
2004 Status Report on the Recommendations of the Trail Community Lead Task Force

Prepared for:

**TRAIL
HEALTH &
ENVIRONMENT
COMMITTEE**



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EXECUTIVE SUMMARY

Trail has been the site of metals smelting and refining facilities for over 100 years. The proximity of the community to the smelter complex has resulted in elevated levels of some metals in community air, soil and dust. The main focus of attention since about 1975 has been lead and its possible health effects on children of pre-school age. Although there has never been a recorded incident of clinical lead poisoning among children in this community, studies elsewhere have found that subtle health effects can occur at low levels of exposure. These effects can only be detected by studying large populations of children.

In 1990, the Trail Community Lead Task Force was formed to develop a strategy for reducing children's lead exposures. This program involved the community, industry and government working together to study the problem, take actions and recommend long-term solutions. The Task Force undertook comprehensive community education and lead health intervention programs, and Teck Cominco Metals Ltd. (Teck Cominco)¹ made several major improvements in emissions control - the most significant by far being the construction and start-up of the new KIVCET lead smelter.

In 1998, the Task Force reached its first short-term goal of having at least 90 percent of children with blood lead levels below 15 µg/dl, which was the Task Force's individual level of concern. By 2000, the next short-term goal of having 95 percent below 15 µg/dl had nearly been reached. When the Task Force was first formed, there were well over 100 children with blood lead levels of 15 µg/dl or higher. By 2000, there were only about a dozen.

The Task Force wrapped up its work and submitted its recommendations for long-term actions in February 2001. The BC Ministry of Water, Land and Air Protection² has not yet formally reviewed the Task Force recommendations, which are presented in detail later in this document. However, Teck Cominco, the Interior Health Authority³ and the City of Trail all committed to implementing the Task Force's recommendations without delay. Key programs, such as blood lead testing and case management, have continued without interruption since 2001.

The 2004 case management program consists of: follow-up testing of children who have elevated (any child with blood lead level ≥ 10 µg/dL) or rising (children under 12 months with blood lead level ≥ 7 µg/dL) blood lead levels; counseling of families with children who have elevated or rising blood lead levels; and provision of case management services to prevent and/or reduce lead exposure. Education will continue to play an important role in decreasing childhood lead exposure, with programs aimed at the prenatal, early childhood, and community levels. Teck Cominco will pursue and report on its progress toward further emission reductions. Community dust control including greening, dust suppression on alleys and street cleaning will continue. Teck Cominco will monitor the work it did in 2001 and 2002 to improve the vegetative buffer between its operations and the community along the boundary with Tadanac. A new Work Project Assistance Program, as recommended by the Task Force, is currently being developed for implementation in 2004.

¹ Note: In 2001, Cominco merged with another Canadian mining company (Teck Corp.) to form Teck Cominco Limited and related subsidiaries. Trail Operations is part of Teck Cominco Metals Ltd..

² Note: Prior to 2001, the BC Ministry of Water, Land and Air Protection was known variously as BC Environment, the BC Ministry of Environment, or the BC Ministry of Environment, Lands and Parks.

³ Note: In 2001, health services delivery regions in BC were also reorganized. The Kootenay Boundary Community Health Service society was superceded at that time by the Interior Health Authority.

The combined three-agency budget for 2004 is approximately \$150,000 which does not include emission control projects at Teck Cominco or salaries of regular staff.

History

Lead has been a fact of life in Trail for the past 100 years. Although there has never been a recorded incident of clinical lead poisoning among children in this community, studies elsewhere have found that very subtle health effects can occur at low levels of exposure. These effects can only be detected by studying large populations of children.

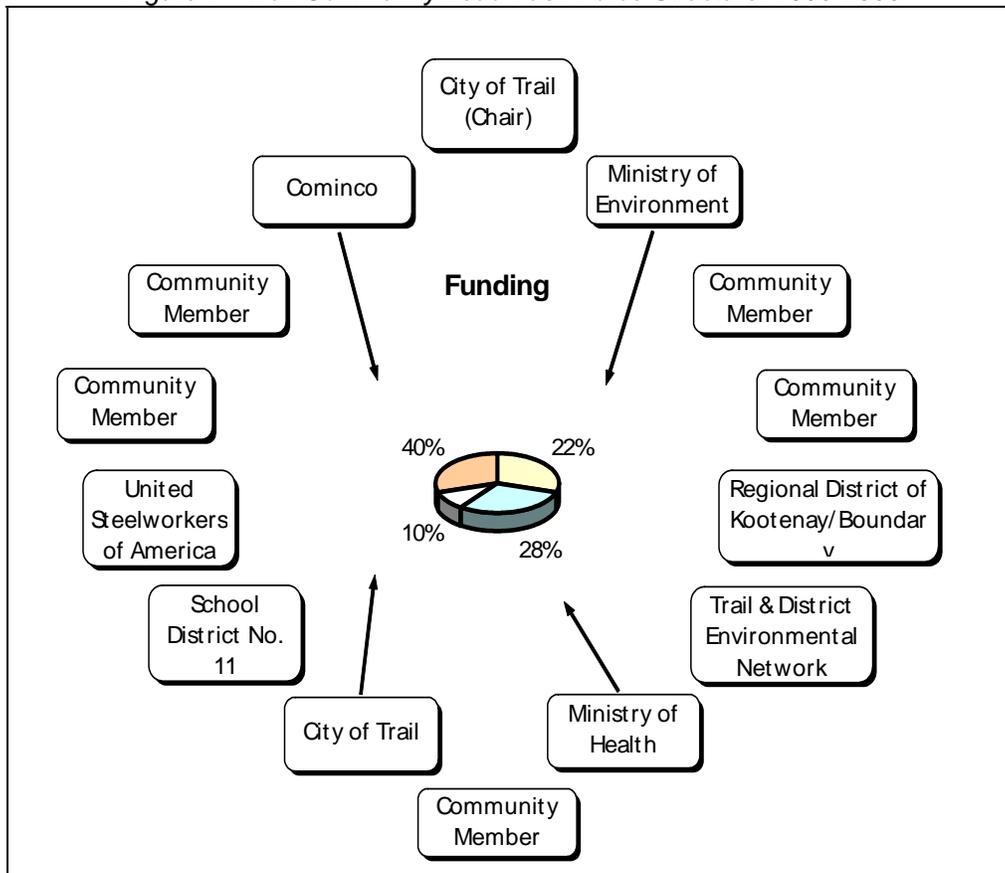
In 1975, Neri et. al. (1978) found that children's blood lead levels in Trail were significantly higher than those in the nearby comparison community of Nelson, BC. A 1989 study found that soil lead concentration and, secondarily, house dust lead concentration, were the principal environmental determinants of elevated blood lead levels in Trail children (Hertzman et al., 1991). Although the average blood lead level had declined from 22.4 µg/dL for 1-3 year olds in 1975 to 13.8 µg/dL for 2-5 year olds in 1989, 39.4% of the children tested in 1989 were above the U.S. Environmental Protection Agency's "level of no concern" of 15 µg/dL at the time (US EPA, 1986).

