

- 1 PDF copy of **Byrne**, James M. *Silent lies and the looming Alberta Water Crisis*. In Trevor W. Harrison, editor, 2005. **THE RETURN OF THE TROJAN HORSE: Alberta and the New World (Dis)Order**, Black Rose Books, ISBN: 1-55164-254-9 346 pp.

This paper is not available in the final pdf format as printed in the book. The book is under distribution by the lead editor. If a photocopy or copy of the book is required please let me know.

James M. Byrne, October 15, 2008

Chapter Eleven

SILENT LIES AND ALBERTA'S LOOMING WATER CRISIS (1)

James M. Byrne

In the end we will remember not the words of our enemies, but the silence of our friends.
– Martin Luther King, 1967.

When is enough, enough?
– Archie Waquan, Mikisew Cree Chief, 2003.

Indeed, when is enough, enough? How much wealth does this generation of Albertans need? The sacred cow of economy and politics is growth – growth in exports, sales, gross national product, economic growth, resource development, population growth. The views of the Premier and his government on growth are reflected in his speech to the Empire Club in Toronto, on January 12, 2005:

The next Alberta will continue to rely on the economic and fiscal policies that have served the province so well: no deficits, no debt, low taxes, economic stability, and the constant elimination of red tape and regulation, which together have attracted tremendous private sector investment . . . a new image of Alberta has emerged. It's an image of high-tech innovation, medical breakthroughs, small-business prosperity, and diversity of opportunity . . . we are creating competitive tax strategies that support research and development, improve global market access, and attract new investment. Translated, those three goals mean: jobs, jobs, jobs.

Growth is the Alberta Mantra – and that growth is based on resource exploitation. But such developments need water – a lot of water. This chapter looks at water in Alberta: how much the province has, and will have; and how much it will need in future, given current trends. It looks at the problems associated with water use and abuse. At a deeper level, however, the chapter critiques the ideology of progress that underlies our approach to water, resource development, and the environment. In considering the global and Albertan approach to the use – and abuse – of resources, we see clearly the application of what Mark Twain described as the Silent Lie. “Almost all lies are acts, and speech has no part in them . . . the silent assertion that nothing is going on which fair and intelligent men (and women) are aware of and are engaged by their duty to try to stop” (quoted in Bartlett, 2004).

This chapter examines Alberta’s looming water crisis. The examination proceeds through four sections: 1) A brief review of the major river basins in the province, placing Alberta’s water supplies and challenges in a global and regional context; 2) A look at past problems and future challenges; 3) A critical look at growth, sustainability and resource development – or, The Silent Lie; and 4) An attempt to answer the question: “Who – and how – will we ensure the safety and security of our rivers?”

This treatise expresses a clear concern about an ongoing serious naivety, or worse, untruths surrounding our water resources – in fact surrounding most of the resource developments in the province. Many are aware we cannot sustain such development, that such development is unwarranted in this age of unmitigated wealth, and that the environmental costs are being burdened on the next generation and the local peoples. But those many do not speak out – they continue to trade off environmental quality and health for their own gains. Such inaction and complicity has been called the Silent Lie. As the discussion herein addresses critical problems, we may arrive at conclusions about Silent Lies in Alberta. Equally important, we may identify the groups who perpetuate the Silent Lies through their actions, inactions, or both.

Alberta Rivers in a Global and Regional Context

The global water cycle is a constant exchange from the oceans and land to the atmosphere, and back to the land and oceans. Almost all of the earth's water – 1.32 billion cubic kilometers - is in the oceans. About 13 thousand cubic kilometers of water is stored in the atmosphere, cycling – and purifying through the process of evaporation - and returning to the planet's surface as precipitation. Precipitation on land may infiltrate into soil water storage (around 65 thousand km³) or percolate to the groundwater system (8250 thousand km³). Some precipitation forms runoff – creating rivers (37,500 km³/year) and lakes (125,000 km³) on which most terrestrial inhabitants depend for water supply. Eventually, runoff water returns to the ocean, and the cycle begins again. Locked away in alpine glaciers as near as Banff and Jasper, and in ice sheets as distant as Greenland and Antarctica, is the remaining volume of earth's water - another 29.2 million cubic kilometers of water (Wilson, 1990: 3).

There is a world water crisis. “Challenges remain widespread and reflect severe problems in the management of water resources in many parts of the world. “These problems will intensify unless effective and concerted actions are taken, as is made clear in the World Water Vision” (United Nations, 2003). Albertans cannot afford to detach from the problems the United Nations describes. Many of the water quantity and quality issues are – and will – occur right here at home.

Some of the causes of increased water usage are readily apparent: increased population growth, forestry mismanagement, intensified livestock production and industrial farming, and oil and gas development. What all these "causes" come down to, however, is an ideology of growth that is unsustainable. We are trading off short-term profit in resource development for long-term environmental problems. Technological fixes to environmental issues that ignore growth as the key issue, thereby allowing growth to continue, simply compound the problem in the future. Those problems will be manifest in degraded health; degraded human health; degraded environmental health. The two health issues are inexorably linked.

