



Overview

on Radioactive Waste Management in Germany

and

Russian – German R&D Cooperation in this Field

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Organisation of Radioactive Waste Disposal



Federal Government - provision of repositories for radioactive waste disposal (§ 9a, Abs. 3, AEA)



BfS - responsible office of the Federal Government for repository construction and operation



DBE - plans, constructs and operates all Federal repositories for radioactive waste on behalf of BfS



Implementing Organisation



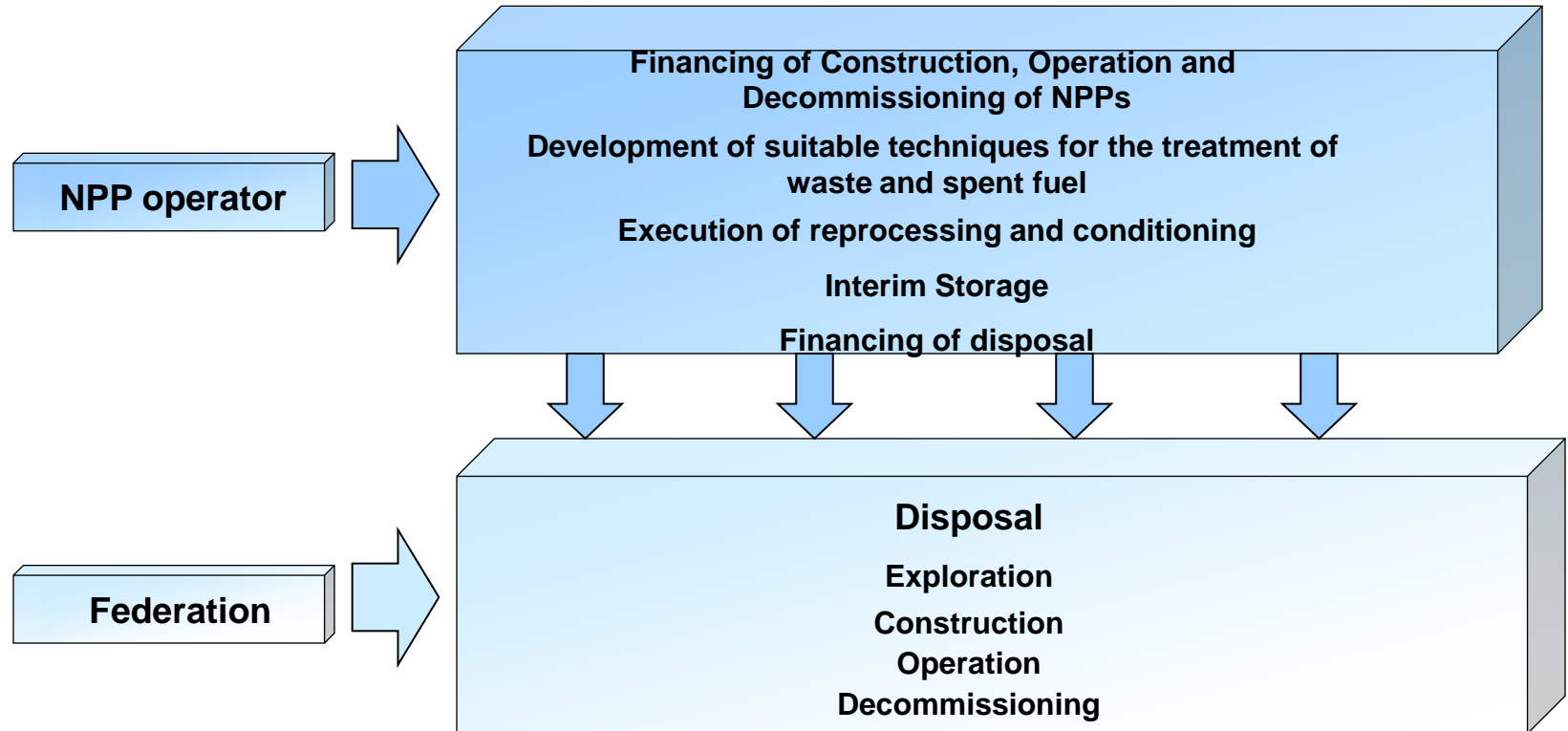
Shareholders

*Repository design,
construction and operation*

*Engineering and consulting for
radioactive waste
management*

Legal Framework - Competencies

Distribution of responsibilities for radioactive waste management



Reimbursement of repository construction costs

(Ordinance on Advance Payments)

