

Regulation of Pulp and Paper Mills in Alberta - Wastewater

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- ◆ **Background**
 - ◆ Pulp and Paper Mills in Alberta
 - ◆ **New Wastewater Standards**
 - ◆ Basis
 - ◆ Comparison
 - ◆ **“Systems Approach” - Shared Governance**
 - ◆ Impact to industry
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- ◆ **Two types of pulp mills in Alberta:**
 - **Kraft Mills**
 - **Four kraft mills in Alberta**
 - **Use chlorine agents for bleaching (ClO_2)**
 - **Mechanical Mills**
 - **Three mechanical mills in Alberta**
 - **Two use hydrogen peroxide based process (CTMP)**
 - **One TMP newsprint uses chlorine-free bleaching agents, also referred to as brightening agents**
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- ◆ **First mill began operation in 1957: Weldwood (kraft)**
 - ◆ Located in Hinton on the Athabasca River
 - ◆ **Second mill built in 1973: Weyerhaeuser (Kraft)**
 - ◆ Located in Grande Prairie on the Wapiti River
 - ◆ **5 new mills began operation from 1988-1993**
 - ◆ Three CTMP and one Kraft on the Athabasca
 - ◆ One kraft on the Peace
 - ◆ Pulp production grew from less than 1500 tonnes/day at the end of 1987 to over 6000 tonnes/day by the end of 1993
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Athabasca Basin Mills

