

teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco



teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco

teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco

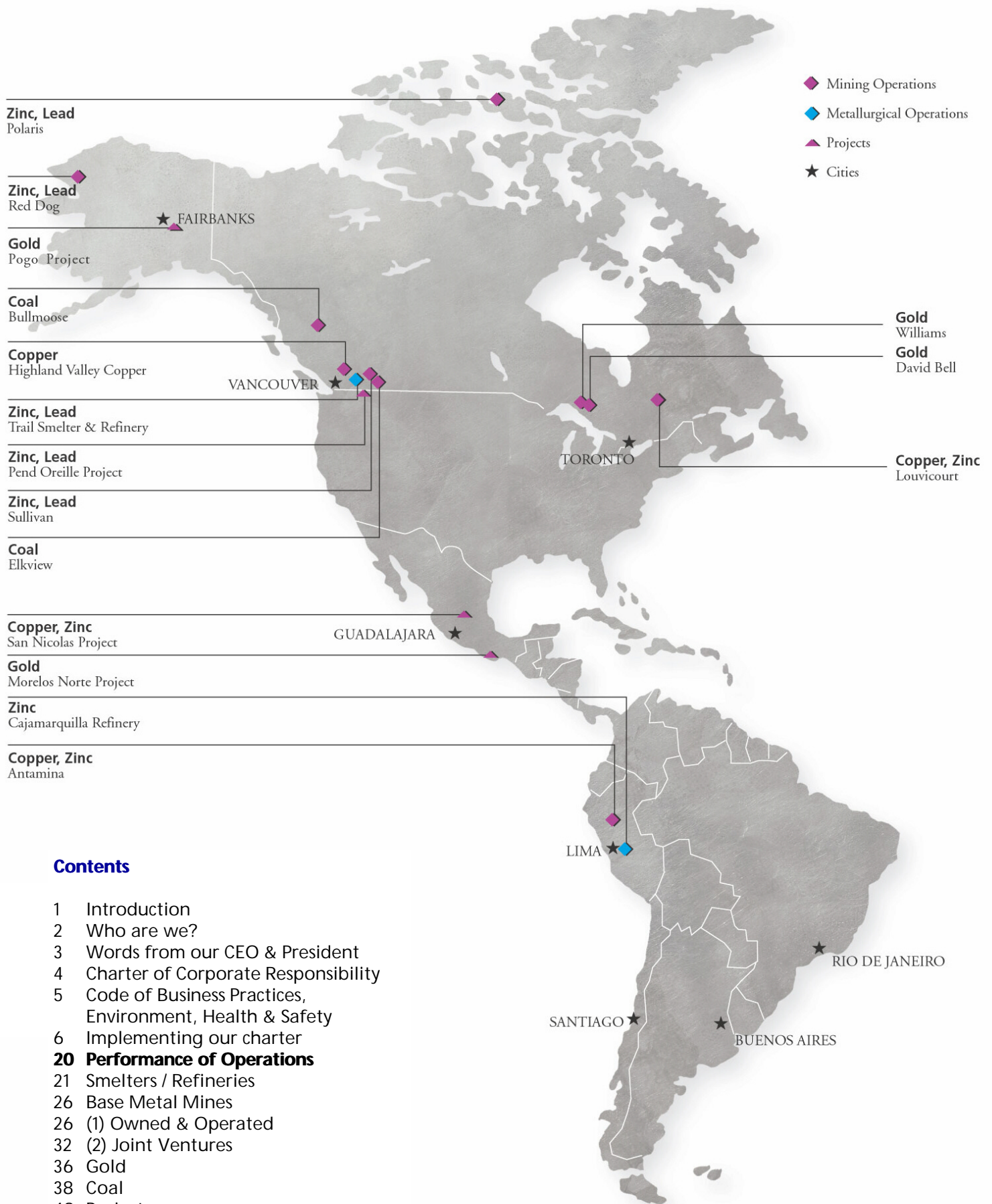
# teckcominco

teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco  
teckcominco teckcominco teckcominco teckcominco teckcominco

2001

*Sustainability*

*Report*



## Contents

- 1 Introduction
- 2 Who are we?
- 3 Words from our CEO & President
- 4 Charter of Corporate Responsibility
- 5 Code of Business Practices, Environment, Health & Safety
- 6 Implementing our charter
- 20 Performance of Operations**
- 21 Smelters / Refineries
- 26 Base Metal Mines
- 26 (1) Owned & Operated
- 32 (2) Joint Ventures
- 36 Gold
- 38 Coal
- 48 Projects
- 53 Data Tables and Conversion Factors

Cover photo - Arctic Fox  
By Mike Kohut

# Introduction

Despite what you hear sometimes, “mining” and “sustainability” are fundamentally compatible. Mining, smelting and refining are the primary steps in the production of metals. And metals are fundamental to sustaining a modern economy. They are necessary components of human development and therefore are needed to sustain life, as we know it. This is not to say that all mining activities, both historical and present day, can be regarded as compatible with the ideals of sustainable development; but mining and primary metals production can, and must, make a positive contribution toward sustainable development worldwide.

At Teck Cominco, we believe that sustainability in the mining and primary metals industries can best be achieved through application of the following three basic principles:

- (1) *Product stewardship* - encouraging the responsible use, re-use and recycling of our products;
- (2) *Environmental performance* - minimizing negative impacts by developing, operating and closing mines responsibly, preventing long-term negative environmental legacies and promoting productive land use on closed mine sites; and,
- (3) *Respect for communities* - being an active partner in the communities in which we work, participating in community affairs in a constructive manner by capacity building and supporting local institutions in order to ensure long-lasting sustainability after we are gone.

Teck Cominco’s Sustainability Report is addressed to our employees, shareholders and the communities where we operate. As a public document available on our website, it is also open to the wider world, including the financial community, our peers, government and non-governmental organizations, and other stakeholders. It presents performance information, discusses case studies and highlights areas in which we need to improve.

Our report is generally based on draft sustainability reporting guidelines developed by the Global Reporting Initiative (GRI). The GRI was established by the Coalition for Environmentally Responsible Economies (CERES), a non-profit, non-governmental organization, which aims to make sustainable development reporting more reliable, consistent and credible.

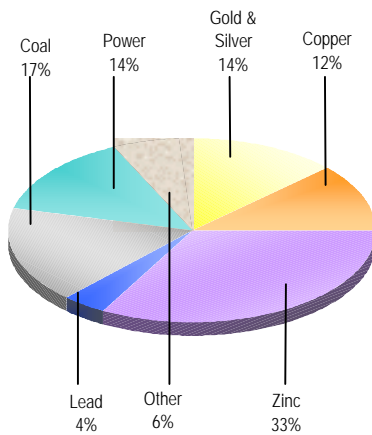
Indicators reported here cover the three principles of sustainable development: economic, environmental and social performance. Although some indicators are applicable to all types of industries, specific mining and metal processing indicators are still being developed through a variety of industry national and international organizations. We will introduce new measurement indicators as they are accepted.

We are requesting your feedback on the content and presentation of this report and on ways to improve it. For further information or questions about this report please contact us.

Teck Cominco Limited  
Environment & Corporate Affairs  
600 – 200 Burrard Street  
Vancouver, BC V6C 3L9  
Canada  
Phone: (604) 687 – 1117  
Fax: (604) 640 – 5387  
Email: [enviro@teckcominco.com](mailto:enviro@teckcominco.com)



## Who are we?



**2001 Revenue Summary**  
By Product

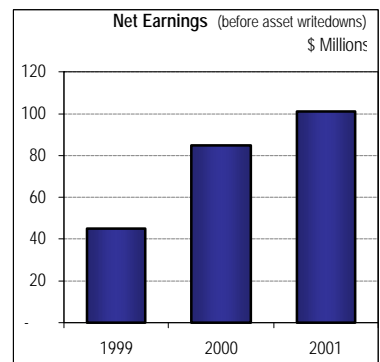
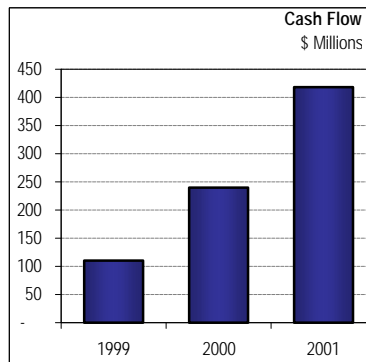
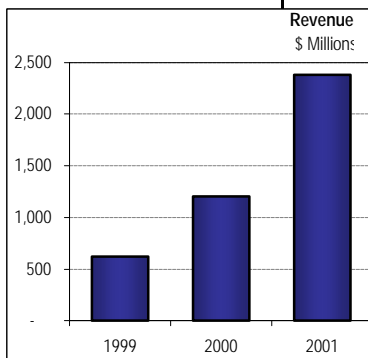
Teck Cominco, headquartered in Vancouver, British Columbia, is an integrated natural resource group whose principal activities are mining, smelting and refining of metals. Teck Cominco Limited was formed in 2001 from the merger of Teck Corporation and Cominco Ltd., the two oldest, continuously operating mining companies in Canada. The company operates or has an interest in ten mines and two refining facilities, which are located in the U.S., Canada and Peru.

Teck Cominco is a world leader in zinc production, operating the Red Dog zinc mine (a partnership with NANA Development Corporation) in Alaska and holding a 22.5% interest in the Antamina copper-zinc mine in Peru - the largest and third largest zinc mines in the world respectively. Teck Cominco operates the Trail zinc/lead refining and smelting complex in Canada and the Cajamarquilla zinc refinery in Peru. In addition, Teck Cominco operates the world's most northerly metal mine, the Polaris zinc mine in the Canadian arctic (which is expected to close in 2002 when the ore body is exhausted), and holds a 25% interest in the Louvicourt copper-zinc mine in Québec.

Balancing this strong position in zinc, the company produces coal, gold, copper and other metals. The Bullmoose (61% owned) and Elkview mines in British Columbia produce metallurgical coal. Teck Cominco's gold mines include the David Bell and Williams mines (50% owned, known together as the Hemlo Operations) in Ontario. Its 64% owned Highland Valley Copper mine incorporates the fourth largest copper concentrator in the world. The Trail refinery is a significant producer of by-product and specialty metals including silver, germanium, indium and low alpha lead.

Presently, Teck Cominco has two advanced development projects in the United States: the Pend Oreille mine in Washington (zinc, lead); and the Pogo project in interior Alaska (gold). Teck Cominco also carries out mineral exploration activities in Canada, the U.S., Latin America and other countries around the world.

Revenues in 2001 were Cdn.\$2.4 billion and net earnings were Cdn.\$101 million (before asset write-downs); the company has 5,870 shareholders and 6,105 employees.



*Note: Cominco's revenue and cash flow were consolidated from Q4 2000.*

## Words of Introduction

### From our Chief Executive Officer and President

Teck Cominco Limited is pleased to present this, its first Sustainability Report, following the amalgamation of the two companies in 2001. Although Teck Cominco is a new company, it has enjoyed a long history through its pre-merger companies, Teck Corporation and Cominco Limited. That history, and the experience and expertise garnered over time, make the company what it is today: a mid-sized, diversified global mining and metals enterprise with world-class zinc, copper and coal assets. Teck Cominco takes pride in its demonstrated ability and willingness to work with the many communities interested in our activities and the products we create.

Today, the concept of sustainable development is a cornerstone of policy making for many governments. There are dozens of interpretations about what sustainable development means. The definition that is most widely quoted is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainable development requires today’s generation to bear in mind the needs of its successors and provide for equity between generations. It calls for the explicit consideration of the economic, social and environmental consequences of activities - the so-called “Triple Bottom Line”.

The key message for the mining and metals industry and our company is that sustainability matters. If we want to have continued success, develop new projects, carry on business, and attract bright young people to our industry, it is imperative that we manage toward our triple bottom line. We must continually work to demonstrate and improve our value to society through our activities and products. As a company we strive to achieve this in several ways: by improving the utility and stewardship of the products we produce; by enhancing the sustainability of the communities where we are active, and through astute financial management to generate the wealth that accrues for future reinvestment, taxes and royalties, wages and the distribution of profits to our shareholders.

This report underscores the commitment to pursuing sustainability that Teck Cominco has made through its recently adopted Charter of Corporate Responsibility. The Charter is intended to guide our decisions and behaviour as a company and as individuals in our capacity as representatives of Teck Cominco. This report is built around the Charter and discusses how the company is fulfilling its requirements in this, the first year of Teck Cominco. While this report represents a start at measuring and comprehensively reporting on performance and progress on the social and environmental aspects of our business, we believe that Teck Cominco is already making significant contributions to sustainable development. Our objective is to manage our affairs to maximize our value to those with an interest in what we do. Our goal is to accomplish this by providing above average returns to our shareholders, exceptional products and service to our customers and a positive contribution to society’s broader social and environmental objective.

**DAVID A. THOMPSON**  
*Deputy Chairman and  
Chief Executive Officer*

**STEVEN G. DEAN**  
*President*

March 26, 2002



*David Thompson  
Deputy Chairman and  
C.E.O.*



*Steven Dean  
President*

## Charter of Corporate Responsibility

### TECK COMINCO WILL:

- 1 Conduct its operations in a sound environmental manner, seeking to continually improve its performance.
- 2 Provide a working environment where all safety and health hazards are identified and eliminated or controlled.
- 3 Encourage the safe use, reuse and recycling of its products.
- 4 Support local communities near its operations.
- 5 Foster open and honest dialogue with all of its communities of interest.
- 6 Apply ethical behaviour in all business relationships.
- 7 Provide a workplace free of discrimination in which all employees can fulfill their potential based on merit and ability.



*J. A. Thompson*

DAVID A. THOMPSON  
*Chief Executive Officer  
and Deputy Chairman*

*Steven G. Dean*

STEVEN G. DEAN  
*President*

February 20, 2002

*The Board of Directors approved Teck Cominco's Charter of Corporate Responsibility on February 8, 2002. It sets out broadly, the tenets of behaviour expected of the company and its employees. It also forms the basis for a Code of Business Practices - Environment, Health and Safety, which serves as further guidance on how those aspects of the Charter are to be implemented throughout the company and its operations.*



## Code of Business Practices Environment, Health and Safety

### TO IMPLEMENT ITS CHARTER OF CORPORATE RESPONSIBILITY, TECK COMINCO:

- 1 Incorporates the principles of pollution prevention and waste minimization into its daily actions;
- 2 Continually improves its environmental, health and safety management systems, ensuring that these systems are fully integrated into each operation's business plan;
- 3 Conducts regular environmental and worker health audits of all operations, and identifies and deals with all shortcomings and problems;
- 4 Monitors environmental and worker health performance at operations and continually reinforces a commitment to excellence;
- 5 Encourages recycling and provides information to customers on the safe use of its products;
- 6 Commits to establishing means for local dialogue and communication at each of its operations;
- 7 Respects the interests and aspirations of local indigenous people where they are impacted by its operations;
- 8 At all times and in all matters, as a minimum, conducts its activities in compliance with applicable regulations. Where regulations or guidance are lacking or incomplete, applies technically proven and economically feasible measures to advance protection of the environment and worker health and safety;
- 9 Supports local community development by seeking locally-sourced goods and services; and, to the extent possible, employing people living near its operations; plans in advance for the environmental and social impacts of the closure of its operations;
- 10 Supports and conducts research to improve environmental performance of its operations and the contribution of its products to the economic, social and environmental needs of people everywhere.



DAVID A. THOMPSON  
*Chief Executive Officer  
and Deputy Chairman*



STEVEN G. DEAN  
*President*

February 20, 2002

*Every employee within the Teck Cominco organization is required to understand the Code of Business Practices and to know what is expected of him or her in order to implement it. Supporting company management and employees in achieving all elements of the code is the responsibility of the Environment and Corporate Affairs Department and site management at each of Teck Cominco's operating sites.*

# Implementing Our Charter

## 1. Teck Cominco will conduct its operations in a sound environmental manner, seeking to continually improve its environmental performance.

### Through...

- Environmental Management Systems
- Environmental Data Management
- Auditing to Support Continual Improvement and Regulatory Compliance
- Voluntary and Regulatory Reporting Programs

### Environmental Management Systems

The commitments of the Code of Business Practices - Environment Health and Safety are implemented through environmental management systems (EMS's) now being enhanced at key Teck Cominco operations. EMS's are formal, documented programs for determining environmental priorities, allocating sufficient resources to manage environmental risks, planning and executing environmental management programs, measuring environmental performance and communicating environmental information, both internally and externally.

The updated EMS will follow the guidance provided by the International Standards Organization (ISO) 14000 series of standards along with a commitment to improve compliance performance by focusing on the requirements of permit conditions and regulatory requirements. The EMS development project will be undertaken at corporate offices in Vancouver and in particular, at key operations, including Trail (British Columbia), Red Dog (Alaska), Elkview (British Columbia), Cajamarquilla (Peru), Pend Oreille (Washington State) and Pogo (Alaska).

### Environmental Data Management



*Taking samples in Red Dog Creek.*

Teck Cominco's various operations collect significant amounts of air, water, terrestrial and biological information, which must be carefully managed. These data are used to evaluate the performance of operations in meeting regulatory permit conditions and assessing impacts to the receiving environment. It is essential that samples are collected properly, preserved and shipped according to standard operating procedures and within specified time frames to certified laboratories. It is also essential that the large amounts of data obtained from the monitoring programs are properly maintained in a secure database, evaluated for trends and regulatory compliance and reported according to the time frames and specifications of the regulatory agencies. These activities are significant tasks and can be very time consuming unless appropriate procedures and software applications are used.

To address these issues, the former Teck Corporation developed a Windows based environmental data management software system known as EQWin. In 1996, Teck partnered with Gemcom, a software development company, to continue development and marketing of EQWin through a joint venture company called GemTeck Environmental Software, Ltd ([www.gemteck.com](http://www.gemteck.com)). There are currently more than 100 installations of the product in a variety of industries and applications ranging from the mining industry to municipal applications.



All of the operations originally operated by the former Teck Corporation have been using EQWin to manage their environmental databases for several years. The original Cominco operations also manage environmental data using either custom built or purchased environmental software. Regardless of the method used, Teck Cominco is confident that our data are being managed in a professional and scientifically sound manner that can be rapidly accessed, viewed, evaluated and reported.

## Auditing to Support Continual Improvement and Regulatory Compliance

Teck Cominco undertakes regular EHS audits of operations in order to evaluate and improve upon our environmental performance, to assure compliance with regulatory requirements and to compare our systems and procedures with industry accepted best management practices including international standards such as ISO 14001. We also undertake risk assessments of our major facilities, conduct specific issue audits (e.g., fugitive dust management) and perform other types of audits including new facility acquisitions and exploration site audits.

The corporate audit program follows accepted auditing procedures such as those promulgated by the Canadian Environmental Auditing

Association. Audit results are reported to the Corporate Environmental Risk Management Committee (CERMC) and to the Board of Directors. Audited facilities prepare and implement follow-up action plans in response to audit reports, addressing each of the audit findings. Progress in implementing the action plans is monitored by CERMC.

