

Uranium mining Overview

Peter Diehl
WISE Uranium Project



Uranium Project

Stockholm April 27, 2007



Uranium exploration in Wyoming, USA (High Plains Uranium, Inc.)



NOTICE OF VIOLATION

Uranium Energy Corporation (UEC)

e Weesatch Project Permit No. Exp
ine: ☐ Coal ☒ Uranium ☐ Other
ddress: Suite 230-9801 Anderson Mill Road City Austin Zip
Goliad Telephone Number: (512) 828-69
r: March 7-9, 2007
n: FROM: 8:00 A.M. TO: 12:00 A.M.
 P.M. P.M.

iolation(s) The permittee failed to complete surface plugging and drill site reclamation as
Exploration Permit No. 123. Specifically, the permittee failed to segregate and replace topsoil
surface plug, and/or allow pits to dry before backfilling and/or backfill or compact backfilled



former Key Lake open pit uranium mine, Saskatchewan, Canada



former Lodève uranium mine, France, 1992



Rössing open pit uranium mine, Namibia, 1987 (T.Siepelmeier)



Rössing, Namibia, 1987 (T.Siepelmeier)



Rössing, Namibia, 1987 (T.Siepelmeier)

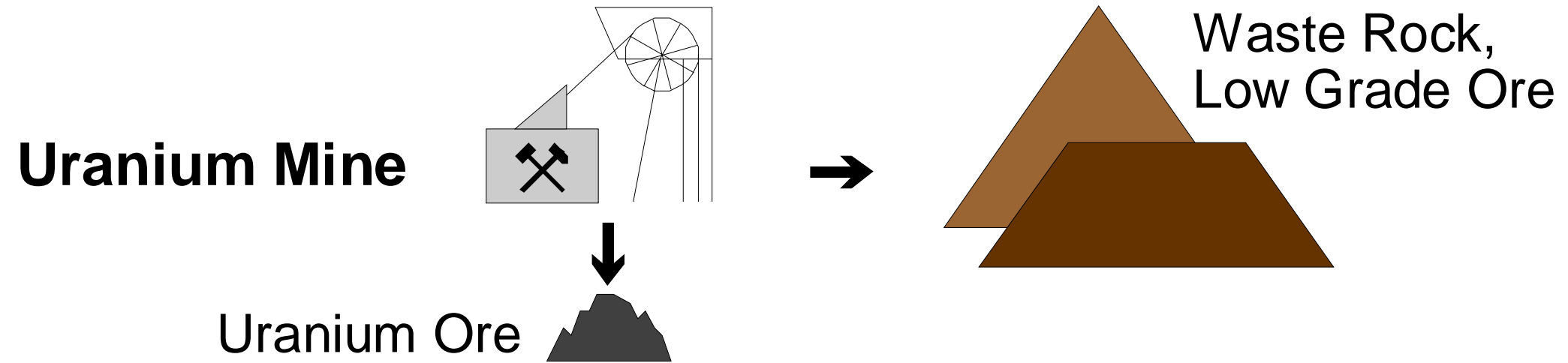


Rössing, Namibia, 1987 (T.Siepelmeyer)

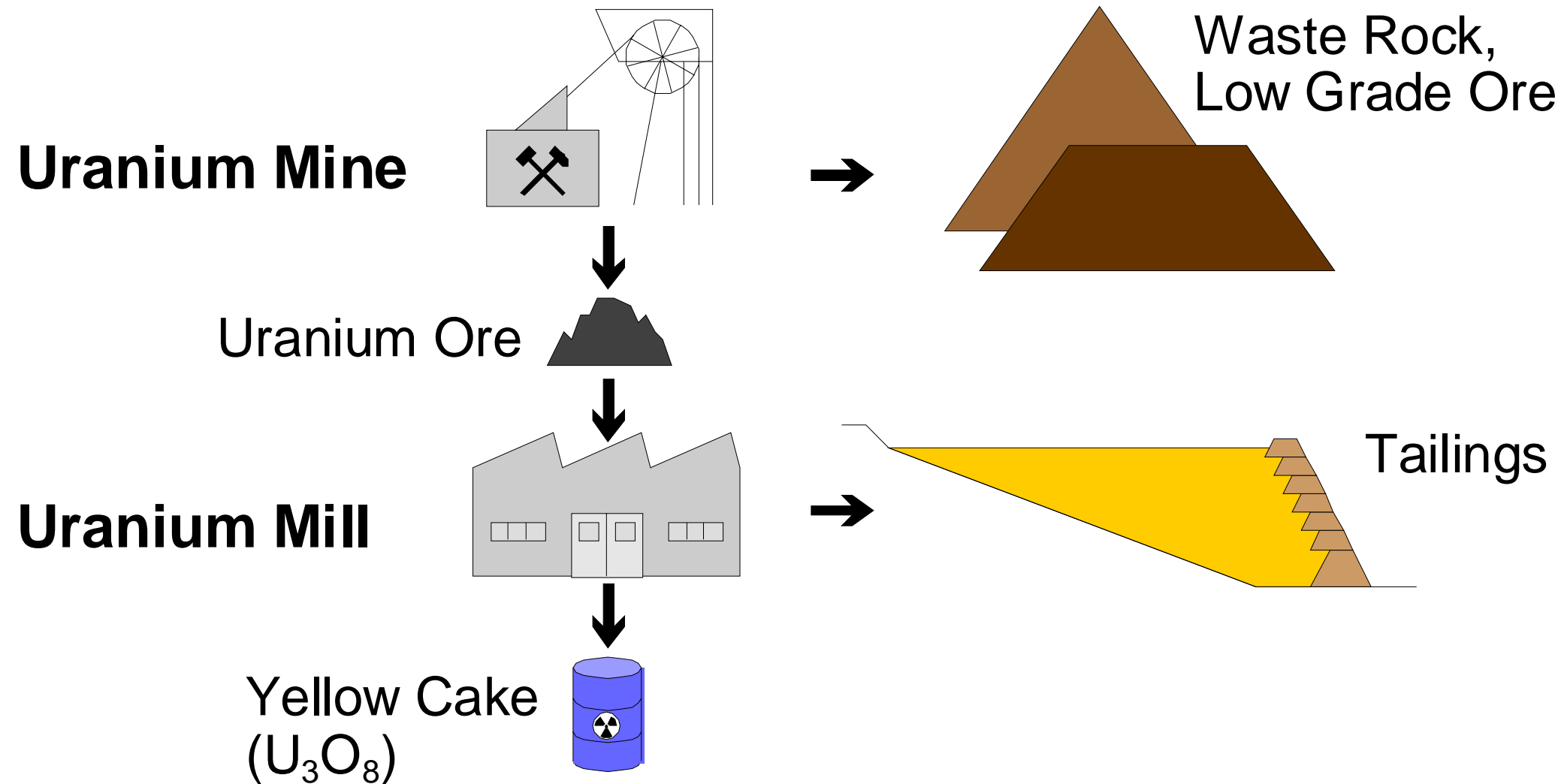
Hamr, Czech Republic, 1995



Nuclear Fuel Production



Nuclear Fuel Production



Ronneburg, Thuringia, Germany, 1990





Heap leaching, Pécs, Hungary, 1990



Heap leaching, Pécs, Hungary, 1990



Rio Algom Ambrosia Lake mill, New Mexico, USA (1958-1985)



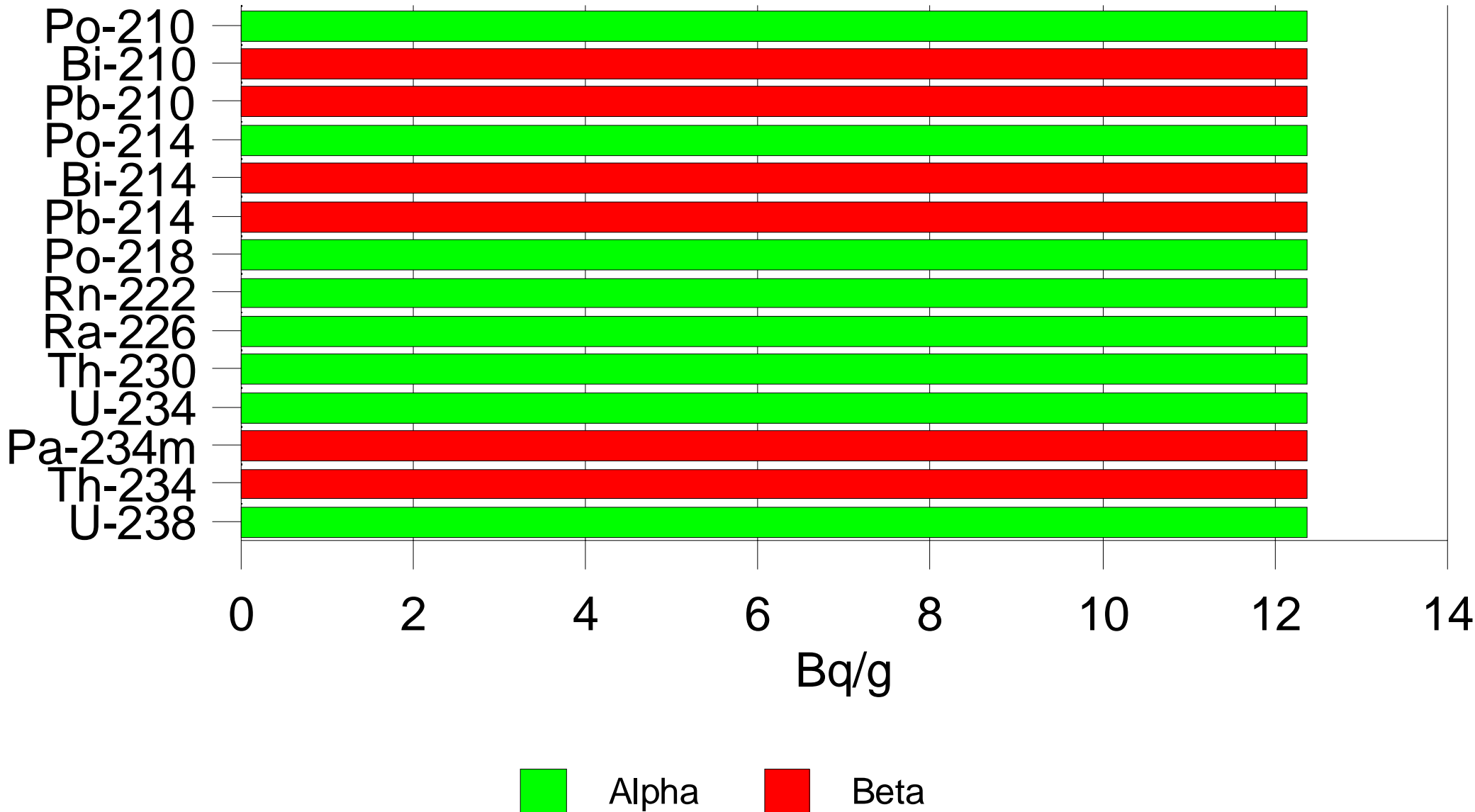
Rio Algom Ambrosia Lake mill, New Mexico, USA (1958-1985)



Culmitzsch, Thuringia, Germany, 1990 (M.Beleites)

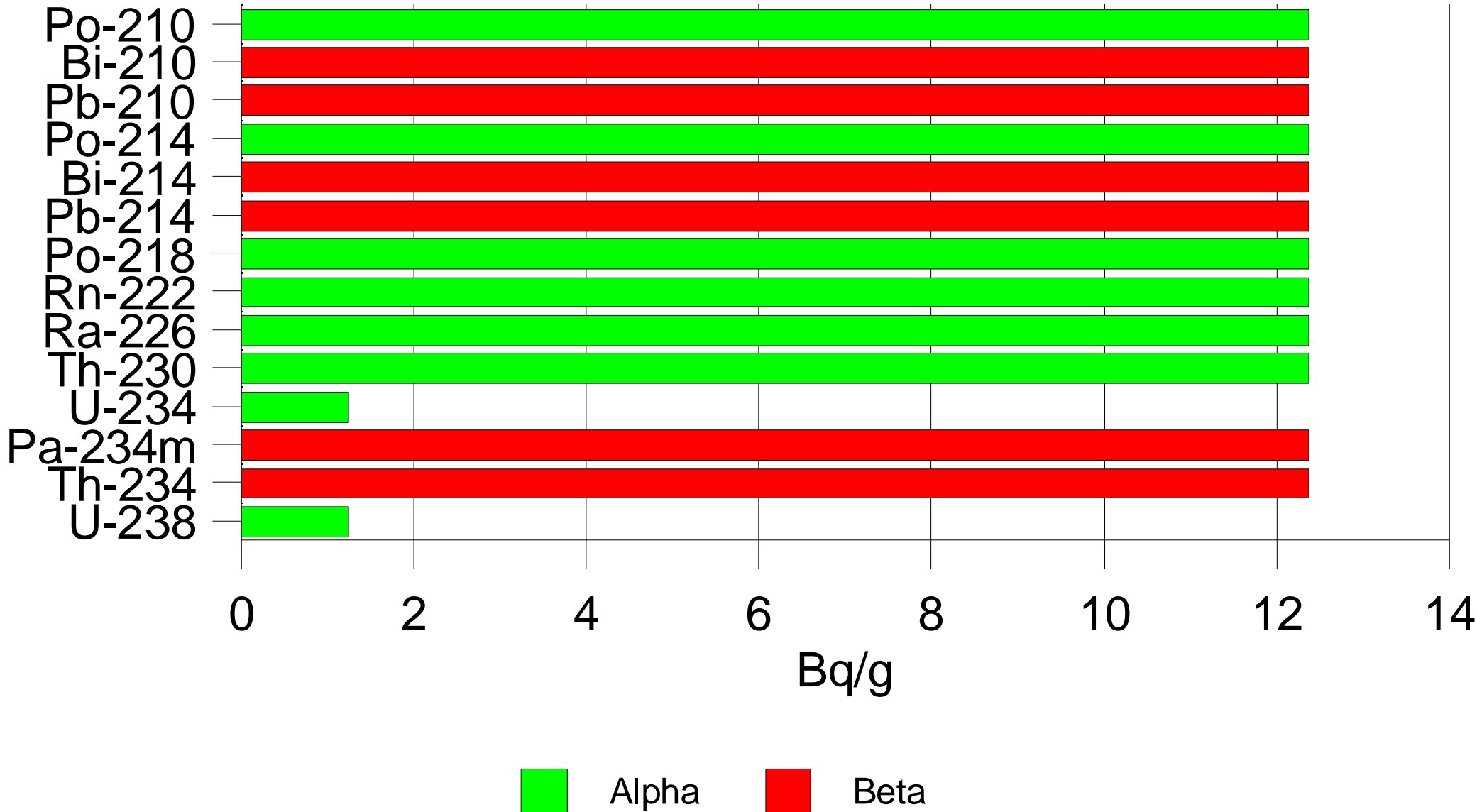
Activity of U-238 series nuclides in ore

(ore grade 0.1% U)



