Country Waste Profile Report for

SWITZERLAND

Reporting Year: 2009

For guidance on reading Country Waste Profile Reports,
please refer to the following internet based document:

http://www-newmdb.iaea.org/help/profiles9/guide.pdf

For further information, please contact the Responsible Officer via e-mail:
NEWMDB@IAEA.org

Waste Classification Schemes

Country: SWITZERLAND Reporting Year: 2009

Waste Class Matrix: **IAEA Def.**

This country does use the IAEA Scheme: Yes

Description: The Agency's standard matrix

	Distribution %			
Waste Class Name	VLLW	LLW	ILW	HLW
VLLW	100.0	0.0	0.0	0.0
LLW	0.0	100.0	0.0	0.0
ILW	0.0	0.0	100.0	0.0
HLW	0.0	0.0	0.0	100.0

Comment **# 7198: Matrix use**

The IAEA standard waste classification system is not applied within offical reports on radwaste in Switzerland. In the context of NEWMDB, it is, however, adopted as default to meet basic technical requirements for the definition of reporting groups within the database (i.e. need for waste matrix allocation) in case of reporting groups without any associated classification system (e.g. because there is no official reporting at all).

Waste Class Matrix: **Nagra**

Description: Classification scheme adopted by Nagra for provisional waste allocation to planned SMA and HAA/LMA repositories within Swiss disposal programme in 1985-2002 [kept in NEWMDB up to decisions on site/concept of new SMA repository]. Precise classification rules have not yet been established; the basic criterion is that the system of repositories and allocated wastes can be demonstrated to comply with the national overall long-term safety targets stated in HSK-R-21 (November 1993).

	Distribution %		
Waste Class Name	LILW-SL	LILW-LL	HLW
SMA	97.0	3.0	0.0
LMA	0.0	100.0	0.0
HAA	0.0	0.0	100.0

Comment **# 345: Waste class SMA**

SMA (low-level and short-lived intermediate level waste) shall be disposed of in a geologic repository, EL-SMA. This stream covers all LILW-SL (suitable for near-surface disposal) and might, from a technical point of view, also include part of LILW-LL (wastes passing IAEA limit on specific alpha activity in LILW-SL). The volume of this LILW-LL fraction can be expected to be up to a few percent of the total SMA volume; the distribution factors given represent a rough estimate.

Comment **# 346: Waste class LMA**

LMA (long-lived intermediate-level waste) refers to the fraction of LILW-LL which are not to be disposed of in an EL-SMA.

Comment **# 347: Waste class HAA**

HAA (high-level waste) denote canisters with vitrified HLW from reprocessing spent Swiss fuel in France and Great Britain, being returned to Switzerland.

Comment **# 360: Waste class BE**

Not included. IAEA has explicitly excluded BE (spent fuel) from reporting in NEWMDB.

Waste Classification Schemes

Country: SWITZERLAND Reporting Year: 2009

Waste Class Matrix: **NEA-SD**

Description: Classification scheme used by IAEA to report on Swiss waste disposed of by OECD/NEA sea dumping campaigns in the Atlantic Ocean between 1969 and 1982 (IAEA-TECDOC-1105 [August 1999], Annex A.11).

	Distribution %		
Waste Class Name	LILW-SL	LILW-LL	HLW
MD	100.0	0.0	0.0
MDLC	85.0	15.0	0.0

Comment **# 361: Waste class MD**

MD (200-l metal drums), nominal volume 0.21 m3, include solidified (generally: cemented) waste. They are assumed to be LILW-SL.

Comment **# 362: Waste class MDLC**

MDLC (metal drums lined with concrete) represent 200-l drums with cemented waste, grouted into a concrete container (nominal volume 0.98 m3) before shipment. Overpacking purposes are shielding (gamma emitters) and enhanced safety (alpha emitters, including Ra-226). Volume distribution over LILW-SL and LILW-LL is estimated on the basis of the alpha activities processed (AGNEB-165 [28.04.1983], table 1), the numbers of dumped MDLC (IAEA-TECDOC-1105 [1999], Annex A.11), and the assumption of a 60% use of the IAEA limits on specific activities for Ra-226 and other alpha emitters (AGNEB-165 [28.04.1983], p.4).

Waste Class Matrix: **KEV 2004** Yes

Description: Generic, disposal-oriented waste classification scheme as defined in Article 51 of the Swiss Nuclear Energy Ordinance (KEV) dated 2004-12-10.

	Distribution %			
Waste Class Name	VLLW	LLW	ILW	HLW
SMA	15.2	84.5	0.3	0.0
ATA	0.0	0.0	100.0	0.0
HAA	0.0	0.0	0.0	100.0
SMA ybc	1.9	97.3	0.8	0.0
ATA ybc	0.0	0.0	100.0	0.0

Comment **# 20681: Definition of KEV 2004 classes**

a) HAA (acronym for "hochaktive Abfälle"): spent fuel elements (when assigned as waste) and vitrified high-level liquid waste from reprocessing of spent fuel. b) ATA ("alphatoxische Abfälle"): radioactive waste not classified as HAA, with total alpha activity above 20 kBq per g of conditioned waste. c) SMA ("schwach- und mittelaktive Abfälle"): radioactive waste not classified as HAA or ATA. As the criterion for discrimination between ATA and SMA is strictly applicable to conditioned waste (i.e. waste packages ready for storage) only, two additional classes "ATA ybc" and "SMA ybc" are introduced for a tentative ranking of waste "yet to be conditioned".

Comment **# 20682: Derivation of Matrix Coefficients**

Waste accounting entities (such as a waste package) are allocated in parallel to classification systems A (here: the national system "KEV 2004") and B (here: IAEA reference system), based on system specific criteria (here: see attachment, Tables 2/3 and 6/7, respectively). Based on the volume associated with each waste accounting entity, the following parameters are calculated: 1) the total volumes for any couple of A/B classes, 2) the total volumes for any A class. Matrix coefficients are derived by divding the total volume of any A/B couple through the total volume of the pertinent A class.

Attachment **#1877: Waste Matrix**

Derivation WasteMatrix KEV 2004 2010-02-13.pdf

Outline on Derivation of the NEWMDB Waste Class Matrix "KEV 2004".

Definition of «unprocessed waste» and «processed waste»:

Waste Classification Schemes

Country: SWITZERLAND Reporting Year: 2009

This country uses the following definitions:

	as-generated waste	processed for handling	processed for storage	processed for disposal
Unprocessed means:	x	x		
Processed means:			x	x

Comment **# 12140: Definitions for Unprocessed and Processed Waste**

In reporting on Swiss radioactive waste, information is quite commonly, e.g. in the case of the Joint Convention Report, discriminated by a waste processing status qualifier, "conditioned" or "yet to be conditioned".

The status "conditioned" refers to waste which has been formally accepted by the pertinent authority as meeting the following general principle: "Radioactive waste shall be conditioned in such a way that the resulting waste forms, together with the packaging elements permanently tied to them, can be submitted to the waste management stages of transport, storage and disposal, without any further intrusive action, overpackaging measures remaining admissible".

The complementary status "yet to be conditioned" logically applies to all waste not fully complying with this principle.

In order to carry the reference information unambiguously forward to NEWMDB, the national terms "conditioned" and "yet to be conditioned" have been simply equalled to NEWMDB terms "processed" and "unprocessed", respectively. Hence, data given for "processed waste" in NEWMDB in fact relate to waste considered as being ready for storage and, intentionally, suitable for disposal.

Groups Overview

Country: SWITZERLAND Reporting Year: 2009

Reporting Group:	**BAG**
Inventory Reporting Date:	December 2009
Waste Matrix Used:	KEV 2004
Description:	Wastes from Nuclear Applications in Medicine, Industry and Research Held under BAG's Supervision

Site Name	Facility Name	Facilities Defined		
CERN	WMF@CERN	processing	storage	
PSI(BAG)	WMF@PSI-W	processing	storage	

Comment **# 7226: General**

The Federal Office of Health (BAG) is the supervisory body for radwaste management activities at sites which do not fall under nuclear regulation in a legal sense [note: those are supervised by the Swiss Federal Nuclear Safety Inspectorate (ENSI)], dealing with a broad variety of waste producers in the field of nuclear applications in medicine, industry and research.

Waste arisings destined to disposal in a nuclear repository are

(a) collected on behalf of BAG (possibly after pretreatment, subject to fee) and routed to a national delivery point (PSI-East), where they are conditioned and stored under ENSI's supervision (see: Reporting Group "ENSI") - standard procedure for small producers, option for large nuclear research centres (CERN, PSI outside ENSI's supervision), or

(b) storage after/without treatment or conditioning at site - standard procedure for large-sized decommissioning wastes of large nuclear research centres.

