



Alcan in BC.

Committed to Continual Improvement



Performance 1999



A b o u t t h i s R e p o r t . . .

Like most companies today, Alcan is striving to be transparent and accountable to the many publics with which we interact. We are committed to the principles of sustainability and working diligently to ensure that we are a net contributor to the environmental, economic, and social wellbeing of our communities.

These commitments are not new for Alcan. They are reflected in our corporate Code of Conduct, first published in 1978. We realize, though, that in order for our publics to assess how well we are meeting our commitments, they need to know more about what we do, how we do it, and how we plan to improve our performance. We have also come to realize that the more our publics – or stakeholders – know about our challenges, the more likely they are to participate in identifying mutually beneficial solutions.

This report is our first attempt in B.C. to provide, in a single package, a large amount of information about our performance in the three areas generally considered to be the pillars of sustainability: environmental stewardship, economic contribution, and social responsibility. Many companies call this kind of reporting "Sustainability" or "Triple Bottom Line" reporting. We have refrained from assigning those labels to this document for two reasons. First, this is a regional report, dealing only with the power generation and aluminum production operations of the Alcan Primary Metal Group in British Columbia. Second, we believe we need additional input from our stakeholders about the quality and quantity of the information we're presenting here in order to define what this report eventually becomes. We intend to meet with stakeholder groups over the coming months to seek their views on how we can improve our reporting process.

On behalf of the management of Alcan's B.C. Operations, I invite you to review this first effort and to share your thoughts with us about how we might make subsequent reports more useful to you. We welcome your comments by the reply card provided in this publication, by telephone (1-800-94-ALCAN) or by Email (alcan.in.bc.mag@alcan.com). The contents of this report are available at www.alcaninbc.com, where you will find links to additional information on our operations and performance in British Columbia.

Louis Delage,

A handwritten signature in black ink that reads "Louis Delage". The signature is written in a cursive, flowing style.

Director, B.C. Operations, Alcan Primary Metal Group



C o n t e n t s

Page 2A Building Tradition
4Industrial Facilities
6Production Processes
7Products and Markets
7Power Production
9Employees and Communities
9Status of Kitimat Expansion Study

Page 10 . . .Environmental Progress
12 . . .Aluminum Manufacturing
13 . . .Reservoir Management
15 . . .Environmental Principles
and 1999 Performance

Page 32 . . .Economic Benefits
33 . . .Contribution to the B.C. Economy
33 . . .Contribution to the Regional Economy
35 . . .Employment

Page 36 . . .Social Responsibility
37 . . .Health and Safety
39 . . .Work Environment
41 . . .Community Investment,
Support, Consultation

Page 46 . . .Public Perception Attributes
48 . . .Glossary





A Building Tradition

Half a century ago, Alcan came to B.C. as a builder. At the time, Alcan's internal engineering department was larger than any independent engineering firm in Canada. Alcan engineers had overseen an eightfold increase in the size of the company's Arvida, Quebec smelter during the war years to meet the demand of the Allied War Effort. In peacetime, at the invitation of the B.C. government, they turned their skills to the challenge of creating an aluminum industry on the province's rugged north coast.

They built one of the largest clay-core, rock-filled dams in the world – whose life, engineering journals predicted, would be measured not in historical time but in geological time. They built a 16-km water tunnel through solid rock and penstocks with 16 times the drop of Niagara Falls; an eight-generator powerhouse inside the base of a mountain; an 80-km transmission line over some of the most treacherous terrain in Canada; a technologically advanced aluminum smelter; and two towns – the tiny village of Kemano and the community of Kitimat. At the

Alcan's industrial facilities in B.C.



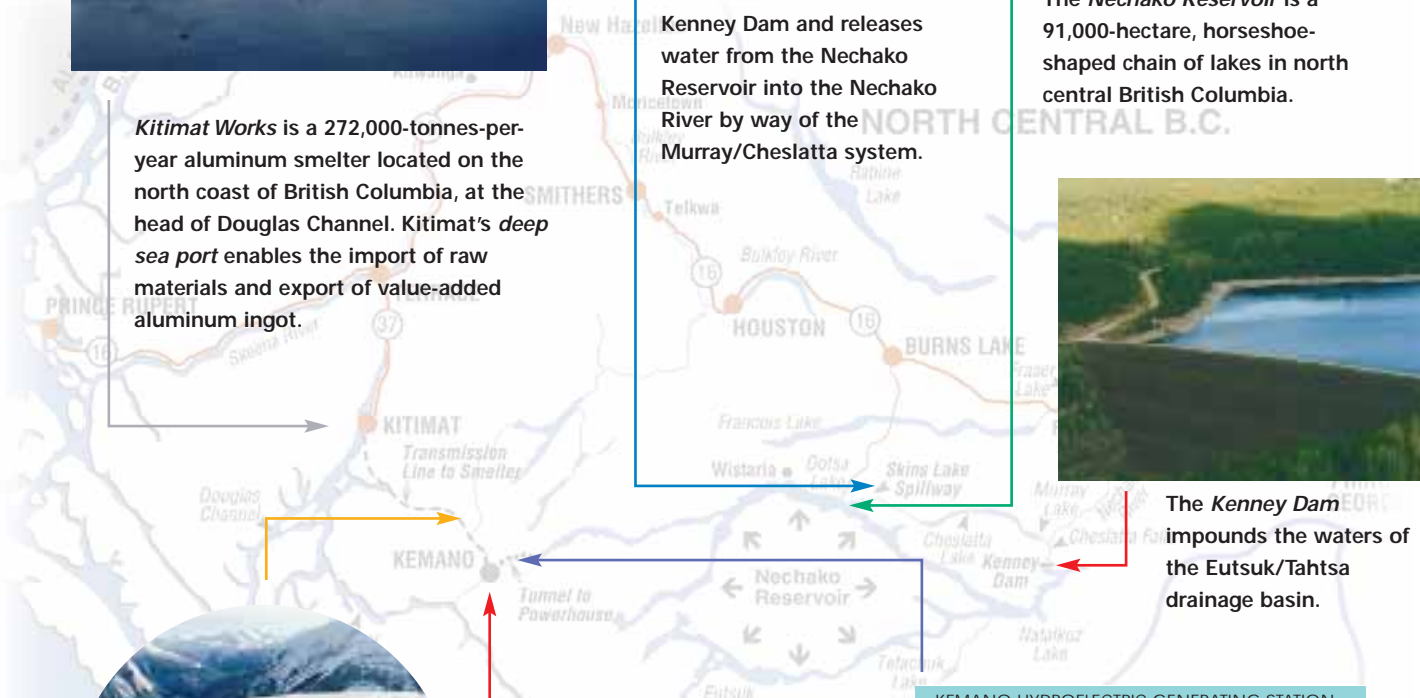
Kitimat Works is a 272,000-tonnes-per-year aluminum smelter located on the north coast of British Columbia, at the head of Douglas Channel. Kitimat's deep sea port enables the import of raw materials and export of value-added aluminum ingot.



The Skins Lake Spillway is situated 80 km west of Kenney Dam and releases water from the Nechako Reservoir into the Nechako River by way of the Murray/Cheslatta system.



The Nechako Reservoir is a 91,000-hectare, horseshoe-shaped chain of lakes in north central British Columbia.



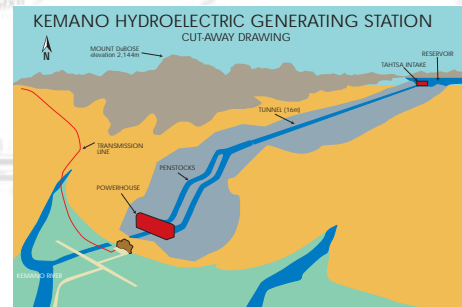
The Kenney Dam impounds the waters of the Eutsuk/Tahtsa drainage basin.



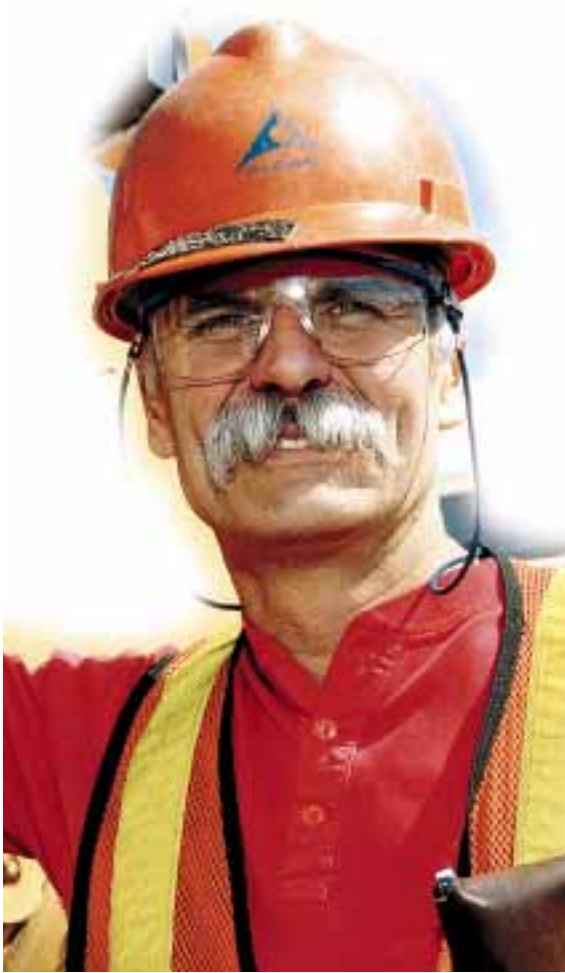
The 82-km transmission line carries power from Kemano to Kitimat Works over the 1,500-meter high Kildala Pass.



The Kemano powerhouse is a 1,000 megawatt hydroelectric generating station built inside the base of Mount Dubose.



The power tunnel slopes for 16 km through the Coast Mountains to transport water from the Nechako Reservoir to the Kemano powerhouse. Its penstocks have an 800-meter vertical drop.

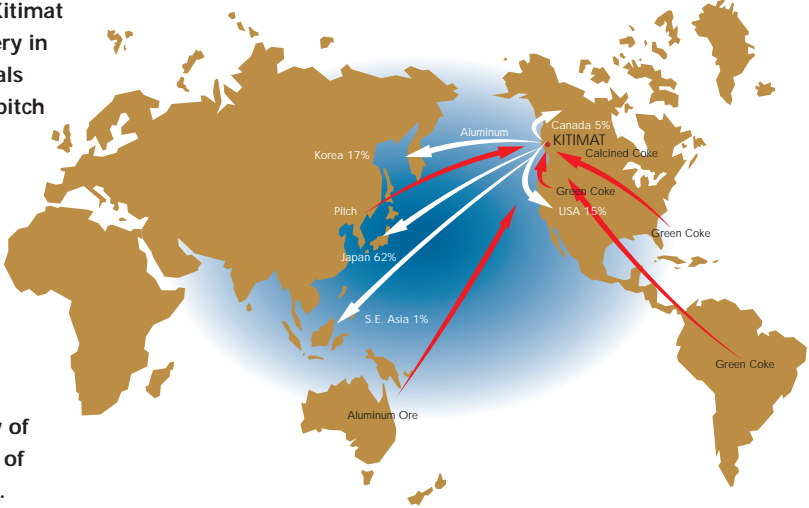


Kirk Underwood, wharf equipment operator, part of Alcan for 17 years

time, it was the largest private-sector project ever undertaken in Canada.

In providing goods and services to this unprecedented development, existing businesses prospered and new ones sprouted – including the companies that would eventually evolve into Canadian Helicopters Corporation and Canadian Airlines.

Alcan ships alumina to its Kitimat Works smelter from a refinery in Australia. Other raw materials shipped to Kitimat include pitch and coke, used in the electrolytic reduction process by which aluminum is made. Pitch is shipped to Kitimat Works from Korea, while coke comes from other parts of Canada, the United States and South America. Alcan also imports a variety of minerals for the production of high-value aluminum alloys.



A 1952 film produced by International Harvester to chronicle a project so large as to be dubbed the eighth wonder of the world featured the voice of actor Raymond Massey thundering, “Man harnesses nature in northern Canada...” In the 1950s, it was considered in society’s best interest to harness nature.

Today, the societies that evolved through industrial development consider it in their best interest to live – to the extent possible – in harmony with nature. Alcan has evolved in the same direction.

In the 1950s, we harnessed nature to produce a product which – due to its inherent properties of lightness, strength, corrosion-resistance, and recyclability – pays great dividends to industrial societies grappling with how to harmonize 21st century life with the needs of the planet.

We are still builders in B.C. And we still build things to last. But, as we enter the next century, our building instincts are focused on relationships – with employees, customers, shareholders, communities, governments, non-governmental organizations, First Nations... all of the stakeholders who interact to build sustainable societies.

Industrial Facilities

The first aluminum ingot was poured at Kitimat Works in August of 1954 by HRH Prince Philip. Since that time, the smelter has produced thousands of tonnes of aluminum ingot each year for export to Asia-Pacific and other markets around the world. Kitimat Works is the largest smelter in the Alcan network, representing about 16 per cent of the company’s annual global production.



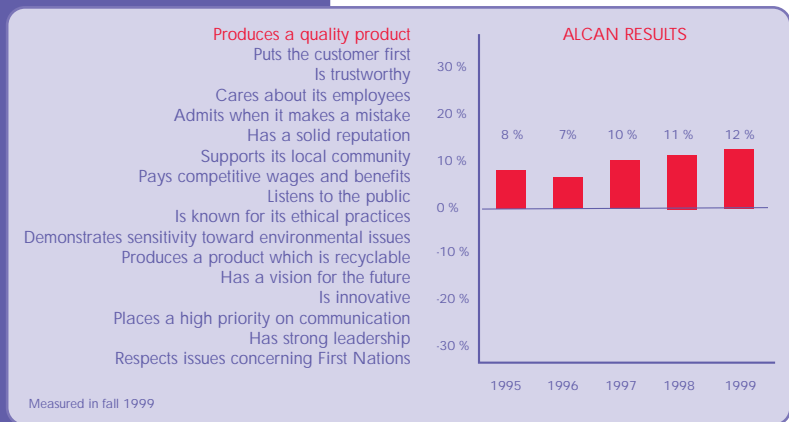
Public Perception Attributes

Produces quality products

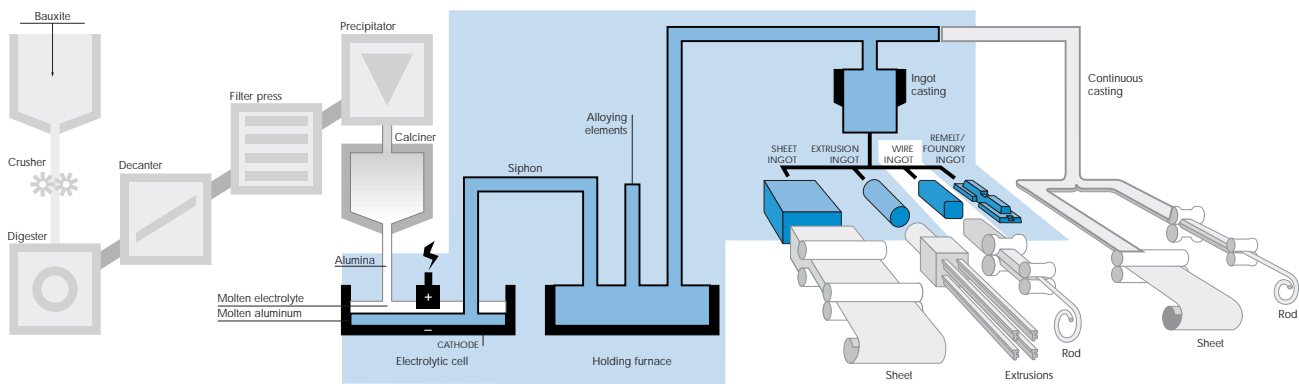
As part of an annual research program to determine how we are viewed publicly, Alcan asks three representative samples of British Columbians to rate the relative importance of 17 attributes that they associate with companies they admire. The sample groups – one province-wide, the other two made up of residents of Alcan's operating areas in the north – are then asked to rank the performance of Alcan and seven other prominent B.C. organizations in the private and public sectors with respect to those attributes. In 1999, the survey found that 'Produces quality products' was the most important factor affecting public perception of a corporation. The 17 attributes are listed to the right, in order of the importance assigned to them by the public. In 1999, province-wide perception of Alcan on the 'Produces quality products' attribute (highlighted in red) was found to be 12 per cent higher than average for the eight organizations included in the survey.



Al Pfeffer, power systems operator, part of Alcan for 19 years



Other public perception indicators are found throughout this publication, within the sections to which they are most relevant. For a full description of how and why Alcan carries out this research, and for complete 1999 results, please see pages 46 and 47.



Aluminum Production: this schematic shows the manufacturing process, starting with bauxite refining and ending with the output of various forms of ingots. The portions of the process shown in light blue take place at Kitimat Works.