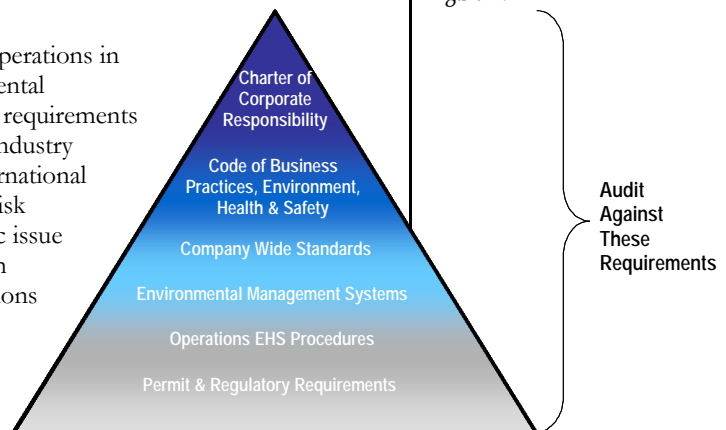
### 2001 Audit Program

During 2001, the following audits were performed at Teck Cominco operations:

- The Red Dog lead-zinc mine in Alaska received a comprehensive two phase audit in which the facilities were reviewed with respect to industry good management practices and all applicable federal and state environmental regulations and permits.
- The Williams gold mine in Ontario received a joint partner audit (with Homestake Canada Inc., now Barrick Gold Corporation) in which a review of environment, health and safety management systems was completed.
- A fugitive dust management audit was undertaken in response to silicosis concerns raised by a number of employees at the Williams mine.
- A third party (Jacques Whitford Environment Limited) health and safety audit was conducted at the Trail smelter and refinery complex, following the exposure of contract workers to thallium.

### 2002 Audit Program

In 2002, audits are planned for the Cajamarquilla zinc refinery in Peru, the Antamina copper-zinc mine in Peru, the Elkview coal mine in British Columbia, the Hemlo gold operations in Ontario and the Pogo advanced exploration project in Alaska. Field



verification and follow-up on action plans will be undertaken for the Trail, Williams and Red Dog operations.

## Voluntary and Regulatory Reporting Programs

In addition to the reporting required under operating permits and licenses, Teck Cominco and its operations are engaged in various regulatory and voluntary programs for the reporting of contaminant releases to air, water and land.

In Canada, Cominco Ltd. (now Teck Cominco Metals Ltd.) was an active participant in the voluntary initiative known as ARET (Accelerated Reduction and Elimination of Toxics) until it was concluded at the end of 2000 ([www2.ec.gc.ca/aret/index.html](http://www2.ec.gc.ca/aret/index.html)). This program challenged participating companies to reduce discharges of specified substances from a base year by at least 50%. Based on results summarized in Table 1,

Table 1:

ARET: Reductions of releases at Cominco's Canadian Operations						
	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc
% Reduction from base year to 2000*	91%	96%	49%	97%	96%	71%
% Target Reduction by 2000	72%	88%	53%	77%	84%	84%

\* Base year is 1988 for all metals except copper, which is 1993.

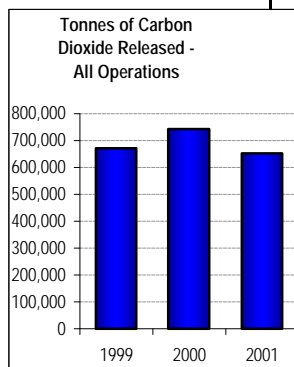
Cominco exceeded the challenge target for all but one substance (copper) and surpassed its own higher goals with four of the six substances. Overall releases were reduced by 81% since 1988.

All of Teck Cominco's Canadian operations participate in the National Pollutant Release Inventory (NPRI). Data on releases can be found at ([www.ec.gc.ca/pdb/npri/index.html](http://www.ec.gc.ca/pdb/npri/index.html)). This program is authorized under the Canadian Environmental Protection Act and is administered by Environment Canada. Data reported under the NPRI and ARET programs may not be consistent due to differences in reporting criteria for various substances.

In the United States, the Red Dog Mine commenced reporting releases under the Toxic Release Inventory (TRI) program mandated by the Emergency Planning and Community Right to Know Act in 1998. This program is different from the Canadian NPRI in that metals associated with tailings and waste rock are reported as "releases". It is Teck Cominco's view that such reporting creates a distorted perception of environmental management conditions at mine sites. For example, Red Dog's reported releases of zinc and lead during 2000 were in excess of 400 million pounds but more than 99.98% of the total were in the form of waste rock and tailings that are securely managed at the site. Only 336 pounds were actually released off-site to the aquatic environment.

On climate change, Teck Cominco is committed to doing its part consistent with reasonable national policies that, in particular, foster a progressive move to increase carbon energy efficiency in industry and all applications in society. At the same time, we are very concerned about the potential economic ramifications from certain policy measures that could be implemented to achieve national greenhouse gas emission reduction targets. We believe that voluntary action by industry can make substantial contributions to national goals and towards this objective both Teck and Cominco have been participants in the Canadian Voluntary Challenge and Registry (VCR) program ([www.vcr-mvr.com](http://www.vcr-mvr.com)). This encourages companies to make continual improvements in reducing the carbon energy intensity in products and in reducing greenhouse emissions. For 2001, Teck Cominco will submit its first consolidated report to the VCR.

Figure 2:



The graph shown includes data for all operations with the exception of Antamina and Highland Valley Copper, which are independent operating companies.

## 2. Provide a working environment where all safety and health hazards are identified, eliminated or controlled.

Teck Cominco Health & Safety Statistics			
	1999	2000	2001
Lost Time Accidents	193	186	105
Fatalities	0	1	2
Frequency*	2.8	2.4	1.7
Severity**	63.7	137.3	240.5

\* Frequency = Lost Time Accidents per 200,000 Hours Worked

\*\* Severity = Days Lost per 200,000 Hours Worked

(Contractors not included)

Table 2:

### New Directions

In November of 2001, the Corporate Health and Safety Committee, comprising senior management and chaired by the President began the task of improving Health and Safety performance throughout the corporation.

The Committee has adopted a new Health and Safety Policy, with the stated objective of Zero Incidents. It has also developed Health and Safety Standards and Guidelines to be implemented throughout the organization. These documents will serve as a guide for management to assess current Health and Safety Programs, creating a consistent set of objectives and standards that cover all operating locations.

The Committee will oversee regular Health and Safety audits of our operations with the purpose of measuring the effectiveness of corporate and site standards and guidelines, and identify areas for improvement. Operations will develop and implement an audit action plan and timetable for achieving those improvements.

Teck Cominco operates in many jurisdictions, both in Canada and abroad. In the past, the focus has been on compliance with Health and Safety regulations relevant to each business location. Although the safety performance has been good, the focus has now shifted to finding ways to reduce safety incidents to zero.

The past year proved to be a difficult year for the Company, its employees and contractors and their families due to three unfortunate incidents. In August, a helicopter crash at an exploration project in northern Canada resulted in the death of three people, two of which were Teck Cominco employees.

At Trail, sixty-five contract workers were exposed to thallium during routine maintenance of a boiler in the Kivcet smelter complex. All but two of the affected workers were symptom-free at the time of this report publication. The Company took responsibility for the incident and put in place procedures to avoid any repeat occurrence.

Teck Cominco's goal is to avoid any similar occurrences in the future through a strong emphasis on health and safety at all of its operations.



## **HEALTH & SAFETY POLICY**

EVERYONE HAS THE RIGHT TO A SAFE AND HEALTHY WORKPLACE

OUR OBJECTIVE THEREFORE, IS TO ATTAIN **ZERO INCIDENTS**.

To achieve this objective, this statement of policy and the associated standards must influence all our daily activities and decisions, including those to do with the selection of resources and information, the design and operation of working systems, and the design and delivery of products and services.

The challenge of implementation into effective practice must be supported by communications and the promotion of competence enabling all employees to make a responsible and informed contribution to the zero incidents objective. Everyone at every work site must be fully committed in this effort to attain the desired health and safety performance.

Teck Cominco therefore commits to:

1. Implement the Company-wide health and safety policy standards;
2. Provide the necessary resources to satisfy the requirements of the standards;
3. Measure performance against these standards; and
4. Clearly identify accountability for health and safety.

Everyone in our workplaces must commit to actively participate in the health and safety program by:

1. Taking a moment at the start of each day to think about their safety and the safety of their co-workers;
2. Working in compliance with established work procedures;
3. Recognizing hazards and striving to minimize the risks associated with these hazards;
4. Asking for guidance or information if there is any uncertainty;
5. Assisting in the search for better ways of doing things; and
6. Demonstrating leadership by setting a good example.

Visible and active leadership by all is required to maintain the focus of the health and safety policy performance.

**ZERO INCIDENTS IS OUR OBJECTIVE**

### 3. Encourage the safe use, reuse and recycling of its products.

Teck Cominco is encouraging the safe use, reuse and recycling of its products through its product stewardship activities. To achieve this, a Product Stewardship System (PS<sup>2</sup>) was established to advise customers and others on the safe use of our products and to encourage product life cycle management. PS<sup>2</sup> is set up to ensure that information requirements and potential risk issues regarding the safe use and handling of Teck Cominco's products are managed in a manner that conforms with legal and regulatory requirements, company policies and sound management practices. One of the ways in which this is accomplished is through the required use of Material Safety Data Sheets (MSDS). Every product that is made must have an accompanying MSDS that provides information on the safe use and handling of the product, as well as company contact information.

The Product Stewardship Committee, a cross-functional team of corporate officers and senior managers reporting to the Chief Executive Officer, oversees the management of product information and provides guidance and direction on new product development (Figure 3). The committee's objective is to further Teck Cominco's goal of providing products that offer high value-added utility to our customers and society while minimizing environmental, health, safety and product-related risks.

Before a product is marketed, the Product Business Development (PBD) Team creates a business case proposal. As the proposal is developed, it passes through the PS<sup>2</sup>, is reviewed by the Product Stewardship Committee and is finally approved by the Chief Executive Officer. Once this is achieved, the product is added to the Teck Cominco Master Product Lists and can be sold for authorized uses in approved jurisdictions. The internal approval process is rigorous, requiring consideration of the business case, environmental concerns, health and safety regulatory requirements, and product lifecycle management issues including reuse and recycling opportunities and environmental fate. Despite this rigor, the company is capable of moving expeditiously to review prospective products in order to take advantage of new opportunities as they arise. Currently, there are 46 products on the Master Products List, with seven added in 2001.

Teck Cominco's commitment to product stewardship extends to building relationships with customers and others to foster re-use and recycling of our products. Building on its experience in lead acid battery recycling, the company is pursuing opportunities to expand its recycling activities and increase recycled content in its products.

### 4. Support local communities near its operations.

Mining companies can play a crucial role in supporting sustainability in the communities where they operate. Since mining often occurs in remote areas, the advent of a mine project can create opportunities for establishing infrastructure, amenities, and developing local businesses. If not handled and controlled carefully, however, a mining project can be very disruptive to the life of adjacent communities. Teck Cominco has gained significant experience working with communities to support development and

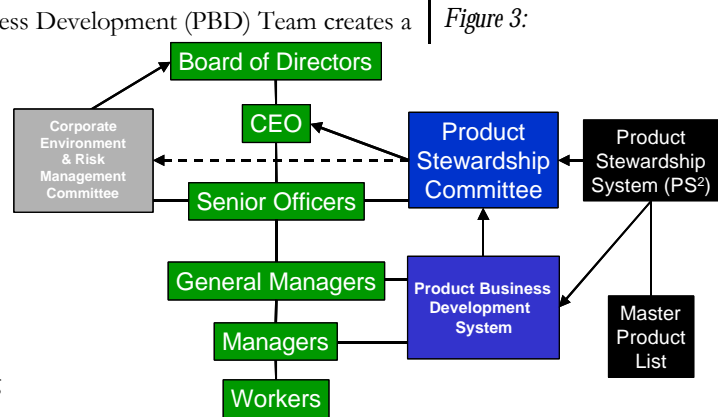


Figure 3:

local capabilities while avoiding the excesses of boom and bust.

The Antamina, Red Dog, and Sullivan Mines are just three examples of what is being done to collaborate with local communities in promoting sustainability, in a variety of cultural and social settings and at different stages of mine life. In November, Teck Cominco, together with the City of Kimberley and the World Bank co-chaired the Sullivan Round Table, a conference that examined the role that mining can play in contributing to sustainable development. The Round Table brought together experts representing many interested communities from several countries. Comprehensive proceedings of the conference will be available shortly and planning is underway for a follow-up conference, likely to be held at World Bank headquarters later this year or early in 2003.



In the summer of 2001, Teck Cominco, in conjunction with the Sullivan Round Table and with support from Natural Resources Canada, commissioned research on the development of Sustainability Indicators, which could be used to plan and measure how mine operations may best contribute to community sustainability. Various key sustainability indices were reviewed to identify and define meaningful performance indicators built around economic, environmental and social performance, particularly at the community level. Development of these indicators is a dynamic process. Beginning with a detailed analysis of the Sullivan Mine, which ceased production after over ninety years of operation, the company is learning from its history how best to enhance community sustainability. This research will consider activities throughout the mine life cycle, from exploration through to construction, operation, closure and post-closure activities. Adopting key sustainability indicators will expand the company's ability to plan, implement, measure and report on activities intended to contribute to community sustainability.

At Teck Cominco's metallurgical facilities - Trail Operations and Cajamarquilla - the company works with local communities with a view to a long term operating horizon. In Trail, Teck Cominco's smelting and refining operations have been the major employer in the community for over one hundred years.

Trail Operations' history dates back to 1906. The company's relationship with the communities in which its employees, and a significant number of its retirees, live was established at that time. These communities are Trail, Warfield, Rossland, Castlegar, Fruitvale, Montrose and Beaver Valley – all in the West Kootenay region of southeastern British Columbia. Company initiatives to support local communities include participation in tourism and beautification projects, operation of an interpretive centre, and donations and sponsorship of numerous community programs.



*Cominco Gardens in Kimberley, B.C.  
near the Sullivan Mine.*

*The Dressing Plant, part of Trail's lead  
production circuit in the days prior to  
KIVCET, was demolished in July 1999.*

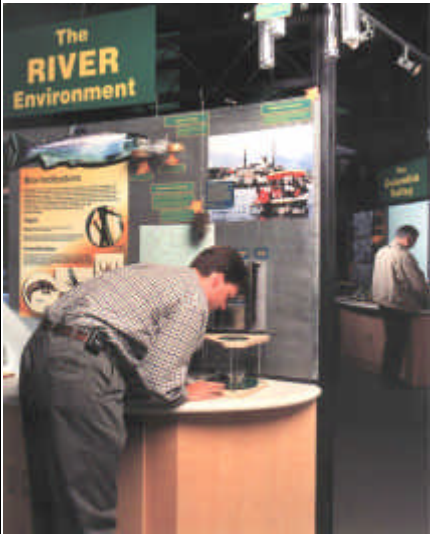


## Trail Operations and its Local Communities

Highlights of some recent initiatives to support these local communities:

### Donations and Sponsorships

Trail Operations' donations totaled over \$258,000 in 2001. In recognition of the City of Trail's Centennial, Trail Operations became the Cornerstone Sponsor of the Trail Regional Hospital Foundation's Ambulatory Care Expansion Project by pledging \$200,000 over a two-year period. Over the past century, Cominco has played a significant role in the development of health facilities in Trail, providing the necessary financial support for the construction of hospitals as well as improvements in medical services and technological advancements.



### The Interpretive Centre

The Trail Operations Interpretive Centre, located in downtown Trail, offers an entertaining and interactive opportunity to learn about the company's environmental initiatives, product uses and production processes.

Trail Operations has invested \$500,000 in the Interpretive Centre since it first opened its doors in the winter of 1998. Visitors also have the opportunity to join the guides at the Centre for a tour of the Electrolytic and Melting plant. A total of 2,837 visitors experienced the Centre in 2001. The Centre is managed by the Trail and District Chamber of Commerce, which is located next door. This is a partnership that is beneficial to both parties.

### The Teck Cominco Wing of the Rossland Museum

The story of Cominco's history, from its early days to the merger with Teck Corporation in the summer of 2001, is showcased in the Historical Mining Museum in Rossland, BC. The Cominco wing received a \$57,000 facelift last summer, bringing a fresh look to the company's colourful history through storyboards and displays.

The museum is located at the site of the original Rossland mines. There are many interesting exhibits about the mines and Rossland's glory days – visitors can also take an underground tour and pan for gold.

### Tourism

Trail Operations is a player in the region's tourism through the Interpretive Centre, the public tours of the Electrolytic and Melting plant, and its wing at the Rossland Museum. In 2001, Trail Operations spent \$8,000 publicizing these tourist attractions in a number of vacation and park guides that are distributed throughout the Pacific Northwest, Alberta and Alaska.

### Image Committee

Teck Cominco is playing an active role in the City of Trail Image Committee, which was formed in early 2002 by Mayor Dieter Bogs. The committee is charged with developing a program to alter the perceptions media and the BC public have of Trail as a result of its long industrial history. The committee's work is beginning with an audit of principal BC media and a public opinion survey to identify the issues the committee should address in its program. The audit and survey are being funded by Trail Operations.

## Beautification

Over \$22 million dollars has been spent at Trail Operations during the past three years on demolition, painting and greening projects. The beautification plan brings two important benefits: an improved physical environment for employees and the community and lower insurance costs.

## Business Visitors to Trail Operations

Trail Operations hosted over 300 business visitors in 2001, many of whom stayed at least one night in town. These guests included representatives from competing companies, financial groups, potential customers and business associates, Canadian and provincial government ministry officials, foreign government representatives and organizations, and university students.





## 5. Foster open and honest dialogue with all of its communities of interest.

Teck Cominco is committed to open, transparent and honest communications with all of its communities of interest. This commitment is carried forward throughout the mining and metals lifecycles. It begins at the exploration stage by identifying interested parties and introducing the company through its onsite personnel. Following this introduction, Teck Cominco personnel communicate information and consult with community representatives to provide an overview of project activities and to respond to questions. Typical questions may range from inquiries on employment and business opportunities to expressions of concern related to potential environmental impacts and interruption of traditional lifestyles.



*Public meeting in Noria de Angeles concerning possible mine development at San Nicolas.*

Teck Cominco strives to share information early and works to identify and resolve concerns expeditiously. The company's objective is to work with communities to build cooperation, trust and mutual respect that will earn community support for the company's activities. At the same time, this approach increases the company's ability to address issues before they become material concerns. For example, Teck Cominco has been engaging the communities where it actively operates through several fora.

### Sullivan Mine

At the Sullivan Mine, the preparations for closure and progressive reclamation activities have been under regulatory and community review and input since 1991, when the initial version of the mine's closure program was issued. The primary forum for this process has been the Sullivan Public Liaison Committee (SPLC), a joint community/regulatory agency group mandated under the British Columbia (BC) Mines Act. The final version of the mine's closure plan as approved by the committee was issued in late 2001 and contains significant input from groups such as the East Kootenay Environmental Society. The SPLC has received widespread recognition from regulatory agencies and Environmental Non-Governmental Organizations as a model for community engagement in the environmental management of all phases of mining operations.



*SPLC Meeting in progress*

### Elkview Mine

At the Elkview mine, the local community of Sparwood is considering a proposal put forward by the company to establish a public liaison committee that would have similarities to the SPLC. Further, an Elkview community outreach office was established at the Greenwood mall in Sparwood and is staffed one afternoon each week by senior management and environmental staff from the site. This office provides an open and transparent forum for discussions in regard to the mine operations and environmental issues.

### Mine Development Review Committees

For the coal mines in BC, the regional Mine Development Review Committee (MDRC) process in the Northeast and Southeast portions of the province provide an excellent forum to address coal mine expansions, closure plans and general mining updates to First Nations and government agencies. This Committee comprises the chair (Regional Manager, Ministry of Energy and Mines), regional representatives of the provincial Ministry of Environment, Crown Lands, Forestry, Transportation and Agriculture Branches, staff from Environment Canada and the Department of Fisheries and Oceans

and local representatives of First Nations and other aboriginal groups. The Northeast MDRC reviewed the Quintette closure plan and comments were provided to the site prior to its acceptance. The Kootenay MDRC in southeastern BC has been very active in reviewing and providing comments on new Elkview applications for waste rock dumps and pit expansions and have facilitated the dissemination of information to all parties. Recently the Sparwood Town Council joined this review committee.