BAG has no legal obligation for public reporting on wastes falling under (b) [note: category (a) is included under reporting for PSI(ENSI)]. Hence, information given is restricted to some qualitative issues.

Note, however, that registration of wastes of category (b) into the database system for Swiss radioactive wastes (ISRAM) has been accepted by PSI and CERN and is being implemented.

Groups Overview

Country: SWITZERLAND Reporting Year: 2009

Reporting Group:	**ENSI**
Inventory Reporting Date:	December 2009
Waste Matrix Used:	KEV 2004
Description:	Wastes from Swiss nuclear power industry, research reactors and other nuclear installations (including the national collection centre for Federal wastes at PSI-East) held under ENSI's supervision

Site Name	Facility Name	Facilities Defined		
KKB	WMF@KKB	processing	storage	
KKG	WMF@KKG	processing	storage	
KKL	WMF@KKL	processing	storage	
KKM	WMF@KKM	processing	storage	
PSI(ENSI)	WMF@PSI-E	processing	storage	
ZWILAG	WMF@ZWILAG	processing	storage	

Comment **# 373: Reference Data for Reporting to NEWMDB**

Reporting relies on an evaluation of electronic data extracted from the database system ISRAM (Information System on Radioactive Materials), referring to site-specific waste inventories at key date 2009-12-31.

Comment **# 374: Reporting on NPP sites**

Reporting on NPP sites (KKB, KKG, KKL, KKM) is based on the following concept: (a) information on local waste management facilities is given collectively under "WMF@KKX", (b) waste data are presented for each site in terms of a generic "overall" storage unit (named "all@KKX"), (c) the start of both treatment/conditioning and storage operations is generically set equal to the first year of commercial operation of the NPP, and (d) the type of the "overall" storage unit is defined as "various" due to effective or potential variations within the set of locally available storage units [note: conditioned waste and solid waste yet to be conditioned are usually stored in buildings or bunkers, liquids or sludges awaiting treatment in tanks].

Comment **# 378: Reporting on PSI(ENSI)**

Reporting on PSI(ENSI) is based on the following concept: (a) information on local waste management facilities is given collectively under "WMF@PSI-E", (b) waste data are presented in terms of a generic "overall" storage unit (named "all@PSI-E"), (c) the start of both treatment/conditioning and storage operations is generically set equal to the first year of operation of PSI-East, and (d) the type of the "overall" storage unit is defined as "various" due to effective or potential variations within the set of locally available storage units [note: conditioned waste and solid waste yet to be conditioned are usually stored in buildings or bunkers, liquids or sludges awaiting treatment in tanks].

Comment **# 7224: Reporting on ZWILAG**

Reporting on ZWILAG, the central Swiss waste management facility owned by the 4 Swiss NPP, is based on the following concept: (a) information on local waste management facilities is given collectively under "WMF@ZWILAG" with the active storage units (Buildings H, M and further summarized under "others") being identified for comprehensiveness, (b) waste data are presented collectively for the site, (c) the start of both treatment/conditioning and storage operations is indicated as known. [note: vitrified HLW from reprocessing is stored in heavy transport/storage casks at Building H, other conditioned waste or solid waste yet to be conditioned are usually stored in buildings or bunkers, liquids or sludges awaiting treatment in tanks]

Comment **# 7225: Reporting on Storage Capacities**

Individual statements on site-specific storage capacities are omitted. As NPPs can use the large storage capacity of ZWILAG, problems with NPP waste storage are not expected to occur. At PSI-East, a need for increased capacity could be solved in time by adding further storage buildings or by use of ZWILAG storage capacity.

Groups Overview

Country: SWITZERLAND Reporting Year: 2009

Reporting Group:	**Foreign**
Inventory Reporting Date:	December 2009
Waste Matrix Used:	IAEA Def.
Description:	Swiss wastes stored outside Switzerland

Site Name	Facility Name	Facilities Defined		
ForeignRP	BNFL	processing		
	Cogema	processing		

Comment **# 7229: General**

All Swiss NPP's have current service contracts with BNFL (United Kingdom) and COGEMA (France) for the reprocessing of a qualified amount of spent fuel. These are subject to a return-of-waste clause which is exercised by both reprocessors.

Reprocessing wastes to be returned include, in both cases, vitrified HLW and a spectrum of LILW types which have been or are to be submitted to acceptance procedures in Switzerland (as well as in other countries concerned).

Known are the fuel deliveries (fuel assembly types, fuel masses, burnups) from [not reported in NEWMDB] and the waste returns to Switzerland [reported under site "ZWILAG"], up to the key date.

The overall amount of waste expected to be returned to Switzerland is known but not finalized, hence volumes are not reported.

Reporting Group:	**Nagra**
Inventory Reporting Date:	December 2009
Waste Matrix Used:	Nagra
Description:	Swiss Repository Projects

Site Name	Facility Name	Facilities Defined		
EL-HAA/LMA	DU-HAA			disposal
	DU-LMA			disposal
EL-SMA	DU-SMA			disposal

Comment **# 7287: General**

Nagra, the National Cooperative for the Disposal of Radioactive Waste, has been founded in 1972 as a private organization in order to manage the task of finding and planning Swiss radwaste repositories. Shareholders are the Swiss nuclear power industry and the Swiss Confederation (on account of waste arisings from nuclear applications in medicine, industry and research).

Due to the actual state of Nagra's programmes, reported information will frequently include generic statements.

Groups Overview

Country: SWITZERLAND Reporting Year: 2009

Reporting Group:	**NEA-SD**
Inventory Reporting Date:	December 2009
Waste Matrix Used:	NEA-SD
Description:	OECD/NEA sea dumping

Site Name	Facility Name	Facilities Defined		
N-Atlantic	Sea Floor			disposal

Comment **# 372: Waste volumes**

See IAEA-TECDOC-1105 (August 1999), Annex A.11.

Site (Structure) : CERN

Country: SWITZERLAND Reporting Year: 2009

Full Name: Centre Européen pour la Recherche Nucléaire

Description:

Official Website:

License Holder(s): "Not licensed as a nuclear facility" / Organisation Européenne pour la Recherche Nucléaire

Comment **# 7294: CERN Wastes**

CERN is located at the Swiss/French border, extending into both countries, and has the status a international research facility. Radwastes arise from operation and decommissioning of accelerators and experimental equipment. There is a general understanding that these wastes will be routed to disposal within the two host countries, but final decisions have not been made.

A small fraction of "Swiss" wastes, e.g. incinerable waste, is traditionally routed to the national delivery point (PSI-East) for treatment, conditioning and subsequent storage.

The remaining wastes, e.g. large-sized decommissioning waste, are stacked, partially after pretreatment, at dedicated CERN buildings, awaiting free release or conditioning. A project aiming at characterizing and inventorying pertinent wastes according to ENSI (formerly HSK) standards has been launched in 2003, in order to meet potential requirements for subsequent disposal in a Swiss repository and to evaluate optimized conditioning methods.

Potential waste arisings for disposal in Switzerland are estimated to be in the order of 10,000 -20,000 m3 (conditioned) SMA.

Waste management facilities that are located at this site:

Site (Structure) : CERN

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@CERN**
Description:	CERN Waste Management Facilities

Storage part of facility **WMF@CERN**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

List SRS?	No
List UMMT?	No

Capacity:	

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@CERN	building	1970	No	No	No	No

Processing part of facility **WMF@CERN**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment
Year opened:	1970

Site (Structure) : PSI(BAG)

Country: SWITZERLAND Reporting Year: 2009

Full Name: Paul-Scherrer-Institut (Facilities under BAG supervision)

Description:

Official Website:

License Holder(s): "Not licensed as a nuclear facility" / Paul-Scherrer-Institut

Comment **# 7296: PSI(BAG) Wastes**

Wastes arising from decommissioning of accelerators and experimental equipment at PSI-West are, normally, not routed to the national delivery point at PSI-East. Instead, they are conditioned by grouting in large concrete containers which are used afterwards as shielding elements at site.

Due to their functionality, such waste-containing shielding elements are not (yet) waste in a legal sense, and any reference to "storage units" at PSI-West must be related to that aspect.

Expected overall volume for conditioned waste is around 10,000 m3 SMA.