The 1989 study's recommendations prompted the formation of the Trail Community Lead Task Force in 1990. The Task Force was given responsibility for developing a strategy for reducing Trail children's lead exposures. Communities with inactive smelters or mine sites have often implemented large clean-up programs to permanently reduce lead exposures. By contrast, the strategy for Trail is expected to help the smelter and the community to continue to co-exist by focussing on actions that will be effective in the midst of ongoing, albeit reduced, emissions.

The Task Force was composed of representatives from numerous community groups, local government, the Province of British Columbia and the smelter company (Teck Cominco, Limited). All meetings were open to the public and the media (see Figure 1). Task Force members worked cooperatively to reach consensus on most issues and Teck Cominco participated voluntarily in all Task Force programs. Teck Cominco, the BC Ministries of Health and Environment, and the City of Trail provided a total of approximately \$5 million in funding from 1990 to 2000. In addition to financial contributions, the Province and Teck Cominco provided technical resource people with health, environment and public relations backgrounds to participate in program planning.

The Trail model of co-operative, multi-stakeholder program planning and shared funding contributed enormously to the program's effectiveness and efficiency. The program's work is recognized internationally and the Trail co-operative model has been adopted in several other jurisdictions.

Figure 1 - Trail Community Lead Task Force Structure: 1990-2000



Early in its mandate, the Task Force estimated the cost of residential soil replacement in Trail at about \$50,000,000 and expressed concern that excavation and soil transport might result in a transient increase in lead exposure. In addition to the financial deterrent and questions of efficacy, soil removal appeared to be socially unacceptable in Trail. Also, the lead smelter in operation in 1990 relied on outdated process technology and, despite efforts to control emissions, the amount of lead discharged to the environment was about 300 kg/day (Cominco Ltd., 1993). At the time, Cominco was encountering technical difficulties in implementing new lead smelting technology in Trail. Smelter emissions, and therefore soil contamination rates, were expected to continue at these levels for number of years. For all of these reasons, the Task Force chose not to recommend any immediate soil replacement. Instead, the Task Force embarked on ambitious programs of community education and case management, as well as environmental assessment aimed at better understanding lead exposure pathways.

Teck Cominco began operating a new lead smelter in Trail in April, 1997. The state-of-the-art smelter reduced lead emissions from stacks by about 70%. In addition, the new smelter dramatically lowered fugitive (non-stack) emissions through the replacement of several existing plants with a single, enclosed plant.

The reduction in lead emissions has had a significant effect on children's blood lead levels. From 1989 through 1996, average blood lead levels of Trail children tested for the first time declined at

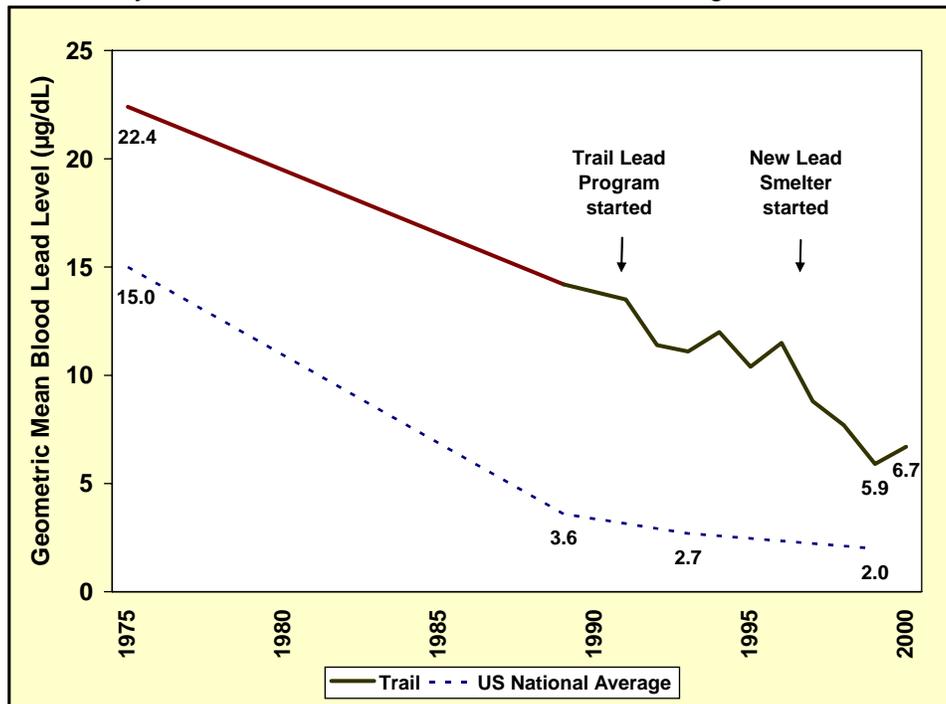
an average rate of 0.6 µg/dL/year. The year-to-year variability in average blood lead levels during this period appeared to be related to weather conditions during the month preceding the fall blood testing clinic. Specifically, when August was relatively dry, blood lead levels tended to be higher.