Production Processes

Aluminum is among the most abundant natural resources on the planet, making up about eight per cent of the earth's crust. But aluminum is never found in nature as a metal. It is derived from a white powder called alumina, which is processed from a reddish ore called bauxite. Four to five tonnes of bauxite will yield two tonnes of alumina, which in turn will yield about one tonne of aluminum metal.

Aluminum is manufactured at Kitimat Works in 912 electrolytic cells or 'pots.' These are massive containers in which alumina is dissolved in a molten salt, and electrical current is transferred from a positive anode to a negative cathode. The electrical current separates oxygen molecules from aluminum molecules in alumina, precipitating aluminum as molten metal.



Remelt ingot

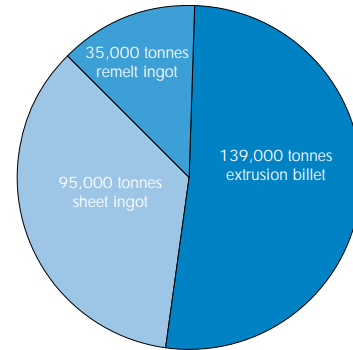


Extrusion billet

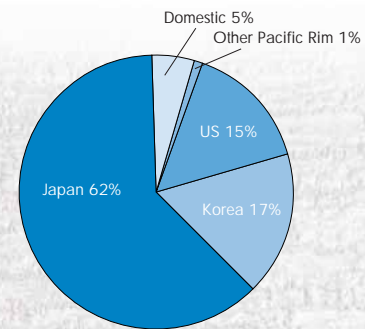


Sheet ingot

Kitimat Works 1999 Production:
269,000 tonnes of aluminum
(approximate value of US\$600 million)



Product Destination





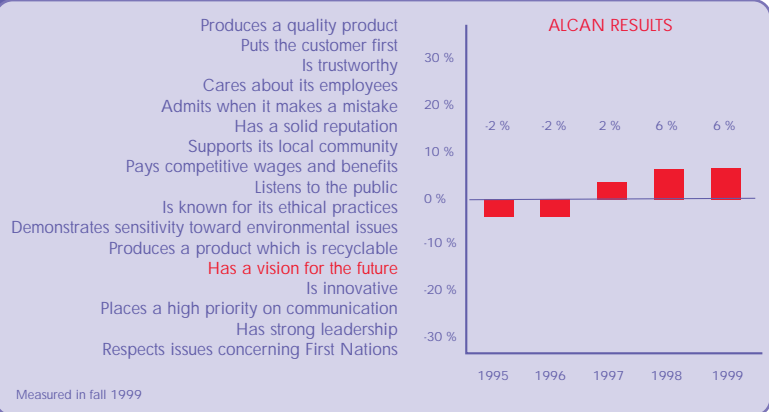
Public Perception Attributes

Has a vision for the future

In 1999, public perceptions of Alcan on the 'Has a vision for the future' attribute were found to be six per cent higher than average for the eight organizations included in the survey.



Krzysztof Trzos, wharf equipment operator, part of Alcan for 15 years



Products and Markets

Hot metal produced in Kitimat Works' potrooms is formed into 'ingots' at the smelter's casting facilities. The casting department's primary products are sheet ingot used by Alcan customers to make aluminum cans and other rolled sheet and foil products, and extrusion billet for the manufacture of aluminum doors, windows and other extruded products. These value-added products are made to exacting customer standards.

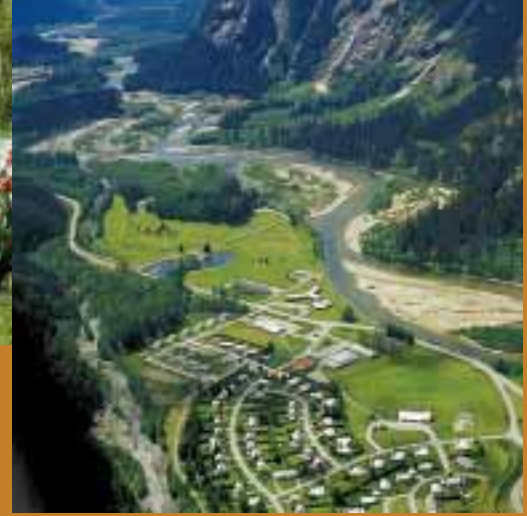
Power Production

Alcan's hydroelectric generating station at Kemano has a 'nameplate' capacity of 1,000 megawatts, though production at this level is not possible due to hydraulic limitations in the power tunnel and the amount of water Alcan is permitted to use under the terms of the 1987 Settlement Agreement.* During 1999, Kemano's average rate of power generation was approximately 760 megawatts. About 80 per cent of this power was used to produce aluminum at Kitimat Works. The balance was sold to B.C. Hydro and Eurocan Pulp and Paper in Kitimat.



Bill Franklin, casting centre operator, part of Alcan for 11 years

*The amount of water Alcan may use to generate hydroelectric power at Kemano is governed by an agreement signed with the federal and provincial governments in 1987. The agreement specifies the water flow protocol that Alcan must follow in order to protect Nechako River Chinook and Sockeye salmon.



Profiles

Kemano: A wilderness community leaves lasting memories

In 1999, due to technological advances over the years and as part of the company's Full Business Potential program, Alcan announced that the Kemano Powerhouse facility would no longer be operated and maintained by a residential workforce. After nearly 50 years, the village of Kemano would be no more.

Located 75 kms southeast of Kitimat across the rugged Coast Mountain range, Kemano is accessible only by sea or air. The community has been home to between 200 and 250 people since 1954, and is known for its pioneer spirit and wilderness lifestyle.

"My kids have seen more bears, sea lions, eagles and whales than most people see in a lifetime," said Kevin Gleeson, a Kemano resident for six years and former chair of the Kemano Community Association. "That's something they'll never forget."

Despite its small size, Kemano has been a fully functioning community for most of its history. It offered schooling to the eighth grade, cable TV and radio, a shopping centre, medical

clinic, non-denominational church, daycare, nine-hole golf course, recreation centre, library, bowling alley, boat marina and curling rink.

Despite its attractions, Gleeson acknowledges that life in Kemano had its challenges. "Going to the dentist or doctor was quite a procedure," he said. "We'd have to get the kids up at 5:00 a.m. and take a three-hour boat ride to Kitimat."

The majority of Kemano employees have been reassigned to rotating powerhouse crews based in Kitimat, or to other jobs at Kitimat Works. Twenty jobs were lost in the transition. Alcan is working closely with all employees and their families to help them reintegrate into larger, more sustainable communities. All residents were relocated by the end of July, 2000 and the village site at Kemano is being returned to its natural state.

"We feel very thankful for our time in Kemano," said Gleeson. "There was a real sense of community there – things like potluck dinners or getting together to help build a cabin. It was a positive experience for our whole family."

Employees and Communities

Alcan's operations in British Columbia rely on a highly skilled and experienced workforce. In total, Alcan employed 1,916 people in B.C. at the end of 1999, including 1,817 employees in Kitimat and 93 employees in Kemano. Four employees are located at a corporate office in Vancouver, and two at a regional office in Vanderhoof.

About 78 per cent of Alcan's workforce in British Columbia is unionized, represented by the Canadian Auto Workers (CAW), Local 2301. Alcan's unionized workforce remained stable in 1999, while the number of non-union staff positions was reduced by 60.

In addition to employees, there are a number of northern communities that Alcan considers important stakeholders. Alcan actively consults with elected officials and residents in communities from Kitimat, Terrace, and Prince Rupert in the west to Vanderhoof and Prince George on the eastern side of the Nechako Watershed.

Status of Kitimat Expansion Study

Ever since the Kitimat Works smelter began operations in 1954, Alcan has planned to expand aluminum manufacturing in B.C. to serve Pacific Rim markets. Today, Alcan has the dual goals of modernizing Kitimat Works and enhancing our production capacity in British Columbia.

The road to expansion was preserved for Alcan

in 1997, when we reached an agreement with the B.C. government that resolved issues arising from the cancellation of the Kemano Completion Project (KCP) in 1995. While KCP would have provided an additional 285 megawatts of Alcan-owned hydroelectric power to fuel expansion, the provincial government agreed to provide a long-term, stable supply of competitively priced electricity if we expand our existing smelter facilities by January 1, 2010.

After reviewing several expansion options, we recently initiated a feasibility study on a rebuild/expansion plan for Kitimat Works. The plan calls for introducing modern smelter technology to Kitimat Works' 50-year old potrooms over a period of about eight to nine years, without expanding the footprint of the existing plant. This could increase capacity by up to 80 per cent – from 272,000 tonnes to as much as 490,000 tonnes per year.

Although a decision on the proposal will not be made until detailed studies have been completed in 2002, Alcan is optimistic about the social, economic, and environmental benefits that rebuilding the smelter could provide. In addition to creating some 400 construction jobs over the rebuild period, the project would stabilize Alcan's existing employment, secure Kitimat's industrial base, and create new economic opportunities in the region. It would also significantly improve the smelter's environmental performance.





Environmental Progress

"Aluminum possesses a unique combination of properties for a wide range of uses and is derived from raw materials that are abundant. By combining lightness with ease of recycling, aluminum incorporates qualities of energy and resource conservation, as well as reduced environmental impact, that are superior to many other materials."

– Alcan Code of Conduct

To make aluminum, Kitimat Works uses a range of raw materials and generates a variety of emissions, effluents, and solid wastes.

Therefore, efficiency of raw material use and management of pollutants are important environmental issues for us. Many of these issues are subject to strict regulation, making compliance an important issue in and of itself.

Alcan's power generation requires large-scale water diversion from a natural system. Efficient use of the diverted water and management of impacts on other natural values, such as salmon habitat, present additional environmental challenges. These are subject to regulation under both legislation and specific agreements with the provincial and federal governments.

Alcan is committed to continually improving the way we manufacture aluminum and generate hydroelectricity. Since the mid-1970s, we have

spent more than half a billion dollars on environmental upgrading at Kitimat Works. As we have improved, so have scientific understanding of environmental impacts and public expectations with regard to their management. Today, in B.C., industry is operating in a much stricter regulatory climate than existed even a few years ago. To meet and move beyond today's standards, we have added two components to the foundation of our **Environmental Management System**: an **Environmental Improvement Program (EIP)** to eliminate the underlying causes of non-compliances in our operations; and a **Pollution Prevention Plan (P2)** to take us beyond compliance toward the reduction or elimination of pollutants at source. The entire structure of our Environmental Management System and programs will be strengthened by **ISO 14001 registration**, which we expect to achieve by the end of the year 2000.

Environmental Management System
An effective Environmental Management System, or EMS, is a necessary foundation for continual improvement in environmental performance. Our EMS includes corporate environmental policies and objectives that take into account legislative requirements and the best available information regarding environmental impacts.

ISO 14001 registration
Kitimat Works' EMS is currently being refined in preparation for an application to be registered under the ISO 14001 standard, developed by the International Organization for Standardization. ISO 14001 certification provides independent verification that a company is both conforming to and continually improving its EMS.

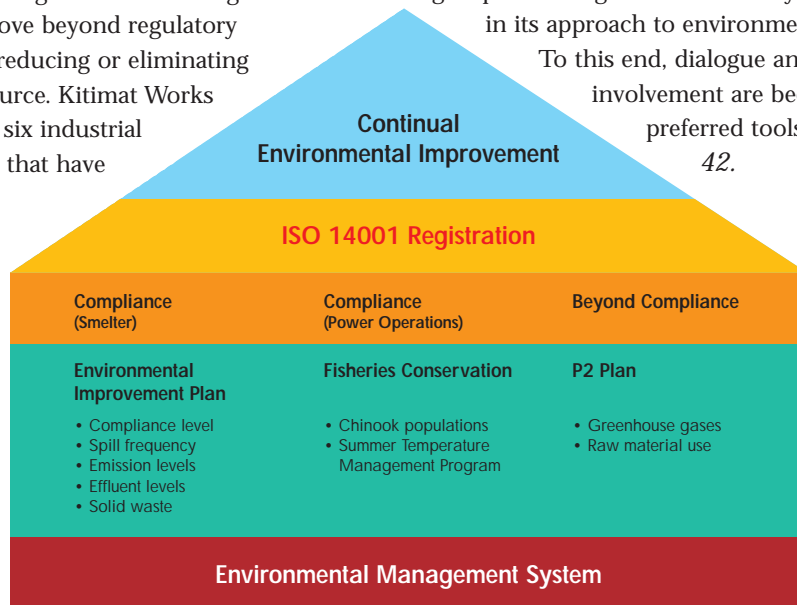
Environmental Improvement Program
Alcan is committing \$50 million over five years to an Environmental Improvement Program (EIP) designed to address the underlying causes of current incidents of non-compliance or other deviations from the preferred state of operations at Kitimat Works. *Please see page 19.*

Pollution Prevention Plan
Alcan is the first large industrial operation in B.C. to have a Pollution Prevention, or P2, Plan endorsed by a local Public Advisory Committee and the provincial government. The goal of the P2 Plan is to move beyond regulatory compliance by reducing or eliminating pollutants at source. Kitimat Works is the largest of six industrial facilities in B.C. that have

developed P2 Plans over the past several years as part of a government-initiated pilot project, and the first to have its plan accepted by the Province. *Please see page 23.*

Alcan is also the first industrial facility in B.C. to obtain a Multi-Media Environmental Permit from the provincial government – largely on the strength of its P2 Plan. As the name suggests, the permit addresses multiple emissions, effluents, and solid wastes. The new permit sets standards but allows the company greater latitude in terms of how the standards are achieved. This new approach is intended to be more efficient, easier to monitor from a compliance perspective, and more transparent from a public perspective. Under the terms of the new permit, Alcan provides reports on outputs of the pollutants covered at www.sno.net/alcan/.

Fisheries Conservation
Alcan uses water diverted from the Nechako River in north central B.C. to generate hydroelectricity at Kemano. Under a 1987 Settlement Agreement with the federal and provincial governments, Alcan accepted certain obligations designed to protect and conserve salmon stocks that use the Nechako River. *Please see page 13.* On the power side of our business, these could be considered "compliance" obligations. Like our aluminum manufacturing operations, though, Alcan's Power Operations group is striving to move well beyond compliance in its approach to environmental stewardship. To this end, dialogue and stakeholder involvement are becoming the preferred tools. *Please see page 42.*

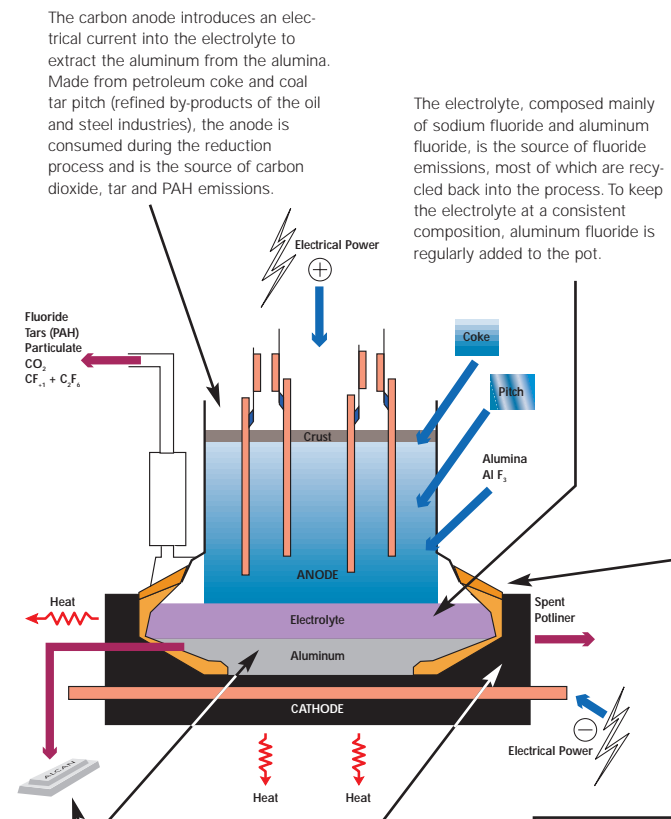


Our Environmental Management System is the foundation of our efforts in B.C. to ensure compliance with our existing obligations and to move beyond compliance as we strive for continual environmental improvement.

Aluminum Manufacturing

The Process

Aluminum metal is extracted from alumina using an electro-chemical 'reduction process' that takes place within a steel-encased cell or pot. The diagram below illustrates the components of a pot and identifies all key raw material inputs and by-product outputs.



The carbon anode introduces an electrical current into the electrolyte to extract the aluminum from the alumina. Made from petroleum coke and coal tar pitch (refined by-products of the oil and steel industries), the anode is consumed during the reduction process and is the source of carbon dioxide, tar and PAH emissions.

The electrolyte, composed mainly of sodium fluoride and aluminum fluoride, is the source of fluoride emissions, most of which are recycled back into the process. To keep the electrolyte at a consistent composition, aluminum fluoride is regularly added to the pot.

Molten aluminum is extracted from the pot and cast into ingots.

Pot lining is made of carbon and refractory bricks. It must be regularly extracted from the steel shell and replaced, usually after 2,000-3,000 days of use. Spent pot lining is a special waste, subject to specific requirements regarding handling and storage.