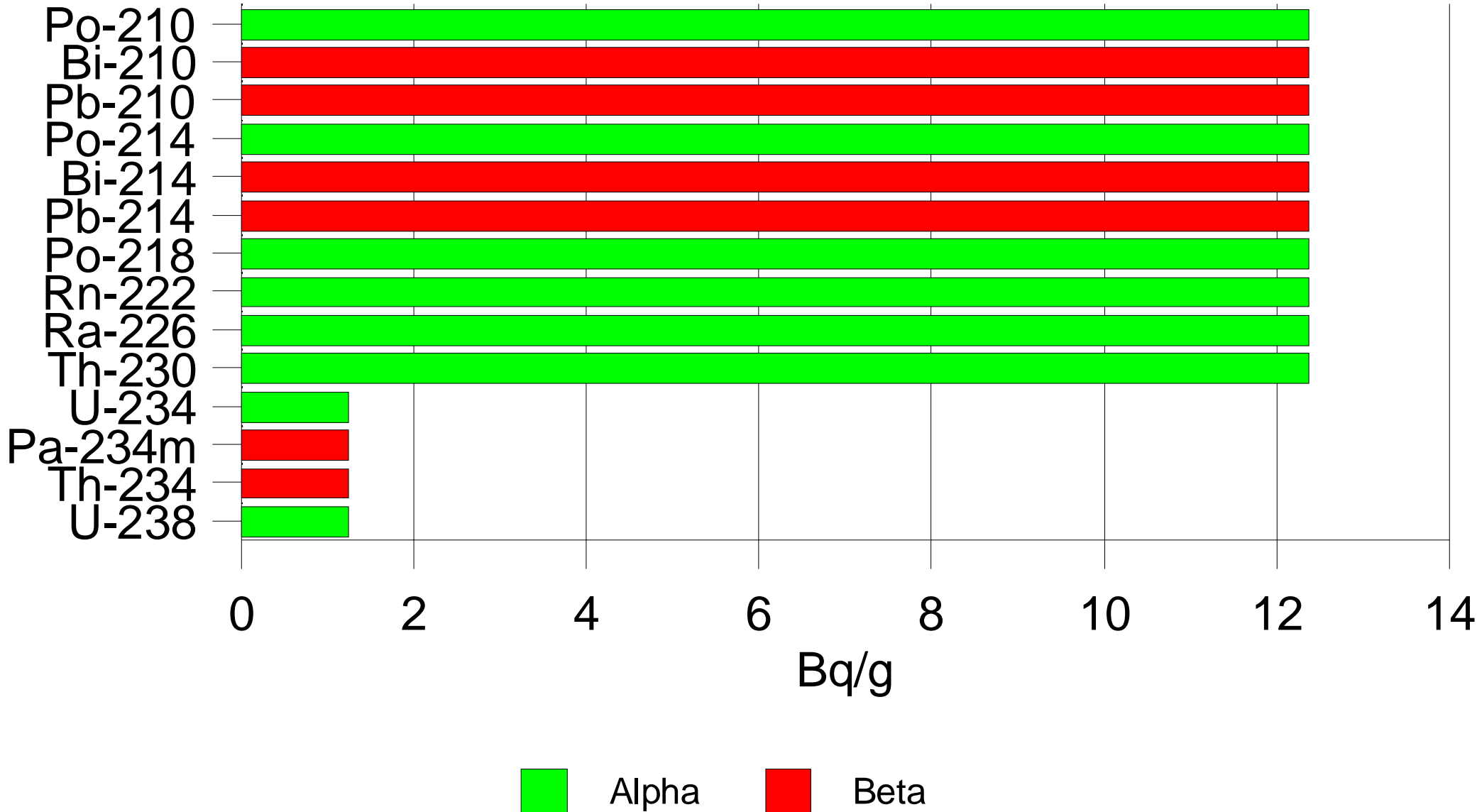
Activity of U-238 series nuclides in tailings

(ore grade 0.1% U, extraction 90%, fresh)



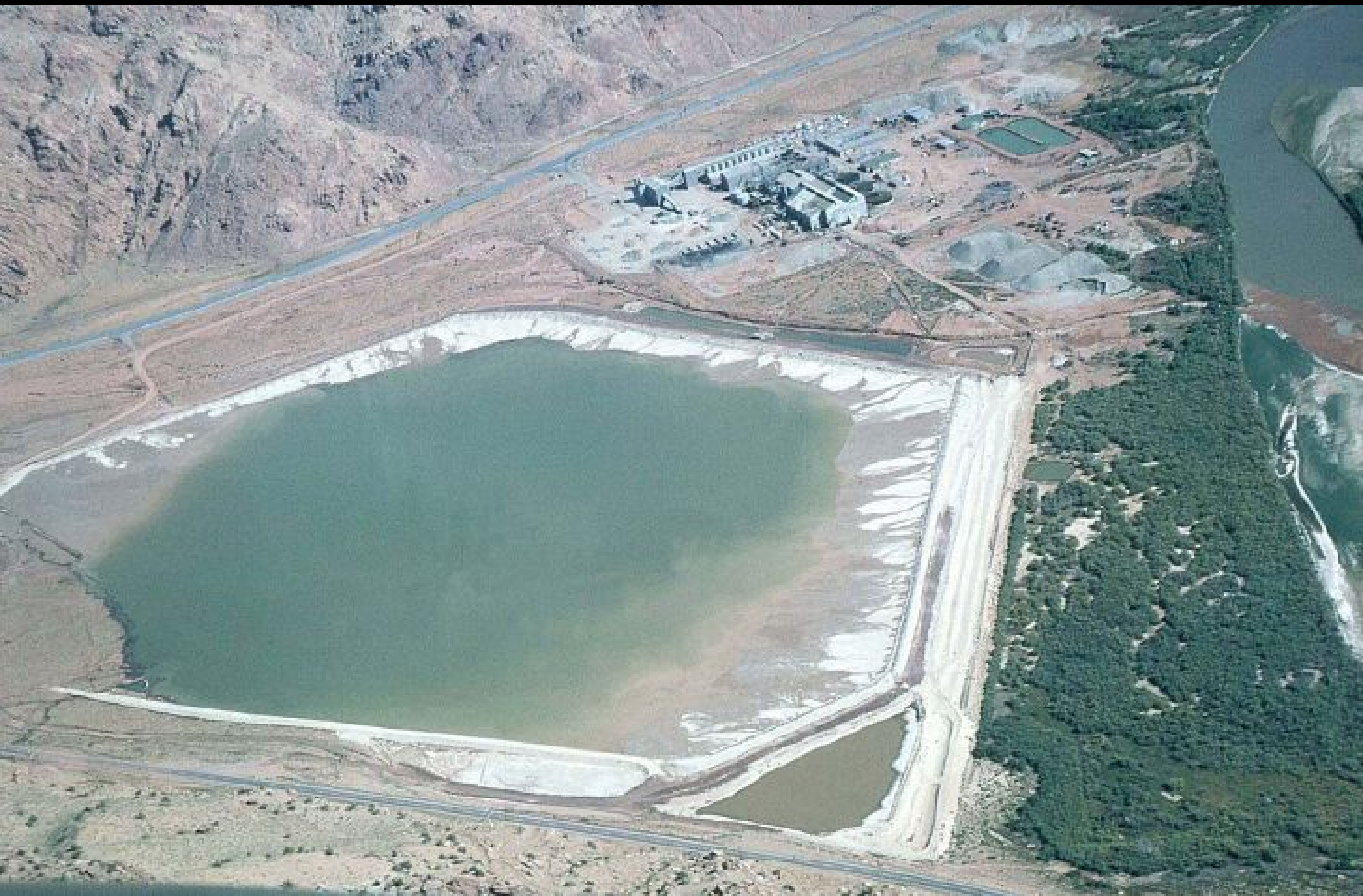
Activity of U-238 series nuclides in tailings

(ore grade 0.1% U, extraction 90%, after 1/2 year)



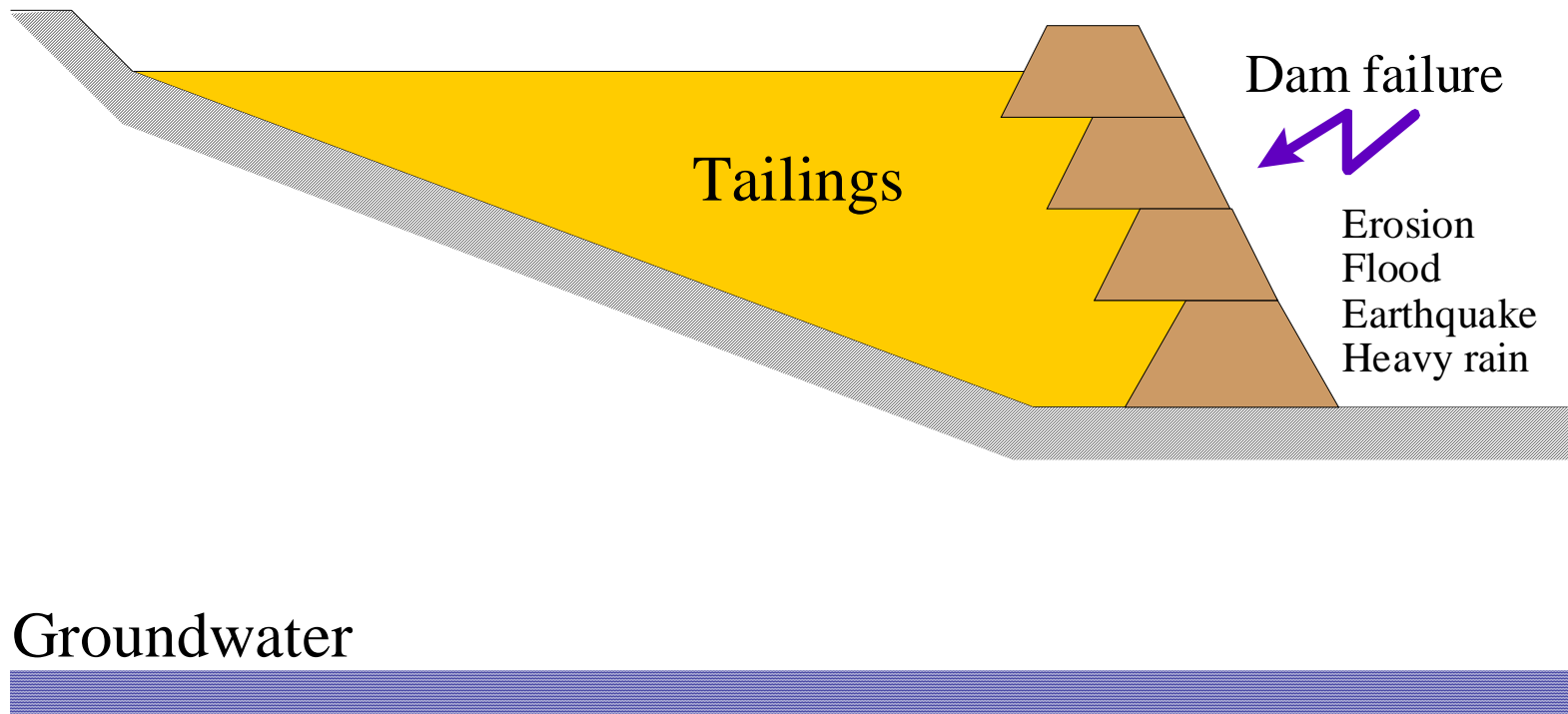


Mounana, Gabon, 2004 (Res Gehriger)



Atlas tailings, Moab, Utah, USA, 1966 (U.S. DOE)

Uranium Mill Tailings Hazards





Mayлуу-Suu tailing #7, Fergana valley, Kyrgyzstan, April 1958



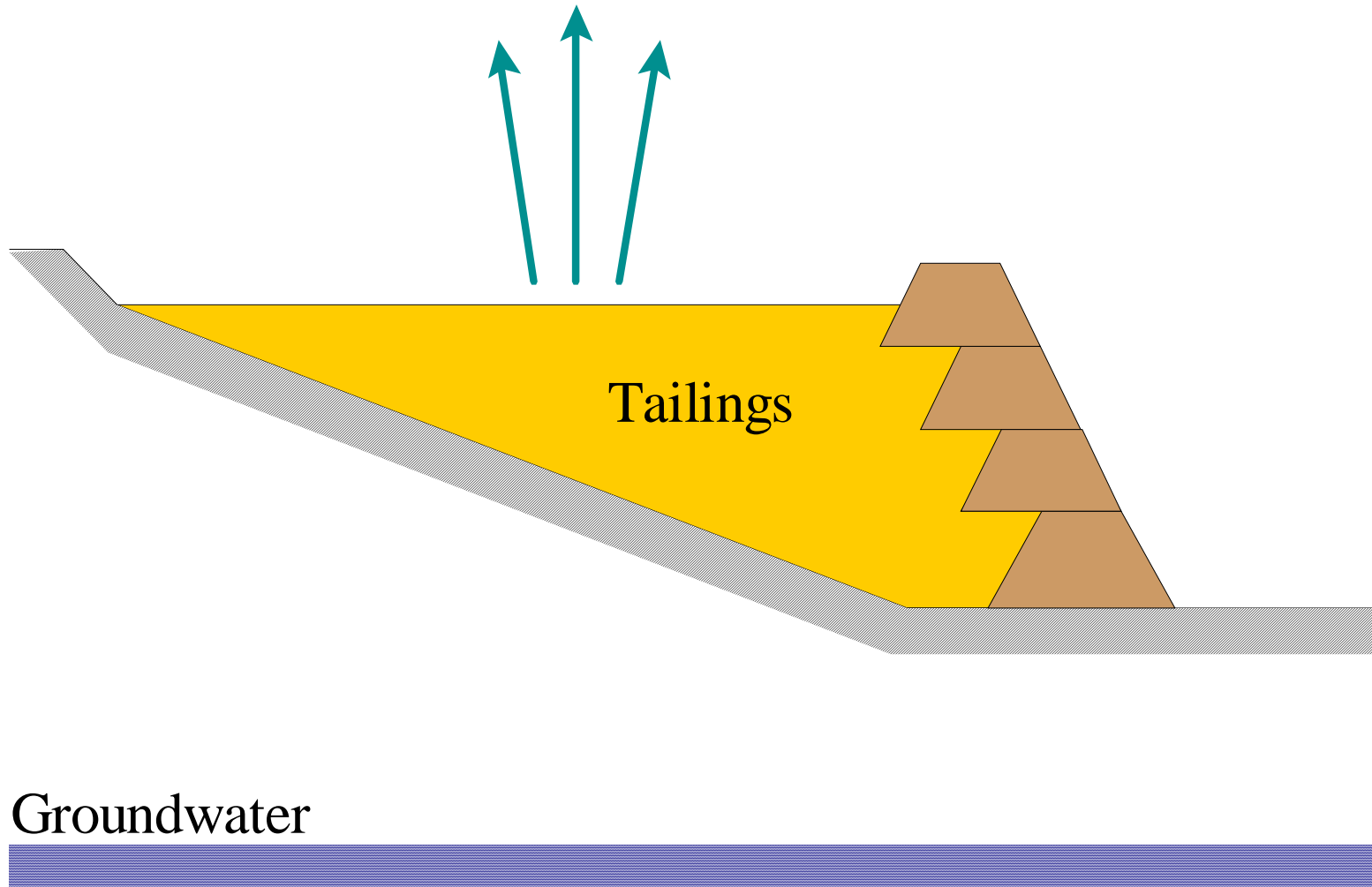
United Nuclear Church Rock tailings dam failure, New Mexico, USA, July 16, 1979