Waste management facilities that are located at this site:

Site (Structure) : PSI(BAG)

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@PSI-W**
Description:	Waste Management Facilities at PSI-West

Storage part of facility **WMF@PSI-W**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

List SRS?	No
List UMMT?	No

Capacity:	

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@PSI-W	building	1980	No	No	No	No

Processing part of facility **WMF@PSI-W**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment, Conditioning
Year opened:	1980

Site (Structure) : KKB

Country: SWITZERLAND Reporting Year: 2009

Full Name: Kernkraftwerk Beznau

Description:

Official Website:

License Holder(s): Nordostschweizerische Kraftwerke AG, CH-5400 Baden

Waste management facilities that are located at this site:

Site (Structure) : KKB

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@KKB**
Description:	Waste Management Facilities at KKB
Waste Packages:	package formats for conditioned waste : 100 l steel drum, 200 l steel drum, 1000 l concrete drum

Storage part of facility **WMF@KKB**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

List SRS?	No
List UMMT?	No

Capacity:	Refer to comment #7225 under topic "Reporting Group : ENSI"

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@KKB	various	1969	No	No	No	No

Processing part of facility **WMF@KKB**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment, Conditioning
Year opened:	1969

Site (Data) : KKB

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

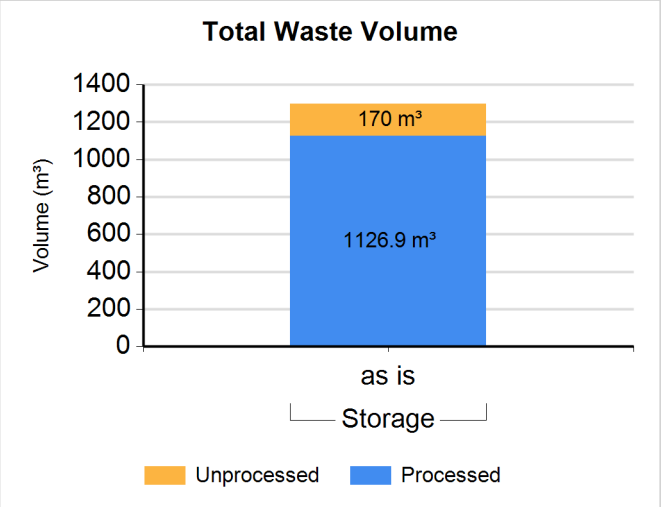
Site Name: **KKB**

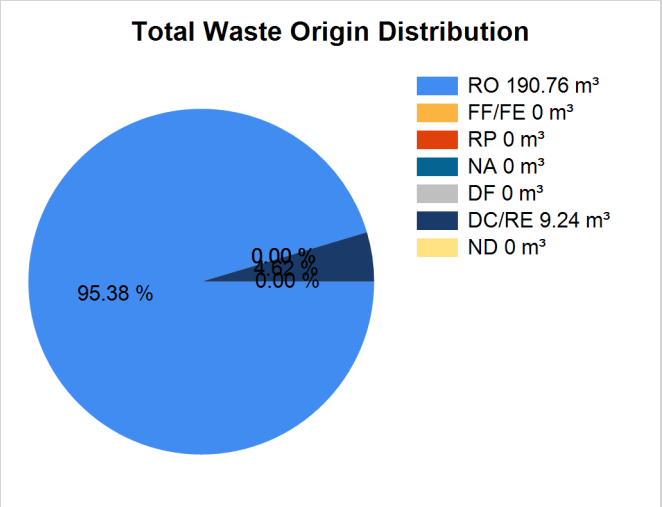
Full Name: Kernkraftwerk Beznau

Inventory Reporting Date: December 2009 Waste Matrix Used: KEV 2004

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **SMA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA	Storage	Y	N	1126.900	1126.900	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Waste Class: **SMA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA ybc	Storage	N	N	170.000	170.000	90.76	0.00	0.00	0.00	0.00	9.24	0.00

Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Chemical Precipitation	N	N	Same	N
Decontamination	N	N	Same	N
Evaporation	N	N		Y

Site (Data) : KKB

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Cementation	N	N	Same	N
Polymerization	N	N	Same	N

RadioNuclide Inventory in Storage

Total Alpha Activity (GBq):	120
Total Beta/Gamma Activity (GBq):	600000

Comment **# 22625: Scope of Nuclide Inventory Data**

Reported overall activities refer to processed (i.e. conditioned) waste, only, and relate to the reference date of the submission. Information on unprocessed (i.e. yet-to-be conditioned) waste is excluded as pertinent provisional data are, frequently, assessed, reviewed or completed during the conditioning process.

Site (Structure) : KKG

Country: SWITZERLAND Reporting Year: 2009

Full Name: Kernkraftwerk Gösgen

Description:

Official Website:

License Holder(s): Kernkraftwerk Gösgen-Däniken AG, Däniken

Waste management facilities that are located at this site:

Site (Structure) : KKG

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@KKG**
Description:	Waste Management Facilities at KKG
Waste Packages:	package formats for conditioned waste : 200 l steel drum, 1000 l concrete drum

Storage part of facility **WMF@KKG**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

List SRS?	No
List UMMT?	No

Capacity:	Refer to comment #7225 under topic "Reporting Group : ENSI"

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@KKG	various	1979	No	No	No	No

Processing part of facility **WMF@KKG**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment, Conditioning
Year opened:	1979

Site (Data) : KKG

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

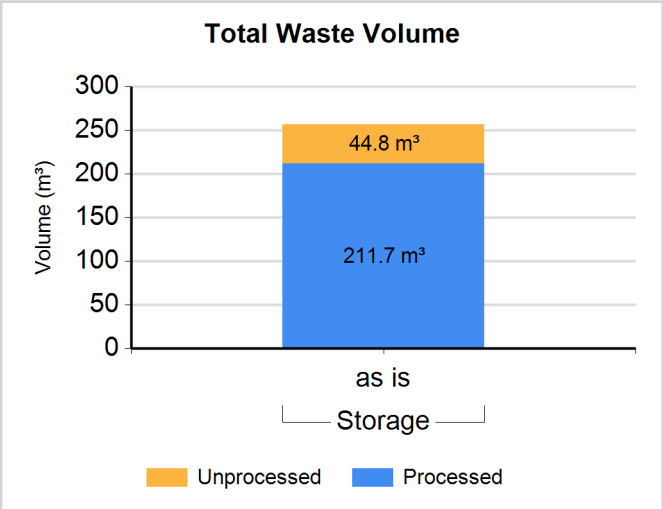
Site Name: **KKG**

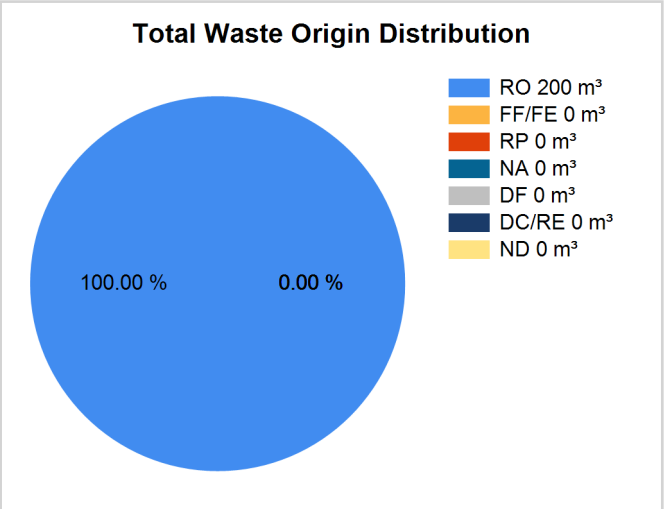
Full Name: Kernkraftwerk Gösgen

Inventory Reporting Date: December 2009 Waste Matrix Used: KEV 2004

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **SMA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA	Storage	Y	N	211.700	211.700	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Waste Class: **SMA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA ybc	Storage	N	N	44.800	44.800	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Calcination	N	N	Same	N
Decontamination	N	N	Same	N
Evaporation	N	N	Same	N

Site (Data) : KKG

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Bituminization	N	N	Same	N
Cementation	N	N	Same	N

RadioNuclide Inventory in Storage

Total Alpha Activity (GBq):	3.5
Total Beta/Gamma Activity (GBq):	66000

Comment **# 22626: Scope of Nuclide Inventory Data**

Reported overall activities refer to processed (i.e. conditioned) waste, only, and relate to the reference date of the submission. Information on unprocessed (i.e. yet-to-be conditioned) waste is excluded as pertinent provisional data are, frequently, assessed, reviewed or completed during the conditioning process.