### **Pend Oreille Project**

In Washington State, the company is preparing to re-open the Pend Oreille zinc mine. Teck Cominco approached the project with the objective of making the local community a partner with the implicit understanding that they would have sway over certain aspects of the mine's interactions. The mayor was asked to form a committee of local stakeholders who would be interested in working with the company to plan for the eventual closure of the then proposed Pend Oreille mine and its impact on the local quality of life. This committee, while originally formed to address a narrow issue of post-closure economic sustainability, grew its mission to consider development, operations and closure issues. The Selkirk Community Teck Cominco Planners (SCTCP) group was designed to represent all members of the local community so people not directly profiting from the mine development have a forum.

The SCTCP has begun to address issues of health care, environment, economic development in tandem with the mine, economic sustainability throughout the mine life cycle, training/education, infrastructure development, and reuse of the mine property following closure.

### **Trail Metallurgical Operations**

In Trail, the Trail Health and Environment Committee has created a means for public involvement in the oversight of measures to protect community health and the environment. Its mandate arose from recommendations put forward by the Trail Community Lead Task Force, a group with representatives from the City of Trail, the BC Ministries of Health and Environment, Teck Cominco, and the community. The Task Force was an example of industry/community/government cooperation that achieved international recognition as it worked to address concerns about lead and other metals in the Trail environment.

Due to a combination of the Task Force's programs, the start-up of the new lead smelter and other environmental improvements at Teck Cominco, the Task Force's short-term goals for children's blood lead levels were reached. Nonetheless, the Task Force wrapped up its term by setting new goals for the community and recommending that Teck Cominco, the City and Kootenay Boundary Health continue to monitor and improve local environmental conditions.

*Antamina community meeting in Ayash.*



The Trail Health and Environment Committee was formed in July 2001 and meets about four times per year. The mayor of Trail chairs the committee and some of the committee members also served on the Lead Task Force. Teck Cominco is a keen participant on the new committee and is committed to doing its part to ensure that the Lead Task Force's recommended goals will be met.

### **Antamina Mine**

At the Antamina project in Peru, the Environment and Community Affairs departments of Compañía Minera Antamina S.A. (CMA) have implemented

a policy of transparency in working closely with communities, regulators and non-governmental organizations to address community concerns over project development and environmental impacts. At the mine site, where nearby communities are concerned about the project's potential effects on river water quality and availability, CMA has led several joint water quality monitoring exercises, where community representatives and regulators have had the opportunity to participate in water sampling and to learn about sampling protocols and laboratory analyses. In addition, Antamina's annual aquatic life monitoring program involves representatives of local communities, who are invited to observe and participate in the monitoring activities. At the port of Huarney, where local residents were concerned about the operation of the concentrate slurry pipeline and port facilities, CMA participated in a multi-sector technical commission that investigated community concerns and provided a forum for stakeholders to learn about the operation. In addition, CMA participates in environmental committees in the communities of San Marcos and Ayash (both near the mine site) and in Huarney. Data on environmental effects, compliance and project activities are reported regularly to these committees. CMA also provides technical assistance and funding for other committee projects, such as reforestation efforts in the Andean highlands around the mine.

### **Red Dog Mine**

Over the last sixty years, Teck Cominco has gained extensive experience working with indigenous people, particularly in northern Canada and Alaska. With that experience, we have gained knowledge of and respect for the interests and aspirations of indigenous people who live in the vicinity of our operations. In Alaska, Teck Cominco has partnered with NANA Development Corporation to develop the Red Dog Mine on their lands. The partnership agreement creates a joint Management Advisory Committee, sets out provisions for addressing issues related to the operation of the mine, including environmental and wildlife management issues, and provides NANA shareholders with extensive employment and training opportunities. After 12 years of operation, the workforce is now made up of about 60 percent NANA shareholders.



## **6. Apply ethical behaviour in all business relationships.**

Teck Cominco undertakes all its business dealings according to the highest possible standards of ethical behaviour. It applies and strictly adheres to Canadian GAAP rules for accounting and discloses all of its accounting practices in its annual report.

Teck Cominco purchases goods and services in manners that ensure that all purchases provide the best value for shareholders. In the vast majority of cases this involves open, competitive tendering with the purchase choice made on the basis of a clear set of criteria developed in advance.

Teck Cominco recruits and promotes people on the basis of merit ensuring that the best-qualified individuals available are employed across the company.

Teck Cominco employs risk management procedures, including a cost-effective program of purchasing insurance to manage risks in cases where that is appropriate.

An internal audit group maintains the continuous vigilance on financial and other dealings of company personnel and reports independently to the Audit Committee of the Board of Directors. As well as examining financial issues, the internal audit group

examines policies and practices employed by the company to ensure that these are consistent with proper business ethics.

The company reports publicly through its annual report and other official documents. In this regard the company applies a disclosure policy to ensure complete and fair non-discriminatory and timely disclosure of all material information. The company deals openly with governments, regulators and other officials and ensures, to the best of its ability, that local communities are informed of issues that could affect them.

For example, the company has undertaken shutdowns of the metal production facilities at Trail Operations in order to sell power. The company's employees had their income protected during this period through access to vacation and the opportunity for employment in maintenance work around the facility. Care was taken to ensure that no employees were adversely impacted during this shutdown. A similar approach has been taken for the proposed shutdowns in 2002 at the Cajamarquilla facility and again at Trail.

Teck Cominco uses internal and external experts to assess the political and other risks of operating in various countries around the world. The apparent existence of corruption in a country is one of the basic criteria used to eliminate countries from the lists of those in which new exploration expenditure would be made.

Teck Cominco counsels all employees to avoid any payments to government officials or anyone else for the purposes of securing contracts, rights to operate or other business activities. In one recent case where facilitation payments were sought, Teck Cominco abandoned the project in question and exited from the jurisdiction involved.

## **7. Provide a workplace free of all forms of discrimination in which all employees can fulfill their potential based on merit and ability.**

Teck Cominco strives to provide a working environment free of discrimination and offering opportunities for further education, training and professional advancement based on merit and ability.

### **Discrimination/Harassment Policies**

Teck Cominco has developed an in-depth policy dealing with discrimination and harassment. This policy outlines the company's philosophy on the issue as well as measures to be taken when a complaint is brought forward. In addition, some operations have adopted policies that have been developed jointly with the unions. For example, at Elkview a joint policy with the United Steel Workers of America was developed in 1996. There have been no reported cases of discrimination or harassment in the last four years.

### **Training and Education Programs**

Some operations have competency development programs in place. These are programs that are designed to highlight the core competencies that are required for an employee to perform their duties and goals for training and education to build on those competencies.

Each operation has its own training programs in place, which target the specific training

needs of the operation staff. For example, Elkview has initiated the *Achieve* program, which includes 18 units of managerial / interpersonal training offered to all frontline supervisors and lead-hands. Elkview staff also receive training from outside agencies for specific skills. At Highland Valley Copper, training is offered to staff in problem solving, troubleshooting, decision analysis and conflict resolution.

Teck Cominco funds professional registrations (i.e. P. Eng.) and encourages participation in courses and conferences that relate to an employee's career path.

In addition to skills training for employees, Teck Cominco collaborates with communities where it operates to foster competency development through local training initiatives.

## Workplace Diversity Initiatives

Senior management at Red Dog have completed a cross-cultural training program presented by NANA. This program is being made available to all supervising staff in order to help people of western origins understand the Inupiat culture. The training will also help to avoid the misunderstanding that can sometimes arise in the workplace due to cultural differences.

The Red Dog mine has a number of practices in place to encourage and support diversity in the workplace. School-to-work programs encourage and maximize regional Native Alaskan hire rates and create avenues for local school children to assess career opportunities. These programs include career awareness trips for junior high/ high school students at the mine; job shadow experiences to view mining-related professional and technical careers, and a summer camp to visit the mine-mill-port operations.



Red Dog also supports local technical centers through pre-apprentice programs geared toward mine jobs and is presently supporting 10-15 Alaska Native students in mine-related college degree programs.

## Labour Relations

Union representation is present at most of Teck Cominco's operations. The company has had few work stoppages over the course of the last ten years. The most recent work stoppage occurred at Cajamarquilla in 2001. This lasted 22 days and involved a total of 374 employees.

Trail Operations has had the most number of (union) grievances over the last year with 55 that went to third stage, which is the final formal opportunity to resolve an issue before going to the next step of third-party arbitration if no solution is found. Elkview recorded 28 grievances that went to third stage in 2001 with five that are set for arbitration in 2002. Bullmoose recorded 13 grievances that went to this stage with four going to arbitration in 2001.

As mines approach closure, Teck Cominco works with union representatives to provide a smooth transition for employees. At the Sullivan mine, for example, a union contract was negotiated to cover the last seven years of the mine life. At the same time a Transition Committee was established with the union to assist workers in gaining skills certification and help with job searches. This initiative was undertaken in conjunction with MITAC (the Mining Industry Training and Adjustment Committee), a partnership that includes the Government of Canada, unions and several mining companies.

## **Performance of Operations**

---

# Performance of Operations Smelters / Refineries

## Trail Metallurgical Operations

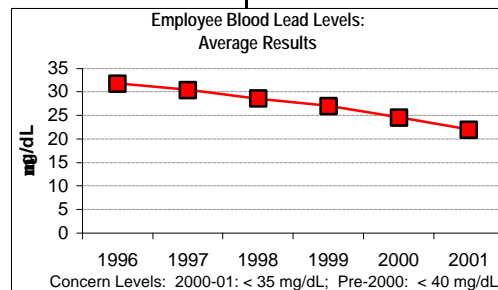
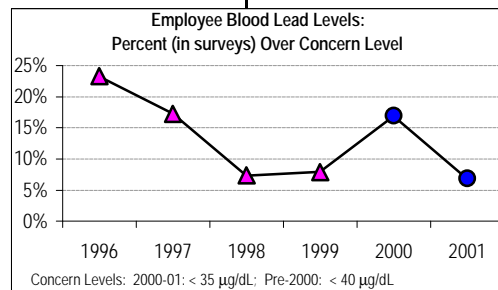
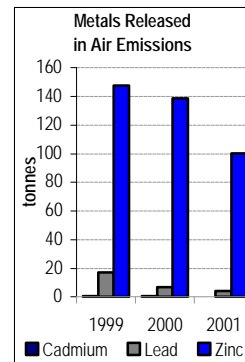
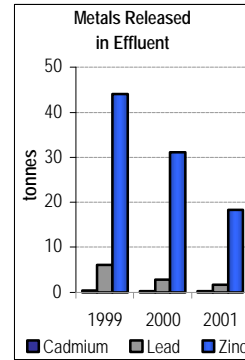
*The metallurgical operations at Trail, British Columbia, constitute one of the world's largest fully-integrated zinc and lead smelting and refining complexes. In addition, eighteen other metal and chemical products are produced there.*

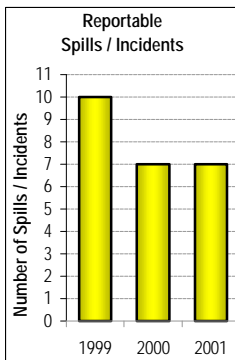
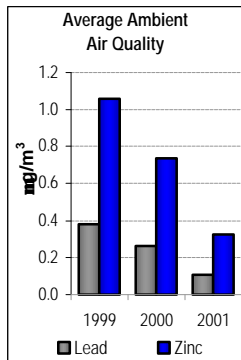
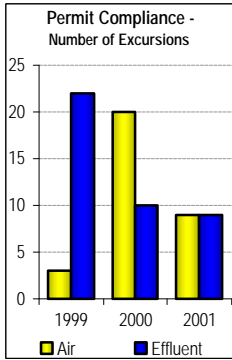
Production of zinc, lead and associated metals and chemical products was curtailed in the first eight months of 2001, including a three-month shutdown and this is reflected in certain of the environmental performance indicators in the accompanying graphs. It was during the shutdown that 65 contract workers became exposed to high levels of thallium while undertaking maintenance work on a boiler associated with the Kivcet lead smelter. This exposure resulted in significantly elevated thallium levels in a number of workers and the development of flu-like symptoms in some. The company took responsibility for the failure to identify the unexpected exposure. Subsequently, the work was resumed and safely completed with appropriate protection measures and management controls.

At the time of the issuance of this report, symptoms of thallium exposure had disappeared in all but two of the exposed workers and none are expected to suffer long-term effects. Action was taken by the Company to prevent a re-occurrence of this kind of incident and included a comprehensive audit of health hazard management systems at Trail that involved participation by union representatives. The final report for this audit has been distributed to the unions involved, the Workers Compensation Board of BC and others.

Notwithstanding the thallium incident, the fine results of occupational health protection practices at Trail continue to be reflected in key indicators such as employee blood lead levels (see accompanying charts). The operation voluntarily reduced the "level of concern" for employee blood-lead at the start of 2001. This is the concentration at which action is taken to reduce risk to the employee. The management practices for lead risks to employees are believed to be among the most rigorous in the industry. In a report concerning the health hazard audit, an international expert on industrial hygiene practices stated: "What is significant about this program is that Teck Cominco has imposed on itself a biological monitoring program that not only exceeds the requirements under British Columbia law but also that required throughout most of the international community, including the US".

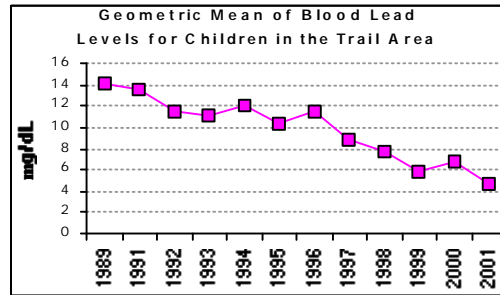
In addition, there were noteworthy developments related to Trail Operations on the community health front during the year. Following the completion of its successful ten-year mandate in 2000, the Trail Community Lead Task Force released its final report and recommendations (<http://mypage.direct.ca/t/tlp/>). This group, an internationally recognized model of community, government, union and industry cooperation, recommended a continuance of blood lead and environmental monitoring, case management, community greening and other programs. It was also recommended that Trail Operations continue its ongoing work at reducing the emissions of lead and other metals. Blood lead levels in children continued to fall in Trail as





illustrated in the following graph and were at a mean of 4.7 µg/dL in the fall of 2001.

The long-term goal set by the Task Force is to have no more than 10% of children over the 10 µg/dL level and in 2001 the proportion was already down to 18%, the lowest level since the monitoring program began. Both the summer shutdown of operations and overall improvements in emissions are believed to be factors in the 2001 results.



Finally, while the focus at Trail Operations is on current and future environmental performance and health protection, significant attention is also being given to the effects of historical emissions and materials management practices, particularly with respect to metals in soils in areas around Trail. Started in 2000, an ecological risk assessment (ERA) is underway involving a number of specialist consultants that is one of the most complex and comprehensive ever undertaken in Canada. This year preliminary fieldwork was carried out on the ERA, which is scheduled to be completed by 2004. It will then be linked under BC legislation with health risk studies completed by the Trail Community Lead Task Force.

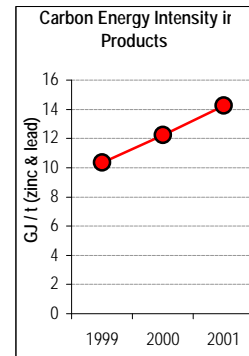
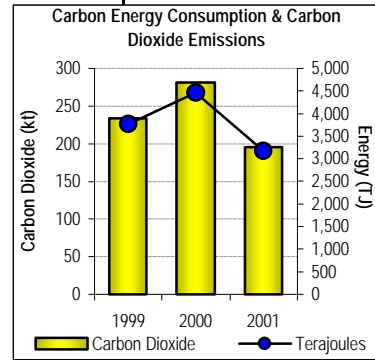
### Discussion of Performance Indicators

- Reportable Spills/Incidents**  
 Seven were reported to government in 2001 the same as the previous year but down from the ten reported in 1999. The majority of these are due to process incidents which had short-term impact on effluent quality.
- Permit Limit Exceedances**  
 There were a total of 18 air and effluent quality exceedances in 2001 in comparison to 30 in 2000. It should be noted that a new more restrictive one hour ambient SO<sub>2</sub> limit came into effect in 2000 which was then a challenge to meet but results under this limit improved considerably in 2001. The limit exceedances that the operation has incurred represent 80,000 compliance determinations in a year.
- Metals Loading in Effluent**  
 Very significant progress continues to be made in reducing metals discharges to the Columbia River through improved controls in the production plants. However, it should be noted that annual totals for 2001 were influenced by the three-month shutdown of operations.
- Air Emissions and Ambient Air Quality**  
 The data in both graphs reflects a sustained period of improvement in both indicators over the past three years due primarily to improved emission controls, but the shutdown was an additional factor in 2001. Those related to lead are of particular importance. Ambient lead concentrations within the City of Trail are now a small fraction of the U.S. EPA standard of 1.5 µg/m<sup>3</sup>.



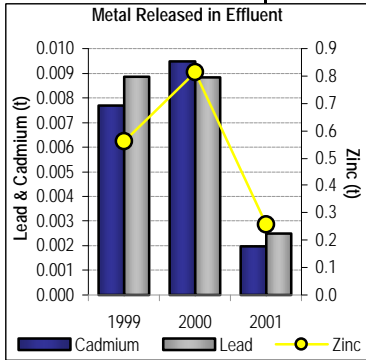
- Fuel Energy Consumption/Greenhouse Gas Emissions

Consumption and emissions were down significantly in 2001 due to the shutdown of operations. The increase in energy intensity in metal products over the past three years is mainly due to the operation of an additional fuming furnace for the treatment of slag. It is expected that the intensity will return to the low levels established in 1998 within about two years.



*Southeast British Columbia*

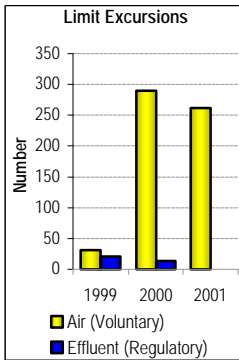




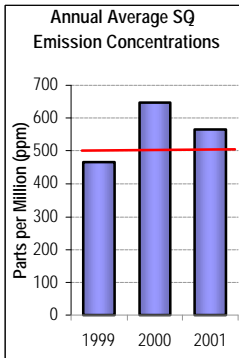
## Cajamarquilla Zinc Refinery

Cajamarquilla is a 120,000 tonne per year zinc refinery built by the Peruvian Government in the late 1970's and located in the outskirts of Lima, Peru. Acquired from a State-owned company in 1995, the refinery employs modern technology in the production of zinc from concentrates supplied by a number of Peruvian mines. Approximately 600 people are employed at the operation, of which four are Canadian expatriates in management positions.

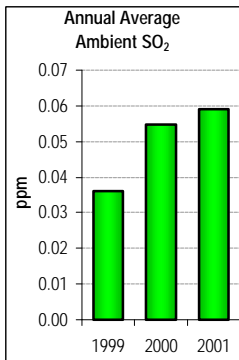
The primary regulatory authority involved at the refinery is the Ministry of Energy and Mines but the ministries of Health and Agriculture also have significant involvement. The main permit and regulatory stipulations concern air emissions and ambient air quality, effluent and irrigation water discharges and the management of hazardous substances. The refinery has a very good environmental performance track record and is one of the few that was not required to undertake major upgrades following the promulgation of new regulatory standards in 1997. Through the Peruvian environmental impact assessment review process and that applied by North American financial institutions, the refinery has an expansion to 240,000 tonnes per year approved and engineered. Construction is on hold pending a return to better economic conditions for the zinc industry.