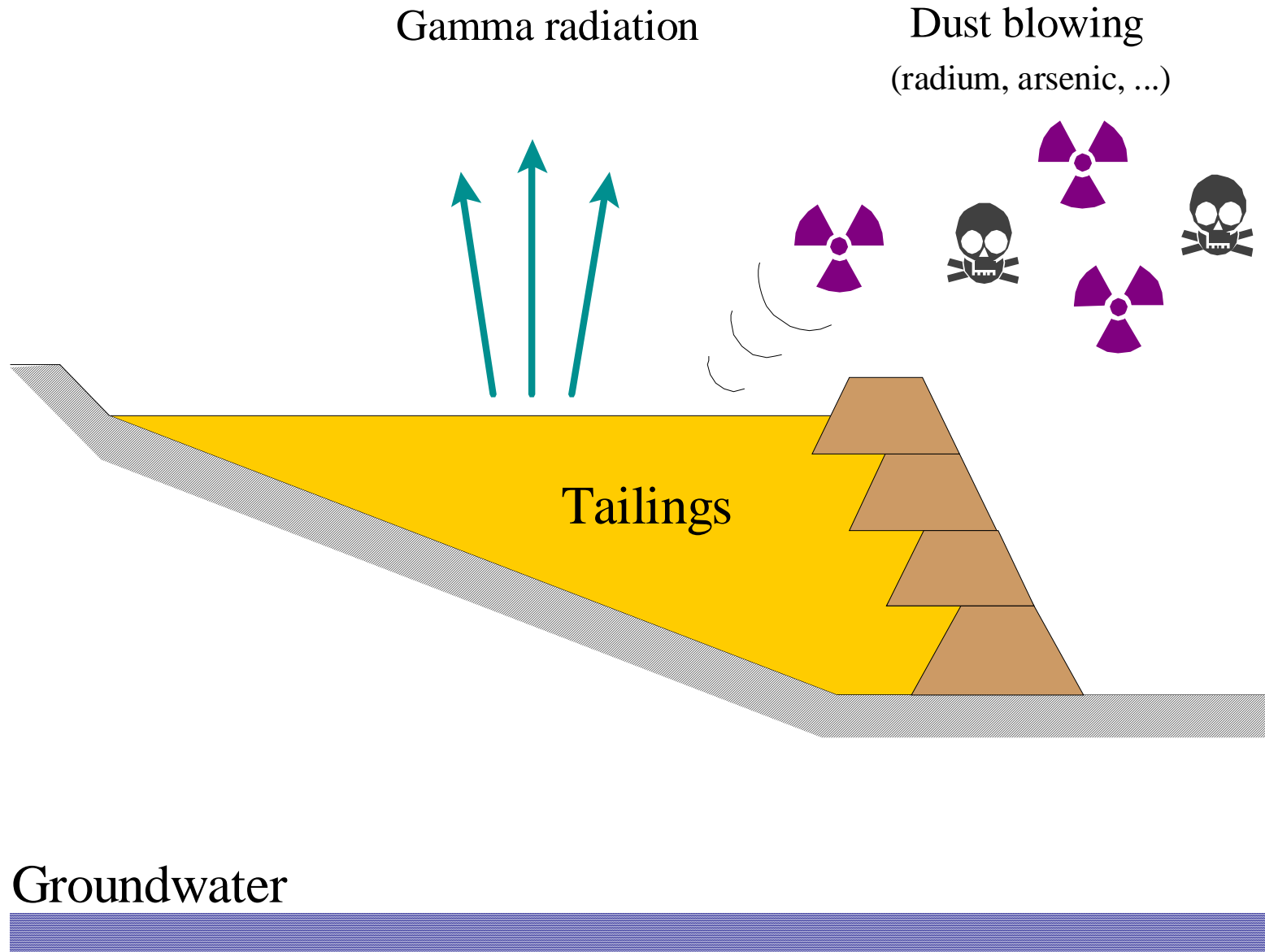
Aitik copper tailings dam failure, Gällivare, Sweden, Sept. 8, 2000 (Länsstyrelsen)

Uranium Mill Tailings Hazards

Gamma radiation



Uranium Mill Tailings Hazards

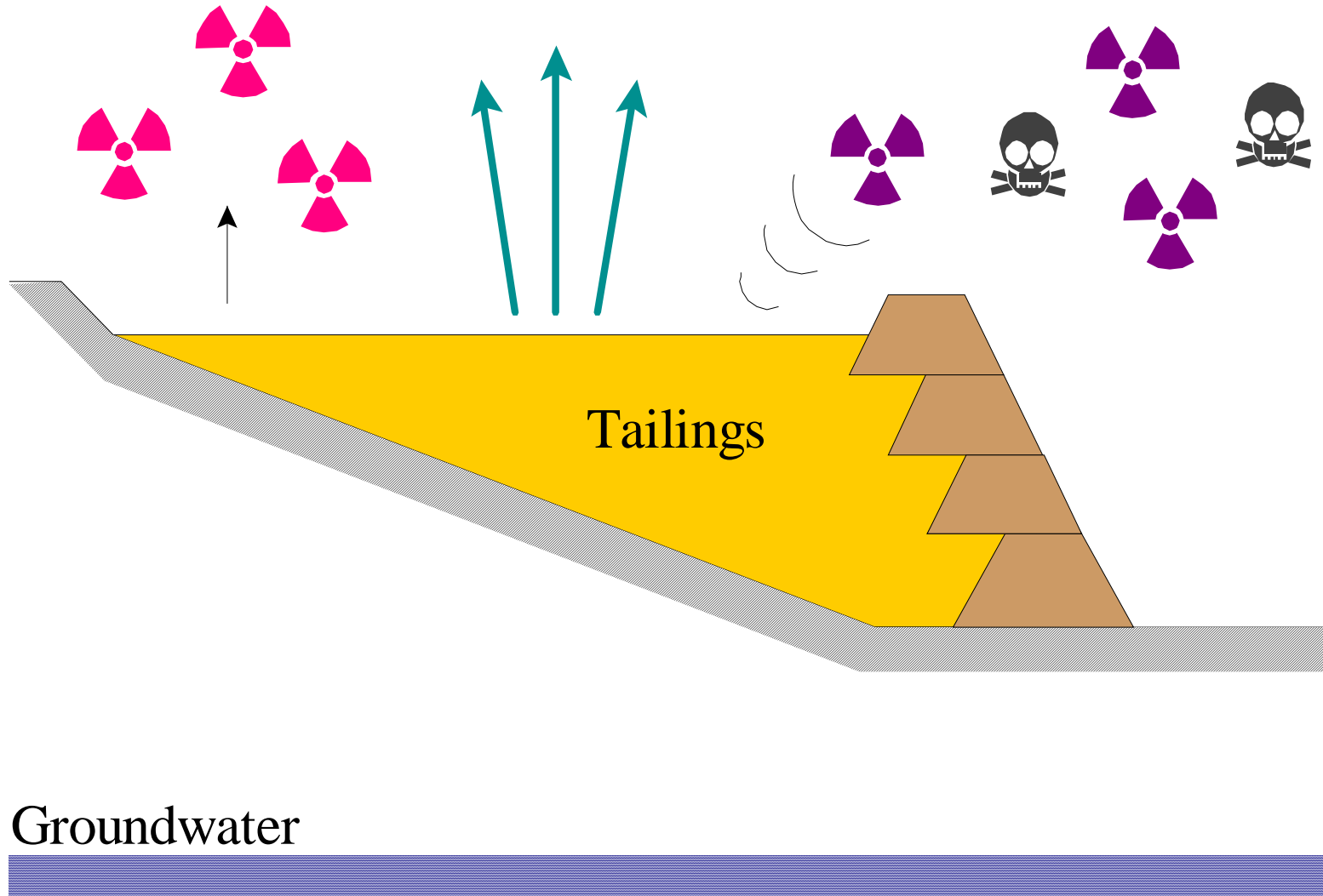


Uranium Mill Tailings Hazards

Radon exhalation

Gamma radiation

Dust blowing
(radium, arsenic, ...)



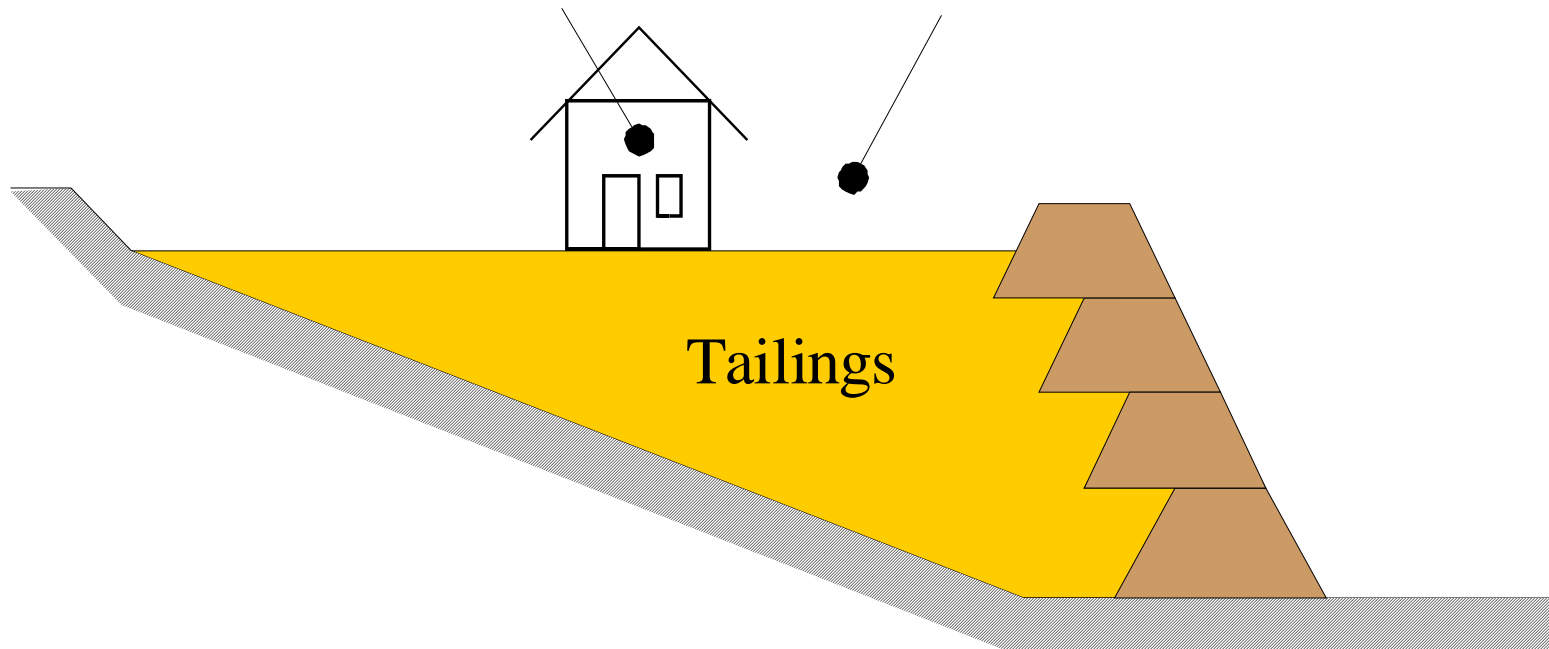
Groundwater



Moab, Utah, USA

Uranium Mill Tailings Hazards

	Indoor	Outdoor	Annual dose
Radon concentr.	60,000 Bq/m ³	260 Bq/m ³	1000 mSv/a
Gamma dose rate	1.8 µSv/h	4.6 µSv/h	16 mSv/a