Site (Structure) : KKL

Country: SWITZERLAND Reporting Year: 2009

Full Name: Kernkraftwerk Leibstadt

Description:

Official Website:

License Holder(s): Kernkraftwerk Leibstadt AG

Waste management facilities that are located at this site:

Site (Structure) : KKL

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@KKL**
Description:	Waste Management Facilities at KKL
Waste Packages:	package formats for conditioned waste : 200 l steel drum

Storage part of facility **WMF@KKL**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

List SRS?	No
List UMMT?	No

Capacity:	Refer to comment #7725 under topic "Reporting Group : ENSI"

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@KKL	various	1984	No	No	No	No

Processing part of facility **WMF@KKL**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment, Conditioning
Year opened:	1984

Site (Data) : KKL

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

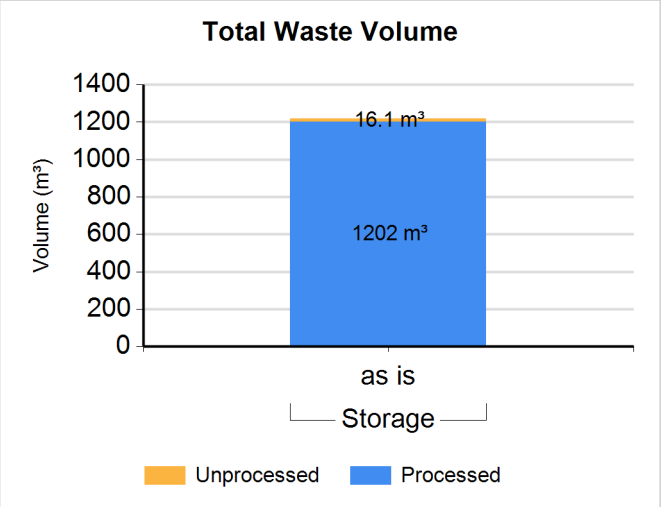
Site Name: **KKL**

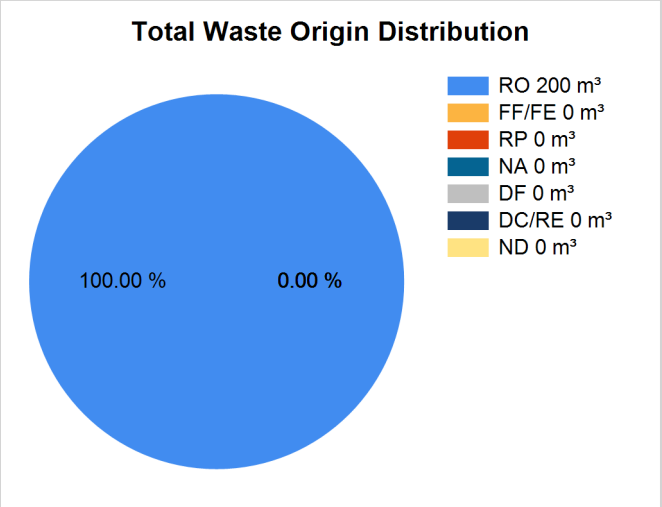
Full Name: Kernkraftwerk Leibstadt

Inventory Reporting Date: December 2009 Waste Matrix Used: KEV 2004

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **SMA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA	Storage	Y	N	1202.000	1202.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Waste Class: **SMA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA ybc	Storage	N	N	16.100	16.100	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Decontamination	N	N		N
Evaporation	N	N		N
Size Reduction	N	N		N
Super Compaction	N	N		Y

Site (Data) : KKL

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Cementation	N	N		N

RadioNuclide Inventory in Storage

Total Alpha Activity (GBq):	64
Total Beta/Gamma Activity (GBq):	200000

Comment **# 22627: Scope of Nuclide Inventory Data**

Reported overall activities refer to processed (i.e. conditioned) waste, only, and relate to the reference date of the submission. Information on unprocessed (i.e. yet-to-be conditioned) waste is excluded as pertinent provisional data are, frequently, assessed, reviewed or completed during the conditioning process.

Site (Structure) : KKM

Country: SWITZERLAND Reporting Year: 2009

Full Name: Kernkraftwerk Mühleberg

Description:

Official Website:

License Holder(s): BKW FMB Energie AG

Waste management facilities that are located at this site:

Site (Structure) : KKM

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@KKM**
Description:	Waste Management Facilities at KKM
Waste Packages:	package formats for conditioned waste : 200 l steel drum

Storage part of facility **WMF@KKM**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

List SRS?	No
List UMMT?	No

Capacity:	Refer to comment #7225 under topic "Reporting Group : ENSI"

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@KKM	various	1971	No	No	No	No

Processing part of facility **WMF@KKM**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment, Conditioning
Year opened:	1971

Site (Data) : KKM

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

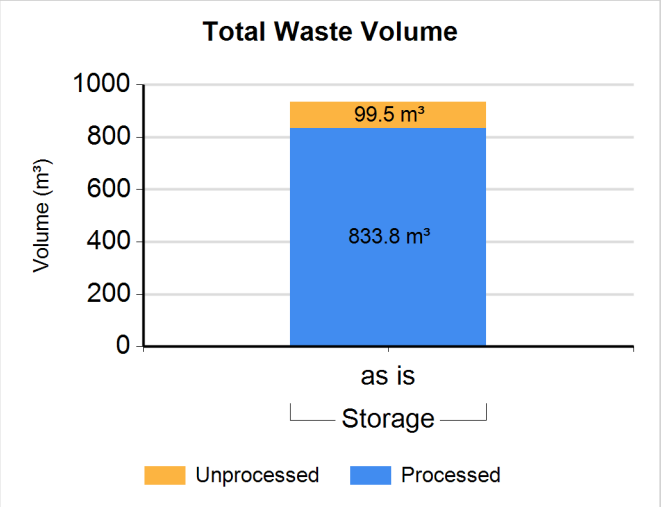
Site Name: **KKM**

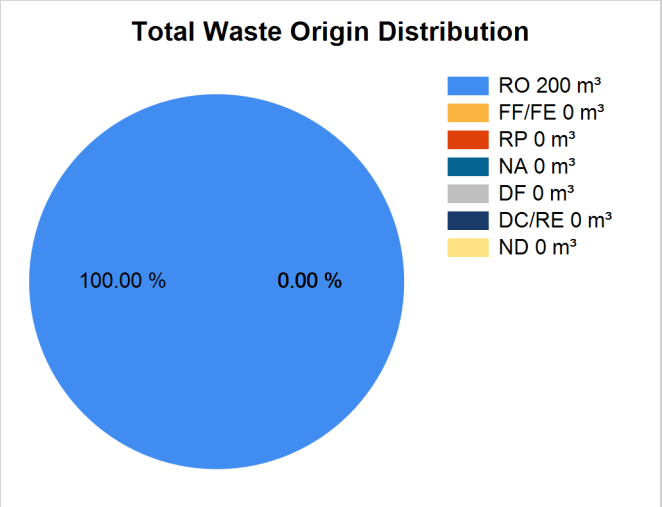
Full Name: Kernkraftwerk Mühleberg

Inventory Reporting Date: December 2009 Waste Matrix Used: KEV 2004

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **SMA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA	Storage	Y	N	833.800	833.800	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Waste Class: **SMA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA ybc	Storage	N	N	99.500	99.500	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Decontamination	N	N	Same	N
Size Reduction	N	N	Same	N
Thermal Treatment (non incineration)	N	N	Same	N

Site (Data) : KKM

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Cementation	N	N	Same	N

RadioNuclide Inventory in Storage

Total Alpha Activity (GBq):	45
Total Beta/Gamma Activity (GBq):	290000

Comment **# 22628: Scope of Nuclide Inventory Data**

Reported overall activities refer to processed (i.e. conditioned) waste, only, and relate to the reference date of the submission. Information on unprocessed (i.e. yet-to-be conditioned) waste is excluded as pertinent provisional data are, frequently, assessed, reviewed or completed during the conditioning process.

