

Environmental Profile Data Sheet (EPDS)TM

Pulp, Paper and Paperboard¹

To develop a better informed marketplace in the pursuit of sustainable development

Product

Description:	Newsprint (45g, 48.8g and 52g) <i>N.B.: one air dry metric ton of this product contains on average 20.87 1000-m²</i>
Product unit:	1000 square metres [numbers in parantheses are for one air dry metric ton]
Production period:	October 01, 2000 - September 30, 2001
Mill location:	Pine Falls, Manitoba, Canada

Manufacturer

Company:	Tembec - Pine Falls Operations (website: www.tembec.ca)
Address:	Highway 11 and Mill Road, P.O. Box 10, Pine Falls, Manitoba R0E 1M0 Canada
Contact person:	Brian Kotak, Environment Director

Corporate Environmental Management Attributes²

Environmental management system	Tembec Pine Falls Operations' environmental management system has been registered against ISO 14001 under the Tembec corporate certificate since January 2001 (audited in September 2000 by Quality Management Institute Inc.). A key component of the EMS is the Tembec Impact Zero® Environmental Management Program.
Environmental/sustainable development report	An annual environmental performance report (including mill & woodlands activities, regulatory compliance, & improvement programs) is in planning stages. Performance is reported weekly in joint union/management meeting, monthly/quarterly to on-site & corporate management, by internal env. website for employees, and by newsletter/articles in local newspapers to stakeholders (including adjacent First Nations). Pine Falls also participates in: the Voluntary Challenge Registry (VCR), the National Pollutant Release Inventory (NPRI), the FPCA Industry Survey, Canada's EEM Program, and the PAPRICAN Annual Toxicity Survey.
Sustainable forest management system	The cornerstone of Pine Falls Operation's forest management system is Tembec's Forever Green® Forest Guiding Principles and Code of Practices (based on FSC Principles & Criteria). Forever Green® is implemented through an EMS that was audited (October 2000) and registered (January 2001) to ISO 14001. Applies to Forest Management License 01 (approximately 1,000,000 hectares in Eastern Manitoba). Pine Falls forestry operations are pursuing FSC certification.

Forestry Attributes of Raw Fibre Sources³

			Comments
Forest Land Managed by Company			
Public ownership	(% of total)	100	Forest Management License 01 is 100% Crown land. Located in eastern Manitoba with a total of 901,200 hectares (598,057 productive forest hectares, 255,860 non-productive hectares and 47,283 hectares water). Company quotas outside FML 01 are harvested as specified by in EMS on two Integrated Wood Supply Areas (IWSAs). The Province of Manitoba has primary management responsibility for these IWSAs.
Private ownership		0	
Forest Management Plans			
Type and term	Forest management plans are required by Manitoba Conservation and are for a 10-year term with an Annual Operating and Renewal Plan. Issues addressed by these plans include: pre-harvest surveying (all sites); harvesting (based on sustainable annual allowable cut (AAC) set by Manitoba Conservation); stream crossing; wildlife planning; road construction; non-timber values; reforestation (must meet Manitoba standards); and inclusion of EMS scope and direction. Integrated Wood Supply areas under planning responsibility of province, harvest planning specified in EMS.		
Public participation	Pine Falls Operations has a multi-stakeholder Sustainable Forest Management Advisory Committee that meets a minimum of 4 times per year to provide advise on forest management issues. Includes representatives from ENGOs, First Nations, local towns and communities, unions, recreational & outfitter groups, Province of Manitoba. Pine Falls also holds open houses for site-specific annual and long-term plans that are open to any interested party, and advertised and held in local communities. Pine Falls is currently developing a joint planning process with First Nations communities to address site-specific issues and economic opportunities.		
Non-timber values	Non-timber values accounted for in forest management planning. Includes: recreation (portages, campsites, trails); wildlife (co-operative wildlife management committees); biodiversity (developed local indicators); water quality (protection of water resources); aesthetics (buffering and garbage disposal); extraction of other resources (roads open to public unless directed by Manitoba Conservation); and culture/heritage (partner in First Nations land use study, archaeological modeling). Special projects include: Natural Disturbance Study with the Manitoba Model Forest and participation in multi-stakeholder Caribou Advisory Committee.		
Government approval required	Forest Management Plans (FMP) are for a 10-year term, require Manitoba Conservation (MC) Forestry Branch approval and must follow guidelines issued by MC. Plans require: Environmental License under the Manitoba Environment Act (administered by MC's Environmental Approvals Branch); Environmental Impact Statement (adheres to publicly vetted guidelines); and Clean Environment Commission public hearings (decided by MC). Result is Environmental License that is in force for plan term. Annual Operating and Renewal Plan follows MC guidelines, follows approved FMP, and is approved and permitted by MC Forestry Branch.		
Performance inspections/audits	Internal audits conducted under EMS procedures including comprehensive audits of every contractor up to 2 times annually. Local First Nations community invited to participate in audit finding meetings and receives a copy of the audit report. Inspections also conducted during operations. Road and watercourse crossing inspections conducted annually. Inspections of forest management activities conducted by MC Conservation Officers. Annual audits conducted by independent auditors for EMS's ISO 14001 certification.		
Forest Renewal/Regeneration			
Natural	(% of total)	60 - 65	Site preparation includes disc trenching, drag chains and alternative strip winter blading. Planting performed by hand by local contractors, and seeding is performed by helicopter.
Planted and/or seeded		35 - 40	
• native species		100	
• non-native species		0	