From 1996 to 1999, the average blood lead level of children tested for the first time fell by 54% - from 11.0 µg/dL to 5.1 µg/dL. The average annual rate of decline during this three-year period was 1.9 µg/dL/year. The rapid decline appears to be attributable to the replacement of the old lead smelter in May of 1997. Air lead levels in Trail during the summer of 1997 were about 50% lower than during the summers of 1994-1996. By 1998, summer air lead levels were 75% lower than during the last years of operation of the old lead smelter. Annual average air lead levels in Trail are now about 0.25-0.30 µg/m³.

In 2000, the average blood lead level among Trail pre-schoolers tested for the first time increased to 6.3 µg/dl. Air lead levels and dustfall lead levels did not increase during the summer of 2000, so the increase in blood lead levels in 2000 appears to be due to very dry weather experienced during the month of August.

Shows the history of average blood lead levels for all children tested from 1975 to 2000. The U.S. national average for children aged 1-5 is also presented for comparison.

Figure 2 - History of Children's Blood Lead Levels in Trail - Averages for All Children Tested



From 1997 to 1999, the Task Force conducted a human health risk assessment to evaluate in detail the risk posed by other smelter contaminants, such as arsenic, cadmium and antimony. For chemicals other than lead, the study found "no imminent (short-term) threat to human health" and "very limited potential for adverse health effects from long-term residence in Trail".

In 2000, the Task Force completed its evaluation and selection of options for long-term remedial actions. This process involved in-depth consultation with the community at large. Options for long-term remediation included institutionalizing blood lead monitoring, case management and education programs to ensure their continuation, as well as various physical actions that might be taken to further improve environmental conditions.

The Task Force based its recommendations on consideration of the following major factors:

- Estimated health risk levels (based on studies conducted elsewhere that have linked exposure to metals with health effects in humans and animals)
- Community feedback on the estimated health risk levels
- Effectiveness of options for reducing health risks (based on experiences in Trail and at other sites)
- Socioeconomic impact of intervention and remediation options (including both monetary costs and disruption to the community)

The Task Force submitted its final recommendations to the BC Minister of Environment in February 2001.

The Next Phase – Implementing the Recommendations

The BC Ministry of Water, Land and Air Protection continues to have under review the Task Force recommendations, which are presented in detail later in this document. Ultimately, the recommendations must become part of an approved overall remediation plan for area. However, Teck Cominco, the Interior Health Authority and the City of Trail all committed to implementing the Task Force's recommendations without delay. Key programs, such as blood lead testing and case management, have continued without interruption since 2001.

This report describes the current status of implementation of the Task Force's recommendations and planned activities for 2004.

As of fall 2003, the average blood lead level for children under 3 years of age was 5.7 µg/dL and only 4 children had blood lead levels above the U.S. Centres for Disease Control's individual intervention level (15 µg/dL). By comparison, in 1991, over 100 Trail children had blood lead levels above 15 µg/dL.

A major blood lead screening campaign is planned for 2005 – the year for which the Trail Community Lead Task Force set new goals in 2000. Children under 6 years of age will be recruited to participate in 2005, which will allow Trail blood lead levels to be properly compared against the guidelines.

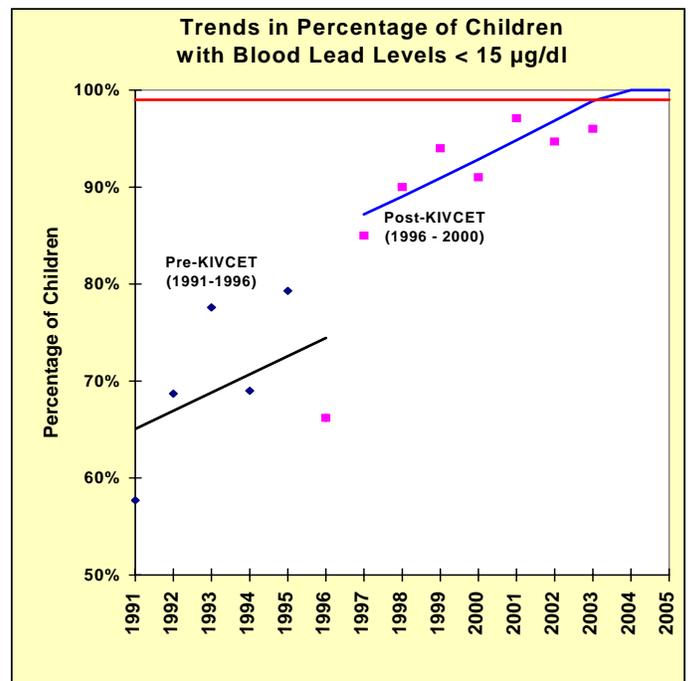
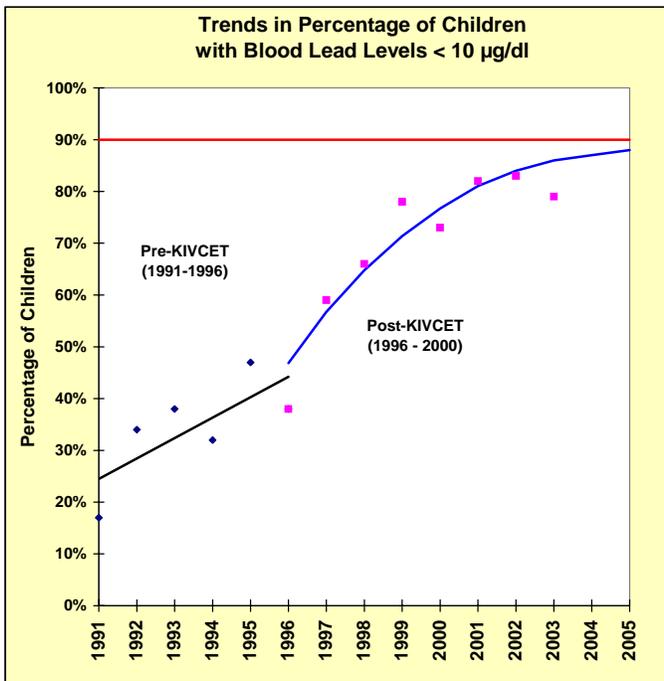
The Trail Health and Environment Committee continues to oversee the actions of Teck Cominco, Interior Health and the City of Trail in carrying out the Task Force recommendations. The number one recommendation - continued source reduction – is being met, as evidenced by recent ambient air data. All other recommendations have also been implemented, with the exception of the Work Project Assistance Program which is currently under development for implementation in 2004.

