



### QUESTIONNAIRE PULP AND PAPER PRODUCTION (SECTOR RELATED QUESTIONS)

The completion of this questionnaire is voluntary. However, replying to the relevant questions as completely as possible will facilitate and speed up the assessment of the environmental, social and human rights impacts of the project for which the German export supplies or services offered for cover are intended. This – together with the questionnaire not related to a particular sector, the completion and submission of which should also be considered in order to speed up the assessment procedure – can replace the description of the environmental, social and human rights impacts in the memorandum.

The questionnaire provides guidance on what information may be important for this sector. It is based on the World Bank/IFC General Environmental Health and Safety (EHS) Guidelines and the EHS Guidelines Pulp and Paper Mills. Additional information on the applicable standards can be found at the [AGA Portal](#).

This is a list of possible questions. Depending on the individual case only some of them, or perhaps also additional information, may become relevant in the course of the application procedure. Because of the specific features of each project further clarification may be required.

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## A. Type of project

### A.1. Overall project

- Does the overall project (beyond the German portion of the supplies) comprise the establishment of an integrated paper and pulp plant?
- Does a pulp production plant already exist on the site?
- If so, please provide information as to whether that plant will be extended as part of the project and state the respective increase in capacity in tons/year.

If only a paper production plant is to be built and a pulp production facility does not exist on the site, section A.2 can be skipped.

### A.2. Pulp production

- What type of process is used (e.g. Kraft pulping, sulfite pulping, CTMP, mechanical pulping)?
- Please give a technical description of the individual process steps. Please also provide information on the individual process steps (pulping, delignification, bleaching, where applicable also chlorine dioxide and ozone production, etc.) as well as any associated facilities such as power plants.
- What capacity will the plant have (in metric tonnes of air dry pulp (ADt))? Please also state the capacity of already existing facilities on the site.

### A.3. Paper production

- What type of paper will be produced (coated/uncoated paper, recycled paper, tissue, speciality papers)?
- What capacity will the plant have (in metric tonnes of air dry pulp (ADt))? Please also state the capacity of already existing facilities on the site.

## B. Pulp and paper projects

### B.1. Effluents

- What wastewater streams are generated?
- Please describe measures taken to avoid/reduce/treat wastewater (e.g. dry debarking, wastewater recycling, TFC bleaching, oxygen delignification, minimization of loss due to waste, separation of different types of effluents).
- Please state whether wastewater is discharged into a public sewage treatment system or a surface water body (river, lake, sea).
- How are effluents treated before they are discharged?
- If wastewater is discharged into a surface water body, please state the maximum values for pollutants in the wastewater in the relevant table(s) below according to the project scope and process applied.

The following should be noted:

- Please state the annual average values (daily averages should not be greater than 2.5 times the annual average values).
- The values for paper machines may be stated either in kg/ton paper or kg/ton air dry pulp.
- In the case of integrated paper and pulp production plants the values must be stated in kg/ton of paper and should include the emissions of both the paper and the pulp mill.
- If an integrated paper and pulp production plant sells both paper and pulp, the values must be stated in kg/ton pulp total. This means the total value of produced paper and the marketed pulp.
- In the case of an extension, please state the current values as well as the values after the extension.

Effluent Guidelines for Pulp and Paper Facilities — <u>Bleached Kraft Pulp, Integrated</u>			
Parameter	Unit	Guideline Value	Project Value
Flow <sup>(a)</sup>	m <sup>3</sup> /ADt	50	
pH	S.U.	6 – 9	
TSS	kg/ADt	1.5	
COD	kg/ADt	20	
BOD <sub>5</sub>	kg/ADt	1	
AOX	kg/ADt	0.25	
Total N	kg/ADt	0.2 <sup>(b)</sup>	
Total P	kg/ADt	0.03	
European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430. <b>Notes:</b> kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp (a) Cooling water and other clean water are discharged separately and are not included. (b) Any nitrogen discharge associated with the use of complexing agents should be added to the figure of tot -N. Source: WELTBANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 26			

### Effluent Guidelines for Pulp and Paper Facilities — Unbleached Kraft Pulp, Integrated

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	25	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	1.0	
<b>COD</b>	kg/ADt	10	
<b>BOD<sub>5</sub></b>	kg/ADt	0.7	
<b>Total N</b>	kg/ADt	0.2	
<b>Total P</b>	kg/ADt	0.02	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 26

### Effluent Guidelines for Sulfite Pulp and Paper Facilities — Sulfite Pulp, Integrated and Non-Integrated

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	55 <sup>(d)</sup>	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	2.0	
<b>COD</b>	kg/ADt	30 <sup>(c)</sup>	
<b>BOD<sub>5</sub></b>	kg/ADt	2.0	
<b>AOX</b>	kg/ADt	0.005	
<b>Total N</b>	kg/ADt	0.5	
<b>Total P</b>	kg/ADt	0.05	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

(c) Because of higher kappa number after cooking for magnefite process the BAT associated level is 35 kg COD/ADt.

