
Pulp Mills and the Environment:
An Annotated Bibliography for Northern Alberta

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May 1992

Published jointly by

Athabasca University
Athabasca, Alberta

Canadian Circumpolar Institute
University of Alberta, Edmonton, Alberta
Environmental Research and Study Centre
University of Alberta, Edmonton, Alberta

Canadian Cataloguing in Publication Data

Holmberg, Robert George.

Pulp mills and the environment.

ISBN 0-919737-06-4

I. Wood-pulp industry—Environmental aspects—Alberta—Bibliography. 2. Paper mills—Environmental aspects—Alberta—Bibliography. I. Athabasca University. II. Canadian Circumpolar Institute. III. University of Alberta. Environmental Research and Study Centre. IV. Title.

Z7914.P2H64 1992 016.676'042 C92-091365-2 .

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Printed in Canada

Introduction

The following is an annotated list of books, technical reports and periodical articles related to the development and operation of pulp and paper mills in northern Alberta. The purpose of this work is to encourage members of the public to learn about these industries and their effects on the environment. I hope that readers of the materials listed in this bibliography will become better informed and will help influence the decisions being made in these industrial developments.

The nearly 350 references are grouped into 16 categories. The categories and the items in each category are listed alphabetically. Each category has some very general as well as some very technical materials. Hence, readers should be able to find something at an introductory level before they attempt to read the more complex materials. As some materials may fit into more than one of the categories, the titles of some categories include references to other categories. Some materials on pesticides and heavy metals (such as mercury) are included because their behaviour in ecosystems is similar to some waste chemicals of pulp and paper mills.

Air Pollution	air quality around pulp mills, and general measurement and abatement techniques
Chemistry	introductory as well as very technical materials
Economics	environmental, community and industrial
Environment	general materials
Environmental Impact Assessments	procedures, examples and suggestions about how to improve the process
Fish Toxicology	studies on effluent effects on fish
Forestry	caring for forests and planting trees
Human Health	worker and resident health aspects of environmental pollution
Legal	legal requirements and procedures
Logging	tree cutting and related regulations
Monitoring	monitoring mills and their effluents
Planning	for the future, including accidents
Pulp and Paper Mills	general aspects of design and operation
Waste Management	techniques and problems
Water Pollution	effluent problems and solutions
Water: Rivers and Lakes	quality and management

Most of the materials listed were published after 1980. At least 90% of the materials are available in each of the following three libraries. All are available in at least one of these libraries.

Alberta Environment Library	Athabasca University Library	Cameron Library
14th Floor, Oxbridge Place	Athabasca University	University of Alberta
9820 106 Street	Athabasca, Alberta	Edmonton, Alberta
Edmonton, Alberta	T0G 2R0	T6G 2J8
T5K 2J6	[Telephone: (403) 675-6254]	[Telephone: (403) 492-4174]
[Telephone: (403) 427-5870]		

For legal materials, readers could also consult the library at the:
Environmental Law Centre
201 10350 124 Street
Edmonton, Alberta
T5N 3V9
[Telephone: (403) 482-4891]

Government publications are often available both as paper materials as well as on microfiche (photographs condensed onto film that are read on a special reader). Microfiche materials are indicated by their MICROLOG numbers.

Acknowledgements

This bibliography was compiled from computer searches of the Scitech Database (based on three Alberta Government Libraries: Alberta Environment, Alberta Agriculture and Alberta Research Council) and the holdings of the libraries of Athabasca University and the Environmental Law Centre.

I thank the many people, especially the staffs of the libraries mentioned above and members of Friends of the Athabasca Environmental Association, who contributed considerable time and effort to help make this information available to the public.

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May 11, 1992

Air Pollution (see also Waste Management)

- Bell, R.W. and D.J. Ogner. *Ambient Air Quality Survey in the Vicinity of Great Lakes Forest Products Limited, Dryden, Ontario*. Technical Memorandum, Air Quality and Meteorology Section, Air Resources Branch, January 1986. Prepared for Northwestern Region, Ontario Ministry of the Environment. MICROLOG 87-02538, 2 fiche
- Gases from the lagoon included reduced sulphur compounds and hydrocarbons (e.g. para-cymene, chloroform).
- Calvert, Seymour and Harold M. Englund, editors. *Handbook of Air Pollution Technology*. New York: John Wiley and Sons, 1984.
- A technical manual including affects on plants, control of gases and particulates, and source control for pulp mills.
- Davison, D.S. et al. *Airshed Management System for the Alberta Oil Sands. Volume I: A Gaussian Frequency Distribution Model. Volume II: Meteorological Data. Volume III: Verification and Sensitivity Studies*. Edmonton: Alberta Environment, 1981.
- Prepared by Intera Environmental Consultants and Western Research and Development Ltd. for Research Management Division of Alberta Environment.
- Alberta Oil Sands Environmental Research Program (AOSERP) Reports 119, 120 and 124.
- An air quality model that uses three components: a time series file of meteorological data, a program that estimates ground level concentrations, and a frequency analysis program to allow examination of various scenarios.
- Douglas, G.W. and A.C. Skorepa. *Monitoring Air Quality with Lichen: A Feasibility Study*. [Edmonton]: Syncrude Canada, 1976.
- Some lichens (each a combination of a fungus and an alga) are very sensitive to air pollution. This study set up a permanent set of monitoring plots. During the study, 79 species were found in the Fort McMurray area.
- Henderson-Sellers, B. *Pollution of Our Atmosphere*. Bristol: Adam Hilger Ltd., 1984.
- A technical introduction to air pollution.
- Hilborn, J. and M. Still. *Canadian Perspectives on Air Pollution. A State of the Environment Report*. Ottawa: Environment Canada, 1990. Catalogue No. EN1-11/90-1E.
- A layperson's introduction to origins, effects, kinds, approaches to study, importance, and responsibility for air pollution.
- Jim Lore and Associates Ltd. *A General Literature Review Concerning Atmospheric Emissions of SO₂ and H₂S on Animal Health*. Calgary: Jim Lore and Associates, 1989.
- Prepared for Beal Associates Consulting.
- This report was prepared on the effects of these air pollutants on mammalian livestock and wildlife.
- Keith, Lawrence H., editor. *Identification and Analysis of Organic Pollutants in Air*. Boston: Butterworth Publishers, 1984.
- Includes sampling, analytical techniques, environmental analyses, and emissions from combustion sources.
- Racette, D.J. *Dustfall and Snow Sampling in the Vicinity of James River-Marathon Limited, Marathon, 1985-86*. Toronto: Ontario Ministry of Environment, Northwestern Section, Technical Support Section, 1987. MICROLOG 87-06350, 1 fiche
- A short study on wood fibers blown from chip piles into a near-by residential area.
- Smith, William H. *Air Pollution and Forests: Interaction Between Air Contaminants and Forest Ecosystems*, 2nd edition. New York: Springer-Verlag, 1990.
- Comprehensive treatment of how air pollutants affect forest health.
- Stern, Arthur, C., Richard W. Boubel, D. Bruce Turner and Donald L. Fox. *Fundamentals of Air Pollution*, second edition. Toronto: Academic Press, 1984.
- An introduction to air pollutants, effects of air pollution, measurement of air pollution, meteorology, regulations and control of air pollutants.

Strauss, W. and S. J. Mainwaring. *Air Pollution*. London: Edward Arnold, 1984.

A short introduction to air pollution.

Toole, Gary, Director. *Trouble in the Forest*. National Film Board of Canada, 1991.

This videotape describes the relationship between air pollution and the decline of forests in eastern North America. From the *Nature of Things* Series with David Suzuki.

Chemistry (see also Waste Management)

Crone, Hugh D. *Chemicals and Society: A Guide to the New Chemical Age*. New York: Cambridge University, 1986.

A compact introduction to chemistry for the layperson.

Hawley, Gessner, G. *The Condensed Chemical Dictionary*, 9th edition. New York: Van Nostrand Reinhold, 1977.

A help for chemical compounds and terms.

Levin, Simon A. and Kenneth D. Kimball, editors. *New Perspectives in Ecotoxicology*. Environmental Management, volume 8, number 5, pages 375-442, September 1984.

A special issue of this periodical on the effects of toxic chemicals on ecosystems.

National Council of the Paper Industry for Air and Stream Improvement. *Procedures for the Analysis of Resin and Fatty Acids in Pulp Mill Effluents*. New York: the Council, August 1986.

Also as the Council's Technical Bulletin 501.

Not seen.

O'Neill, Peter. *Environmental Chemistry*. London: George Allen and Unwin, 1985.

An introduction to the major earth elements and their interactions with other elements and with living things.

Ramamoorthy, S. *Mercury Analysis in Environmental Samples*. Vegreville, Alberta: Alberta Environmental Centre, 1982. AECV82-M2.

An example of a protocol for taking and analyzing samples.

Ramamoorthy, Sita and James W. Moore. *Chemical Agents of Environmental Concern in Alberta Waters: A Bibliography. Part I: Organic Compounds*. Vegreville, Alberta: Alberta Environmental Centre, 1982. AECV82-B1.

A bibliography of 1300 citations on organic compounds of potential concern.

Ramamoorthy, Sita and James W. Moore. *Chemical Agents of Environmental Concern in Alberta Waters: A Bibliography. Part II: Mercury and Cadmium*. Vegreville, Alberta: Alberta Environmental Centre, 1983. AECV83-B1.

A bibliography of 1100 citations on these two heavy metals.

Sittig, Marshall. *Handbook of Toxic and Hazardous Chemicals*. Park Ridge, New Jersey: Noyes Publications, 1981.

Gives information on chemical names, formulas, synonyms, exposure limits (for the USA), harmful effects and symptoms, etc. for thousands of compounds.

Wardrop, W. L. and Associates Limited. *Poplar Chemical Process Development and Demonstration Facility*. Edmonton: W.L. Wardrop and Associates, 1982.

Prepared for Alberta Energy and Natural Resources.

Potentials for extraction of various chemicals (rather than pulp) from poplar trees. Perhaps some of the byproducts of pulp mills could be used for manufacture of useful chemicals?