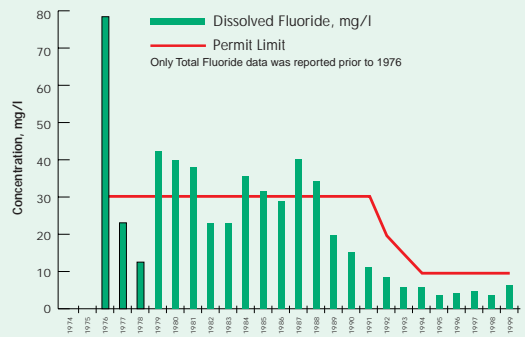
Alumina is dissolved in molten electrolyte at a temperature of about 965°C. It must be regularly fed into the pot as aluminum is extracted. This requires breaking the crust around the pot, giving rise to alumina dust emissions. When alumina concentrations are critically low, an 'anode effect' takes place. This chemical reaction produces two perfluorocarbon gases, CF₄ and C₂F₆, both major contributors to greenhouse gas emissions on a carbon dioxide equivalency basis.

The Environmental Record

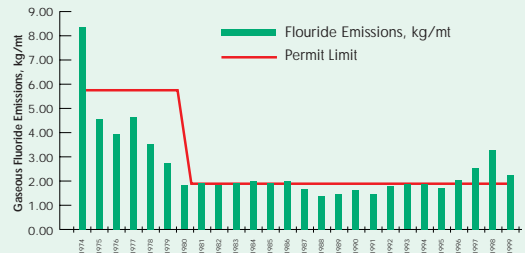
Alcan monitors and manages emissions, effluents, and solid wastes created in the aluminum manufacturing process. Investments in new technology and procedures have decreased the level of many of these pollutants. At the same time, regulatory changes have sharply reduced the permissible levels of such outputs. These trends are evident in the graphs on this page that show Kitimat Works' performance over time on our most serious pollutants.

Alcan's current performance in managing these pollutants is addressed in more detail in the Principles and Performance section.

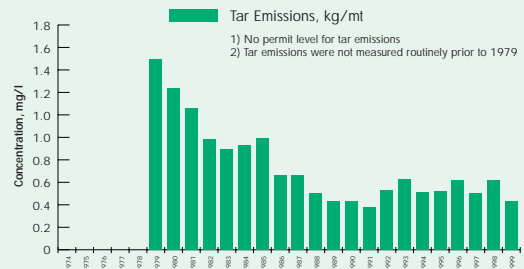
Dissolved Fluoride in Effluent at Kitimat Works (1974 - 1999)



Fluoride Emissions History at Kitimat Works (1974 - 1999)



*Tar Emissions (incl. PAHs) History at Kitimat Works (1974 - 1999)



*Tar emissions measured as benzene soluble matter, approximately 50% of which are the sum of the 18 PAHs listed in glossary, page 48.

Reservoir Management

The Process

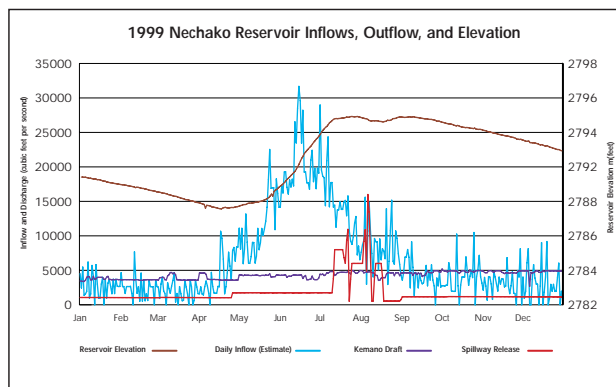
Alcan meets the energy needs of Kitimat Works (and generates some surplus for sale to other power users) through a hydroelectric generation infrastructure that capitalizes on unique features of the hydrology and geography of northern B.C. The key component is the Nechako Reservoir.

Reservoir management is a complex undertaking which must ensure salmon conservation, provide flood control to the extent possible, and meet power generation and other needs. Water is released from the reservoir at one of two locations: the Skins Lake Spillway, from which water flows into the Nechako River via the Murray-Cheslatta system, and the Kemano Powerhouse which draws water from the reservoir through the West Tahtsa Intake.

The Environmental Record

The 1987 Settlement Agreement established a hierarchy in which the needs associated with salmon conservation come ahead of those associated with power generation. It also established the Nechako Fisheries Conservation Program to expand and refine initiatives aimed at protecting and conserving the Nechako River's Chinook and Sockeye runs.

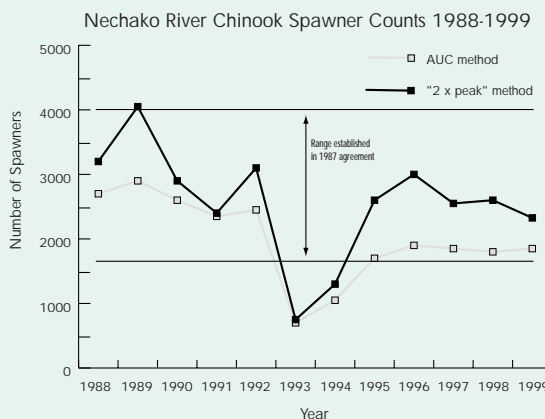
Population target ranges were established for the Nechako Chinook, which spawn and rear in the Nechako River. Sockeye do not spawn in the Nechako River but use it as a migration route to their natal streams in the Stuart River system. Alcan's obligation with respect to Sockeye is to maintain water temperatures that will provide appropriate habitat conditions during the Sockeye migration season. The graphs below show the degree of success in meeting these two key objectives.



- The Nechako Reservoir impounds the waters of the Eutsuk-Tahtsa Basin, one of three major drainages that feed the Nechako River. Inflows are highest during spring run-off and vary from year to year depending on snow loads. The reservoir's normal operating elevation is between 849.2 metres and 853.4 metres. Each metre of elevation represents 850 million m³ of stored water.
- The Kenney Dam is the only flood control mechanism on the entire Fraser River system and has greatly reduced the incidence of downstream flooding since its construction. Each year, Alcan holds back water in the Nechako Reservoir until after the Fraser River freshet has peaked to reduce the risk of flooding from Prince George to the Lower Mainland.
- Water releases from the Skins Lake Spillway are governed by the 1987 Settlement Agreement, to which Alcan and the federal and provincial governments are parties. Releases are directed by the Nechako Fisheries Conservation Program. Base flows must average no less than 36.8 m³ per second over the year. Additional cooling flows are released in July and August, for the benefit of migrating Sockeye. Releases during this time period are often close to or even above the inflow level. *Please see graph page 25.* Periodic releases of surplus reservoir inflows are also made for flood control.
- The amount of water available for use at Kemano is determined once conservation-related releases have been allocated. The Kemano Powerhouse relies on a water flow of between 100 and 140 m³ per second. A reduction in water flow to the powerhouse of 40 m³ per second reduces power generation capacity by 250 Mw. After flowing through the powerhouse, water is released into the Kemano River which flows into the Pacific Ocean.

Frequency of Water Temperature Exceedances			
Nechako River		Stuart River (unregulated)	
Greater than 20°C	Greater than 21.7°C	Greater than 20°C	Greater than 21.7°C
1953-1982 (Days/Year)	3.0	0.66	4.8
1983-1999 (Days/Year)	2.9	0	7.7
Difference	-3%	-100%	+50%

Water temperature is a key habitat consideration for migrating Sockeye. Through the Summer Temperature Management Program (STMP), introduced in 1983, Alcan has reduced exceedances of both the 20°C and 21.7°C thresholds in the Nechako River, at a time when such exceedances have increased significantly in the unregulated Stuart River. Since 1987, the STMP has operated under the Nechako Fisheries Conservation Program.



Estimates of the number of Chinook spawning in the Nechako River are made each year using two different scientific methods. The NCFP uses the 'area-under-the-curve' method, which generally results in somewhat lower estimates. Federal fisheries authorities, however, generally use the '2X peak-of-spawn' method, which was also the basis for the target population range established in the 1987 Agreement.



B.C.'s environment minister, Hon. Joan Sawicki, congratulates Louis Delage of Alcan on receiving Alcan's multi-media environmental permit.

Profiles

Drawing on Public Input to Control Pollution at Source

Some of the key principles that underlie this report are reflected in Alcan's involvement in the B.C. government's Pollution Prevention or P2 pilot program.

Through this program, Alcan arrived at a set of priority action items aimed at shifting the focus at Kitimat Works from pollution control to the reduction and elimination of pollution at source.

Alcan drew on stakeholder input in setting these priorities, through the establishment of a Public Advisory Committee (PAC). The committee included representatives of the company, the union, other local industrial facilities, the federal and provincial environment ministries, the Haisla First Nation, the District of Kitimat, and a variety of other local organizations.

Members invested heavily of their own time and effort in developing a better understanding of the operation of the Kitimat smelter. Their mandate was to assist in identifying environmental impacts, within the context of economic and social effects on the community, and setting action priorities to minimize those impacts.

Chair Bob Corless, a local municipal councillor who represents the Lions Club on the PAC, notes that the committee offered input on a list of more than 100 issues. Members' views, he says, were reflected in a list of action priorities, arrived at by consensus, which were incorporated into Alcan's P2 Plan – the first from a large

industrial facility to be endorsed by the B.C. government.

Corless says he doesn't know how to account for the success in reaching consensus but he and other members comment on the high degree of openness Alcan demonstrated in its dealings with the committee. "My file is over 12 inches deep," notes Allan Egan, representing the Northwest Communities Coalition on the PAC.

Terry Roberts, regional pollution prevention manager with the B.C. Environment Ministry in Smithers, was one of the provincial government representatives on the committee. From the perspective of a regulatory agency, he says there is tremendous value in having a broad-based agreement on environmental priorities. "This process got everyone up to speed on the issues and very much increased the level of cooperation and trust," he says.

"P2 is delivering a systematic, prioritized approach to environmental improvement," says Ken Omotani, one of Alcan's representatives on the PAC. "And thanks to the Public Advisory Committee, we're confident that we're working first on those issues that are top-of-mind for stakeholders who are directly affected by our operations."

The PAC is continuing to meet to monitor implementation of the P2 Plan and as a consultative forum on aspects of environmental management at Kitimat Works.



Kitimat Works' liquid pitch storage facility was built in 1997-98, at a cost of \$14 million, to enclose pitch handling and eliminate pitch losses.

Environmental principles and 1999 performance

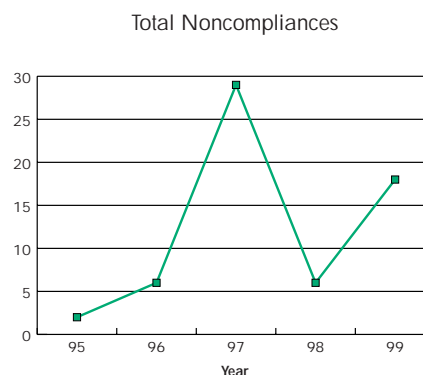
This section outlines our operating principles and 1999 performance in the three broad program blocks shown in the Environmental Management System illustration on page 11: regulatory compliance in both smelting and power operations, and moving beyond compliance. It is important to note that fisheries conservation is only one aspect of environmental stewardship associated with power generation. However, it is the one governed by measurable targets (others are discussed in case studies throughout the report).

Regulatory Compliance

PRINCIPLE Alcan strives to identify and implement technological and process solutions to minimize and eliminate harmful emissions, effluents, and solid wastes from its Kitimat Works aluminum smelter; to comply with all regulatory permits and standards; and to respond effectively to all environmental emergencies and issues.

PERFORMANCE Compliance level

Regulatory authorities in British Columbia demand a total of 1,533 compliance checks each year to monitor the environmental performance of Alcan's



Kitimat Works smelter. These compliance checks assess the smelter's air emissions, water effluents, and solid waste management practices against strict federal and provincial standards.

In 1999, Alcan was in full compliance with environmental permits more than 99 per cent of the



Public Perception Attributes

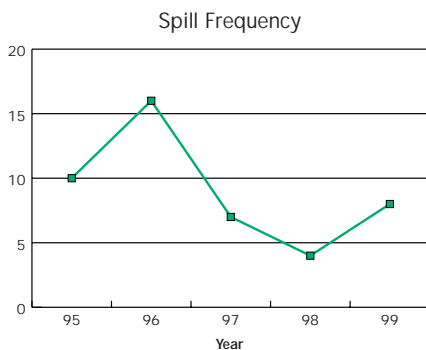
Environmental Sensitivity

In 1999, public perceptions of Alcan on the 'Demonstrates sensitivity toward environmental issues' attribute were found to be six per cent lower than average for the eight organizations included in the survey.

Produces a quality product
Puts the customer first
Is trustworthy
Cares about its employees
Admits when it makes a mistake
Has a solid reputation
Supports its local community
Pays competitive wages and benefits
Listens to the public
Is known for its ethical practices
Demonstrates sensitivity toward environmental issues
Produces a product which is recyclable
Has a vision for the future
Is innovative
Places a high priority on communication
Has strong leadership
Respects issues concerning First Nations



time. Six different issues gave rise to incidents of non-compliance, although only one of them resulted in measurable environmental impacts. Kitimat Works' environmental performance in 1999 was consistent with or better than previous years. Through its Environmental Improvement Program, which will be implemented within an ISO 14001 framework, Alcan is moving towards a goal of 100 per cent regulatory compliance.



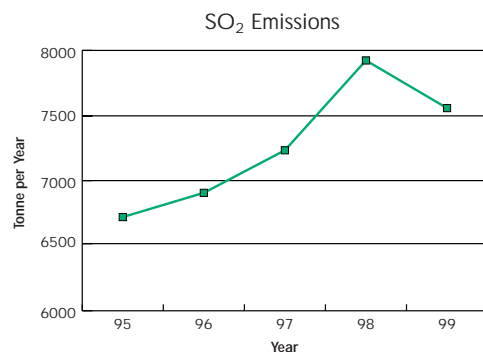
PERFORMANCE Spill frequency

Alcan reported a total of eight spill incidents at the Kitimat Works site in 1999 that resulted in foreign materials entering the environment outside of the plant site. All such spills must be reported to regulatory authorities with a description of the containment, clean-up and management response.

Spills in 1999 ranged from the release of 3,000 m³ of water from a burst water line to the leaking of 1-2 litres of diesel oil into Tahtsa Lake. The most significant of these events was a spill of five tonnes of liquid pitch into Kitimat Harbour. The

clean-up effort required a team of divers to recover the spilled substance (which solidified in the water) from the bottom of the harbour.

None of the spill events reported in 1999 resulted in measurable environmental impacts. Alcan's emergency and long-term response to spills in 1999 was judged to be appropriate by the provincial Ministry of the Environment.



PERFORMANCE Emission levels

Significant air emissions from Kitimat Works include fluorides and polycyclic aromatic hydrocarbons (PAH), also referred to as tar fumes. Gaseous fluoride (*please see page 12*) is the only emission at Kitimat Works that has any measurable impact on the external environment. This impact is principally related to vegetation around the smelter.

Alcan monitors fluoride levels in vegetation surrounding Kitimat Works at 35 locations every year. Fluoride levels in tree foliage have declined over the past 25 years, while the visible health of



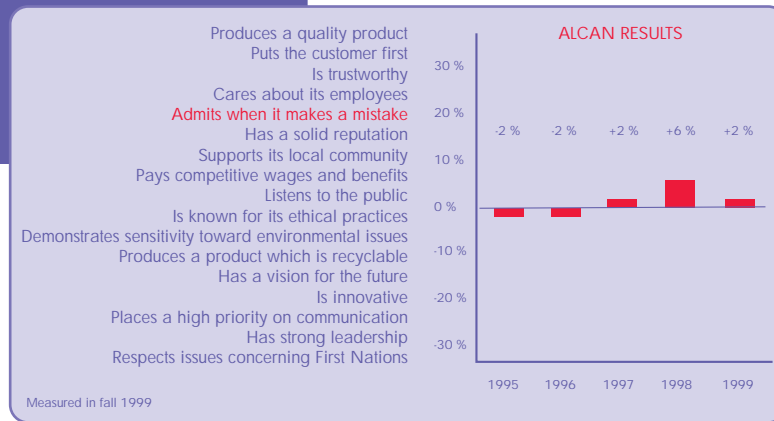
Public Perception Attributes

Admits mistakes

In 1999, public perceptions of Alcan on the 'Admits when it made a mistake' attribute were found to be two per cent higher than average for the eight organizations included in the survey.



Joe Carrita, trackman crewleader, part of Alcan for 26 years



native plant species has improved. A 1992 study by Dr. Hubert Bunce of Reid Collins & Associates into the impact of fluoride emissions on forest growth found that: "It may be concluded that the effect of smelter emissions on the forest growth is now negligible, immeasurable, or even by some indications, beneficial."

Since 1996, however, gaseous fluoride emissions have been on the increase at Kitimat Works and actually exceeded permit limits for each of the past three years. This is due to poor anode performance in the electrolytic process used to manufacture aluminum.