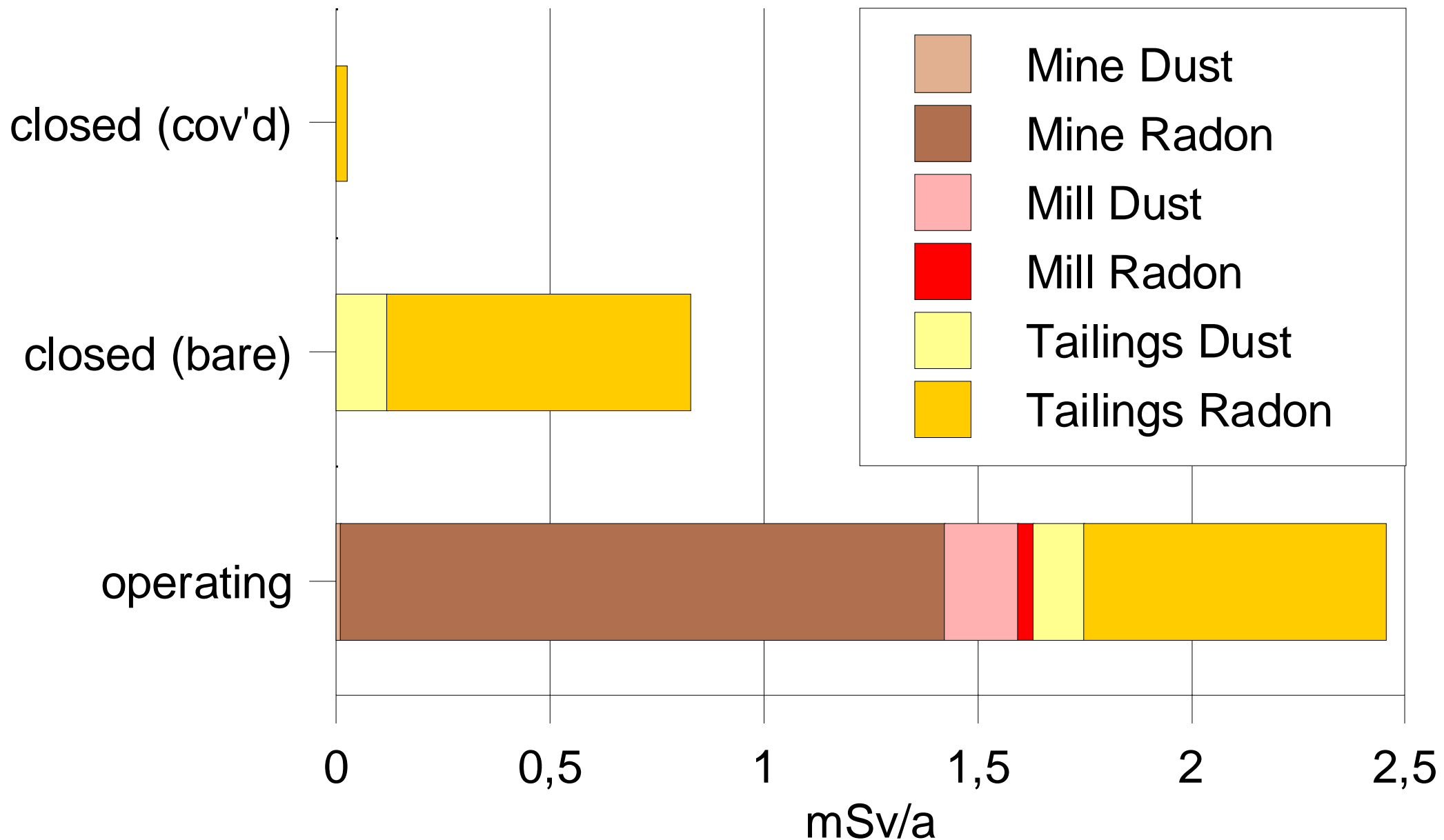


Ore grade: 0.1% U, Extraction: 90%

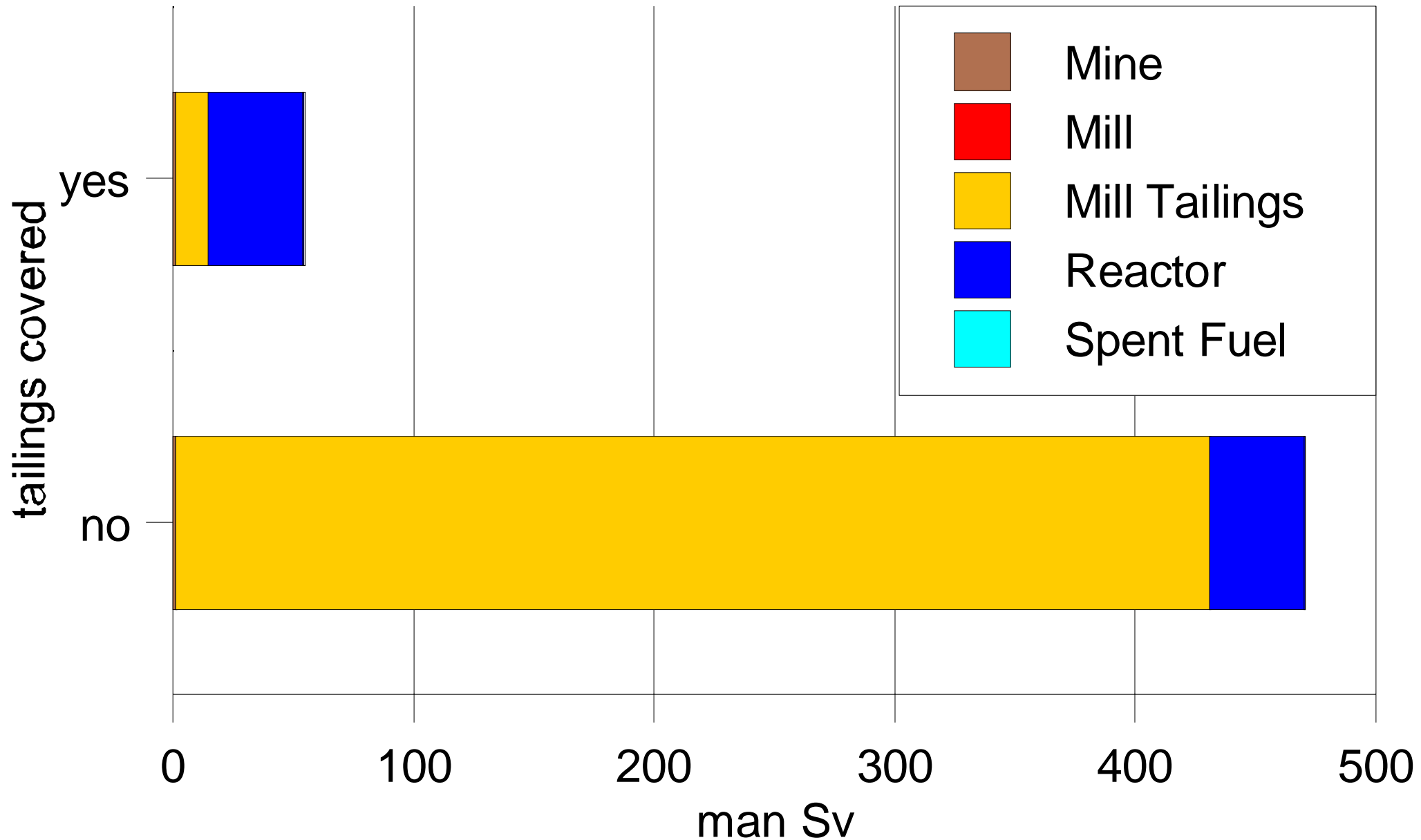
Groundwater

Dose for resident near typical 1000 t U/a mine

Annual Dose at 1 km in Sector WSW



Longterm Collective Dose per GWa_e

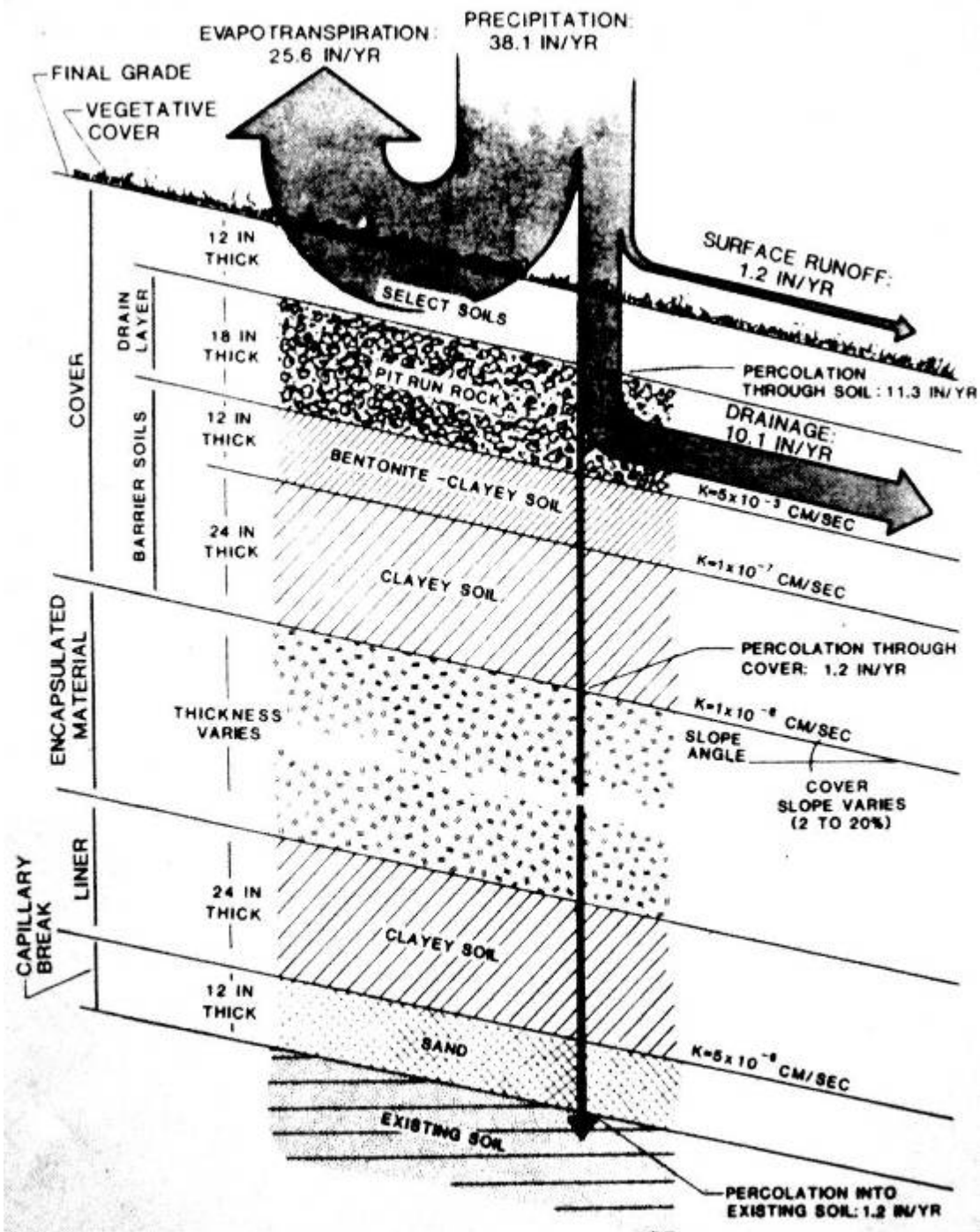




Culmitzsch, Thuringia, Germany, September 1990



Culmitzsch, Thuringia, Germany, June 1992



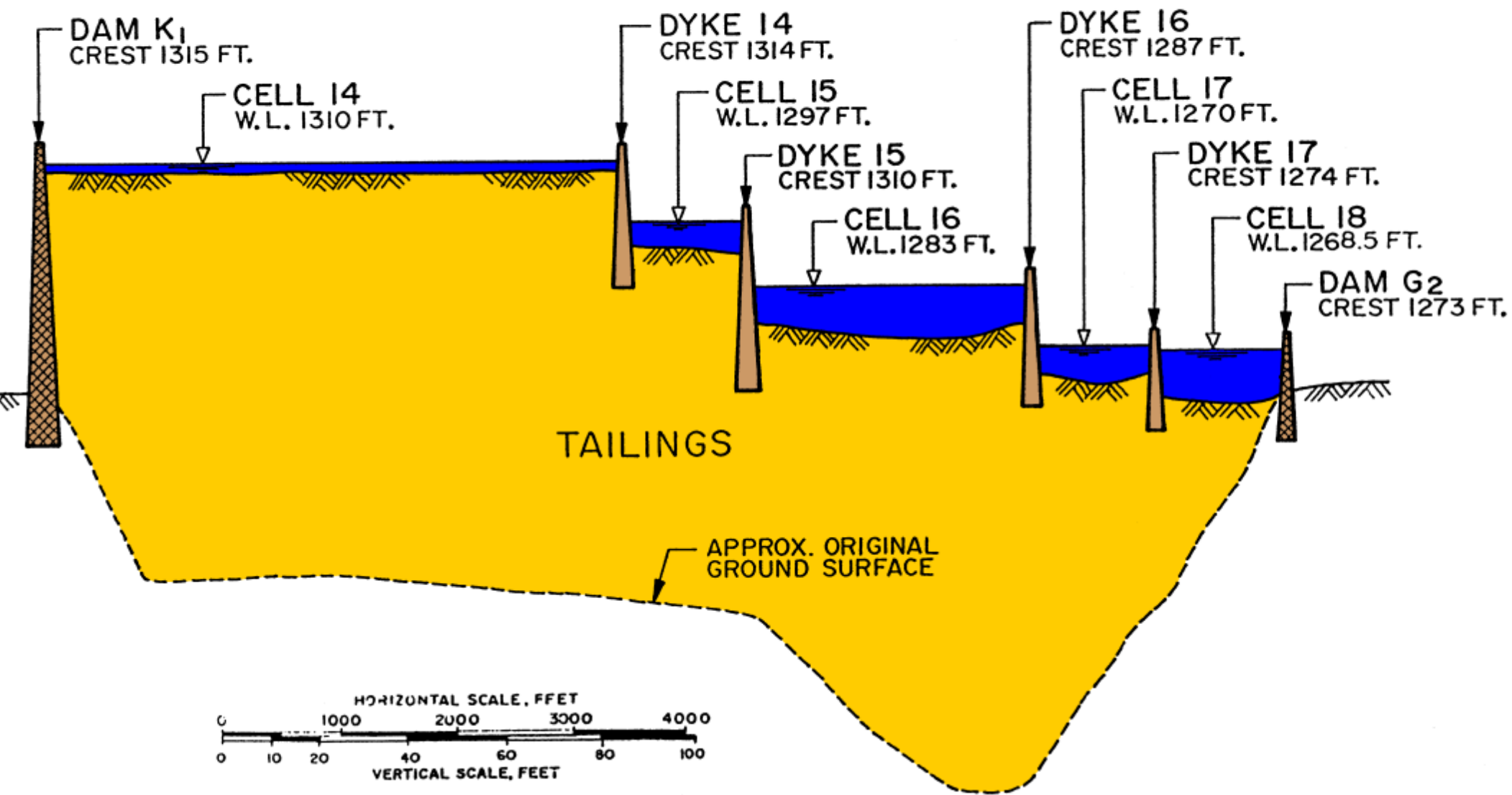
PROFILE OF ENCAPSULATION COVER AND LINER
WITH WATER BUDGET RESULTS -- CANONSBURG SITE



Ambrosia Lake uranium mill tailings, New Mexico, USA (Rio Algom)