Windholz, Martha, Susan Budavari, Rosemary F. Blumetti and Elizabeth S. Otterbein, editors. *The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals*, 10th edition. Rathway, New Jersey: Merck and Co., 1983.

The chemist's "Bible" for finding out basic information on chemicals.

Economics

Anderson, F.J., N.C. Bonsor et al. *The Economic Future of the Forest Products Industry in Northern Ontario*. Thunder Bay: Royal Commission on the Northern Environment, 1981.

Prepared for the Royal Commission on the Northern Environment by Lakehead University.

MICROLOG 83-0302, 3 fiche

Covers North American locational trends, markets and prices, manufacturing costs, wood supplies, and economic prospects.

Beak Consultants Ltd. *Estimate of Costs for Water Pollution Control Measures in the Pulp and Paper Industry*. Ottawa: Water Pollution Control Directorate, 1977.

Dated but covers some of the things to be considered.

Beck, James A. Jr., Richard G. Anderson, Glen W. Armstrong and Glenn H. Farrow. *Alberta Economic Timber Supply Analysis*. Edmonton: Northern Forestry Centre, Canadian Forestry Service, 1988 (revised).

An economic timber supply model including: delivered wood cost model, geographically-referenced forest inventory and harvest scheduling model.

Bormann, F. Herbert and Stephen R. Kellert, editors. *Ecology, Economics, Ethics: The Broken Circle*. New Haven: Yale University Press, 1991.

Includes chapters on: species diversity and extinction, modern agriculture, environmental values, pollution and waste, and market mechanisms.

Canadian Council on Rural Development. *The Relationship of Canada's Forests to Rural Employment and Community Stability*. Ottawa: Canadian Council on Rural Development, 1978.

An old look at how forestry contributes to rural employment across Canada.

Carroll-Hatch (International) Limited. *Market Assessment for Poplar Products*. Vancouver: Carroll-Hatch (International) Limited,

Consulting Engineers, July 1983, 3 volumes. Prepared for Governments of Canada, Alberta, British Columbia.

MICROLOG 84-0790, 7 fiche

Examined: selected pulp and paper products, wood chips, pulpwood, fiber-board, particle-board, wafer-board, hard-board, veneer and plywood, lumber, energy, chemicals and animal feed for markets in North America, Europe, and Asia.

Coban Institute. *Costs of Harvesting Aspen Stands for Energy Production*. Edmonton: Coban Institute, 1981.

ENFOR Project P-163.

MICROLOG 83-2336, 1 fiche

ENFOR is an acronym for ENergy from the FORest, a program for renewable energy production from biomass. Based on work done in 1977, it was concluded that wood chips would be competitive with natural gas until 1983. The research found that felling and skidding costs were higher for aspen cut by chain saw rather than a mechanical cutter.

Daly, Herman E. *Economics, Ecology, Ethics: Essays Toward a Steady-State Economy*. San Francisco: W.H. Freeman, 1980.

Twenty-two essays.

Daly, Herman E. *Steady State Economics*. Covelo, California: Island Press, 1991.

Dealing with non-growth.

Daly, Herman E. and John B. Cobb Jr. *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*. Boston: Beacon Press, 1989.

Rethinking economics and economic policies for the United States.

Decker, Daniel J. and Gary R. Goff, editors. *Valuing Wildlife: Economic and Social Perspectives*. Boulder, Colorado: Westview Press, 1987.

A broad view of wildlife's worth.

Dykeman, Floyd W., editor. *Entrepreneurial and Sustainable Rural Communities*. Sackville, New Brunswick: Department of Geography, Mount Allison University, 1990.

Sixteen papers on the economics of small towns and rural areas including discussions on

- linking theory and action, community adaptation and innovation, and support systems for development.
- Economics Branch, Canadian Forestry Service. *Selected Forestry Statistics*. Ottawa: Canadian Forestry Service, 1986. Cat. No. Fo29-7/37E.
- One hundred tables and many figures broken down by province and region. Statistics on forestry resources and management activities, production, export, employment and prices in Canada as well as some information on world trade.
- Ekono Consulting Ltd. *Study of Chemithermomechanical Pulp (CTMP) Production Potential for Alberta*. Edmonton: Canadian Forestry Service, Northern Forestry Center and Department of Forestry, Alberta Forestry, Lands and Wildlife, 1986.
- Not seen.
- Jacobs, Peter and Barry Sadler. *Sustainable Development and Environmental Assessment: Perspectives on Planning for a Common Future*. Hull, Quebec: Canadian Environmental Assessment Research Council (CEARC), [1990?].
- Ideas from round table discussions held in 1987.
- Keating, Michael. *Toward a Common Future. A Report on Sustainable Development and its Implications for Canada*. Canada: Environment Canada, 1989. DSS cat. no. En 21-83/1989E.
- A short (47 pages) introduction to the environmental problems facing Canada and some suggested solutions.
- Nikiforuk, Andrew and Ed Struzik. *The Great Forest Sell-off*. The Globe and Mail Report on Business Magazine, volume 6, number 5, pages 57-59, 61, 63-65, 67, 68, November 1989.
- On overview of forest projects in northern Alberta.
- Nystrom, Lee, Kobayashi and Associates. *Training Needs Associated with Major Forest Projects in Alberta*. Vancouver: The company, April 1988.
- Not seen.
- Pearce, David, Anil Markandya and Edward B. Barbier. *Blueprint for a Green Economy*. London: Earthscan, 1989.
- The authors are from the London Environmental Economics Centre and prepared this information for the U.K. Department of the Environment. The book covers sustainable development, including environmental costs in calculating total economic value, discounting the future, and incentives for environmental improvements.
- Phillips, W., D. DePape and L. Ewanyk. *A Socioeconomic Evaluation of the Recreational Use of Fish and Wildlife Resources in Alberta, with Particular Reference to the AOSERP Study Area. Volume I: Summary and Conclusions*. Edmonton: Alberta Environment and Environment Canada, 1978. Alberta Oil Sands Environmental Research Program Report 43, Project TF 6.1.
- In 1975-76 at least \$608,000 was spent in the Fort McMurray area on consumptive and non-consumptive use of fish and vertebrate wildlife. This estimate excludes non-Albertans, commercial and non-recreational uses of these animals.
- Prescott-Allen, Christine and Robert Prescott-Allen. *The First Resource: Wild Species in the North American Economy*. New Haven: Yale University Press, 1986.
- Economic values of wildlife, logs, fish, trapping and collecting, medicines, food and industrial products, new domesticated organisms, genetic resources, pollination, pest control and recreation.
- Wengert, Eugene M. *Utilization and Marketing Opportunities for Alberta Aspen Solid Wood Products*. Edmonton: Forestry Canada and Alberta Forestry, Lands and Wildlife, 1988. Catalogue No. FO 42-91/46-1988E.
- Potentials for other uses of aspen besides pulp: veneer and plywood, furniture blanks and parts, pallet stock, animal bedding, etc.

Environment (general)

Blaikie, Piers and Harold Brookfield. *Land Degradation and Society*. London: Methuen, 1987.

The history and cost of land degradation with examples from around the world.

Canadian Environmental Network. *The Green List: A Guide to Canadian Environmental Organizations and Agencies*. Ottawa: Canadian Environmental Network (Box 1289, Station B, K1P 5R3), 1991.

Names, addresses, telephone numbers, mandates, publications and periodicals.

Dahlberg, Kenneth A., Marvin S. Soroos, Anne Thompson Feraru, James E. Hart and B. Thomas Trout. *Environment and the Global Arena: Actors, Values, Policies, and Futures*. Durham, N.C.: Duke University Press, 1985.

A series of essays from a world perspective.

Forman, Richard T and Michael Godron. *Landscape Ecology*. New York: John Wiley and Sons, 1986.

Structure, dynamics, heterogeneity and management of landscapes.

Friends of the Athabasca Environmental Association. *The FOTA Files: Pulp Mill Pollution and Politics 1988-1991*. Athabasca, Alberta: FOTA, 1991.

A collection of letters and papers written by members of the association about pulp mill developments on the Athabasca River.

International Union for Conservation of Nature and Natural Resources (IUCN). *World Conservation Strategy: Living Resource Conservation for Sustainable Development*. Gland, Switzerland: IUCN, 1980.

Prepared with the United Nations Environment Programme (UNEP), World Wildlife Fund (WWF), Food and Agricultural Organization of the United Nations (FAO), and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Gives a set of objectives and priorities for national and international action.

Kormondy, Edward J. *Concepts of Ecology*, 3rd Edition. Englewood Cliffs, New Jersey: Prentice-Hall, 1984.

A short, general introduction to ecology.

Macintosh, Rob, editor. *The Alberta Environmental Directory, Third Edition: An Annotated Guide to Alberta's Environmental Organizations and Agencies*. Drayton Valley, Alberta: Pembina Institute (Box 7558, T0E 0M0), August 1989.

This lists the names, addresses, contact persons, and brief description of over 200 organizations and agencies in Alberta and Yukon that are concerned with environmental matters.

McLaren, Christie. *Heartwood*. Equinox, volume 9, number 53, pages 42-55, September/October 1990.

An environmentalist views the "wholesale sell-off of Canada's Boreal forest".

Miller, G. Tyler Jr. *Environmental Science: Sustaining the Earth*, 3rd edition. Belmont, California: Wadsworth, 1991.

A good introduction to the sciences, economics, and ethics involved with exploitation of resources.

Mitsch, William J. and Sven Erik Jorgensen, editors. *Ecological Engineering: An Introduction to Ecotechnology*. New York: John Wiley and Sons, 1989.

Basic principles and case studies.

Oelschlaeger, Max. *The Idea of Wilderness: From Prehistory to the Age of Ecology*. New Haven: Yale University Press, 1991.

When one looks at exploitation of natural resources, one often fails to look at the importance of wild lands.

Organization for Economic Co-operation and Development. *Environmental Indicators: A Preliminary Set*. Paris: OECD, 1991.

An overview of environmental indices for Canada, France, Japan, West Germany, Italy, United Kingdom and United States.

Owens, Susan and Peter L. Owens. *Environment, Resources and Conservation*. Cambridge: Cambridge University Press, 1991.

