT ARE TO APPLY TO THE ACTIVITIES TO BE CARRIED OUT UNDER THE CONTRACT.

D. Total - All Costs (Budget Items A - C):

Total estimated project cost:	**€ 41,000.00**

E. Overall Cost Estimates (in EUR €):

Amount to be contributed by the Institute:	**€ 41,000.00**
Amount expected from other (non-IAEA) sources:	**€ 0.00**
Amount requested from the IAEA:	**€ 9,000.00**
	€ 50,000.00

11. IF THE PROJECT NEEDS MORE THAN ONE YEAR TO COMPLETE, PLEASE GIVE ESTIMATE OF FUNDS REQUIRED (in EUR €) FOR EACH PROJECT YEAR.

Project Year	Staff Costs	Equipment	Miscellaneous	Project Total	Requested from the IAEA
1st	**€ 24,000.00**	**€ 11,000.00**	**€ 6,000.00**	**€ 41,000.00**	**€ 9,000.00**
2nd					
3rd					
Total	**€ 24,000.00**	**€ 11,000.00**	**€ 6,000.00**	**€ 41,000.00**	**€ 9,000.00**

12. DOES INSTITUTE HAVE INDEPENDENT LEGAL PERSONALITY? ☐ X Yes ☐ No

If no, please provide details of the organization that would be the contracting partner:

The National Research Council is a public body and is formed by about 100 Institutes; the Institute for Chemical Methodologies is one of these Institutes.

13. PROPOSED PROJECT COMMENCEMENT DATE:
October 29, 2008

14. SIGNATURES:

CHIEF SCIENTIFIC INVESTIGATOR:

Signature Date

HEAD OF INSTITUTE:

Signature Date

Memorandum of Understanding
between

Department of Earth Sciences , Shahrood Univ. of Technology ,Iran
and
Department of Environmental Sciences, University of L'Aquila, Italy
and
National Research Council (C.N.R.), Institute of Chemical Methodology, Italy

Preamble

The Department of Earth Sciences (ES) , Shahrood University of Technology and Department of Environmental Sciences (ENS), University of L'Aquila, Italy, and Institute of Chemical Methodology (IMC), National Research Council, Italy, are willing to initiate cooperatives in areas of mutual interest.

The coordinators of these activities are Dr. Gholam Hossein Karami from ES Shahrood University of Technology, Iran, and as Italian partners Prof. Ezio Burri of the Department of Environmental Sciences, University of L'Aquila, Italy, Dr. Angelo Ferrari of Institute of Chemical Methodology, National Research Council, Italy.
The research activities will be done by researchers of these academic Institutes and C.N.R and their collaborators.

Article I

The purpose of this Memorandum of Understanding is to study three Qanats of Shahrood County (i.e. Qanat of Shahrood, Qanat of Torud, and Qanat of Biarjomand) and also to study the karstic areas in the North and West of Shahrood (Tapal mountains and surrounding regions).

Article II

To achieve the aims and purposes expressed in the preamble and in Article I, the following is agreed.

1. ENS will install 6 Recordable Multi-Parameter Gauges in the mentioned Qanats to monitor EC, pH, and T (eventually D.O.) of water in Galleries of Qanats continuously.
2. IMC will measure the amount of Radon in the mentioned Qanats using Radonmeter.
3. ENS will monitor the precipitation in the area of mentioned Qanats using Recordable Rain Gauges.

4. ENS will study the geomorphology of the karst in the North and West of Shahrood.
5. IMC and ENS will study the mentioned Qanats to valuate the cultural heritage of Shahrood area.
6. ES will cooperate with the mentioned Italian team to carry out the above mentioned items.
7. ES will prepare accommodation and transportation for mentioned Italian team during their stay in Shahrood.
8. All derived results will be published by all names of ES, ENS, and ICM.
9. ENS and IMC make effort to provide funds for these researches from relevant Italian and European projects.
10. All equipments applied in the mentioned project will be remained permanently in ES.

Article III

This agreement will be signed by the Chancellors of Shahrood University of Technology, University of L'Aquila and the Authority of CNR or their delegates.

Article IV

This memorandum of understanding shall remain valid for two years and may be expanded by mutual agreement of mentioned parties.

Signed by:

Dr. G.H. Karami
Head of Dept. of Earth Sciences
Shahrood University of Technology
Shahrood, Iran

Prof. Ezio Burri
Department of Environmental Sciences, University of L'Aquila, Italy

Dr. Angelo Ferrari
National Research Council
Institute of Chemical Methodology, , Italy

Project 2.4.5.1 Terrestrial radioecology
CRP Title: Development of Methodologies for Radon Surveys (Activity 4)
CRP Code: To be assigned

Radon-222 (“radon”) and radon-220 (“thoron”) are naturally-occurring radionuclides, members of the uranium and thorium decay series, respectively. Present estimates published by UNSCEAR indicate that approximately half of the natural-origin radiological dose to humans originates from inhalation of the short-lived progeny of radon isotopes. Such estimates are based upon data from the numerous radon surveys which are carried out in Member States. Unfortunately, there is no standardised methodology or even guidelines for survey design, implementation and data analysis. The CRP is planned to concentrate on the development of methods and guidelines, testing, validation and use of these in case study surveys carried out by participant institutions. The specific objective of this CRP is to coordinate development, validation and application of standardised methods for conducting surveys of radon concentration in air in dwellings, appropriate for input to compilations of radiological dose to the population.