Albertans are indeed fortunate to live in a land absolutely rich in many resources. On a regional basis, however, water is not a resource in abundance. The major rivers of Alberta are shown in Figure 1. The average annual river flow in Alberta is about 130 km³ – about 0.35 percent of the global water fresh supply. Over 86 percent of that water supply is in the northern river basins – the Peace and Athabasca Rivers that feed the McKenzie River, draining into the Arctic Ocean.

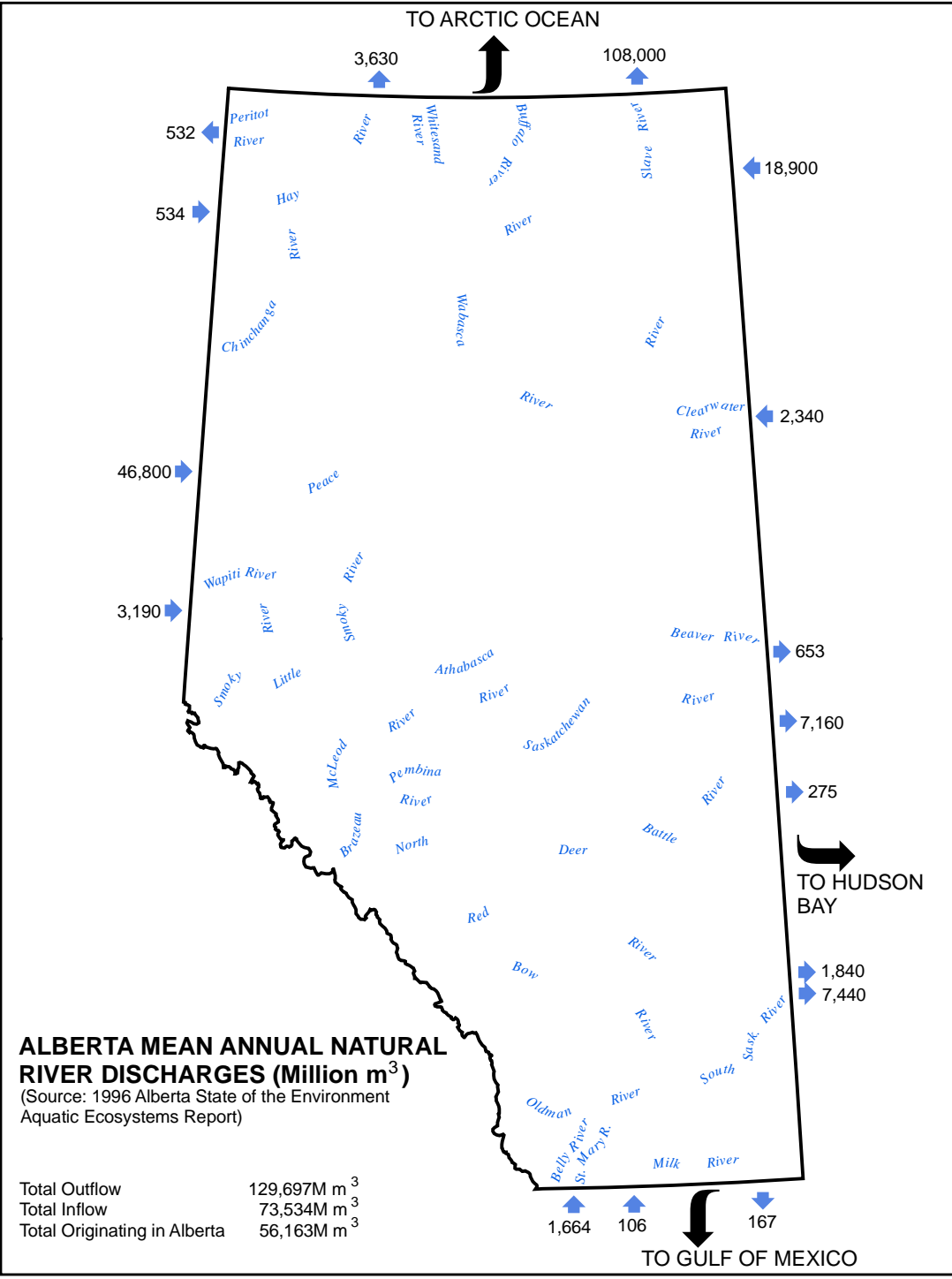


Figure 1 – Locations and flow volumes of major rivers in Alberta.

Only about 400,000 people live in the Peace and Athabasca river basins. The rest of us – 2.8 million Albertans – must survive on the much smaller water supplies in the south, where warm dry climate results in greater water needs. A brief discussion of the major river basins in the province sets the scene for the concerns shared in this treatise.

The Oldman and Bow Rivers run out of the alpine areas of Banff, Kananaskis, Crowsnest and the Waterton-Glacier International Peace Park, and eventually meet to form the South Saskatchewan River east of Taber. The Bow and Oldman have been heavily tapped to develop thirteen irrigation districts with about 536,000 ha (1.3 million acres) of irrigated land. About 70 percent of the Oldman and 68 percent of the Bow (Alberta Environment, 2005) has been allocated to diversion licenses, based on the median natural flow. Median means middle – in one half of all years, flows will be below the median value. In a dry year, flow volume may be half the median annual flow. In such years, there is insufficient water to meet the licensed allocation. Surprisingly, recent studies (AIPA et al., 2002) suggested the Oldman Basin could sustain a ten percent expansion of irrigation, and the Bow Basin could sustain up to 20 percent! This study makes no mention of climate change, even though the author and others have presented results of a number of studies on climate change reporting water supplies will decline and water needs for a hectare of irrigation will increase due to warmer, longer growing seasons. Over allocated and shrinking water supplies and increasing crop water demands do not add up to expansion of irrigation.