A short overview from a European perspective.

Purdom, P. Walton and Stanley H. Anderson. *Environmental Science: Managing the Environment*, 2nd edition. Toronto: Charles E. Merrill, 1983.

An introductory text.

Simpson-Lewis, Wendy, Ruth McKechnie and V. Neimanis. *Stress on Land in Canada*. Ottawa: Policy and Development Branch, Lands Directorate, Environment Canada, 1983. Catalogue number: En 73-2/6E.

An overview of environmental problems in Canada.

Statistics Canada. *Human Activity and the Environment, 1991*. Ottawa: Statistics Canada, Environment and Wealth Accounts Division, System of National Accounts, 1991. Catalogue number 11-509E Occasional

General facts on population, socio-economic factors and environmental conditions.

Syncrude Canada Ltd. *The Habitat of Syncrude Tar Sands Lease #17: An Initial Evaluation*. Edmonton: Syncrude Canada Ltd., 1973. Environmental research Monograph 1973-1.

An overview of the major habitats, vascular plants and vertebrate animals typical of the boreal forest of Alberta.

Thompson, M.D. *Ecological Habitat Mapping of the AOSERP Study Area*. Calgary: Intera Environmental Consultants Ltd., 1978. Prepared for Alberta Oil Sands Environmental Research Program.

Eighteen maps showing vegetation and surficial geology of the study area around Fort McMurray.

Townsend, Colin R. *The Ecology of Steams and Rivers*. London: Edward Arnold, 1980. Studies in Biology no. 122.

A short introduction to the ecology of running water.

Turk, Jonathan and Amos Turk. *Environmental Science*, 3rd edition. Philadelphia: Saunders College Publishing, 1984.

Another introductory text.

Environmental Impact Assessments (EIAs) (see also Legal)

A.A. Aquatic Research Limited. *An Environmental Review of the Daishowa Rail Spur*. [Edmonton?]: A.A. Aquatic Research Ltd., 1988.

Prepared for the Alberta Railway Corporation.

An EIA for the rail line to the Daishowa mill in the Peace River area.

Alberta Energy Company Limited. *Environmental Impact Assessment. Bleached Chemi-Thermo-Mechanical Pulp Mill [at] Slave Lake, Alberta*. Calgary: Alberta Energy Company Ltd., 1989.

Prepared by Western Research with assistance from: E.V.S. Consultants, Kensington Consulting, Ramsay & Associates Consulting Services Ltd., and Fedirchuk McCullough & Associates Ltd.

Main Report. Supplemental Report.

EIA and supplemental reports for the pulp mill at Slave Lake.

Alberta Environment. *Environmental Impact Assessment Guidelines*. Edmonton: Alberta Environment, Environmental Assessment Division, 1985.

Old guidelines on planning, preparation, review, and decisions on EIAs. Notes on various acts.

Alberta Department of Lands and Forests. *Public Hearing on Proposed Pulp Mill Development in the Grande Prairie Area, October 27th, 1967, Grande Prairie, Alberta: Summary*. [Edmonton]: Department of Lands and Forests, 1968?

A very early EIA.

Alberta Newsprint Company. *Environmental Impact Assessment*. Whitecourt, Alberta: Alberta Newsprint Company, Ltd., 1988. Volume 1 with Supplemental. Prepared by Nystrom, Lee, Kobayashi and Associates.

EIA for the Whitecourt paper mill.

Alberta-Pacific Forest Industries Inc. *Environmental Impact Assessment. Bleached Kraft Mill*. Edmonton: Alberta-Pacific Forest Industries Inc., 1989. Prepared by Beak Consultants. Main Report. Summary Report. Public Participation Program.

This EIA actually has many parts that were produced separately and after these publications. For example see also: Jack Phelps (Roadway Planning Branch) *Alberta-Pacific Pulp Mill: Roadway Infrastructure Brief* of October 1989.

Alberta-Pacific Forest Industries Inc., Beak Consultants Ltd and H.A. Simons Ltd. *Mitigative Response to Concerns Regarding Chlorinated Organic Compounds*. Edmonton: Alberta-Pacific Forest Industries Ltd., 1990.

This is a supplement to the EIA concerning substitutes for molecular chlorine gas bleaching.

Alberta-Pacific Environmental Impact Assessment Review Board. *The Proposed Alberta-Pacific Pulp Mill: Report of the EIA Review Board*. [Edmonton]: Alberta Environment, 1990.

This is the initial review of the Alberta-Pacific EIA. The public hearings associated with this review were the most extensive in Alberta's history. Transcripts of the hearings (50 volumes) and written submissions (750) are held in the Alberta Environment, Athabasca University and University of Alberta libraries.

Alberta-Pacific Scientific Review Panel. *A Review of the Modified Wood Pulping and Bleaching Processes Proposed for Alberta-Pacific Forest Industries Inc. Pulp Mill*. Edmonton: Alberta Environment, 1990.

This is a review of the above review of the Al-Pac proposal but it only considers the bleaching process.

Bird, Bud and Pauline, Jack and Beverly Macklin, Lyle and Sharon Roth. *Fair Play*. Privately printed, 1990 but available from: Calgary: Maps and Publications Counter, Energy Resources Conservation Board; Edmonton: Community Affairs Branch, Alberta Environment; Olds: Alberta Agriculture.

A short handbook produced by the residents of Eagle Valley from their experiences dealing with developments in the Caroline Gas Field. Chapters include: Talk to Your Neighbours and Stick Together, Stand Up to the Company, Be Reasonable and Cooperative, Get Involved in the Emergency Response Plan, Keep an Eye on the Company, Obtain Information and Stay Informed, Expect Both Negative and Positive Impacts in Your Community.

Blumenfeld, Mark. *Conducting an Environmental Audit*. New York: Executive Enterprises Publications, 1989.

A handbook for doing an environmental audit of a company. Could be used to help prepare or critique an EIA.

Bowles, Roy T. *Social Impact Assessment in Small Communities: An Integrative Review of Selected Literature*. Toronto: Butterworths, 1981.

When EIAs are done the human social impacts also have to be considered.

Carley, Michael J. and Eduardo S. Bustelo. *Social Impact Assessment and Monitoring: A Guide to the Literature*. Boulder, Colorado: Westview Press, 1984.

Social Impact Assessment Series, No. 7.

A critical review of 600 publications on SIA.

Champion Forest Products Ltd. *Hinton Modernization and Expansion Project: Environment Impact Assessment*. Hinton: Stanley Associates Engineering Ltd. and Beak Associates Consulting Ltd., 1987.

EIA (in 4 volumes) for expansion of the pulp mill in Hinton. Champion recently changed its name to Weldwood. Former names were St. Regis Pulp Mill, Northwood Pulp and Paper Co., and Northwest Pulp and Power Co.

- Chem-Security (Alberta) Ltd. *Environmental Impact Assessment for Proposed Expansion of the Alberta Special Waste Treatment Centre. Volume I: Executive Summary*. Calgary: The company, 1991.
- An example of an EIA for a plant that disposes of waste chemicals by incineration, land burial, and deep well injection.
- Clark, Michael and John Herrington, editors. *The Role of Environmental Impact Assessment in the Planning Process*. London: Mansell Publishing, 1988.
- A European view of the EIA process.
- Couch, William J., editor. *Environmental Assessment in Canada: 1988 Summary of Current Practice*. [Ottawa]: Canadian Council of Resource and Environment Ministers, 1989. Cat. No. En 104-4/ 1988.
- A review of the processes across Canada.
- CPL Bibliographies. *Public Involvement in Environmental Decisionmaking: An Annotated Bibliography*. Chicago, Illinois: CPL Bibliographies, 1981.
- A commercial listing of publications on how the public can be involved in decisions affecting the environment.
- Daishowa Canada Company Ltd. *Environmental Assessment Report. Daishowa Canada Co. Ltd. Peace River Kraft Pulp Mill*. Vancouver: H.A. Simons Ltd. and Pacific Liaison Ltd., 1987-1988.
- An EIA in five volumes: the report itself (December 1987), two addenda on their public Consultation Program Documentation (November and December 1987), a Supplemental Information to the Environmental Assessment Report (April 1988), and An Environmental Review of the Daishowa Rail Spur (June 1988).
- Derksen, G and M. Lashmer. *Environmental Review of the Crestbrook Pulp Mill at Skookumchuk, British Columbia*. [Vancouver]: Environmental Protection Service, Environmental Protection Branch, Pacific Region, December 1981.
- An example of a review process in British Columbia.
- Edwards, Paul. *The Alberta Pacific Pulp Mill Proposal: A Review of the Environmental Assessment of a Bleached Kraft Mill*. Journal of Pesticide Reform, volume 10, number 2, pages 14-17, 1990.
- A brief overview of the EIA process on the Al-Pac mill up to May 1990.
- Edwards, Paul. *The Al-Pac Review Hearings: A Case Study*. Edmonton: Environmental Law Centre, 1990.
- A study of the review process for the Alberta-Pacific pulp mill with recommendations for future hearings on environmental matters.
- Eso Resources Canada Limited. *Cold Lake Project: Final Environmental Impact Assessment*. Calgary: ESSO, 1979.
- Volume I - Project Description. Volume II - Biophysical Resources Impact Assessment. Volume III - Socio-Economic Assessment. Executive Summary.
- The EIA for the heavy oil project at Cold Lake.
- E.V.S. Consultants Ltd. *Baseline Environmental Studies of the Lesser Slave River. Volume II [of EIA]*. North Vancouver: E.V.S. Consultants Ltd., 1991.
- Prepared for the Slave Lake Pulp Corporation.
- This is the environmental baseline survey of the river and is a supplemental report for the EIA.
- Federal Environmental Assessment Review Office. *Manual on Public Involvement in Environmental Assessment: Planning and Implementing Public Involvement Programs*. Calgary: Praxis, 1988.
- Includes: context, rationale, support from decision-makers, staffing and organization, and trends.
- Jaakko Poyry. *Complementary Scientific Review of the Proposed Alberta-Pacific Pulp Mill Project Environmental Impact Assessment. Main Report*. Helsinki, Finland: Jaakko Poyry, 1990.
- Prepared for Alberta Research Council, ARC Contribution Series 1855.
- This is a review of the review, of the review of the Al-Pac proposal. It concentrates on the effects of chlorinated organic compounds and biological oxygen demand of the effluent.