Elevated fluoride emissions occur in Kitimat Works potrooms when anodes crack and cause the pots to overheat. When this happens, metal production is reduced and fluoride gases escape through the roofs of the potrooms, by-passing the plant's gas collection and treatment systems.

The higher incidence of anode cracks at Kitimat Works in recent years is primarily due to a problem with the quality of raw materials – pitch and coke – from which anodes are made.

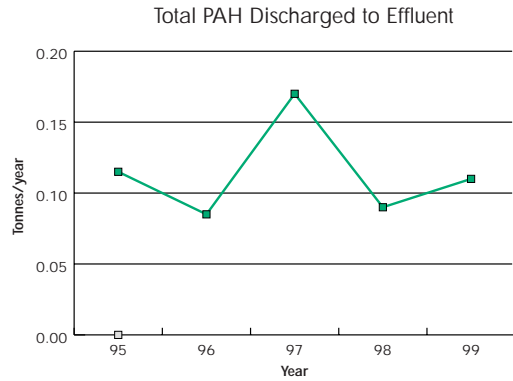
As part of its Environmental Improvement Program, Alcan has implemented a multi-faceted strategy to reduce the frequency of anode cracks,

including improvements in the quality of raw materials, as well as process and technological changes. As a result, the smelter's gaseous fluoride emissions are expected to be reduced to 1.6 kg/t.Al, a full 0.3kg/t.Al below permitted levels, by December, 2002.

Alcan's monitoring of fluoride levels in vegetation surrounding Kitimat Works indicates a small increase in leaf damage over the past three years. This is expected to reverse as fluoride levels drop.

The presence of fluorides and PAHs at the levels found in Kitimat are not believed to have adverse health affects on people. Monitoring at sites around the plant and in the community indicates that Kitimat enjoys excellent air quality. Dustfall levels are below the lower range identified in the Provincial Air Quality Objectives.

Subject to a number of conditions, Alcan's SO₂ permit level was increased in 1999 to reflect higher levels of sulphur in the raw material, green coke. The B.C. Environment Ministry recognizes that use of low-sulphur green coke results in poor anode quality and a corresponding increase in fluoride emissions. Also taken into account was the fact that ambient levels of SO₂ in Kitimat are well below Federal guidelines.



PERFORMANCE Effluent levels

Water is used at three points in the aluminum production process at Kitimat Works: in the steam plant, at the anode paste plant, and for cooling ingots. Water used at the first two places is recycled and is not released into the environment. Water used for cooling, along with rainwater and melting

snow, is collected and treated in two settling lagoons. While cooling water is unaltered, except for its temperature, rainwater can come into contact with spills and pollutants on the plant site.

As a result, Alcan monitors water discharged from the lagoons into Kitimat Harbour for a range of elements, including:

- dissolved fluoride (*please see page 12*);
- dissolved aluminum;
- polycyclic aromatic hydrocarbons (PAH);
- total suspended solids; and,
- cyanide.

Kitimat Works exceeded its daily permit levels for dissolved fluoride, dissolved aluminum, and suspended solids on some occasions in 1999 – associated with extreme storms. These were short-term events with no measurable effects on the receiving environment.

With the exception of dissolved aluminum, all

Summary of Non-Compliance Issues – 1999

NON-COMPLIANCE	CAUSE	IMPACT	ACTION TO DATE
Gaseous fluoride emissions exceeded permit levels from Jan. – Sept. 1999.	Increased frequency of anode failures.	Mild leaf damage in vegetation near smelter	Improvements in raw material quality, technological and process changes have reduced anode failure frequency.
SO ₂ emissions exceeded permit levels for seven months in 1999.	Increased sulphur levels in green coke.	None	B.C. Ministry of Environment increased permit level from 20.7 to 27 tonnes per day, in light of low ambient SO ₂ levels in Kitimat air.
Exceedance of dissolved aluminum in settling lagoon on Nov. 30	Alumina losses from potroom roofs, washed into lagoon during storms.	None	Higher cleaning frequency in areas where alumina dust settles, testing of cattails as potential means of natural sequestration, and ongoing study of means to mitigate storm impacts.
Two dissolved fluoride exceedances in settling lagoon in December.	Leaching from spent pot liner, buried during early years of smelter operation, possibly entering cracked sewer pipe.	None	Development of groundwater management plan, assessment of condition of sewer pipe.
Total suspended solids (TSS) discharged from settling lagoon exceeded permits on five occasions.	Extreme storm events and construction activities caused unfiltered run-off to enter the lagoon, and the re-suspension of green coke particles.	None	Additional slot filter installed, more frequent sweeping implemented around filters, dredging undertaken to remove accumulated solids.
A special waste audit performed by the B.C. Ministry of Environment identified problems with the storage of flammable liquids, and the outdoor storage of industrial waste.		None	Fire alarms installed in building housing flammable liquids. Industrial waste moved to indoor storage facility.

of the problems that caused Kitimat Works to exceed effluent permit levels in 1999 are expected to be remedied in 2000 and 2001 by the Environmental Improvement Program. We anticipate some exceedances of dissolved aluminum permit levels in 2000 due to aluminum-containing losses from potroom roofs. Alcan has submitted an action plan to investigate sources of dissolved aluminum and to quantify storm impacts. In the interim, we have requested a short-term increase

in our permit. Measures are being taken to reduce dissolved aluminum concentrations, and long-term treatment options (such as use of cattails as a means of natural sequestration) are under assessment. Average annual discharges of dissolved aluminum in 1999 were well below permitted levels of three mg per litre, at a concentration of 0.75 mg per litre.

All sanitary water used at Kitimat Works is sent to the municipal sewage plant for treatment.

Environmental Improvement Plan

1999	PHASE 1 – 2000	PHASE 2 – 2001	PHASE 3 – 2002–2005
Roof Emissions	<ul style="list-style-type: none"> • Stud upgrade accelerated to complete upgrade & stud quality management system implemented • Lithium expansion, 1 building per Quarter 	<ul style="list-style-type: none"> • Lithium expansion complete in Q2 2001 – 10 bldgs on Lithium 	
*TSS at D-lagoon	<ul style="list-style-type: none"> • Higher frequency of sweeping around slot filters • Determine effectiveness of coagulant addition • Preliminary engineering of: <ul style="list-style-type: none"> – coke storage bldgs – coke conveyors & unloader – Diversion to B-lagoon • Identify separation technology for effluent polishing • Conduct storm drain study and supply action plan to MELP 	<ul style="list-style-type: none"> • Divert D-outfall to B-lagoon • Construct coke storage buildings • Install coke conveyors & unloader 	<ul style="list-style-type: none"> • If required, treatment of D-lagoon effluent • Add back-up filtering of D-lagoon effluent using identified effluent polishing technology • If D-outfall diverted to B-lagoon, dredging will be considered if required to increase settling time • Determine remediation solution for B-lagoon dredgate if dredging required
Diss. Fluoride at B-lagoon	<ul style="list-style-type: none"> • Determine condition of J-sewer & line if necessary • Identify other major sources of fluoride to B-lagoon <ul style="list-style-type: none"> – determine sediment fluoride content – complete continuous monitoring studies • Develop ground water management plan <ul style="list-style-type: none"> – Install water table height continuous monitor – Identify ground water interception technology – Preliminary engineering for bentonite lined trenches – Complete preliminary engineering for the capping of the west SPL landfill 	<ul style="list-style-type: none"> • Construct bentonite lined trench • Dredge B-lagoon to remove sediment if it is determined to be an important source of dissolved fluoride & determine dredgate remediation plan • Modify management of main landfill if determined to be a major source to B-lagoon 	<ul style="list-style-type: none"> • If required, install French Drain system to pump groundwater & treat on ocean side of SPL landfills
Dissolved Al at B&D lagoons	<ul style="list-style-type: none"> • Conduct mass balance for dry and storm event • Develop a storm water management plan • Increase frequency of courtyard sweeping • Determine long-term treatment options <ul style="list-style-type: none"> – Continue cattail (Phyto remediation) tests – Membrane Technology – Ion Exchange 	<ul style="list-style-type: none"> • Install wetlands (cattails) concept for B-lagoon if Cattails test proves positive at D-lagoon • Modify management of main landfill if determined to be a major source to B-lagoon 	
PAH Inner Harbour	<ul style="list-style-type: none"> • Complete NOAA study (PAH impact on fish in harbour) • Determine sources of PAH & develop control plan 	<ul style="list-style-type: none"> • Implement PAH control plan pending NOAA & clam study results • Remediate Scow Grid if required 	

ESTIMATED COSTS

\$ 10 MILLION / YEAR FOR NEXT 5 YEARS

* Total Suspended Solids



Public Perception Attributes

Recyclable products

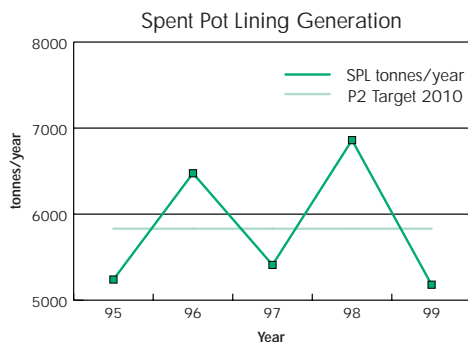
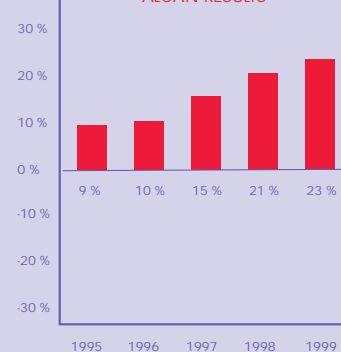
In 1999, public perceptions of Alcan on the 'Produces a product which is recyclable' attribute were found to be 23 per cent higher than average for the eight organizations included in the survey.



Produces a quality product
 Puts the customer first
 Is trustworthy
 Cares about its employees
 Admits when it makes a mistake
 Has a solid reputation
 Supports its local community
 Pays competitive wages and benefits
 Listens to the public
 Is known for its ethical practices
 Demonstrates sensitivity toward environmental issues
Produces a product which is recyclable
 Has a vision for the future
 Is innovative
 Places a high priority on communication
 Has strong leadership
 Respects issues concerning First Nations

Measured in fall 1999

ALCAN RESULTS



PERFORMANCE Solid waste

Solid waste generated at Kitimat Works includes the following four materials, all classified as special wastes under the B.C. Waste Management Act:

- duct scrapings;
- dust and steel shot;
- sandblast waste;
- spent potlining (SPL).

The first three of these materials are collected, stored in one-tonne weatherproof bags, and shipped to a secure landfill in Alberta for permanent disposal. Alcan shipped about 1,200 tonnes of these materials last year. All landfills used by Alcan are audited by the company annually to ensure proper handling procedures are in place.

Approximately 5,500 tonnes of SPL was gener-

ated in 1999, consisting of deteriorated refractory bricks and carbon. SPL waste is impregnated with fluoride, sodium, aluminum, iron, silicon, cyanide, and other compounds. Permanent disposal of SPL is a challenge for the entire aluminum industry.

In the past, Alcan had disposed of SPL in three landfills on the Kitimat Works site. These landfills were subsequently upgraded and capped to minimize the leaching of pollutants into groundwater. However, they are believed to be the source of elevated levels of the dissolved fluoride in Kitimat Works effluent that resulted in non-compliance incidents during 1999 (*please see page 18*).

Since the 1980s, Alcan has stored all SPL in a secure, indoor facility while we study potential opportunities for treating and safely storing the special waste, and for minimizing SPL waste through energy recovery, re-use and recycling. Work is also under way to develop a longer-lasting pot shell, the use of which is expected to result in a 15 per cent reduction in SPL produced by 2010.

In our P2 Plan, Alcan has committed to assess and implement energy recovery and/or reuse or recycle programs for duct scrapings and dust and steel shot. Classification and recording of special waste from sandblasting will also be implemented. *Please see page 23.*

Environmental benefits inherent in the product

The environmental costs of aluminum are primarily found in the vicinity of smelters and other upstream manufacturing facilities. The environmental benefits of the metal are much more widespread, and relate to its inherent properties.

Aluminum can be repeatedly recycled with virtually no reduction in quality or volume. Recycled or secondary aluminum requires only 5 –10 per cent of the energy needed to produce primary aluminum and yields 90 per cent fewer environmental releases. In 1999, 32 per cent of Alcan's worldwide aluminum production (805,000 tonnes) came from recycled metal.

In addition to recyclability, the natural properties of aluminum – including its light weight, high strength-to-weight ratio, durability, corrosion resistance, formability, ease of finishing, thermal and electric conductivity, and barrier qualities – provide a range of environmental benefits.

Take the aluminum beverage can. The formability of aluminum allows for the can's familiar tab closure, while its ease of finishing allows manufacturers to stamp labels directly onto the metal. Containers made of other materials require additional

raw materials and energy to manufacture caps and labels that often end up as waste.

Aluminum beverage cans represent about four per cent of the total weight of a packaged soft drink, as opposed to 52 per cent for glass bottles. This weight savings contributes to a significant reduction in fuel use and associated atmospheric pollutants when aluminum cans are shipped to market.

Aluminum beverage cans are also the most recycled packaging material in the world, with more than 62 per cent of used cans in North America being recycled each year. The aluminum can is the only packaging material that more than covers its own cost of collection and recycling, and actually subsidizes less valuable packaging materials in many recycling programs.

In transportation applications, aluminum's lightness and strength contribute to energy efficiency and reduced fuel emissions. For example, every tonne of aluminum used in car manufacturing reduces carbon dioxide emissions due to auto exhaust by 20 tonnes. Increasingly, car makers are looking to aluminum to help them meet the emission-control standards of the 21st century.





Rupi Kahlon,
metallographer, part
of Alcan for 19 years

Profiles

Studying PAH effects in Kitimat harbour

As part of its Pollution Prevention (P2) plan for Kitimat Works, Alcan is committed to conducting ongoing research into the environmental impacts of its smelter operation. One of the priority research topics for 2000 is the effect that polycyclic aromatic hydrocarbons (PAHs) in Kitimat Harbour sediments may have on resident fish.

The build-up of PAHs in the inner harbour is largely due to past practices at Kitimat Works, before technological changes improved materials handling and upgraded the plant to an almost closed-loop process. Although these changes were made some years ago, PAH concentrations have not declined significantly. Possible environmental impacts of PAHs on marine life are not yet fully understood.

To advance this understanding, Alcan is supporting a Haisla First Nation initiative – in partnership with the governments of B.C. and Canada – to have the National Oceanic Atmospheric Administration (NOAA) study the impact of PAHs and

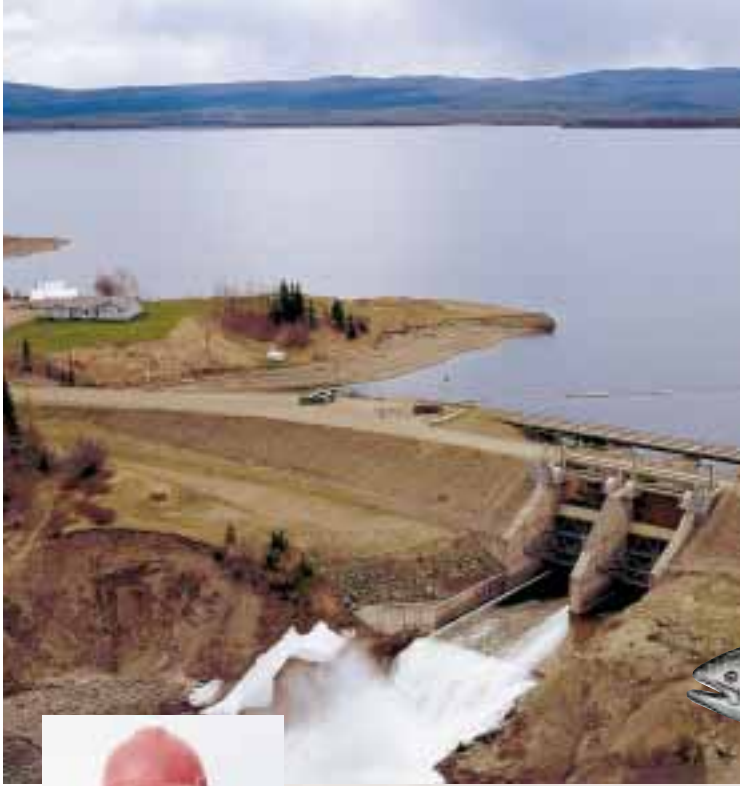
other contaminants on fish in the inner Kitimat harbour. The U.S. federal agency is a recognized authority on the effect of pollutants on marine ecosystems, and views the Haisla invitation as a valuable opportunity.

Alcan has provided \$200,000 in funding to the Haisla to permit NOAA scientists to study PAH impacts on Chinook salmon and flatfish in the Kitimat Harbour during the summer of 2000. The company is also funding a parallel study with Simon Fraser University to determine what happens to PAHs in the environment.