PROFILE OF QUIRKE MINE WMA

VERTICAL EXAGGERATION = 40:1

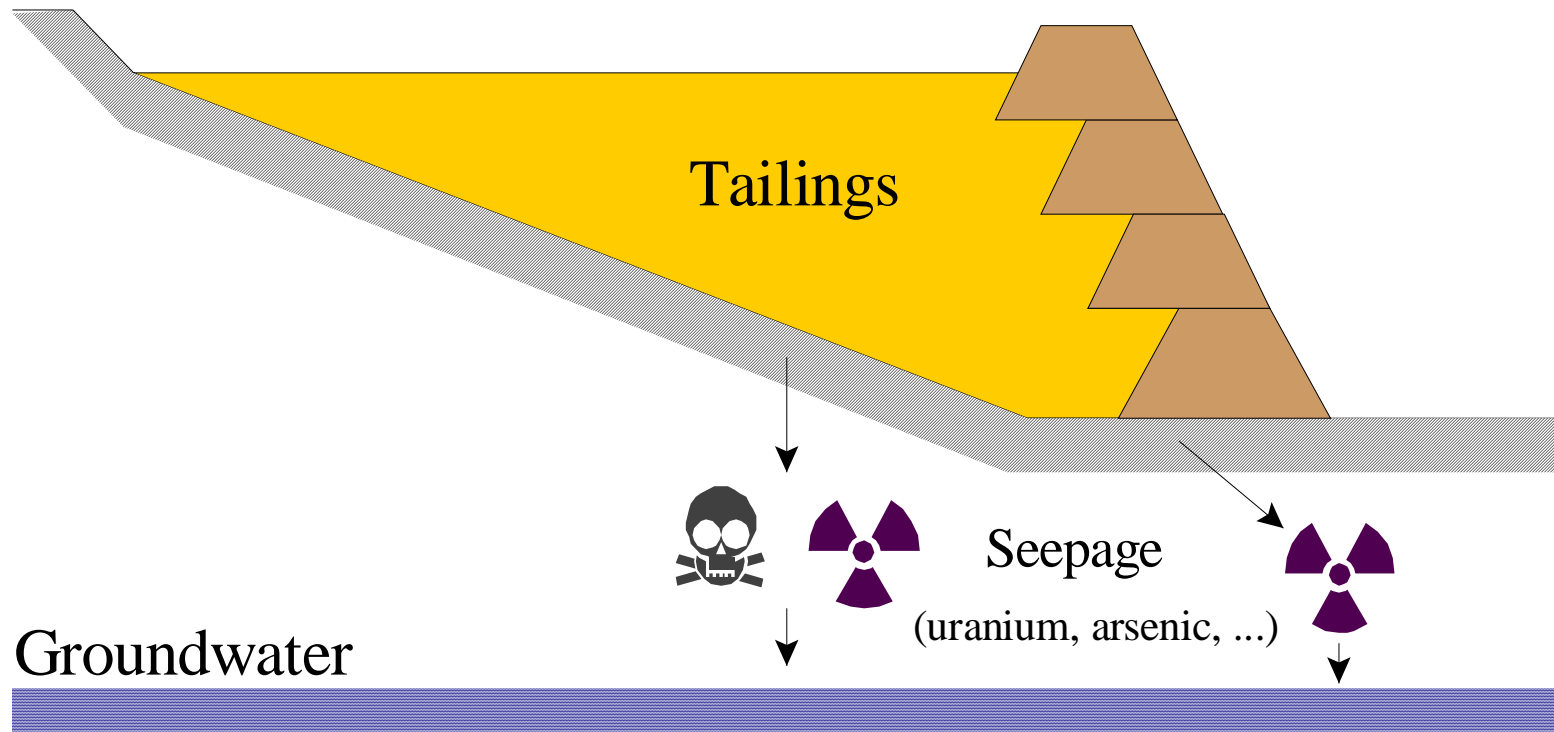


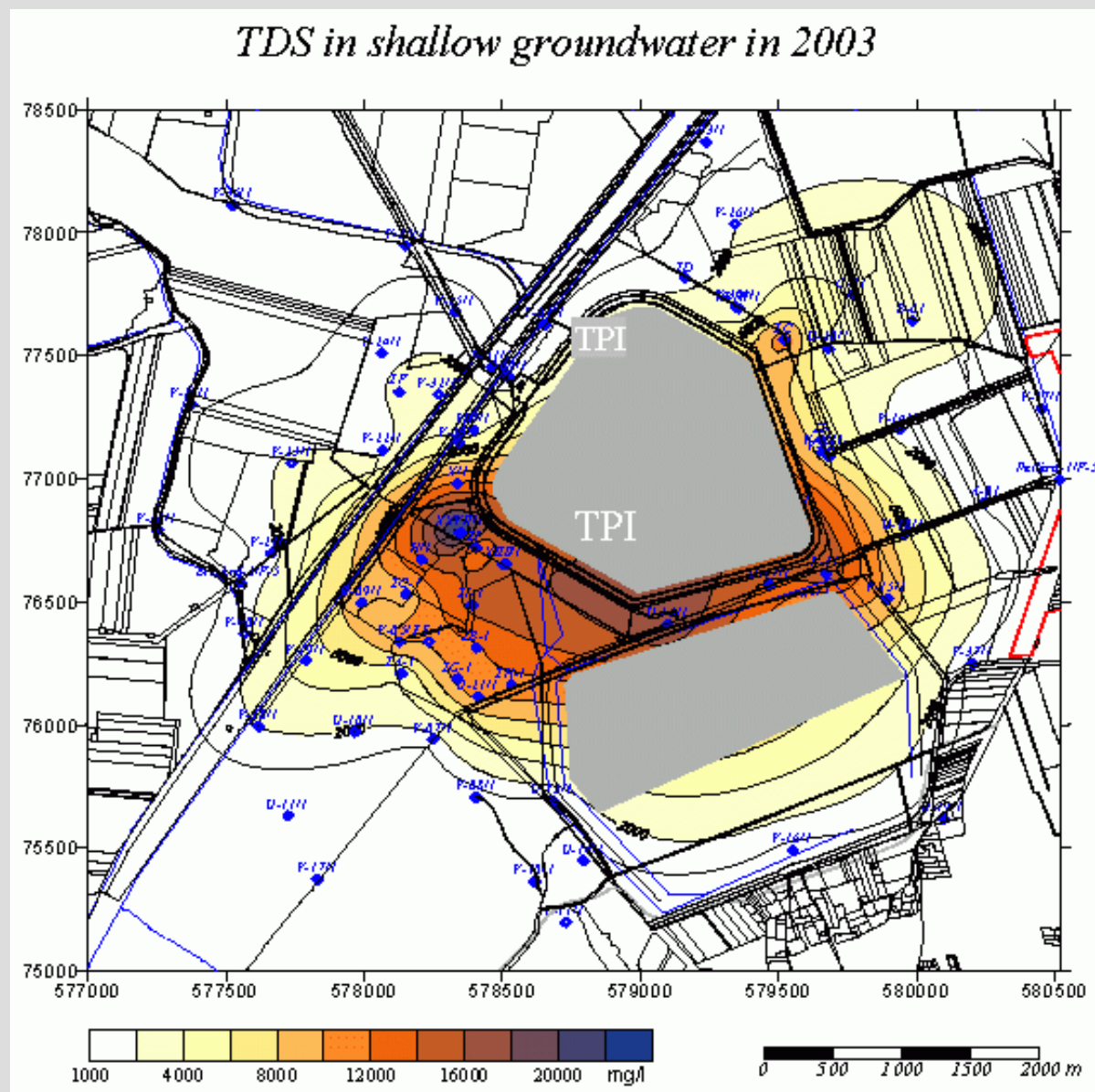
Rio Algom Quirke tailings, Elliot Lake, Ontario, Canada



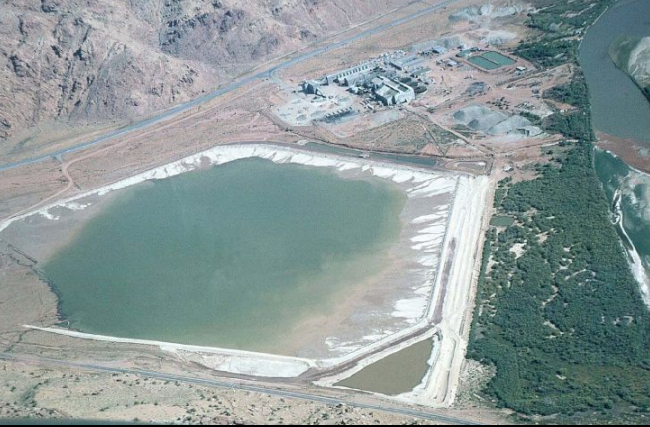
Quirke tailings, Elliot Lake, Ontario, Canada, 1999 (Rio Algom Ltd.)

Uranium Mill Tailings Hazards





Pécş uranium mill tailings, Hungary



Atlas tailings, Moab, Utah, USA (U.S. DOE)

Tailings disposal in Bellezane MCO 105 open pit (Haute Vienne, France)

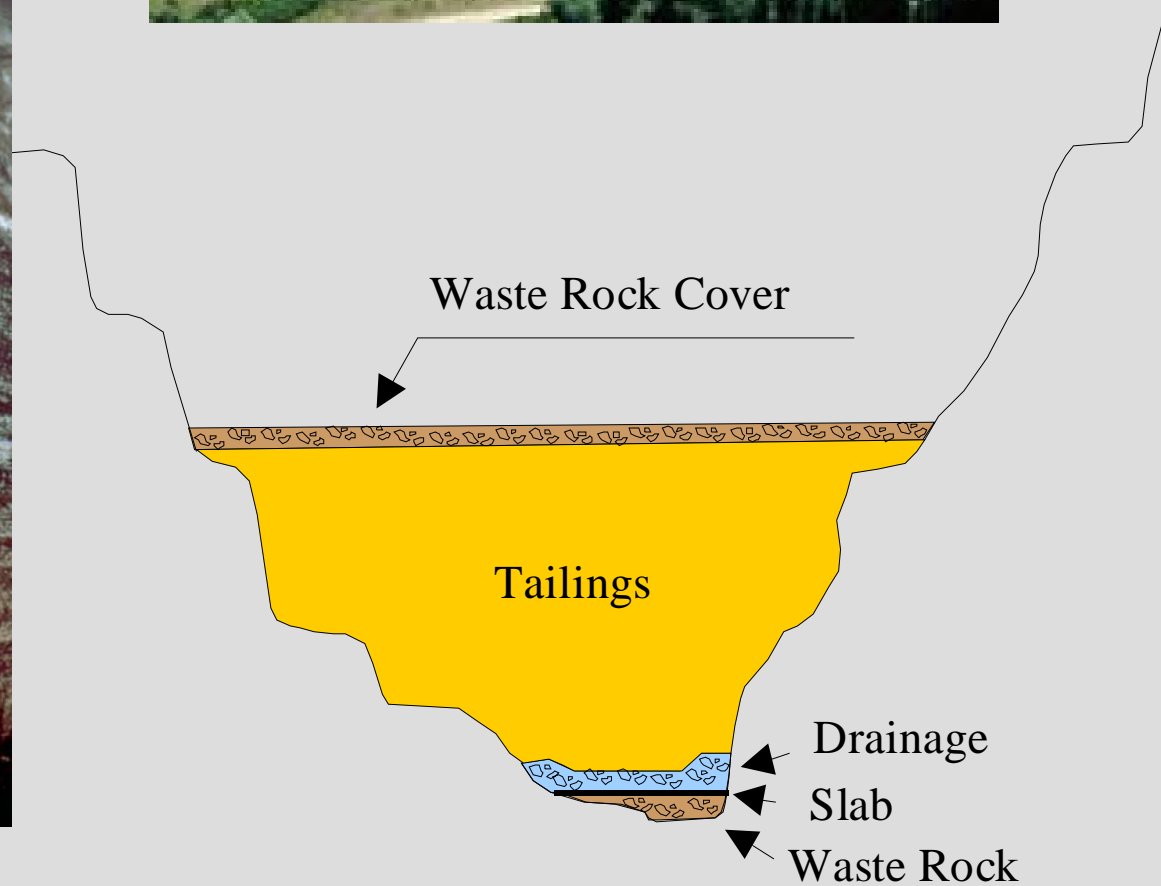


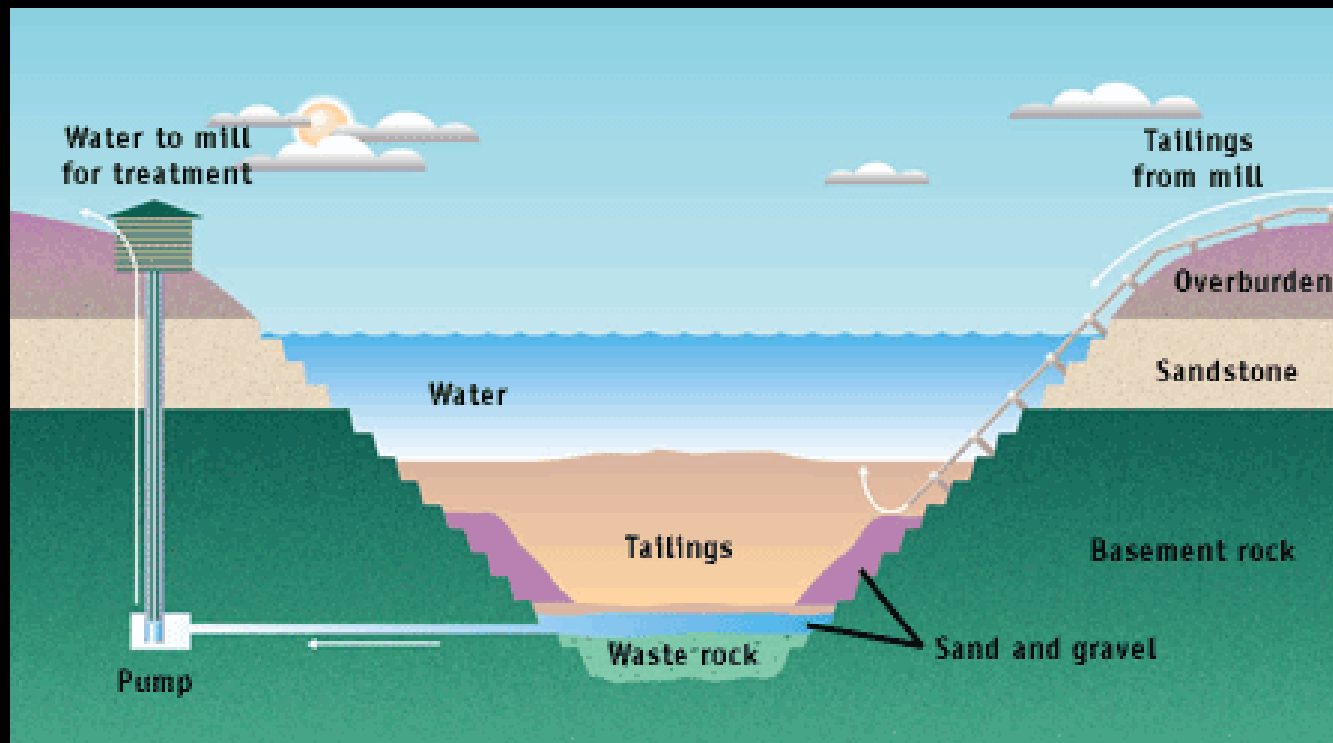
1992

Tailings disposal in Bellezane MCO 105 open pit (Haute Vienne, France)