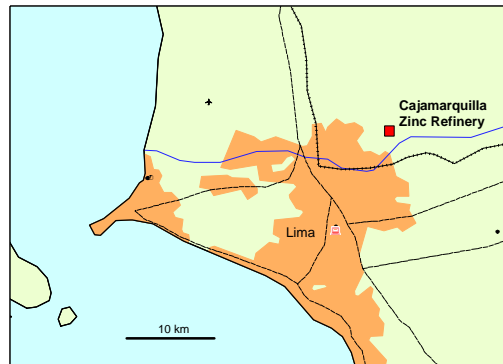
Being a zinc refinery with roaster and acid plant unit operations, sulphur dioxide emissions and related ambient environmental quality are a major environmental consideration. While emissions are generally less than 2% of those authorized by regulation, the operation has been experiencing a more difficult challenge with its own voluntary stack emission limit of 500 ppm. Numerous exceedances of this voluntary limit have occurred over the 2000/2001 period due, in part, to success with production rate increases but also because of difficulties with acid plant performance. A major review of all aspects of emissions control is underway with the objective of determining the performance upgrades necessary to improve conformance with the voluntary limit.



Concentrations of sulphur dioxide in ambient air near the refinery are normally within regulatory limitations and occasional exceedances are primarily due to abnormal emission conditions during plant startups and shutdowns. However, ambient concentrations are generally high in comparison to those near North American refineries, due to a significant influence from general air quality conditions within the City of Lima. This is also reflected in suspended particulate and associated metals concentrations in air. Average PM<sub>10</sub> and lead concentrations approach 200 µg/m<sup>3</sup> and 0.2 µg/m<sup>3</sup> respectively, both within and outside of areas influenced by the refinery. By way of comparison, the PM<sub>10</sub> concentrations in North American urban areas are generally less than 30 µg/m<sup>3</sup>.



Major improvements have been made in the quality of both metallurgical and non-contact cooling water and treated sewage effluents at the refinery. These improvements have been achieved through the construction of a new effluent treatment plant and storage pond facilities that are used to assess effluent quality before discharge to an irrigation pond. It should be noted that there is no discharge of effluent to the environment. Local farmers ultimately use all treated water from the refinery for irrigation water after it is mixed with water pumped from the Rimac River.



Lima, Peru

In 2001, about 232,000 m<sup>3</sup> of treated effluent was beneficially used in this manner in local agriculture.

## Community Work

The nearest residential area to Refinería de Cajamarquilla is the small community of Villa Leticia. It is one of many communities surrounding Lima that has developed in the last 10 to 15 years, as Lima's population has grown. While very few of the refinery's employees actually live in Villa Leticia, there has always been a close relationship between Cajamarquilla and the community. Recently, the refinery's assistance has been centered on the school. Several times each week Cajamarquilla's water truck refills the school tank.

The operation has also made available its medical staff to complete a health assessment and education program for the school's pupils. Using donated medication, the refinery's chief doctor has successfully treated many of the children for various illnesses, including a young girl with a very debilitating case of brucellosis, a bacterial infection resulting from contact with farm animals. The girl has recovered fully.

## Discussion of Performance Indicators

- Limit Exceedances

The operation had no permit or regulatory standard exceedances in emissions or effluent discharges but exceeded its own voluntary target for sulphur dioxide (SO<sub>2</sub>) concentration in emissions in about 250 days of 2001. This was improved somewhat from 2000 but is still a significant decline in performance for that in 1999. It should be noted, however, that the quantity of SO<sub>2</sub> in emissions is only about 2% of those authorized by Peruvian regulation.

- Sulphur Dioxide in Emissions

The average annual SO<sub>2</sub> concentration in emissions improved to about 580 ppm in 2001 but was still significantly above the voluntary target level. Increased production rates and difficulties with acid plant controls were the main contributors to the period of difficulty over the past two years. Improvements have been made that should result in lower emission levels in 2002.

- Sulphur Dioxide in Ambient Air

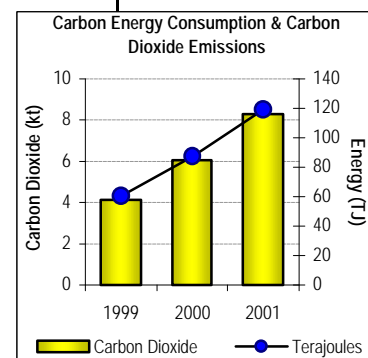
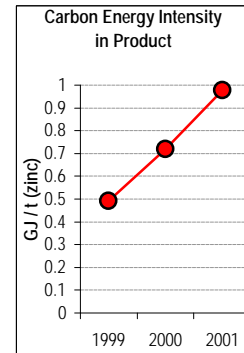
Average annual SO<sub>2</sub> concentrations were significantly higher in 2000/2001 relative to 1999 but still below the regulatory standard. This is partly related to increased emissions but another factor has been a change in monitoring technique implemented early in 2000.

- Metals Releases in Effluent

Quantities released in 2001 were greatly reduced over those released in the two preceding years due to improved effluents management at the refinery. Quality in the year was consistently within regulatory standards. All effluent from the refinery is combined with Rimac River water and used for local irrigation purposes.

- Fuel Energy Consumption/Greenhouse Gas (GHG) Emissions

Consumption, GHG emissions and the product intensity factor have all increased significantly over the past three years due to increased fuel requirements for auxiliary steam generation. It is expected that the trend in these factors will stabilize in 2002.



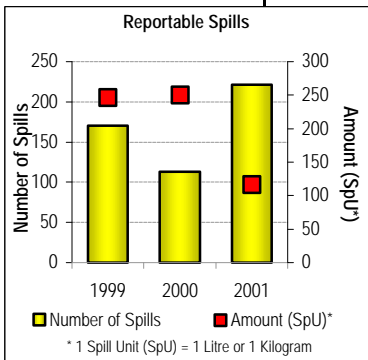
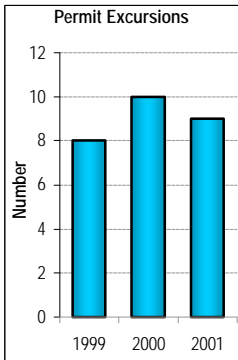
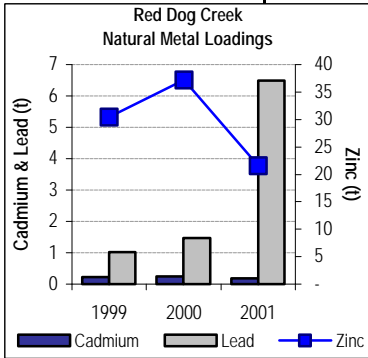
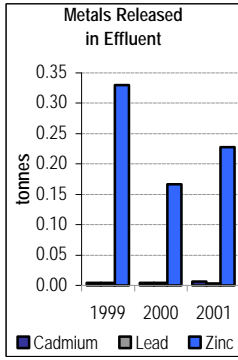
# Performance of Operations

## Base Metals

### (1) Owned and Operated

### Red Dog Mine

*The Red Dog mine in Alaska is a partnership of Teck Cominco and the NANA Development Corporation, and is the largest zinc mine in the world.*



In terms of environmental and related regulatory issues, 2001 was a challenging year for the mine but also one with significant activity creating promise for the future. Being the largest zinc mine in the world and operating in a sensitive arctic environment results in environmental performance expectations on the part of stakeholders that go beyond those typically assigned to most mining operations. These, and the exceptional regulatory requirements associated with the need to generate on-site power with diesel engines, demand a commitment to environmental quality and regulatory compliance that is likely unmatched in the mining industry worldwide. In spite of shortcomings made evident in this regard in the past, Teck Cominco believes that the overall performance at the mine is on a par with the best and is determined to achieve significant improvements in the future.

The control of fugitive dust along the haul road and at the port emerged as a key objective with the finding of low-level metals contamination in a National Parks Services (NPS) study and Red Dog's own assessment programs.

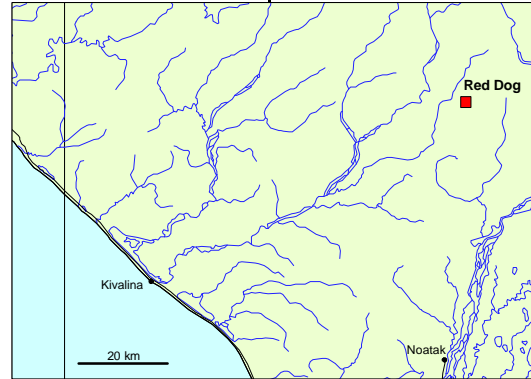
Several corrective measures were implemented and others are being planned. These included the use of new hard-covered haulage trailers, the application of truck washing when permitted by weather and improvements in dust control at the port. Monitoring has been established to track the performance of control measures that were implemented and others that are planned. The fugitive dust contamination issue is under review by a group from State and Federal Agencies and our partner NANA, which represents the people in the regional villages. During the year, State Health authorities issued a determination that there were no health risks from local subsistence food use or in the nearest regional villages. More information on the fugitive dust issue is available at Teck Cominco's web page ([www.teckcominco.com](http://www.teckcominco.com)) and at [www.nps.gov/akso/reddog/RedDogrpt.pdf](http://www.nps.gov/akso/reddog/RedDogrpt.pdf).

The mine and the State reached a settlement agreement concerning alleged air permit violations that were found during agency inspections in August 2000. This resulted in a net penalty to the mine of US \$579,000 split about equally between a cash payment and several projects. These include a commitment to complete the development of an ISO 14001-based environmental management system (EMS) and a commitment to implement measures for enhanced communication on environmental issues and environmental monitoring in the NANA region.

Managing and improving environmental performance and regulatory compliance are the top priorities at the mine. To support this emphasis, Red Dog advanced the development of a comprehensive environmental management system (EMS) compatible with the ISO 14001 standard. The goal is to complete the implementation of an ISO standard certifiable system in 2003 and, in the meantime, to have pilot projects operational on eight priority aspects early in 2002.

By the end of 2001, the aspect assessment component of EMS development was about 95% complete with about 1,100 aspects having been identified that are related to 114 distinct activities at the operation. About 200 aspects are considered to be significant based on either risk or stakeholder interest. Since more than one half of the mine's employees are from villages in the region, local interests rather than just technical considerations were important factors in the rating of the aspects identified.

At the same time significant progress has been made on the identification and consolidation of all permit and regulatory requirements in a compliance assurance system that is a key part of the overall EMS. This illustrates the complexity of the regulatory challenges at the mine. There are 54 active permits and, at least, 3,000 specific compliance items.



Northwest Alaska

## Discussion of Performance Indicators

- Reportable Spills

The mine has a gain sharing program called Sivulliqsi, meaning “pulling together”, that encourages the internal reporting of spills regardless of the material, quantity or location. Most other operations only record spills that exceed the regulatory thresholds for reporting. The number recorded for 2001 is increased over previous years but the average quantity is down significantly.

- Permit Limit Exceedances

The graph illustrates the trend of exceedances of limitations specified in the major effluent discharge permits. Most of the exceedances in 2001 were of the cyanide limits in the mine permit which are 9 µg/L maximum and 4 µg/L monthly average. As these concentrations are below practical analytical thresholds, we believe the exceedances are of an “apparent” rather than “actual” nature.

- Metals Releases

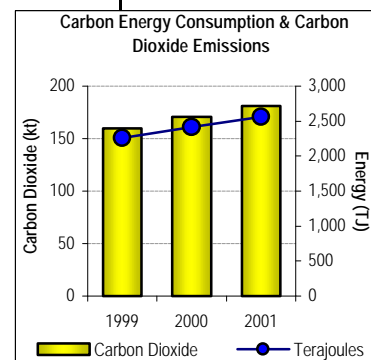
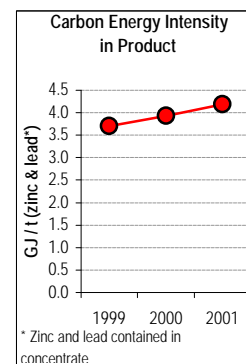
The graph illustrates the trend in the quantities of metals discharged in treated effluent from the mine. The average annual volume of effluent is about 5 million m<sup>3</sup> and the concentrations are very small, well below those achieved by most mining operations in comparable circumstances (see also the TRI coverage earlier in this report).

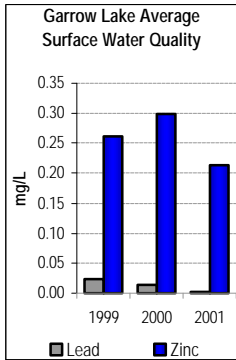
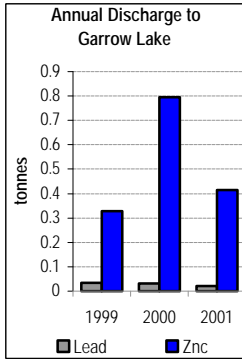
- Zinc Loadings in Effluent and Streams

This trend data compares the loadings of zinc in treated effluent from the mine and those estimated as background in the receiving stream, Red Dog Creek. This clearly indicates that natural metals loadings far exceed those in effluent discharges.

- Fuel Energy Consumption/Greenhouse Gas Emissions

The primary use of fuel is on-site power generation with diesel engines but, in addition, large quantities of diesel are consumed in trucks and other mobile equipment. The mine has recently been undergoing a period of major production rate increases during which fuel consumption, GHG emissions and energy intensity in metal containing products have increased. More stable operations will prevail in 2002 and improvements in these indicators are expected.





## Polaris Mine

Teck Cominco's Polaris mine, located in Nunavut in Canada's high arctic, is the most northerly metal mine in the world. The mine commenced production in 1980 and is scheduled to close in the summer of 2002. While the mine operates all year, the shipment of zinc and lead concentrates to smelters in Europe and the re-supply of fuel and materials by sea are only possible during the short arctic summer.

Being an underground mine with compact surface facilities and no conventional tailings impoundment, the mine has a relatively small environmental footprint. Additional advantages in terms of environmental protection requirements stem from the fact that the high carbonate mineral deposit is in permafrost and there is no mine drainage. However, during the brief summer period it is necessary to use a refrigerant system to cool mine ventilation and preserve frozen conditions underground.

The tailings disposal method utilized at Polaris is unique in the mining industry. Tailings are thickened and the high density tailings pulp is discharged to the bottom zone of Garrow Lake which is a meromictic body of water. That is, it is a lake with stratified layers that do not mix. The bottom zone is anoxic and super-saline with about twice the salinity of seawater and significant concentrations of soluble sulphide produced from biological sulphate reduction. The surface layer, which discharges to the sea in the summer, is relatively fresh and supports a limited fish population of four-horned sculpin. Water from the tailings thickener is recycled to the concentrator to minimize fresh water consumption, an important consideration in this northern climate.

The objective in tailings disposal to the lake has been to protect the water quality of the surface and this has generally been met except for the incidents in the late 1980's in which tailings line breaks caused surface layer contamination by zinc, in particular. Residual effects of these incidents are apparent today in the low concentrations of zinc in the surface layer and in the discharge to the sea, but these concentrations are well within permit limits and continue to fall.

The major environmental management initiatives at the mine have been and continue to be focused on mine closure. Activities include the completion of a comprehensive environmental site assessment, the development of appropriate remediation criteria for areas of the site affected by mining and service activities, the assessment of remedial options and the preparation of a final closure plan, which includes post-closure monitoring provisions. A noteworthy feature of the plan is that surface soils significantly contaminated by metals and fuel will be placed in the mine under the protection of permafrost.

During 2001, extensive consultations on the plan were carried out with federal and Nunavut regulatory authorities and with people in arctic villages. It is expected that approval for the closure plan will be issued by the spring of 2002 and that contracts will then be let. The mobilization of contractor's equipment to the mine

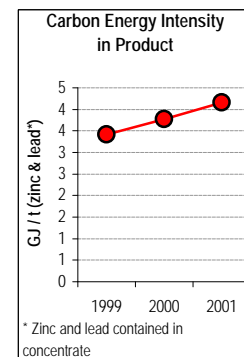
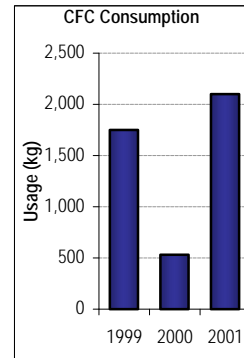


*When personnel at the Polaris Mine were out doing inspections, they came across a baby seal stranded miles away from the ocean. The pup was gently and willingly picked up and returned to the shore.*

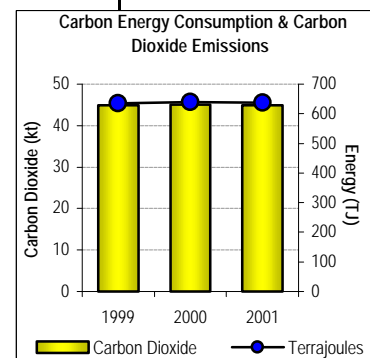
site is required this year so that the major decommissioning and remediation work can be initiated in 2003.

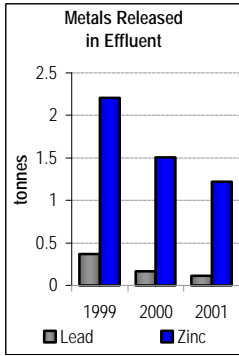
## Discussion of Performance Indicators

- Garrow Lake Water Quality**  
 This is reflected by zinc and lead concentrations in the surface layer above the anoxic bottom zone used for tailings deposition. Monitoring is in accordance with Water Licence requirements and concentrations are well within limitations. It is expected that water quality will continue to improve.
- Metals in Garrow Lake Discharge**  
 Data are the loadings of zinc and lead discharged to the Arctic Ocean in flow from the surface layer during the summer. Water quality is a factor but the primary determinant has been flow volume variations from year to year.
- CFC Consumption**  
 The main refrigerant used in the system for cooling mine ventilation air during the summer months is R-22. This is needed to maintain permafrost conditions underground. Consumption will cease when the mine closes in the summer of 2002.
- Fuel Energy Consumption/GHG Emissions**  
 The primary use of fuel is on-site power generation with diesel engines. Heat is recovered from generator emissions for heating the accommodations complex and the exhaust gases are used for drying the concentrates. Consumption and emissions have been stable in recent years but intensity has increased due to declining ore grades.



Canadian Arctic

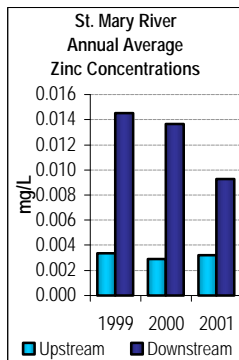




## Sullivan Mine

The Sullivan Mine closed at the end of 2001 after more than 90 years of operation as one of the pillars of the former Cominco Ltd. The employment and economic activity generated by the mine gave rise to the City of Kimberley, which is being transformed into a sustainable community based primarily on recreation and tourism.

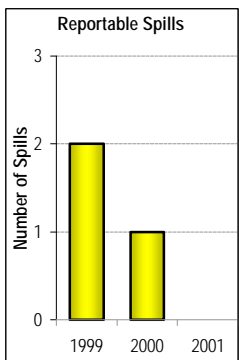
The environmental management challenges at the Sullivan mine have their roots in the nature of the ore mined and the historical operational practices related to the disposal of waste rock, tailings and treated effluent. The ore body contained massive sulphides with abundant pyrrhotite and little or no accompanying alkaline mineralization. Therefore, the mine and its waste materials generate acid rock drainage which in combination with practices of the day going back to 1909 resulted in a need to conduct costly remediation and reclamation programs that have been underway since the 1970's. The current focus of activities at the mine is on continued watercourse protection, decommissioning of operating facilities, reclamation of tailings and waste rock storage areas and the completion of remediation of off site land areas impacted by past practices.



