

Investigations & Remediation Plan for Radium & VOC Residential Area, France

Client: Confidential

HPC-Contact: Dr. F. KARG +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Remediation & Redevelopment	20.000 €	2001-2004



Project description:

The underground of 86 residential houses were contaminated with Radium by deposits of a former facility. Site investigations, risk assessments & remediation were managed by the Radium Committee of the Environment.

As a member of the Ministry of Environment's, Dr. F. Karg (HPC) participated as an expert in the Radium Committee in various site investigations, risk assessments & remediation projects concerning

Purpose:

An environmental investigation was carried out to identify the presence of radio-isotopes. A remediation management plan was prepared and remediation action was done.

The expertise and co-organization of all measures and investigation, focussing on Radium & Radon were given.

Our services:

- Expertise & co-organization of site investigations and Health Risk Assessment (HRA)
- Co-Organization of the remediation management plan.

Client benefits:

- The investigation and assessments enables to select optimal and realizable remediation.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.

Health Risk Assessment & Remediation Plan for Radium, Tritium, Americium, VOC & TPH, France

Client: Confidential

HPC-Contact: Dr. F. KARG +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Remediation	50.000 €	2003-2005



Project description:

The underground of 86 residential houses were contaminated with Radium by deposits of a former facility. Site investigations, risk assessments & remediation were managed by the Radium Committee of the Environment.

As a member of the Ministry of Environment's, Dr. F. Karg (HPC) participated as an expert in the Radium Committee in various site investigation, risk assessments & remediation projects.

Purpose:

Co-Organization and support of site investigations, risk assessment & remediation concerning radio-isotopes (e.g. Radium, Radon).

Our services:

- Co-organization and consultation on focussing on radio-isotopes
- Co-organization and consultation of a Health Risk Assessment (HRA)
- Co-organization and consultation on remediation management plan incl. cost-benefit analysis

Client benefits:

- The investigation and assessments enables to select optimal and realizable redevelopment solutions.
- It provides the basis to identify potential areas of concern regarding the change of use.
- Legal and financial safety for site remediation and management.



Remediation of a Former Leather Plant, France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Remediation	100.000 €	2006



Project description:

The site (approx. 5 ha) hosted for 60 years facilities for the manufacture of leather for the shoe industry, leather goods, furniture, automotive and aviation. HPC was commissioned, under the supervision of a judicial expert, to ensure the elimination of hazardous waste and to carry out a diagnostic and risk assessment for the future use of the land. Site investigations have been conducted concerning soil, dust and plants, seeking of chemical substances and radioelements (e.g. alpha, beta and gamma emitters), followed by the quantification of health risks associated with exposure to radioisotopes.

Purpose:

An environmental investigation was carried out to identify the presence of radio-isotopes, heavy metals, metalloids, hydrocarbons, phthalates, solvents and others. A remediation management plan was prepared and remediation action was done.

Our services:

- Soil surveys and excavation
- Sampling of groundwater and surface water (ponds and rivers) incl. sediments
- Emptying and decommissioning of tanks; grouping and disposal of various chemicals in approved centers
- Dismantling of transformers substations
- Monitoring of radio-isotope

Client benefits:

- The investigation and assessments enables to select optimal and realizable remediation.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.



Investigations & Remediation Management Plan (Radium, Radon & Asbestos) France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service area	Value	Project duration
Remediation	60.000 €	2016

Project description:

The site, used in the past for radium Activities is polluted e.g. with radium, radon and asbestos.

Purpose:

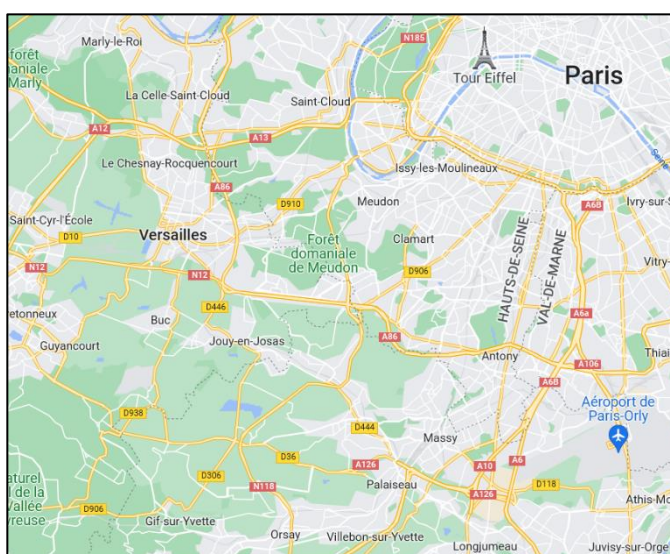
The site will undergo site investigations and a risk assessment & remediation planning will be evaluated for real estate development.

Our services:

- Historical survey and site investigations
- Health Risk Assessment (HRA)
- Definition of Site Specific
- Remediation Goals (SS-RG)
- Pollution remediation management plan

Client benefits:

- The investigation and assessments enables to select optimal and realizable remediation.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.



HRA & Remediation Plan at a Fertilizer Plant, France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Remediation & Redevelopment	60.000 €	2007-2012



Our services:

- Site assessment incl. the investigation of e.g. radio-isotopes, MTE, chlorinated solvents & PAHs
- Elaboration of a conceptual scheme of the site and its neighbourhood
- Realization of a Health Risk Assessment (HRA)
- Remediation management plan and cost-benefit analysis

Client benefits:

- The investigation and assessments enables to select optimal and realizable redevelopment solutions.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.

Project description:

The site has hosted various industrial activities over time: manufacture of hydrogen, phosphoric acid, paper and ammunition, the large storage of flammable liquids, chemical products and fertilizers and the deposit of industrial waste.

The use of hazardous materials are at the origin of an impact on soil, soil gas and groundwater.

Purpose:

An environmental assessment was carried out, followed by a risk assessment of pollution concerning human health. A remediation management plan was prepared as part of a redevelopment project.

Soil Remediation of Former Army Barracks & Petrol Station, France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Remediation	83.000. €	2012



Project description:

The site was occupied by Army barracks until 1998 and remained without activity until 2007.

The environmental study showed an area impacted with hydrocarbons by a former petrol station, a DFO-tank located in the basement of a building and an area of impacted by domestic fuel and contaminated with Uranium. The redevelopment plan showed the construction of residential and areas for green spaces and recreation. HPC delivered a conception of remediation and rehabilitation.

Purpose:

Through the investigation and a site-specific assessment the two main potential issues, the presence of radioactive uranium and hydrocarbons were examined.

Our services:

- Excavation & sorting of material
- Cleaning, degassing, emptying, cutting and off-site disposal of the DFO tank
- Excavation & disposal of material impacted by domestic fuel oil
- Off-site treatment of Uranium contaminated soil

Client benefits:

- The investigation and assessments enables to select optimal and realizable redevelopment solutions.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.



Groundwater Monitoring at a Nuclear Power Plant France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Radio-Isotopes Groundwater Monitoring	100.000 €	2015 – on going



Project description:

As part of the environmental monitoring programme of the former Nuclear Power Plant, the client commissioned HPC for achieving samplings of groundwater, chemical and radiological analysis and risk assessment of results. These results are transmitted frequently (every 15 days) to the National Agency for Nuclear Safety (ASN).

Purpose:

Through the investigation and a site-specific risk assessment at the 100 MW former nuclear reactor block, cooled by lake water, the two main potential issues, the presence of radioactive elements (tritium etc.) and other chemical pollutants (e.g. heavy metals, hydrocarbons) are examined.

Our services:

- Bi-monthly campaigns conducted on several groundwater monitoring wells
- Measurement of in-situ physico-chemical parameters, management of purge water used water tanks
- Monitoring chemical and radiological input (e.g. radio-isotopes & radiation)
- Regular reporting on radio-Isotope & radiation content/findings
- Training courses for project team on radiology and medical supervision & exposure monitoring on website

Client benefits:

- Independent, transparent & matching environmental monitoring to ensure a high level of safety and insurance.
- Minimizing losses through professional trainings.
- Optimal & permanent control and supervision through secured monitoring via internet.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.