(d) Does not include process water from the paper mill in integrated sulfite pulp mills.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 26

### Effluent Guidelines for CTMP Facilities

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	20	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	1.0	
<b>COD</b>	kg/ADt	5	
<b>BOD<sub>5</sub></b>	kg/ADt	1.0	
<b>Total N</b>	kg/ADt	0.02	
<b>Total P</b>	kg/ADt	0.01	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 26

### Effluent Guidelines for Pulp and Paper Facilities — Mechanical Pulping, Integrated

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	20	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0.5	
<b>COD</b>	kg/ADt	5.0	
<b>BOD<sub>5</sub></b>	kg/ADt	0.5	
<b>AOX</b>	kg/ADt	0.01	
<b>Total N</b>	kg/ADt	0.1	
<b>Total P</b>	kg/ADt	0.01	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 27

### Effluent Guidelines for Pulp and Paper Facilities — Recycled Fiber, Without Deinking, Integrated

Parameter	Unit	Guideline Value	Project Value
<b>Flow <sup>(a)</sup></b>	m <sup>3</sup> /ADt	10	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0.15	
<b>COD</b>	kg/ADt	1.5	
<b>BOD<sub>5</sub></b>	kg/ADt	0.15	
<b>AOX</b>	kg/ADt	0.005	
<b>Total N</b>	kg/ADt	0.05	
<b>Total P</b>	kg/ADt	0.005	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 27

### Effluent Guidelines for Pulp and Paper Facilities — Recycled Fiber, With Deinking, Integrated

Parameter	Unit	Guideline Value	Project Value
<b>Flow <sup>(a)</sup></b>	m <sup>3</sup> /ADt	15	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0.3	
<b>COD</b>	kg/ADt	4.0	
<b>BOD<sub>5</sub></b>	kg/ADt	0.2	
<b>AOX</b>	kg/ADt	0.005	
<b>Total N</b>	kg/ADt	0.1	
<b>Total P</b>	kg/ADt	0.01	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 27

### Effluent Guidelines for Pulp and Paper Facilities — Recycled Fiber Tissue Mills

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	25	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0,4	
<b>COD</b>	kg/ADt	4.0	
<b>BOD<sub>5</sub></b>	kg/ADt	0.5	
<b>AOX</b>	kg/ADt	0.005	
<b>Total N</b>	kg/ADt	0.25	
<b>Total P</b>	kg/ADt	0.015	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 27

### Effluent Guidelines for Pulp and Paper Facilities — Uncoated Fine Paper Mills

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	15	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0.4	
<b>COD</b>	kg/ADt	2.0	
<b>BOD<sub>5</sub></b>	kg/ADt	0.25	
<b>AOX</b>	kg/ADt	0.005	
<b>Total N</b>	kg/ADt	0.2	
<b>Total P</b>	kg/ADt	0.01	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 28

### Effluent Guidelines for Pulp and Paper Facilities — Coated Fine Paper Mills

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	15	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0.4	
<b>COD</b>	kg/ADt	1.5	
<b>BOD<sub>5</sub></b>	kg/ADt	0.25	
<b>AOX</b>	kg/ADt	0.005	
<b>Total N</b>	kg/ADt	0.2	
<b>Total P</b>	kg/ADt	0.01	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 28

### Effluent Guidelines for Pulp and Paper Facilities — Tissue Mills

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	25	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	0,4	
<b>COD</b>	kg/ADt	1,5	
<b>BOD<sub>5</sub></b>	kg/ADt	0,4	
<b>AOX</b>	kg/ADt	0,01	
<b>Total N</b>	kg/ADt	0,25	
<b>Total P</b>	kg/ADt	0,015	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 28



### Effluent Guidelines for Pulp and Paper Facilities— Fiber Preparation, Non-Wood

Parameter	Unit	Guideline Value	Project Value
<b>Flow</b> <sup>(a)</sup>	m <sup>3</sup> /ADt	50	
<b>pH</b>	S.U.	6 – 9	
<b>TSS</b>	kg/ADt	2,0	
<b>COD</b>	kg/ADt	30	
<b>BOD<sub>5</sub></b>	kg/ADt	2,0	
<b>Total N</b>	kg/ADt	0,5	
<b>Total P</b>	kg/ADt	0,05	

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA Effluent Guidelines for the Pulp, Paper, and Paperboard Point Source Category, 40 CFR Part 430.