The Red Deer River begins in the front ranges of the Rockies east of Lake Louise, and flows northeast to Red Deer, then southeast and east to join the South Saskatchewan just after crossing the Alberta border. The total of licensed allocations of water from the Red Deer River appears quite low – 18.4 percent (Alberta Environment, 2005) compared to the over allocated Oldman and Bow Rivers to the south. However, the Master Apportionment Agreement, administered by the Prairie Provinces Water Board, states “Alberta shall permit a quantity of water equal to one-half the *natural flow* of each watercourse to flow into the Province of Saskatchewan.” Obviously, in dry years the Oldman and Bow Rivers may not be able to meet the apportionment agreement, and Red Deer River water is used to meet this shortfall.

The North Saskatchewan River begins in the high alpine regions midway between Banff and Jasper, winding east and north to Edmonton, and then rolling eastward through the parkland, historically a well-watered region with few water supply demands on the river. But in the last few years, the region has suffered the worst drought in over 130 years (Case and MacDonald, 2003). Further, tree ring analyses of past climates suggested the 20th century was one of the wettest periods in the last 500+ years. Does the severe drought of 1999-2002 imply a return to pre-1900 conditions, or is it human induced climate change, or both?

The North Saskatchewan River is not so far removed from semi arid lands. Just a few miles to the south lies over 40,000 km² of dry open prairie, and a tiny ribbon of water called the Battle River. The Battle River is the only meaningful water in the wide expanse between the Red Deer and North Saskatchewan Rivers. But the Battle River is a tiny and undependable resource, less than 4 percent of the flow in the North Saskatchewan. Residents to the south of the Battle River are currently pushing a water transfer scheme. “The Special Areas Water Supply Project has an estimated price tag of \$168 million and would use pipelines, canals and reservoirs to rejuvenate

one of the most arid regions of Alberta” (Special Areas, 2005). The net benefits of this project are 8000 to 12000 ha (20-30 thousand acres) of irrigation development. These numbers represent an investment of well over one million dollars per quarter section of land. Is this an appropriate investment? There may be reasonable means of providing more dependable water supplies to Alberta’s Special Areas, but the proposal described on the Special Areas website does not appear to be economically viable.

Continuing the discussion of the major rivers in Alberta takes one to the Athabasca Basin. Melt waters from Athabasca Glacier in Jasper National Park run north to Jasper Town site, and then trend northeast for almost a thousand kilometers to Fort McMurray. The Athabasca is Alberta’s third largest river behind the Slave and Peace Rivers. The joining of the Peace and Athabasca Rivers at the Peace Athabasca delta forms Alberta’s largest river, the Slave. The Athabasca River receives effluent from five pulp and paper mills at Hinton, Whitecourt (2 mills), Slave Lake and Athabasca. Some people feel the pulp mills are not good neighbours, citing threats of lawsuits regarding publicity on environmental concerns, promises made at the time of approval hearings by companies and government are broken; and sight smell and sound pollution has made life difficult for local residents. Chambers et al. (1997) established that pulp mill effluent causes declines in dissolved oxygen (DO) for hundreds of kilometers downstream. DO is critical to the survival of aquatic life in the river.

Downstream from the pulp mills the Athabasca River flows through the oil sands region around Fort McMurray. Oil sands developments are land disruption on perhaps the greatest scale ever by humans! Syncrude Canada states they have moved a third more earth than was excavated to construct the Panama Canal- all oil sands plants together can move enough material to fill Toronto’s SkyDome in two days (Alberta Energy, 2005b). Gee that last idea is not so bad given the Blue Jays play in recent years. Oil sands developments have something in the range of 25,000 km² of lease areas, and have approvals for plants to develop over one half million ha (60 townships). Indeed, this is environmental change on the most fearsome scale – a point to which I will later return.

And, finally, the Mighty Peace: Alberta’s great river and one of the great rivers of Canada. The Peace originates in the alpine regions of central British Columbia, north of Prince George. The Peace rolls east to Alberta, north to Fort Vermilion and east to the Peace-Athabasca delta. Four pulp mills in British Columbia and two in Alberta impose their effluent on the river, likely with similar effects on water quality as for the Athabasca River. Both the Peace and Athabasca are subject to other compromising developments (NRBS, 1996). Agriculture has an unknown effect on each river – but developments are much more extensive adjacent to the Peace. Extensive oil and gas formations underlie both rivers and there are many oil and gas plants in each basin. Coal mines are common in both basins, and a number of abandoned Saskatchewan uranium mines have an unknown effect on Lake Athabasca, and the Slave River to the north.