Resource Attributes

		Comments
Fibre Use		
Efficiency (ADMT fibre/product unit)	0.06 [1.31]	Pine Falls Operations has goals to maximize fibre use to 98% utilization of tree fibre by the end of 2005
Chemical oxygen demand (COD) ⁴ (kg COD/product unit)	1.52 [31.7]	Pine Falls Operations has goals to reduce COD emissions to 1937 kg/day (3.92 kg/tonne) by the end of 2005. Although not a regulated parameter, COD is measured to track the success of process improvements, for reporting to non-regulating agencies such as FPAC, and regional stakeholders.
Fibre content (% of total product weight)	100 [100]	
Non-fibre content	0 [0]	
Fibre Type		
Raw fibre (% of total fibre weight)	78.3 [78.3]	
• roundwood	52.4 [52.4]	
• chips	25.9 [25.9]	
Recovered fibre	21.7 [21.7]	
• planer shavings/sawdust	0 [0]	
• other pre-consumer	0 [0]	
• post-consumer	21.7 [21.7]	
Non-wood fibre	0 [0]	
Raw Fibre Source		
From land managed by company (% of total fibre weight)	100 [100]	
From other sources	0 [0]	
Under certified/registered forest management standard/program	100 [100]	These forest lands are publicly owned by the Province of Manitoba, and are managed by Pine Falls under Forest Management License 01. The forest management system was audited (October 2000) and registered (January 2001) to ISO 14001. Pine Falls forestry operations are pursuing FSC certification.
Energy Use		
Efficiency (GJ/product unit)	2.07 [43.10]	This include direct (used on-site at the mill) as well as indirect (off-site sawmill activities, off-site chemical manufacture, fuels to transport fibre sources to the mill) sources. Pine Falls Operations has goals to reduce energy consumption by 10% from 1996 values by the end of 2005.
Hydroelectric (% of total)	80.0 [80.0]	99.9% of Manitoba Hydro's electricity is generated by hydro sources.
Biomass	4.8 [4.8]	This includes burning wood wastes, bark and sludge in power boilers
Fossil fuels	15.2 [15.2]	This includes coal for the power boilers, on-site use of propane, diesel and gasoline, and fuels used to transport fibre to the mill
Nuclear	0 [0]	
Other sources	0 [0]	
Water Use		
Process water (m ³ /product unit)	2.77 [57.75]	Water is drawn from the Winnipeg River, and is regulated by Manitoba Conservation at 10,500,000 m ³ per year. Pine Falls Operations has goals to reduce water consumption to 30m ³ /tonne of newsprint by the end of 2005.
Cooling water	0.54 [11.19]	