Site (Structure) : PSI(ENSI)

Country: SWITZERLAND Reporting Year: 2009

Full Name: Paul-Scherrer-Institut (Facilities under ENSI supervision)

Description:

Official Website:

License Holder(s): Paul-Scherrer-Institut

Waste management facilities that are located at this site:

Site (Structure) : PSI(ENSI)

Country: SWITZERLAND Reporting Year: 2009

Facility:	**WMF@PSI-E**
Description:	Waste Management Facilities at PSI-East (Nuclear Facilities under HSK supervision)
Waste Packages:	package formats for conditioned waste : 200 l steel drum, 1000 l concrete drum, 1200 l fibre concrete drum, Mosaik II, 4.5 m3 container KC

Storage part of facility **WMF@PSI-E**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	Yes	Yes
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	Yes	Yes

List SRS?	No
List UMMT?	No

Capacity:	Refer to comment #7225 under topic "Reporting Group : ENSI"

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
all@PSI-E	various	1967	No	No	No	No

Processing part of facility **WMF@PSI-E**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	Yes	Yes

Type:	Treatment, Conditioning
Year opened:	1967

Site (Data) : PSI(ENSI)

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

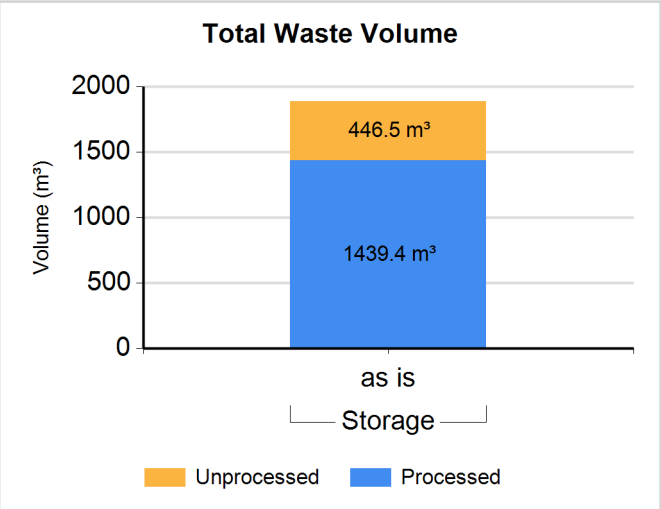
Site Name: **PSI(ENSI)**

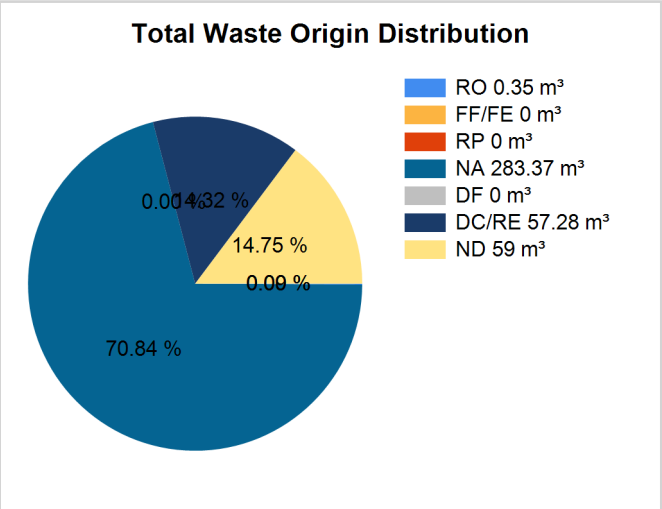
Full Name: Paul-Scherrer-Institut (Facilities under ENSI supervision)

Inventory Reporting Date: December 2009 Waste Matrix Used: KEV 2004

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **SMA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA	Storage	Y	N	1378.000	1378.000	0.35	0.00	0.00	74.59	0.00	25.06	0.00

Waste Class: **ATA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
ATA	Storage	Y	N	61.400	61.400	0.00	0.00	0.00	100.00	0.00	0.00	0.00

Waste Class: **SMA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA ybc	Storage	N	N	425.200	425.200	0.00	0.00	0.00	8.78	0.00	32.22	59.00

Waste Class: **ATA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
ATA ybc	Storage	N	N	21.300	21.300	0.00	0.00	0.00	100.00	0.00	0.00	0.00

Site (Data) : PSI(ENSI)

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Compaction	N	N	Same	N
Decontamination	N	N	Same	N
Incineration	N	N		Y
Metal Melting	N	N	Same	N
Size Reduction	N	N	Same	N

Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Cementation	N	N	Same	N
Encapsulation	N	N	Same	N
Grouting	N	N	Same	N

RadioNuclide Inventory in Storage

Total Alpha Activity (GBq):	19000
Total Beta/Gamma Activity (GBq):	7000000

Comment **# 22629: Scope of Nuclide Inventory Data**

Reported overall activities refer to processed (i.e. conditioned) waste, only, and relate to the reference date of the submission. Information on unprocessed (i.e. yet-to-be conditioned) waste is excluded as pertinent provisional data are, frequently, assessed, reviewed or completed during the conditioning process.

Site (Structure) : ZWILAG

Country: SWITZERLAND Reporting Year: 2009

Full Name: Zentrales Zwischenlager Würenlingen

Description:

Official Website:

License Holder(s): Zwischenlager Würenlingen AG

Waste management facilities that are located at this site:

Facility:	**WMF@ZWILAG**
Description:	Waste Management Facilities at ZWILAG
Waste Packages:	package formats for conditioned waste : 200 l steel drum, 1000 l concrete drum, Mosaik II, 4.5 m3 container KC, 180 l steel flask (AREVA)

Storage part of facility **WMF@ZWILAG**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	Yes	Yes
ATA	Yes	Yes
HAA	Yes	Yes
SMA ybc	Yes	Yes
ATA ybc	No	Yes

List SRS?	No
List UMMT?	No

Capacity:	Refer to comment #7225 under topic "Reporting Group : ENSI"

Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
Lager H	building	2001	No	No	No	No
Lager M	bunker	2001	No	No	No	No
others	building	2001	No	No	No	No

Site (Structure) : ZWILAG

Country: SWITZERLAND Reporting Year: 2009

Processing part of facility **WMF@ZWILAG**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
SMA	No	No
ATA	No	No
HAA	No	No
SMA ybc	Yes	Yes
ATA ybc	No	No

Type:	Treatment, Conditioning
Year opened:	2001

Site (Data) : ZWILAG

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

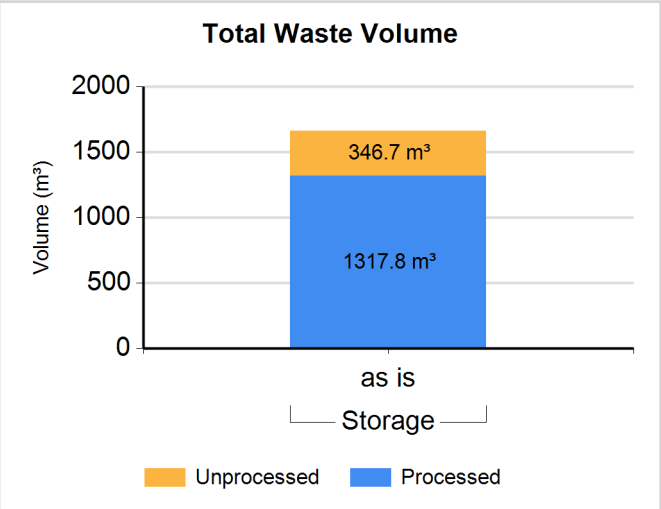
Site Name: **ZWILAG**

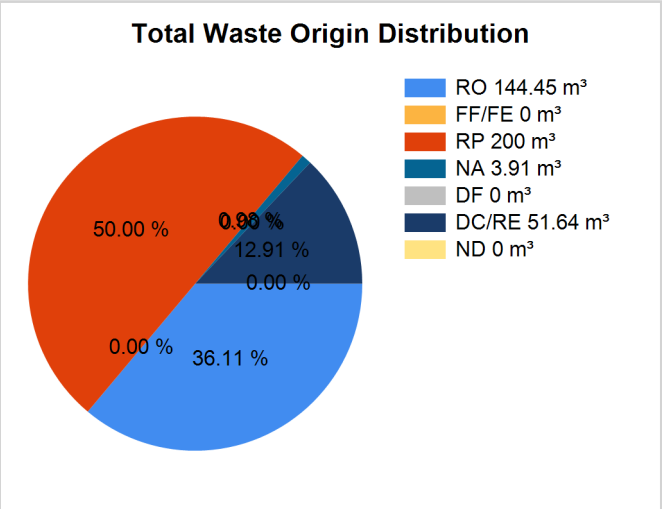
Full Name: Zentrales Zwischenlager Würenlingen

Inventory Reporting Date: December 2009 Waste Matrix Used: KEV 2004

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **SMA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA	Storage	Y	N	1270.400	1270.400	97.10	0.00	0.00	1.90	0.00	1.00	0.00

Waste Class: **ATA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
ATA	Storage	Y	N	7.100	7.100	0.00	0.00	100.00	0.00	0.00	0.00	0.00

Waste Class: **HAA**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
HAA	Storage	Y	N	40.300	40.300	0.00	0.00	100.00	0.00	0.00	0.00	0.00

Waste Class: **SMA ybc**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
SMA ybc	Storage	N	N	346.700	346.700	47.35	0.00	0.00	2.01	0.00	50.64	0.00

Site (Data) : ZWILAG

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Decontamination	N	N	Same	N
Incineration	N	N	Same	N
Metal Melting	N	N	Same	N
Super Compaction	N	Y		N

Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Casting (of metal and slag)	N	N		N
Cementation	N	Y		N
Grouting	N	N		N

Comment **# 9721: ZWILAG Plasma Arc Incinerator/Melter**

Facilty designed to incinerate/decompose/melt mixed waste (organics, metals, inorganics) fed in drums by very high temperature treatment.. Primary process residues are molten slag (non-metallic residues immersed into molten glass) and molten metals. These are casted into 145 l moulds. After waste product solidification by cooling, the moulds are overpacked in 200 l drums. Active commissioning of the facility has started in November 2004. Until the end of 2008, 587 drums have been produced within 9 test campaigns. Definitive license for facility operation was given by ENSI in September 2009.

