

Block I General details	
1	<p>Location of the PCB disposal facility:</p> <p>Name of Facility: Valorec Services AG, Regionale Sondermüllverbrennungsanlage (RSMVA) City: Basle Country: Switzerland <i>(Provide address information in Block IV)</i></p>
2	<p>Licence / authorization:</p> <p>Is this facility licensed or authorized to handle PCBs? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If "Yes": (i) Nature of licence / authorization: Authorization for Reception/Storage/Disposal (ii) Please submit the licensing history <i>(please attach to this questionnaire)</i></p> <p>Issuing authority <i>(name)</i>: Amt für Umwelt und Energie, Kanton Baselstadt</p> <p><input type="checkbox"/> National <input checked="" type="checkbox"/> Local or <input type="checkbox"/> Independent</p>
3	<p>Please provide information on storage at the facility including:</p> <p>Capacity for the various PCB waste and equipment types: Up to 500 tons for both solid and liquid waste</p> <p>Method: Warehouse for solid and liquid waste in drums, Iso tanks for liquid waste</p> <p>Holding time: Several months possible</p>
4	<p>Worker protection <i>(Please summarize protective measures applied during treatment of PCB wastes)</i></p> <ol style="list-style-type: none"> 1. Minimization of open handling with liquid PCB waste 2. Protective measures: working clothes, protection suit resistant to chemicals, gas mask, rubber gloves, safety boots, rubber or plastic apron 3. Medical monitoring of the employees <p>Does the facility have an accident book? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Most frequent cause(s) of incidents involving PCBs: No incident of this kind</p>

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Opinion box - PCB Management issues *(Please describe briefly)*

What are your major concerns?

Provide a global solution to eliminate permanently the hazard represented by PCB-contaminated equipments, residues or liquids in the biosphere. This concept includes following main issues:

- Transportation of PCB-contaminated waste in compliance with the international regulations (ADR for road, RID for train and IMDG for shipment by sea).
- Storage of PCB-contaminated waste in a state of the art warehouse, including automatic fire extinguishing system and well trained professional fire fighters team able to reach the warehouse within 5 min.
- Environmentally sound disposal of the PCB-contaminated waste by high temperature incineration (fluegas residence time of 4 s above 1100°C).

Can you identify research and development needs in PCB management that would be beneficial for your region and waste managers worldwide?

A1.3

Treatment of metallic PCB equipment/material

Immediate destruction of metallic equipment/material containing PCB? Yes No

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated metallic equipment/material subjected to reuse/recycling? Yes No

If 'Yes', please specify in **Block II Part C** (Reuse and recycling)

Part A: Treatment of PCB containing equipment/material

Part A2: Non-metallic Parts

A2.1	Types of non-metallic PCB equipment/material treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>		
		Concentration <i>(specify the unit)</i> unit: %		Quantity <i>(specify the unit)</i> unit:
		min	max	
	<input checked="" type="checkbox"/> PCB-containing materials (clothes, cables, etc.)	0	30	See Block I, Index 3
	<input checked="" type="checkbox"/> PCB-contaminated residues, sludges	0	30	See Block I, Index 3
	<input checked="" type="checkbox"/> PCB-contaminated soils and sediments	0	30	See Block I, Index 3
	<input checked="" type="checkbox"/> Packaged / drummed waste	0	30	See Block I, Index 3
	<input checked="" type="checkbox"/> Other: cementing joints	0	30	See Block I, Index 3
<p><i>Please specify any other limitation on waste accepted:</i></p>				
A2.2	<p>Presentation of non-metallic equipment/material</p> <p>In what form must the non-metallic PCB equipment/material be presented:</p> <p><input checked="" type="checkbox"/> Drums</p> <p><input checked="" type="checkbox"/> Other packaging: Iso tanks</p> <p><input type="checkbox"/> Other constraints:</p>			

A2.3

Treatment of non-metallic PCB equipment/material

Immediate destruction of non-metallic equipment/material containing PCB? Yes No

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated non-metallic equipment/material subjected to reuse/recycling? Yes No

If 'Yes', please specify in **Block II Part C** (Reuse and Recycling)

Part B: Treatment of PCB oils and PCB waste oils

B1	Types of PCB oils and PCB waste oils treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>	
		Concentration <i>(specify the unit)</i>	Quantity <i>(specify the unit)</i>
		unit: min	max unit:
	<input checked="" type="checkbox"/> 100 % PCB oils		
	<input checked="" type="checkbox"/> Mineral oils contaminated by PCB		
	<input checked="" type="checkbox"/> Waste oils contaminated by PCB		
	<input type="checkbox"/> Other:		
<p><i>Please specify any other limitation on waste accepted:</i></p>			
B2	<p>Presentation of PCB oils and PCB waste oils</p> <p>In what form must the PCB oils and PCB waste oils be presented:</p> <input checked="" type="checkbox"/> Drums <input checked="" type="checkbox"/> Other packaging: suitable IBC container, Iso tanks <input type="checkbox"/> Other constraints:		
B3	<p>Treatment of PCB oils and PCB waste oils</p> <p>Please specify the applied technology for the destruction of PCB oils and PCB waste oils in Part III</p>		