Process Attributes

		Comments	
Liquid Effluent ⁵			
Sublethal toxicity (TER _{sub}) (units TER _{sub})	Ceriodaphnia 93.3 Fathead Minnows 127.6	Sublethal toxicity testing is required 2 times per year as required by the Environmental Effects Monitoring Program.	
Acute lethal toxicity (for rainbow trout and daphnia magna)	Trout 95% pass Daphnia magna 73% pass	Effluent is test for acute lethal toxicity on rainbow trout (20 tests with 19 passes and 1 failure), and daphnia magna (83 tests with 61 passes and 22 failures). Pine Falls has been working in collaboration with the Pulp and Paper Research Institute of Canada (PAPRICAN) to investigate the cause of periodic daphnia toxicity failures. This work is still in progress. Acute lethal toxicity testing of both rainbow trout and daphnia magna is permitted federally by Environment Canada and mortality must not be greater that 50%.	
Environmental Effects Monitoring ⁶	Cycle 1 & 2 complete Cycle 3 in progress	Participation in the Environmental Effects Monitoring Program is a regulatory requirement of Environment Canada. The EEM Program for the pulp and paper sector, unique to Canada, requires that mills conduct studies to determine environmental impacts of their effluent on the receiving environment. The purpose of Cycle 1 was to establish a baseline of data. The purpose of Cycle 2 was to determine the extent of potential impacts on the receiving environment. Cycle 3 (in progress) consists of a study design, in-situ testing with fish and invertebrate surveys and final data analysis. It will continue to build on the information acquired during Cycles 1 and 2.	
Biochemical oxygen demand (BOD) (kg BOD ₅ /product unit)	0.03 [0.68]	Daily composite samples collected 3 times per week and analyzed weekly by an outside laboratory. Permitted by Environment Canada at a daily limit of 6875 kg/day, and a monthly limit based on the reference production rate and number of days in the month (an average of 125,469 kg/month). Pine Falls Operations has goals to reduce BOD emissions to 182 kg/day (0.36 kg/tonne) by the end of 2005.	
Total suspended solids (TSS) (kg TSS/product unit)	0.07 [1.44]	Daily composite samples collected 7 times per week and analyzed each day in the Pine Falls laboratory. Permitted by Environment Canada at a daily limit of 10312 kg/day, and a monthly limit based on the reference production rate and the number of days in the month (an average of 188,203 kg/month). Pine Falls Operations has goals to reduce TSS emissions to 286 kg/day (0.58 kg/tonne) by the end of 2005.	
Polychlorinated dioxins (PCDD) and Polychlorinated furans (PCDF) (ppb 2,3,7,8-TCDD equiv./product unit) ⁷ (ppb 2,3,7,8-TCDF equiv./product unit) ⁷	- PCDD - PCDF	Pine Falls Operations is not required to test for PCDDs/PCDFs since no chlorine bleaching occurs. Therefore, no measurement data are available.	
Solid Waste			
Volume (m ³ /product unit)	0.017 [0.353]]		
Landfilled (% of total solid waste)	8.3 [8.3]	This includes on-site wastes that were landfilled (some waste bark, contraries from the de-inking plant and domestic garbage) as well as woodwaste landfilled by contributing off-site sawmills. The yard waste volumes were extrapolated from 4-months of actual data. Pine Falls Operations operates a landfill site under an Operating Permit from Manitoba Conservation. Permit requirements include carrying out ground and surface water monitoring programs, operating a leachate collection system and performing leachate analyses. Pine Falls Operations has goals to reduce the amount of waste sent to landfills by 75% by the end of 2005.	
Incinerated without energy recovery	13.3 [13.3]	This represents woodwastes burned without energy recovery at contributing sawmills. No wastes are burned without energy recovery at the mill.	
Diverted	78.4 [78.4]	This includes on-site wastes that were diverted (bark, sawdust and sludge that were burned as an energy source; and sludge that was used in land applications) as well as woodwaste diverted from contributing off-site sawmills.	
Air Emissions ⁸	Grid breakdown	Marginal fuel	Comments
Total reduced sulphur compounds (TRS) (kg TRS/product unit)	-	-	Pine Falls Operations is not required to test for this compound. Therefore, no measurement data are available
Total suspended particulates (TSP) (kg TSP/product unit)	0.68 [14.1]	0.68 [14.1]	Permitted by Manitoba Conservation at a limit of 0.90 g/m3 as combined emissions from the 4 power boilers. Under Tembec's Impact Zero Program, Pine Falls has a goal to reduce TSP emissions to 0.055 g/m ³ by 2005.
Global warming potential (kg CO ₂ equiv./product unit)	37.3 [779]	196.8 [4107]	"Grid breakdown" is based on actual energy sources. "Marginal fuel" is based on utilities fulfilling incremental energy demands with marginal fuels, which are generally fossil fuels in North America
Acidification potential (kg SO ₂ equiv./product unit)	0.51 [10.7]	1.28 [26.6]	"Grid breakdown" is based on actual energy sources. "Marginal fuel" is based on utilities fulfilling incremental energy demands with marginal fuels, which are generally fossil fuels in North America
• SO ₂ (kg/product unit)	0.37 [7.71]	Permitted by Manitoba Environment. Limits: 0.69 kg/106 kJ heat input; 2 kg/ADMt for combined emissions from SO ₂ absorption process & digester relief process; 5 kg/ADMt for digester blowing process; and 17.5 kg/ADMt for total mill emissions. Due to process changes at the mill, limits for SO2 absorption, digester relief & digester blowing processes are no longer applicable. Pine Falls Operations has goals to reduce SO ₂ emissions to 0.29 kg/tonne of newsprint by the end of 2005.	
• NO _x	0.21 [4.34]	Pine Falls Operations has goals to reduce NO _x emissions to 0.17 kg/tonne of newsprint by the end of 2005.	
Other Information			
Comments			
Adsorbable (total) organic halogens (AOX) ⁹ (kg AOX/product unit)	0.0002 [0.005]	Pine Falls Operations is not required to test for AOX since no chlorine bleaching occurs. Therefore, no measurement data are available. The values provided here are from off-site manufactured sources of kraft pulp used to make the newsprint.	


