



WATER









PLATFORMS



Our SOLUTIONS



BRGM's PRIME platform in Orléans for soil and water decontamination. Plurimetric pilot. © BRGM – Didier Depoorter

An innovative test laboratory for soil and water: PRIME

In France, almost 9,000 sites are contaminated by heavy metals, such as lead, copper and chromium, as well as by hydrocarbons and organochlorine compounds, which include pesticides and solvents. Decontaminating them is a major challenge for our environment. This is the objective of the experimental PRIME platforms, installed at the BRGM site in Orléans.





BRGM's PRIME platform in Orléans for soil and water decontamination. Submetric platform. © BRGM – Didier Depoorter

YOUR ISSUES AND NEEDS

The PRIME platform responds to practical needs and issues linked to the monitoring and decontamination of water, soil and the subsurface. PRIME acts as an intermediate link between laboratories and contaminated sites, and develops, qualifies and validates various tools and methods at different scales, such as:

- Environmental metrology tools (sensors, samplers, etc.) to identify and quantify pollution in the soil, subsurface and groundwater.
- Models to predict the potential impact of a given type of contamination on the environment, in the short and medium term (degradation, storage, transfer, etc.).
- Innovative and environmentally friendly remediation methods and processes (physical, chemical and biological).

PRIME's experimentation facilities are housed in a purpose-built 1,000m² hall located near BRGM's analytical facilities. PRIME is a facility classified for environmental protection (ICPE) and therefore gives industrial and academic partners the opportunity to develop and test remediation solutions for potentially hazardous substances.



OUR VALUE PROPOSITION

The management of polluted sites and soils is crucial from an environmental as well as from a health and economic perspective. BRGM's PRIME platforms in Orléans are experimental facilities with 3 objectives:

- Identify and quantify ground, subsurface and groundwater pollution.
- Predict their potential impact on our environment in the short and medium term.
- Propose solutions (tools and methods) for remediating and studying the affected areas.

PRIME platforms carry out multi-contaminant (inorganic and organic), multi-matrix (soil, sediment, water, rock) and multi-method (physical, chemical, biological) studies.

PRIME has already contributed to the understanding and rehabilitation of environments polluted by hydrocarbons (petrol station leaks for example), chlorinated solvents (used in dry cleaning, degreasing for metallurgy, etc.), pesticides (in crops) and heavy metals (linked to industrial and mining activities).

Its platforms are also developing innovative ecotechnologies, for example using the properties of micro-organisms or nanoparticles to clean up pollution.



PRIME, a research and innovation platform for environmental metrology. A plurimetric pilot. © BRGM – Hélène Fournié

Multiple access points

Piezometers & multiparameter probes

BRGM's PRIME platform in Orléans for soil and water decontamination. Metric platform. © BRGM – Didier Depoorter



Monitoring of diesel displacement in the PRIME plurimetric pilot, at Orléans, 2022. © BRGM – Didier Depoorter

BRGM's PRIME platform in Orléans for soil and water decontamination. Metric platform. © BRGM - Huques Thouin

TOOLS AND PLATFORMS

PRIME is a unique system in Europe for studies on different scales:

- On small scales (a few kg or cm3 of soil, sediment or liquids). Each parameter (temperature, pollutant concentration, etc.) can be checked and its precise role identified.
- On a large scale (several tonnes or tens of m3). This allows for more realistic conditions that are close to those encountered in the field.



PluriMetric Pilot



FIELDS OF APPLICATION

ENVIRONMENTAL METROLOGY

Simulating groundwater circulation for testing sensors and passive samplers.

MIGRATION AND FATE OF CONTAMINANTS IN SOILS, ROCKS AND GROUNDWATER

- Management and optimisation of excavated materials from work on the Greater Paris Express Metro line.
- Understanding the mechanisms that control the distribution of metallic contaminants between river water and sediments when they are released back into suspension.
- Studying the behaviour of waste treatment residues (bottom ash) and slag from metal production.
- Studying the transfer of organic contaminants (pesticides, pharmaceutical compounds, body-care products, degradation products, metabolites, etc.) in the environment.

PHYSICO-CHEMICAL OR BIOLOGICAL **REMEDIATION TOOLS AND PROCESSES**

- Selecting the appropriate plant cover to rehabilitate industrial wastelands;
- Development of passive mine water treatment facilities;
- Development of a bioprocess for pesticide degradation based on the use of active microbial communities;
- Using foam to treat groundwater contaminated by heavy chlorinated compounds.



AVAILABLE Resources

BRGM provides the skills and know-how of a team of technicians, engineers, researchers and business managers to meet your needs, from fundamental research to product or service validation (TRL1 to 9).

All PRIME's resources can be mobilised within the framework of:

- Collaborative research projects (design, implementation, transfer) with regional, national or European funding.
- Services at different levels of the value chain.
- Possibilities for development, testing or validation of methods and equipment.
- Training/demonstration.

Discover our virtual tour of the PRIME platform





brgmformation

EDUCATION & TRAINING, one of BRGM's missions

BRGM helps to develop scientific and technical skills through both "off-the-shelf" and "tailor-made" training courses, provided by its specific professional training branch: BRGM Formation.

Training course themes :

Geology | Sustainable management of groundwater resources | Mineral resources and circular economy | Environment, land-use projects | Energy transition and underground space | Natural risks, impacts of climate change.

Geoscience for a sustainable Earth

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