GOALS SET BY THE TRAIL COMMUNITY LEAD TASK FORCE

Blood Lead

Recommendations:

- At least 90% of children aged 6 to 72 months in area 2 and 3 (see drawing below) should have blood lead levels less than 10 µg/dL by 2005.
- At least 99% of children aged 6 to 72 months in area 2 and 3 should have blood lead levels less than 15 µg/dL by 2005.
- Once these goals are achieved, blood lead testing should continue, in order to provide ongoing protection of young children in Trail.
- If these goals are not achieved, the remedial plan should be re-evaluated.

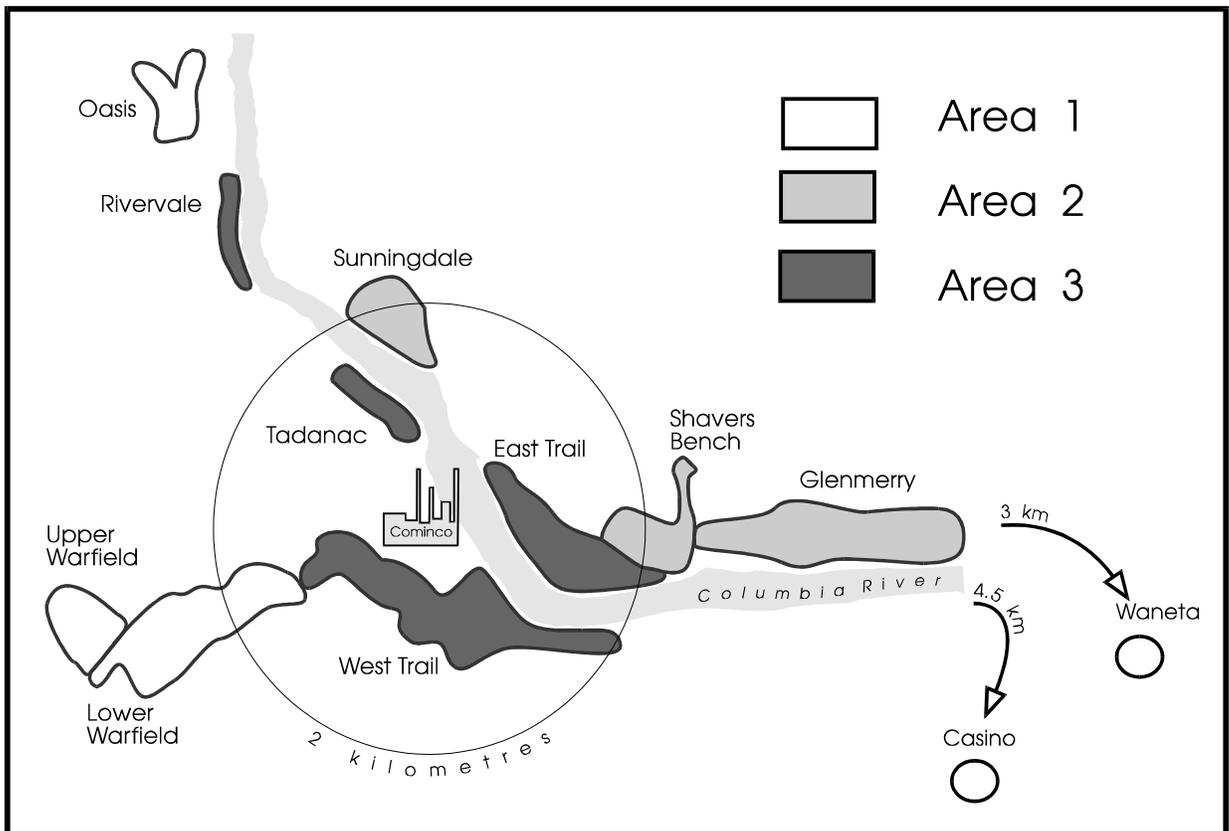


Background:

- 10 µg/dL is the "community concern" level recommended by the US Centers for Disease Control (US CDC) and it is intended to apply to children in the 6-72 months age group. An association between children's blood lead levels and IQ has been observed down to this level in studies involving large numbers of children. These studies have found that, *on average*, groups of children with blood lead levels around 20 µg/dL score about 1-2 points lower on IQ tests than

groups of children with blood lead levels around 10 µg/dL, after controlling for other factors that affect IQ.