- **BfS on behalf of the Federal Government invoices the actually incurred costs to the waste producers legally obligated to share the costs**
- **Distribution of costs to the NPP operators is based on the installed nuclear capacity**
- **Share to be carried by other Waste Producers is based on distribution scheme previously agreed upon**



Political decision in the early 60s:

- ❖ Consider geologic disposal as the most sustainable and only disposal option for radioactive waste
 - Cancellation of deep sea dumping
 - No long-term storage option
 - No near surface disposal option

Not questioned within four-decades, even radioactive waste management has been a hot spot of the public debate on nuclear energy permanently

Why Geologic Disposal Only?



- Perception of the few hundred meters thick geologic barrier as sufficient protection
- Favourable geologic conditions – particularly more than 200 salt domes in northern Germany
- Best conditions for non-retrievable maintenance free disposal – without institutional control requirements
- High population density stressed as argument against surface disposal
- Simplification of waste classification:
just heat and non-heat generating radioactive waste





- 1970 Transfer to GDR NPP Operator
- 1971 Start of Trial Operation (LLW)
- 1974 Repository Construction Approval
- 81/86 1st and 2nd Licenses for Continuous Operation
- 10/90 Morsleben becomes a Federal Facility



- 91 – 94 Waste Disposal Interruption
(Until Feb. 91: 14.300m³ Waste)
- 09/98 Waste Acceptance discontinued
- 05/99 BfS: No further Waste Disposal
Licensing of closure
and decommissioning
- 11/2000 Beginning of stabilizing
and backfilling the
central part of the mine
- 2014 License for closure (expected)