Groundwater Monitoring at a Nuclear Power Plant, France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Radio-Isotopes Groundwater Monitoring	1 Mio. €	2015 – on going



Project description:

As part of the environmental monitoring of the Nuclear Power Plant, this client commissioned HPC to sample the groundwater, incl. chemical and radiological analysis and a risk assessment. These results are transmitted every 15 days to the National Agency for Nuclear Safety (ASN).

Purpose:

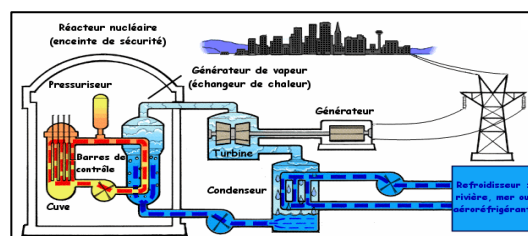
Through the investigation and a site-specific risk assessment the two main potential issues, the presence of radioactive elements (tritium etc.) and other chemical pollutants (e.g. heavy metals, hydrocarbons) are examined.

Our services:

- Bi-monthly campaigns conducted on 30 groundwater monitoring wells
- Measurement of in-situ physico-chemical parameters
- Management of purge water used water tanks
- Monitoring chemical and radiological input (e.g. radio-isotopes & radiation)
- Regular reporting on radio-Isotope & radiation content/findings
- Training courses for project team on radiology
- Medical supervision & exposure monitoring on website

Client benefits:

- Independent, transparent & matching environmental monitoring to ensure a high level of safety and insurance.
- Minimizing losses through professional trainings.
- Optimal & permanent control and supervision through secured monitoring via internet.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.



Radio-Isotopes Survey & HRA at a Incineration Plant France

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service area	Value	Project Duration
Reception of low-level radioactive waste	25.000 €	2003 - 2005



Project description:

Due to on-site reception of low-level radioactive waste for incineration, a Health Risk Assessment was carried out regarding Off-Gas Emissions and neighboring population.

Site investigations have been conducted concerning soils, dusts and plants (seeking of radio-elements: alpha-, beta- and gamma- emitters), followed by quantification of health risks associated with exposure to radio-isotopes.

Purpose:

The on-site investigations and the Health Risk Assessment assessed the potential presence of radioelements in emissions (off-gas), soil, dust and auto-produced food.

Our services:

- Realization of a radiological investigation via alpha- & gamma-spectroscopy
- Health Risk Assessment (HRA) of the nearby site population.

Client benefits:

- Independent, transparent & matching environmental monitoring to ensure a high level of safety and insurance.
- Minimizing losses through professional trainings and maintaining of operation permits
- Optimal & permanent control and supervision through secured monitoring via internet.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.
- Legal and financial safety for site.
- Ensuring a high level of quality and acceptance by use of a sspecialized and approved radio-isotope laboratory.



Site Investigations & Site Remediation of a Radium-Contamination, Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Site Remediation	250.000 €	2003 - 2005



Our services:

- Site Investigations
- Conceptual Scheme of the site and its neighbourhood
- Remediation Plan & Supervision
- Pollution Remediation Control

Client benefits:

- Independent, transparent & matching environmental monitoring to ensure a high level of safety and insurance
- Optimal & permanent control and supervision
- Ensuring a high level of quality and acceptance by use of a specialized & approved radio-isotope laboratory
- Legal and financial safety for site

Project description:

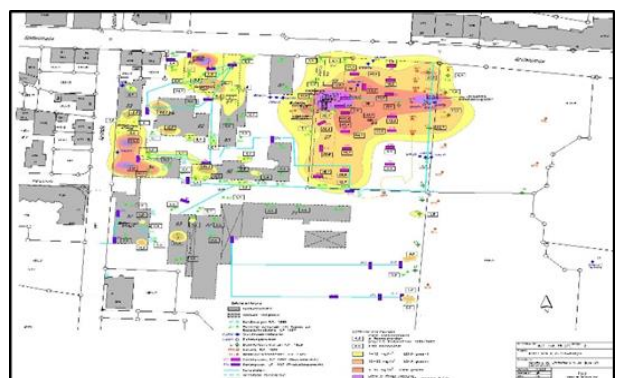
The site has hosted an industrial activity up to 1989 with use of Radio-luminescent paints for watches, etc. several soil, soil gas and groundwater contamination were the consequence on site. An Environmental Assessment was carried out, followed by a Remediation Management Plan. Remediation actions are:

- Confinement and Engineered & controlled Landfill.
- Groundwater Remediation by P&T: Pump and Treat.