With the exception of isolated minor incidents, the mine has maintained an outstanding compliance record with air emissions and effluent discharge permits under the authority of the BC Ministry of Water, Land and Air Protection. Performance related to the collection, management and treatment of metals contaminated drainages has been particularly noteworthy and is reflected in major improvements in the quality of receiving waters impacted by historical activities.



One of the major activities in preparation for closure during 2001 consisted of the completion of a new water management system that will allow for the reclamation of the tailings pond to be completed. As well, the progressive reclamation of inactive tailings areas continued during the year using a method developed from the mine's research that results in the establishment of sustainable vegetation and, at the same time, mitigates acid rock drainage from the underlying sulphide tailings. Based on the advice from the Sullivan Public Liaison Committee, the final reclaimed surfaces on the tailings ponds will enhance the diversity of vegetation and habitat suitability for a range of wildlife.



The mine has achieved considerable success in the remediation of off site lands impacted by past practices and incidents. One such event was a major tailings dyke failure in 1948 that resulted in heavy contamination of lands and watercourses over several kilometres distance. During 2001, the remediation of a parcel of land was completed in preparation for its use by the City of Kimberley as a golf course development.



## Discussion of Performance Indicators

- Reportable Spills

There were none in 2001, which culminates a favourable trend in the past three years.

- Metals Loadings in Effluent

Contaminated drainages from the mine, tailings pond and waste dumps are collected and treated in an effluent treatment plant which, under permit, discharges treated water to the St. Mary River. This facility has an outstanding compliance record with only one excursion of a permit limitation in the last three years. The loadings of metals discharged in treated effluent have fallen over the past three years due to both performance improvements and reduced effluent flows.

- St. Mary River Water Quality

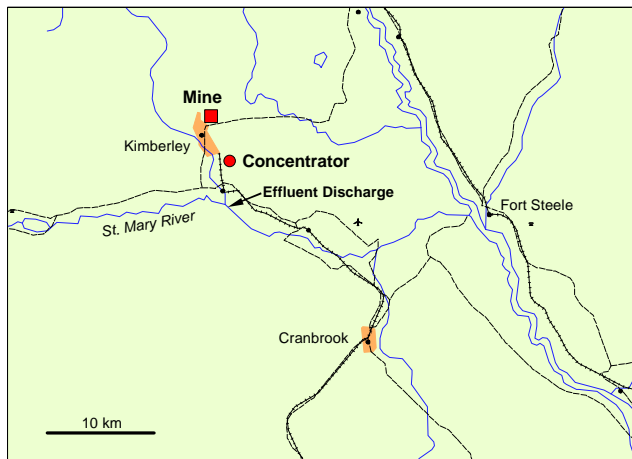
The data in the graph indicates average annual zinc concentrations in the river upstream and downstream from the influence of the mine and the City of Kimberley. Downstream concentrations are well within the aquatic life criterion for zinc and continue to improve. Only a small proportion of these are due to contributions from treated mine effluent. This river has an outstanding sports fishery.

- Reclamation Progress

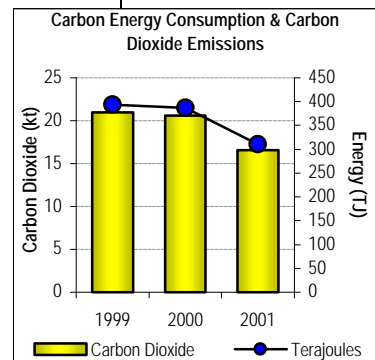
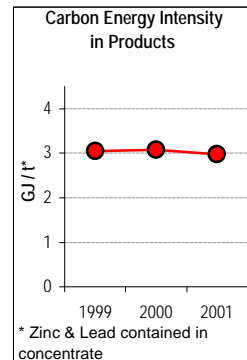
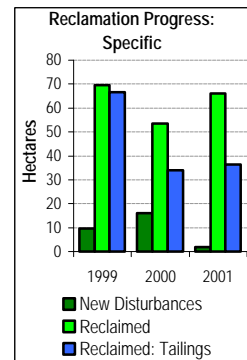
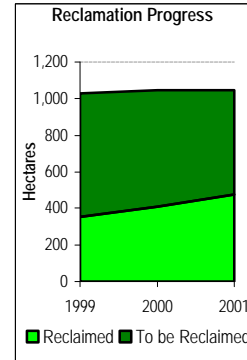
The two trend graphs illustrate specific and overall reclamation progress over the past three years. Now that the mine is closed, decommissioning and reclamation activities will continue through 2006.

- Fuel Energy Consumption/Greenhouse Gas Emissions

Being an underground mine, fuel consumption at the Sullivan has been relatively small in relation to that at most open pit mines. Fuel consumption and emissions have been reduced over the past three years while energy intensity in concentrate metals has been stable.



Southeastern British Columbia



# Performance of Operations

## Base Metals

### (2) Joint Ventures

#### Antamina

Compañía Minera Antamina S.A. (CMA) operates the Antamina copper-zinc mine in the high Andes of northern Peru. Teck Cominco is one of four partners in the Antamina project, with 22.5% ownership. The other partners are Noranda (33.75%), BHP Billiton (33.75%) and Mitsubishi (10%).



Antamina, which completed construction and reached commercial production during 2001, is one of the largest greenfield mining developments in the world. Major facilities include an open pit mine, froth flotation concentrator, tailings impoundment, maintenance facilities and a camp at the Yanacancha mine site, 4,200 metres above sea level in the Peruvian Department of Ancash, 250 kilometres north of Lima. Mineral concentrates of copper and zinc are transported to a concentrate storage facility and marine terminal near Huarney on the Pacific coast, by way of a 302 kilometre-long slurry pipeline. The mine is accessed via a 120 kilometre-long surfaced road from the Conococha crossroads. In Huaraz, the major population and commercial center of Ancash, CMA has constructed a housing complex for staff and workers and their families.

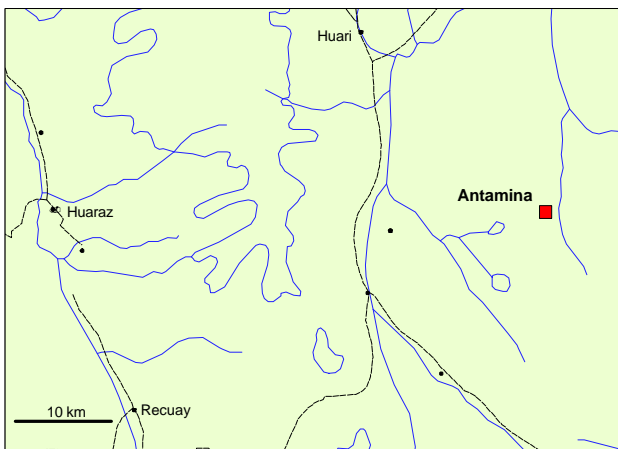
Environmentally and socially, Antamina is a challenging project. The climate at the mine features pronounced dry and wet seasons and a water balance that swings from surplus to deficit each year. The tailings impoundment, which will grow over the course of the mine's operating life to become one of the largest in the world, is situated only a few kilometres upstream from Andean villages and farms, whose residents are accustomed to drawing water for irrigation and domestic consumption directly from the river. The people living in the vicinity of the operation are understandably concerned over the potential impacts that the operation could have on water quality and availability in the area.

CMA has committed significant resources to managing environmental issues associated with the construction and operation of the project. Major programs include waste management, environmental monitoring, erosion and sedimentation control, reclamation and regulatory compliance. During 2001, these programs evolved as the project completed construction and began operation. In progressive reclamation, for example, the company continued to revegetate areas disturbed by construction as they became available. To the end of 2001, some 100 hectares of land had been successfully revegetated at the mine site. Along the access road, revegetation and erosion control continued throughout 2001 to mitigate the effects of road construction.

The key environmental problem that arose during 2001 was water quality control in the tailings impoundment. Water quality issues in the tailings pond included elevated levels of copper and cyanide, as well as perceived aesthetic changes (foam and odor) to water quality in Quebrada Ayash, the watercourse below the tailings impoundment. In November and December, several short-term non-compliance events in effluent

discharge were experienced. These problems have been managed through a concerted effort that has included water quality treatment for cyanide destruction in the concentrator, addition of anti-foaming agents to water discharged from the impoundment, minimization of process reagent usage and the construction of additional water management structures intended to increase the diversion of fresh water around the tailings facility.

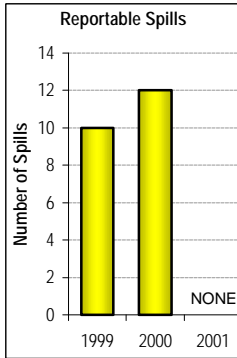
Poverty and lack of infrastructure are pervasive problems in communities in the area surrounding the mine site. Many local communities survive mainly through subsistence agriculture, and are in need of economic opportunities and infrastructure development. Consequently, the Antamina project is viewed by some community representatives as a source of jobs and direct economic assistance to alleviate poverty and unemployment. CMA has established a successful community development program centered in San Marcos, the major community in the immediate vicinity of the mine. Development projects have included training, introduction of new agricultural technology and community infrastructure improvements. The intent of the community development program is to encourage the establishment of economic enterprises that do not depend directly on the mine's operation, and thus will provide long-term (i.e., post-closure) benefits to the communities surrounding the mine.



*Northeast Peru*

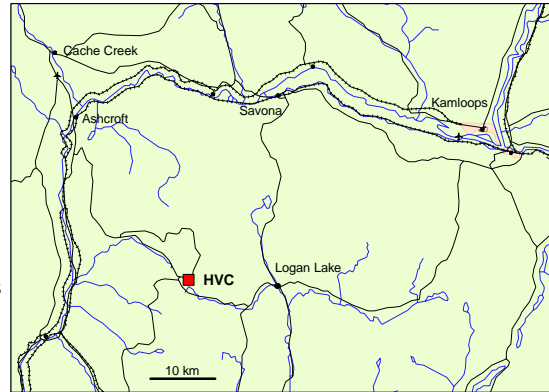
*Local residents are invited to observe and participate in studies on the mine's effects aquatic life in nearby watercourses.*





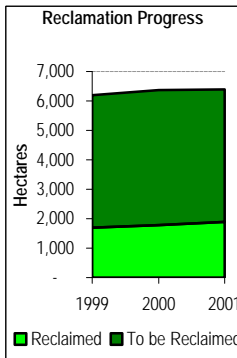
## Highland Valley Copper

The Highland Valley Copper mine, 63.9% owned by Teck Cominco, is Canada's largest non-ferrous metal mine. It comprises inactive mine areas operated in the past by predecessor companies as well as two producing open pits, the largest of which is known as the Valley Pit. The total land disturbance from all mining, tailings disposal, waste rock storage and infrastructure activities to date has been 6,400 hectares of which 1,900 hectares have been reclaimed and the balance will be reclaimed over the remaining mining life to 2009 and for several years following closure.



South Central British Columbia

Under its major environmental permits, the mine has maintained a 100% compliance record over the past three years and in 2001 had no reportable spill incidents. The primary environmental focus continues to be on progressive reclamation to meet commitments under an End Land Use Plan (ELUP) approved by the BC Ministry of Energy and Mines (MEM). The ELUP calls for the bulk of the mine's land disturbance to be reclaimed to a mix of sustainable land use categories. These include agriculture, wildlife and aquatic uses. The reclamation challenges and the considerable progress to date are illustrated in the accompanying photograph. Noteworthy success includes the establishment of a productive trout fishery in cooperation with Fish and Wildlife officials in a former tailings pond. Additional initiatives are underway to establish viable fish populations in flooded open pits.



Establishing sustainable vegetation on relatively barren waste rock and tailings that contributes to productive land use is a major challenge. To assist in meeting objectives, the mine has been engaged in the large-scale use of biosolids from the Greater Vancouver Regional District and other sewage treatment facilities as a reclamation amendment for a number of years. About 22,000 tonnes were used in 2001 and the total since 1996 has been 121,000 tonnes. Very much a key to effective operational reclamation at the mine, this application of biosolids is also beneficial to municipalities that must dispose of the material.

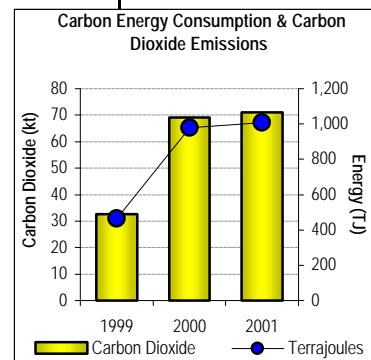
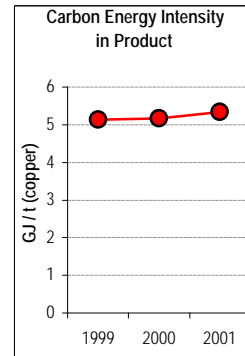
While the mine is fortunate in that tailings and waste rock do not generate acid rock drainage, it is not without issues that arise from metals release from these materials. One concern relates to the accumulation of molybdenum in vegetation grown to meet agricultural land use objectives. Cattle can develop a debilitating disease known as "molybdenosis" from the consumption of forage with high levels of molybdenum particularly with an imbalance of copper. This concern is not unique to Highland Valley Copper but it is clearly a potential impediment to a sustainable agricultural land use for a small percentage of reclaimed mine areas in a location where grazing lands are at a premium. The issue has been under study for a number of years in cooperation with the MEM, Agriculture Canada and local ranchers, which utilize areas that have been reclaimed. While research is ongoing, there is considerable promise that a combination of copper supplementation of feed and herd management during the grazing season can be used safely to meet the agricultural land use objective.

The other concern related to metals release from mine materials is the presence of elevated concentrations of molybdenum in mine waters and specific seepages, in particular. While the issue does not cause impacts on drinking water, fish or other aquatic organisms, it could give rise to the accumulation of molybdenum in vegetation grown by farmers using downstream creek water for irrigation. Molybdenum leaching is likely to continue for a long period of time and there is a need to implement water treatment measures that are applicable to localized seepages with elevated concentrations.

This objective is being pursued with considerable success using a passive biological system, which removes molybdenum from solution. Interestingly, the energy source for the bacteria responsible for treatment is a mixture of cow manure and wood chips. One system has been operational with high treatment efficiency for several years and a second system will be completed in 2002.

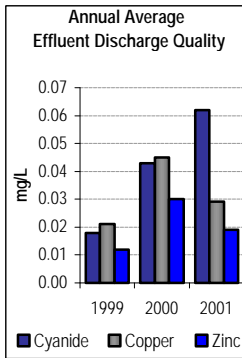
### Discussion of Performance Indicators

- Reportable Spills**  
 The mine formerly reported a significant number of spills (primarily hydraulic fluid) which exceeded thresholds in the BC Spill Reporting Regulation. However, commencing in 2001, the mine was formally exempted from reporting spills within the area of active operations.
- Reclamation Progress**  
 Significant operational reclamation has been completed to date and the rate will increase as closure in 2009 is approached. A large proportion of the total area disturbed is the tailings pond and this can only be reclaimed after closure.
- Fuel Energy Consumption/Greenhouse Gas Emissions**  
 The majority of the energy consumed at the mine for conveying and processing ore is hydroelectricity. However, being a high tonnage but low grade mine, large quantities of fuel are needed for trucks and other mobile equipment. Consumption and GHG emissions have been stable over the past two years but up significantly from 1999 when production was suspended for part of the year. Energy intensity in terms of copper in concentrate is up very slightly in 2001 due to increased truck haulage requirements.

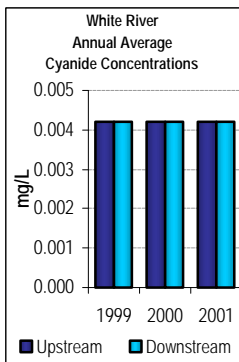


# Performance of Operations Gold

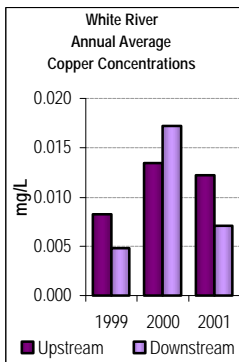
## Hemlo Operations



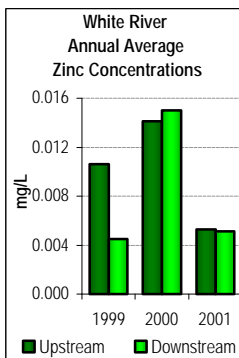
In partnership with Barrick Gold Corporation, Teck Cominco operates the David Bell and Williams gold mines in northern Ontario, 40 kilometres east of Marathon. Ore is mined from underground mines at both properties and from an open pit at Williams. Since the closure of the David Bell mill in 1999, ore from both operations is processed at Williams, which also operates the tailings impoundment, polishing pond and (seasonally) the effluent treatment plant. Mill throughput during 2001 averaged 9,600 tonnes per day.



The David Bell and Williams operations represent a success in the responsible use and management of cyanide, a necessary process reagent in the recovery of gold. Since 1999, when the David Bell mill was shut down, the David Bell tailings impoundment has been used as a polishing and recirculation pond for excess water from the Williams tailings pond, prior to treatment for metals removal in the seasonally operated effluent treatment plant. The final treated effluent, that discharges to the White River, has consistently complied with Certificate of Approval (COA) limits and consistently tests non-toxic to both rainbow trout and invertebrates represented by the water flea *Daphnia magna*, in routine test work conducted under the Ontario Municipal Industrial Strategy for Abatement (MISA) program. Based on these results, Teck Cominco foresees no problems in meeting the requirements of the new federal Metal Mining Effluent Regulations (MMERs) which will apply to all gold mining operations.



During four weeks in April and May of 2001, spring run-off and storm events caused the old mine water polishing pond (now used mainly to receive storm water runoff from the mine site) to overflow. The discharged water, legally considered to be an effluent, was tested and met all applicable chemical limits, showing that it was non-toxic to both fish and invertebrates. However, total suspended solids levels were elevated on two occasions in April, exceeding the MISA daily limit for of 30 mg/L; and the discharged water did not comply with the COA monthly average limit of 15 mg/L. The excessive suspended solids were attributed to storm event that caused road fines to enter the pond near the discharge point. This was the first instance of non-compliance for effluent at Hemlo since the MISA regulations came into effect in 1997.



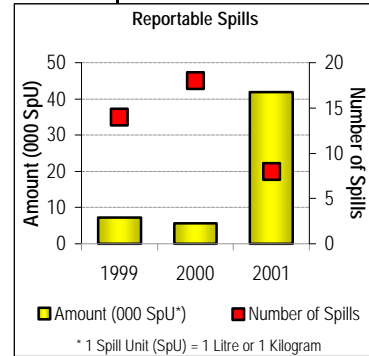
A significant change to Hemlo's waste management program was made in 2001 as mercury was added to the Williams waste stream. Mercury is concentrated in the gravity circuit, which started operating in September 2000 and uses Knelson concentrators to recover fine gold particles from the circulating load on the ball mills. Initially, the Knelson concentrate was shipped off site to a custom refiner but since early 2001 it is being processed on site in the Williams refinery. Mercury in the gravity concentrate is produced as a metallic by-product. During 2001, approximately 115 kg of metallic mercury was produced, stored and subsequently shipped off site in November, by a licensed carrier and receiver, for recycling.