1992

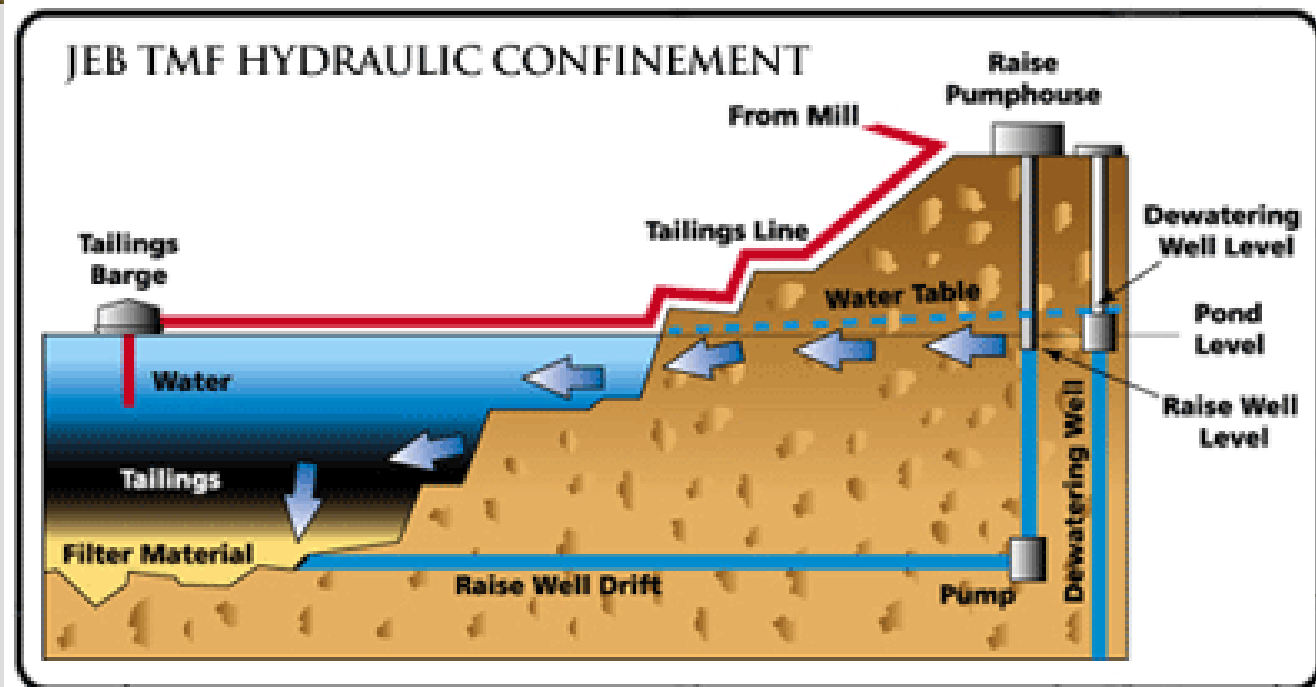




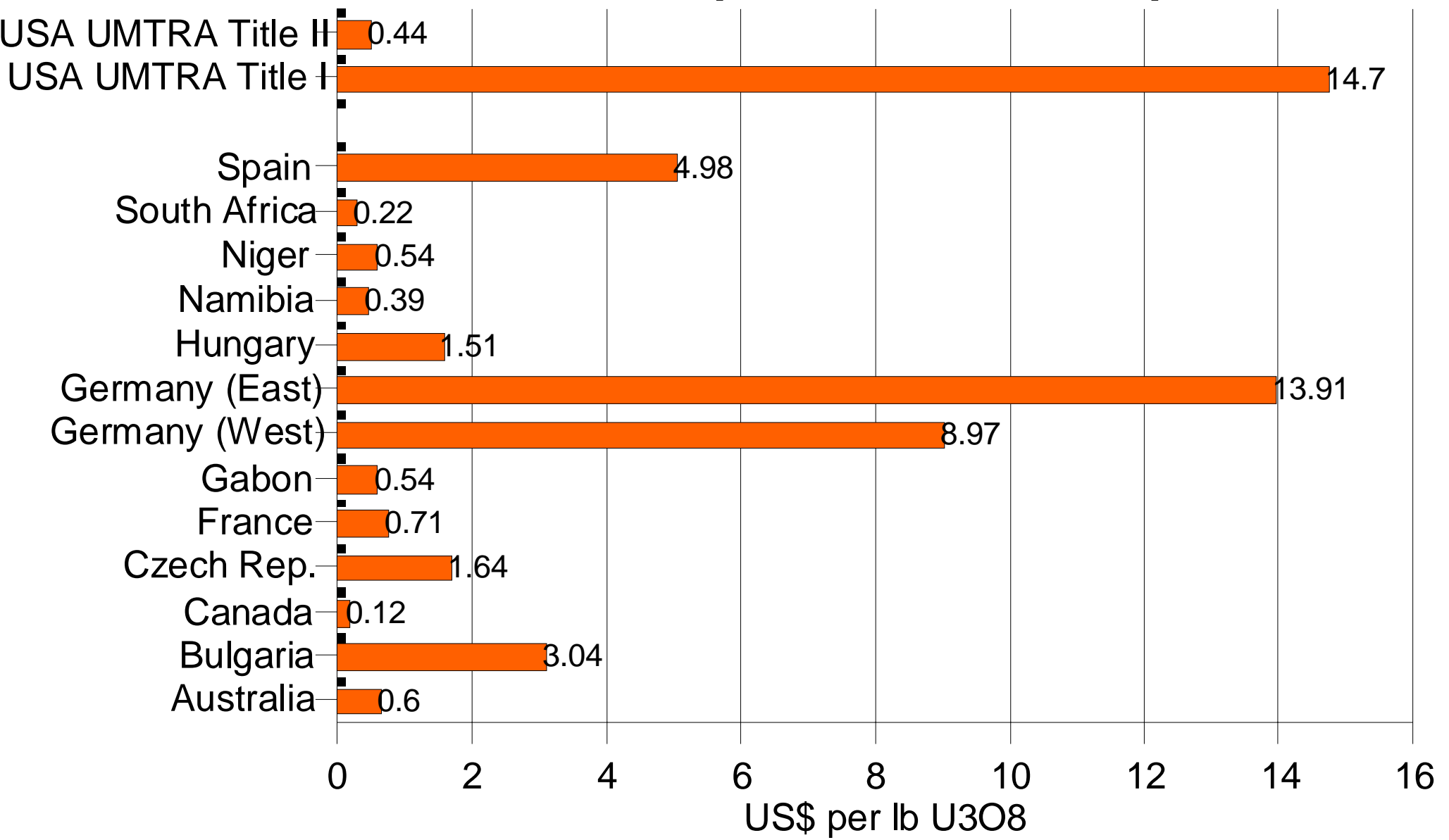
Tailings disposal in Deilmann open pit, Key Lake, Saskatchewan, Canada (Cameco)



Tailings disposal in
JEB open pit, McClean Lake,
Saskatchewan, Canada
(Areva NC)

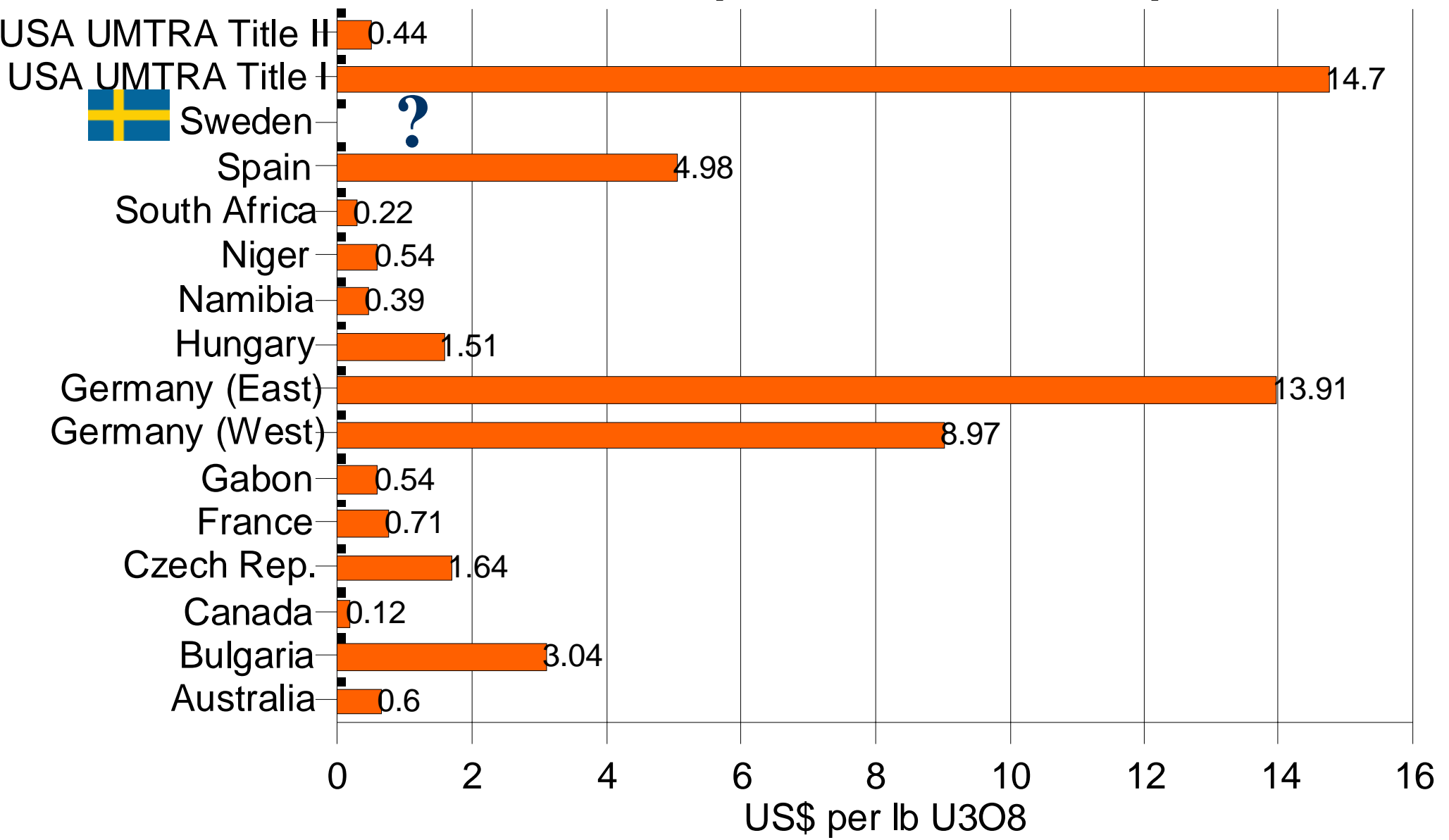


Reclamation Cost per lb U3O8 produced



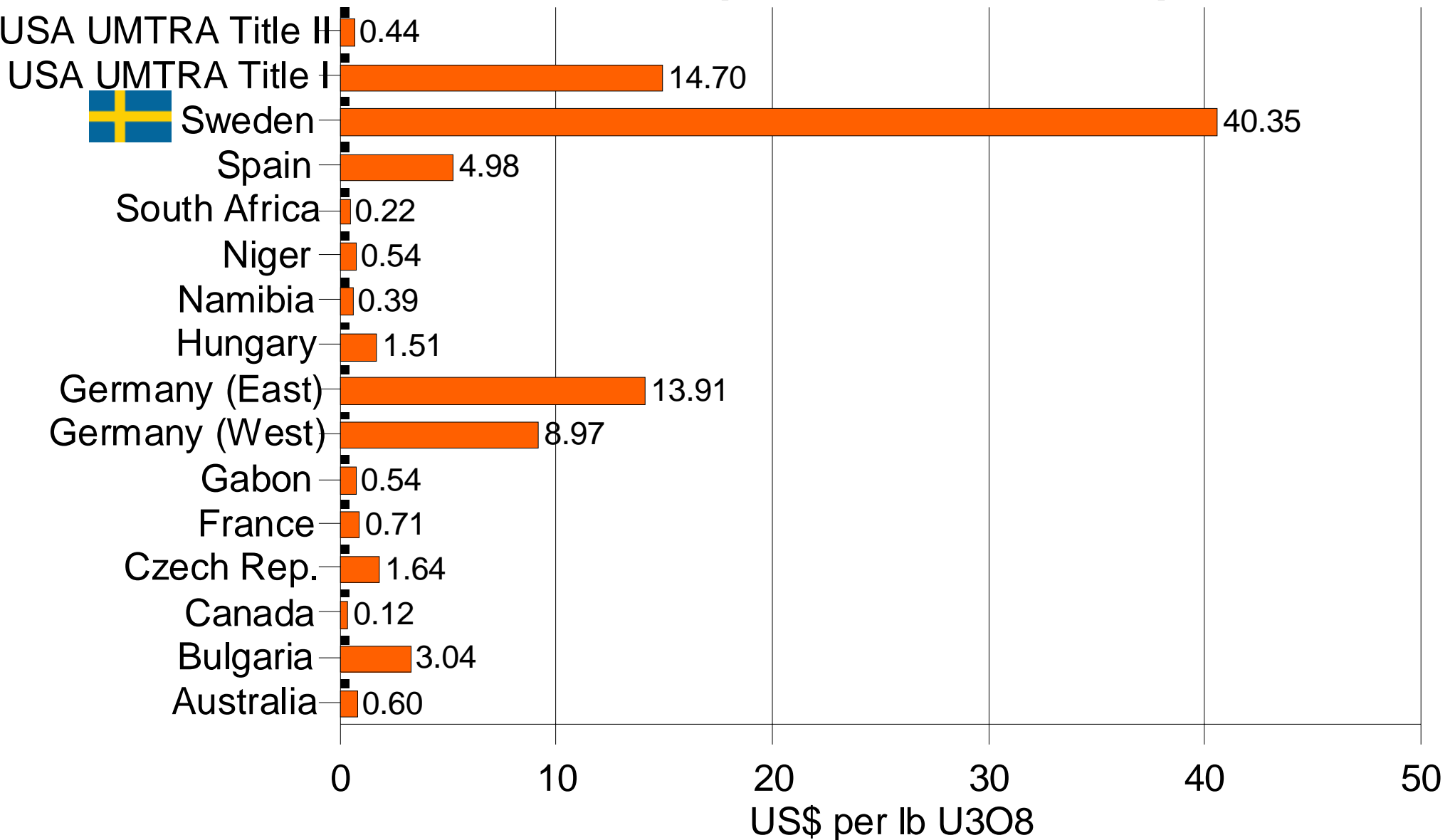
(after: BMWi 1995)

Reclamation Cost per lb U3O8 produced



(after: BMWi 1995)

Reclamation Cost per lb U3O8 produced



(after: BMWi 1995)