MacLaren, Virginia and Joseph B. Whitney, editors. *New Directions in Environmental Impact Assessment in Canada*. Toronto: Methuen, 1985.

Nine papers from a conference held in 1983.

Millar Western Pulp Ltd. *Environmental Impact Assessment of the Proposed Whitecourt Pulp Mill*. Vancouver: H.A. Simons Ltd., Consulting Engineers, 1986.

EIA for the Whitecourt pulp mill.

Parenteau, Rene. *Public Participation in Environmental Decision-Making*. Ottawa: Federal Environmental Assessment Review Office, 1988.

Recommendations on how the public should be involved in decisions made that affect the environment. Topics include: right to participate, various mechanisms for public consultation, and typical presentations made by the public.

Phaneuf, Yves. *EIS Process and Decision Making*. Hull, Quebec: Canadian Environmental Assessment Research Council, 1990. Cat No. En 107-3/16-1990.

Testing the ELECTRE method of determining environmental consequences on a proposed electrical transmission line.

Study Group on Environmental Assessment Hearing Procedures. *Public Review: Neither Judicial, Nor Political, but an Essential Forum for the Future of the Environment. A Report Concerning the Reform of Public Hearing Procedures for Federal Environmental Assessment Reviews*. Ottawa: Federal Environmental Assessment Review Office, 1988.

This report reviews the federal Environment Assessment and Review Process (EARP) and makes several recommendations on the public hearing procedures, intervenor funding, and changes in legislation.

Synchrude Canada Ltd. *Biophysical Impact Assessment for the New Facilities at the Synchrude Canada Ltd. Mildred Lake Plant*. Edmonton: Synchrude Canada Ltd., 1984.

Another EIA for northern Alberta.

Fish Toxicology (see also Monitoring)

Alberta Environment Centre. *Chemical Residues in Fish Tissues in Alberta. I. Wabamum Lake, Lake Newell, McGregor Lake, Beaver River, Battle River*. Vegreville, Alberta: Alberta Environmental Centre, 1983. AECV83-R1.

Forty-five pesticides and PCBs were examined in 190 fish.

Alberta Environment Centre. *Chemical Residues in Fish Tissues in Alberta. II. Mercury in the North Saskatchewan River*. Vegreville, Alberta: Alberta Environmental Centre, 1983. AECV83-R2.

Mercury was thought to come from former use of fungicides or fish migration from Saskatchewan. This study was used to determine the amount of fish that could be safely consumed.

Alberta Environment Centre. *Chemical Residues in Fish Tissues in Alberta. III. Pesticides and PCBs in the North Saskatchewan River and the Red Deer River*. Vegreville, Alberta: Alberta Environmental Centre, 1983. AECV83-R4.

Forty-five compounds were tested for in 500 fish.

Alberta Environment Centre. *Methoxychlor and 2,2-Bis(P-Methoxyphenyl)-1,1-Dichloroethylene Residues in Fish in Alberta*. Vegreville, Alberta: Alberta Environmental Centre, 1984. AECV84-R1.

Although these compounds were not detected in the Athabasca River where methoxychlor was used for killing black fly larvae, they were found in the North Saskatchewan River. Their presence there was hypothesized to come from black fly control efforts in Saskatchewan via fish migration.

Alberta Environment Centre. *Mercury in Fish from Six Rivers in Southern Alberta*. Vegreville, Alberta: Alberta Environmental Centre, 1984. AECV84-R2.

For comparisons between southern and northern rivers.

- Alberta Environment Centre. *Partitioning of Polychlorinated Biphenyls in the North Saskatchewan River*. Vegreville, Alberta: Alberta Environment Centre, 1984. AECV84-R3.
- Concentrations of PCBs were analyzed in intestinal fat of fish, muscle tissue of fish, fine sediments and water. PCBs were not considered a significant environmental risk.
- Alberta Environment Centre. *Acute and Subacute Toxicity of Different Fractions of Athabasca Bitumen to Fish*. Vegreville: Alberta Environment Centre, 1986. AECV86-R5.
- Fish toxicity to oil sand derivatives.
- Alberta Environment Centre. *Toxicity of Polyelectrolyte Flocculants to Rainbow Trout*. Vegreville, Alberta: Alberta Environment Centre, 1987. AECV87-R3.
- Fish toxicity to six flocculants in municipal water or coal-mine wastewater was studied.
- Alberta Environment Centre. *Toxicity and Environmental Chemistry of Wastewater from a Kraft Pulp and Paper Mill: Fish Toxicity Studies*. Vegreville, Alberta: Alberta Environmental Centre, 1987. AECV87-R4.
- A study on the effluent discharged into the Wapiti River by the Procter and Gamble Cellulose Ltd. kraft mill of Grande Prairie. The fish contained contaminants from the mill as well as pesticides such as DDT and DDE.
- Alberta Environment Centre. *Toxicity of Methoxychlor to Fish*. Vegreville, Alberta: Alberta Environmental Centre, 1988. AECV88-R5.
- Toxicity of this pesticide and its emulsifying agent were studied in rainbow trout and five native species of fish.
- Anderson, P.D., P. Spear, S. D'Apollonia, S. Perry, J. De Luca and J. Dick. *The Multiple Toxicity of Vanadium, Nickel, and Phenol to Fish*. Edmonton: Alberta Environment and Environment Canada, 1979. Alberta Oil Sands Environmental Research Program Report 79, Project AF 3.6.1.
- Most toxicity studies look at the effects of a single chemical. This study showed synergistic effects of three toxic substances on rainbow trout.
- Andersson, Tommy. *Sublethal Physiological Effects of Pulp and Paper Mill Effluents on Fish: A Literature Review*. Solna, Sweden: National Swedish Environmental Protection Board Report 3366, 1987.
- Reproduced by U.S. Department of Commerce, National Technical Information Service, Springfield, VA, 22161.
- Abstracts of 76 papers published between 1973 and 1986. The papers relate the effects of pulp effluents on fish respiration, oxygen transport, metabolism, growth, and reproduction.
- Giles, M.A., J.F. Klaverkamp and S.G. Lawrence. *The Acute Toxicity of Saline Groundwater and Vanadium to Fish and Aquatic Invertebrates*. Edmonton: Alberta Environment and Environment Canada, 1979. Alberta Oil Sands Environmental Research Program Report AF 3.2.1.
- These studies were done because groundwater was to be pumped into the Athabasca River in connection with the oil sands mining and because the groundwater is saline and has considerable vanadium. The studies were done with rainbow trout, lake whitefish, four crustaceans, a chironomid and a mayfly.
- Loch, J.S. and J.C. MacLeod. *Fish Toxicity Survey of Four Prairie Province Pulp Mill Effluents*. Ottawa: Canada Fisheries and Marine Service, 1973. Technical Report Series CEN/T-73-4.
- An old review.
- Macdonald, G. and H.R. Hamilton. *Model Calibration and Receiving Water Evaluation for Pulp Mill Developments on the Athabasca River: Dissolved Oxygen*. Calgary: HydroQual Consultants, 1989.
- Prepared for Alberta Environment, Standards and Approvals Division.
- Not seen.
- McLeod, C. *The Effects of Methoxychlor Exposure on Early Life Stages of the Native Fish in the Athabasca River*. Edmonton: Alberta Environment, 1987.
- A very short term study, but gives an idea of the problems involved in fish bioassays. Some

procedures on how to conduct fish toxicity studies.

Monenco Consultants Ltd. *Fish Tissue and Sediment Studies in the Vicinity of the Peace River Pulp Mill Company Mill at Peace River, Alberta. April, 1990.* Calgary: Monenco Consultants Ltd., 1990. Prepared for Daishowa Canada Co. Ltd.

An example of a short term study of some organic compounds found in pike and sediments.

Monenco Consultants Ltd. *Chlorinated Organics, Water Quality and Fisheries Survey in The Peace, Smokey and Slave Rivers, Alberta and Northwest Territories. Volumes I and II.* Calgary: Monenco Consultants Ltd., 1991. Prepared for Daishowa Canada Co. Ltd.

An example of a larger study of chlorinated organics found in fish and sediments.

Moore, J.W., S. Ramamoorthy and A. Sharma. *Mercury Residues in Fish from Twenty-Four Lakes and Rivers in Alberta.* Vegreville, Alberta: Alberta Environmental Centre, 1986. AECV86-R4.

Sampling sites included the Athabasca, Beaver, Peace and Saskatchewan River systems. In the Athabasca River, nine species of fish were collected from five locations. Mercury concentrations averaged from 45 to 321 micrograms per kilogram [ug/Kg] (= .045 to .321 milligrams per kilogram [mg/Kg] or parts per million [ppm]) of fish.

National Council of the Paper Industry for Air and Stream Improvement. *Effects of Biologically Treated Bleached Kraft Mill Effluent During Early Life Stage and Full Life Cycle Studies with Fish.* New York: the Council, 1985. Also as the Council's Technical Bulletin 474. Not seen.

National Council of the Paper Industry for Air and Stream Improvement. *Guidelines to Methods for the Analysis of the Effects of Effluent on the Flavor of Fish.* New York: the Council, January 1987. Also as the Council's Technical Bulletin 513. Fish tainting is seen to be a problem for anglers.

Post, George. *Textbook of Fish Health*, revised and expanded addition. Neptune City, New Jersey:

T.F.H. Publications, 1987.

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Forestry (see also Logging)

Alberta Forest Service. *Alberta Phase 3 Forest Inventory: Forest Cover Type Specifications.* Edmonton: Alberta Forestry, Lands and Wildlife, 1984, reprinted 1988. ENR Report No. Dept. 58.

This outlines the procedures and codes used to describe forest stands. Descriptors include: density, height, species, commercialism, origin, slope, disturbances, condition, understory and treatment of clearings.

Alberta Forest Service. *Alberta Phase 3 Forest Inventory: An Overview.* Edmonton: Alberta, Forestry, Lands and Wildlife, Timber Management Branch, 1985. ENR Report No. I/86.