Purpose:

The Site Investigations and Remediation concerning the following issues:

- Radio-Isotopes (Radium, etc.), Aliphatic Hydrocarbons, chlorinated solvents & other VOC.



Hydro-Chemical Characterization of a Uranium Mining Tailing Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Mining & Hydro-Chemical Investigation	120.000 €	1997 - 2012



Project description:

An essential condition for the rehabilitation of waste heaps of the remediation operation This site is the prevention and minimization of hazardous leachate by reducing the effluent load into the receiving water and mine water incl. reduction of the release of harmful substances via the water path. The study aimed to characterize the essential physico-chemical factors, reaction conditions and processes for substance mobilization and to quantify current and future releases.

Purpose:

Hydro-chemical characterization to improve the environmental situation and to evaluate the needs for further activities in remediation and water cleaning resp. protection measurements.

Our services:

- Characterization of heaps to Lithological, mineralogical, macro- & micro-chemical characterization, incl. NP-SP Value
- Heap-lechate
- Simulation of mass transfer Execution and evaluation of column tests with waste rock material
- Water balance models

Client benefits:

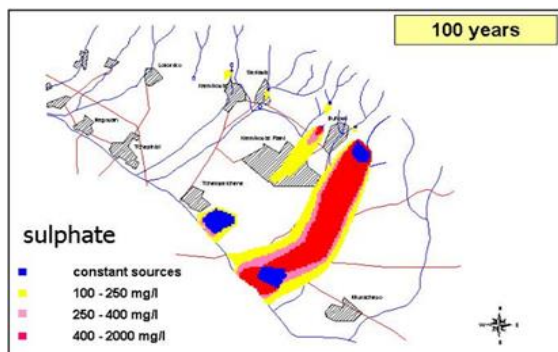
- Action and decision-making basis for the overall concept
- Use of the latest geochemical modeling concepts
- Minimizing the long-term effects on the environment
- The investigation and assessments enables to select optimal and realizable remediation.
- Legal and financial safety for site remediation and management.

Water Management & Clean-up Uranium Mining Area, Bulgaria

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Water Management & Remediation	400.000 €	1999 - 2000



Project description:

Development of a systematic method for an overall water management system in the framework of the client 'Multi-country Environmental Sector Program - Remediation Concepts for the Uranium Mining Operation in CEEC' and the framework of the project on management and clean-up of ground and surface waters, polluted with Radio-nuclides, as a result of Uranium Mining and Processing Activities in the area.

Purpose:

Water management concept and rehabilitation plans for ground and surface water of the decommissioned Uranium mining area for eight different underground mining areas and approx. 100 mining dumps and 2 tailings ponds.

Our services:

- Survey of the state of the art of U-mining rehabilitation
- Survey of available remediation concepts and of the environmental situation
- Establishment of an environmental data base and GIS
- Hydraulic and hydrochemical modelling of the mine flooding and seepage water from tailings ponds and dumps
- Definition of rehabilitation measures
- Modelling of the water path of ground- and mine water
- Rehabilitation concept & cost estimate

Client benefits:

- The investigation and assessments enables to select optimal and realizable remediation.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.

Rehabilitation Works Uranium Mining Area Bulgaria

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Uran Mining & Rehabilitation	240.000 €	2002 - 2005



Project description:

According to the legislation the program for the radiation protection is compulsory during the implementation of any kind of projects which relate to activities, directly or indirectly connected with works at open and/or closed sources of ionizing radiation. The objectives are:

- To ensure the individual protection of the personnel, carrying out the activities for the construction of a waste disposal near to Barutin (Dospat) and to prevent the exceed of the exposure limits determined by the Basic Radiation Protection Norms (BRPN-2000).
- To avoid additional contamination of the environment as well as to protect the population from the impact of the ionising radiation during the construction works.