- A Canadian Federal-Provincial Task Force recommended in 1994 that communities with unusual sources of lead exposure may need special programs where the percentage of children in those communities with blood lead levels above 10 µg/dL is double that seen in the general population. Since the percentage of children above 10 µg/dL in North America is currently about 5%, this would indicate a target of no more than 10% above 10 µg/dL.
- 15 µg/dL is the "individual intervention level" recommended by the US Centers for Disease Control. The Task Force felt that ideally, children should rarely exceed this blood lead level (less than 1%).
- A few recent studies involving large numbers of children in the U.S. suggest that even blood lead levels less than 10 µg/dL may impact on children's IQ scores. Therefore, the US CDC convened an expert panel to review its present guideline for children's blood levels. The panel made a preliminary recommendation in late 2003 that the level of concern be maintained at 10 µg/dL. Nonetheless, the level of concern may still be revised in coming years, which would result in the Trail Health and Environment Committee revisiting the blood lead goals set by the Lead Task Force.



Other Smelter Contaminants

Recommendations:

- **Potential health risks from other smelter contaminants (i.e. cadmium and arsenic) should be reduced to the levels required by provincial regulations, without shutting down the smelter or conducting widespread soil replacement in the area.**

Background:

- The BC Cancer Agency and BC Ministry of Health have looked at routine health data and conducted several specific studies to see whether the incidence rates of any diseases that may be associated with metals exposure (e.g. lung cancer, kidney disfunction) are higher than normal in Trail. No measureable increases in disease rates have been found.
- The Trail Lead Task Force conducted a detailed risk assessment for other smelter contaminants in 1997-99. The assessment involved first comparing concentrations of metals in the local soil and air against screening guidelines. The elements that exceeded screening guidelines were the subject of more detailed assessment, involving estimation of health risks based on the levels of contaminants in people's air, water, food and in local soil and dust.
- The detailed assessment focused mainly on antimony, arsenic and cadmium and found that:
 - Estimated exposures to cadmium in the local population are well below levels that might be associated with kidney disfunction.
 - Estimated lifetime cancer risks due to arsenic and cadmium in the local population exceed the BC "default" standard of 1 in 100,000. However, in the Trail population, exposure to smelter-related arsenic and cadmium might result in:
 - no more than 1 extra case of lung cancer every 60 years or so
 - no more than 1 extra case of skin cancer every 200 year or so

Summary Status Report to End of 2003

Source Reduction

Teck Cominco Emissions and Dust Control

Stack Emissions

- In 2001, Teck Cominco assigned an environmental technician to identify, prioritize and address opportunities for improvements in air emissions control systems.
- Opportunities for future improvements were identified and prioritized in 2001/02. A top priority was improvements to in-stack monitoring systems on the lead stack, the DRAACO baghouse stack and the silver refinery baghouse stacks. Various performance improvements were made to these three systems.
- The performance of the new baghouse on the lead smelter feed preparation plant has been improved through better control of dryer operating temperature. The performance of the DRAACO baghouse on the #2 Slag Fuming Furnace is now being optimized through round-the-clock operator coverage, implementation tighter new Standard Operating Procedures and inclusion of this baghouse in the plant's Integrated Process Management System (IPM). The ABB baghouse on the new #3 Slag Fuming Furnace has seen extensive optimization efforts aimed at improving operational reliability and environmental performance. Comprehensive audits of the silver refinery baghouses led to recommendations for new instrumentation for real-time monitoring of baghouse performance. The new instrumentation has been installed and operators are now trained in how to optimize the performance of the baghouses using the new instrumentation and best operating practices.

Fugitive Dust from Property

- In summer 2002, community air lead levels and blood lead levels did not drop as expected during/following the shutdown in August. The suspected cause was a prolonged drought and extreme wind events in late July and August. Although Teck Cominco followed the same dust control procedures used during the longer shutdown in 2001, more dust seems to have spread into the community in 2002.
- The Trail Health and Environment Committee, at its fall 2002 meeting, asked that Teck Cominco report to the committee on plans to improve upon its on-site dust control procedures.
- Teck Cominco made a report to the committee on January 14, 2003 which reviewed the dust control procedures that were already in place, described the process that was used in the fall of 2002 to determine which areas and activities on the property should have priority for improvement and outlined the plans to improve procedures.
- Teck Cominco has since managed to minimize the dumping of fine drosses at the "Flats" by staying "in balance" with their processes. Nonetheless, a water spray system was on the bins in summer 2003 anyway.

- A wind flag was installed at the Flats so that mixing/screening activities could be ceased when the wind is blowing away from Trail Operations.
- A "highways" type loc-bloc and tent structure (25' x 60') was installed in Fall 2003 at the lead mix area so that mixing of secondary lead smelter feeds can be done under shelter.
- Additional paving was done at the Beach/Flats to provide a smoother, easier to clean surface.
- A water spray system was installed on the Roaster Mix bins in spring 2003, so that the materials can be wet preventatively, rather than waiting to call a water truck when the materials appear dry/dusty.
- All uncovered stockpiles were sprayed with a coating of dust suppressant in early May 2003.
- Repairs to existing geomembrane covers on stockpiles were made in 2003.

Community Monitoring

Blood Lead Testing

2001

- testing focused on children 6 – 36 months of age in all Trail neighbourhoods.
- Clinic participation: 76%
- Geometric mean lead level: 4.7 µg/dL (lowest seen to date in Trail)
- 16 children had lead levels ≥ 10 µg/d
- 4 children had levels ≥ 15 µg/dL
- 1 child had a level ≥ 20 µg/dL.
- There was a significant difference between the geometric mean blood lead in area 2 (4.1 µg/dL) and area 3 (5.7 µg/dL).

2002

- children 6 – 36 months were again tested
- Clinic participation: 75%
- Geometric mean lead level: 6.0 µg/dL
- 13 children had lead levels ≥ 10 µg/dL
- 6 children had blood leads ≥ 15 µg/dL
- 2 children had levels ≥ 20 µg/dL
- There was again a significant difference between the mean blood lead level in area 2 (5.0 µg/dL) and area 3 (7.8 µg/dL).

