

## **THE IAEA DIRECTORY OF RADIOACTIVELY CONTAMINATED SITES (DRCS)**

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### **ABSTRACT**

A key instrument for collecting and disseminating information about radioactively contaminated sites and pertinent management strategies and remediation techniques will be the Directory of Radioactively Contaminated Sites (DRCS) currently under development at the International Atomic Energy Agency. This paper describes the contents and modes of access for the DRCS.

### **INTRODUCTION**

In fulfilling its obligations under Article VIII of its statutes, the IAEA attaches great importance to the dissemination of information that can assist Member States with the development, implementation, maintenance and continuous improvement of systems, programmes and activities that support the nuclear fuel cycle and nuclear applications, including managing the legacy of past practices and accidents. In response to this, the IAEA has initiated a comprehensive programme of work covering all aspects of environmental remediation.

A key instrument for collecting and disseminating information about radioactively contaminated sites and pertinent management strategies and remediation techniques will be the Directory of Radioactively Contaminated Sites (DRCS) currently under development.

### **HISTORICAL DEVELOPMENTS**

The process to establish a world-wide directory of radioactively contaminated sites was started in 1996, when a questionnaire was sent to the Member States, asking them to provide information on relevant sites on their respective territories. The survey explicitly addressed sites contaminated with radioactivity as a result of

- (a) nuclear or radiological accidents
- (b) nuclear weapons production and testing
- (c) poor waste management and disposal practices
- (d) industrial manufacturing involving radioactive materials
- (e) conventional mining and milling of ores resulting in radioactive residues.

Only a limited number of Member States responded with information on such sites. After reviewing thoroughly the results of its previous efforts, the Agency decided to re-define the purpose and structure of the directory.

The Agency developed a technical document [1] that fulfilled two main objectives:

- (a) to describe the activities and underlying considerations and concepts for the development by the Agency of a world-wide Directory of Radioactively Contaminated Sites;
- (b) to give some recommendations for the development of such directories at the Member State level.

Using this conceptual basis, the Agency developed a WWW-based tool for submitting and viewing relevant information, the DRCS.

## THE STRUCTURE OF THE DRCS

The DRCS is accessible on the Internet, using a Web-browser. It is essentially divided into two domains, one public, the other one private. The public domain allows the free viewing the published database content. The private domain serves to submit data to DRCS.

The data are grouped into 18 main categories, ranging from site identifiers, to geographical, geological, hydrological, socio-economic data and characteristics of the contaminants, hazards and impacts, remediation measures, to references to pertinent published references (Table I).

Table I Main data categories in the DRCS

100	Identification And Location Of The Site (Area)
200	Legal / Institutional Responsibilities
220	Ownership, Operation And Administrative Responsibilities
230	Administrative Responsibilities For The Site's Environmental Remediation
240	Social & Economic Aspects
300	Site History
410	Physical Geographical
430	Geological And Hydrological Characteristics
440	Climatological Characteristics
450	Demographic Data
460	Economic Data
500	Type, Levels And Extent Of Contamination
510	Radiological Contamination Level
520	Contaminated Environmental Media Characterization
540	Radioactive And Hazardous Waste Characterization
600	Potential And Actual Hazards Issuing From The Site And Emergency Measures
700	Restoration Strategies And Techniques
900	Published Information On The Site

## ACCESSING DATA

Sites of interest can be selected by two routes of entry:

- a list of Member States (MS) and a list of sites within the boundaries of this MS is provided from which to choose (Fig. 3).

**DIRECTORY OF RADIOACTIVELY CONTAMINATED SITES**  
**IAEA DRCS**

Home | Access Data | Search | Submit Data | Logout | Help

Submit Data : Updating | Previous Page | Main Menu | Next Page

Site: **Kraton-E** | Country: **Russian Federation**

**410 PHYSICAL GEOGRAPHICAL CHARACTERISTICS**

412 **Topographical map** |

If a map/document is available on Internet and can be accessed through HTTP or FTP connection, type its address in the field. To upload a map from your computer click on upload button and follow the instructions.

420 **Land Cover**

421 **Sealed/built-up area (sq.km)** |

422 **Prevailing land cover** |

423 **Land-cover map** |

If a map/document is available on Internet and can be accessed through HTTP or FTP connection, type its address in the field. To upload a map from your computer click on upload button and follow the instructions.