Spring snowmelt used to rush off the mountains, and down the Peace River, northward to the Peace-Athabasca delta. Thick hard river ice, formed over the long cold sub-arctic winter resisted the flood, and then broke up to form immense ice trains that routinely hooked and jammed on river bed and banks, building into massive ice jam floods that inundated the surrounding valley. Perhaps nowhere were ice jams as consistent as those that routinely formed

on the north side of the delta, causing flood waters to rise metres above river level, and pour into the elevated lake basins of the Peace-Athabasca delta. A dynamic diverse ecology formed in the elevated basins – wetlands with million of muskrats, mink, marten. But the Bennett Hydro Dam on the upper Peace changed the river dynamics. Ice jam floods do not occur because the spring flood is held back. The delta has dried out, fur-bearing mammals have left, and thistles and other invasive southern plants, not capable of surviving the rough and tumble floods, are now overtaking the desiccated lake basins.

Past Problems and Future Challenges

Think about the big news stories that relate to water in Alberta in recent years.

- Floods - the number one weather event of 2004 in Canada, the Edmonton thunderstorm, dropped 150 mm of rain in under an hour on a city already saturated by earlier storms. Losses were estimated at \$175 million (Environment Canada, 2004).
- Droughts – the drought of 2001-2003 in central Alberta was the most severe on record. The Palmer Drought Severity Index (PDSI) in 2002 at Lacombe is negative 3.6. This is an all time low for the period shown – almost 90 years (Kienzle et al., 2005). Environment Canada (2004) characterized the 2002 crop year as “the worst ever for farmers in Western Canada.” In 2001, the St. Mary River Irrigation Project in southern Alberta had insufficient water to meet annual allocations – farms were only provided with 60 percent of their water needs.
- Insect pests – wet weather favours some crop diseases, and drought favours certain terrestrial insects such as grasshoppers. Dry weather, beginning in some areas in 1999, allowed their numbers to increase in 2002. Hot, dry weather in 2003 allowed the more serious pest species (which happen to be the species that most respond to warm, dry weather) to reach massive densities that cleaned crop and forage off fields in some regions, such as east-central Alberta. The cold, wet summer of 2004 slowed the grasshopper outbreak, at least temporarily (Johnson, 2005).
- Contaminants – Alberta Environment reported that over one quarter of treated drinking water samples collected between 1995-2003 in Alberta contained pesticide residues, with the worst contaminations found in samples from treatment plants in the South Saskatchewan (55.7 percent), Oldman (46.9 percent) and Battle (40.3 percent) Rivers. This is not surprising given the intensity of agriculture practices in these river basins. There were no overall trends in the data, possibly indicating the problem is an issue of systemic, long term overuse of pesticides in rural – and likely urban – environments. Other studies (Cash et al., 2001) have shown the same pesticides found in Alberta’s drinking water are also found in Saskatchewan in wetlands distant from application locations. The authors hypothesize that many agricultural pesticides are rapidly vapourised at application, and either directly absorbed to the surface of wetlands from the atmosphere, or entrained in clouds, and redistributed widely and evenly by rainfall.

- Bacteria - monitoring for pathogens in southern Alberta surface waters since 2000 has found that several pathogens, including *Salmonella* ssp. and *Escherichia coli* O157:H7 are prevalent in irrigation and river water (Gannon et al., 2004). The number of pathogens isolated from raw water peaked during the summer months, coinciding with the time of peak water-based recreation. Waterborne pathogens disease outbreaks killed people in Ontario, and caused major outbreaks in public drinking water systems in other locations across the country. Media reports linked much of the contamination threat to the intensive livestock industry (Macleans, 2000).
- Viral outbreaks – wet or dry weather can encourage disease vectors as well. The mosquito (*Culex taralis*) that spreads West Nile Virus thrives in hot, dry weather. In summer 2002, 340 Canadian were infected with West Nile Virus, and 2 deaths resulted. In 2003, 1,400 Canadians were infected, and there were 14 deaths. But unseasonably wet cold weather in summer 2004 hampered mosquito populations, resulting in just 29 clinical cases of West Nile virus and no deaths (Health Canada, 2002; Environment Canada, 2004). Other studies (Naugle et al., 2004) report West Nile infections has left wildlife and public health officials scrambling to address surface water and disease vector control issues in western North America. West Nile reduced late-summer survival of greater sage-grouse an average of 25 percent. Sage grouse populations, and other species at risk, may be severely depleted as the disease becomes more prevalent during warm summers.

These are water problems. Water controls the climate – too much or too little water produces cold and wet, or hot and dry weather; bringing extremes that stress the ecology and environment, and the financial, medical, and human resources of society.

These are not the only problems we face. Citizens and specialists have shared their opinions on the state of our waters.

From northern Alberta ...

- “In northern Alberta, the drying of the (Peace-Athabasca) delta (PAD) is related to the Bennett Dam . . . exacerbated by climate variability . . . Ecological changes . . . impacts . . . fisheries . . . waterfowl migration routes, decline in ungulates, muskrats and other wildlife, and changes to the way-of-life of people living in the delta . . . dioxins, furans and mercury exist in burbot liver and the muscle and liver of other fish species . . . pulp mill contaminants have reached the perched basins” (NRBS, 1996).
- An oil spill is never cleansed: “The oil came down one time, that oil spill . . . Couldn’t eat the fish, even the dogs wouldn’t eat ‘em, you cook ‘em over there, throw it out to the dogs, no, too much oil, they wouldn’t eat it . . . God knows how much pollution there is in that to change the colour of that water, and the cups is all just yellow, you know it just stains everything, that water was so bad” (Water Under Fire, 2004, quoting Andrew Campbell, Mikisew Cree Elder, 2003). The Mikisew Cree Elders say that oil is still in the delta – they cannot drink or use the water in that region since the time of the oil spill in the Athabasca River.