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Alberta Forest Service. *Volumes and Stem Numbers for Forest Types: Steps to Volume Table Formulation.* Edmonton: Alberta Energy and Natural Resources, 1985. ENR Report No. Dept. 61a.

Outlines how calculations were made to calculate volumes of usable wood fiber.

Alberta Forest Service. *Alberta Phase 3 Forest Inventory: Single Tree Volume Tables: Methods of Formulation.* Edmonton: Alberta Energy and Natural Resources, 1985. ENR Report No. Dept. 86a.

Outlines how calculations were made for Gross Total Volume (cubic metres of tree stems per hectare), Gross Merchantable Volume (excluding stump and top volumes) and Defect Volume (volumes not usable, defective or decayed, for saw logs or pulpwood).

- Alberta Forest Service. *Alberta Phase 3 Forest Inventory: Single Tree Volume Tables: Volume Sampling Region 8*. Edmonton: Alberta Energy and Natural Resources, 1985.
ENR Report No. Dept. 86j.
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ENR Report No. Dept. 61d.
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ENR Report No. I/51.
MICROLOG 85-2002, 1 fiche
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- Alberta Forest Service. *Alberta Phase 3 Forest Inventory: Ground Truthing Procedures*. Edmonton: Forestry, Lands and Wildlife, 1989.
ENR Report No. Dept. 53.
Ground and aerial checks on the accuracy of how air photographs were interpreted.
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Cat. No. YM32-1-87-1-1987-1E.
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A world view of forestry and development.
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Catalogue number: Fo42-80/1985
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- Buongiorno, Joseph and J. Keith Gilliss. *Forest Management and Economics: A Primer in Quantitative Methods*. New York: MacMillan Publishing, 1987.
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- Corns, I.G.W. and R.M. Annas. *Field Guide to Forest Ecosystems of West-Central Alberta*. Edmonton: Northern Forestry Centre, Canadian Forestry Service, 1986.
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- Cote, Wilfred A. *Alberta Aspen: Tomorrow's Resource Today*. Edmonton: Alberta Research Council, [1988].
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- Drushka, Ken. *Stumped: The Forest Industry in Transition*. Vancouver: Douglas and McIntyre, 1985.
- An outline of the problems in the forest industries in Canada.
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- This panel was chaired by Bruce P. Dancik. It made comments and submitted 133 recommendations on: public involvement, regulatory agencies (Forestry, Lands and Wildlife; Recreation and Parks), forestry planning, forest inventories, environmental impacts, integrated management, and reforestation.
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- Swift, Jamie. *Cut and Run: The Assault on Canada's Forests*. Toronto: Between the Lines, 1983.
A result of interviews with people who live and work in Canada's forests.
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Environmental Research Monograph 1974-3.
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Saskatchewan Research Council document
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An 18 page summary of "An Exploration and Assessment of the Implications of Climatic Change for the Boreal Forest and Forestry Economics of the Prairie Provinces and Northwest Territories: Phase One" by E.E. Wheaton, T. Singh, R. Dempster, K.O. Higginbotham, J.P. Thorpe, G.C. Van Kooten, and J.S. Taylor. One major prediction is that, because of global warming, the southern edge of the boreal forest may shift northwards between 250 and 900 km.

Human Health (see also Chemistry and Planning)

Bertazzi, P.A., C. Zocchetti, A.C. Pesatori, S. Guercilena, M. Sanarico and L. Radice. *Ten-Year Mortality Study of the Population Involved in the Seveso Incident in 1976*. American Journal of Epidemiology, volume 129, number 6, pages 1187-1200, 1989.

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Environ Corp. *Dioxin: Critical Review of Its Distribution, Mechanism of Action, Impacts on Human Health, and the Setting of Acceptable Exposure Limits*. New York: National Council of the Paper Industry for Air and Stream Improvement, Special Report 87-07, 1987.

Impacts on human health have to be reconsidered after recent allegations of fraud in some key studies. See Van Strum and Merrell below.

Hawks, M.P.G. *Health Effects from Kraft (Sulphate) Pulp Mill Operations*. Edmonton: Environment Conservation Authority, 1976.

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Lave, Lestor. B. and Arthur C. Upton, editors. *Toxic Chemicals, Health, and the Environment*. Baltimore: Johns Hopkins University Press, 1987.

Ten general papers on environmental and health effects of toxic chemicals.

Merrell, Paul and Carol Van Strum. *Negligible Risk: Premeditated Murder?* Journal of Pesticide Reform, volume 10, number 1, pages 20-22, Spring 1990.

A quick look at risk assessment.

National Technical Information Service. *Pulp and Paper Mill Effluents: Toxicity to Humans*. (Jan. 76 -Jan. 87). Springfield, Virginia: The service, February 1987.

A review.

O'Brien, Mary. *If Not Risk Assessment, Then What?* Journal of Pesticide Reform, volume 10, number 1, pages 2-7, Spring 1990.

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Schwartz, E. *A Proportionate Mortality Ratio Analysis of Pulp and Paper Mill Workers in New Hampshire.* British Journal of Industrial Medicine, volume 45, pages 234-238, 1988.

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Van Strum, Carol and Paul Merrell. *Dioxin Human Health Damage Studies: Damaged Data?* Journal of Pesticide Reform, volume 10, number 1, pages 8-12, Spring 1990.

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Wein, Eleanor E. *Nutrient Intakes and Use of Country Foods by Native Canadians Near Wood Buffalo National Park.* Guelph: doctoral thesis, University of Guelph, 1989.

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Zack, Judith A. and Raymond R. Suskind. *The Mortality Experience of Workers Exposed to Tetrachlorodibenzodioxin in a Trichlorophenol Process Accident.* Journal of Occupational Medicine, volume 22, number 1, pages 11-14, January 1980.

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Legal (see also EIAs)

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Alberta, Province of. *Clean Water Act. Revised Statutes of Alberta 1980, Chapter C-13 with Amendments in force as of August 1, 1985.* Edmonton: Queen's Printer, 1987.

The act that controlled water pollution in Alberta.

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- Elder, P.S. *Environmental Impact Assessment in Alberta*. Alberta Law Review, volume 23, number 2, pages 286-309, 1985.
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- Flett, Jillian and Dan Rogers. *The Environmental Legal Action Handbook: A Citizen's Guide to Legal Action*. Edmonton: Student Legal Services, 1980.
- The Acts are old but the possible actions are not.
- Malvern, R.J., W.M. Paterson and W.J. Platt. *A Reference Guide to Environmental Legislation in Canada (1989 Update)*. Ontario Hydro, Environmental Studies and Assessments Department, Report No. 90212, 1990.
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- Moen, Andrea B. *Demystifying Forestry Law: An Alberta Analysis*. Edmonton: Alberta Law Centre, 1990.
- Discusses ownership, regulation and management including: disposition of timber, Forest Management Agreements, reforestation, enforcement and environmental concerns.
- Review Panel for Environmental Law Enforcement. *An Action Plan for Environmental Law Enforcement in Alberta*. Edmonton: Alberta Environment, 1988.
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- Tingley, Donna, editor. *Environmental Protection and the Canadian Constitution*. Edmonton: Environmental Law Centre, 1987.
- Proceedings of the Canadian Symposium on Jurisdiction and Responsibility for the Environment.
- Environmental perspectives by various levels of government, industry and the public on the constitutional framework, policies, administration of policies, and future directions.
- Tingley, Donna, editor. *Into the Future: Environmental Law and Policy for the 1990's*. Edmonton: Environmental Law Centre, 1990.
- Proceedings of a national conference.
- Vomberg, Mac. *Bibliography of Legal Materials on Transportation of Hazardous Substances*.

Edmonton: Environmental Law Centre, 1982.
Seven pages of cases, articles and acts. There are many implications for the transport of chemicals to pulp mills.

Zimmerman, Rae. *Governmental Management of Chemical Risk: Regulatory Processes for Environmental Health*. Lewis Publishers, 1990.
American federal law and incentives.

Logging (see also Forestry)

Anderson, Phillip and Robert Anderson. *Erosion Potential Index. A Method for Evaluating Sheet Erosion at Stream Crossings*. Edmonton: Forest Service, Alberta Forestry, Lands and Wildlife, 1987.

ENR Report Number T/137.

How to estimate the potential of soil erosion at stream crossings and how to reduce the damage.

Anderson, Robert A. and David Asquin. *Culvert Sizing for Stream Crossings: A Handbook of Three Common Methods*. Edmonton: Alberta Forestry, Lands and Wildlife, Forestry Services, 1986.

Regulations on sizes and positions of culverts for logging and other roads that need to cross streams.

Coulombe, R. and A.B. Lemay. *Evaluation of Potential Interactions Between Forest Biomass Production and Canadian Wildlife*. Ottawa: Environment Canada, 1983.

ENFOR Project P-170.

Contractor: le Groupe Dryade ltee.

MICROLOG 83-4446, 4 fiche

ENFOR is an acronym for ENergy from the FORest, a program for renewable energy production from biomass. Reviews extending forest cutting rotations, removal of snags and fallen trees, sensitivity of animals to human disturbances, and calls for more research in Canada. Concentrates on vertebrates.

Culp, J.M. and R.W. Davies. *An Assessment of the Effects of Streambank Clear-Cutting on Macroinvertebrate Communities in a Managed Watershed*. Canadian Technical Report of

Fisheries and Aquatic Systems No. 1208, 1983.
MICROLOG 84-0471, 2 fiche
Cat. No. Fs 97-6/1208

Studies on a creek on Vancouver Island. Logging without a buffer zone increased soil erosion and hence sediments in the creek. Increased sediments and reduced detritus decreased numbers of organisms. Lack of a buffer zone also increased winter scouring which also decreased populations. A less than 10 m riparian buffer zone and natural debris dams provided leaf litter and so more food for invertebrates and fish.

Curtin, Theodore W. *Farm Your Forest*.

Urbana-Champaign, Illinois: Cooperative Extension Service Circular 1291, College of Agriculture, University of Illinois, 1989.

A pamphlet for managing private wood lots.