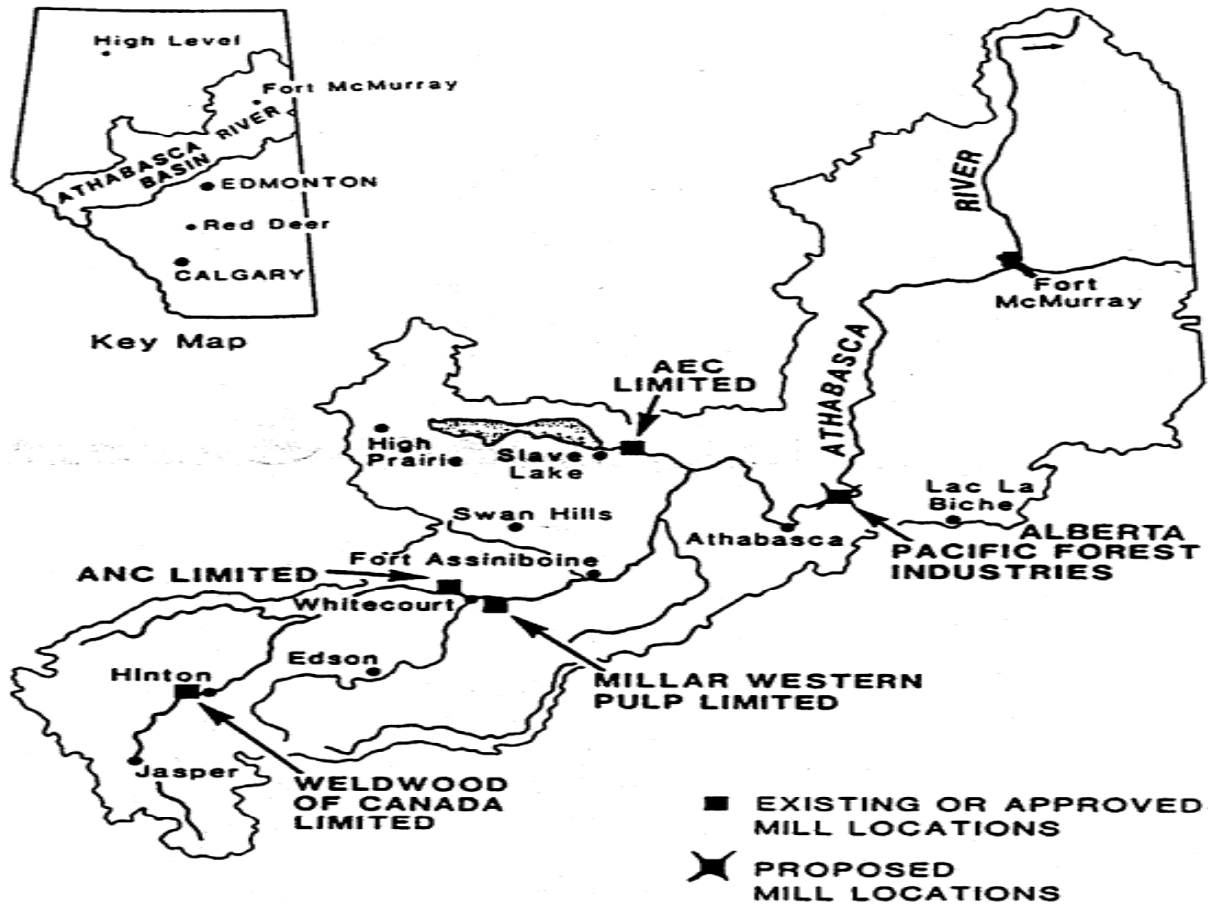


Figure 1. Pulp Mill Locations Athabasca River Basin

AENV Pulp Mill Standards – pre-BATEA (Monthly Average Daily Discharges)

Parameter	Kraft Mills (kg/ADMT)	CTMP Mills (kg/ADMT)
BOD₅	1.5, 3.0	3.0
TSS	3.0, 5.0	5.0
AOX	0.55-1.5	N/A
Colour	55 - 90	36, 45

*ADMT = Air dried metric tonnes

- ◆ Pulp mill approval renewals over the next few years (2004-2008).
 - ◆ Wastewater releases identified as area of highest concern for AENV
 - ◆ Some water quality concerns (D.O., nutrients, benthic, colour).
 - ◆ Current wastewater release standards developed about 15 years ago.
 - ◆ Outcome expected from review is resolution to water quality issues and a path forward on continuous improvement (water quality and standards).
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- ◆ **Review wastewater releases in context of AENV *Industrial Release Limits Policy*.**
 - ◆ More stringent of Technology vs Water Quality
 - ◆ **Review water quality based standards under new D.O. 6.5 mg/L chronic criteria, current actual load and allowable load.**
 - ◆ Continue University of Alberta work to review D.O. for the Athabasca River.
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- ◆ **Comparison of AENV's pulp mill technology, performance, and standards with other jurisdictions**
 - ◆ **Compare with Canada's federal standards, other provinces, USEPA, and Europe**
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Current Alberta Levels of Performance (2003)

	Flow m ³ /Adt	BOD ₅ kg/Adt	TSS kg/Adt	AOX kg/Adt	Type of Wastewater Treatment
Weldwood	89.7	2.3	3.6	0.22	Aerated stabilization basin with 5.5 days design retention time
Alberta Pacific	44.9	0.2	0.8	0.04	Activated sludge with about 40 h retention time
Weyerhaeuser	59.1	1.2	1.8	0.26	Aerated stabilization basin with 14 days design retention time
Daishowa	49.4	0.3	1.7	0.07	Aerated stabilization basin with 10 days design retention time
Slave Lake Pulp	16.9	0.8	1.9	-	Activated sludge bioreactors
Millar Western	16.8	0.4	0.8	-	Aerated basin
ANC	24.5	0.1	0.5	-	Activated sludge

Summary of Kraft Pulp Mills (2003)

Monthly Averages (Unless otherwise specified)				
 Alberta Environment	Flow m ³ /Adt	BOD ₅ kg/Adt	TSS kg/Adt	AOX kg/Adt
Europe (Annual avg)	30-50	0.3-1.5	0.6-1.5	<0.25
USEPA		2.41	3.86	0.272
Canada		7.5	11.5	-
Alberta		1.5-3.0	3.0-5.0	0.55-1.5
Quebec		2.5	3.0	0.25
Ontario		5.0	7.8	0.8
BC		7.5	11.25	0.6
Actual Performance Levels From Alberta Kraft Mills For 2002 (Annual Average)				
Weldwood	99.5	2.4	3.2	0.23
Alberta Pacific	42.5	0.2	1.1	0.05
Weyerhaeuser	61.9	1.2	2.0	0.29
Daishowa	50.5	0.6	2.1	0.11

Summary of Mechanical Pulp Mills (2003)



Environment Monthly Averages (Unless otherwise specified)

	Flow m ³ /Adt	BOD ₅ kg/Adt	TSS kg/Adt
Europe: CTMP (Annual avg)	15-20	0.5-1.0	0.5-1.0
Europe: TMP Newsprint (Annual avg)	12-20	0.2-0.5	0.2-0.5
USEPA: CTMP		2.5	4.6
USEPA: TMP Newsprint		2.5	3.8
Actual Performance Levels From Alberta Mechanical Mills For 2002 (Annual Averages)			
Slave Lake Pulp	17.8	1.1	1.6
Millar Western	17.6	0.7	1.3
ANC	25.0	0.1	0.5