PAHs also occur in air emissions from the smelter, as do they in smoke from forest fires, wood stoves, and vehicle exhaust. PAH emissions from Kitimat Works have been on a slight downward trend for the past three to five years. Alcan monitors ambient air quality at locations around the smelter, and has found current PAH levels to be lower than average for northern B.C. communities.

Summary of opportunities identified in Alcan's Kitimat Works P2 Plan

P2 OPPORTUNITY	TARGET	TARGET DATE
Reduce gaseous fluoride emissions from potroom roofs through raw material quality control, process changes and technological changes.	Reduce annual fluoride emissions to permitted levels by 2000, then reduce by 0.1 kg per tonne of aluminum produced each year to achieve an annual average of 1.6 kg per tonne of aluminum produced.	December 2002
Eliminate the use of coke to preheat electrolytic cells and extend cathode life by using a flame pre-heat system.	Eliminate coke use as a method of preheating electrolytic cells and increase life of cathodes by 10 % from 2,000 to 2,200 days.	January 2002
Reduce anode consumption and resulting carbon losses through raw material and process changes.	Reduce the amount of anode carbon consumed by 4 % from 0.537 to 0.515 tonnes per tonne of aluminum produced.	January 2003
Reduce greenhouse gases produced at Kitimat Works.	A 10 % reduction in greenhouse gas emissions.	January 2004
Reduce chlorine gas use by shortening the period of time that chlorine gas is used to flux impurities from extrusion and sheet ingot from 45-60 minutes to 30-45 minutes.	Limit chlorine gas consumption to 300 kg/day, while accommodating the production of higher grade aluminum products that require additional fluxing.	Ongoing
Replace ozone-depleting substances at Kitimat Works.	Replace Halon 1301 in computer rooms, Halon 1211 in fire extinguishers, HCFC 22 (R22) in air conditioners and HCFC 12 (R12) in refrigerators and vehicles	Halon 1211 – December 2000 Halon 1301 – December 2000 R12 & R22 – December 2010
Improve the efficiency of natural gas consumption at Kitimat Works by installing meters, adjusting burners, installing and repairing dampers, sealing leaks, and eliminating unnecessary equipment and furnaces.	Improve efficiency of natural gas use by 20 %.	January 2002
Reduce the amount of Spent Pot Lining (SPL) waste produced at Kitimat Works by designing a stronger, longer lasting cathode shell.	Reduce amount of SPL produced by 1,000 tonnes or 15 %.	January 2010
Recover the energy and material value of dust and steel shot waste from skirt blasting activities.	Investigate alternative waste management approaches, including energy recovery, re-use and recycling.	June 2002
Recover the energy and material value of duct scrapings.	Investigate alternative waste management approaches, including energy recovery and recycling.	June 2002
Ensure that residual material from sandblasting operations does not enter the storm sewer system.	Classify all residual sandblasting material and ensure that it is properly collected, bagged and stored.	June 1999
Recycle spent dry batteries used at Kitimat Works.	Collect and recycle 75 % of batteries.	June 2000
Reduce loss of alumina from Lines 3 and 8 basements due to wind and runoff by replacing the existing ore truck fleet and improving housekeeping practices.	Recover and recycle 750 tonnes of ore per year.	December 1999
Reduce the amount of alumina lost from wharf unloading activities by replacing existing unloading and handling systems.	Reduce alumina losses by 75 % from 4,200 to 1,050 tonnes per year.	January 2003
Reduce the amount of hydrofluoric, nitric and hydrochloric acid discharged to the sewer system by building a neutralization facility to treat spent caustic soda and Tuckers Eich in the metallurgical laboratory.	Reduce the loadings of dissolved aluminum and fluoride in the metallurgical laboratory effluent by 80 % or more.	June 2000



Daryl McDonagh, Skins Lake Spillway attendant, part of Alcan for 26 years

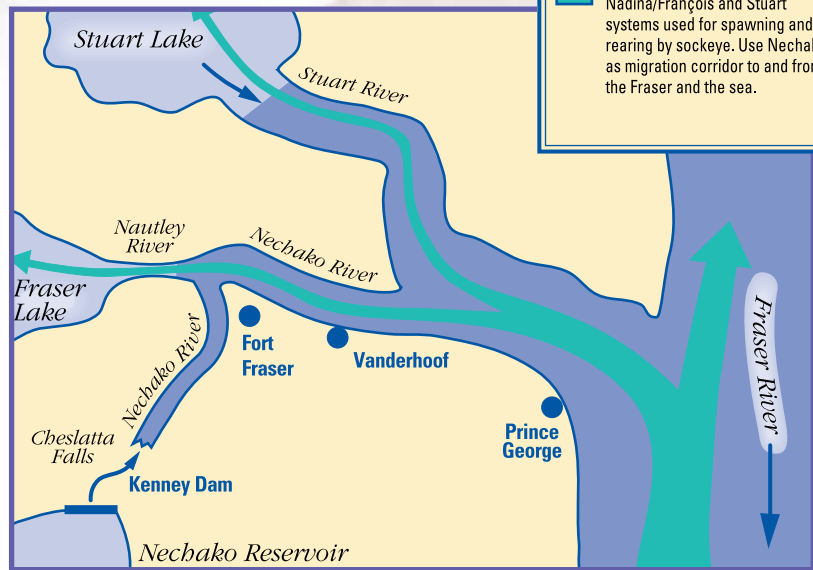


Chinook salmon



Sockeye salmon

Chinook	Spawn, incubate and rear in Nechako. Most spawn up river of Vanderhoof.
Sockeye	Nadina/François and Stuart systems used for spawning and rearing by sockeye. Use Nechako as migration corridor to and from the Fraser and the sea.



Fisheries Conservation

PRINCIPLE Alcan manages flow releases into the Nechako River, in accordance with the terms of the 1987 Settlement Agreement, to protect and conserve the salmon stocks that use the river.

PERFORMANCE Chinook populations

Chinook salmon spawn in various sections of the Nechako River from Cheslatta Falls to Vanderhoof, depositing eggs that incubate in the river's gravel beds over the winter. Juvenile Chinook emerge in the spring and either embark on the long journey downstream to the Pacific Ocean in their first summer, or remain in the Nechako River for a year before embarking. Adult Chinook typically return to the Nechako River at five years of age.

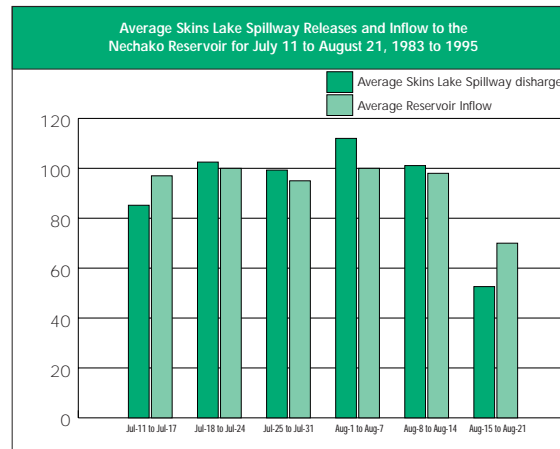


Observation towers in the upper Nechako River, used to track Chinook spawning

Based on a target established in the 1987 Settlement Agreement with the federal and provincial governments, Alcan's objective is to maintain a spawning population of Chinook salmon in the Nechako within a range of 1,700 to 4,000 fish. Actual Chinook returns in 1999 were within this target range, estimated at 1,900 fish. *Please see graph page 13.*

Because Nechako Chinook spend most of their lives outside the Nechako River, many factors can affect their abundance. Each spring the Nechako Fisheries Conservation Program (NFCP), of which Alcan is a member, captures and releases a sample of Chinook fry that emerge from Nechako River gravel beds. The numbers are compared with the total number of spawners in the corresponding brood year. Changes reflected in this index can be attributed to in-river habitat conditions, unlike changes in adult abundance which are highly affected by factors outside the river.

A strong relationship has been found between the number of adult Chinook reaching Nechako River spawning beds during the decade of the 1990s, and the number of emergent fry and migrating juveniles in corresponding years. This indicates that the habitat in which they hatch and rear is of consistent quality. *Please see page 27.*



PERFORMANCE Summer Temperature Management Program

The Nechako River is a migration corridor for four major stocks of Sockeye salmon, which collectively represent about 20 per cent of the total Sockeye production of the Fraser River system. Individual fish take four to seven days to migrate through the Nechako River en route to spawning grounds in the Nadina/Francois and Stuart/Takla systems.

Based on targets established in the 1987 agreement, Alcan's Summer Temperature Management Program (STMP) objective is to maintain water temperatures below 20°C in the Nechako River above the Stuart River confluence between July 20 and August 20 each year. Maintaining these envi-



For fish survey activities, the Nechako River is divided into 16 separate sections or "reaches." In each reach, data is gathered on the movement of fish during the year and their relative abundance from year to year.



A healthy juvenile Chinook is weighed and measured before being returned, unharmed, to the Nechako River. This type of data collection allows the Nechako Fisheries Conservation Program, of which Alcan is part, to monitor the diversity of fish species and the abundance of juvenile chinook in the river each summer.



Rotary Screw Traps are an important method of collecting juvenile chinook and other fish in the Nechako River so that they can be identified, weighed, and measured.

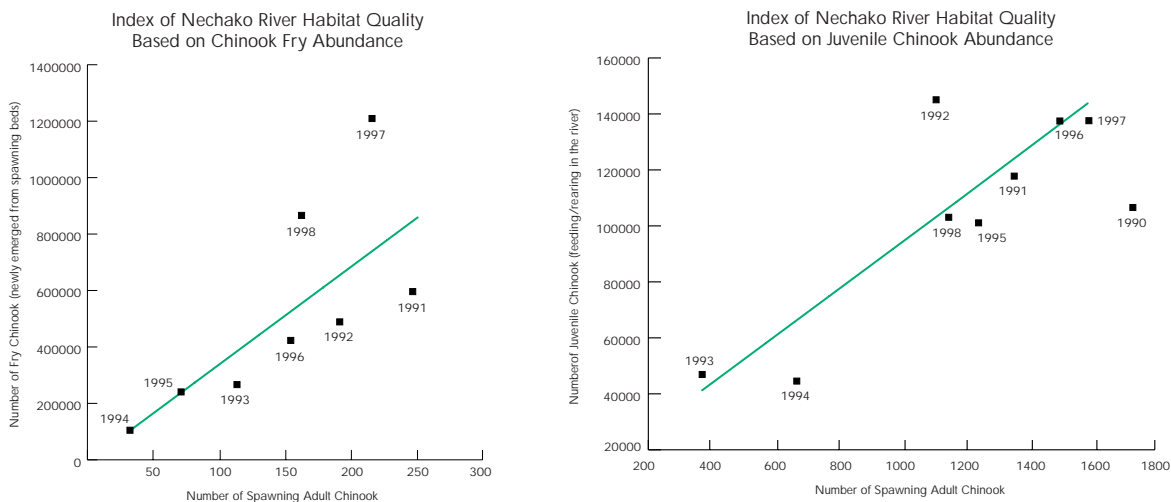
ronmental conditions maximizes the survival of migrating sockeye, and is accomplished by releasing additional cooling flows from the Skins Lake Spillway in the summer months.

While Alcan's STMP objective is to consistently maintain water temperatures below 20°C, this is not always possible due to weather conditions. The Nechako River exceeded the 20°C temperature target on three days in 1999.

Since Alcan's Summer Temperature Management Program was established in 1983, it has reduced the average frequency of water

temperatures above 20°C, from 3.0 days per year to 2.9 days per year. This has been achieved during a period when weather conditions are known to have been generally warmer than in the past, and when there have been significant increases in exceedances of 20°C in the unregulated Stuart River. *Please see graph page 13.*

While 20°C is used as a target temperature, 21.7°C is a more biologically significant threshold, above which fish mortality can occur. There has not been an exceedance of 21.7°C in the Nechako since the STMP was instituted.



As an active participant in the Nechako Fisheries Conservation Program, Alcan carries out annual field studies that provide evidence of the quality of habitat for Chinook salmon, which spawn in the river each year. Chinook young are characterized as either 'fry' that have recently hatched from their eggs buried in the gravel substrate of the river, or as the larger 'juveniles' which actively move within the river to find food for early growth. Determining the relative abundance of fry and juveniles compared to the number of parents that created them (the adult chinook spawners) gives us a good indication of the quality of conditions in the river for survival of eggs, and survival and growth of fry and juveniles.

The two figures above illustrate these relationships based on the collection of data over the last decade. From a scientific perspective, the data collected for the abundance of fry and juveniles show a 'good fit' with the abundance of their parents. In other words, despite the number of parents that return to the river to spawn each year, the proportionate number of young Chinook remains relatively constant and stable. This indicates that habitat conditions for survival and growth of Chinook salmon in the Nechako River have remained stable over this period of time. Each year, Alcan carries out another assessment based on the collection of field data. If the resultant data point continues to show a strong fit to the line in each of these figures, the indication is that there is no change in habitat conditions in the Nechako River.

Beyond Compliance

PRINCIPLE Alcan is committed to working with the B.C. Ministry of Environment, Lands and Parks and stakeholders in the community of Kitimat to move beyond pollution control at Kitimat Works to the reduction or elimination of pollutants at source.

PERFORMANCE Greenhouse Gases

Alcan is striving to reduce greenhouse gas (GHG) emissions from Kitimat Works, in support of Canada's Kyoto Protocol commitment to reduce GHG emissions by six per cent over 1990 levels by the year 2012.

In assessing the impact of GHGs on the environment, the CO₂ equivalency of the gases emitted is a more important indicator than the actual volume of the emissions.

Greenhouse gas production at Kitimat Works comes from three major sources:

- the production of CO₂ in the electrolytic reduction process as a result of carbon anode consumption;

- the production of perfluorocarbons (PFCs) as a result of 'anode effects' in the potrooms; and,
- fossil fuel use around the plant.

The first two of these sources account for the majority of greenhouse gas production at Kitimat Works. PFC emissions account for about 69 per cent of the smelter's total CO₂ equivalency outputs. CO₂ emissions account for about 29 per cent of the smelter's CO₂ equivalency outputs, while fossil fuel use accounts for the balance of about 2 per cent. Although the volume of CO₂ emissions at Kitimat Works far outstrips the volume of PFC emissions, one kilogram of PFCs is equivalent to about 6,500 kg of CO₂ in terms of its contribution to ozone depletion.

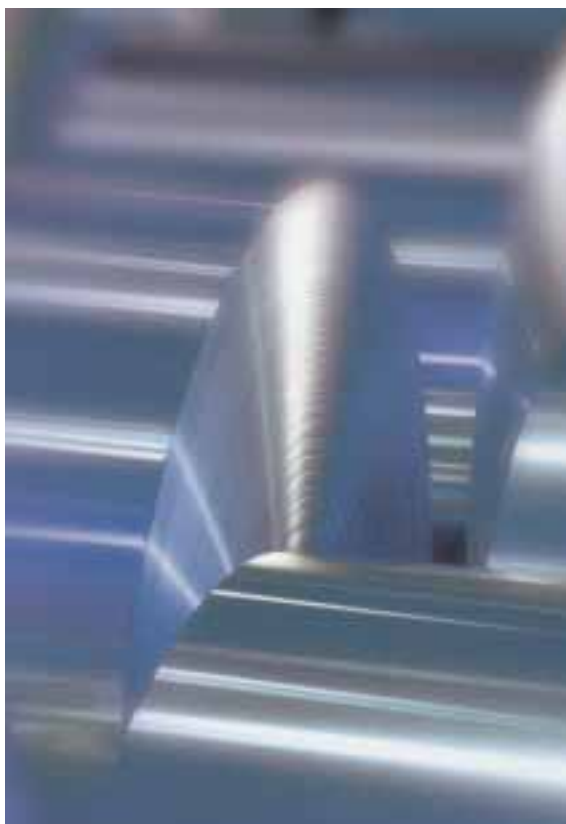
CO₂ is an unavoidable by-product of the electrolytic reduction process by which aluminum is made. Alcan is nevertheless working to reduce all three types of GHG production through process efficiencies, fuel-use reductions, and other measures – and has committed in its P2 Plan to a 10 per cent overall reduction by 2004.

PFCs are produced in Kitimat Works' potrooms as a result of 'anode effects'. These occur when an insufficient supply of alumina causes an electrolytic pot to cease making aluminum and begin making insulating gases or PFCs. Maintaining appropriate alumina levels requires a delicate balance, as an over-supply of alumina can create even more negative environmental consequences.

Work is currently under way at Kitimat Works to improve the alumina feed control, while still working within the constraints of the existing pot design. More advanced feeding improvements, involving substantial technological change, are also being tested.