Hemlo is planning an expansion of the Williams pit, to support continued operation. During 2001, environmental studies - including rock geochemistry, hydrogeology, species at risk and aquatic life - were undertaken to support project planning and permitting activities. This work will continue in 2002.

## Discussion of Performance Indicators

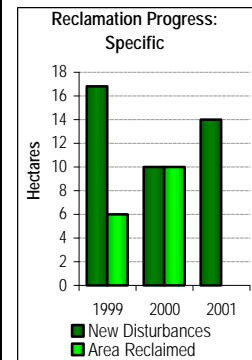
- Reportable Spills

There were fewer reportable spills in 2001 than in the previous two years. However, the total spill quantity was much higher. Most of this increase resulted from a single incident in January, when a pipe carrying mine water burst. Approximately 35 m<sup>3</sup> of mine water was spilled and flowed to a sedimentation pond, from where it was pumped back to the mill. There was no environmental impact as the water did not escape containment.



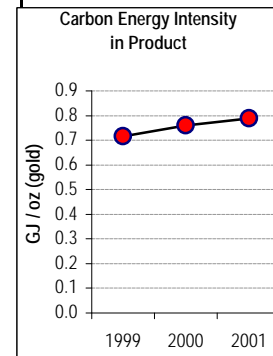
- Treated Effluent Quality

Final effluent quality was well within Certificate of Approval (COA) limits. Average quality for 2001 was comparable to the previous year, with average copper and zinc concentrations somewhat lower, and cyanide higher. Concentrations of these parameters were generally lower in 1999 than in both 2000 and 2001. Water quality impacts to the White River are generally negligible. Cyanide analyses both upstream and downstream of the discharge point have been below detection for the last three years. Average copper concentrations were slightly higher at the upstream site than at the downstream site in 1999 and 2001, and slightly higher at the downstream site in 2000; zinc exhibited similar behavior.



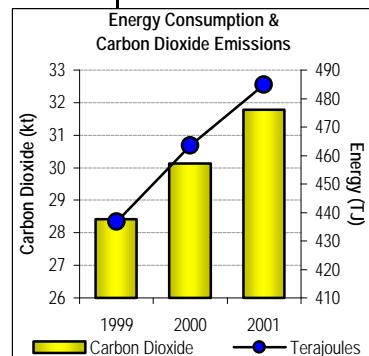
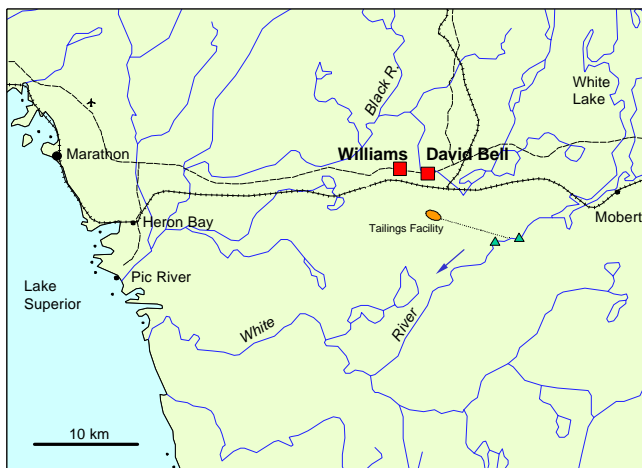
- Progressive Reclamation

Between the two Hemlo operations, 353 ha of land have been disturbed to the end of 2001, including 14 ha disturbed during 2001. No progressive reclamation was undertaken by either operation during 2001. Overall, 73 ha of land have been reclaimed to date and 280 ha will be reclaimed once available, most of this at closure.



- Energy Consumption and Greenhouse Gas (GHG) Emissions

A significant increase in energy consumption was noted at the Hemlo Operations for 2001. At Williams, diesel fuel consumption rose by about 19% in 2001 as compared to 2000. Nearly all of this increase was attributed to increased activity in the open pit, where equipment hours and diesel consumption increased by about 50% in 2001. Overall carbon-based energy consumption and CO<sub>2</sub> emissions for the Hemlo operations rose by about 5% from 2000 to 2001.



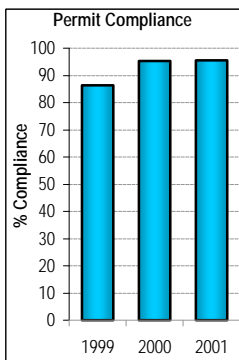
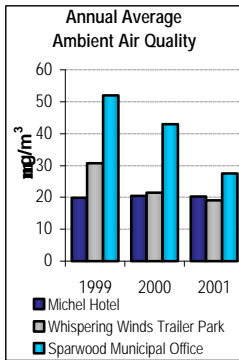
# Performance of Operations

## Coal

### Overview

Teck Cominco operates two metallurgical coal mines in British Columbia, one in the southeastern corner of the province (Elkview) and one in the northeast (Bullmoose). The Quintette coal mine, also in the northeast, closed in the fall of 2000 and is being reclaimed according to provincial requirements and company expectations. These large open pit mines are located in mountainous terrain, resulting in large and high waste rock dumps which pose challenges in relation to dump stability and reclamation. Over the years, extensive experience has been gained in dump re-sloping, contouring practices and re-vegetation techniques, with the overall goal of achieving end land use objectives and equivalent land capability (see Land Capability discussion). Quintette had the additional challenge of establishing vegetation in the high alpine areas of the property, requiring extensive research trials to develop new and innovative approaches.

Some of the other common aspects that must be managed at each of the sites are erosion, water quality in discharges (principally total suspended solids and nitrate) and dust from the mining operations. Issues pertaining to selenium in stream drainages are specific to Elkview, as discussed below.



### Elkview Coal Mine

Elkview is one of only two metallurgical coal mines in the world with reserves of over 200 million tonnes of high strength coking coal. Year 2001 coal production amounted to 5.5 million tonnes and a target of 6 million tonnes has been established for 2002. The operation supports 654 employees, mostly living in the Elk Valley (Sparwood and Fernie). There has been almost continuous coal mining at the Elkview site for nearly 100 years.

Elkview is appropriately named in that the site supports about 350 elk, which graze on both natural and reclaimed landscapes on the property. Much of the property has a southern aspect and these areas are heavily used for over-wintering by a wide range of ungulates. All development on the property must be carefully planned to ensure that impacts to ungulates and other wildlife are minimized. Elkview conducts aerial wildlife surveys over the winter months. This information, along with the Westar wildlife studies that included intensive radio collaring, has enabled the site to understand migration patterns and ensures that our impacts are not having a detrimental effect on the population.

*Early stages of reclamation of the Bodie Dump*



During the Bodie Dump planning and environmental approval process, it was recognized that this area of the property provided important thermal cover and habitat for about 100 elk and 20 mule deer. As compensation for taking this area out of use, four areas of the property were selectively logged to replace the habitat temporarily taken out of production. The selective logging opened the forest floor to increase forage production, while providing many other features attractive to the animals, such as short lines of sight and irregular cleared areas so the ungulates could hide from predators. An aggressive



reclamation program also helped to reduce the impacts of the development. Continued monitoring of the elk herd since construction of the Bodie dump began in 1995 has shown that the population has not been affected and remains healthy.

### Selenium Water Quality Issues

The geomorphology of the Elk Valley is seleniferous in nature, meaning that there are natural elevated concentrations of selenium throughout the geologic formations. Monitoring results downstream of the five southeastern BC coal mines in the valley, of which Elkview is one, has shown an increasing trend in selenium concentration over time. As a result, a government-industry taskforce was formed in 1997 to conduct research into this issue and determine if any adverse effects are occurring to biota, fish or wildlife. Results to date indicate that there have been no adverse effects to fish populations. The studies are being expanded in 2002 to include waterfowl, ungulates and biota in lentic environments.

### Air Quality

Impacts from fugitive and atmospheric emissions of dust are issues of concern to the community of Sparwood, which is located very close to the mine site. 2001 was a difficult year for dust management, particularly during the summer months, which was one of driest in a 20-year record of meteorological observations.

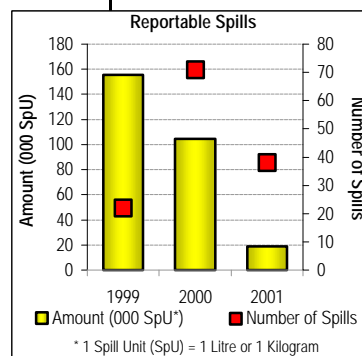
The principal sources of fugitive dust are from the mine haul roads, waste rock loading and dumping operations and the fine coal tailings pond. The operation endeavors to keep all of the haul roads wet and the watering trucks work continuously to achieve this goal. The main access road to the mine is coated with a oil based solution which works extremely well in reducing dust along the road. The coal breaker station is located within the open pit mining operation and is not within the Sparwood air shed. Emissions of dust from this location, which are local to the pit, have been out of compliance for an extended period of time. The operation is reviewing the operation of the dust collection facility and discussing the need for a permit on this facility with the regulatory agencies.

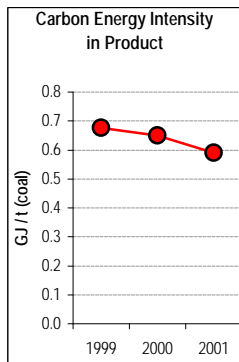
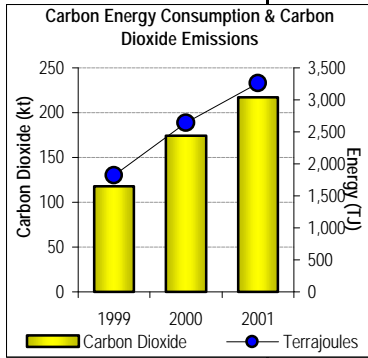
Fugitive dust emissions from the fine coal tailings lagoon have affected homes in the community on at least three occasions since Teck Cominco became operator of the mine. This has resulted in two fines being paid by the operation as well as public apologies and efforts to clean the homes that were affected. Dusting from the lagoons often occurs when there is a combination of freeze drying and high winds, negating the many efforts by mine operations to prevent dusting. This has included construction of an extensive spray irrigation network and wind breaks as well as seeding of the exposed coal fines and containment berms and tree planting. An intensive mulching and tackifying program was implemented in 2001. As a result of the many improvements made since 1994, lagoon dusting has been brought under control even under the drought conditions that were experienced in 2001.

An extensive monitoring network is in place within the community to measure total and respirable dust. Data from this network demonstrated that air quality was within provincial guidelines 99.6% of the time for total suspended particulate dust. It must be stressed that not all of the dust in the community



Working in the pit





results from the mining operation, but discrimination in the types of dust collected in the monitoring network is currently not possible. That is, it is not possible to differentiate between mining related dust and other forms of dust collected with the monitoring equipment. In a presentation to the community, the regional health officer, after reviewing the monitoring data, indicated that air quality was within federal and provincial guidelines and as good or better than many other communities in British Columbia.

Public complaints of dust arising from trains transporting coal to the coast was brought to the attention of the company in 2001 after a new rail routing was used by the rail company. After investigating the complaints and the causes of dusting it became evident that improvements in dust suppression were required. After the rail cars are loaded with coal, they are spray coated on the surface to minimize dust emissions. Improvements were required to the facility and operator practice and in addition, the rail corridor users decided to build a new spray facility about halfway between the mine sites and the coast.

### Discussion of Performance Indicators

- Sedimentation Pond Discharges

Annual average monitoring results for TSS and nitrate in the Elk River drainage indicate that there has been minimal, if any, effect on TSS or nitrate levels in the river.

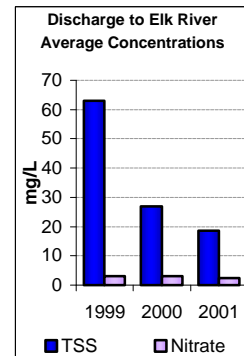
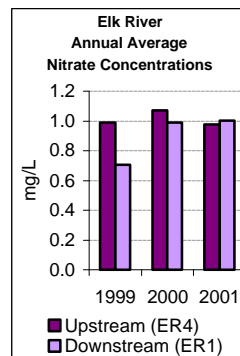
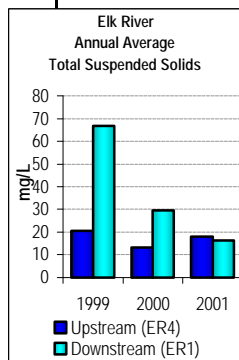
Discharges of nitrate to Michel Creek has increased in the past three years. This has had a measurable effect on nitrate concentrations in the creek. Concentrations in Michel Creek are much less than the provincial guidelines of 10 mg/L for drinking water and 200 mg/L for protection of aquatic life.

- Sedimentation Pond Permit Compliance

The mine operates in mountainous terrain, making construction and operation of sedimentation ponds difficult. The only parameter that the operation has difficulty meeting is total suspended solids (TSS), usually during spring runoff. Overall permit compliance for aquatic discharges has improved during the past three years, partly as a result of the installation of an automated flocculent addition station.

- Air Quality

Annual average ambient total suspended particulate results at three locations in the Elk valley were well within provincial guideline levels of 60 µg/m<sup>3</sup>.



- Energy Efficiency/Greenhouse Gas (GHG) Emissions

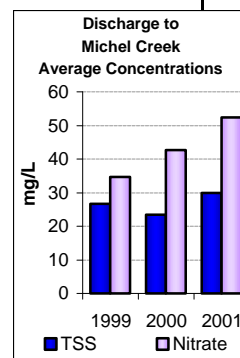
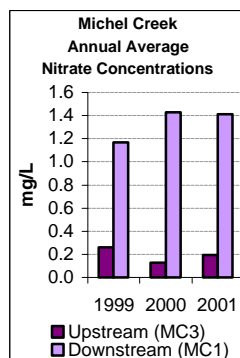
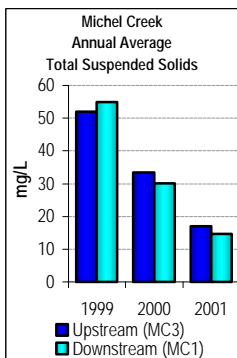
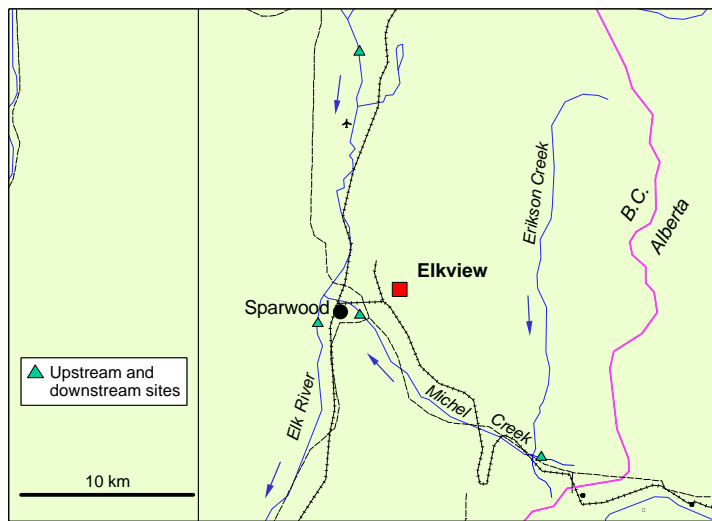
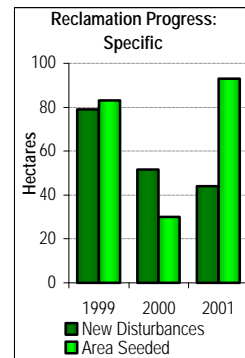
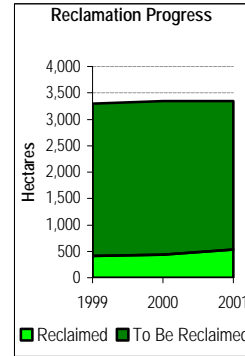
Total fuel consumption and green house gas emissions (which include coal bed methane releases) have increased as a result of increased coal production. Efficiency gains in both the coal plant operations and mining process have resulted in reduced unit energy requirements per tonne of clean coal produced. Because electricity is provided from hydroelectric sources, electrical efficiency gains that have been introduced at the property are not credited against GHG emissions. The property has twice been the recipient of the BC Hydro Energy Smart award program for large industrial facilities.

- Reportable Spills

The number of reportable spills decreased substantially in 2001, as has the volume of spills observed. All of the spills were contained on mine property and none have impacted the receiving environment.

- Progressive Reclamation

About 93 hectares were reclaimed in 2001. The total amount of land reclaimed is around 500 hectares with a total disturbance area of nearly 3,500 hectares.



## Bullmoose Coal Mine

The Bullmoose mine, operated and 61% owned by Teck Cominco, has been in production since 1983 and is slated to close in 2003. The mine produced about 1.9 million tonnes of metallurgical coal in 2001.

The stratigraphy of the coal deposit at Bullmoose has allowed for bottom up mining with bottom up waste dump construction during most of its operating life. This has made possible the construction of relatively low 50-meter high waste dumps on most of the property, thereby enhancing the opportunities for reclamation success. Large quantities of topsoil are salvaged during pre-stripping of up-gradient seams and this material is placed on the faces of the waste dumps and on the dump platforms to create ideal conditions for re-seeding and tree planting. At the end of 2001, the operation had reclaimed 61% of the total area that will need to be reclaimed at closure.

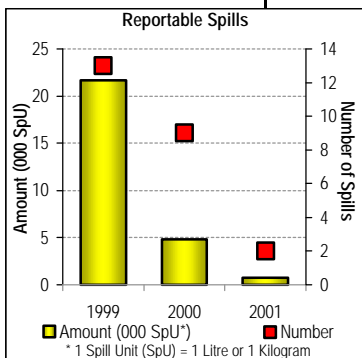
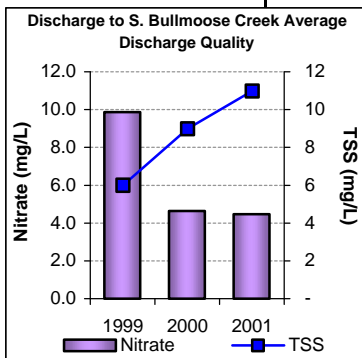
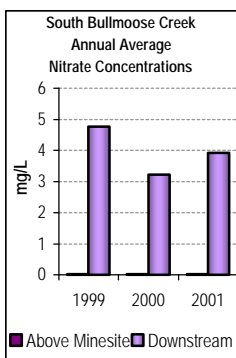
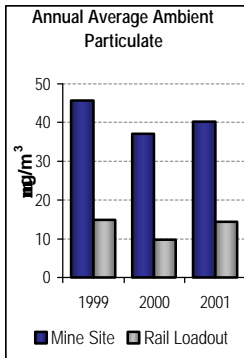
The end land use objectives for the Bullmoose mine site is to recreate habitat that is suitable for wildlife. The wildlife-sighting program documented extensive use of the reclaimed landscape and surrounding terrain, including sightings of white-tailed deer, mule deer, marmots, caribou, black bear, grizzly bear, fox, moose, one mountain goat and a variety of aquatic birds.

All Teck Cominco mines have extensive recycling programs, and Bullmoose is no exception. One example is the government authorized re-use and recycle of used oil generated by the large mobile equipment fleet. Almost the entire volume of used oil is re-used following regulatory and best management practices. The largest use (55%) involves the preparation of an emulsion that is applied to coal during shipping by train to port. This application helps to reduce any dusting concerns along the rail line. The second use (40%) is as a substitute for diesel fuel in the ammonium nitrate/fuel oil (ANFO) explosive mixture used in mining. The remaining volume, only 5% of that generated at the site, is shipped to a permitted used oil recycling facility.