- ◆ **Preparation of new standards document:**
 - ◆ *TECHNOLOGY BASED STANDARDS FOR PULP AND PAPER MILL WASTEWATER RELEASES, April 2005*
 - ◆ *<http://environment.gov.ab.ca/info/library/7543.pdf>*
 - ◆ **Sets requirements for any proposed new mill and promotes improvement for some existing mills**
 - ◆ **Water Quality limits will prevail over Technology limits where determined to be necessary**
 - ◆ **Standards are based on BATEA and are emission intensity based:**
 - ◆ **Limits set based on Reference Production Rate**
 - ◆ **Alberta Pulp and Paper Mills among the best performing in the world.**
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Substance	Pulp Mills Technology Pre 1992		Pulp Mills Technology after 1992 (Includes New and Modified mills)	
	Monthly Average Daily ⁽ⁱ⁾ (kg/ADt)	Maximum Daily ⁽ⁱⁱ⁾ (kg/ADt)	Monthly Average Daily (kg/ADt)	Maximum Daily (kg/ADt)
BOD₅	2.5	5.0	1.5	3.0
TSS	4.0	8.0	3.0	6.0
AOX (Kraft Mills only)	0.5	1.0	0.5	1.0
Colour	See section 3.4 on application			
Dioxins & Furans (Kraft Mills only)	Non-measurable (see Table 8)		Non-measurable (see Table 8)	
Acute Toxicity	>=50% trout survival in 100% concentration test sample			



Systems Approach

- ◆ **Economic and population growth**
 - ◆ **Complexity of environmental issues**
 - ◆ **Rising public expectations**
 - ◆ **In ability to control environmental outcomes (i.e. non-point sources, agriculture)**
 - ◆ **“Traditional” systems no longer sufficient**
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Elements of New Regulatory Framework

- ◆ **Systems approach**
 - ◆ **Outcomes focused**
 - ◆ **Integrated policy**
 - ◆ **Delivery - options**
 - ◆ **Performance assessment**
 - ◆ **Integrated information systems – in support of the above areas**
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Systems Approach to Managing

- ◆ **Builds on “traditional” regulation, but integrates a more comprehensive approach.**
 - ◆ **Outcome and performance driven - policies, standards – delivery – monitoring and evaluation – continuous improvement**
 - ◆ **AENV - coordinator of environmental management and protection.**
 - ◆ **Result is to streamline the regulatory process and introduce a more shared governance approach to achieving outcomes in Alberta.**
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Impact on Pulp and Paper Sector

- ◆ **Unique opportunity with Alberta pulp and paper sector to look at more flexible options for regulation given their superior environmental performance.**
 - ◆ **Industry and stakeholders work to achieve environmental outcomes (through watershed and airshed groups).**
 - ◆ **Placed based approach to deal with environmental concerns (i.e. water quality in the Athabasca River).**
 - ◆ **Expect continuous improvement of standards and watershed performance.**
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Environmental Outcomes

- ◆ **Healthy aquatic ecosystems**
 - ◆ **Safe, reliable water supplies**
 - ◆ **Safe drinking water**
 - ◆ **Clean air remains clean**
 - ◆ **Sustainable land management**
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Environmental Policies