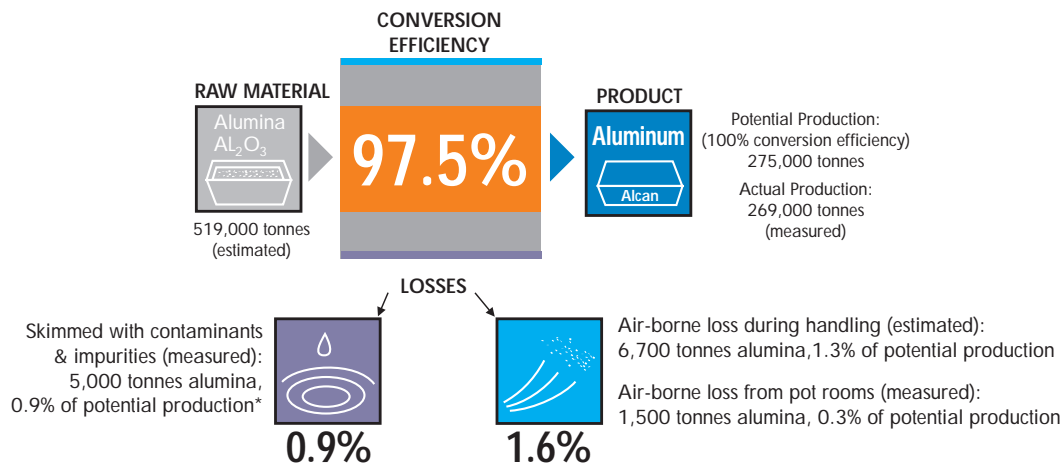
GHG reduction is a priority for Alcan across the corporation. Under the TARGET program, launched in September, 2000, significant resources are being devoted to reviewing and refining our GHG data to improve our management of and reporting on these substances.

Measurement of GHGs requires a great deal of technical rigour. Under our TARGET program, Alcan is developing measurement systems that we hope will result in credible and transparent recording of these emissions in future reports.





The transmission line linking the Kemano powerhouse with the Kitimat smelter



*Significant proportion recycled by third parties

PERFORMANCE Raw Material Use

Alcan strives to optimize the value of the raw materials we use in order to minimize waste and conserve natural resources. The two major materials required to make aluminum are alumina and electricity. The following discussion of our performance in the area of raw materials use focuses on how efficiently we convert alumina to aluminum and how efficiently we use the electricity generated at Kemano for this purpose.

Alumina conversion

Alumina is the raw material from which aluminum is extracted. The alumina used at Kitimat Works is imported from Australia, where the bauxite from which it is derived is mined and refined. The efficiency with which Kitimat Works converted into metal the aluminum contained in the alumina it used in 1999 is estimated at 97.5 per cent.

Alumina is a relatively inert and common substance and its dispersal has no measurable impact on the local environment. Reduction in



The harbour at Kemano Bay

Profiles

Researching the little-known ways of the eulachon

Since 1988, Alcan has studied eulachon in the Kemano River. A member of the smelt family native to the Pacific Coast of North America, eulachon has an important role in the culture of the Haisla people, who return to established fishing camps on the banks of the Kemano each spring.

Alcan's research was initiated to determine if the increased water flows in the Kemano that would have been associated with the now-defunct Kemano Completion Project would have had a negative impact on spawning eulachon. Although the company's hydroelectric power generating activities were found to have little impact, Alcan has continued to study the fish and share its findings with the Haisla.

In fact, when the past 12 years of biological data are analyzed in 2000, Alcan

will have compiled the world's longest-time series of data on eulachon. The information will not only serve as a valuable management tool for the Haisla, it will advance scientific understanding of a species generally ignored by researchers.

Unfortunately, eulachon stocks all along the west coast of North America have suffered dramatic declines in 1999 and 2000. The species appears to be highly susceptible to large-scale changes in ocean conditions, perhaps attributed to the recent El Nino. In 1999, virtually no eulachon returned to the Kemano River and only a small number returned in 2000. Alcan's data analysis has provided useful fishery management information that may be beneficial in restoring the healthy abundance of this species.

alumina losses is nevertheless addressed in Alcan's P2 Plan. There is also an economic rationale for working to reduce alumina losses. The chart above illustrates Alcan's 1999 alumina conversion efficiency, and distinguishes figures that are derived from direct measurements from those estimated.

The largest losses occur during unloading and conveyance from the wharf, and make up most of the estimated 6,700 tonnes lost during handling. These air-borne dust losses are expected to be reduced by half when new unloading and handling equipment is installed at Kitimat Works by the end of 2000, at a cost of \$15 million.

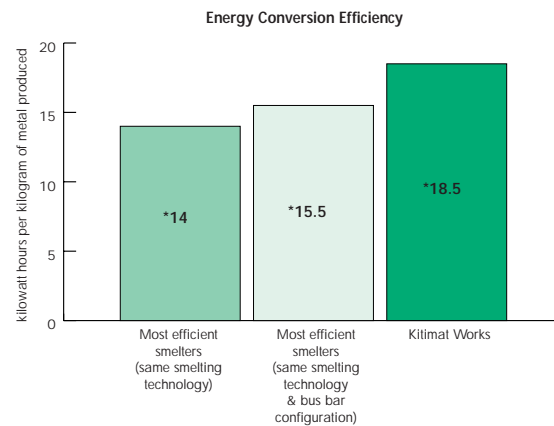
Other losses of alumina do occur – in spent potlining and duct scrapings. Although not measured, these losses are known to be on a much smaller order of magnitude, representing an estimated 200 tonnes in total, or less than one-tenth of one per cent of potential production.

Energy conversion

Some 5.29 terawatt hours* (TWh) of hydroelectricity was used at Kitimat Works in 1999. About five per cent of this total was used for auxiliary purposes such as lighting and heating, while 95 per cent was used directly in the production and casting of aluminum.

Based on Kitimat Works' 1999 production of 269,000 tonnes of aluminum, the smelter's energy conversion efficiency was 18.5 kilowatt hours per kilogram of metal (kWh/kg). The most energy efficient smelters in the world that use the same technology employed at Kitimat Works can produce one kilogram of aluminum with 14 kWh of energy, or 24 per cent less.

The difference of 4.5 kWh/kg in energy conversion between Kitimat Works and world class operation can be attributed to three causes: (1) anode difficulties discussed on page 17, and our performance on other process control variables (representing about one-quarter of the difference); (2) shortcomings in pot design; and (3) shortcomings in the electrical distribution system. The pot design will be addressed through normal pot replacement, which could take 7 to 10 years.



Testing of new pot designs could result in an energy conversion efficiency of about 15.5 kWh/kg Al. Changes to the electrical distribution system would be more difficult to justify without wholesale modernization, thus making impractical the attainment of a 14 kWh/kg Al conversion efficiency.



Water exits the Kemano powerhouse through a "tailrace" into the Kemano River.

* A terawatt hour is the amount of electricity that would be produced over a one hour period at a generation rate of one terawatt (one million megawatts).



Geoff McKay and Connie Mattiuz, wharf equipment operators, part of Alcan for nine months and five years, respectively

Economic Benefits

"Responsible, competitive private enterprise is the most efficient system for producing and supplying goods and services to the public at large. We believe that our role is complementary to the responsibility of governments, which is to develop their own priorities and goals and to set legal and taxation frameworks for corporate enterprises within their jurisdictions. In this way, both Alcan and the communities in which we operate are able to participate in the social and economic benefits of industrialization."

– Alcan Code of Conduct

Economic Contribution Principles and 1999 Performance

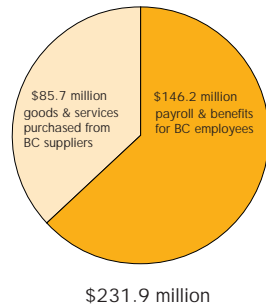
Every year since 1982, Alcan has retained PricewaterhouseCoopers to quantify the economic contribution that its Kitimat Works smelter makes to the northwest region of British Columbia. For the past five years, this assessment has been expanded to consider Alcan's contribution to the provincial economy as a whole. Most of the information in this section is drawn from PricewaterhouseCooper's 1999 report.

Contribution to the B.C. Economy

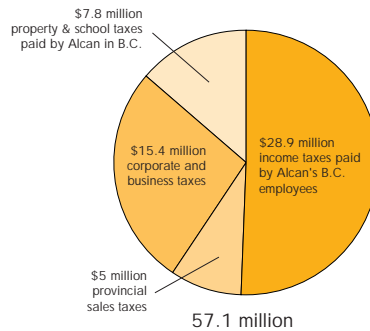
PRINCIPLE Alcan strives to make a significant economic contribution to the province of British Columbia through its business operations, purchasing policies, and employment opportunities.

PERFORMANCE

Direct 1999 economic contribution to B.C. economy



Total 1999 tax revenues generated by Alcan in B.C.



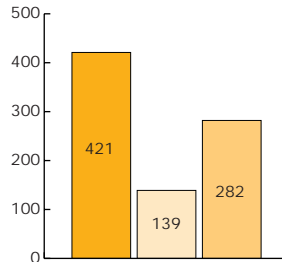
Contribution to the Regional Economy

PRINCIPLE Alcan strives to make a significant economic contribution to the regional economy of northwest British Columbia through a policy of purchasing goods and services from local suppliers and contractors whenever price and quality are competitive.

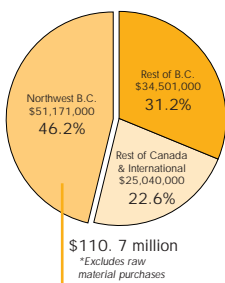
PERFORMANCE

Local Supplier Benefits

- Total number of companies in northwest B.C. that supplied goods and services to Alcan in 1999.
- Number of companies that sold goods or services to Alcan valued at more than \$25,000
- Number of companies that sold goods or services to Alcan valued at less than \$25,000



Total Purchases Goods & Services, 1999

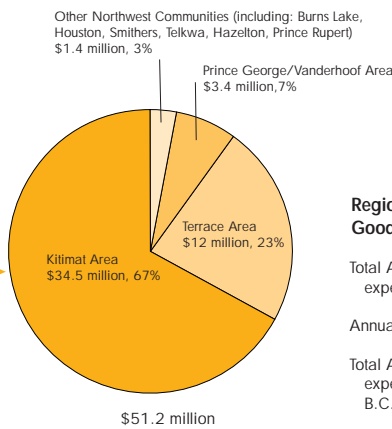


Regional Purchases Goods and Services 1999

Total Alcan goods & services expenditures in B.C.: \$85.7 million

Total Alcan goods & services expenditures in northwest B.C.: \$51.2 million

As a percentage of total B.C. expenditures: 60%



Regional Purchases Goods and Services 1979-1999

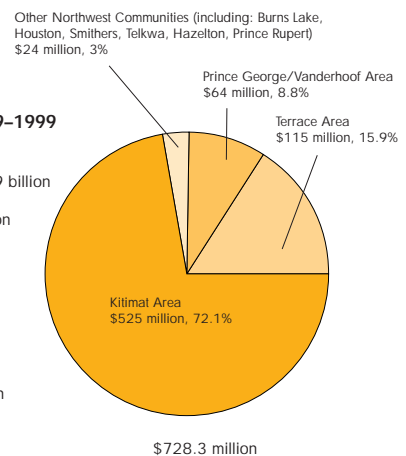
Total Alcan goods & services expenditures in B.C.: \$1.49 billion

Annual Average: \$70.7 million

Total Alcan goods & services expenditures in northwest B.C.: \$728.3 million

As a percentage of total B.C. expenditures: 49%

Annual average \$34.7 million





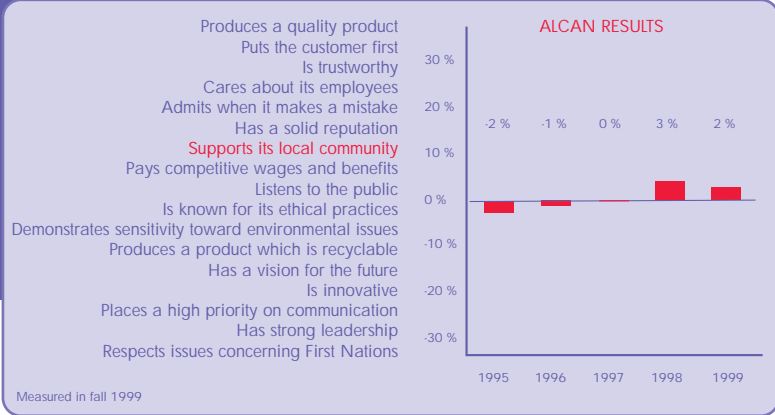
Public Perception Attributes

Supports community

In 1999, public perceptions of Alcan on the 'Supports its local community' attribute were found to be two per cent higher than average for the eight organizations included in the survey.



Dan Goncalves, cell operator, part of Alcan as a summer student employee



Profiles

Small supplier carves out exclusive relationship

John Dal Monte is a craftsman with a love for wood and a head for business.

Originally from a small village near Venice, the Italian-born Dal Monte established a small cabinetry and custom woodworking business in Kitimat more than 30 years ago. While his vision was to provide fine wood craftsmanship for a primarily residential and commercial market, Alcan's industrial presence quickly opened new avenues for business.

Today, Dal Monte Wood Crafts is Kitimat Works' sole supplier of the wood runners on which aluminum ingot is placed during shipping to prevent movement and damage. In fact, Dal Monte produces 28 different products for Alcan, including 12 sizes of hardwood runners.

Working with wife Amabile, son Paul, and seasonal help, Dal Monte has designed and built a specialized, automated wood processing facility in Kitimat to meet Alcan's exacting specifications. Kitimat Works buys an estimated 280 tonnes of runners from Dal Monte Wood Crafts each month, as well as pallets and ingot end protectors.



John Dal Monte

Dal Monte recently made the switch from softwoods to hardwoods in the manufacture of runners to better support ingots that can weigh as much as two tonnes.

Although Alcan is far and away his largest customer, John Dal Monte hasn't abandoned his first love – or the local market – for fine woodworking. He continues to craft cabinetry and furniture, and credits Alcan for his ability to maintain a profitable business in a small market.

"For me, doing business with Alcan is a win-win situation," Dal Monte said. "Alcan needs a consistently high-quality product manufactured to its specifications, and I need an anchor customer around which to build my business."



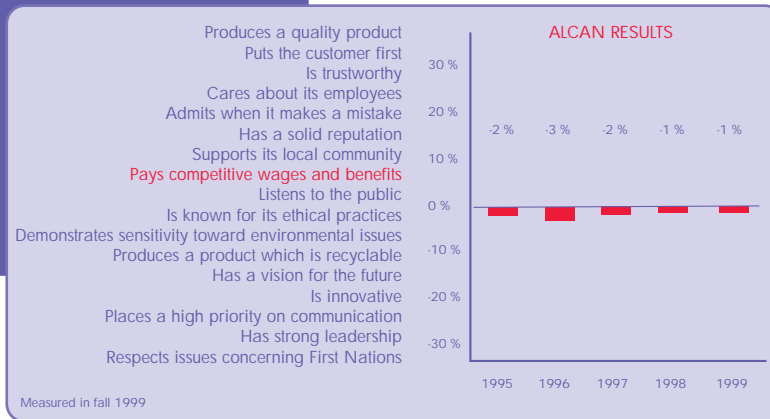
Public Perception Attributes

Competitive wages

In 1999, public perceptions of Alcan on the 'Pays competitive wages and benefits' attribute were found to be one per cent lower than average for the eight organizations included in the survey.



Grant Bliss, senior assistant control room operator, part of Alcan for 26 years



Employment

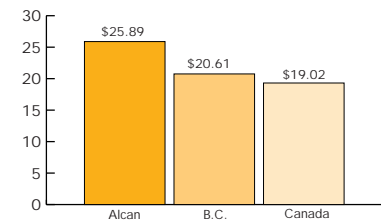
PRINCIPLE Alcan strives to provide long-term, high-quality employment with fair and competitive compensation.

PERFORMANCE

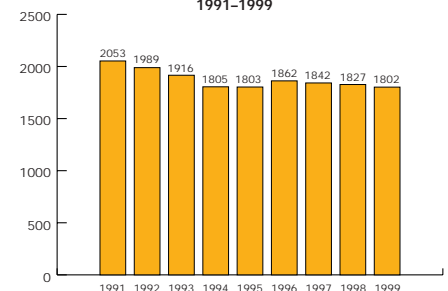
All figures in constant 1999 dollars.

Direct employment in B.C. as of December 31, 1999*	1,916
Average number of active employees in B.C. in 1999	1,802
Direct employment in Kitimat in 1999	1,817
– As a percentage of the total Kitimat workforce	33 per cent
– Estimated direct and indirect employment in Kitimat	3,600
– As a percentage of the total Kitimat workforce	67 per cent
Direct employment in the Kitimat-Stikine Regional District (based on total employees as of Dec. 31, 1999)	1,910
– As an approximate percentage of the total regional workforce	10 per cent
– Estimated direct and indirect employment in the Kitimat-Stikine Regional District	4,800
– As an approximate percentage of the total regional workforce	25 per cent
Total compensation (wages and benefits) for Alcan employees in B.C. in 1999	\$146.2 million
– Average total compensation per Alcan employee in B.C.	\$76,300
Average length of service for Alcan employees in B.C.	16.6 years
– Unionized employee turnover in 1999	3 per cent

Average hourly unionized wage rates



Average number of active employees 1991-1999



* Represents total number of individuals employed by Alcan in B.C. – active and inactive, full and part-time, temporary and permanent, hourly and salaried – as of December 31, 1999.