**Notes:**

kg/ADt = kilograms of pollutant per 1,000 kg of air dry pulp

(a) Cooling water and other clean water are discharged separately and are not included.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 28

- What national standards are applicable for the discharge of sanitary sewage? How is sewage treated before it is discharged? Please state the expected maximum values of the pollution levels in the sewage. If there are no national limit values, please go by the table below.

### Indicative Values for Treated Sanitary Sewage Discharges<sup>1</sup>

Pollutants	Units	Guideline Value	Project Value
<b>pH</b>	pH	6-9	
<b>BOD</b>	mg/L	30	
<b>COD</b>	mg/L	125	
<b>Total nitrogen</b>	mg/L	10	
<b>Total phosphorus</b>	mg/L	2	
<b>Oil and grease</b>	mg/L	10	
<b>TSS</b>	mg/L	50	
<b>Total coliform bacteria</b>	MPN <sup>2</sup> /100 ml	400 <sup>1</sup>	

**Notes:**

<sup>1</sup> Not applicable to centralized, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation.

<sup>2</sup> MPN = Most Probable Number

Source: WORLD BANK/IFC GENERAL EHS GUIDELINES 2007, page 30

## B.2. Raw materials

- What raw materials (wood, other raw materials such as bamboo or market pulp) are used?
- Where do the required wood and plant fibre raw materials come from? Please describe the various sources of supply in detail (country, own plantations, nominated suppliers).
- How high is the annual consumption of wood and plant fibre raw materials?
- Will indigenous people<sup>1</sup> be affected by the project? Please explain both any direct and indirect impacts (e.g. through plantations, which provide the raw materials).
- Does the buyer company practice supply chain management in order to guarantee a sustainable forest management in its own supply chain? If so, please provide additional information (standards, processes, responsibilities, etc.).
- Are the raw material sources certified in accordance with the internationally accepted FSC (Forest Stewardship council) or PEFC (Programme for the Endorsement of Forest Certification) standards or similar?
- Are raw materials used which were sourced in natural or endangered habitats? If not, how is guaranteed that this is not the case?
- Does the project or associated plantations involve the enlargement or opening up of plantation forests or managed natural forests? If so, please also reply to the questions in the sector-related questionnaire *Agriculture and Forestry*.
- Does the project or associated facilities (new roads, a new electricity line, own plantations, etc.) have an impact (e.g. through conversion into plantation forests or managed natural forests) on natural habitats, i.e. habitats that are relatively undisturbed by humans, are of great biological, social or economic importance and are mainly inhabited by local fauna and flora?
- Does the project or associated facilities (new roads, a new electricity line, own plantations, etc.) have an impact (e.g. through conversion into plantation forests or managed natural forests) on endangered natural habitats, i.e. areas protected under national or international law?

## B.3 Water and energy consumption

- How much (fresh) water is used for production? Is the water recirculated?
- Where and how is the water withdrawn?
- Please complete the relevant line(s) in the table on energy and water consumption below depending on the process used and the manufactured products:

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1

Indigenous peoples are considered to be distinct social and cultural groups which (a) regard themselves as members of such a distinct indigenous cultural group and are recognized as such by others, (b) show a collective attachment to their geographically distinct habitats or ancestral territories in the project area and to the natural resources thereof, (c) have customary cultural, economic, social or political institutions that are separate from those of the mainstream society or culture or (d) speak a distinct language or dialect, which often differs from the official language of the country or region.