- In anticipation of a possible upcoming reduction in the U.S. CDC “level of concern” from 10 µg/dL, the Trail Lead Program adopted 10 µg/dL as its *individual* level of concern. (Formerly, it was 15 µg/dL)

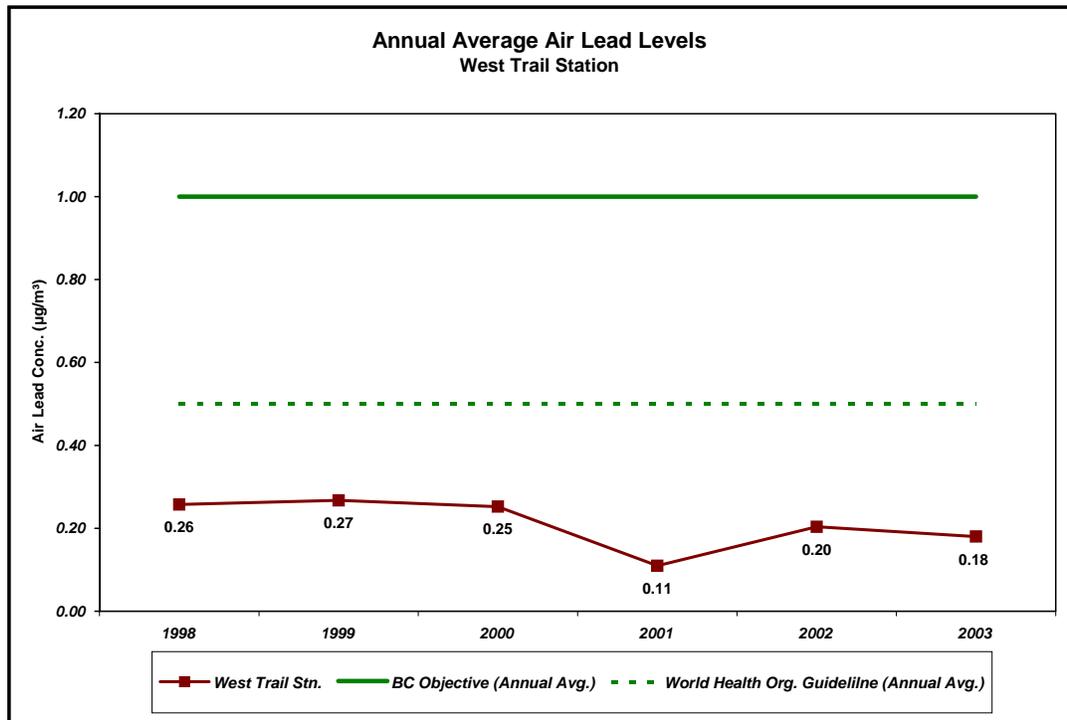
2003

- children 6 – 36 months were again tested
- Clinic participation: 83%
- Geometric mean lead level: 5.7 µg/dL
- 18 children had lead levels ≥10 µg/dL
- 4 children had blood leads ≥15 µg/dL
- 1 child had a level ≥20 µg/dL
- There was again a significant difference between the mean blood lead level in area 2 (5.0 µg/dL) and area 3 (6.5 µg/dL).

Environmental Monitoring

Ambient Air - Lead

Annual average air lead levels at the key West Trail monitoring station continue to be very low. As shown in the graph below, the average air lead level in 2003 was

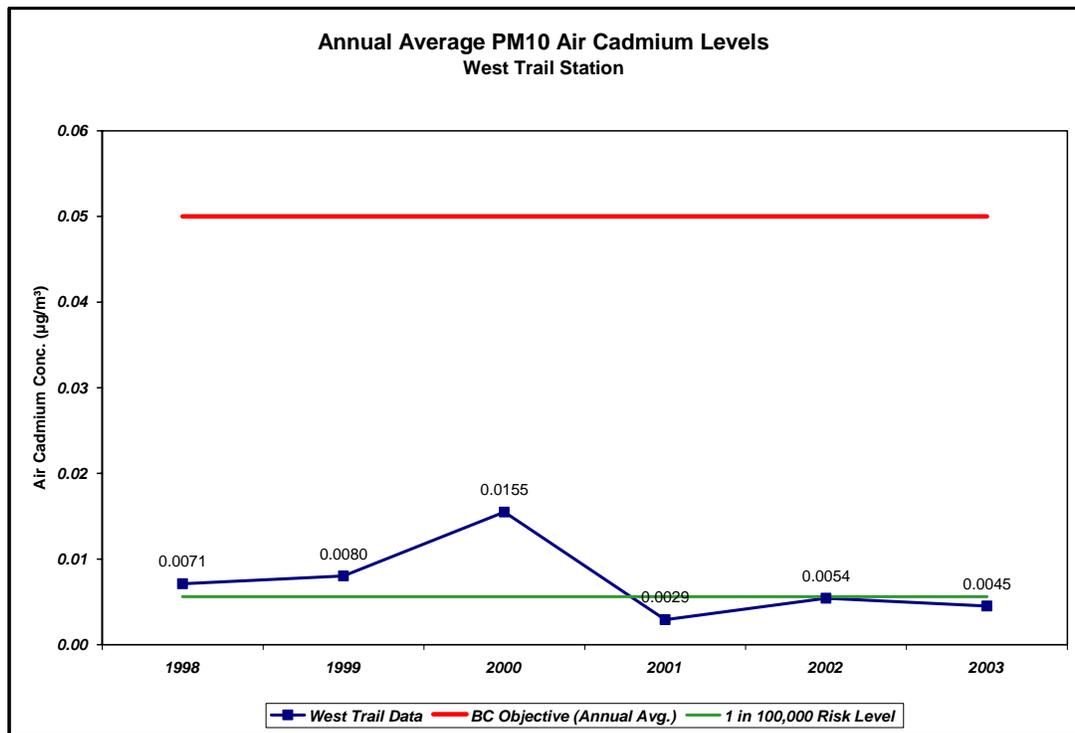


the lowest yet recorded, other than during 2001, when Teck Cominco's Trail Operations were shut down for over 3 months. Prior to installation of the KIVCET lead smelter in 1997, annual average air lead levels at this station used to be in the 0.80 to 1.20 µg/m³ range. As shown in the graph, air lead levels in Trail are now