To central Alberta ...

- “The most severe impacts on soil moisture and groundwater levels are from multi-year drought. The instrumental records indicate that the current sustained drought of 2000-2003 recorded far less total precipitation than the other sustained drought of the 20th century, the mid-1930s” (Sauchyn, 2004).
- “Even if global warming does not occur as forecasted by GCMs, the paleoclimate data suggest that future climate extremes may exceed those experienced during the 20th century. The most plausible climate future for the northern plains, based on the latest climate models, includes a declining net surface and soil water balance, as water loss by evapotranspiration potentially exceeds precipitation to a greater degree. This scenario demands serious thought into the adaptation required by society to adjust soil and water management to limit the risk of desertification” (Sauchyn et al., 2004).
- “The Bow River faces a flood of threats . . . Eleven hydropower generation stations and a storage reservoir . . disrupt the natural flow and alter the aquatic ecology . . . The Bow is drained to irrigate over half a million acres of land . . . Urban runoff was cited as one of the greatest threats to the health of the Bow . . 11.4 million kilograms of waste . . . Fifty golf courses border the Bow and its tributaries . . . Many of them extensively distribute herbicides, fungicides and chemical fertilizers that drain into the river. The cosmetic use of pesticides in landscape maintenance is yet another trial for the Bow . . .” (Wild Canada, 2003).

To southern Alberta:

- “We are taking so much out that there isn’t enough for fish, there isn’t enough for cottonwood forests, there isn’t enough for maintaining channel form and depth and there certainly isn’t enough for many of the recreational activities which southern Albertans wish to participate in . . . “ (Water Under Fire, 2004).
- “Alberta's Feedlot Alley ... produces untreated waste from 1.3 million animals that is the sewage equivalent for a population of eight million people” (Maclean’s, 2000).
- The challenges described above are already intensified by climate change – the greatest single environmental threat ever to societies and ecosystems. Recent work (Lapp et al., 2005) predicts that warming winters will result in a decline of nearly 40 percent of annual runoff volume in the upper Oldman River in southern Alberta. That period begins in 16 years – climate change impacts will rise in the coming years.
- Substantial declines in water supplies, combined with increasing demands due to warmer climates, will obviously stress water availability; and exacerbate almost every water quality issue. Our approach to protecting water quality is to pollute rivers at levels Albertans are promised are safe. The old adage – dilution is the solution to pollution – defines how we treat our rivers. But such treatment is no longer safe or appropriate. Pesticides, herbicides, pharmaceuticals, hormone disrupting chemicals, metals – all these

find the way to our water through sewage effluent and storm water draining off of agricultural lands, off roads, gardens and lawns in major urban centres. As these quantities increase, dilution capacity is declining, and more and more of these materials are being stored in groundwater, surface water, sediments, vegetation, and of course, in the bodies of aquatic and terrestrial beings.

Clearly, we have to make changes.

Economic Development in Alberta

The Alberta Government has said it is committed "to the wise management of Alberta's water quantity and quality for the benefit of Albertans now and in the future" (Alberta Government, 2003). But this statement is in conflict with the actions and plans of governments and corporations, and cities and towns of Alberta. In Alberta, we are in a headlong, pell-mell drive to trade environmental quality for a quick dollar from resource development. The Alberta Government has recently approved a series of intensive resource based economic growth plans. These include:

- Agriculture - increase primary agricultural productivity from \$6.55 billion in 1999 to \$10 billion in 2010; and value added agricultural processing from \$7.8 to \$20 billion in the same time frame (AAFRD, 2005).
- Electrical developments – 5200 MW of new production (over \$5 billion investment) is currently proposed. Only 600 MW are "Green Power" (Alberta Energy, 2005a).
- Coalbed Methane (CBM) – an Alberta Government brochure (Alberta Energy, 2005a) shows coal beds over almost the entire southern half of the province has potential for CBM production. CBM does not typically use water, but instead, produces large volumes of poor quality water when coal beds are dewatered in the production process (Bryner, 2003; Rice, 2003).
- Oil sands are producing 882.5 thousand barrels per day (bbld) with a total investment of \$24 billion between 1996-2002; and total projected investment of \$87 billion by 2010 (Alberta Energy, 2005a). Oil sands are a water and energy intensive refining process. There is considerable confusion over just how much water is needed. Best current estimates are around 6-10 units of water for each unit of oil produced; although Shell Oil indicated they are moving to 3 units of water per unit of oil but that has not been achieved. Assuming similar water/oil efficiencies, production will be over three million bbld in 2010, requiring 15-30 million barrels of water. The author was an expert witness at Energy and Utilities Board Hearings in fall, 2003, addressing the Environmental Impact Assessments for the Canadian Natural Resources Ltd. and Shell Canada applications for new oil sands refining plants. We presented data that argued neither plant could sustain operations during low flow periods in the Athabasca River without damaging the aquatic ecology. We further pointed out that the effects of climate change on water supplies would reduce low flow quantities and increase the length of low flow periods. It was astonishing to find planners for

corporations investing \$8-12 billion on oil sands plants had not considered the costs of shutdowns due to water supply shortfalls. The corporations are now including raw water storage in their development plans. Such simple oversights in planning such a complex industrial operations give cause for grave doubts about the entire planning process.