Curtis, David S. *Woodlot Owner Organizations in Eastern Canada: Historic Development, Legislation, Structure, Financing and Services*. Fredericton, New Brunswick: Canadian Forestry Services - Maritimes, 1987.

Information Report M-X-162.

MICROLOG 87-03020, 2 fiche

In Nova Scotia, Prince Edward Island, New Brunswick, Quebec and Ontario land owners who sell trees for pulp and lumber have formed various organizations to help market their products and share resources for forest management activities.

Fisher, G.L. *Resource Road Planning Guidelines for the Green Area of Alberta*. Edmonton: Alberta Energy and Natural Resources, Forest Service, 1985.

ENR Technical Report Number T/25.

Recommendations for five kinds of roads used by timber and petroleum industries.

Fisher, G.L., A.G.H. Locke, and B.C. Northey. *Stream Crossing Guidelines: Operational Guidelines for Industry*. Edmonton: Alberta Energy and Natural Resources, Forest Service, 1985.

ENR Technical Report Number T/80.

Recommendations for building, maintaining, and abandoning stream crossings.

Forest Land Use Branch. *The Resource Handbook Operational Guidelines for Industry*, revised.

Edmonton: Alberta Energy and Natural Resources, Forest Service, 1984.
ENR Technical Report Number 75.

Recommendations for industries making utility corridors and stream crossings in the forests of Alberta.

Forest Service. *Forest Landscape Management Guidelines for Alberta*. Edmonton: Alberta Forestry, Lands and Wildlife, 1986.

The department's recommendations to reduce the visual impacts of logging.

Forest Service. *Predisturbance Watershed Assessment Manual*. Edmonton: Alberta Forestry, Lands and Wildlife, 1986.
ENR Technical Report Number T/100.

The department's recommendations to reduce erosion in watersheds being logged. The recommendations are to be used in the development of Annual Operating Plans (AOPs).

Forest Service. *Alberta Timber Harvest Planning and Operating Ground Rules*. Edmonton: Alberta Forestry, Lands and Wildlife, 1987.
ENR Technical Report Number 23.

These are the regulations to be followed by loggers with respect to such things as: Annual Operating Plans, setbacks from water courses, reforestation, wildlife habitat considerations, road construction and abandonment, campsites, and waste disposal.

Moore, G.C. and S.G. Henley. *Final Report of G.D.A. Projects 144.201 and 144.202: Management of Watercourse Buffer Zones*. Fredericton, N.B.: Natural Resources, New Brunswick and Government of Canada, Regional Economic Expansion, 1984.
MICROLOG 84-4003, 2 fiche

Experiments and recommendations on management of buffer zones.

Raphael, Ray. *Tree Talk: The People and Politics of Timber*. Covelo, California: Island Press, 1981.

Interviews and ideas on the history, problems and future of logging in the United States.

Sauder, B.J. *Low-Ground-Pressure Tires for Skidders*. Ottawa: Canadian Forestry Service, 1985.
Information Report DPC-X-20

A study on these tires which are supposed to lessen soil compaction.

Swanson, Robert H. and Graham Robin Hillman. *Predicted Increased Water Yield After Clear-Cutting Verified in West-Central Alberta*. Edmonton: Northern Forest Research Centre, Canadian Forestry Service NOR-X-198, 1977.

Research done on the effects of clear-cutting.

Monitoring (see also Fish Toxicology)

Alberta Environment. *Dissolved Oxygen Objectives Workshop, Technical Proceedings, 12 December 1989*. Edmonton: Alberta Environmental Protection Services, Environmental Assessment Division, Standards Research and Development Branch, [1990].

Includes: objectives and guidelines, monitoring of rivers and lakes, biochemical oxygen demand, fish protection, physiological responses, and research needs.

Barton, D.R. and R.R. Wallace. *Ecological Studies of the Aquatic Invertebrates of the Alberta Oil Sands Environmental Research Program Study Area of Northeastern Alberta*. Edmonton: Alberta Environment and Environment Canada, 1980.
AOSERP Report 88, Project AF 2.0.1.

A baseline study of the aquatic invertebrates of the Athabasca, Muskeg and Steepbank Rivers.

Beak Consultants. *Secondary Fibers Pulping/Deinking Effluent Toxicity Study*. Ottawa: Environment Canada, Environmental Protection Service, Water Pollution Control Directorate, Abatement and Compliance Branch, 1979.

About re-cycled paper.

Beaver, R. and M. Ballantyne. *Breeding Behaviour of the White Pelican in the Athabasca Oil Sands Area*. Edmonton: Alberta Environment and Environment Canada, 1979.
Alberta Oil Sands Environmental Research Program Report 82, Project LS 22.2.

White pelicans are fish-eating birds. Their eggs and tissues can be used to monitor toxic substances in water bodies. This report gives

- some behavioural information on these birds. See also D. Ealey. *The Distribution, Foraging Behaviour, and Allied Activities of the White Pelican in the Athabasca Oil Sands Area*. AOSERP Report 83.
- Boerger, Hans. *Distribution and Abundance of Macroinvertebrates in the Athabasca River near Fort McMurray*. Edmonton: Research Management Division, Alberta Environment, 1983. Report OF-53.
- Intended for monitoring water quality with aquatic macroinvertebrates. Chironomids, mayflies, oligochaets, caddisflies and stoneflies comprised 53%, 21%, 18%, 2% and 1% of the 27,229 specimens collected in a 85 km stretch one summer. Densities reached 3,294 individuals per square metre. Densities decreased 31% downstream of the Suncor Tar Sands plant.
- Bond, W.A. *Fishery Resources of the Athabasca River Downstream of Fort McMurray: Volume I*. Edmonton: Alberta Environment and Environment Canada, 1980. Alberta Oil Sands Environmental Research Program Report 89, Project AF 4.3.2.
- Twenty-seven species of fish were found, 11 of which were common. Diversity reduced to 18 species at the Athabasca Delta. Walleye, Goldeye, Long-Nose Sucker and White Sucker migrate upstream in spring even under ice cover. Lake Whitefish migrate upstream in the fall to spawn. Best introduction to the biology of the fish in the Athabasca River.
- Bond, W.A. and K. Machniak. *An Intensive Study of the Fish Fauna of the Steepbank Muskeg River Watershed of Northeastern Alberta*. Edmonton: Alberta Environment and Environment Canada, 1979. Alberta Oil Sands Environmental Research Program Report 76, Project AF 4.5.1.
- A similar study to Machniak and Bond, see below. White and Longnose Suckers seem to be part of the Lake Athabasca population, at least 150 km to the north.
- Bush, Maureen. *Public Participation in Resource Development After Project Approval*. Hull, Quebec: Canadian Environmental Assessment Research Council, 1990. Cat. No. En 107-3/ 17-1990.
- Eight case studies were looked at AFTER the projects were approved and developed.
- Byrtus, G. *Athabasca River Monitoring Program - 1981*. Edmonton: Alberta Environment, Pollution Control Division, 1982.
- A sample of the monitoring carried out when methoxychlor was being used to kill black fly larvae in the Athabasca River.
- Day, K.E., E.D. Ongley, R.P. Scroggins and H.R. Eisenhauer, editors. *Biology in the New Regulatory Framework for Aquatic Protection*. Ottawa: Environment Canada, Environmental Protection, 1989?
- Proceedings of the Alliston Workshop cosponsored by Environment Canada and the National Water Research Institute, 26-28 April 1988.
- Recommendations on the biological criteria (toxicity tests) used to achieve aquatic environmental protection.
- Flannagan, John F. *Life Cycles of Some Common Aquatic Insects of the Athabasca River, Alberta*. Edmonton: Alberta Environment and Environment Canada, 1977. Alberta Oil Sands Environmental Research Program Report AF 2.2.1.
- Life cycle studies were carried out on 7 species of stoneflies, 7 mayflies and 8 caddisflies at Fort McMurray. These studies were disrupted in July and August 1977, presumably because of black fly control measure done 450 km upstream at Athabasca.
- Fransen, M.A.H., R.T. Franson, and A.R. Lucas. *Environmental Standards: a Comparative Study of Canadian Standards, Standard Setting Processes and Enforcement*. Edmonton: Environment Council of Alberta, 1982. ECA83-SP/1.
- Outlines how standards, such as effluent limitations, are set. Many of the standards given are out of date.
- Hartland-Rowe, R.C.B., R.W. Davies, M. McElhone, and R. Crowther. *The Ecology of Macroinvertebrate Communities in Hartley Creek, Northeastern Alberta*. Edmonton: Alberta Environment and Environment Canada, 1979. Alberta Oil Sands Environmental Research Program Report WS 1.3.3.

This creek is a tributary of Muskeg River which in turn is a tributary of the Athabasca River. Over 160 species of macroinvertebrates were collected. Chironomids were most abundant but caddisflies had the most biomass. Several distinctive communities were identified. Most insects had one year life cycles. There was a typical diel drift cycle.

Jones, M.L., G.J. Mann and P.J. McCart. *Fall Fisheries Investigations in the Athabasca and Clearwater Rivers Upstream of Fort McMurray. Volume I.* Calgary: Aquatic Environments Ltd., 1978.
Alberta Oil Sands Environmental Research Program Project AF 4.8.1.

Of 2 213 fish collected by seine and gillnet, 14 species were found. Lake Whitefish (68.2%), Longnose Sucker (6.8%), Goldeye (6.6%), Walleye (4.3%), Northern Pike (3.9%), Flathead Chub (2.8%), White Sucker (2.4%), Trout-Perch (2.2%) Arctic Grayling (1.1%), Mountain Whitefish (0.7%), Burbot (0.7%), Lake Chub (0.2%), Yellow Perch (0.1%), and Rainbow Trout (1 specimen). The Athabasca River between Fort McMurray and Cascade Rapids is a critical spawning habitat for Lake Whitefish. Lake Whitefish, and possibly Goldeye and Walleye, migrate between the study area and the Peace-Athabasca Delta, 300+ km away. Insects are consumed in large numbers by Goldeye, Lake and Mountain Whitefish, and Grayling. Pike and Walleye feed primarily on fish.