== Morsleben Repository Operation ==





Disposal Chamber





Konrad Repository





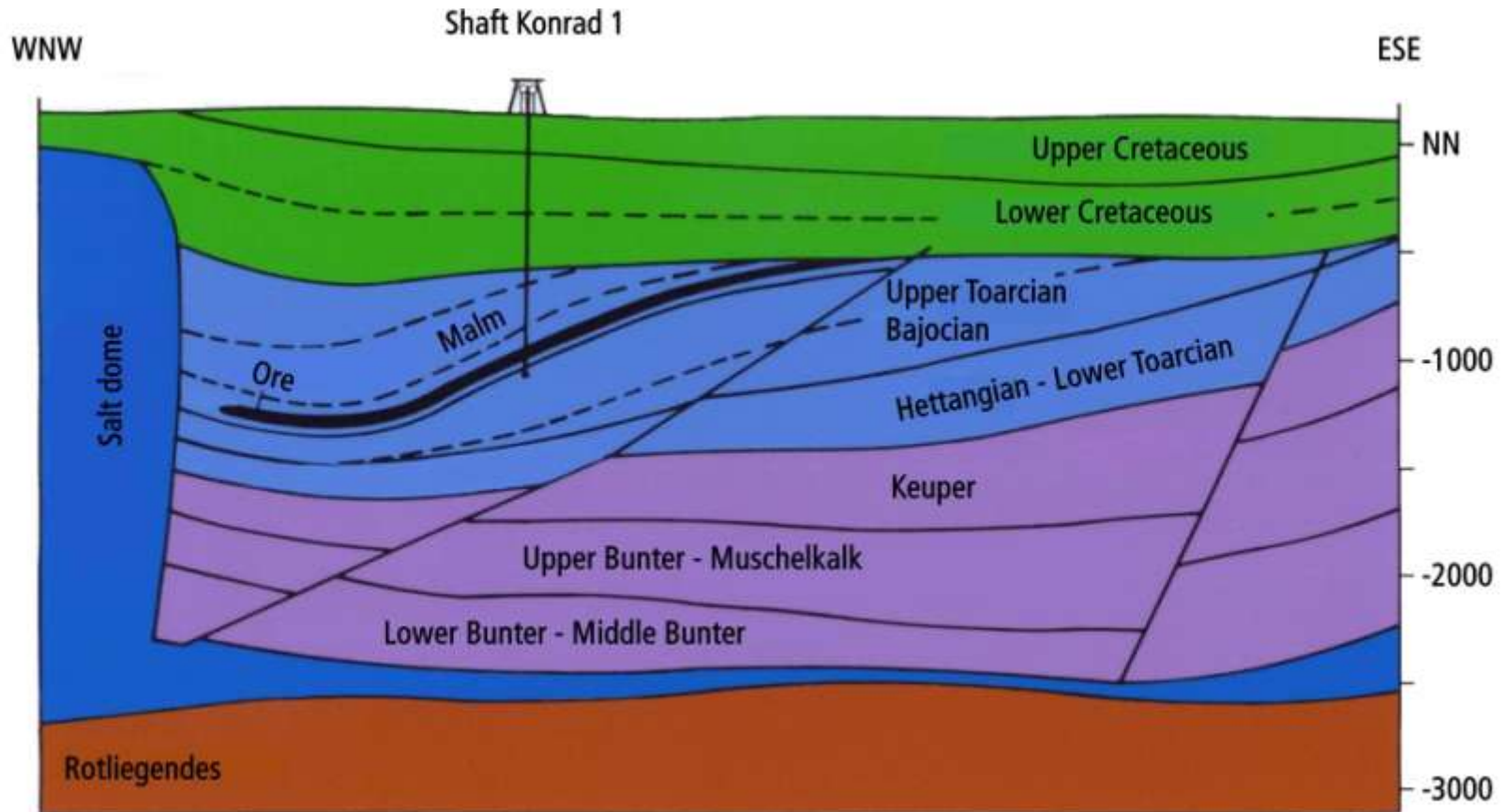
Konrad Repository Milestones



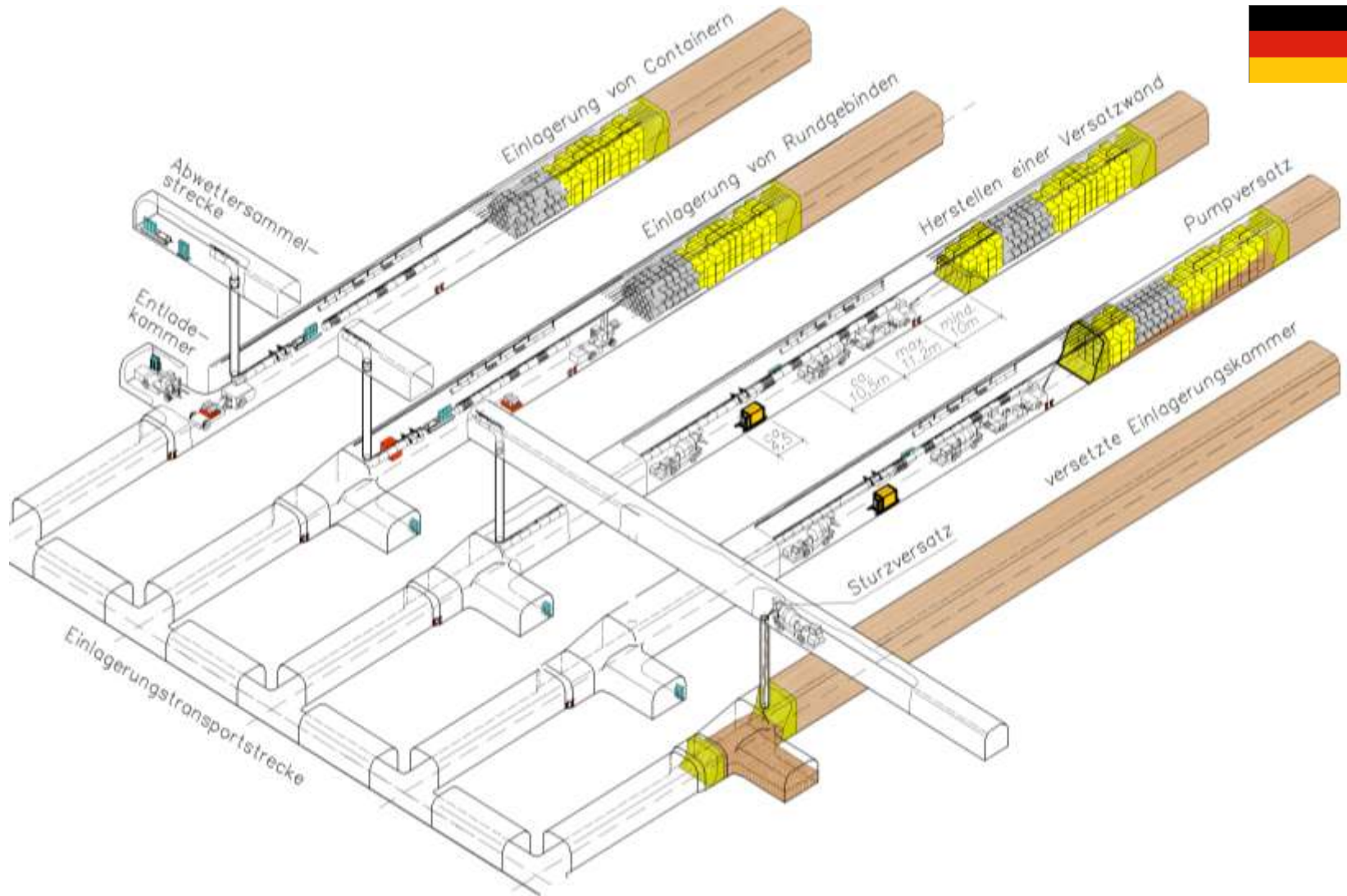
1965 – 1976	Iron ore mining
1975 - 1982	Site suitability investigation
1982	Licensing procedure started
1992 - 1993	Public hearing (800,000 inquiries)
05.06.2002	License granted for 300,000 m ³ L/ILW
09.05.2006	Court rejected all objections without revision opportunity
2007	Construction started
2021	Commissioning Target



Konrad's Unique Geology



... cannot be searched stepwise but just found.