Verification

The Environmental Profile Program and its associated protocols have been developed under the auspices of the Canadian Pulp and Paper Association. This particular Environmental Profile Data Sheet (EPDS) has been prepared in accordance with the protocol as established by TerraChoice Environmental Services Inc. (TerraChoice) in its *EPDS User's Guide*. In calculating loadings, particular stressors and metrics were chosen to allow for the presentation of site-specific data. The data contained within this EPDS are based on annual values and thus represent average conditions that apply to the production of the product. The system boundary used in this quantification starts with cut wood and fibrous by-products from other related activities, and ends at the mill gate. This boundary includes the energy used for: the transportation and processing of all raw fibre, recovered fibre and non-wood fibre; the production of key bleaching chemicals; the on-site or off-site treatment of liquid effluent. It excludes the energy used for transportation of raw materials other than fibre to the mill, and any potential downstream effects after the product has left the mill.

This EPDS has been verified for accuracy and completeness pursuant to the EPDS User's Guide on February 5-7, 2002 by TerraChoice Environmental Services Inc. located at Suite 300, 2197 Riverside Drive, Ottawa, Ontario, K1H 7X3, CANADA (tel.: 613-247-1900).

Please address any enquiries, comments and/or concerns regarding this particular EPDS to TerraChoice.

EXPIRY DATE: June 15, 2003


John Polak, President
TerraChoice Environmental Services Inc.