Purpose:

Radiation protection of the workers and the environment during the closure activities

Our services:

- Personal protection of workers
- Working environment control
- Result analyses, reports and training

Client benefits:

- Close links to the client and, thus, excellent feed back and evaluation of the project
- It provides the basis to identify potential areas of concern regarding the future change of use
- Legal and financial safety for site remediation and management.

Investigation for Rehabilitation Works of Uranium Mining Area, Bulgaria

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Investigation and Rehabilitation	90.000 €	2003



Project description:

Review of existing information sources and preparation of a detailed geological, hydrogeological, engineer-geological and geophysical investigation of the site for further usage as a radioactive waste repository.

Purpose:

Investigation to create the basis for the deposition of radioactive waste.

Our services:

- Detailed geological investigation of the existing shaft and the hole project area
- Preparation of a digital hydrogeologic 3 dimensional model of the site
- Geophysical investigation of the project area and the adjacent region

Client benefits:

- Close links to the client and, thus, excellent feed back and evaluation of the project
- It provides the basis to identify potential areas of concern regarding the future change of use
- Legal and financial safety for site remediation and management.

Investigation for Rehabilitation Works of Uranium Mining Area, Bulgaria

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Investigation and Rehabilitation	90.000 €	2003



Project description:

Review of existing information sources and preparation of a detailed geological, hydrogeological, engineer-geological and geophysical investigation of the site for further usage as a radioactive waste repository.

Purpose:

Investigation to create the basis for the deposition of radioactive waste.

Our services:

- Detailed geological investigation of the existing shaft and the hole project area
- Preparation of a digital hydrogeologic 3 dimensional model of the site
- Geophysical investigation of the project area and the adjacent region

Client benefits:

- Close links to the client and, thus, excellent feed back and evaluation of the project
- It provides the basis to identify potential areas of concern regarding the future change of use
- Legal and financial safety for site remediation and management.

Refilling Concept of Uranium Opencast Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Refilling Concept & Remediation	130.000 €	1994 - 2012



Our services:

- Classification of stockpile material
- Planning of extraction and tilting
- Environmental assessment of back-filling
- Planning of refilling techniques under geomechanical aspects
- Planning of equipment technology
- Cost comparison of refilling variants
- Modeling to characterize the transport processes in the aeration zones of heaps

Project description:

The opencast mine is to be filled with material of the surrounding slopes. In the study the essential criteria of refilling techniques should be worked out in compliance with environmental requirements and minimum cost. Under deriving a viable technology in compliance with the future geochemical mileus in different areas of the mine, is starting from the ratio of neutralizing potential to acid potential and radioactive inventory classification of stockpile material made in three classes.

Purpose:

Concept for the backfilling of the open pit Lichtenberg (130 Mio. m³, 6 heaps, 180 ha).

Client benefits:

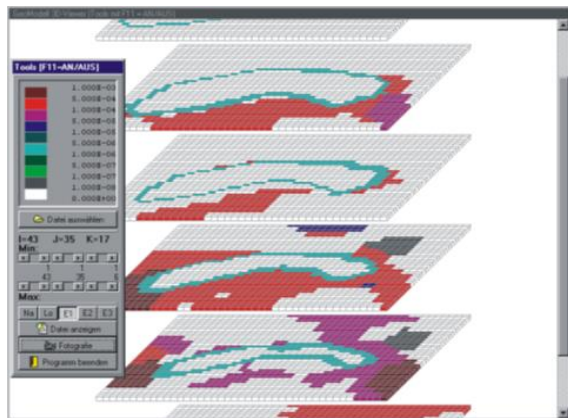
- Action and decision-making basis for the overall concept
- Use of best technologies
- Minimizing the long-term effects on the environment
- Dynamics & remediation optimizing the overall process
- Legal and financial safety for site remediation and management.