Oil sands development is proceeding at a record pace simply to provide continental energy security for the most gluttonous and inefficient energy market in the world. Alberta is taking all the environmental risks to support this horrible inefficiency. What are the risks?

- Oil sands developments have massive impacts on the aquatic and terrestrial environment. Naphthenic acids are toxic and corrosive pollutants (McMartin et al., 2004) produced in large quantities by oil sands refining. They are persistent in water but occurrence and fate has been sparsely studied (Headley and McMartin, 2004). This pollutant could affect up to 25000 km² of oil sands developments, and much more if tailing ponds leak!
- Oil sands developments are changing whole watersheds! The lease area for the approved oil sands plants is almost 560,000 hectares! Go to the Alberta Energy website – they have a promotional video that *brags* the oil sands industry has already reclaimed over 3500 ha! Let's see? $3500/560,000 = 0.625$ percent of the land has been reclaimed so far. Oh sorry – some of that area has not been developed yet – lets cut the developed area in half – that makes it 1.25 percent of the area disturbed has been reclaimed. I feel better now!
- Colomac and Giant mines are two abandoned Gold operations in the Northwest Territories. The Federal Government is currently spending seventy million dollars to decontaminate Colomac Mine, and cost estimates to clean up the Giant Mine in Yellowknife range to one half billion dollars (Water under Fire, 2004). Those mines are a trivial areal disturbance compared to the extent of oil sands developments in Alberta. Is there an unfunded reclamation liability in the half million ha of oil sands development already approved in northern Alberta? If so, how much, and who will ever be able to pay if cost are proportional to areal disruption?

Transfer of Northern Waters Southward

For decades, arguments have been made that the abundant water supplies in the north should be brought southward. In summer 2004, former Premier Peter Lougheed told a Lethbridge water conference that Alberta should “begin planning inter-basin water transfers. While southern Alberta faces water deficits, Lougheed pointed out, there's little use made of the water in the Peace and Athabasca rivers before they run north to the Arctic” (Lethbridge Herald, 2004). However, such comments fly in the face of good science and engineering. The economics of moving water southward will never be feasible: the terrain is entirely uphill, making the costs prohibitive.

Major inter-basin water transfers are responsible for some of the greatest environmental disasters of our times. In Asia, the diversion of the Amu-Dar'ja and Syr-Dar'ja, rivers that fed

the Aral Sea, has resulted in desiccation and widespread destruction of the Sea and surrounding regional environments. A major commercial fishery was lost; drought, and associated salt and dust storms increased causing large-scale decline in agricultural productivity; delta ecosystems were destroyed (German Remote Sensing Data Center, 2005). Public health issues directly related to the decline of the Aral basin arose: Médecins Sans Frontières/Doctors Without Borders (MSF) “has found epidemic levels of tuberculosis and anemia, and children suffering kidney, liver and respiratory diseases, cancers, immunological and neurological problems, and more and more birth defects” (Bowie and Valier, 2001).

Could it happen here? The Science Council of Canada Report *Water 2020* stated “depriving arctic waters of as little as five percent of their supply of fresh water would warm the arctic and trigger climate change over a wide area – possibly on a global scale.” The Arctic is already suffering – the Arctic Climate Impact Assessment (ACIA), released in October 2004, documents widespread environmental change due to climate warming. Do Canadians really want to risk further environmental decline in such a large part of the country? Changing the arctic will radically change all of Canada. Water diversions and associated impoundments on a massive scale in northern Quebec and Manitoba have created wide scale methyl mercury (MeHg) contamination of the aquatic environment, and that contamination has worked through the food web to the polar bears, seals and people of the north. “In 1984, two of every three people in Chisasibi, a community of 2500 at the mouth of the La Grande River, had unacceptably high levels of mercury in their bodies; some elders had 20 times the level deemed acceptable, and some exhibited symptoms of mercury poisoning” (CARC, undated), and current studies document 40-fold increases in MeHg mobilization from new experimental reservoirs in northern Ontario (St.Louis et al., 2004). The mercury releases decline with time but the Hg contamination of fishes remained high for the entire study period of 9 years.

Clearly, the environmental effects make diversion of northern rivers to the south an inappropriate means to meet water demands in the south.

Confronting Progress and the Silent Lie

There is no energy crisis in Alberta. Nowhere in Canada or the United States are populations “freezing in the dark” – nowhere are long lines of SUVs queued at the gas pumps. The rush to develop resources is about the growth mantra and its fatally flawed hypothesis. Growth for growth sake is not good. The problems described above clearly demonstrate our environment and resources cannot sustain this level of development. Furthermore, there is NO justification for such development except that a gluttonous United States and Canada refuse to take meaningful actions to become more efficient with fossil fuels. In this lack of action alone, we are all guilty of the Silent Lie.