Stráz pod Ralskem, Czech Republic, June 1995

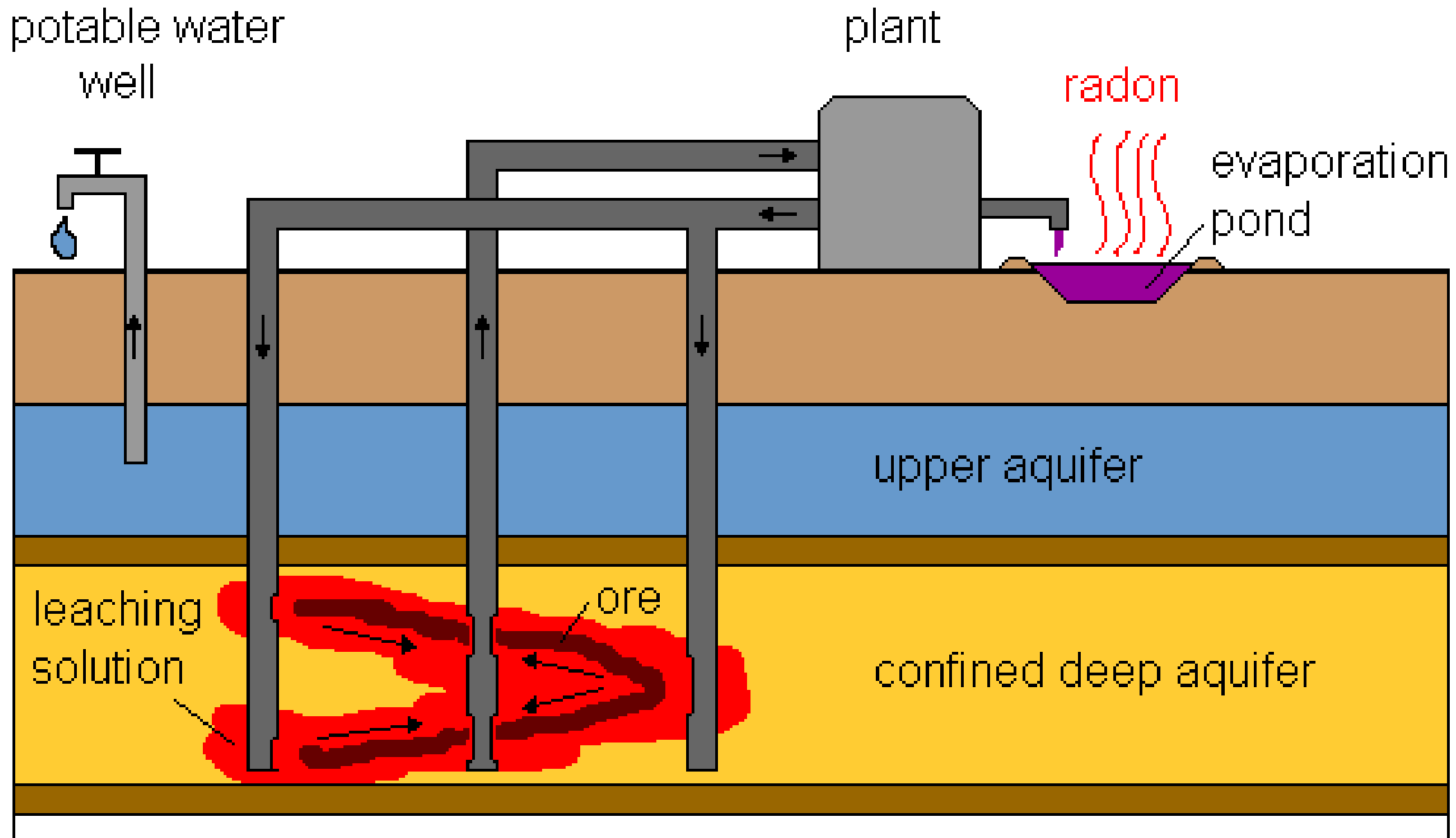


Uranium in-situ leach facility, Zarafshan, Uzbekistan (IAEA)

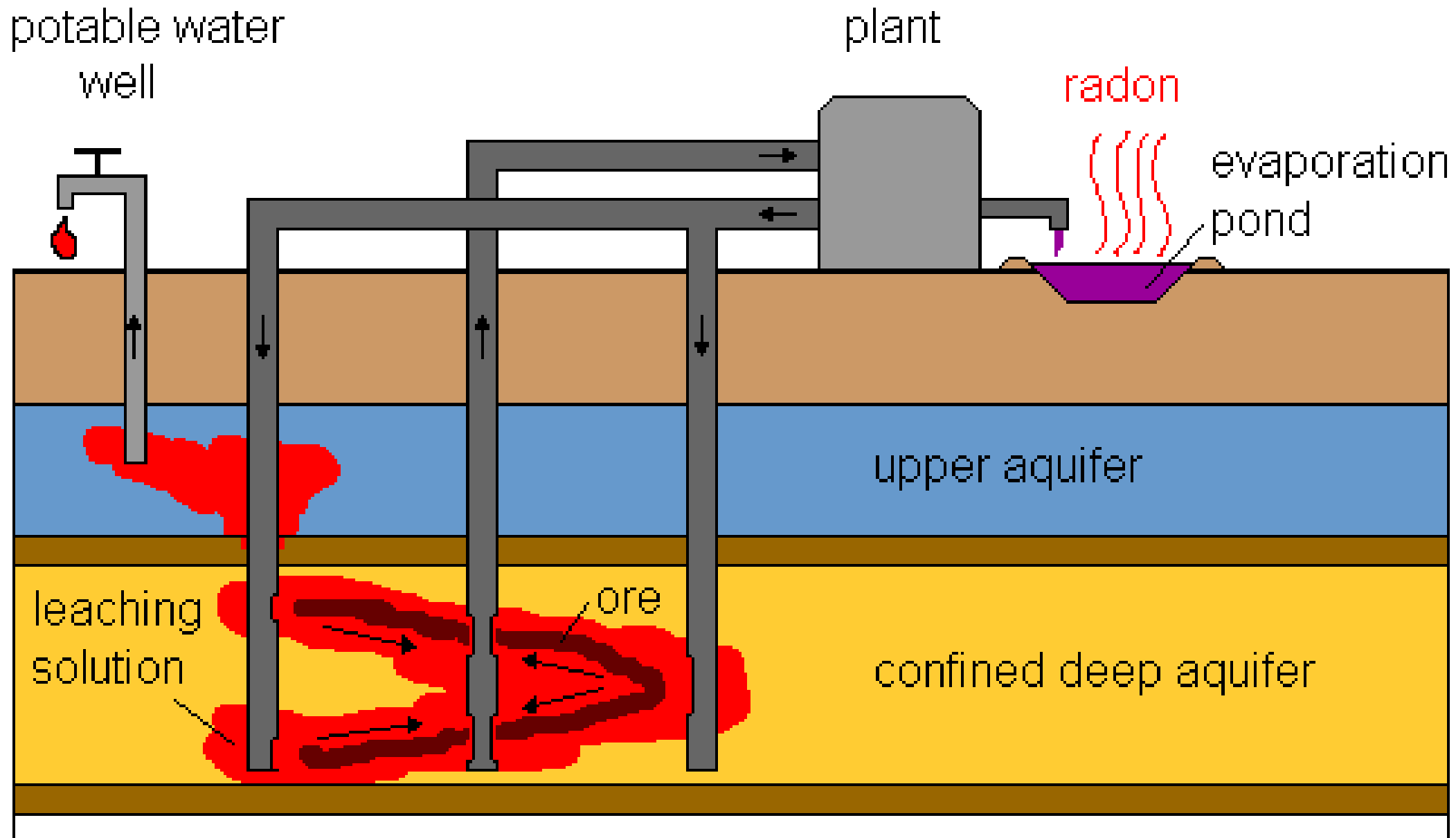


Alta Mesa ISL sorption plant, Texas, USA (Mesteña Uranium LLC)

Solution Mining (In-Situ Leaching)



Solution Mining (In-Situ Leaching)



The Land Quality Division has reviewed the fate and transport modeling conducted by PRI and concurs that the modeling indicates natural attenuation will prevent the groundwater within the wellfield from endangering (with an exceedance of EPA's MCL's) the class of use of the adjacent groundwater. In addition, the B-Wellfield has been partially restored to a condition such that any future restoration efforts in the B-Wellfield will not have a negative impact on the groundwater in the A-Wellfield through the hole in the aquitard between the A and B-Wellfields.

Restoration Determination

The Land Quality Division concurs that PRI has used Best Practicable Technology in its restoration efforts in the A-Wellfield. As outlined in the Joint LQD/WQD Policy (attached), the restoration results have reached baseline or have become asymptotic.

The groundwater has not been returned to its background quality.

I do determine, as allowed in the WQD Rules and Regulations, Chapter 8, Section 4(d)(viii)(B), that although the groundwater has not been returned to baseline conditions, the groundwater quality is consistent with the pre-discharge use suitability of the water (Class IV(A) suitable for industry). This determination is based on the requirement that treatment would be required of the premining groundwater prior to use because of the elevated background concentration of radium. The restored groundwater in the A-Wellfield would require similar treatment before use.

It is my determination that the A-Wellfield has been restored to the statutory and regulatory requirements.



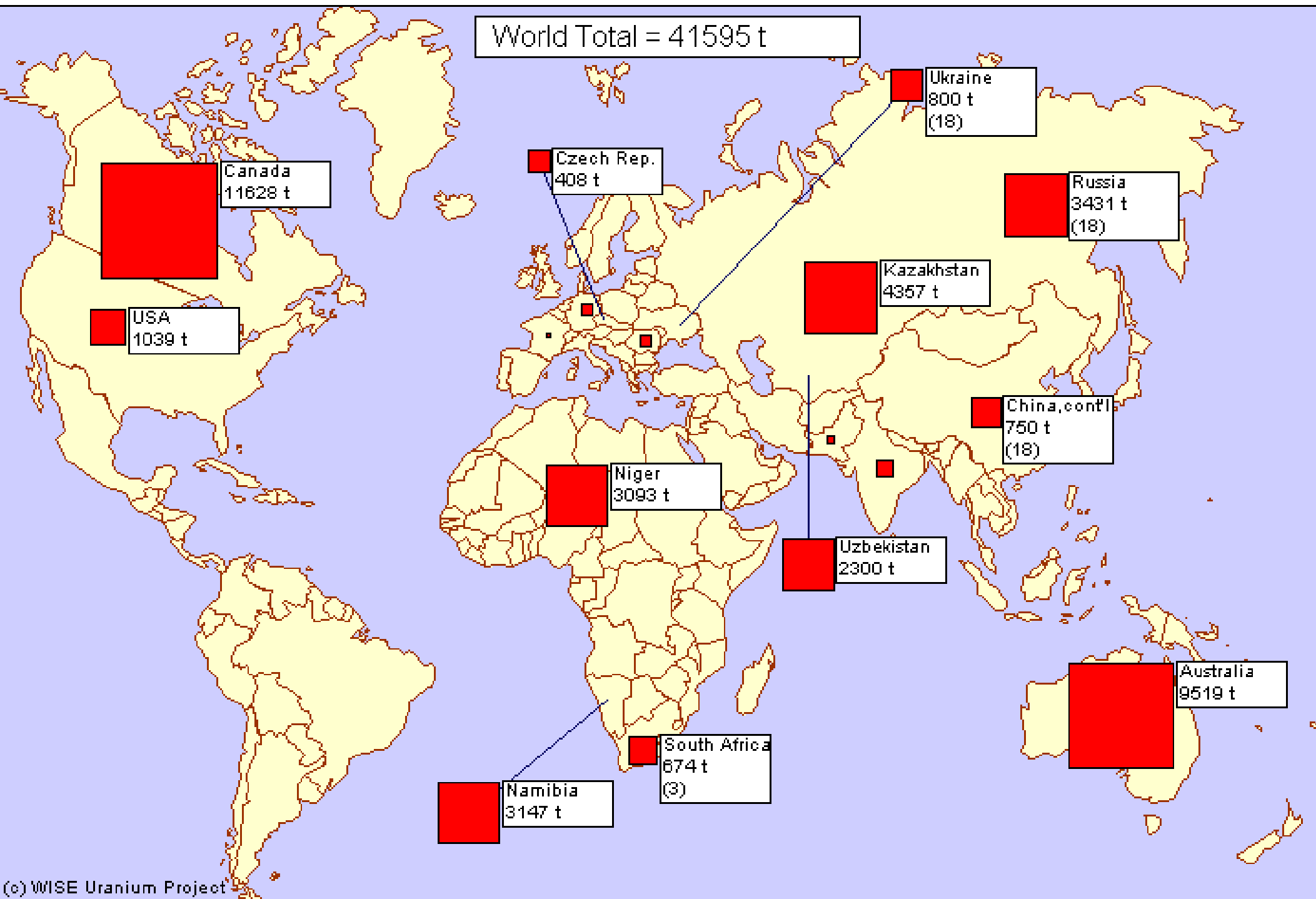
Tzarimir, Bulgaria, 1995



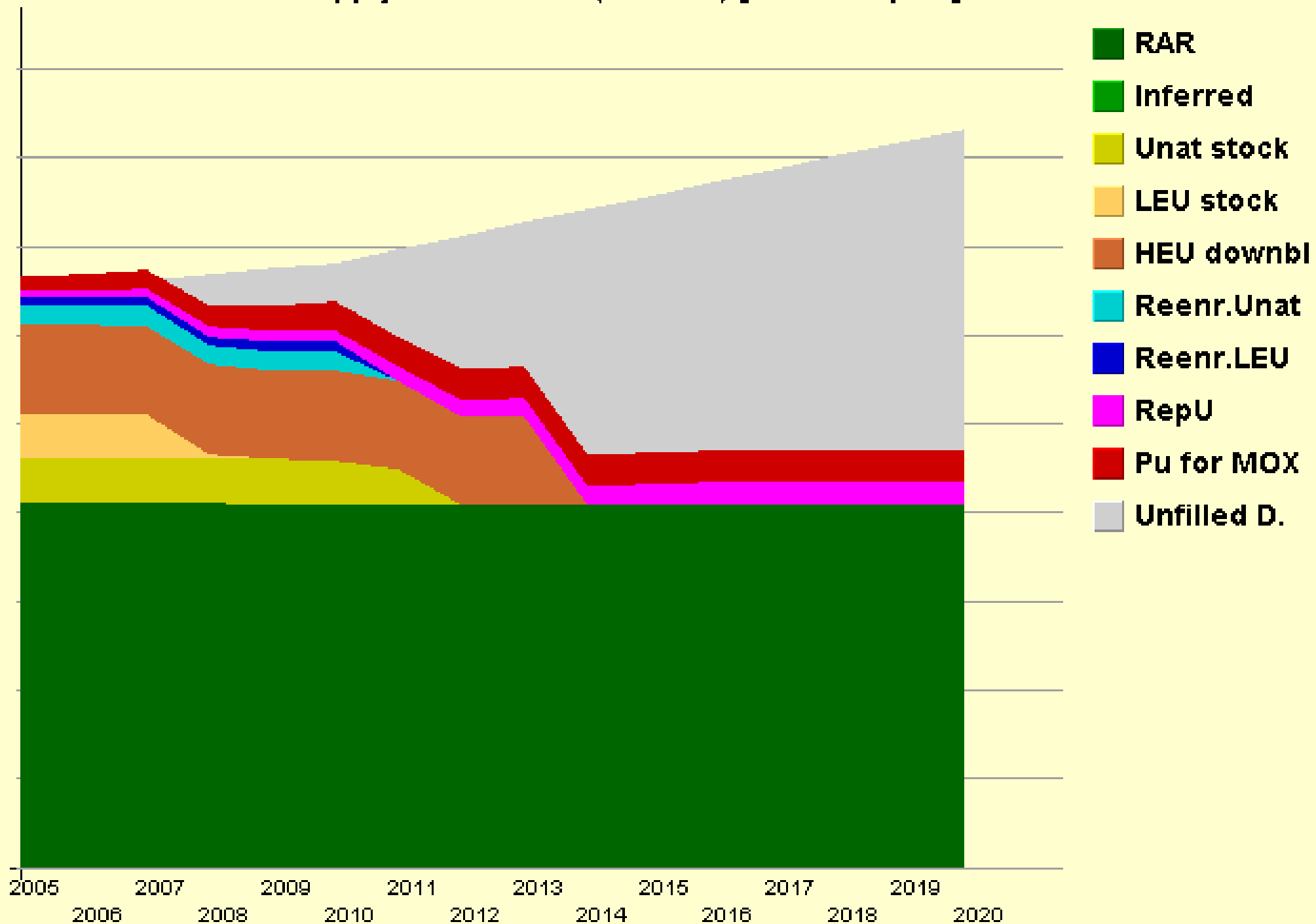
Yellow Cake (Mesteña Uranium LLC)