Save Changes | Previous Page | Main Menu | Next Page

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Contact DRCS Programme Officer with your queries. International Atomic Energy Agency © 2001-2003

**DIRECTORY OF RADIOACTIVELY CONTAMINATED SITES**  
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Site: **Kraton-E** | Country: **Russian Federation**

**510 RADIOLOGICAL CONTAMINATION LEVEL**

511	Radioactive contamination, total activity		
511.1	Surface contamination density	<input type="text"/>	<input type="text" value="kBq/m²"/>
511.3	Contaminated area	<input type="text" value="100"/>	<input type="text" value="km²"/>
511.4	Mean specific activity level in soil, depth 0-15 cm	<input type="text"/>	<input type="text"/>
511.6	Mean specific activity level in soil, depth below 15 cm	<input type="text"/>	<input type="text"/>
511.8	Reference date	<input type="text"/>	
512	Radioactive contamination for (nuclide):	<input type="text" value="Sr-90"/>	<input type="checkbox" value="delete"/>
512.2	Surface contamination density	<input type="text" value="20"/>	<input type="text" value="kBq/m²"/>
512.4	Contaminated area	<input type="text" value="100"/>	<input type="text" value="km²"/>
512.5	Mean specific activity level in soil, depth 0-15 cm	<input type="text"/>	<input type="text"/>
512.7	Mean specific activity level in soil, depth below 15 cm	<input type="text"/>	<input type="text"/>
512.9	Soil sample density (kg/m3)	<input type="text"/>	
512.10	Reference date	<input type="text"/>	
512	Radioactive contamination for (nuclide):	<input type="text" value="Pb-210"/>	<input type="checkbox" value="delete"/>
512.2	Surface contamination density	<input type="text" value="1"/>	<input type="text" value="kBq/m²"/>
512.4	Contaminated area	<input type="text" value="100"/>	<input type="text" value="km²"/>
512.5	Mean specific activity level in soil, depth 0-15 cm	<input type="text"/>	<input type="text"/>
512.7	Mean specific activity level in soil, depth below 15 cm	<input type="text"/>	<input type="text"/>

Fig. 3 Sample Data Entry Pages

- a sequence of ‘clickable’ maps is provided, ‘drilling down’ from the World, to regions, to individual Member States. On this last level, ‘hot spots’ identify individual sites that then can be clicked (Fig. 2).

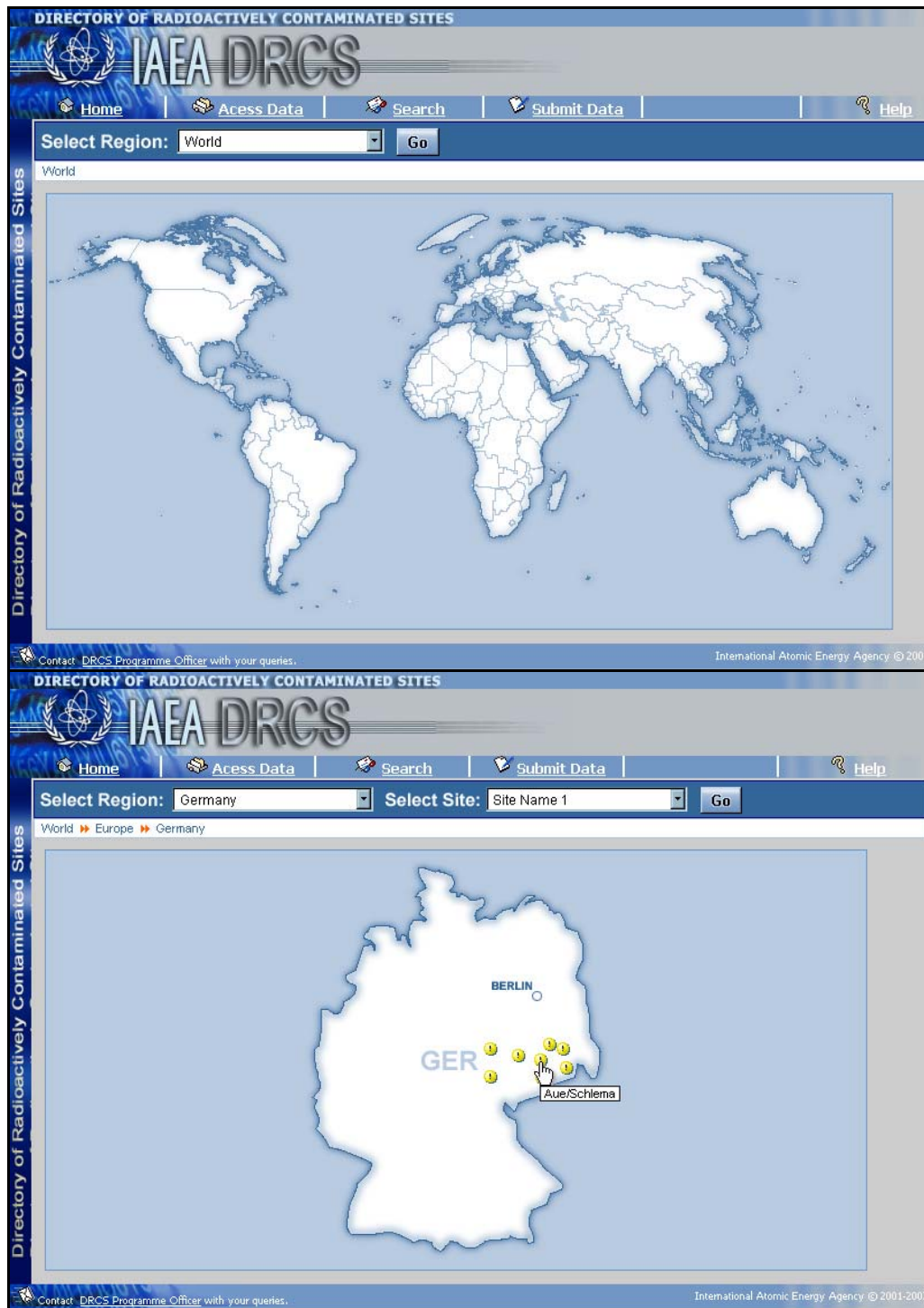


Fig. 2 Contaminated site selection by 'clickable' maps (dummy page)