The two words most often used to describe the 19th century are "progress" and “growth.” The idea that, through technology and science, things were getting better and better every day in every way united both liberals and Marxists. The recent era of neo-liberal globalization is a particularly robust offspring of this hubris. Every environmental and human disaster is met by

neo-liberals with the response that what is needed is an even greater application of human ingenuity and market-driven incentives. This is a fallacy.

David Suzuki once described the outcome of current environmental change something like this: humanity is crammed in a high-powered automobile blithely speeding towards a brick wall; and the environmentalists, the only ones screaming to brake, are locked in the trunk. But this is no longer the case today. There are in fact many who know we need to brake, but still they remain silent, and through their silence, they lie.

Who perpetuates the Silent Lie today? Many of the following:

- Academics – university and college administrators and faculty who trade off geographically distant or future environmental and human health benefits to build research and teaching programs, buildings and institutes dedicated to enhancing the progress race. The structure of current research funding programs should be protested. Many of these programs at both the national and provincial levels are designed to make academic research the servant of development and corporate goals. These inequities are recognized by many academics, and protested by few – a Silent Lie. Academics may not claim naivety or ignorance as cause for a Silent Lie. The heart and soul of their position, their role – my role – our individual and collective mandate from society – is to speak out.
- Politicians – those who truly function on the basis of the four year election cycle, and see jobs, jobs, jobs and unmitigated resource development as their only goal in office. Many may be naïve or ignorant of the true costs of their actions, and hence they would not be guilty of the Silent Lie. But many are aware of the extent of damage and do nothing; or worse, support rampant development.
- Corporations and business leaders – many are fully aware of the consequences of their actions, and they continue to act with profit as the only goal – short-term profit at the expense of environmental and human health.
- Each and every one of us? That is an individual decision. Many of us are guilty of the silent lie.

What do we do? Recognize the Silent Lie; recognize that rampant development and growth are not sustainable. Slow our rate of resource development – we are rich now; there is no reason to develop at breakneck speed; the potential damages associated with such resource exploitation are too great to risk.

Imagine Alberta with sparse supplies of poor quality water. Water is the very essence of health and environmental quality and our greatest single link to nature. As detached as we might become from the earth, our primordial connection is re-established near water – a lakeshore, a marsh, a river, a brook. Do we want to lose this most basic of all connections?

Margaret Mead said “Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.” We all have to act, to speak out and

change the collective direction. Failure to speak will leave a legacy of overexploitation, pollution, unhealthy environments – and unhealthy people – to our children and grandchildren.

Notes

(1) Trevor Harrison provided advice and much appreciated direction in developing this article. Many colleagues lent their expertise through their own writings and discussion. I am forever indebted to First Nation Elders for wisdom they have shared. Albert Bartlett, renowned environmental campaigner and Professor Emeritus of Physics, University of Colorado at Boulder was an inspiration for this work. Greg Dooper provided assistance with developing Figure 1.

References

- AAFRD. 2005. *Ministry of Agriculture, Food and Rural Development Business Plan 2001-04*. <http://www.finance.gov.ab.ca/publications/budget/budget2001/agric.pdf>.
- AIPA, AAFRD, and PFRA. 2002. *Irrigation in the 21st Century*. Accessed at http://www.aipa.org/21st_Century.html.
- Alberta Energy. 2005a. *Introduction to Electricity*. Accessed Jan2005. <http://www.energy.gov.ab.ca/com/Electricity/Introduction/Electricity.htm>
- Alberta Energy. 2005b. *Alberta Blue – Oil Sands Video*. <http://www.energy.gov.ab.ca/100.asp>
- Alberta Environment. 2005. *South Saskatchewan River basin Water Allocation*. http://www3.gov.ab.ca/env/water/regions/ssrb/pdf_phase2/SSRBWaterAllocations_Jan2005.pdf
- Alberta Environment. 2002a. *Northern River Basins Study Final Report; 3. Major Findings; 3.14 Cumulative Effects*. Accessed Jan2005. <http://www3.gov.ab.ca/env/water/nrbs/sect3/sect314.html>
- Alberta Environment. 2002b. *Interbasin Transfers of Water*. Water Management Review Committee. <http://www3.gov.ab.ca/env/water/wmrc/interba.html>
- Barlett, Albert, 2004. “Thoughts on long term energy supplies: Scientists and the Silent Lie.” *Physics Today*, July: 53-55.
- Bowie, Geoff, and Petra Valier. 2001. “The Hospital at the End of the Earth.” *CBC Television: The Nature Of Things*.
- Bryner, Gary C. 2003. “Coalbed methane development: The costs and benefits of an emerging energy resource.” *Natural Resources Journal* 43(2):