Machniak, K. and W.A. Bond. *An Intensive Study of the Fish Fauna of the Steepbank River Watershed of Northeastern Alberta.* Edmonton: Alberta Environment and Environment Canada, 1979.
Alberta Oil Sands Environmental Research Program Report 61, Project AF 4.5.2.

Fish that moved, from the Athabasca River, upstream for spring spawning included Longnose Suckers (52%), Arctic Grayling (20%) and White Suckers (14%). In the spring, Mountain Whitefish (7%) migrated upstream for feeding and movements of Northern Pike (3%) and Walleye (3%) were also recorded. Resident fish included Pearl Dace, Brook Stickleback, Lake Chub, Longnose Dace and Slimy Sculpin. Other fish recorded were: Lake Whitefish, Goldeye, Dolly Varden, Burbot, Trout-Perch, Flathead Chub,

Lake Cisco, Redbelly Dace, Brassy Minnow, Spottail Shiner, Brook Stickleback, and Yellow Perch.

Machniak, K., W.A. Bond, M.R. Orr, D. Rudy and D. Millar. *Fisheries and Aquatic Habitat Investigations in the MacKay River Watershed of Northeastern Alberta.* Edmonton: Alberta Environment and Environment Canada, 1980.
Alberta Oil Sands Environmental Research Program Report 93, WS 1.3.1.

Deals with fish migration and populations of the MacKay, Dover and Dunkirk Rivers. Similar findings as Machniak and Bond, 1979.

McCart, P., P. Tsui, W. Grant and R. Green. *Baseline Studies of Aquatic Environments in the Athabasca River near Lease 17. Volume 1: Baseline Studies.* Edmonton: Syncrude Canada Ltd., 1977?
Environmental Research Monograph 1977-2.
Studies of the water quality, periphyton, benthic macroinvertebrates and fish.

McCart, P., P. Tsui, W. Grant, R. Green and D. Tripp. *Baseline Study of the Water Quality and Aquatic Resources of the MacKay River, Alberta.* Edmonton: Syncrude Canada Ltd., 1978?
Environmental Research Monograph 1978-4.
Studies of the water quality, periphyton, benthic macroinvertebrates and fish.

Monenco Consultants Ltd. *Environmental Monitoring Studies in the Vicinity of the Peace River Pulp Mill Company Mill at Peace River, Alberta.* Calgary: Monenco Consultants Ltd., 1989, 1990.
Prepared for Daishowa Canada Co. Ltd.
Examples of macroinvertebrate and water quality surveys as required by the permit holder.

Monenco Consultants Ltd. *Winter Dissolved Oxygen Monitoring in the Vicinity of the Peace River Pulp Mill Company Mill at Peace River, Alberta. February, 1991.* Calgary: Monenco Consultants Ltd., 1991.
Prepared for Daishowa Canada Co. Ltd.
An example of a short term study of dissolved oxygen.

Noton, L.R. *The Peace and Athabasca River Systems: A Synopsis of Alberta Environment's Monitoring*

Programs and the Water Quality Effects of Existing Pulp Mill Effluents. Edmonton: Alberta Environment, Environmental Assessment Branch, Environmental Quality Monitoring Branch, 1989.

A 12 page overview.

Noton, L.R. and R.D. Shaw. *Winter Water Quality in the Athabasca River System, 1988 and 1989.* Edmonton: Alberta Environment, Environmental Protection Services, Environmental Assessment Branch, environment Quality Monitoring Branch, 1989.

A 200 page report.

Noton, L.R. and others. *Water Quality in the Wapiti-Smokey River System Downstream of the Procter and Gamble Pulp Mill, 1983.* Edmonton: Alberta Environment, Environmental Assessment Division, Environmental Quality Monitoring Branch, 1989.

Not seen.

Smith, Ann C. and William A. Yodis. *Environmental Auditing Quality Management.* New York: Executive Enterprises Publications, 1989.

A handbook for managing an environmental audit. Could be used to help prepare or critique a management plan.

Taylor, J.K. and T.W. Stanley, editors. *Quality Assurance for Environmental Measurements.* Philadelphia: ASTM Publications, 1985.

The results of a technical conference on monitoring air and water quality.

Thompson, M.S. and J. Crosby-Diewold. *Baseline Inventory of Aquatic Macrophyte Species Distributions in the AOSERP Study Area.* Edmonton: Alberta Environment and Environment Canada, 1980.
Alberta Oil Sands Environmental Research Program Report 100, Project LS 10.2.

More than 10 lakes were surveyed to find the kinds (19+) and distributions of the large aquatic plants.

Tripp, D.B. and P.J. McCart. *Investigations of the Spring Spawning Fish Populations in the Athabasca and Clearwater Rivers Upstream from Fort McMurray. Volume 1.* Edmonton: Alberta

Environment and Environment Canada, 1979.
Alberta Oil Sands Environmental Research Program Report 84, Project WS 1.6.1

A basic study of the spawning of the major fish of these rivers.

Walder, G.L. and D.W. Mayhood. *An Analysis of Benthic Invertebrate and Water Quality Monitoring Data from the Athabasca River.* Edmonton: Research Management Division, Alberta Environment, 1985.

A basic review.

Planning (see also EIA and Human Health)

Alberta Energy and Natural Resources, Resource Evaluation and Planning Division. *Resource Development Opportunities in Northern Alberta.* Edmonton: Alberta Energy and Natural Resources, 1985.
ENR Technical Report Number T/88.

An overview of statistics on socio-economics, transportation, forest resources, agriculture, petroleum and natural gas, oil sands, coal, fish and wildlife, water, and recreation for the northern half of the province.

Alberta Energy and Natural Resources, Resource Evaluation and Planning Division. *Big Bend Sub-Regional Integrated Resource Plan.* Edmonton: Alberta Energy and Natural Resources, 1985.

Agriculture, recreation, tourism, logging, hunting and mining plans for provincial lands located between Athabasca and Slave Lake.

Alberta, Government of. *A Policy for Resource Management of the Eastern Slopes.* Edmonton: Government of Alberta, revised 1984.
ENR number T/38, ISBN 0-86499-067-7.

Land use plans for the upper Athabasca River, around Hinton, are described.

Cairns, John Jr., editor. *Ecoaccidents.* New York: Plenum Press, 1985.

A NATO conference that reviews four case histories on ecological accidents, and outlines possible scenarios with oil spills and trichloroethylene.

Cashman, John R. *Hazardous Materials Emergencies: Response and Control*. Lancaster, PA.: Technomic, 1986.

Includes chapters on: public safety organizations, industrial response teams, commercial response organizations, training concerns, tools, and case histories of accidents.

DePol, Dennis R. *Emergency Response to Hazardous Materials Incidents*. Lancaster, PA.: Technomic, 1984.

Includes contingency planning, evacuation, emergency procedures, and emergency equipment. American rules and regulations.

Drabek, Thomas E. *Human System Responses to Disaster: An Inventory of Sociological Findings*. New York: Springer-Verlag, 1986.

Topics include: planning, warning, evacuation, emergency actions, restoration, reconstruction, perceptions of hazards, attitudes and adjustments, and disaster research. A good summary of research findings.

Greenprint for Canada Committee. *Greenprint for Canada: A Federal Agenda for the Environment*. Ottawa: Greenprint for Canada Committee (111 Sparks Street, 4th Floor, K1P 5B5), 1989.

An open appeal to the Prime Minister asking for reforms in policies, regulations, and institutions.

HAZTECH Canada Conference Planning Committee. *Dangerous Goods and Hazardous Waste Management Conference, Proceedings*. Mississauga, Ontario: Canadian Exhibition Management Inc. and Conference Planning Committee, 1988.

A mixture of papers on hazardous materials including: spills, emergency response, transportation, detection, risk assessment, and education. Be careful, some of them were trying to sell certain technologies.

Korten, David C. and Rudi Klaus, editors. *People-Centered Development: Contributions toward Theory and Planning Frameworks*. West Hartford, Connecticut: Kumarian Press, 1984.

Essays on development, some of which deal with environmental issues.

Whyte, Anne and Ian Burton. *Environmental Risk Assessment*. Toronto: John Wiley and Sons, 1980. Published on behalf of the Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions (ICSU).

A primer on deciding between social benefits and environmental risk. Non-mathematical.

Pulp and Paper Mills (see also **Air Pollution and Water Pollution**)

Bamsey, C.R., editor. *Directory of Primary Wood-Using Industries in Alberta - 1988*. Edmonton: Forestry Canada and Alberta Forestry, Lands and Wildlife, 1988.

Names and addresses of the 306 firms (sawmills, planer mills, panelboard mills, wood treatment plants, and pulp and paper mills) that use cut logs in Alberta. Statistics for 1987 are provided for each firm as well as several useful appendices.

Eddie, Howard. *Environmental Control for Pulp and Paper Mills*. Park Ridge, N.J.: Noyes, 1984.

Good overview for air and water pollution but references are old.

Heimbürger, Stanley A., Daniel S. Blevins, Joseph H. Bostwick and G. Paul Donnini. *Kraft Mill Bleach Plant Effluents: Recent Developments Aimed at Decreasing Their Environmental Impact. Parts 1 and 2*. Tappi Journal, volume 71, numbers 10 and 11?, pages 51-60 and 69-78, October and November 1986.

Covers extended and oxygen delignification, substitution of bleaching chemicals and process modifications.

Kirkpatrick, Neil. *Environmental Issues in the Pulp and Paper Industries: A Literature Review*. Leatherhead, Surrey, England: Pira Information Services, 1991.

Reviews environmental issues with respect to use of wood, pulping, bleaching, papermaking and recycling, biotechnology and legislation in the United Kingdom. There are 105 abstracts plus 18 additional references.

McCubbin, Neil. *The Basic Technology of the Pulp and Paper Industry and Its Environmental Protection Practices*. Ottawa: Environmental Protection Programs Directorate, Environment Canada, 1983.
Report EPS-6-EP-83-1.

This is a training manual written mainly from the environment protection point-of-view. It covers the importance and history of the industry in Canada, wood preparation, pulping, screening and cleaning, bleaching, stock preparation, paper machines and dryers, chemical recovery, steam and electrical generation, and effluent treatment. Its appendices include: chemical symbols, wood chemistry, and a glossary.