2005 Annual Uranium Production

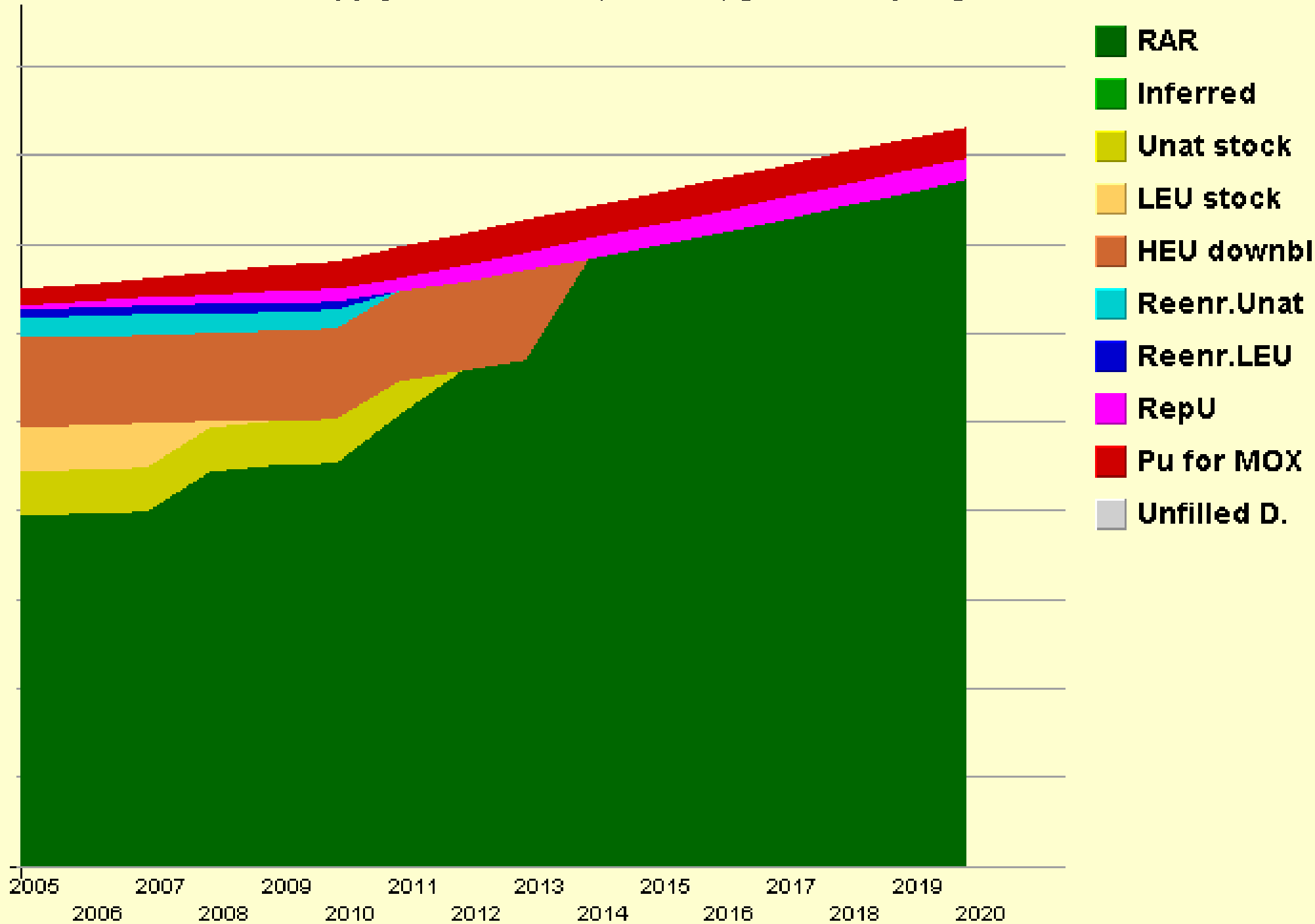
[t U] (WNA 2006)



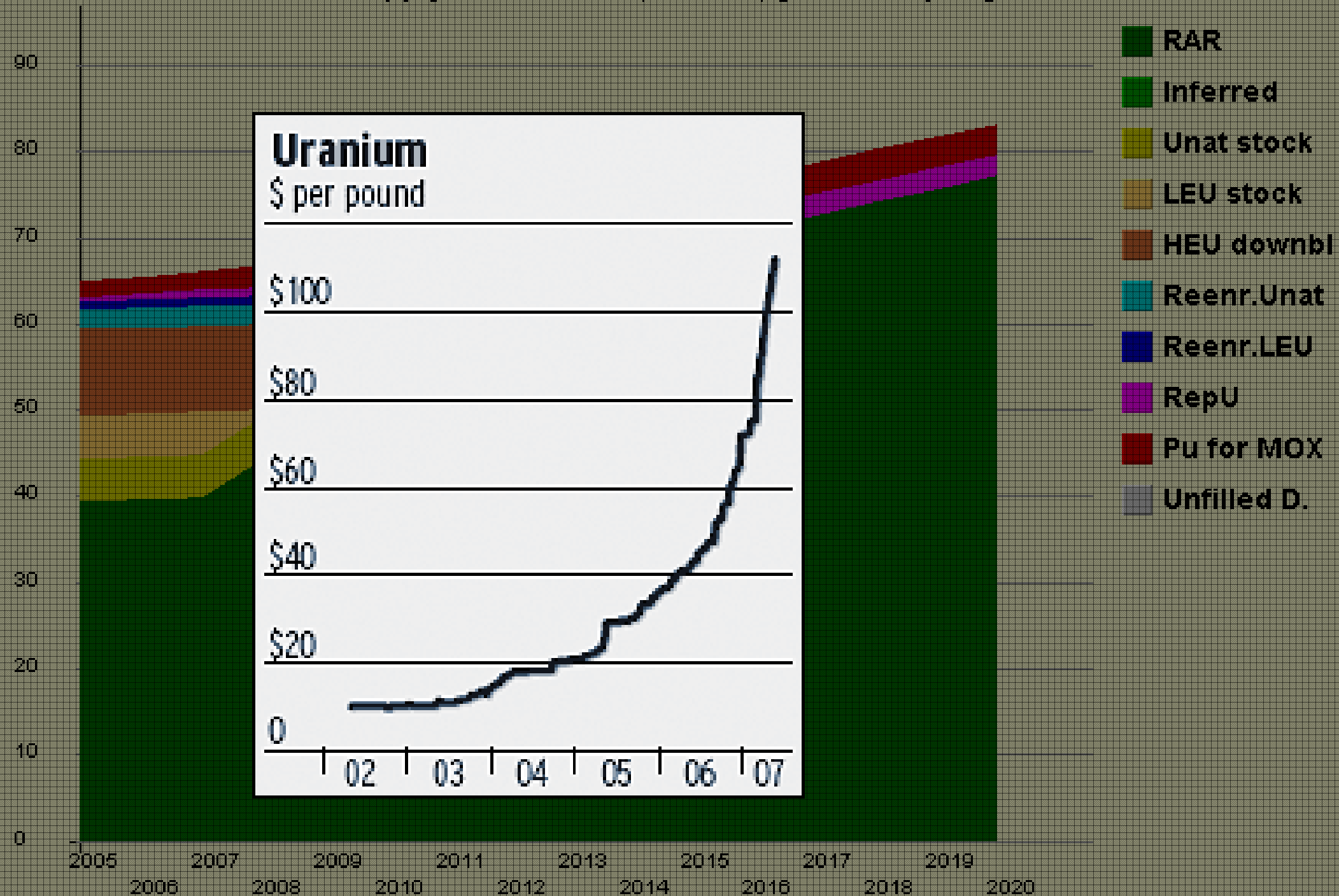
Supply and Demand (stacked) [kt Unat equiv.]



Supply and Demand (stacked) [kt Unat equiv.]



Supply and Demand (stacked) [kt Unat equiv.]



Mine Life Extension



Rössing mine life extension to 2016

Mine Life Extension

Phase 2

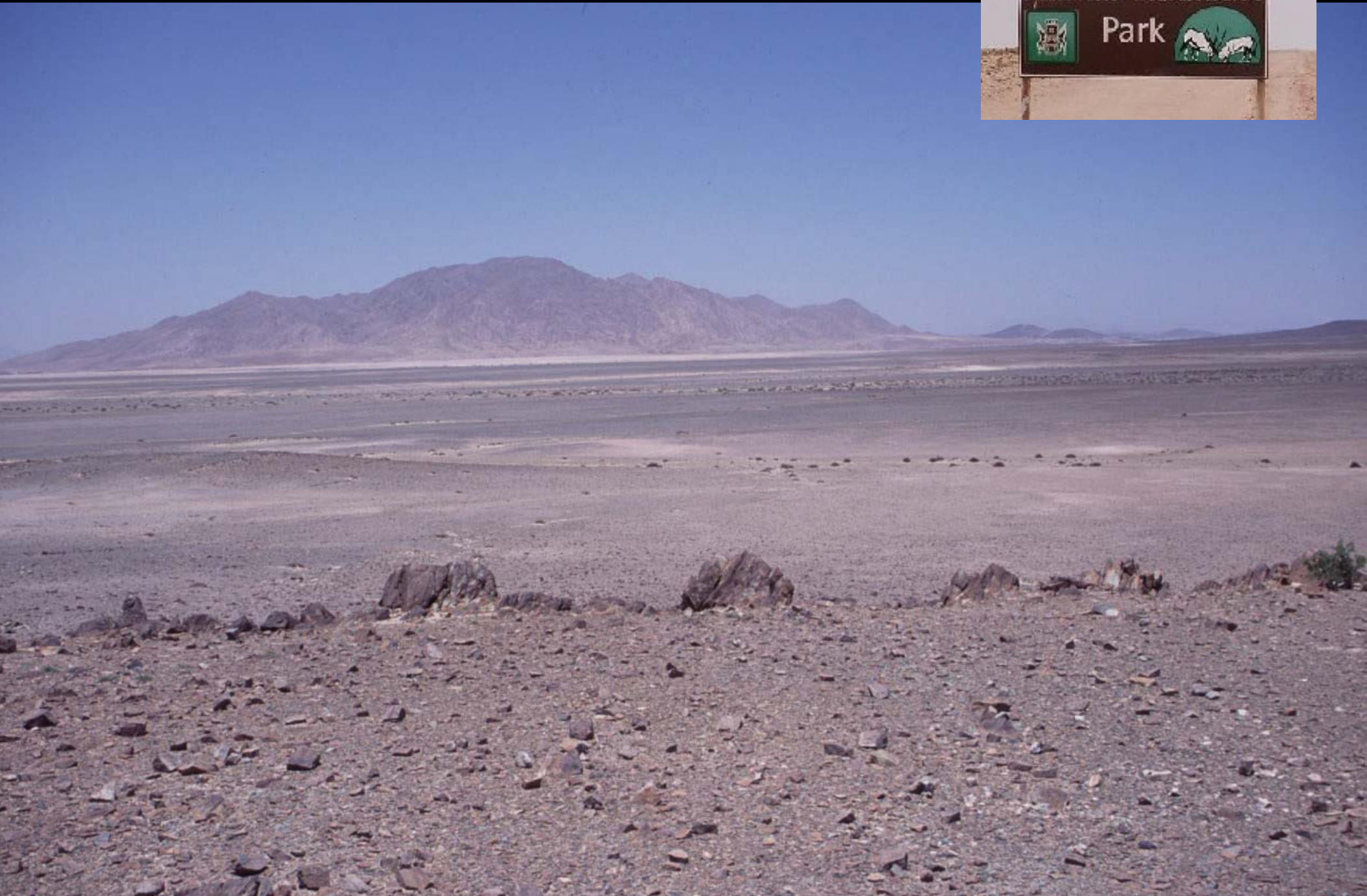
Rössing mine life extension to 2016



Existing Rössing tailings dam



Rössing tailings dam extension



Langer Heinrich mountain, Namib Naukluft Park, Namibia (Paladin)



Langer Heinrich mountain, Namib Naukluft Park, Namibia (Paladin)



Langer Heinrich mountain, Namib Naukluft Park, Namibia (Paladin)

Namib Naukluft
Park



Protest at groundbreaking ceremony of Langer Heinrich mine, Sep. 15, 2005 (NSHR)



Construction of Langer Heinrich mine and mill, 2006 (Paladin)



Exploration at Trekkopje Project, Namibia, 2006 (UraMin Inc.)



THE NAMIBIAN

NATIONAL NEWS

UraMin raises US\$60 m for mine at Trekkopje

• SPECIAL CORRESPONDENT
in LONDON

LONDON – British Virgin Islands-registered UraMin Inc, with access to potential uranium resources of 112 million kg of uranium oxide in Namibia and South Africa, raised £34 million (N\$380 million) via a

Pending approval of the EPL – which was applied for in February 2006 – the company has been assured by the Ministry that its existing mineral deposit retention licence (MDRL) remains in force, according to the AIM listing document prepared by stockbrokers Canaccord Adams.

before it was entitled to.

Although Mines and Energy Minister Erkki Nghimtina recently announced that Trekkopje would commence production at the end of this year, the listing document makes it clear a longer development period is envisaged.

Once the EPL has been

UraMin holds several South African prospecting grants (via a 70 per cent owned subsidiary Mago Resources) and has applied for around 50 others over uranium deposits near Beaufort West in the Karoo Basin – located mainly in northeast Western province and the south of Northern Cape province



Exploration at Valencia Project, Namibia, 2006 (Forsys Metals Corp.)



Exploration at Allemand Ross project, Wyoming, USA (High Plains Uranium, Inc.)




Exploration at Wheeler Project, Saskatchewan, Canada, 2006 (Denison Mines)



Exploration near Norråker, Sweden, by Mawson Resources Ltd. (OP Dec. 29, 2006)

Major uranium deposits in black shale

Location	Area [km ²]	Uranium resource [t U]	Grade [ppm U]
Ronneburg, Germany	164	169,230	850 – 1,700
Ranstad, Sweden 	500	254,000	170 – 250
Chattanooga Shale, USA	80,000	4 – 5 million	57

„While the black shale deposits represent a large resource, they will require very high production costs, and their development would require huge mines, processing plants and mill tailings dams, which would certainly elicit strong environmental opposition.“ [...]

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„Therefore the black shale deposits represent a long term resource that will require market prices in excess of US \$130/kg U to be economically attractive, assuming environmental opposition could be overcome, which is by no means certain for any of the three deposits mentioned above.“



present a large
high production costs,
fire huge mines,
dams, which would
tal opposition.“ [...]

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ÖP Oct. 13, 2006



ÖP Apr. 7, 2007



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World Information Service on Energy

Uranium Project

<http://www.wise-uranium.org>



<http://www.wise-uranium.org>

„selected 'bad news' about uranium (extensive)“ [IAEA]