- Byrtus, G., K. Pongar, C. Browning, R. Burland, E. McGuinness, D. Humphries. 2004. *A Summary of Pesticide Residues from the Alberta Treated Water Survey, 1995-2003*. Edmonton: Alberta Environment, Environmental Assurance Service.
- Canadian Arctic Resources Committee (CARC). Undated. *Sustainable Development in the Hudson Bay / James Bay Bioregion*. Located at: <http://www.carc.org/pubs/v19no3/2.htm>.
- Case, R.A. and MacDonald, G.M. 2003. "Tree ring reconstructions of streamflow for three Canadian Prairie rivers." *Journal of the American Water Resources Association* 39: 703-716.
- Cash, Kevin, Donald, David B., Gurprasad, Narine P. and Quinnett-Abbott, Lynne. 2001. "Diffuse geographic distribution of herbicides in northern prairie." *Environmental Toxicology and Chemistry* 20(2): 273.
- Chambers, P.A., G.J. Scrimgeour, and A. Pietroniro, 1997. "Winter oxygen conditions in ice-covered rivers: the impact of pulp mill and municipal effluents." *Canadian Journal of Fish and Aquatic Science* 54: 2796-2806.
- Environment Canada. 2004. *Top Ten Weather Stories for 2004*. Accessed January 2005 at: http://www.msc-smc.ec.gc.ca/media/top10/2004_e.html#topten
- German Remote Sensing Data Center. 2005. *Background Information on the Aral Sea Disaster*. http://www.dfd.dlr.de/app/land/aralsee/back_info.html.
- Gannon, V.P.J., T.A. Graham, S. Read, K. Ziebell J. Mori, J. Thomas, B. Selinger, I. Townshend and J. Byrne, 2005. "Bacterial pathogens in rural water supplies in southern Alberta." *Journal of Toxicology and Environmental Health* (in press).
- Government of Alberta. 2003. *Water for life: Alberta's Strategy for Sustainability*. Edmonton: Government of Alberta.
- Headley, John V. and Mcmartin, Dena W A. 2004. "Review of the occurrence and fate of naphthenic acids in aquatic environments." *Journal of Environmental Science and Health, Part A – Toxic/Hazardous Substances and Environmental Engineering* 39(8): 1989-2010.
- Health Canada, 2002. *West Nile Virus: 2002 Surveillance Program Canada*. Update 19 November 2003. Accessed January 2005 at: http://www.phac-aspc.gc.ca/wnv-wnv/pdf_sr-rs/2003/situation_report_111903_hm.pdf
- Kienzle, S., James Byrne and David Sauchyn, 2005. "Evidence of changes in the hydrological regime of the Upper Battle River Watershed, Alberta, Canada." Paper in preparation for submission to the *Journal of Hydrology*.

- King, Martin Luther. 1967. *The Trumpet of the Conscience*. New York: Harper and Row.
Located at: <http://nameorg.org/resources/Quotes.htm>
- Lethbridge Herald*. 2004. "Time for Alta. to save its Water, says Lougheed." July 17.
- Lapp, Suzan, James Byrne, Ivan Townshend and Stefan Kienzle. Forthcoming. "Climate warming impacts on snowpack accumulation in an alpine watershed: A GIS-based modeling approach." *International Journal of Climatology* (in press).
- Macleans*. 2000. "When water kills." 113(24), June 12: 18.
- McMartin, Dena W., Headley, John V., Friesen, Duane A., Peru, Kerry M. and Gillies, Jon A., 2004. "Photolysis of naphthenic acids in natural surface water." *Journal of Environmental Science and Health, Part A – Toxic/Hazardous Substances & Environmental Engineering* 39(6): 1361-83.
- Naugle, David E. Cameron L. Aldridge, Brett L. Walker, Todd E. Cornish, Brendan J. Moynahan, Matt J. Holloran, Kimberly Brown, Gregory D. Johnson, Edward T Schmidtman, Richard T. Mayer, Cecilia Y. Kato, Marc R. Matchett, Thomas J. Christiansen, Walter E. Cook, Terry Creekmore, Roxanne D. Falise, E. Thomas Rinkes and Mark S. Boyce' 2004. "West Nile virus: pending crisis for greater sage-grouse." *Ecology Letters* 7:704-713.
- Northern River Basins Study (NRBS), 1996. <http://www3.gov.ab.ca/env/water/nrbs/index.html>
- Rice, Cynthia A., 2003. "Production waters associated with the Ferron coalbed methane fields, central Utah: chemical and isotopic composition and volumes." *International Journal of Coal Geology* 56(1/2), November: 14-42.
- Sauchyn, David, 2004. *Personal Communication*.
- Sauchyn, David, Sam Kennedy and Jennifer Stroich, 2004. Drought, climate change and the risk of desertification on the Canadian Plains. *Prairie Forum* 30(1): 143-156.
- Special Areas Website, 2005. *Overview of the Special Areas Water Supply Project*.
<http://www.specialareas.ab.ca/news.htm#OVERVIEW%20OF%20SPECIAL%20AREAS%20WATER%20SUPPLY%20PROJECT>
- United Nations, 2003. *Water for People, Water for Life*. THE UN WORLD WATER DEVELOPMENT REPORT Accessed January 2005 at:
<http://www.unesco.org/water/wwap/wwdr/index.shtml>.
- Water Under Fire. 2004. *Documentary TV Series* quoting Cheryl Bradley, Southern Alberta Environmental Group on Oldman Basin Water Management.

Wild Canada, 2003. *Canada's Most Endangered Rivers List 2003*.
<http://www.endangeredrivers.net>

Wilson, E.M. 1990. *Engineering Hydrology*. London: MacMillan Education.