Waste Handling Demonstration





== Gorleben Exploration Mine ==





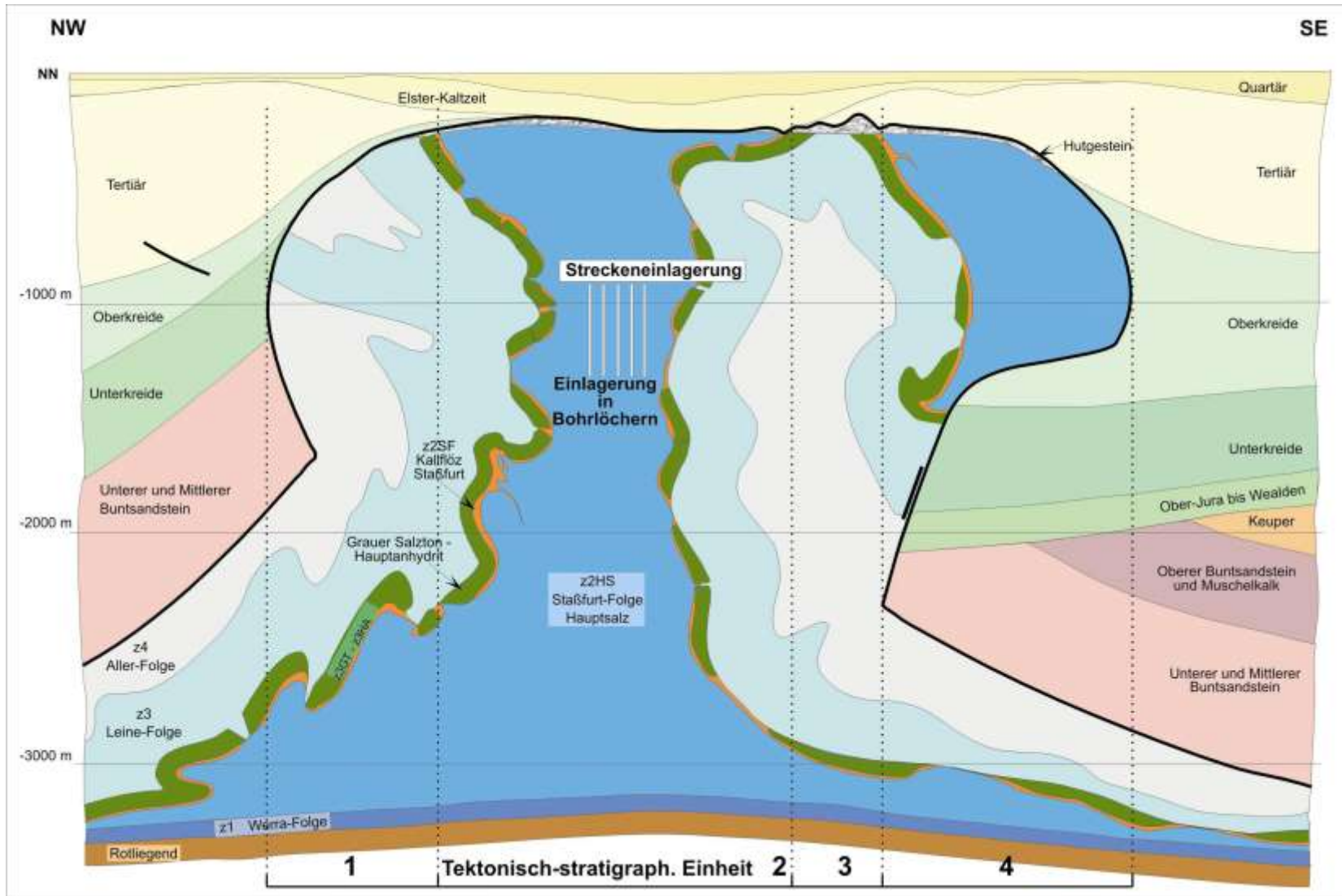
== Gorleben Exploration Mine ==



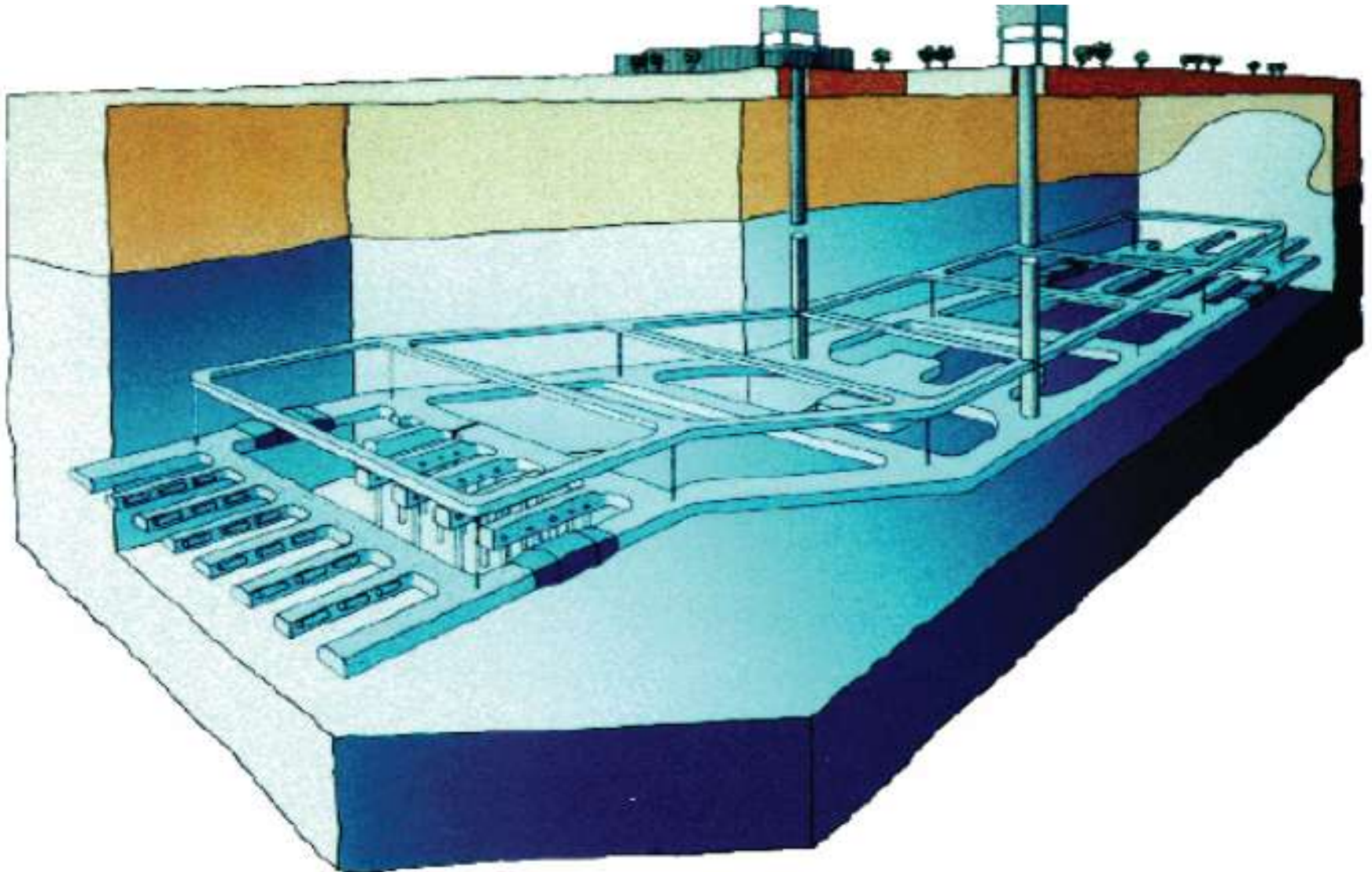
- Purpose: Investigate the GORLEBEN salt dome's suitability to host a repository for HLW and SNF
- 1972 – 76 Siting studies – salt dome screening
- 1977 Political decision to start site investigation at Gorleben
- 1979 Start of above ground site characterization
- 1986 Start of shaft sinking
- 1996 Start of underground site characterization
- 2000 Moratorium on site exploration
- 2010 Site exploration restarted
- Nov. 2012 New interruption of site exploration
- Mar. 2013 Preliminary safety case
- July 2013 New law: Restart site selection