McCubbin, Neil. *State-of-the-Art of the Pulp and Paper Industry and its Environmental Practices*. Ottawa: Environment Canada, 1984.
Report EPS-3-EP-84-2.

A review of such topics as: forestry operations, debarking, pulping systems, chemical recovery, washing and screening, bleaching, papermaking, steam and power, effluents, computer applications, energy, and costs.

Miller Freeman Publishers. *Lockwood-Post's Directory of the Pulp, Paper and Allied Trades*. San Francisco, California: Miller Freeman, 1989.

Addresses of pulp and paper businesses in Canada and U.S.A.

Nghia, Hoc Tran. *Deposit Control Technology for Kraft Recovery Units*. Ottawa: Industrial Programs Branch, Environmental Protection Service, Environment Canada, 1984.
Report EPS 3/PF/1.

When the black liquor is burned in a recovery unit, the combustion products form deposits inside the unit. These deposits reduce the efficiency of the recovery unit. This paper describes an instrument that measures the amount of deposit accumulation.

Sandwell and Company. *Dead Load Reduction in the Kraft Pulping Process*. Industrial Programs Branch, Environmental Protection Service, Environment Canada, 1986.
Report EPS 3/PF/2.

Dead load refers to the amounts of non-reactive chemicals being re-cycled within

the pulping process. This paper focuses on improving the efficiencies of the white liquor evaporation process at the Great Lakes Forest Products mill.

Science Council of Canada. *A Sectoral Approach to Innovation: The Case of the Forest-Product Industries*. Ottawa: Science Council of Canada, 1987.
Catalogue No. SS31-14/6-1987.

Recommendations to the Canadian industry to improve its technologies and increase research and development.

Thomas, Randy. *Pulp and Poison*. Monday Magazine, volume 15, number 3, cover, pages 6 - 9, 12-18 January 1989.

This article concentrates on the environmental problems of a pulp mill in Creston, British Columbia. It also covers the frustrations of ordinary people trying to deal with the pulp industry.

Woodbridge, Reed and Associates. *Aspen for High Quality Chemi-Mechanical Pulps: Overview for Alberta*. Vancouver: The company, 1981.

Use of poplar in an alternative process to Kraft bleaching.

Waste Management (see also Air Pollution and Water Pollution)

Beak Consultants Ltd. *Stripping Kraft Foul Condensates with Waste Gases*. Ottawa: Environment Canada, Environmental Protection Services, Water Pollution Control Directorate, 1982.

Not seen.

Brewer, Heather M. *Anaerobic Technology: A review of Research, Development and Demonstration Activity in the Agrifood and Pulp and Paper Industries*. Ottawa: Industrial Programs Branch, Environmental Protection, Conservation and Protection, Environment Canada, 1988.

Not seen.

Exner, Jurgen H., editor. *Solving Hazardous Waste Problems: Learning From Dioxins*. Washington, D.C.: American Chemical Society, 1987.

From a symposium held by the American Chemical Society in April 1986. Thirty-one papers on distribution, toxicology, risk assessment and risk management.

Freeman, Harry M., editor. *Innovative Thermal Processes for Treating Hazardous Wastes*. Lancaster, PA.: Technomic, 1986.

Covers such techniques as: wet oxidation, fluidized bed incineration, pyrolysis, electric reactors, plasma systems, chemical transformations and advanced incinerators.

Freeman, Harry M., editor. *Incinerating Hazardous Wastes*. Lancaster, PA.: Technomic, 1988.

A review of the thermal mechanisms for destruction of certain hazardous wastes.

Freeman, Harry M., editor. *Standard Handbook of Hazardous Waste Treatment and Disposal*. Montreal: McGraw-Hill, 1988.

Good overview of many topics, including: dioxins, various thermal processes, aerobic and anaerobic decomposition, landfill, and sampling.

Jank, B.E. et al. *An Assessment of Kraft Bleachery Effluent Toxicity Reduction Using Activated Sludge*. Ottawa: Water Pollution Control Directorate, 1977.

Not seen.

Malinen, Raimo, Nils-Erik Virkola and Esko Turunen. *Effluent Characterization and Treatment of Chemithermomechanical Pulping*. Helsinki, Finland: University of Helsinki, Laboratory of Pulping Technology, 1985.

Not seen.

Metcalf and Eddy Inc. *Wastewater Engineering: Treatment, Disposal, and Reuse*, 3rd ed. Revised by George Tchobanoglous and Franklin L. Brown. New York: McGraw-Hill, 1991.

Text on treatment techniques for municipal wastewater.

National Council of the Paper Industry for Air and Stream Improvement. *A Review of the Status of*

Development and Application of Groundwater Models for Prediction of Contaminated Transport of Materials Derived from Land Disposal of Solids and Liquids. New York: The Council, March 1984. Also available as Technical Bulletin 425.

Not seen.

National Council of the Paper Industry for Air and Stream Improvement. *Landfill Gas Generation, Migration, Monitoring and Control*. New York: the Council, May 1984.

Also as the Council's Technical Bulletin 431.

Not seen.

Reed, Sherwood C., E. Joe Middlebrooks, and Ronald W. Crites. *Natural Systems for Waste Management and Treatment*. Toronto: McGraw-Hill, 1988.

Mathematical factors for designing waste water treatment facilities, such as sludge ponds.

Reid, Ian C. *Policy for In-Plant Control of Adsorbable Organic Halides in Kraft Pulp Mill Effluent*. Edmonton: Alberta Environment, Standards and Approvals Division, 1989.

Operating policy.

Springer, Allan M. *Industrial Environmental Control: Pulp and Paper Industry*. New York: John Wiley and Sons, 1986.

General overview.

Water Pollution (see also Fish Toxicology and Waste Management)

A.A. Aquatic Research Limited. *Procedures and Methods for Evaluating Water Quality Changes in Receiving Streams: Technical Manual*. [Edmonton]: Alberta Environment, 1986.

Procedures for testing water samples.

Bonsor, Norman, Neil McCubbin and John B. Sprague. *Kraft Mill Effluents in Ontario*. Toronto: Ontario Ministry of the Environment, 1988. Prepared for the Technical Advisory Committee, Pulp and Paper Sector of MISA (Municipal/Industrial Strategy for Abatement) and Ontario Ministry of the

Environment by the Expert Committee on Kraft Mill Toxicity.

The best overview on the kinds and sources of wastes produced by kraft types of pulp mills.

Cherwinsky, Christina and Don Murray.

Preliminary Investigation of Trace Contaminants in Pulp and Paper Mill Effluents. Toronto: Queen's Printer for Ontario, 1986.

MICROLOG 87-01079, 2 fiche

Gives long lists of chemicals and groups of chemicals found in pulp mill effluents. Such chemicals cause, or are suspected of causing: toxicity to aquatic organisms, mutations, cancers, fish tainting, or taste and odour problems for drinking water.

Colodey, A.G. *Environmental Impact of Bleached Pulp and Paper Mill Effluents in Sweden, Finland, and Norway: Implications to the Canadian Environment.* Ottawa: Unpublished report IP-99 of Environment Canada, Conservation and Protection, Pacific and Yukon Region, 1989.

This report looks into what pollution impacts (especially on fish) may occur in Canada. There is a large annotated bibliography on the effects of pulp and paper mill effluents; also a short summary of human health effects of such mills.

Daishowa Canada Co. Ltd. *Peace River Kraft Pulp Mill: Water Quality and Fisheries Impact Analysis and Dioxin Evaluation.* Calgary: Monenco Consultants Limited, 1987.

This is a draft report.

Dioxin Committee (a Joint Committee of the Air Pollution Control Division and Solid Waste Processing Division). *Bibliography on Dioxins.* Alexandria, Virginia: American Society of Mechanical Engineers, 1987.

Not seen.

Eisler, Ronald. *Dioxin Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review.* United States Fish and Wildlife Service, U.S. Department of the Interior, 1986.

Biological Report 85 (1.8).

Contaminant Hazard Review number 8.

A concise introduction to the problems of dioxins in wildlife. Recommends a maximum

of 0.01 ppt (parts per trillion) in water to protect aquatic life or 10-12 ppt in food items of wildlife.

Griffiths, W.H. and B.D. Walton. *The Effects of Sedimentation on the Aquatic Biota.* Edmonton: Alberta Environment and Environment Canada, 1978.

Alberta Oil Sands Environmental Research Program AF 4.9.1.

Reviews detrimental effects of increased suspended and settled sediments on fish, benthic invertebrates, and primary producers. Upper tolerance for fish is about 80-100 mg/L and as low as 10-15 mg/L for bottom invertebrates. Sediments can arise from vegetation removal, road construction, and industrial activities.

Haufe, W.O. *Control of Black Flies in the Athabasca River. Evaluation and Recommendations for Chemical Control of Simulium arcticum Malloch.* Edmonton: Alberta Environment, Pollution Control Division, 1980.

Addition of pesticides to the Athabasca River has many similarities to the addition of toxic effluents. This summary paper has a number of useful references.

Haufe, W.O. and G.C.R. Croome, editor. *Control of Black Flies in the Athabasca River. Technical report. An Interdisciplinary Study for the Chemical Control of Simulium arcticum Malloch in Relation to the Bionomics of Biting Flies in the Protection of Human, Animal, and Industrial Resources and its Impact on the Aquatic Environment.* Edmonton: Alberta Environment, Pollution Control Division, 1980.

Twenty-one papers related to application of methoxychlor to the Athabasca River. As stated above the behaviour of pesticides is similar to many toxic wastes.

Hogge, H.L. *Disposal of Waste Waters from Bleached Kraft Pulp Mills to the Athabasca River.* Edmonton: Alberta Department of Public Health, Division of Sanitary Engineering, April 1965.

A historical document.

Industrial Programs Branch, Environmental Protection Programs Directorate, Environmental Protection Service,

- Environment Canada. *Status Report on Abatement on Water Pollution from the Canadian Pulp and Paper Industry (1982)*. 1984. Ottawa: Environment Canada, 1984.
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