Part C: Reuse & Recycling of decontaminated PCB equipment/material

<p>C1</p>	<p>Types decontaminated PCB equipment/material treated:</p> <p><input type="checkbox"/> Transformers</p> <p><input type="checkbox"/> Capacitors</p> <p><input type="checkbox"/> Materials (clothes, cables, etc.)</p> <p><input type="checkbox"/> Residues, sludges</p> <p><input type="checkbox"/> Soils and sediments</p> <p><input type="checkbox"/> Other:</p>	<p>Limitation on waste accepted <i>(please specify, if appropriate)</i></p> <p>Quantity <i>(specify the unit)</i></p> <p>unit:</p>
<p><i>Please specify any other limitation on waste accepted:</i></p>		
<p>C2</p>	<p>Presentation of decontaminated PCB equipment/material</p> <p>In what form must the decontaminated PCB equipment/material be presented:</p> <p><input type="checkbox"/> Drums</p> <p><input type="checkbox"/> Other packaging:</p> <p><input type="checkbox"/> Other constraints:</p>	

C3

Treatment of decontaminated PCB equipment/material

Reuse and Recycling of decontaminated PCB equipment/material? Yes No

If 'Yes', please specify the applied technology in Part III

Is the decontaminated PCB equipment/material disposed of? Yes No

If 'Yes', please specify:

Transport to the disposal site? Yes No

If 'Yes':

International transport

National transport

Location of disposal site:

Please provide a short description of disposal site:

Block III

Detailed information on applied technologies

1	The following description refers to Block II, Part:	Type of PCB waste or decontaminated equipment/material:
	<input checked="" type="checkbox"/> A1 (Treatment of metallic PCB equipment/material)	Capacitors
	<input checked="" type="checkbox"/> A2 (Treatment of non-metallic PCB equipment/material)	Soils, residues, sediments
	<input checked="" type="checkbox"/> B (Treatment of PCB oil and PCB waste oil)	Oils for transformers, contaminated waste oils
	<input type="checkbox"/> C (Reuse and recycling of decontaminated PCB equipment/material)	

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Applied technologies (Please specify the technology used for disposal):

- Pyrolysis / gasifiers
- Gas Phase Chemical Reduction (GPCR)
- Base Catalysed Decomposition (BCD)
- Sodium Reduction
- Super-Critical Water Oxidation (SCWO)
- Plasma Arc
- Molten Salt Oxidation
- Solvated Electron Technology
- Retrofilling
- Other: incineration

Type of technology (1-sentence description):
 Incineration in a rotary kiln (T = 1050-1200°C) followed by a post combustion chamber (T=1100-1300°C), steam recovery boiler and flue gas treatment.

Description of the technology please provide additional information as appropriate (*summarize here and, if necessary, attach documentation*)
 Incineration part: rotary kiln and post combustion chamber, residence time of 4 s above 1100°C
 Steam recovery boiler: production of superheated steam (20 t/h, p = 40 bar, T = 300 °C) used to operate a steam turbine and to supply heat to chemical production plant.
 Flue gas treatment: wet scrubber with 6 stages to remove particulates, heavy metals and acidic components (HCl, HF, SO₂, HBr, HI)
 SCR-DeNO_x : catalytic reduction of nitrogen oxides and oxidation of dioxine
 Waste water treatment plant: treatment of 2 streams issued from the wet scrubber (pH adjustment, heavy metal separation by flocculation) prior to release into river.

Commissioned? Yes No Year: 1995

Can the technology be used in a mobile facility? Yes No

3

State of development

Does the technology exist as an industrial unit? Yes No

If "No", please indicate when it will become operational:

If "Yes", please indicate how many units exist: 50 to 100

In what countries: worldwide

4

Pretreatment:

Does the technology require any pretreatment procedures? Yes No

If "Yes", please specify required pretreatment procedures:

- Thermal Desorption
 Dilution
 Low Temperature Rinsing
 Electro-osmosis
 Draining/Solvent washing
 Dismantling/Shredding
 Other:

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Byproducts

What byproducts does the technology produce? *(please specify below)*

Byproduct	Kind	Amount
Liquids:		L per tonnes of waste treated
Solids:		kg per tonnes of waste treated
Steam:	Superheated (40 bar, 300°C)	6.5 t per ton of waste treated (annual average)

Does the technology allow all byproducts to be monitored for POPs*/PTS** before release? Yes No

If POPs*/PTS** are discovered, can the byproducts be returned to the process for further treatment? Yes No

Are any of the byproducts classified as other sorts of hazardous wastes? Yes No

If "Yes" please specify:

What volumes of such byproducts are generated by handling a unit volume of PCB wastes:

Can third party monitoring data be provided? Yes No

If "Yes", please attach to this questionnaire.