Social Responsibility

Koreen Algor,
assistant casting
centre operator, a
new employee at
Alcan

Alcan's objectives are as follows:

- 1. operate at a level of profitability that will ensure our long-term economic viability by providing a return on the shareholders' investment that will enable us to attract capital adequate to support our growth;*
- 2. maintain an organization of able and committed individuals in the many countries in which we operate and provide opportunities for their growth and advancement both nationally and internationally;*
- 3. strive for a level of operating, technical, marketing and environmental excellence that will ensure a strong and continuing competitive position in the markets we serve;*
- 4. balance the interests of our shareholders, employees, customers and suppliers, as well as governments and the public at large, while achieving Alcan's business objectives, taking into account the differing social, economic and environmental aspirations of the communities in which we operate;*
- 5. demonstrate high standards of integrity in all phases of our business.*

– Alcan Code of Conduct

Social Principles And Performance 1999

This section covers some of the ways in which Alcan fulfills its responsibilities in B.C. to be a good employer and socially responsible corporate citizen. The information presented here is not meant to be a comprehensive list of everything Alcan does in our interactions with employees, stakeholders, and communities. Rather, we have selected key activities that provide a picture of our overall approach to these relationships.

Health and Safety

PRINCIPLE Alcan strives to provide a healthy and safe working environment through prevention, adaptive management, and continuous improvement.

PERFORMANCE Fostering a culture of safety consciousness

- Alcan management works with its unionized workforce through the Kitimat/Kemano Occupational Health and Safety Committee (KKOHS) to reduce accidents and improve occupational health. The KKOHS appointed a full-time union safety representative in 1999.
- Through the KKOHS, Alcan implemented a safety culture reinforcement program in 1999. The workshop-format training emphasized the importance of safety practices and initiatives and encouraged crew and individual actions. It will be provided to all employees in 2000-01.

PERFORMANCE Assessment and action

- In 1999, the KKOHS undertook a priority-setting exercise to identify the most pressing health and safety issues at Kitimat Works and Kemano, as well as the opportunities for the greatest improvement. These areas are the focus of KKOHS efforts in 2000.
- Alcan uses an approach called 'root cause analysis' to ensure that all safety incidents are thoroughly investigated and understood. The objective is to go beyond the immediate circumstances of an incident to identify its root causes. Training was provided to some 350 employees in 1999 to facilitate broader use of 'root cause analysis'.

Casting furnace



Sheet ingot emerging from casting pit



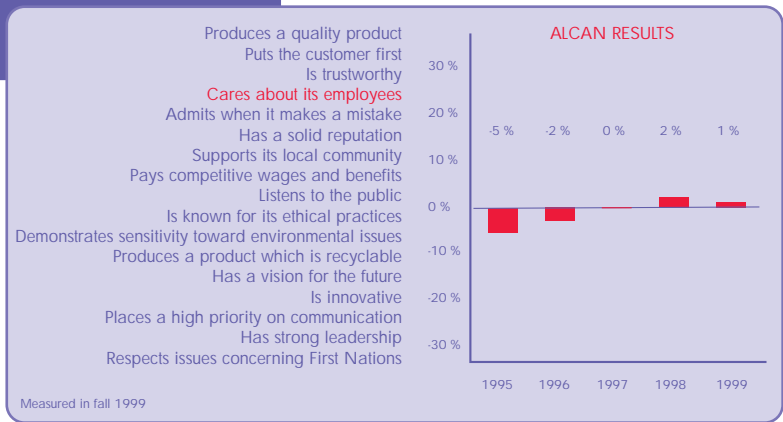
Public Perception Attributes

Cares about its employees

In 1999, public perceptions of Alcan on the 'Cares about its employees' attribute were found to be one per cent higher than average for the eight organizations included in the survey.



Lawrence Pettet, senior laboratory analyst, part of Alcan for 19 years



Profiles

Training produces superlative contractor safety results

Alcan's contractor workforce has one of the best safety records in B.C., with injury frequencies that are a fraction of the provincial average. This enviable record is largely due to a Construction Safety Policy instituted by Alcan in 1995, which focuses on training for contract project managers and for contract workers.

Since 1995, more than 250 project managers have completed an intensive three-day training program that focuses on provincial regulatory requirements and safety-related considerations specific to Kitimat Works. Contractors' employees are also required to complete a one-day safety training program, while their employers are required to adhere to stringent requirements related to hazard identification,

safety planning and ongoing safety meetings. Enforcement provisions are in place, although they rarely have to be used.

Alcan's approach to contractor safety is a strict one, but the results speak for themselves. An assessment of contractor safety results between 1995 and 1997 found that Alcan recorded three injuries for every 500 person-years worked, compared to a provincial average of 50 injuries. Days lost due to injury among Alcan contractors totaled 28 per 500 person-years worked, compared to a provincial average of 2,850, during the same period. Strong results have been maintained since then, with only one lost-time accident within Alcan's contract workforce in 1998, and none in 1999.

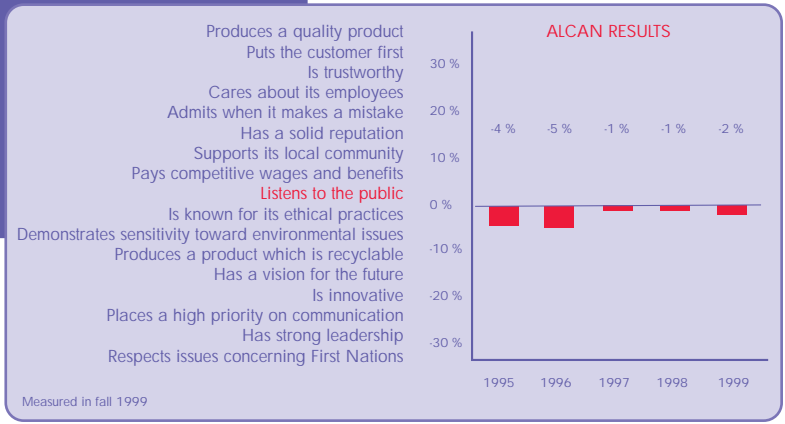


Mark Unrau, casting centre operator, part of Alcan for two years

Public Perception Attributes

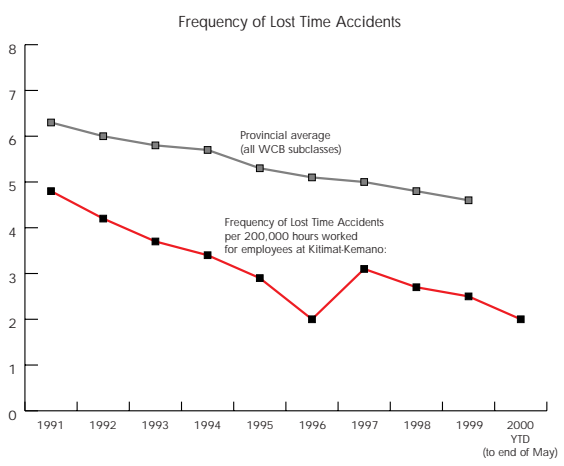
Listens to the public

In 1999, public perceptions of Alcan on the 'Listens to the public' attribute were found to be two per cent lower than average for the eight organizations included in the survey.



PERFORMANCE Improving safety results

The frequency of injuries that lead to time off work for Alcan employees in British Columbia is well below the provincial average, and has shown a generally declining trend for the past 10 years.



PERFORMANCE Health and well-being

- Alcan promotes employee fitness through the sponsorship of fitness classes at Kitimat schools and community centres (also available to the broader community), and subsidies for other sporting and recreational activities. Kitimat Works also maintains an on-site employee fitness centre.
- Kitimat Works employees can access no-cost, confidential counselling services for a broad range of personal problems through the Alcan Employee and Family Assistance Program.
- Kitimat Works employees who experience significant noise, heat or other industrial exposure in the course of their work receive annual check-ups at Alcan's on-site medical centre to ensure early detection and treatment of health problems or disease.

Work Environment

PRINCIPLE Alcan strives to provide a work environment characterized by opportunities for training and advancement, an absence of discrimination and harassment, and accommodation of disability.

PERFORMANCE Training and advancement opportunities

- 'Progression Systems' at Kitimat Works allow employees to improve their skills and assume greater levels of responsibility and compensation. Employees are able to advance through defined stages of work, typically over several years, to achieve a workplace position appro-



Public Perception Attributes

First Nations issues

In 1999, public perceptions of Alcan on the 'Respects issues concerning First Nations people' attribute were found to be eight per cent lower than average for the eight organizations included in the survey.



Sarah McLeod, wharf equipment operator, part of Alcan for four years



priate to their aptitudes and abilities.

Progression systems allow entry-level employees with limited experience to access important employment opportunities.

- Alcan has sponsored qualified Kitimat Works employees to become certified tradespeople since 1961. In 1999, seven employees initiated their apprenticeship training at Kitimat Works, while eight others either continued or completed their apprenticeship program.
- The Northern Emergency Services Training Academy was founded at the Kitimat Skills Centre in 1998 with financial support from Alcan. The Academy provided specialized training in emergency response and fire fighting to Alcan personnel and fire departments from throughout northwest B.C. in 1999.
- Alcan sponsored 15 employees to obtain their provincial instructor's diploma through a six-week course of study in 1999. These individuals are now developing work-related skills and training programs at Kitimat Works.
- Alcan continues to offer a seven-week foreman development training program at Kitimat Works. In 1999, 23 employees successfully completed this training.
- Alcan offers an unpaid leave of up to eight months per year to employees who wish to

pursue education programs, whether work-

related or not. Alcan also subsidizes the cost of tuition and texts for approved courses of study taken in the evening, on a part-time basis or for short duration. The subsidy covers 50 to 100 per cent of costs, depending on the degree of relevance to an employee's work.

PERFORMANCE Human rights

- Alcan and the C.A.W., Local 2301 have a joint Human Rights Policy through which both parties are working to create and sustain a discrimination and harassment-free work environment. It addresses (1) discriminatory harassment based on race, gender, disability and other grounds prohibited by law, and (2) personal harassment, which consists of offensive conduct or comment directed towards an individual, unrelated to legally prohibited grounds of discrimination.
- Alcan undertook a comprehensive human rights training initiative in 1999, in which more than 1,700 employees received eight hours of instruction to foster better understanding and respect for the Human Rights Policy. The training focused on heightening awareness of human rights issues, the type of incidents that contravene the policy, and the recourse avail-

able to employees who believe their rights have been violated.

- During 1999, 17 formal complaints from Alcan employees were investigated. The Human Rights Policy requires that all complaints be taken seriously, handled in a prompt manner, and treated with the utmost confidentiality. Although investigations are conducted jointly, Alcan management has final responsibility for determining when the policy has been contravened and what action must be taken in response.

PERFORMANCE Medical placement

- Alcan has an accommodation policy for employees with medical restrictions – whether the cause is industrial or non-industrial – and works cooperatively with the union to re-integrate such employees into the workforce wherever possible. The joint union-management Medical Placement Committee supports the identification of temporary accommodations to allow employees to maintain their current positions. When this cannot be accomplished, a temporary or permanent re-assignment is pursued. During 1999, a total of nine employees were permanently assigned to different positions when their medical restrictions could not be overcome by workplace modifications.

Community Investment, Support, Consultation

PRINCIPLE Alcan strives to make a positive contribution to the quality of life of the communities in its operating area, and to foster an open dialogue and mutual understanding with all external stakeholders.

PERFORMANCE Community Investment

Alcan is a member of *Imagine*, an initiative of the Canadian Centre for Philanthropy that encourages all Canadian companies to commit at least one per cent of pre-tax income to community giving each year. Although Alcan's B.C. operations do not

report financial results separately from the company's Primary Metals Group, corporate giving in British Columbia is commensurate with B.C. Operations' size and contribution within the Primary Metals Group.

Alcan's corporate donations in British Columbia are administered through its Community Investment Fund (CIF). In 1999, some \$865,000 in CIF funds supported a diverse program of community investments, sponsorships, and donations in Alcan's operating areas and throughout B.C.

In addition, Alcan often commits community investment funding from operating budgets outside the CIF. In 1999, the company invested close to \$200,000 in such additional funding for programs and initiatives of benefit to its operating communities and other external stakeholders in B.C.





The Nautley River, with Fraser Lake in the background, near the confluence with the Nechako

Profiles

Working to address Nechako Watershed interests

When Alcan and the B.C. government reached agreement in 1997 on issues arising from the cancellation of the Kemano Completion Project, two funds aimed at addressing social, environmental and economic issues in northern B.C. were established. They are:

- the Nechako-Kitamaat Development Fund (NKDF) – a fund of \$15 million, to which Alcan and the B.C. government have each contributed \$7.5 million, to promote sustainable economic development in the Nechako region and on lands traditionally used by the Haisla people; and,
- the Nechako Environmental Enhancement Fund (NEEF) – a fund of potentially \$100 million or more to finance projects that will benefit the Nechako Watershed environment. Alcan has committed \$50 million to NEEF on a matching-dollar basis, with the B.C. government expected to contribute a similar amount.

The NKDF approved its first funding proposals in 1999 when grants for a community proposal writing workshop and value-added forest products forum were awarded in Vanderhoof. In subsequent years, the NKDF will provide grants to improve local infrastructure and enhance the capacity of communities to foster economic development.

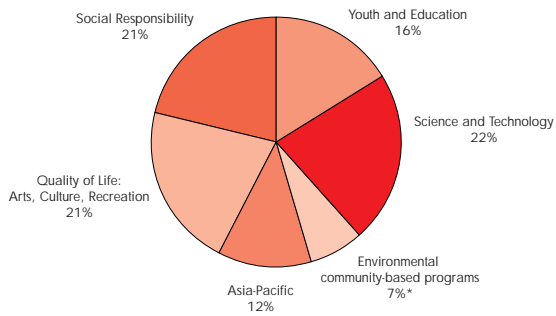
The NEEF is overseen by a Management

Committee, composed of one representative from the Province, one from Alcan, and an independent chairperson. This Management Committee has spent the past year and a half consulting with Nechako River stakeholders about their views as to how the fund should be used to enhance the Nechako Watershed environment. A report and recommendations from the NEEF Management Committee to the Province are expected early in 2001.

Another initiative that arose after the cancellation of KCP is the Nechako Watershed Council (NWC). The NWC is a multi-stakeholder organization whose 23 members represent community groups; business interests; local, regional, and provincial governments; and First Nations. It provides a vehicle for stakeholders to work together to enhance the long-term health and viability of the Nechako Watershed, and to gain a better understanding of one another's interests.

Despite the diversity of views represented within the NWC, it arrived at a consensus recommendation in 1999 regarding the best use of the Nechako Environmental Enhancement Fund. The council supports construction of a cold water release facility at the Kenney Dam as "the best opportunity to enhance the downstream environment of the Nechako Watershed area," and has recommended this to the NEEF Management Committee.

Approximate 1999 Expenditure Breakdown by category



*Includes only direct funding to community-based environmental programs. Does not reflect investments in environmental improvements to operations, environmental studies, or the dollars spent on creating environmental programming within Alcan-sponsored community events.

PERFORMANCE Carefully selected projects, valued partnerships
Alcan's Community Investment Fund (CIF) is administered by company representatives in Kitimat, Vanderhoof, and Vancouver, who review all requests for financial support and approve each community investment.

CIF funds are targetted in six areas that reflect Alcan corporate characteristics and values in B.C.

Although the level of financial support provided is at the discretion of the CIF committee, Alcan seeks to support worthy programs in each of the six areas as shown in diagram above.

The CIF criteria are reflected in Alcan's highest profile sponsorships and community investments in B.C., including the Alcan Omnimax Theatre at Science World, the Alcan Salmon Rearing Pond at the Vancouver Aquarium Marine Science Centre,





Profiles

Close partnerships add value to community investment

Alcan's community investment program brings more than dollars to the organizations that benefit from our support. In most cases, Alcan forges close partnerships with the groups we sponsor creating a greater return on investment for all parties as a result.

"I've never come across a sponsorship that was truly based on partnership to the same degree as our relationship with Alcan," says Sonny Wong, sponsorship and marketing manager for the Alcan International Dragon Boat Festival. "Alcan makes a significant contribution to the success of the festival that goes well beyond writing a cheque."

Wong notes that Alcan contributes to the

festival program each year by developing innovative aluminum-based displays and activities that support the festival's Asian theme and family values.

Joanne Leslie, director of development for Vancouver's Bard on the Beach theatre company, concurs that the sponsorship relationship with Alcan is special. She notes that Alcan makes direct contact with the students who take part in the company's summer workshops, presenting each with a gift at the conclusion of the program. "It's an especially nice touch," she says, "and it's going that one step further that sets them apart from the typical corporate sponsor."

An elementary approach...

The Cormorant Card Company produces and markets greeting cards made from recycled paper collected at Alcan facilities and throughout the community of Kitimat. What distinguishes it from the growing number of recycling businesses in B.C. is that it is owned and operated by the students of Cormorant Elementary School, with the support of Alcan.