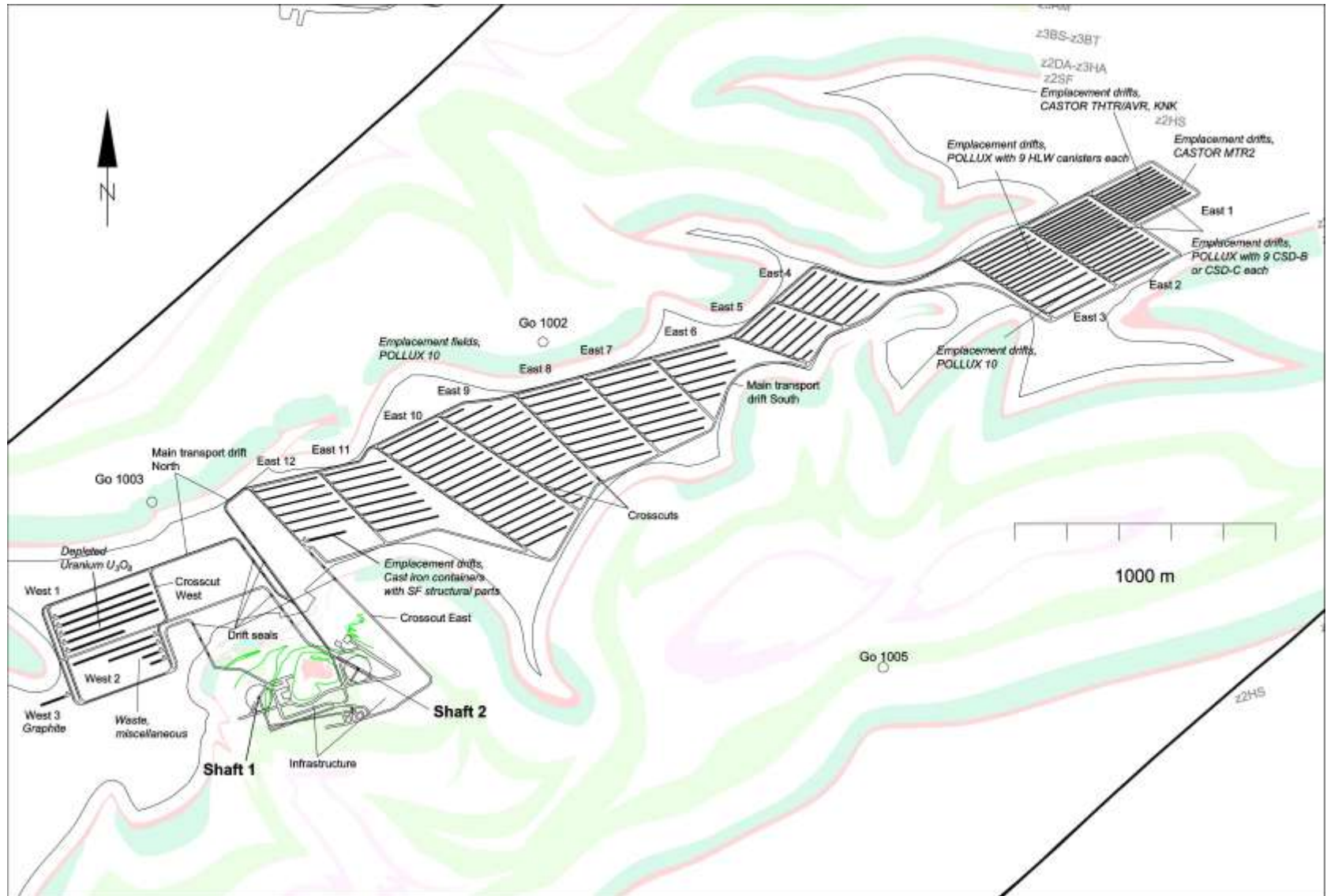
Cross-section of the Gorleben Salt Dom



= Gorleben Repository Project



Design of the Entire Repository – Drift Disposal Concept



== Russian – German Research Cooperation



June 2001: Agreement between MINATOM and Federal Ministry of Economy to enter into a R&D-Cooperation regarding radwaste disposal

Project B.2 Investigations regarding HLW disposal in granitoid formations

Russia

Germany

Coordinators VNIPI Promtechnologii

DBE TECHNOLOGY GmbH

Participants Radium Institute
Mining-Chemical Combine

Federal Institute for Geosciences
and Natural Resources(BGR)