Explanatory Footnotes

- 1 Reporting on additional environmental attributes may be required for some grades.
- 2 The first parameter in the *Corporate Environmental Management Attributes* section ("Environmental management system") applies exclusively to the specific mill, whereas the two other parameters ("Environmental / sustainable development report" and "Sustainable forest management system") can apply to all of the company's operations.
- 3 Forest management practices encompass a wide range of complex issues. While not all of these issues have been listed in the *Forestry Attributes of Raw Fibre Sources* section, the EPDS does address those for which meaningful data are available, and for which customer and general public concern has been expressed. It is also important to note that many companies are currently at various stages of pursuing forest management certification which deal with this broader complexity of issues. Although the effects of forest management practices are best evaluated on a long term basis, data have only been given for the stated annual production period in order to be consistent with other reported data.
- 4 Levels of COD in the treated effluent can be considered an indicator of slowly degradable and non-biodegradable organic matter, and of possible long term oxygen demand. This matter consists primarily of those organic materials removed from wood in the pulping process, since other organics are usually removed by primary and secondary treatment. Therefore, the amount of COD present in treated effluent is a measure of the poorly degraded compounds which are discharged, and in the case of kraft production, a measure of the efficiency and effectiveness of chemical recovery. For this reason, COD is being used as a measure of fibre efficiency, and is listed in the *Fibre Use* section of the EPDS.
- 5 The first three *Liquid Effluent* parameters ("Sublethal toxicity", "Acute lethal toxicity" and "Environmental effects monitoring") apply to the entire mill operation and, therefore, are not product specific.
- 6 Canadian mills are required to provide a report and supporting data to Environment Canada in accordance with the *Environmental Effects Monitoring Program*. The objective of this program is to allow Environment Canada to assess the adequacy of the federal *Pulp and Paper Effluent Regulations* for protecting fish, fish habitat and the use of fish resources based on the magnitude and spatial effects (if any) in receiving waters. Where effects are demonstrated, Environment Canada can apply more stringent regulations.
- 7 "ppb" means parts per billion (10^{-9}). This is equivalent to micrograms per litre.
- 8 The *Air Emissions* parameters have been calculated using two methodologies. The first is based on the breakdown of energy sources (as provided for the *Energy Use* parameter in the *Resource Attributes* section) including the average fuel ratio used to supply the electricity grid which provides electricity to the mill. The second is the marginal fuel approach. To supply electricity in Canada, utilities use either hydroelectric or nuclear facilities operating at the maximum required rate. To fulfill any incremental or marginal needs, as may be required by pulp and paper production, the utilities generally use fossil fuels. Therefore, these air emission calculations have been based upon the use of this marginal fuel as the energy source. This marginal fuel approach is recommended for internal mill use by the Canadian Standards Association's final draft standard *Guideline for Life Cycle Impact Assessment: Pulp and Paper Production Phase* (CAN/CSA-Z810-96) dated July 1996.
- 9 There is general consensus among scientists that AOX is not correlated to persistency, bioaccumulation or toxicity at levels below 2.0 kg per tonne (see listed references). Environment Canada considered and rejected an AOX regulation. [References: (1) J. Carey, and P. Hodson; "Recent Canadian Studies on the Physiological Effects of Pulp Mill Effluents on Fish," Environment Canada, *Green Plan*, 1990. (2) C.W. Dence, D.W. Reeve, eds.; *Pulp Bleaching - Principles and Practice* (Atlanta: TAPPI Press, 1996), Chapter 2 of Section VIII, "Assessing the Potential Impacts of Pulping and Bleaching Operations on the Aquatic Environment," by J.W. Owens, K-J Lehtinen, 778. (3) K-J. Lehtinen, et al; "Characterization of pulp mill effluents by the model ecosystem technique, SSVL - investigations in the period 1982-1990," *Nordic Pulp and Paper Research Journal*, no. 2/1991: 81-88.]