RadioNuclide Inventory in Storage

Total Alpha Activity (GBq):	39000000
Total Beta/Gamma Activity (GBq):	3000000000

Comment **# 22630: Scope of Nuclide Inventory Data**

Reported overall activities refer to processed (i.e. conditioned) waste, only, and relate to the reference date of the submission. Information on unprocessed (i.e. yet-to-be conditioned) waste is excluded as pertinent provisional data are, frequently, assessed, reviewed or completed during the conditioning process.

Site (Structure) : ForeignRP

Country: SWITZERLAND Reporting Year: 2009

Full Name: Foreign Reprocessing Plants

Description:

Official Website:

License Holder(s):

Waste management facilities that are located at this site:

Facility:	**BNFL**
Description:	BNFL, Sellafield, U.K.

Processing part of facility **BNFL**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
VLLW	No	No
LLW	No	No
ILW	No	No
HLW	No	No

Type:	Treatment, Conditioning
Year opened:	0

Site (Structure) : ForeignRP

Country: SWITZERLAND Reporting Year: 2009

Facility:	**Cogema**
Description:	Cogema, Cap de la Hague, France

Processing part of facility **Cogema**

The following shows processing status for waste classes and SRS.

Waste CLass	Actual	Planned
VLLW	No	No
LLW	No	No
ILW	No	No
HLW	No	No

Type:	Treatment, Conditioning
Year opened:	0

Site (Structure) : EL-HAA/LMA

Country: SWITZERLAND Reporting Year: 2009

Full Name: Swiss repository project for high-level and long-lived intermediate-level waste

Description:

Official Website:

License Holder(s):

Comment **# 355: Programme status EL-HAA/LMA**

Feasibility demonstration for an EL-HAA/LMA in 1985 (Projekt Gewaehr 85), based on deep geologic disposal in crystalline host rock in northern Switzerland, led to follow-up project for completion of disposal feasibility demonstration. Subsequent extensive field investigations in areas of promising rock formations (crystalline and, as an extension, Opalinus clay in the northern part of the Canton of Zurich) lead to a supplementary feasibility study (Entsorgungsnachweis) which has been submitted to authorities in 2002, referring to Opalinus clay as candidate host rock. Swiss Government approved Entsorgungsnachweis on June 28, 2006. Region/site selection shall be based on the Sectoral Plan (Sachplan) as required by the new Nuclear Energy Ordinance (KEV). Multinational repository options are not to be ruled out.

Comment **# 7285: Information on Disposal Unit Capacities**

Capacity numbers given are rough GUIDELINES FOR SITE SELECTION PURPOSES and refer to wastes at emplacement into disposal areas (i.e. they account for overpacking into disposal containers within repository site facilities). A reserve volume for spent fuel is included in the capacity planned for HAA disposal units. With the basic scenario, Swiss repositories defined below shall accommodate all Swiss radwaste (i.e. of NPP and any other origin) arisings as nowadays stored or being accumulated in future, until all of the Swiss NPP actually in operation are decommissioned. Note that these capacity data represent by definition an upper envelope for waste arisings which have been defined for safety assessment reports and engineering studies, relying on distinct scenarios. Excavation will be adjusted at construction time to meet effective needs.

Since 2008, capacity planning also includes new NPPs.

Comment **# 9718: Conditioning Facilities Envisaged for EL-HAA/LMA**

According to Nagra's actual plans, delivered waste units shall be conditioned / overpacked after reception at the site, before transport to disposal units:

(a) LMA units (small size packages): to be emplaced/grouted into standardized LMA disposal containers;

(b) canisters with vitrified HLW from reprocessing in transport & storage containers (TSC) : unloading from TSC, emplacement into disposal containers, welding of the HAA disposal container.

[note: if direct disposal of spent fuel is to be planned/performed:

(c) spent fuel in TSC: transfer from TSC into BE disposal container, sealing of BE disposal container.]

Waste management facilities that are located at this site:

Facility:	**DU-HAA**
Description:	Disposal Unit(s) for HAA

Site (Structure) : EL-HAA/LMA

Country: SWITZERLAND Reporting Year: 2009

Disposal part of facility

The following shows disposal status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	No	No
LMA	No	No
HAA	No	No

List SRS?	#Error
List UMMT?	#Error

Type:	
Facility is modular?	#Error

Depth (m):		Host medium:	

Phase Name	Start Year	End Year	Estimate

Site (Structure) : EL-HAA/LMA

Country: SWITZERLAND Reporting Year: 2009

Facility:	**DU-LMA**
Description:	Disposal Unit(s) for LMA

Disposal part of facility

The following shows disposal status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	No	No
LMA	No	No
HAA	No	No

List SRS?	#Error
List UMMT?	#Error

Type:	
Facility is modular?	#Error

Depth (m):		Host medium:	

Phase Name	Start Year	End Year	Estimate

Site (Data) : EL-HAA/LMA

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Site Name: **EL-HAA/LMA**

Full Name: Swiss repository project for high-level and long-lived intermediate-level waste

Inventory Reporting Date: December 2009 Waste Matrix Used: Nagra

Comment **# 355: Programme status EL-HAA/LMA**

Feasibility demonstration for an EL-HAA/LMA in 1985 (Projekt Gewaehr 85), based on deep geologic disposal in crystalline host rock in northern Switzerland, led to follow-up project for completion of disposal feasibility demonstration. Subsequent extensive field investigations in areas of promising rock formations (crystalline and, as an extension, Opalinus clay in the northern part of the Canton of Zurich) lead to a supplementary feasibility study (Entsorgungsnachweis) which has been submitted to authorities in 2002, referring to Opalinus clay as candidate host rock. Swiss Government approved Entsorgungsnachweis on June 28, 2006. Region/site selection shall be based on the Sectoral Plan (Sachplan) as required by the new Nuclear Energy Ordinance (KEV). Multinational repository options are not to be ruled out.

Comment **# 7285: Information on Disposal Unit Capacities**

Capacity numbers given are rough GUIDELINES FOR SITE SELECTION PURPOSES and refer to wastes at emplacement into disposal areas (i.e. they account for overpacking into disposal containers within repository site facilities). A reserve volume for spent fuel is included in the capacity planned for HAA disposal units. With the basic scenario, Swiss repositories defined below shall accommodate all Swiss radwaste (i.e. of NPP and any other origin) arisings as nowadays stored or being accumulated in future, until all of the Swiss NPP actually in operation are decommissioned. Note that these capacity data represent by definition an upper envelope for waste arisings which have been defined for safety assessment reports and engineering studies, relying on distinct scenarios. Excavation will be adjusted at construction time to meet effective needs.

Since 2008, capacity planning also includes new NPPs.

Comment **# 9718: Conditioning Facilities Envisaged for EL-HAA/LMA**

According to Nagra's actual plans, delivered waste units shall be conditioned / overpacked after reception at the site, before transport to disposal units:

(a) LMA units (small size packages): to be emplaced/grouted into standardized LMA disposal containers;

(b) canisters with vitrified HLW from reprocessing in transport & storage containers (TSC) : unloading from TSC, emplacement into disposal containers, welding of the HAA disposal container.

[note: if direct disposal of spent fuel is to be planned/performed:

(c) spent fuel in TSC: transfer from TSC into BE disposal container, sealing of BE disposal container.]

No Waste Data to report.

Site (Structure) : EL-SMA

Country: SWITZERLAND Reporting Year: 2009

Full Name: Swiss repository project for low-level and short-lived intermediate-level waste

Description:

Official Website:

License Holder(s):

Comment **# 353: Project status EL-SMA**

Feasibility demonstration for an EL-SMA repository (Projekt Gewähr 1985) accepted by authorities in 1988. After a site selection procedure, Wellenberg, Canton of Nidwalden, has been selected as EL-SMA site in 1993 (application for general license to Confederation in 1994). Apart from licensing according to Atomic Law, a cantonal mining concession was required in Nidwalden for repository-related excavation; this concession was subject to public referendum. Mining concession has been disapproved twice by the people of Nidwalden - 1995 (for exploratory drift and repository) and 2002 (for exploratory drift only) - despite the fact that the repository concept had been modified since 1995 to meet primary public concerns (extended monitoring, enhanced retrievability). After the 2002 vote, the project has been abandoned by the potential operator. In 2003, Nagra launched a programme to re-evaluate candidate host rocks/sites from the scratch and to reconsider alternative repository concepts. Region/site selection is going to be based on the Sectoral Plan (Sachplan) procedure, as required by the new Nuclear Energy Ordinance (KEV). Preliminary work on testing the procedure started mid 2006.