Principal Agnes Casgrain said the project has tremendous educational value because it exposes students to all aspects of running a business – from process development and quality control to safety issues and product delivery deadlines. All students in the K-7 school design, produce and sell cards, with each grade taking responsibility for a specific busi-

ness function, such as accounting or marketing. The students take special care to ensure that their business is environmentally, socially, and economically responsible.

Profits generated by the Cormorant Card Company have paid for playground and classroom equipment, trips, and other activities.

In 1999, the Cormorant Card Company was named a winner of the Royal Bank National Partnerships in Education Award, which recognizes schools that have partnered with local industry to promote environmental education.

The Cormorant Card Company is based on the "micro-business" model, developed by Alcan in Quebec more than a decade ago and now operating in countries around the world.

the Alcan Dragon Boat Festival, Arts Umbrella and the Alcan Performing Arts Award.

These criteria are applied to the company's community investments in northern B.C. as well, but Alcan also supports a range of smaller-scale community initiatives and programs in its operating communities. These include local scholarships, community health and social service agencies, sports, recreation, arts and culture programs, First Nations, and economic development organizations.

PERFORMANCE Community Dialogue

Alcan continued efforts to consult and work cooperatively with communities throughout our operating area in 1999. These efforts are embodied in the work of the Nechako Watershed Council (NWC), whose 23 diverse members have issued a consensus recommendation for the best use of the NEEF (*please see page 42*).

Alcan also continued its tradition of transferring land deemed surplus to its needs (largely in and around Kitimat) to advance community interests. A parcel of land previously leased to Kitimat's non-profit Hirsch Creek Golf and Winter Club was recently transferred in fee simple, allowing for the development of a new multi-use facility that officially opened in 1999.

A similar land donation to the Kitimat Child

Development Centre, together with a cash donation from the CIF, will help make possible the construction of a new facility for this important child and family resource centre.

Alcan took significant steps in 1999 to enhance consultation and dialogue with local First Nations communities. The company entered into formal protocols with both the Haisla Nation of Kitimaat and the Cheslatta Carrier Nation of Grassy Plains, which will guide further discussion and enhance cooperation and co-existence in the future.

These protocols are short-term agreements, intended to serve as the basis for more detailed relationship agreements. But the discussions upon which they were built have already led Alcan to assist First Nations to realize community aspirations. For example, a key concern identified by the Haisla was the lack of space available for new development within Kitimaat Village. To remove ourselves as part of the problem, Alcan relocated a portion of our transmission line in 1999 at a cost of about \$7 million.

In 1999, the Cheslatta Carrier Nation was contracted to undertake forest surveys on Alcan property in response to a massive beetle infestation affecting northern forests. This type of initiative is based on an understanding of the mutual benefits to be realized by matching Alcan's business needs with the skills of First Nations to meet them.



Alcan was a proud guest this summer when the Haisla celebrated raising a replica of a totem pole taken from the Kitlope Valley to Sweden at the beginning of this century. The original will be coming home when the Haisla have a facility to house it.

Public Perception Attributes

In 1995, Alcan introduced a research tool to assess how the public perceives us relative to a mix of other large private and public sector organizations operating in the province. Alcan's rating on various attributes are reported throughout this publication in the sections to which they are relevant. On the facing page are our ratings on the seven remaining attributes measured in the 1999 survey. The baseline of 0% represents the average overall rating of all organizations in the survey. Therefore, results above the baseline reflect the public's perception of above average performance on the attribute being measured; results below the baseline reflect a perception of performance below the average of the organizations assessed.

Each year, Alcan surveys some 900 British Columbians, broken down into three different sample groups – one province-wide, the other two made up of residents of the Kitimat-Terrace area, and of the 'Watershed Region' east of Terrace to Prince George (added in 1996). The research determines how these publics perceive the performance of Alcan and seven comparable organizations on 17 attributes identified by British

Columbians as the key drivers of corporate reputation. A slightly different mix of private and public-sector organizations, all large and prominent within their geographic areas, is used with the different sample groups.

The 17 attributes were initially compiled through focus group research, and their relative importance to British Columbians is updated annually. Although rankings have changed slightly from year to year, public attitudes about key reputation drivers have remained relatively stable since 1995. 1999 rankings are set out below.

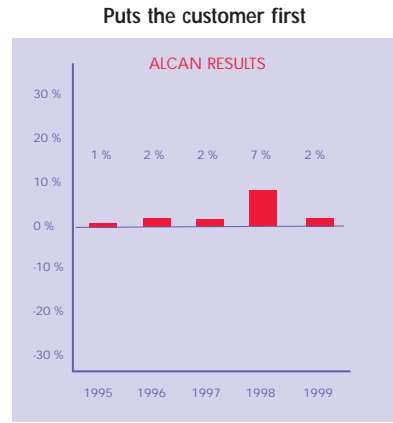
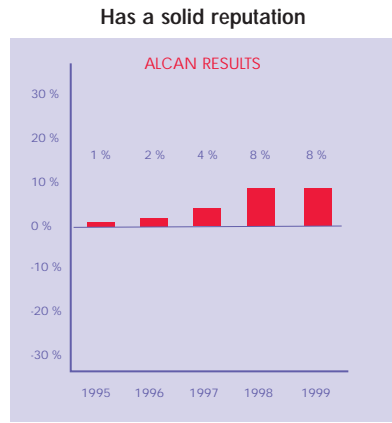
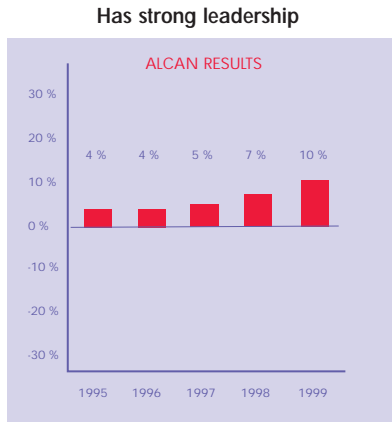
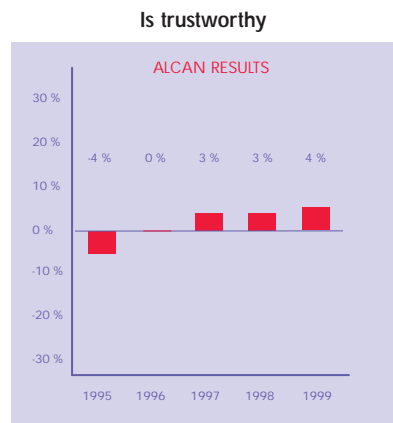
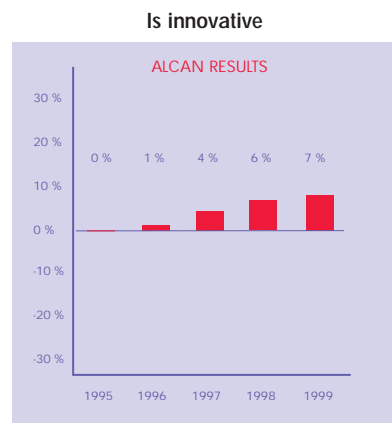
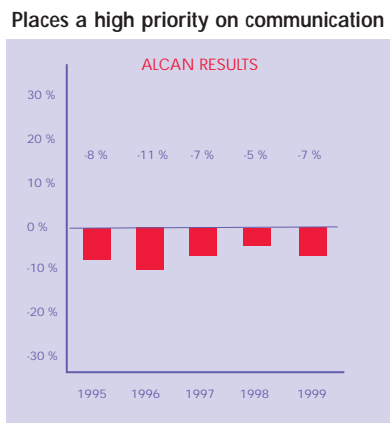
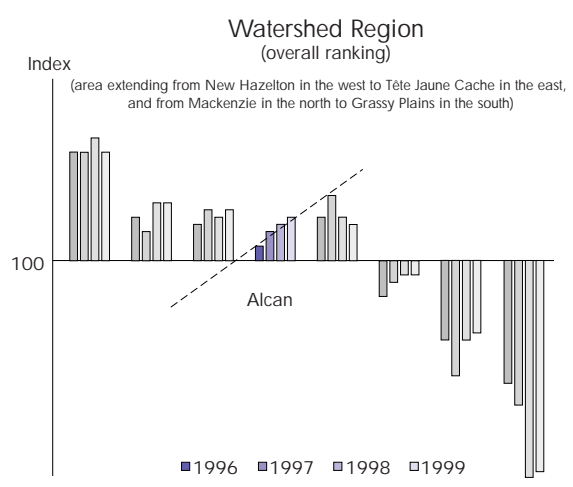
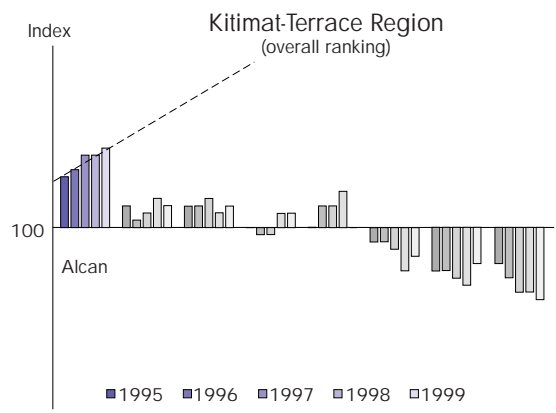
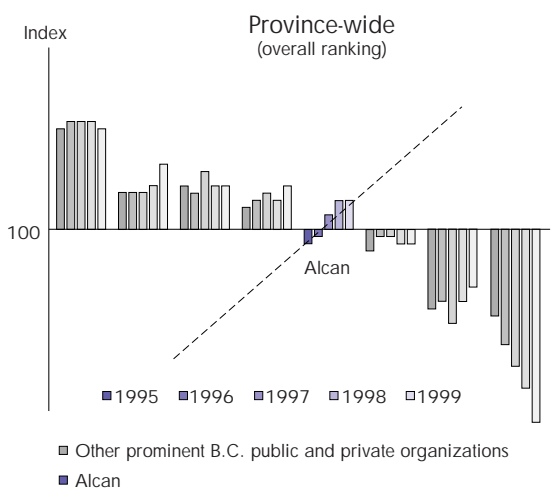
Findings for most attributes indicate that perceptions of Alcan have improved over time. In fact, Alcan is the only organization to have shown consistent, year-to-year improvement on overall ratings since the research was initiated. For confi-

dentiality reasons, the other organizations included in the survey cannot be named.

Overall results over the past five years – for each of the organizations within each of the three different samples – are also presented here. These results are weighted, in that they take into account not only the ratings of each organization on each of the attributes but also the relative importance of each attribute as a driver of public perception.

ATTRIBUTE	1999 AVERAGE IMPORTANCE (ON A SCALE OF 1 – 10, PROVINCE-WIDE BASIS)
Produces a quality product	8.7
Puts the customer first	8.3
Is trustworthy	8.3
Cares about its employees	8.3
Admits when it makes a mistake	8.3
Has a solid reputation	7.9
Supports its local community	7.9
Pays competitive wages and benefits	7.9
Listens to the public	7.8
Is known for its ethical practices	7.7
Demonstrates sensitivity toward environmental issues	7.6
Produces a product which is recyclable	7.5
Has a vision for the future	7.3
Is innovative	7.3
Places a high priority on communication	7.3
Has strong leadership	6.9
Respects issues concerning First Nations	6.1





Glossary

Alloys – Combination of two or more metals, designed to meet particular specifications for product applications.

Alumina – Raw material from which aluminum is extracted.

Anode – One of the two electrodes required to produce an electric current.

Anode Effects – Brought about when the level of alumina in a pot falls below a critical level. A chemical reaction occurs in which aluminum production is reduced and PFCs are produced.

Anode Failures – Brought about when a crack occurs in an anode, causing the pot to overheat and allowing fluoride emissions to bypass the smelter's collection and treatment systems.

CO₂ Equivalency – A measure of the significance of an output of greenhouse gases, based on converting a given emission into a volume of CO₂ with an equivalent environmental impact.

Cathode – One of the two electrodes required to produce an electric current.

Coke – One of the materials from which the anodes used in the electrolytic reduction process are manufactured, and a byproduct of oil refining.

Dissolved Aluminum – Water-borne aluminum which generally results from contact between aluminum dust and rain water.

Dissolved Fluoride – Water-borne fluoride which generally results from leaching from spent pot lining buried during the early operation of the smelter.

Duct Scrapings – Waste material that results from regular cleaning of the collection ducts carrying pot gases for treatment. Duct scrapings contain high levels of fluorides, alumina, and tars.

Dust and Steel Shot – Waste material that results from regular steel shot blast cleaning of the steel studs used to transport electricity to the pots. Contains high levels of tars.

Electrolytic Reduction Process – Process by which aluminum is produced from alumina. Aluminum is precipitated when an electrical current is passed through a molten bath in which alumina has been dissolved.

Gaseous Fluoride – An emission that comes from the molten bath, most of which is collected and recovered, but some of which is lost.

Greenhouse Gases – CO₂ and other emissions which are believed to contribute to global warming.

Ingots – Primary aluminum cast into various shapes and sizes which are shipped from the smelter to other value-added manufacturing facilities, where they are converted into a wide variety of end-use products. The ingots produced at Kitimat Works are in the form of sheet slabs, cylindrical extrusion billet, and 50-pound trilok.

Kemano Completion Project – A second and final phase of the original Kitimat-Kemano project, which would have increased power generation capacity at the Kemano Powerhouse. Work on KCP was half-finished when it was suspended in 1991 due to a court challenge. The project was cancelled by the B.C. government in 1995. Issues arising out of this cancellation were resolved through a 1997 agreement.

Kyoto Protocol – International convention negotiated in Japan in 1997, under which Canada committed to reduce annual greenhouse gas emissions to six per cent below 1990 levels by 2012.

Particulates – Air-borne dusts or solids.

Penstocks – Tunnels through which water descends before entering a hydroelectric generating facility.

Perfluorocarbons (PFCs) – A variety of gases which have a very high CO₂ equivalency and constitute major contributors to greenhouse gas emissions. PFCs are produced at Kitimat Works as a result of anode effects.

Pitch – One of the materials from which anodes used in the electrolytic reduction process are made and a byproduct of metallurgical coke production during the steel manufacturing process. Pitch contains high levels of PAHs.

Polycyclic Aromatic Hydrocarbons (PAH) – One of the most widespread environmental contaminants known today, these compounds have their main sources in fossil or synthetic fuels or from combustion or high-temperature reactions of organic materials. Many PAH compounds exhibit carcinogenic or co-carcinogenic properties. PAHs listed in Kitimat Works permit:

Acenaphthene; Acenaphthylene; Anthracene; Benz(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Benzo(j,k)fluoranthene; Benzo(g,h,i)perylene; Chrysene; Dibenz(a,h)anthracene; Fluoranthene; Fluorene; Indeno(1,2,3-c,d)pyrene; Naphthalene; Phenanthrene; Pyrene; Perylene; Benzo(e)pyrene

Pots – Large steel-encased chambers where the electrolytic reduction process takes place. Also known as cells.

Sandblast Waste – Waste material that results from sandblast cleaning of metal components at the smelter.

Sequestration – A biological or chemical process through which pollutants are stored in a way that prevents environmental harm.

Special Wastes – Wastes defined under B.C.'s Waste Management Act. The Act sets out special collection and handling procedures to prevent or minimize potential harm to human health and the environment.

Spent Pot Lining – Lining, made of refractory bricks and carbon, inside the steel pots that has deteriorated to the point where it must be replaced.

Sulphur Dioxide (SO₂) – A gaseous emission that results from the burning of sulphur present in the coke used during the electrolytic reduction process, and from heat treating or calcination of green coke.

Suspended Solids – A general description for any water-borne solid that fails to settle in the lagoons and is discharged in effluent.

Tuckers Etch – A mixture of chemical reagents, used in the casting area to etch aluminum samples for quality control.

Water Release Facility (WRF) – If constructed at the Kenney Dam, a water release facility would enable the release of flows directly into the Nechako Canyon, reducing the distance water currently travels from the Nechako Reservoir to the Nechako River and potentially allowing the redistribution of summer cooling flows to other times of the year.



Headquartered in Montreal, Canada, Alcan Aluminium Limited is a multinational, market-driven, low-cost producer of aluminum products. With operations and sales offices in more than 30 countries, Alcan is one of the most international aluminum companies in the world. It is a leading producer of primary metal and a global producer and marketer of rolled aluminum products.



ALCAN PRIMARY METAL GROUP

Alcan Corporate Affairs

400 Burrard Street Suite 1910
Vancouver BC V6C 3A6
Tel: 604-257-1400
Fax: 604-257-1421

Alcan Regional Office

PO Box 25, 158 West Stewart St
Vanderhoof BC V0J 3A0
Tel: 250-567-5105
or 250-561-1189
Fax: 250-567-5800

Alcan Community Office

224 City Centre Mall
Kitimat BC V8C 1T6
Tel: 250-632-4712
Fax: 250-632-4927

Alcan Kitimat Works

P O B o x 1 8 0 0
Kitimat BC V8C 2H2
Tel: 250-639-8000
Fax: 250-639-8586