* POPs: Persistent Organic Pollutants
 ** PTS: Persistent Toxic Substances

How are byproducts disposed of? *(please describe briefly)*

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Efficiency

(please specify, if appropriate)

Destruction efficiencies (DEs): 99.9999 %

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Monitoring & Control of releases

What technologies are used to monitor releases:

Air: continuous emission monitoring system based on IR-Spectroscopy (O₂, CO, SO₂, HCl, NO_x, NH₃) and Flame Ionization Detector (VOC), continuous dust monitoring system

Effluents: TOC, pH, Temperature and Turbidity online, daily and monthly sample for analysis of salts and heavy metals concentration

Solids: sampling of slag and metal hydroxide sludge, leachate test according to Swiss regulations (TVA)

Are all releases monitored for POPs/PTS before release? Yes No

If POPs*/PTS** are discovered, can the releases be returned to the process for further treatment? Yes No (for solids only)

Are any of the releases classified as hazardous wastes? Yes No

If "Yes" please specify: slag, metal hydroxide sludge

What technologies are used/ required to monitor and treat any such releases prior to release: sampling and leachate test according to Swiss regulation (TVA)

What volumes of such releases are generated by handling a unit volume of PCB wastes: annual average values considering all types of waste: 0.09 t slag/t of waste, 0.05 t sludge/t of waste

Is third party monitoring data available? Yes No

If "Yes", please attach to this questionnaire.

* POPs: Persistent Organic Pollutants
** PTS: Persistent Toxic Substances

How are releases disposed of? *(please describe briefly)*

Release of clean flue gas in the atmosphere through stack

Release of treated waste water into the river Rhine if all online measured parameters are in compliance with the regulations. Otherwise the waste water will be redirected to the industrial waste water treatment plant (combined physical-chemical-biological treatment).

Release of solids residues: slag is disposed in a landfill of the class "residual substance" in Switzerland, metal hydroxide sludge is disposed in obsolete salt mines in Germany.

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Disposal costs

What are the *approximate* costs for applying the technology per unit[‡], **including** costs for all technical pretreatment steps, **excluding** all costs **not** related to the technical application of the technology (transport costs, costs for disposal of decontaminated transformers/capacitors/materials, etc.)?

Please specify type of treated/disposed PCB equipment/material/oil below:

	Costs per unit [‡]	Currency
a) Capacitors	1.2 – 2.5	CHF
b) Soils, residues contaminated with PCB	0.5 – 1.0	CHF
c) Cementing joints	1.7 – 2.5	CHF
d) Oils	1.7 – 2.5	CHF
e)		
f)		
g)		

[‡] Specify the unit for a) to g): kg

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Treatment capacities and scaling (tonnes per year for main waste & equipment types)

Capacity of existing facilities: 16'000 – 25'000 (of which approx. 5'000 for PCB waste) units[‡] per year

Can the technology be adapted to higher or lower capacities? Yes No

If "Yes": adjustment of the feed rate according to the amount of waste available

- (i) What is the capacity of the smallest commercially viable facility: units[‡] per year
- (ii) What is the capacity of the largest commercially viable facility: units[‡] per year

Does the adaptation will cause additional costs? Yes No

If "Yes" specify the increase in costs for the adaptation (%) of the initial costs:

- (i) For smaller plants: %
- For larger plants: %

[‡] Please specify the unit: tons

Block IV**Facility: Address and Service Information**

1

Facility Name: Valorec Services AG, Regionale Sondermüllverbrennungsanlage (RSMVA)

Address: Neuhausstrasse 90

City/Town: 4019 Basle

P.O. Box: 118

District/State: BS

Country: Switzerland

Telephone: +41 61 468 86 55

Fax: +41 61 468 86 60

Email: werner.wagner@valorec.com

Web site: www.valorec.com

Person completing form

Name: Werner Wagner / Marino Rota

Position: Plant Manager / Plant Chemist

Parent Company (*if different*)

Veolia Environnement

Address: 36 – 38 Avenue Kléber

City/Town: Paris

P.O. Box:

District/State: 75116 Paris

Country: France

Telephone: +33 1 71 75 00 00

Fax: +33 1 71 75 10 00

Email: www.veoliaenvironnement.com

<p>2</p>	<p>Other Services offered by the company</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Laboratory analysis / testing <input type="checkbox"/> PCB waste packaging for shipment <input checked="" type="checkbox"/> PCB classification / labeling <input type="checkbox"/> Clean-up of PCB contaminated sites <input type="checkbox"/> PCB wastes transport <input checked="" type="checkbox"/> Other PCB-related services: consulting activities
<p>3</p>	<p>Further information</p> <p>Identify any company information (brochures, notes etc...) provided separately and if you wish provide additional comments on your services in not more than 50 words:</p> <p>Valorec "Im Spannungsfeld zwischen Mensch, Technik, und Umwelt"</p> <p>Veolia Environnement Sustainable Development Report 2002</p>