The Bullmoose mine was fully compliant with provincial requirements for effluent discharges and air quality in 2001.

### Discussion of Performance Indicators

- Sedimentation Pond Discharge**  
The operation has been 100% compliant with effluent discharge requirements for the past several years. Discharges of nitrate are low and have been decreasing, on average.
- South Bullmoose Creek Water Quality**  
The influence of the operation on south Bullmoose Creek is illustrated for nitrate. Levels are well below BC guidelines for drinking water (10 mg/L) and protection of aquatic habitat (200 mg/L).
- Air Quality**  
Ambient air quality results are well within the B.C. provincial guideline level of 60 µg/m<sup>3</sup>.



- Energy Efficiency/Greenhouse Gas (GHG) Emissions

The primary sources of greenhouse gas emissions are consumption of diesel fuel in the mobile equipment fleet, drying coal and emissions of fugitive coal bed methane. Diesel consumption and GHG emissions increased in 2001 as a result of increased mine production. However, efficiency gains in the mining process resulted in a net improvement in energy consumption per unit of coal produced.

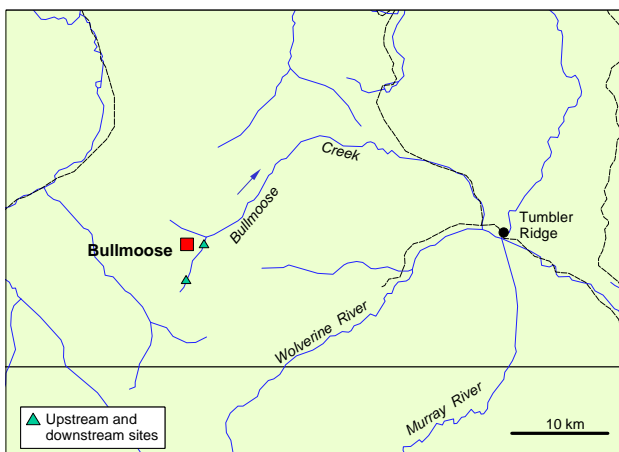
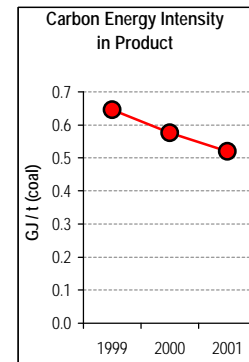
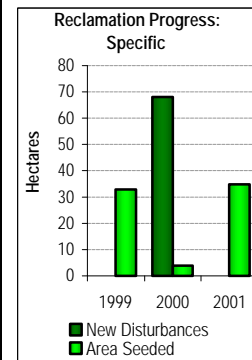
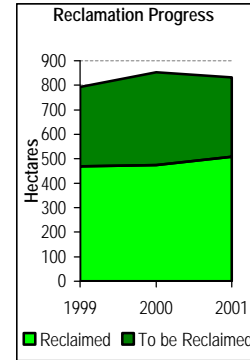
- Reportable Spills

The number of reportable spills has decreased over time in both volume and number of incidents. This may be partly attributed to increased employee awareness since tracking and reporting of spills began in 1993.

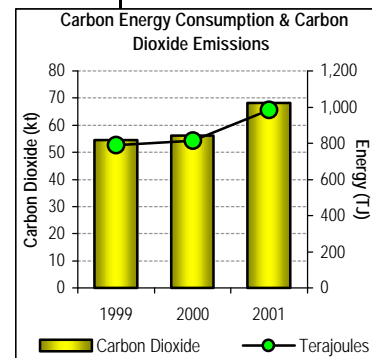
- Progressive Reclamation

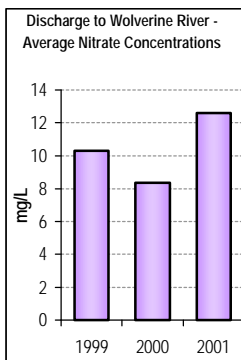
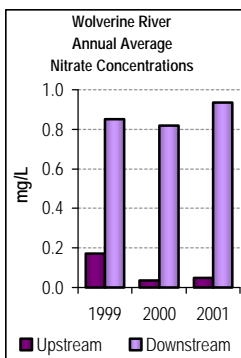
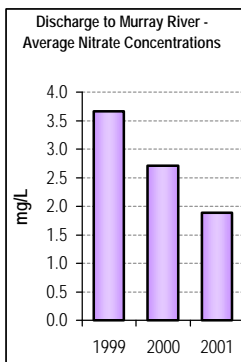
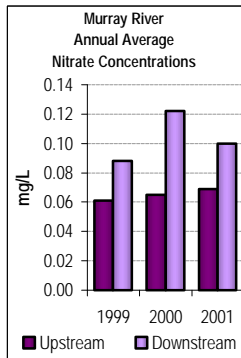
Bullmoose has been able to reclaim more than one half of its disturbance area, a significant accomplishment.

Reclamation work completed to date



Northeastern British Columbia





## Quintette Coal Mine

The Quintette mine was an open-pit metallurgical coal mine located in northeastern British Columbia, near Tumbler Ridge, BC, which closed in 2000 after 18 years of operation. During its operating life, Quintette produced 65 million tonnes of metallurgical coal, generating over \$5 billion in economic activity.

Quintette is a very large site spanning several kilometres between the high elevation Mesa/Wolverine area, the coal preparation plant site and the Babcock mining area. A third mining area was located virtually adjacent to the coal preparation plant at lower elevation and is known as Shikano. Extensive reclamation work has been undertaken at the mining property since closure, including waste dump re-contouring, selected topsoil placement, seeding, tree, shrub and native island planting and construction of water management works. In all, 809 hectares of land were fully reclaimed in 2001, which was a significant undertaking.

Reclamation of the Mesa/Wolverine area posed a significant challenge to the operation in that there was no topsoil available for use and much of the area was located in a high alpine environment. After several years of research, Quintette was able to demonstrate that the seeds of native high elevation species could be successfully harvested and germinated in a dedicated nursery at the site. Given the severe alpine conditions and intensive effort required to collect the



*Reclaimed landscape Mesa/Wolverine area*

seeds, it is not possible to collect sufficient quantities to distribute across the entire alpine disturbed area. As a result, a native island-planting program was proposed and the research team established several trial areas. The research demonstrated that transplanting of the nursery species could be successfully undertaken, and that once these plants reached maturity, would colonize downwind areas. About 5% of the reclaimed high elevation landscape is being seeded in strategically located islands in this fashion. The native island seeding program augments the agronomic helicopter seeding program and will eventually result in a restored high alpine vegetation environment.

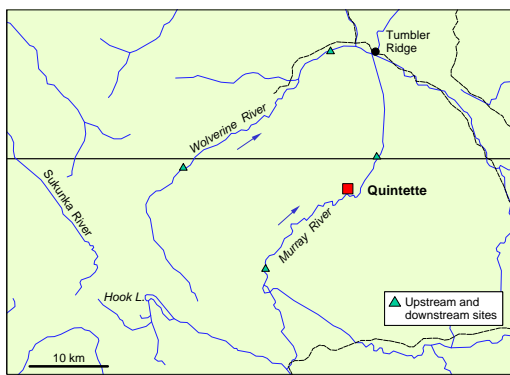
One of the challenges at Quintette has been the reclamation of high elevation dumps resulting from mining in this rugged terrain. Waste dump construction by the original operators did not contemplate or allow for re-contouring of the dumps and several high elevation dumps (in excess of 200 metres) were created. Failures in some of these dumps resulted in large run-out areas, significantly increasing the area of mine disturbance. Although Teck Cominco has been exempted from re-sloping the high dumps by the provincial government, it has undertaken to round the crests, distribute fines and seed the dump faces in order to accelerate natural regrowth. Teck Cominco has also seeded the dump run-out areas and these are now showing signs of recovery.

The low elevation Shikano mine area and local terrain allowed for soil salvage and the creation of low height (<50 metre) dumps. As a result, very high quality reclamation success has been demonstrated in this area. The Babcock mining area was permitted in more recent times and was the last area to be mined before mine closure. Two large waste dumps were built, both nominally 150 metres in height. These high elevation dumps have been re-contoured to 50% of their height in compliance with permit

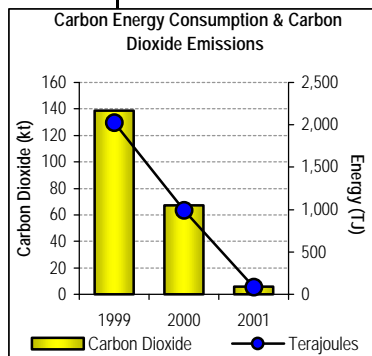
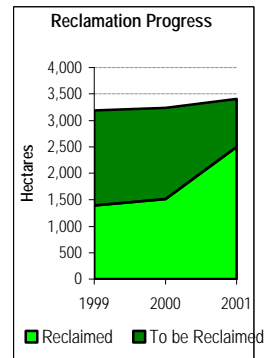
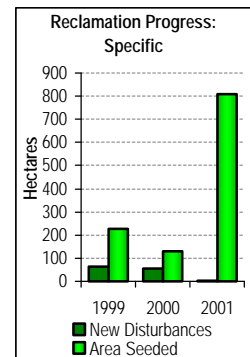
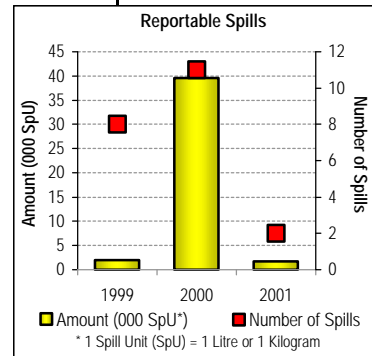
conditions and in an effort to minimize the size of the overall footprint. The base of the dumps butt up against stands of forested ground. During the re-sloping process, large quantities of fines were generated on the face of the bottom 50% of the dump faces. Before vegetation had an opportunity to stabilize the dumps, a heavy rainstorm (1:30 year event) resulted in saturation of the dump face, causing significant slumping and erosion. The dumps have been re-seeded and the success of re-vegetation in stabilizing the dump and controlling erosion will be monitored over time.

## Discussion of Performance Indicators

- Sedimentation Pond Discharges**  
Sedimentation pond discharges have been between 97.3 and 98.8 percent compliant during the past three years. Three suspended solids samples exceeded the compliance limit of 50 mg/L during 2001.
- Murray and Wolverine Rivers**  
Nitrate levels in the Murray and Wolverine River systems increase downstream of the mine site but are less than 1 mg/L and are much less than the BC drinking water guideline of 10 mg/L and the level for protection of aquatic life, which is 200 mg/L.
- Energy Efficiency/Greenhouse Gas (GHG) Emissions**  
Energy consumption and GHG emissions have decreased dramatically since 1999. This results from the fact that the mine permanently ceased operations in August 2000. Energy efficiency indicators were not produced for Quintette because of the closure of operations.
- Reportable Spills**  
The quantity and number of reportable spills increased in 2000 as compared with 1999 and subsequently have decreased dramatically in 2001. There has been far less activity on site since closure, with the principal fuel consuming activity being the re-contouring of waste piles in preparation for seed and fertilizer application. None of the spills resulted in an impact on the environment.
- Reclamation**  
The main activity on-site since August 2000 has been reclamation of the mine site disturbances, dismantling and removal of mine site structures and selling of used equipment. More than 800 hectares of land were reclaimed in 2001. 72% of the total disturbance area has been reclaimed.



Northeastern British Columbia



## Land Capability and Reclamation

All mining projects eventually deplete their ore reserves and must then be closed in an environmentally responsible manner respecting government requirements, public expectations and company policy. Typically, mine reclamation efforts are directed towards establishing a landscape that will support the end land use objectives established for the property, such as wildlife habitat for specific target species, forestry, backcountry recreation or cattle grazing, to name a few. Water management control is also an important consideration in closure planning in that erosion must be controlled and sometimes, water containment and treatment is needed to ensure that drainage discharges do not exceed permit conditions. All mining operations must prepare detailed closure and reclamation plans for review and approval by the appropriate government authorities. These documents also provide estimates for the cost of closure and financial securities are posted with the government to provide assurance that sufficient funds will be available at the time of closure.

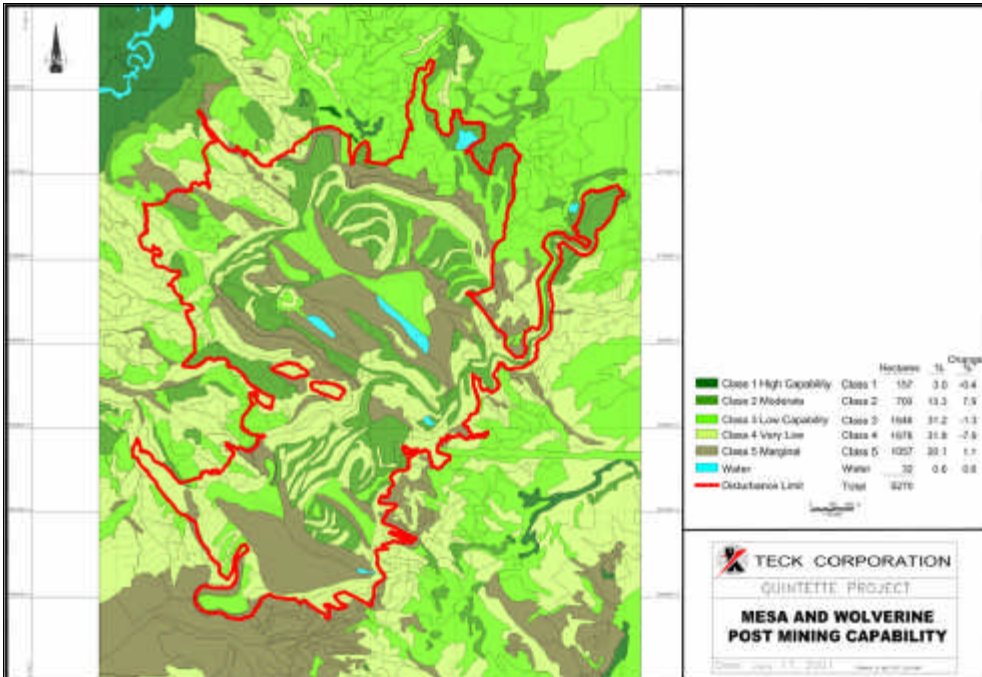
All of Teck Cominco's mining operations conduct progressive reclamation. Progressive reclamation is a term which means that when a part of a mining operation is no longer needed for mining purposes, it is reclaimed according to the methods and procedures approved by government and for the end land use objectives established. Progressive reclamation provides evidence over time that mine waste dumps and other facilities can be successfully reclaimed, provides experience and input into future activities, returns the property to nature on a faster time scale than would otherwise be the case and reduces the final reclamation costs. Progressive reclamation also affirms to both the regulatory agencies and the general public that the company is committed to reclamation and to reducing impacts on the environment.

In British Columbia, all of Teck Cominco's coal mines contain a clause within their reclamation permits that pre- and post-mining land capability be equivalent to or greater on an average property basis. Land capability is defined as the ability of land resources to support a given land use on a sustained basis. The return of equivalent land capability does not imply that the various types of capability will be identical to pre-disturbance conditions. It provides for flexibility – individual land capabilities may change, but overall capability will be equivalent.

Implicit within the definition of equivalent productivity or capability is the assumption that reclaimed mined lands should be capable of supporting similar, but not necessarily identical land uses, when comparisons are made with pre-mining conditions. In practice, this requires that landscape, soil, vegetation, wildlife and human-use components of the development area be considered in conjunction with mine development plans and addressed in a reclamation plan

that conserves land and soil resources, minimizes surface disturbance and completes reclamation in a timely manner. By returning these basic components, a reclaimed landscape is created that maintains similar land management options as existed prior to mining.

After reclamation, many decades will be required before equivalent land capability can be





physically demonstrated in the field. Even after this time period, plant succession will continue. Thus, in order to demonstrate that reclamation plans will meet the equivalency criteria in the future, Teck Cominco is developing, with the assistance of consultants, a land capability assessment technique following the Canada Land Inventory process. Pre- and post- mining reclamation areas are mapped using this technique and field verified in order to assess and document the findings. In addition, the company and the Mining Association of British Columbia are working jointly with the Province to develop objective field measurement techniques to follow the progress of reclaimed areas and verify that the objectives of the reclamation program and the predictions of the land capability assessment are being achieved.

The critical features of land capability are the landscape form (primarily slope), aspect, drainage, and soil quality and quantity. The assessment is rather lengthy and requires careful scientific scrutiny in defining polygons of similar features for both pre-mining and post-mining landscapes. An example of the land capability assessment for post-mining conditions at the Quintette Mesa/Wolverine area, which is located between elevations 1400 and 1800 m above sea level in northern B.C., is shown herein.

The land capability classes are colour coded from high capability (Class 1) in the river valley (dark green) to marginal land capability (Class 5, brown) both inside and outside of the mine area, which is defined by the red line. Medium green is used to identify moderate land capability (Class 2) on flat dump platforms while the rock walls and floor of the open pit are of marginal capability. The results of the pre- and post-mining land capability assessment are summarized in the legend, which provides the total percentage change for each land capability class. Once reclamation is complete, there will have been an overall 7.9% decrease in very low land capability (lime green, Class 4) and a 7.9% increase in the moderate Class 2 land capability. Thus, the reclaimed landscape will provide about equivalent land capability as existed prior to mining on an average property basis. In addition to land capability analysis, wildlife capability maps for various target species are also being prepared.



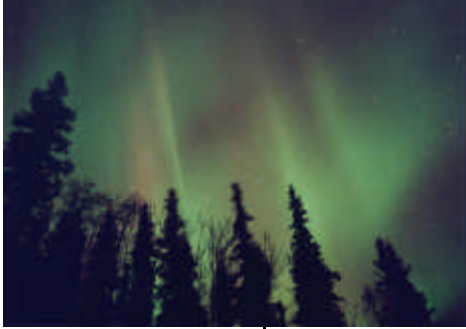
*Mountain goat grazing in reclaimed coal pit (Shikano)*



*Woodland caribou grazing at base of waste dump*

## Projects

### Pogo



*A view of the  
Northern Lights from Pogo*

Teck Cominco Limited, through its subsidiary Teck-Pogo Inc., is proposing to develop an underground gold mine in the interior of Alaska. A National Environmental Policy Act (NEPA) review and the Environmental Impact Statement (EIS) process was triggered for the Pogo Project in August 2000 by the submission of an application to the Environmental Protection Agency (EPA) for a National Pollutant Discharge Elimination System (NPDES) permit. A draft scoping document was published in August 2000 and the scoping meetings required for the EIS were conducted in Alaska in September 2000. As required by the EIS process, public hearings on the draft EIS will be held in Alaska during 2002.

To date, 86 permits including their renewals and amendments have been issued by state and federal agencies for project activities associated with the surface and underground exploration programs; at present, 30 of these authorizations are active. The two main permits issued by the State of Alaska for advanced exploration activities are the Plan of Operations and the non-domestic Wastewater Disposal Permit. Quarterly reports submitted to the State include: a summary of advanced exploration activities; data from the water treatment plant, compliance and groundwater quality monitoring well data; as well as information regarding surface water and adit drainage management.

There are 46 major federal and state permits and approvals anticipated for mine development. A series of documents containing updated and detailed information on the major components of the project has been submitted for agency review as part of the permit application process. The EIS review process and documentation are maintained by the EPA at [www.pogomineeis.com](http://www.pogomineeis.com).