Comment **# 354: Project characteristics EL-SMA**

EL-SMA facility description must be considered as being open. The total capacity envisaged has been increased to 200'000 m3 in order to include wastes from potential new NPPs.

Comment **# 7286: Information on Disposal Unit Capacity**

The capacity numbers given are rough GUIDELINES FOR SITE SELECTION PURPOSES and refer to wastes at emplacement into disposal areas (i.e. they account for overpacking into disposal containers within repository site facilities). With the basic scenario, Swiss repositories defined below shall accommodate all Swiss radwaste (i.e. of NPP and any other origin) arisings as nowadays stored or being accumulated in future, until all of the Swiss NPP actually in operation are decommissioned. Note that these capacity data represent by definition an upper envelope for waste arisings which have been defined for safety assessment reports and engineering studies, relying on distinct scenarios. Excavation will be adjusted at construction time to meet effective needs.

Comment **# 9719: Conditioning Facilities Envisaged for EL-SMA**

After reception at the site, delivered waste units shall be conditioned / overpacked before transport to disposal units:

(a) Small-size packages: to be emplaced/grouted into standardized SMA disposal containers.

Waste management facilities that are located at this site:

Site (Structure) : EL-SMA

Country: SWITZERLAND Reporting Year: 2009

Facility:	**DU-SMA**
Description:	Disposal Unit(s) at EL-SMA

Disposal part of facility

The following shows disposal status for waste classes and SRS.

Waste Class	Actual	Planned
SMA	No	No
LMA	No	No
HAA	No	No

List SRS?	#Error
List UMMT?	#Error

Type:	
Facility is modular?	#Error

Depth (m):		Host medium:	

Phase Name	Start Year	End Year	Estimate

Site (Data) : EL-SMA

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Site Name: **EL-SMA**

Full Name: Swiss repository project for low-level and short-lived intermediate-level waste

Inventory Reporting Date: December 2009 Waste Matrix Used: Nagra

Comment **# 353: Project status EL-SMA**

Feasibility demonstration for an EL-SMA repository (Projekt Gewähr 1985) accepted by authorities in 1988. After a site selection procedure, Wellenberg, Canton of Nidwalden, has been selected as EL-SMA site in 1993 (application for general license to Confederation in 1994). Apart from licensing according to Atomic Law, a cantonal mining concession was required in Nidwalden for repository-related excavation; this concession was subject to public referendum. Mining concession has been disapproved twice by the people of Nidwalden - 1995 (for exploratory drift and repository) and 2002 (for exploratory drift only) - despite the fact that the repository concept had been modified since 1995 to meet primary public concerns (extended monitoring, enhanced retrievability). After the 2002 vote, the project has been abandoned by the potential operator. In 2003, Nagra launched a programme to re-evaluate candidate host rocks/sites from the scratch and to reconsider alternative repository concepts. Region/site selection is going to be based on the Sectoral Plan (Sachplan) procedure, as required by the new Nuclear Energy Ordinance (KEV). Preliminary work on testing the procedure started mid 2006.

Comment **# 354: Project characteristics EL-SMA**

EL-SMA facility description must be considered as being open. The total capacity envisaged has been increased to 200'000 m3 in order to include wastes from potential new NPPs.

Comment **# 7286: Information on Disposal Unit Capacity**

The capacity numbers given are rough GUIDELINES FOR SITE SELECTION PURPOSES and refer to wastes at emplacement into disposal areas (i.e. they account for overpacking into disposal containers within repository site facilities). With the basic scenario, Swiss repositories defined below shall accommodate all Swiss radwaste (i.e. of NPP and any other origin) arisings as nowadays stored or being accumulated in future, until all of the Swiss NPP actually in operation are decommissioned. Note that these capacity data represent by definition an upper envelope for waste arisings which have been defined for safety assessment reports and engineering studies, relying on distinct scenarios. Excavation will be adjusted at construction time to meet effective needs.

Comment **# 9719: Conditioning Facilities Envisaged for EL-SMA**

After reception at the site, delivered waste units shall be conditioned / overpacked before transport to disposal units:

(a) Small-size packages: to be emplaced/grouted into standardized SMA disposal containers.

No Waste Data to report.

Site (Structure) : N-Atlantic

Country: SWITZERLAND Reporting Year: 2009

Full Name: North Atlantic Ocean

Description:

Official Website:

License Holder(s):

Comment **# 371: Background**

Switzerland has participated in the OECD/NEA Atlantic Ocean dumping programme between 1969 and 1982. IAEA-TECDOC-1105 and documents referenced there provide a summary on history, safety assessments and wastes processed. In 1983, dumping operations with Swiss waste have been stopped, and Swiss Government formally renounced on continued use of this disposal option in 1992.

Waste management facilities that are located at this site:

Facility:	**Sea Floor**
Description:	

Disposal part of facility **Sea Floor**

The following shows disposal status for waste classes and SRS.

Waste Class	Actual	Planned
MD	Yes	No
MDLC	Yes	No

List SRS?	No
List UMMT?	No

Type:	sea dumping (sea bed disposal)		
Facility is modular?	No		
Capacity existing (m3):	2308	Capacity planned (m3):	0

Depth (m):	3600-4750	Host medium:	sedimentary (sand)

Phase Name	Start Year	End Year	Estimate
operation	1969	1982	False

Site (Data) : N-Atlantic

Stock of waste as at December 2009

Country: SWITZERLAND Reporting Year: 2009

Site Name: **N-Atlantic**

Full Name: North Atlantic Ocean

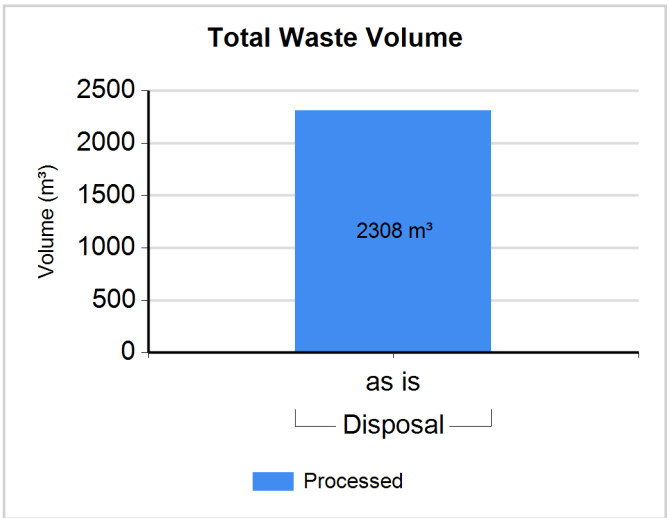
Inventory Reporting Date: December 2009 Waste Matrix Used: NEA-SD

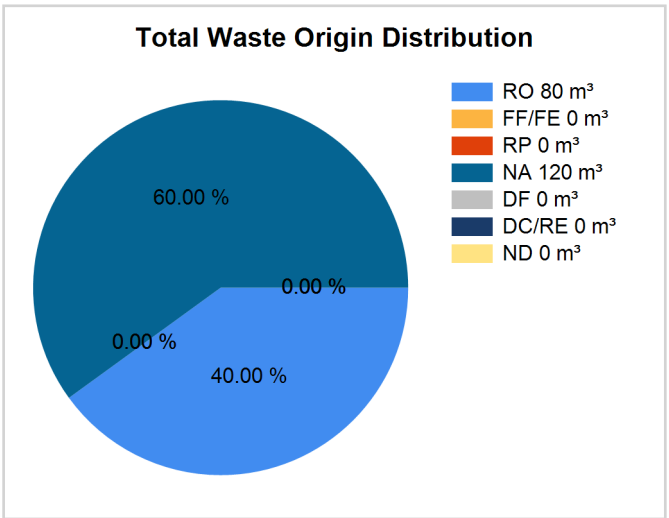
Comment **# 371: Background**

Switzerland has participated in the OECD/NEA Atlantic Ocean dumping programme between 1969 and 1982. IAEA-TECDOC-1105 and documents referenced there provide a summary on history, safety assessments and wastes processed. In 1983, dumping operations with Swiss waste have been stopped, and Swiss Government formally renounced on continued use of this disposal option in 1992.