Forecasting of Uranium Open Cast Mine Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Forecasting & Rehabilitation	Confidential	2002 - 2012



Project description:

The opencast mine is filled with material of the surrounding slopes. The aim of the studies was the sensitive modelling of the geohydraulic and geochemical-mix processes in the mining business. There were concrete optimization variants to calculate in terms of coverage of the open pit and the refilling concept related variants to minimize the spreading of contamination from the unsaturated and saturated zone. The calculation was made using the model developed by HPC (Mass Transport Model TEN3D).

Purpose:

Model specifications to figure geochemical and geohydraulic operations at backfilled and covered mine in Germany. Support of remediation and basis for decision making for remediation alternatives and for planning further action.

Our services:

- Implementation of model runs for geochemistry of surface mining inventory and variation between single and multi-layer covers of the opencast mine
- Development of a model for sufficiently sensitive imaging of geohydraulic and geochemical processes of the simulated in a transport model for open pit area
- Model application for the calculation of optimization variants in terms of coverage of the open pit in connection with the evaluation of possible measures for the safekeeping of the stored material classes in the unsaturated zone.

Client benefits:

- Action and decision-making basis for the overall concept
- Use of the latest geochemical modeling concepts
- Optimization refilling concept
- Minimizing the long-term effects on the environment
- Dynamics & remediation optimizing the overall process
- Legal and financial safety for site remediation and management.

Remediation of 2 Heaps, Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Remediation & Redevelopment	Confidential	1994 - 2012



Project description:

As part of the permit application and based on a assessment of the current situation, HPC was obliged to analyze the need for rehabilitation and to evaluate remediation alternatives with special emphasis on radiological components within the two heaps (volume: 7,6 Mio. m³ and 6,5 Mio. m³). Two alternatives were developed:
 Option 1: Leave the pointed cone of the heap locally and securing means of encapsulation
 Option 2: Rearrangement and custody of stockpile material in open pit Lichtenberg

Purpose:

An environmental investigation was carried out to identify the presence of radio-isotopes. In focus was the rehabilitation of legacies of uranium mining in the East-Germany.

Our services:

- Review of the current situation and derivation of the need for redevelopment
- Review of the air path from the standpoint of radiation exposure
- Description consideration for redevelopment
- Justification for the choice of the preferred option under technological aspects and assessment of environmental impact
- Consideration of emissions and pollution, impact on landscape design, residue accumulation and utilization, climate change impact

Client benefits:

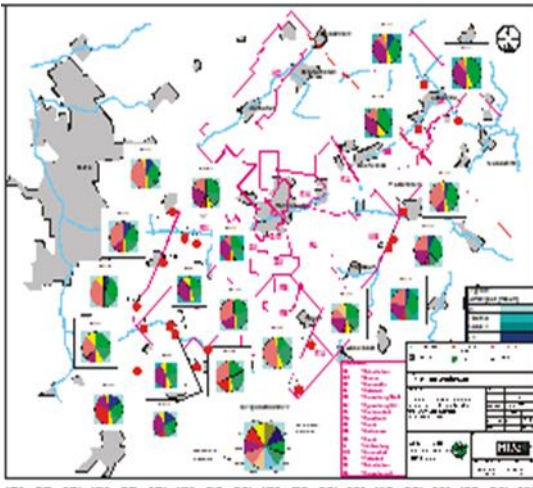
- Action and decision basis for dismissal of land from mining supervision by BbergG
- Minimizing the effects of pollutants spreading on the environment
- The investigation and assessments enables to select optimal and realizable remediation.
- Legal and financial safety for site remediation and management.
- Ensuring a high level of quality and acceptance by use of a specialized and approved radio-isotope laboratory.

Flooding Monitoring of Uranium Mining Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Water Management & Remediation Plan	55.000 €	1999 - 2012



Project description:

As part of the application process annual status reports were requested for flood monitoring by the Authority.

Purpose:

Water management concept and rehabilitation plans for ground and surface water of the decommissioned uranium mining area in a catchment area of 120 km.