Energy and Water Consumption						
Mill type	Reported Ranges					
	Water consumption [m <sup>3</sup> /t] <sup>(a)</sup>		Heat Energy [GJ/t]		Electrical Energy [kWh/t]	
	Guideline Value	Project Value	Guideline Value	Project Value	Guideline Value	Project Value
<b>Kraft Pulping, bleached</b>	20 – 100 <sup>(b)</sup>		10 – 14		600–1200 <sup>(i)</sup>	
<b>Sulfite Pulping</b> (magnesium base)	40-100		--	--	--	--
<b>Mechanical Pulping —</b> Groundwood	5 – 15		--	--	1100-2200 <sup>(c)</sup>	
<b>Mechanical Pulping —</b> TMP	4 – 10		--	--	1800-3600 <sup>(d)</sup>	
<b>Mechanical Pulping —</b> CTMP	15 – 50		--	--	1000–4300 <sup>(e)</sup>	
<b>Recovered Paper Mill —</b> Uncoated Folding Boxboard	2 – 10		--	--	--	--
<b>Recovered Paper Mill —</b> Coated Folding Boxboard	7 – 15		--	--	--	--
<b>Recovered Paper Mill —</b> Corrugated Medium and Packaging Paper	1.5 – 10		--	--	--	--
<b>Recovered Paper Mill —</b> Newsprint	10 – 20		--	--	--	--
<b>Recovered Paper Mill —</b> Tissue	5 – 100 <sup>(c)</sup>		--	--	--	--
<b>Recovered Paper Mill —</b> Writing and Printing Paper	7 – 20		--	--	--	--
<b>Paper Mill —</b> Tissue	10 – 50 <sup>(f)</sup>		--	--	500 – 3000	
<b>Paper Mill —</b> Printing and Writing Paper, Uncoated	5 – 40 <sup>(g)</sup>		--	--	500 – 650	
<b>Paper Mill —</b> Printing and Writing Paper, Coated	5 – 50 <sup>(g)</sup>		--	--	650 – 900	
<b>Paper Mill —</b> Paper Board	0 – 20 <sup>(h)</sup>		--	--	~550 – 680	
<b>Paper Mill —</b> Specialty Paper	10 – 300		--	--	--	--

European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001

**Notes:**

(a) Clean cooling water is generally not reported as part of the water consumption.

(b) Reported quantities greater than about 50 m<sup>3</sup>/t probably include cooling water.

(c) Approximately 20% of energy is recoverable as hot water.

(d) Approximately 20% of energy is recoverable as hot water, and about 40 – 45% of energy is recoverable as steam.

(e) Water consumption in tissue mills is highly dependent of the process conditions (e.g., machine speed) and product (e.g., basis weight). Because of the low basis weight of the product, water consumption per ton of product can be higher than for other types of paper mills.

(f) For RCF based tissue; includes RCF processing

(g) May include water used in pulp processing

(h) Includes water used in pulp processing.

(i) Modern bleached kraft mills are net exporters of electricity typically generating about 30% more than they consume by burning black liquor and bark.

Source: WORLD BANK/IFC EHS Guidelines PULP AND PAPER MILLS 2007, page 31

## B.4 Emissions and ambient air quality

- Please state the maximum values for the air emissions for all process steps in accordance with the table below. In the case of an expansion: please state the current values as well as the values after the expansion. Please take the entire project into account where integrated pulp and paper mills are concerned.

Emission Guidelines for Pulp and Paper Facilities				
Parameter	Type of Mill	Unit	Guideline Value	Project Value
TSP	Kraft, bleached	kg/ADt	0.5	
	Kraft, unbleached — Integrated	kg/ADt	0.5	
	Sulfite, integrated and non-integrated	kg/ADt	0.15	
SO <sub>2</sub> as S	Kraft, bleached	kg/ADt	0.4	
	Kraft, unbleached — Integrated		0.4	
	Sulfite, integrated and non-integrated		1.0	
NO <sub>x</sub> as NO <sub>2</sub>	Kraft, bleaches	kg/ADt	1.5 for hardwood pulp 2.0 for softwood pulp	
	Kraft, unbleached — Integrated		1.5 for hardwood pulp 2.0 for softwood pulp	
	Sulfite, integrated and non-integrated		2,0	
TRS as S	Kraft, bleached	kg/ADt	0.2	
	Kraft, unbleached — Integrated		0.2	
European Commission. 2001. Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Pulp and Paper Industry. December 2001; and U.S. EPA National Emission Standards for Hazardous Air Pollutants For Source Categories, 40 CFR Part 63.				
Notes:				
TSP= total suspended particulates				
SO <sub>2</sub> = sulfur dioxide				
S = sulfur				
NO <sub>2</sub> = nitrogen dioxide				
N = nitrogen				
TRS = total reduced sulfur compounds				
Kg/ADt = kilograms of pollut ant per 1,000 kg of air dry pulp				
Source: WORLD BANK/IEC EHS Guidelines PULP AND PAPER MILLS 2007, page 30				

- Please describe in addition any measures to reduce/avoid emissions (e.g. combustion of malodorous gases, oxidation of black liquor, absorption of SO<sub>2</sub> in alkaline solutions, use of low-sulfur fuels, collection of VOCs and further treatment).
- Please also state the (expected) emission values (in particular dust (PM), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) in mg/Nm<sup>3</sup>) for any steam and electricity generation if applicable. Please use the sector-related questionnaire *Conventional Energy* as guideline for plants with a capacity of more than 50 MWth.