below the WHO's guideline of $0.50 \mu\text{g}/\text{m}^3$, which a number of European countries are proposing to adopt over the next several years. The U.S. EPA's current standard for ambient air lead is $1.5 \mu\text{g}/\text{m}^3$ on a quarterly average basis. (Note that for lead, the guidelines/standards are based on lead in *total* airborne particulate - not just a fine fraction. This is appropriate because we're interested both the direct effect of airborne lead through inhalation of fine particles and the indirect effect through ingestion of particles that fall out of the air onto surfaces.)

Ambient Air - Cadmium

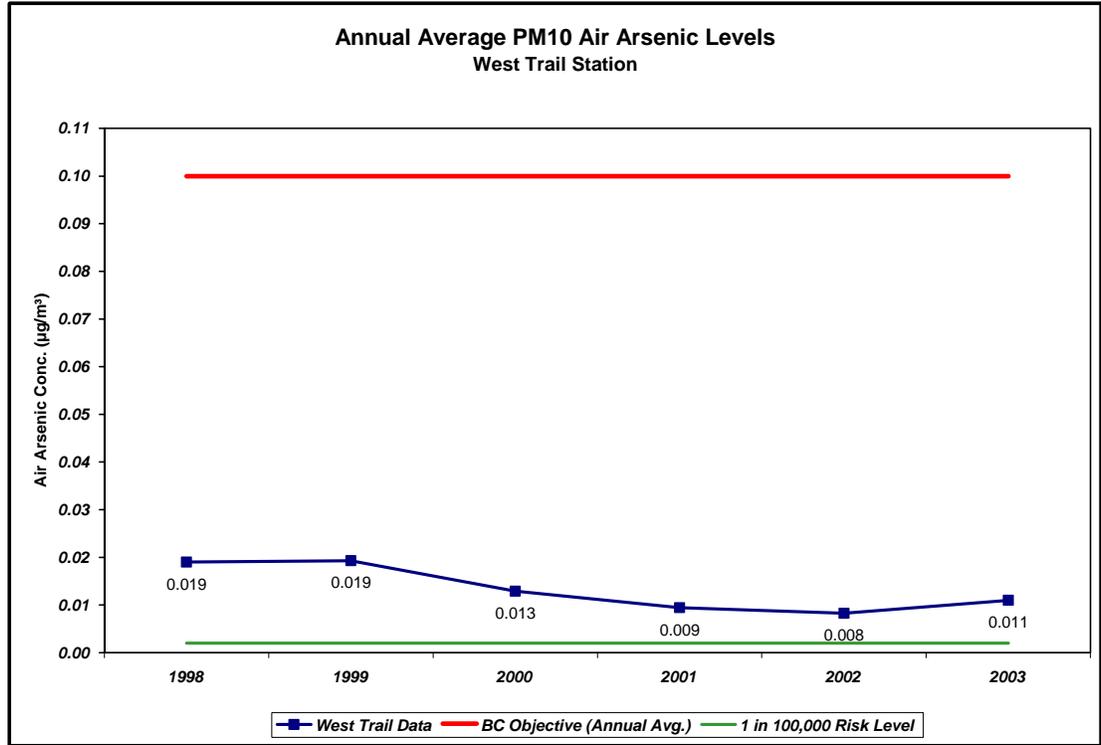
Annual average air cadmium levels over the past several years are also looking quite positive. As shown in the graph below, the annual average cadmium level in respirable (PM_{10}) particulate at West Trail has hovered around the level which corresponds to an estimated 1 in 100,000 incremental lifetime cancer risk - the default acceptable risk level in B.C. The goal is to maintain or improve upon this level of performance. (Note that for cadmium, we focus on the amount of cadmium in the *respirable* fraction of ambient air particulate because we're interested mainly in the direct effect of airborne cadmium through inhalation of fine particles. PM_{10} particulate is the fraction that is less than $10 \mu\text{m}$ in size.)



Ambient Air - Arsenic

Annual average arsenic levels in ambient air have shown an improving trend over the past several years, as shown in the graph below. Arsenic levels in respirable particulate have declined by about 50% since 1998, making some good progress toward the level that corresponds with the estimated default acceptable risk level.