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined





Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: **MD**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
MD	Disposal	Y	Y	1367.000	1367.000	40.00	0.00	0.00	60.00	0.00	0.00	0.00

Comment **# 6678: The additional characteristics of the waste**

Processed: solid (non-dispersible)

Waste Class: **MDLC**

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
MDLC	Disposal	Y	Y	941.000	941.000	40.00	0.00	0.00	60.00	0.00	0.00	0.00

Comment **# 6679: The additional characteristics of the waste**

Processed: solid (non-dispersible)

Regulators

Country: SWITZERLAND Reporting Year: 2009

Name:	**ENSI**
Full Name:	Swiss Federal Nuclear Safety Inspectorate ENSI
Divison:	Division for Transport and Waste Management Safety (SITE)
City or Town:	CH-5200 Brugg
Main Website:	

Comment **# 6658: Domain of Regulation / Supervision**

Radwaste management at sites / facilities licensed under the Nuclear Energy Act (KEG).

Name:	**BAG**
Full Name:	Swiss Federal Office for Public Health
Divison:	Radiation Protection
City or Town:	CH-3003 Berne
Main Website:	

Comment **# 7233: Domain of Regulation / Supervision**

Radwaste management at sites / facilities not licensed under the Nuclear Energy Act (KEG).

Regulations / Laws

Country: SWITZERLAND Reporting Year: 2009

Name:	**KEG**	
Title or Name:	Nuclear Energy Act	
Reference Number:	732.1	
Date Promulgated or Proclaimed:	3/21/2003	Law

Name:	**KEV**	
Title or Name:	Nuclear Energy Ordinance	
Reference Number:	732.11	
Date Promulgated or Proclaimed:	12/10/2004	Law

Name:	**StSG**	
Title or Name:	Radiological Protection Act	
Reference Number:	814.50	
Date Promulgated or Proclaimed:	3/22/1991	Law

Name:	**StSV**	
Title or Name:	Radiological Protection Ordinance	
Reference Number:	814.501	
Date Promulgated or Proclaimed:	6/22/1994	Law

Name:	**SEFV**	
Title or Name:	Federal Ordinance on the Decommissioning Fund and on the Waste Management Fund for Nuclear Facilities	
Reference Number:	732.17	
Date Promulgated or Proclaimed:	12/7/2007	Law

Name:	**VARA**	
Title or Name:	Ordinance on the Collection of Radioactive Waste (BAG supervision area)	
Reference Number:	814.557	
Date Promulgated or Proclaimed:	9/3/2002	Law

Regulations / Laws

Country: SWITZERLAND Reporting Year: 2009

Name:	**B05**	
Title or Name:	Requirements for Conditioning of Radioactive Waste	
Reference Number:	HSK-B05	
Date Promulgated or Proclaimed:	2/1/2007	Regulation

Name:	**LDC**	
Title or Name:	London Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter	
Reference Number:		
Date Promulgated or Proclaimed:	12/29/1972	Regulation

Name:	**G05**	
Title or Name:	Transport and Storage Casks (T/S-Casks) for Interim Storage	
Reference Number:	ENSI-G05	
Date Promulgated or Proclaimed:	4/28/2008	Regulation

Name:	**GStSV**	
Title or Name:	Federal Ordinance on Fees in the Area of Radiation Protection	
Reference Number:	814.56	
Date Promulgated or Proclaimed:	7/5/2006	Law

Name:	**R-29**	
Title or Name:	Requirements for Interim Storage of Radioactive Waste	
Reference Number:	HSK-R-29	
Date Promulgated or Proclaimed:	3/1/2004	Regulation

Regulations / Laws

Country: SWITZERLAND Reporting Year: 2009

Name:	**B02**	
Title or Name:	Periodic Reporting by Nuclear Facilities	
Reference Number:	ENSI-B02	
Date Promulgated or Proclaimed:	12/23/2008	Regulation

Comment **# 18058: Regulation B02**

Includes requirements for reporting on radioactive waste management and inventories:

a) annual reports : all facilities (§ 4; § 4.2 lit c, f, e)

b) quarterly reports : ZWILAG (§ 7 lit g); PSI-East (§ 7 lit g, k, l)

c) monthly reports : NPP (§ 8; § 8.2 lit b)

Name:	**G03**	
Title or Name:	Specific Design Principles for Deep Geological Repositories and Requirements for the Safety Case	
Reference Number:	ENSI-G03	
Date Promulgated or Proclaimed:	4/1/2009	Regulation

Comment **# 22474: New Entry in 2009**

Replacing HSK-R-21

Name:	**B04**	
Title or Name:	Clearance of Materials and Areas from Controlled Zones	
Reference Number:	ENSI-B04	
Date Promulgated or Proclaimed:	8/1/2009	Regulation

Comment **# 22473: New Entry in 2009**

Replacing HSK-R-13

Milestones

Country: SWITZERLAND Reporting Year: 2009

Start Year or Reference Year:	2004	End Year:	2009
Description of Milestone:			
Sectoral Plan (Sachplan) for deep geological repositories, as required by the new Nuclear Energy Ordinance (KEV) : Tool elaborated by the Federal Office of Energy (a) to settle safety-related and other criteria relevant to the selection of regions and sites, (b) to define the procedure on how to designate sites from candidate regions. Key intentions are to present transparent technical and procedural rules for the site selection process and to clarify public involvement. Draft versions of the strategic part have been submitted to commenting by involved bodies in 2006 and 2007. Its final version has been released by the Federal Council on April 2, 2008. In October 2008, Nagra submits a waste management programme and a proposal on candidate regions for deep geologic disposal of SMA and LMA/HAA, as foreseen by the Sectoral Plan.			

Start Year or Reference Year:	2002	End Year:	2006
Description of Milestone:			
EL-HAA/LMA: Completion of feasibility study (Project "Entsorgungsnachweis"), based on Opalinus clay host rock formation in Northern Switzerland (Zürcher Weinland). Report was submitted by Nagra to the Federal Government by end of 2002. At the same time, Nagra asked the Federal Government to agree to Nagra's proposal to focus future investigations for the Swiss SF/HLW/ILW programme on the Opalinus clay and the candidate siting area of the Zürcher Weinland. After review of Nagra's Technical documentation by national and international expert teams, the Federal Council approves the Entsorgungsnachweis on June 28, 2006. Focussing investigations on the proposed potential region was, however, disapproved.			

Start Year or Reference Year:	1996	End Year:	2003
Description of Milestone:			
EL-SMA: Despite decisions on a stepwise concession approach (first only exploratory drift, then repository), project modifications (monitoring, retrievability) and definition of exclusion criteria: negative outcome of a new cantonal vote on mining concession for an exploratory drift in September 2002. The project is abandonded by the potential operator company GNW, which is formally disbanded in 2003 after completion of recultivation and settlement of further obligations.			

Start Year or Reference Year:	1993	End Year:	1995
Description of Milestone:			
EL-SMA: Wellenberg identified as candidate site after a 12 years' site evaluation procedure (1993), agreement with local community (1994), applications for general licence (federal) and mining concession (cantonal) for exploratory drift and repository in 1994, mining concession being rejected by public referendum in June 1995.			

Start Year or Reference Year:	1990	End Year:	1992
Description of Milestone:			
Implementation of a standardized, decentralized computer-based database system for Swiss radioactive waste (ISRAM), which enables characterization and book-keeping for all conditioned and most of unconditioned waste packages.			

Milestones

Country: SWITZERLAND Reporting Year: 2009

Start Year or Reference Year:	1988	End Year:	2004
Description of Milestone:			
ZWILAG: Planning, construction and commissioning of a central storage facility for spent fuel, HLW and any other type of waste, with conditioning facilities and plasma arc incinerator/melter.			

Start Year or Reference Year:	1985	End Year:	1988
Description of Milestone:			
"Project Gewaehr 85": Feasibility demonstration for disposal of all waste categories in Switzerland submitted by Nagra in 1985. Decision of Federal Government in June 1988: demonstration for EL-SMA accepted, for EL-HAA/LMA (crystalline host rock) safety concept and engineering feasibility accepted, but siting feasibility yet to be demonstrated.			

Start Year or Reference Year:	1982	End Year:	1982
Description of Milestone:			
End of OECD/NEA sea dumping activities for LILW in the Northern Atlantic Ocean.			

Start Year or Reference Year:	1978	End Year:	1978
Description of Milestone:			
Concept report on geological disposal in Switzerland (Nagra)			

Future Outlook

Country: SWITZERLAND Reporting Year: 2009

Data not available.

Future Outlook

Country: SWITZERLAND Reporting Year: 2009

Data not available.

Future Outlook

Country: SWITZERLAND Reporting Year: 2009

Data not available.

Future Outlook

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Data not available.