**DIRECTORY OF RADIOACTIVELY CONTAMINATED SITES**  
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Site: **Kraton-E** Country: **Russian Federation**

**600 POTENTIAL AND ACTUAL HAZARDS ISSUING FROM THE SITE AND EMERGENCY MEASURES**

610	Actual Hazards	
620	Potential Hazards	Radiation situation at the "Kraton-3" object is under control. There are local contaminated spots. Practically no radionuclide migration has been detected. Measures for ensuring the radiation safety and a number of restrictions rule out any radiation impact on the population
631	Implemented countermeasures	At the site within the area of R = 100 m around the well a layer of soil had been removed. The well head and a burial of contaminated soil and technical equipment are protected by an earth rampart against snowmelt and rain-water runoff.
632	Planned countermeasures	The Federal Special Program "Radioactive Waste and Spent Nuclear Materials Management and Disposal (1995- 2000)" envisaged development and implementation of special measures for exploration of sites, where peaceful nuclear explosions had been carried out, and drawing up of environmental certificates of radiation-contaminated objects, including the "Kraton-3" epicenter zone.

Save Changes

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Site: **Kraton-E** Country: **Russian Federation**

**700 RESTORATION STRATEGIES AND TECHNIQUES**

711	Identification of sub-site(1) to which measure is applied	Check to delete <input type="checkbox"/>																														
<table border="1"> <thead> <tr> <th>Measure 1</th> <th>Taken/Planned</th> <th>Begin time period</th> <th>End time period</th> <th>Costs/Estimate</th> <th>Currency</th> </tr> </thead> <tbody> <tr> <td>712</td> <td>Planned</td> <td>2003</td> <td>2004</td> <td>1000000</td> <td>Belarussian Ruble</td> </tr> <tr> <td>712</td> <td>Measure Description</td> <td colspan="4">capping</td> </tr> <tr> <td>712</td> <td>Technique(s) applied</td> <td colspan="4"></td> </tr> <tr> <td>712</td> <td>Results of taken measure</td> <td colspan="4"></td> </tr> </tbody> </table>			Measure 1	Taken/Planned	Begin time period	End time period	Costs/Estimate	Currency	712	Planned	2003	2004	1000000	Belarussian Ruble	712	Measure Description	capping				712	Technique(s) applied					712	Results of taken measure				
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712	Planned	2003	2004	1000000	Belarussian Ruble																											
712	Measure Description	capping																														
712	Technique(s) applied																															
712	Results of taken measure																															

[display remediation measures](#)

Save Changes

711	Identification of sub-site(2) to which measure is applied	new
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Fig. 4 Detailed information on site hazards and remediation measures

## CONTAMINATED SITES INFORMATION

In Figs. 3 and 4, screen shots show examples of data entry pages. The 'view only' pages (entry through 'Access Data') would look very much the same, except that, of course, nothing can be changed. The user can view the pages in sequences using a 'next' button, or navigate through the site information using the main selection page.

## SEARCH FACILITY

The database user can configure various search profiles as illustrated in Fig. 1. The user then is provided with a list of sites matching the selected criteria to choose from.

Fig. 1 The Main Web-page of the DRCS and Search Profile

## DATA COLLECTION AND QUALITY CONTROL/QUALITY ASSURANCE

The main tool for data collection is a system of Country Contact Points (CCPs) that has been established in the Member States. To date 25 countries have registered CCPs. These CCPs will collate relevant site data and ensure that they are compatible with the respective Member State's policy and practices. This route was chosen in order to avoid possible conflicts over the decision what constitutes a 'contaminated site'. The definition may vary from Member State to Member State and the Agency does not want to prejudice a decision in a Member State.

## **CURRENT STATUS**

The DRCS is now operational and can be accessed at '<http://www-drcs.iaea.org/>'. However, the data content at present is very limited, pending the submissions by the Country Contact Points.

## **CURRENT STATUS**

The Agency invites contributions to this ongoing programme. The contact details for the relevant Country Contact Point can be obtained from the DRCS administrator (DRCSProgrammeOfficer@iaea.org).

## **REFERENCES**

- 1 International Atomic Energy Agency, Design Criteria for a worldwide directory of radioactively contaminated sites (DRCS), IAEA-TECDOC-1251, Vienna (2001).

## **ACKNOWLEDGEMENTS**

Numerous people have, over the years, contributed to the design and finally the implementation of the software tool. More recently, Iouri Podzniakov, Anne Scanlon, and Holger Schlaminger have contributed to the software development.