IGEM

Gesellschaft für Reaktor- und
Anlagensicherheit (GRS) mbH

VNIPIET

NO.RAO



Russian – German R&D Cooperation

1st Phase: Requirements for Site Investigation for a
2002 - 05 HLW Repository in Hardrock Formations

Objective: To develop a well-justified methodological approach for site investigation and selection for disposal of

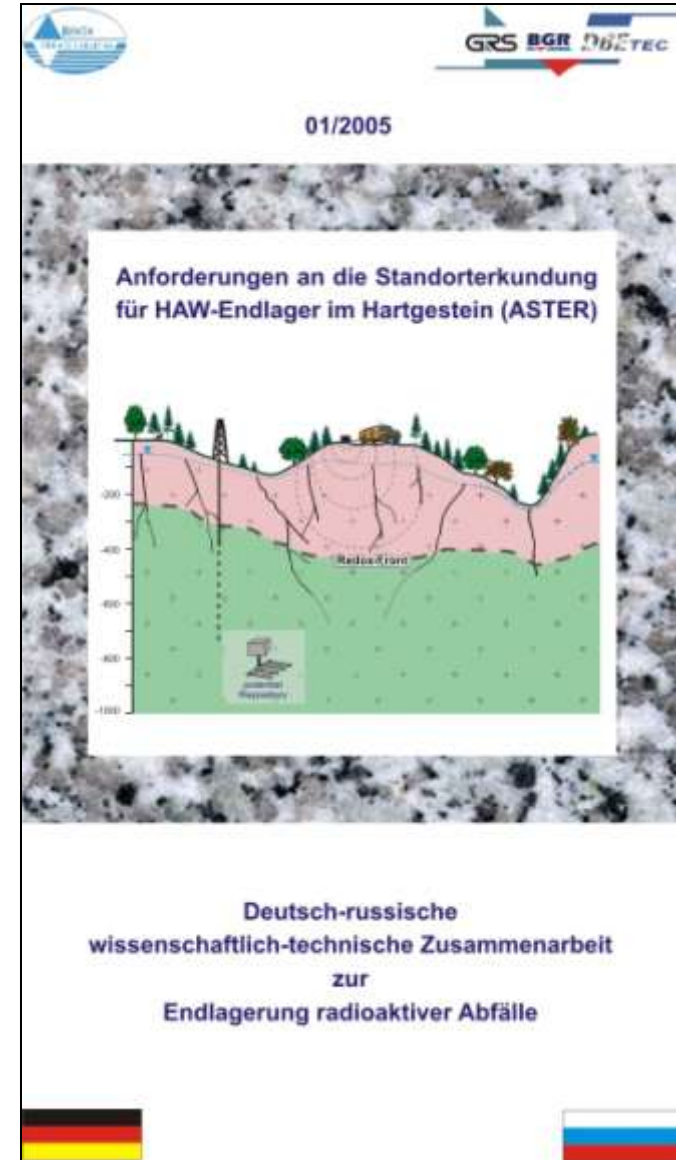
- conditioned HWL sludge from former weapon plutonium production and
- vitrified reprocessing HLW

in the Nizhnekansk granite formation near Krasnoyarsk

Funded by: Rosatom & Federal Ministry of Economy

== Main Project Results ==

- Specification of data requirements
- Drafting of recommendations for further site investigation
- Joint project report in Russian and German published in May 2005





Yeniseyskiy Site: Top View





Russian – German R&D Cooperation

- 2nd Phase:** Performance investigation of engineered and geological barriers of a HLW repository in magmatic host rock
2005 – 08
- Motivation:** Dispute between Russian experts on the “importance” of geologic vs. engineered barriers
- Objective:** Safety function based performance analysis of the system of geologic and engineered barriers for the proposed HLW disposal facility at the Yeniseyskiy site
- 3rd Phase** Investigation of the robustness of an HLW disposal system in magmatic rock and its safety - PSAR (2014)
2009 – 16
- Funded by:** Rosatom (NO.RAO) & Federal Ministry of Economy

Thank you for your attention



Questions ?