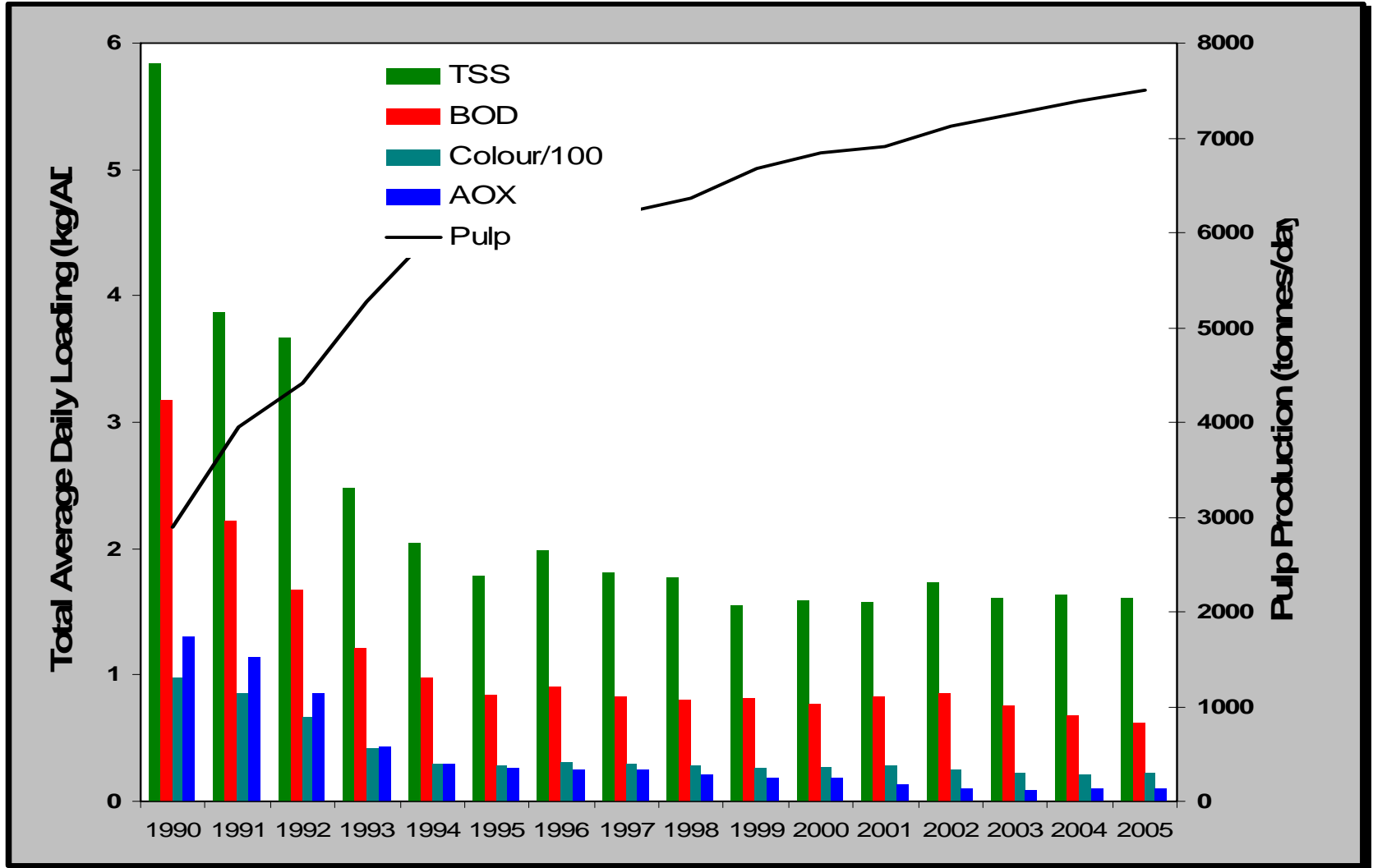
- ◆ **Ambient air quality guidelines**
 - ◆ **Surface quality guidelines**
 - ◆ **Land reclamation and remediation guidelines**
 - ◆ **Groundwater quality protection**
 - ◆ **Water supply objectives**
 - ◆ **Wastewater management (standards)**
 - ◆ **Chemical and material storage**
 - ◆ **Waste management and disposal**
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Options:

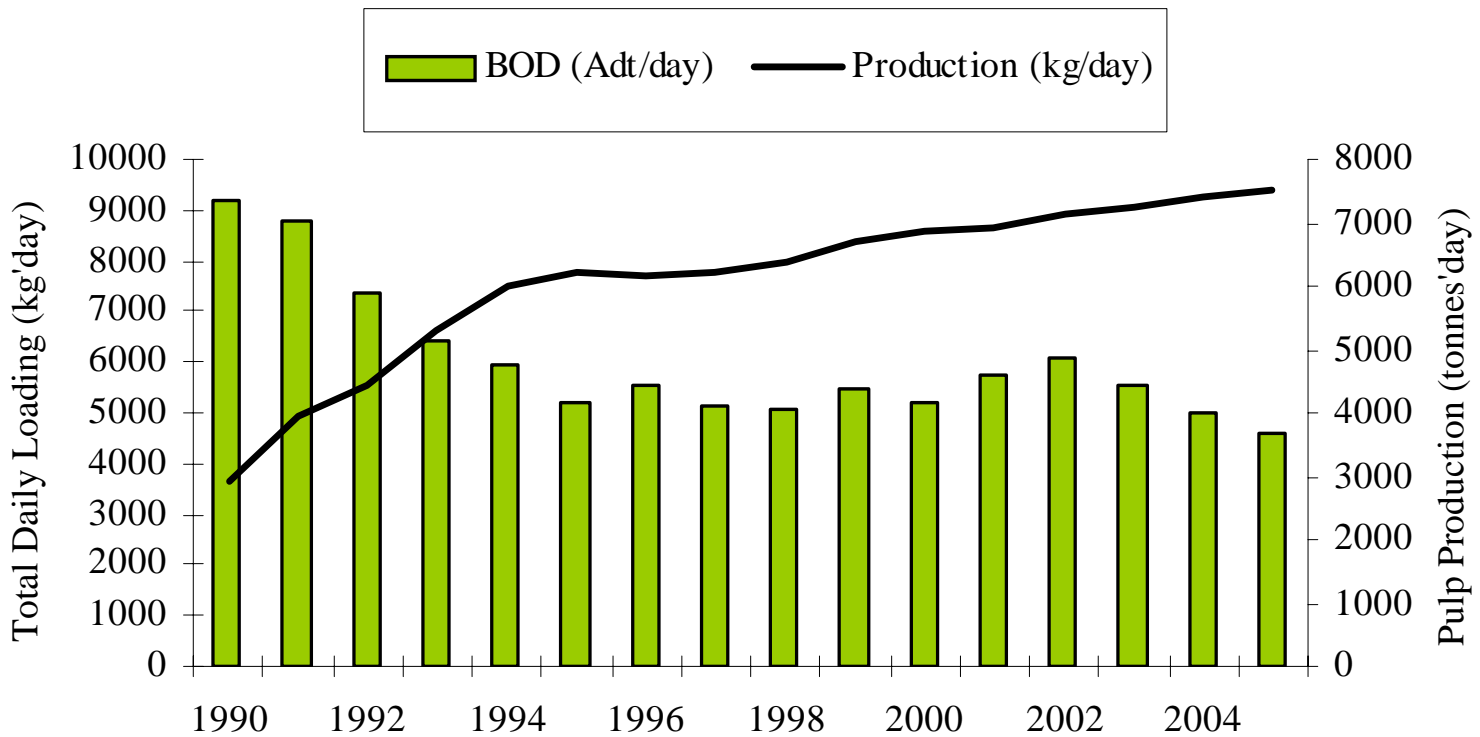
- ◆ **Current – Direct regulation through EIAs and Approvals**
 - ◆ **Single sector regulator**
 - ◆ **Designated Administrative Authority – watershed groups or industry association**
 - ◆ **Shorter approval with some requirements such as monitoring and reporting assigned to outside agency**
 - ◆ **Decision makers must consider and integrate environmental outcomes and policies in decisions.**
 - ◆ **Reporting, inspection and compliance includes review of regional environmental performance as related to outcomes and policies.**
 - ◆ **Government responsible to build capacity – Science, expert analysis and advice needed for decision-makers.**
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- ◆ **Water Quality monitoring of receiving waters.**
 - ◆ **An annual update of how each pulp mill is performing in comparison to its regulated limits.**
 - ◆ **Possible monitoring and reporting done by external agency.**
 - ◆ **Only BOD₅ is currently used for AENV annual report.**
 - ◆ **This measure is one indicator of AENV's performance in protecting aquatic ecosystems.**
 - ◆ **The target of this measure is to show continual improvement in technology performance.**
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Alberta Pulp Mill Performance 1990-2005



Effluent Discharges from all Alberta Pulp Mills, 1990-2005



- ◆ **Charts show continual improvement up to 1995, steady level since then.**
 - ◆ Minor fluctuations due to production changes and nutrient use within treatment systems
 - ◆ **Well performing industry that has continually improved environmental performance.**
 - ◆ **Continue to review more effective ways to regulate sector.**
 - ◆ Opportunity to look at non-regulatory management options for the sector regulator.
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- ◆ **Clearly defined roles and responsibilities for achieving outcomes**
 - ◆ **GOA remains overall accountable for environment**
 - ◆ However, now there is shared accountability at local levels
 - ◆ AENV roles are to build local capacity, guide policy, and facilitate achievement of outcomes
 - ◆ **Process driven by:**
 - ◆ Clear, concrete environmental outcomes, policy, and performance measures
 - ◆ **Science to ensure sound understanding of**
 - ◆ Environment (watershed, airshed, landscape)
 - ◆ Environmental management systems
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Questions?