- What limit values for ambient air quality are applicable in the buyer's country (please make a table available)? Please state the relevant expected ambient air quality values. Please give details on any changes in the ambient air quality before and after the project implementation. If there are no national values, please go by the table below.

WHO Ambient Air Quality Guidelines <sup>1,2</sup>					
	Averaging Period	IFC Guideline Value [µg/m <sup>3</sup> ]	Guideline Value Host country	Project Value (baseline status) [µg/m <sup>3</sup> ]	Project Value (after implementation) [µg/m <sup>3</sup> ]
<b>Sulfur dioxide (SO<sub>2</sub>)</b>	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)			
	10 minute	500 (guideline)			
<b>Nitrogen dioxide (NO<sub>2</sub>)</b>	1-year	40 (guideline)			
	1-hour	200 (guideline)			
<b>Particulate Matter (PM<sub>10</sub>)</b>	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)			
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)			
<b>Particulate Matter (PM<sub>2.5</sub>)</b>	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)			
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)			
<b>Ozone</b>	8-hour daily maximum	160 (Interim target-1) 100 (guideline)			
<b>Notes:</b> <sup>1</sup> World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile. <sup>2</sup> Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.					
Source: WORLD BANK/IFC GENERAL EHS GUIDELINES 2007, page 4					

## B.5 Waste

- What types of waste (solid/liquid) are generated in the production process and where are they deposited?
- Do these wastes contain hazardous pollutants? If so, how are they disposed of?
- What measures are taken to treat and dispose of any waste generated (e.g. recycling of the fibre sludge, dewatering and incineration of the sludge, incineration of organic materials, recycling of the ash as filling material in the construction industry).

## B.6 Noise

- Please state the noise impact (existing background noise level and additional noise emissions of the project) on the nearest receptors (industrial estates and residential areas) in dB(A) for day and night after completion of the project pursuant to the table below.

Noise Level Guidelines <sup>1</sup>				
Receptor	One Hour LA <sub>eq</sub> (dBA)			
	Guideline Value Daytime (07:00-22:00)	Project Value Daytime (07:00-22:00)	Guideline Value Nighttime (22:00-07:00)	Project Value Nighttime (22:00-07:00)
Residential; institutional; educational <sup>2</sup>	55		45	
Industrial; commercial	70		70	
<b>Notes:</b> <sup>1</sup> Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, WHO, 1999. <sup>2</sup> For acceptable indoor noise levels for residential, institutional, and educational settings refer to WHO (1999). Source: WORLD BANK/IFC GENERAL EHS GUIDELINES 2007, page 53				

- Do the project's noise emissions lead to an increase of the background noise level at the nearest receptors by more than 3 dB(A)?
- How far is the nearest residential area away?
- Are any measures to reduce the noise level necessary or planned? If so, what measures?

## B.7 Occupational health and safety

- What safety measures and/or control systems are planned to prevent accidents?
- How are safety and health (in particular with regard to chemical and physical health risks, wood dust, biological hazards, confined spaces, noise and radiation) guaranteed at the work places?
- What average and maximum noise exposure is to be expected at the work places? What safety measures are taken at work places where the noise exposure exceeds 85 dB(A)?
- How are subcontractors integrated into the occupational health and safety measures on site?
- Please make accident statistics for the past two years available to us (where an existing plant is concerned).

## B.8 Health and safety of the population

- What measures are taken to minimize impacts and possible risks for adjacent communities, in particular with regard to the storage of chemicals and their transport, odours and traffic, sulphur and nitrogen emissions, fire and explosions?

## C. Additional information

Additional information on the **Common Approaches**, our **environmental, social and human rights due diligence** and the **applicable standards** can be found at:

<https://agaportal.de/en/main-navigation/schnellzugriff-aga-konsortium/verantwortung>

The **WORLD BANK/IFC EHS Guidelines** can be found on the website:

[http://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/ifc+sustainability/our+approach/risk+management/ehsguidelines](http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/ehsguidelines).