The Pogo Mine will require approximately two years to construct and will have an operating life of 11 years based on the current ore reserves. It is estimated that 500 employees will be required for mine construction and 288 for operation. Many of these new employees will be recruited from local hire and training programs, in which the Pogo Project is already an active participant, for example:

- Teck-Pogo participates in a job training program for the local Alaskan-Russian population. The program utilizes the Delta Mine Training Center as a venue for training miners, with the curriculum having been developed by Pogo staff. Of the 28 students who have successfully completed the program, six have been hired on a temporary basis at Pogo and six others have been placed with other companies. Two part-time employees continue to work at Pogo.
- The company also sponsors and supports an Alaskan Native Hire and training program and currently employs three full-time and four temporary Alaskan Native workers. In addition, Teck-Pogo is involved in a local village recruitment and training initiative aimed at getting Alaskan Native people interested in and trained to work at Pogo. Presentations are given in the villages to explain the project and include descriptions of training and funding available for mine-related employment. The recruitment interest far exceeds the current need for new project employees.

- An Underground Mine Rescue Team for Pogo is currently undergoing training. The team consists of mostly local employees along with 3 local non-employee team members. Training modules include Emergency Trauma Training (an Alaskan Medical Certification), Fire Fighting and Environmental Response. So in addition to satisfying safety requirements at Pogo, the local communities will benefit from having residents with the training to respond to medical and environmental emergencies during their time off.

Teck-Pogo's involvement in all of these programs will increase as the project proceeds to construction and operation and the need for employees escalates.

*Pogo advanced exploration site*



*Alaska*

## Pend Oreille

The Pend Oreille Mine is an underground zinc mine located in northeastern Washington State. Formerly owned by Bunker Hill, the mine operated from 1952 to 1977, when it was closed for economic reasons. Cominco acquired the mine in 1995 as a concentrate source for the Trail smelter and refinery operations, which are located only 100 kilometres away.

There were many hurdles to be overcome before the reopening becomes a reality. In order to make its required rate of return, the Pend Oreille resource needed to be increased to allow mining for at least ten years. Also representing a challenge to the operation was the political climate of the state. Mining had long ceased to be a viable industry in the increasingly urban and high-tech business climate of Washington. A new mining law, passed in 1994, imposed strict environmental measures on any proposed metal mine in the state. Cominco was required to complete an Environmental Impact Statement for this mine reopening.



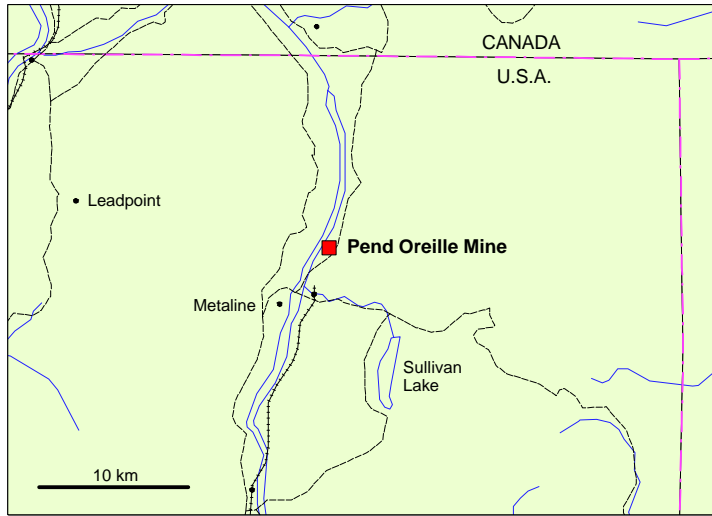
The company recognized that despite strong local support for the reopening, a portion of the community had serious doubts about its suitability. The townspeople in general worried about the effects of the opening on their way of life. Due to the expected relatively short life span of the reopened mine, it was realized that the adverse effects of the “Boom/Bust” economic cycle would be accentuated. This cycle of rapid economic growth during development and operation (the “Boom”) followed by severe economic downturn (the “Bust”) after closure has been the rule rather than the exception in the rural western United States’ natural resource development. As had been witnessed by Metaline Falls, mining communities can suffer at both ends of a mine project’s life. Community life can be altered by the rapid influx of people and

capital at the front end and fall even more rapidly as economic viability declines when a mine shuts down leaving most people no choice but to move away in search of work elsewhere.

In order to address these concerns, Teck Cominco approached the project with the objective of making the local community a partner with the implicit understanding that they would have sway over certain aspects of the mine’s interactions. The mayor was asked to form a committee of local stakeholders who would be interested in working with the company to plan for the eventual closure of the then proposed Pend Oreille mine and its impact on the local quality of life. This committee, while originally formed to address a narrow issue of post-closure economic sustainability, grew its mission to include issues of the development stage, the operation stage as well as closure. The Selkirk Community Teck Cominco Planners (SCTCP) was designed to be inclusive of all aspects of the local community so people not directly profiting from the mine development have as much say as those that only saw the negative impacts from the development.

The SCTCP has begun to address issues of health care, environment, economic development in tandem with the mine, economic sustainability throughout the mine-life cycle, training, education, infrastructure development, and reuse of the mine property following closure. At a recent community open house, over 150 residents from an area

with a population of less than 1000 spent three hours discussing what they wanted their community to look like as the mine developed. For once the community feels as though they have a stake in the project rather than just being helpless bystanders. As the mine develops and operates the role of the SCTCP will expand to provide a forum for community discussion of the mine's social, economic and environmental influences on town life.



*Northwest Washington State*

## List of Acronyms

ARET – Accelerated Reduction and Elimination of Toxics  
CCME – Canadian Council of Ministers for the Environment  
CERES - Coalition for Environmentally Responsible Economies  
CERMC – Corporate Environment & Risk Management Committee  
CLI – Canada Land Inventory  
CMA – Compañía Minera Antamina S.A.  
COA – Certificate of Approval  
EHS – Environment, Health & Safety  
EIS – Environmental Impact Statement  
ELUP - End Land Use Plan  
EMS – Environmental Management System  
EPA – Environmental Protection Agency  
ERA – Environmental Risk Assessment  
EVSTF - Elk Valley Selenium Task Force  
GHG – Greenhouse Gas  
GRI – Global Reporting Initiative  
MEM – Ministry of Energy and Mines  
MDRC - Mine Development Review Committee  
MISA - Municipal Industrial Strategy for Abatement  
MITAC - Mining Industry Training and Adjustment Committee  
MMER – Metal Mining Effluent Regulations  
MMLER – Metal Mining Liquid Effluent Regulations  
MSDS - Material Safety Data Sheet  
NEPA - National Environmental Policy Act  
NGO - Non-Governmental Organizations  
NPDES – National Pollutant Discharge Elimination System  
NPRI – National Pollutant Release Inventory  
NPS – National Parks Service  
PBD - Product Business Development  
PM<sub>10</sub> – Particulate Matter (less than 10 microns)  
PS<sup>2</sup> – Product Stewardship System  
SCTCP - Selkirk Community Teck Cominco Planners  
TRI – Toxic Release Inventory  
TSS – Total Suspended Solids  
VCR – Voluntary Challenge & Registry  
WQG – Water Quality Guidelines

## Data Tables - Smelters / Refineries

### Trail Metallurgical Operations

Metals Released in Effluent				
	tonnes	1999	2000	2001
Cadmium		0.41	0.29	0.18
Lead		4.9	2.8	1.7
Zinc		40	31	18

Metals Released in Air Emissions				
	tonnes	1999	2000	2001
Cadmium		0.60	0.25	0.09
Lead		17.0	6.7	4.2
Zinc		147.4	138.7	100.3

Average Ambient Air Quality				
	mg/m <sup>3</sup>	1999	2000	2001
Zinc		1.06	0.74	0.33
Lead		0.38	0.26	0.11

Reportable Spills / Incidents				
	1999	2000	2001	
Number	10	7	7	

Permit Compliance - Number of Excursions				
	1999	2000	2001	
Air	3	20	9	
Effluent	22	10	9	

Carbon Energy Consumption and Carbon Dioxide Emissions				
	1999	2000	2001	
Carbon Dioxide (kt)	233.6	281.6	195.9	
Energy (TJ)	3,767	4,455	3,180	

Carbon Energy Intensity in Products				
	1999	2000	2001	
GJ / t (zinc & lead)	10.34	12.23	14.24	

### Cajamarquilla Refinery

Limit Excursions				
	1999	2000	2001	
Air (Voluntary)	31	290	262	
Effluent (Regulatory)	21	14	0	

Annual Average SO <sub>2</sub> Emission Concentrations				
	ppm	1999	2000	2001
Sulphur Dioxide		466	647	566

Annual Average Ambient SO <sub>2</sub> Conditions				
	mg/m <sup>3</sup>	1999	2000	2001
Radio Observatory		0.036	0.055	0.059

Metals Released in Effluent				
	tonnes	1999	2000	2001
Zinc		0.56	0.81	0.26
Cadmium		0.008	0.009	0.002
Lead		0.009	0.009	0.002

Carbon Energy Consumption and Carbon Dioxide Emissions				
	1999	2000	2001	
Carbon Dioxide (kt)	4.13	6.06	8.30	
Energy (TJ)	60.3	87.3	119.3	

Carbon Energy Intensity in Product				
	1999	2000	2001	
GJ / t (zinc)	0.49	0.72	0.98	

## Red Dog Mine

Reportable Spills			
	1999	2000	2001
Number of Spills	170	113	221
Amount (000 SpU*)	246.5	250.2	117.0

\* 1 Spill Unit (SpU) = 1 Litre or 1 Kilogram of material

Permit Excursions			
	1999	2000	2001
Number	8	10	9

Metals Released in Effluent			
tonnes	1999	2000	2001
Cadmium	0.004	0.004	0.007
Lead	0.005	0.004	0.004
Zinc	0.330	0.166	0.227

Red Dog Creek Natural Metal Loadings			
tonnes	1999	2000	2001
Zinc	30.4	37.2	21.6
Cadmium	0.22	0.25	0.18
Lead	1.03	1.46	6.49

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	160	171	181
Energy (TJ)	2,262	2,416	2,563

Carbon Energy Intensity in Product			
	1999	2000	2001
GJ / t (zinc & lead*)	3.71	3.93	4.18

## Polaris Mine

Garrow Lake Surface Water Quality			
mg/L	1999	2000	2001
Lead	0.023	0.014	0.002
Zinc	0.26	0.30	0.21

Annual Discharge to Garrow Lake			
tonnes	1999	2000	2001
Lead	0.03	0.03	0.02
Zinc	0.33	0.79	0.41

CFC Consumption			
kg	1999	2000	2001
Usage	1,750	530	2,102

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	44.8	45.1	45.0
Energy (TJ)	635	639	637

Carbon Energy Intensity in Product			
	1999	2000	2001
GJ / t (zinc & lead*)	3.4	3.8	4.2

\* Metal contained in concentrate



## Sullivan Mine

Reportable Spills			
	1999	2000	2001
Number of Spills	2	1	-
Amount (SpU)*	2.1	0.2	-

\* 1 Spill Unit (SpU) = 1 Litre or 1 Kilogram of material

Metals Released in Effluent			
tonnes	1999	2000	2001
Lead	0.37	0.17	0.11
Zinc	2.21	1.50	1.22

St. Mary River - Annual Average Water Quality			
Zinc			
mg/L	1999	2000	2001
Upstream	0.003	0.003	0.003
Downstream	0.015	0.014	0.009

Reclamation Progress			
Hectares	1999	2000	2001
To be Reclaimed	676.9	639.3	575.1
Reclaimed	353.3	406.9	473.1

Reclamation Progress: Specific			
Hectares	1999	2000	2001
New Disturbances	9.7	16.0	2.0
Reclaimed	69.5	53.6	66.2
Reclaimed: Tailings	66.5	34.0	36.4

Carbon Energy Consumption & Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	20.9	20.6	16.5
Energy (TJ)	393	387	311

Carbon Energy Intensity in Products			
	1999	2000	2001
GJ / t (zinc & lead*)	3.05	3.08	2.98

\* Metal contained in concentrate

## Highland Valley Copper

Reportable Spills			
	1999	2000	2001
Number	10	12	-

Reclamation Progress			
Hectares	1999	2000	2001
To be Reclaimed	4,512	4,598	4,500
Reclaimed	1,693	1,772	1,900

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	32.7	69.0	71.1
Energy (TJ)	464	978	1,007

Carbon Energy Intensity in Product			
	1999	2000	2001
GJ / t (copper*)	5.1	5.2	5.3

## Gold

### Hemlo Operation

Reportable Spills			
	1999	2000	2001
Number of Spills	14	18	8
Amount (000 SpU*)	7.2	5.6	41.8

\* 1 Spill Unit (SpU) = 1 Litre or 1 Kilogram of material

Annual Average Effluent Discharge Quality			
mg/L	1999	2000	2001
Cyanide	0.018	0.043	0.062
Copper	0.021	0.045	0.029
Zinc	0.012	0.030	0.019

White River - Annual Average Water Quality			
Cyanide			
mg/L	1999	2000	2001
Upstream	0.0042	0.0042	0.0042
Downstream	0.0042	0.0042	0.0042
Copper			
mg/L	1999	2000	2001
Upstream	0.008	0.013	0.012
Downstream	0.005	0.017	0.007
Zinc			
mg/L	1999	2000	2001
Upstream	0.011	0.014	0.005
Downstream	0.005	0.015	0.005

Reclamation Progress			
Hectares	1999	2000	2001
To be Reclaimed	283	266	280
Reclaimed	52	73	73

Reclamation Progress: Specific			
Hectares	1999	2000	2001
New Disturbances	17	10	14
Area Reclaimed	6	10	-

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	28.4	30.1	31.8
Energy (TJ)	437	464	485

Carbon Energy Intensity in Product			
	1999	2000	2001
GJ / oz (gold)	0.72	0.76	0.79

## Coal

### Elkview

Reportable Spills			
	1999	2000	2001
Number of Spills	22	71	38
Amount (000 SpU*)	155.3	104.6	18.9

\* 1 Spill Unit (SpU) = 1 Litre or 1 Kilogram of material

Permit Compliance			
	1999	2000	2001
% Compliance	86.5	95.4	95.6

Reclamation Progress			
Hectares	1999	2000	2001
To Be Reclaimed	2,883	2,905	2,812
Reclaimed	408	438	531

Reclamation Progress: Specific			
Hectares	1999	2000	2001
New Disturbances	79.0	51.7	-
Area Seeded	83.0	30.0	93.0

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	117.7	174.0	217.2
Energy (TJ)	1,823	2,638	3,261

Carbon Energy Intensity in Product			
	1999	2000	2001
GJ / t (coal)	0.68	0.65	0.59

Annual Average Ambient Air Quality Particulate			
µg/m <sup>3</sup>	1999	2000	2001
Michel Hotel	19.9	20.4	20.4
Whispering Winds Trailer Park	30.8	21.6	19.0
Sparwood Municipal Office	51.9	42.9	27.5

Elk River - Annual Average Water Quality			
Suspended Solids			
mg/L	1999	2000	2001
Upstream	20.4	13.1	18.1
Downstream	66.9	29.6	16.3
Nitrate			
mg/L	1999	2000	2001
Upstream	0.988	1.070	0.975
Downstream	0.705	0.990	1.003

Discharge to Elk River			
Average Concentrations			
mg/L	1999	2000	2001
TSS	63.0	26.9	18.6
Nitrate	3.0	3.2	2.5

Michel Creek - Annual Average Water Quality			
Suspended Solids			
mg/L	1999	2000	2001
Upstream	51.9	33.3	17.0
Downstream	54.9	30.1	14.7
Nitrate			
mg/L	1999	2000	2001
Upstream	0.26	0.13	0.19
Downstream	1.17	1.43	1.41

Discharge to Michel Creek			
Average Concentrations			
mg/L	1999	2000	2001
TSS	26.8	23.5	29.9
Nitrate	34.7	42.7	52.4

## Bullmoose Mine

Reportable Spills			
	1999	2000	2001
Number	13	9	2
Amount (000 SpU*)	21.7	4.8	0.7

\* 1 Spill Unit (SpU) = 1 Litre or 1 Kilogram of material

Annual Average Ambient Air Conditions			
Total Suspended Particulate			
mg/m <sup>3</sup>	1999	2000	2001
Mine Site	45.7	37.0	40.2
Rail Loadout	15.0	9.8	14.3

South Bullmoose Creek Annual Average Water Quality			
Nitrate			
mg/L	1999	2000	2001
Above Minesite	0.019	0.015	0.027
Downstream	4.8	3.2	3.9

Discharge to South Bullmoose Creek			
Average Discharge Quality			
mg/L	1999	2000	2001
TSS	6	9	11
Nitrate	10	5	4

Reclamation Progress			
Hectares	1999	2000	2001
To Be Reclaimed	323.5	379.5	324.5
Reclaimed	469.5	473.5	508.5

Reclamation Progress: Specific			
Hectares	1999	2000	2001
New Disturbances	0	68	0
Area Seeded	33.0	4.0	35.0

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	54.5	56.2	68.2
Energy (TJ)	790.3	815.3	985.8

Carbon Energy Intensity in Product			
	1999	2000	2001
GJ / t (coal)	0.65	0.58	0.52

## Quintette Mine

Reportable Incidents			
	1999	2000	2001
Number of Spills	8	11	2
Amount (000 SpU*)	2.0	39.6	1.8

\* 1 Spill Unit (SpU) = 1 Litre or 1 Kilogram of material

Murray River - Annual Average Water Quality			
Nitrate			
mg/L	1999	2000	2001
Upstream	0.06	0.07	0.07
Downstream	0.09	0.12	0.10

Discharge to Murray River			
Average Nitrate Concentrations			
mg/L	1999	2000	2001
Nitrate	4	3	2

Wolverine River - Annual Average Water Quality			
Nitrate			
mg/L	1999	2000	2001
Upstream	0.17	0.04	0.05
Downstream	0.85	0.82	0.94

Discharge to Wolverine River			
Average Nitrate Concentrations			
mg/L	1999	2000	2001
Nitrate	10	8	13

Reclamation Progress			
Hectares	1999	2000	2001
To be Reclaimed	1,800	1,708	731
Reclaimed	1,388	1,518	2,499

Reclamation Progress: Specific			
Hectares	1999	2000	2001
New Disturbances	63.3	56.4	4.0
Area Seeded	227.4	130.4	809.0

Carbon Energy Consumption and Carbon Dioxide Emissions			
	1999	2000	2001
Carbon Dioxide (kt)	138.8	67.1	5.8
Energy (TJ)	2,027	991	86

## Unit Definitions and Conversion Factors

t	tonnes
kt	kilotonnes (1,000 tonnes)
mg	milligram (0.01 g)
µg	microgram (0.000001 g)
ppm	parts per million
L	litre
GJ	Gigajoule ( $10^9$ Joules)
TJ	Terajoule ( $10^{12}$ Joules)

## Greenhouse Gas Conversion Factors for Fuel

(source: Mining Association of Canada)

	<b>CO<sub>2</sub></b>	<b>GJ</b>
Diesel	2730 g/L	38.68 GJ/m <sup>3</sup>
Gasoline	2360 g/L	34.66 GJ/m <sup>3</sup>
Natural Gas	1880 g/m <sup>3</sup>	0.03723 GJ/m <sup>3</sup>
Propane	1530 g/L	25.53 GJ/m <sup>3</sup>
Light Fuel Oil	3090 g/L	38.68 GJ/m <sup>3</sup>
Coal	2110 g/kg	30.5 GJ/t
Coke	2480 g/kg	28.83 GJ/t