Our services:

- Documentation & evaluation of monitoring results of about 130 measuring points incl. water level, chemical components in a catchment area of 120 km
- Hydrographical interpretation of water levels and geochemical parameters
- Thematic mapping
- Deriving conclusions on sampling and rhythm to be analyzed parameters
- Bi-annual monitoring report
- Evaluation of the consistency of the data and proposals to improve the data base
- Expert consulting services

Client benefits:

- Flood forecasting
- Dynamics & chemistry optimizing the overall process
- The investigation enables to select optimal and realizable remediation.
- It provides the basis to identify potential areas of concern regarding the future change of use.
- Legal and financial safety for site remediation and management

Monitoring of Uranium Mining Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Water Management & Modelling	400.000 €	1994 - 2012



assessment of the radiological exposure in the effluent and timing of flooding dynamics). Optimizing of the overall process.

Our services:

- Combined pore-range model for the description and prediction of groundwater contamination of uranium mining
- Complex environmental assessment problem "opencast - flooding-stockpiles" with transport modeling and special regard to sorption and decay processes
- Evaluation of the radiological impact on the water path (dose model)
- Flooding concepts for the uranium mining area
- Fine modeling of the area Gessental opencast - Ronneburg reg. BUGA 2007 waterlogging and water outlet

Project description:

As part of the restructuring plan for the Ronneburger uranium deposits of this site, the flooding after the cessation of mining activity and to solve a pending hydrogeological problem HPC predicted the hydrogeological and hydro-chemical conditions and contaminant transport processes during and after the flooding of the reservoir. The modelling was a robust and effective to calibrated the hydro-geological model and to build an contaminant transport model. Project data: 50 km², 0-900 m depth, flooding time: 15 years, 1.000 km cavity

Purpose:

Basis for decision making for remediation alternatives and for planning further action during and after the flooding, incl. dimensioning of systems for contaminated groundwater,

Client benefits:

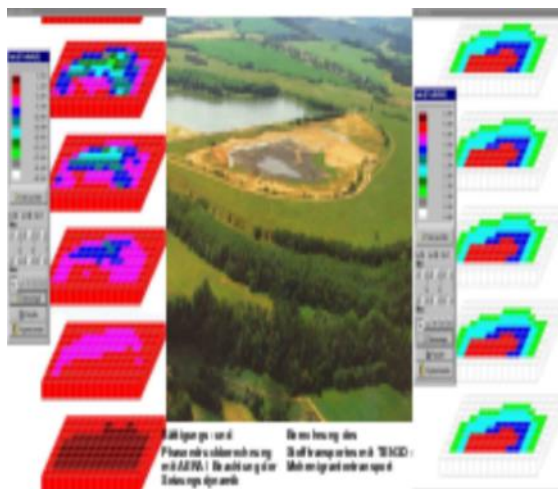
- Dynamics & remediation optimizing the overall process
- The investigation enables to select optimal and realizable remediation.
- Legal and financial safety for site remediation and management.

Hydrochemical Modelling of Uranium Tailings Germany

Client: Confidential

HPC-Contact: Dr. F. KARG, +33 607 346 916 frank.karg@hpc-international.com

Service Area	Value	Project Duration
Modelling & Remediation	110.000 €	1998 - ongoing



- Good model technical description of the given circumstances and so far the processes involved, which are measured in the form of liquid concentrations, solids contents, permeability measurements etc.
- Carrying out measurable application

Client benefits:

- Sound pollution forecasts for over 250 years to carry out environmental assessments and cost optimization
- Derivation profound geochemical predictions for the possible remediation alternatives taking into account the specific characteristics of sludge ponds
- Measuring of the interactions between the unsaturated flow, complex geochemistry with the gas phase
- Minimizing the long-term effects on the environment
- Dynamics & remediation optimizing the overall process
- Legal and financial safety for site remediation and management.

Project description:

Development of hydrogeochemical model for determining the temporal spreading of contamination from tailings of uranium ore processing incl. a sensitivity analysis

Purpose:

Permit application for final storage of industrial tailings.

Our services:

- Development of a 3-dimensional multi-migrants solute transport model based on finite differences, which connects the flow model congruent with the thermodynamic model of all geochemical possible responses, combined flow model unsaturated - mass transport