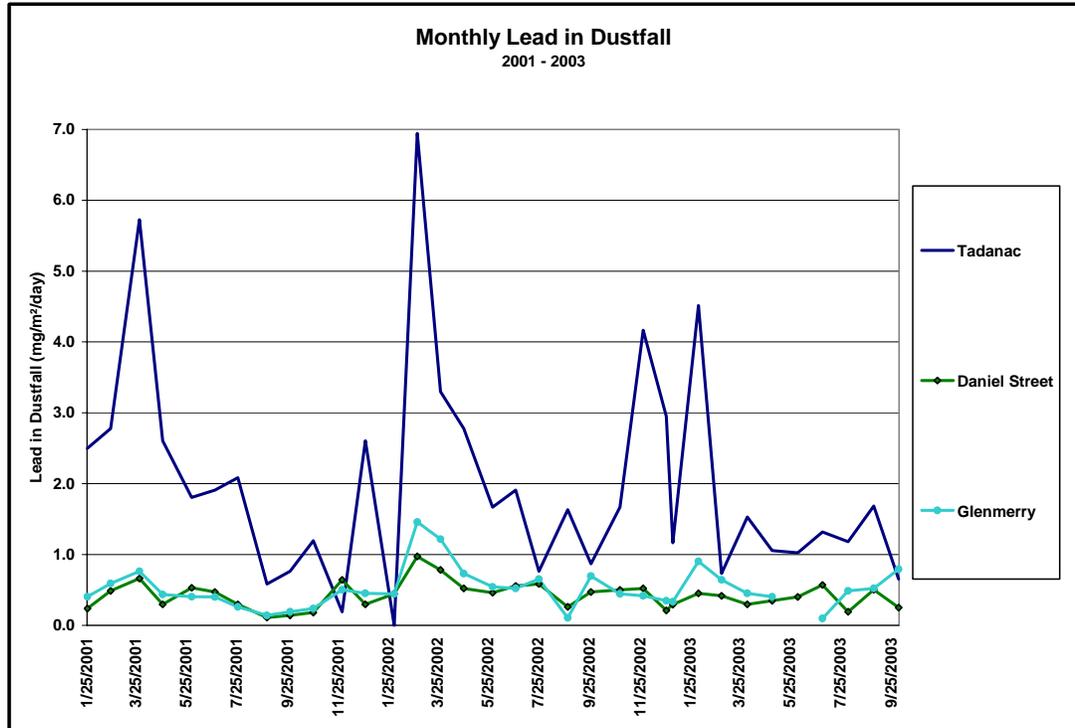
Prior to the startup of KIVCET in 1997, the annual average arsenic level in respirable particulate at West Trail station was about 0.10 $\mu\text{g}/\text{m}^3$.



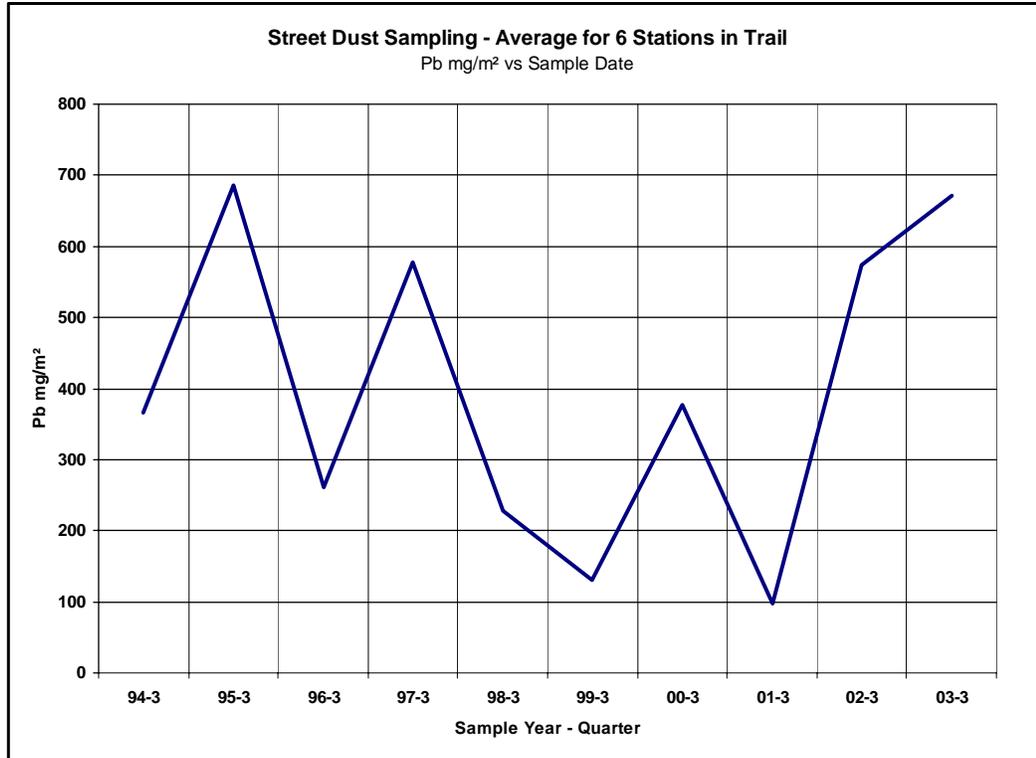
Dustfall - Lead

The graph below shows dustfall lead levels for three selected stations from 2001-2003. It is clear from the graph that lead loadings in dustfall were generally higher in the winter months (particularly in Tadanac).

The graph also shows that the dustfall lead loading *did* drop during Teck Cominco's August 2002 shutdown, despite the windstorms that were noted that month. However, the dustfall lead levels recorded in August 2002 were generally somewhat higher than those recorded during the 2001 shutdown. In 2003, dustfall lead levels at all three stations showed somewhat lower winter peaks than in 2002.



Street Dust - Lead



The graph above shows the street dust lead loading (average for 6 stations) measured in September of each year from 1994 to 2003. The graph shows a decline in lead loading after 1997, but a return to relatively high levels in 2002 and 2003. This is

perhaps due to the prolonged drought in both years from July through October, which allows settled dust to accumulate on roads without being washed away by rain.

Community Exposure Reduction

Dust Control

Greening

- Teck Cominco has completed various revegetation projects on its properties in Trail, as well as contributed to greening projects in the community. Teck Cominco has provided about \$20,000 in funding plus materials for projects carried out by the City of Trail and the Trail Flying Club over the past several years.
- Teck Cominco retained a consulting team to develop a phased design for revegetation of the riverbank below Trail Operations. The total project cost is estimated at over \$2,000,000, including terracing of the slope for stabilization.

Dust Suppression on Roads

- Each year, the City of Trail grades the alleys and arranges/supervises the contract application of magnesium chloride in mid-June. Teck Cominco and the City split the costs in Trail and at the Beaver Creek campground and Teck Cominco pays for additional work in other locations outside the City limits.

Street Cleaning

- The City of Trail has continued to perform at least two extra sweeping/flushings after the major spring road cleanup in all residential areas of Trail. The City tries to ensure that the roads are pre-wetted prior to the sweeper brush hitting them so that clouds of dust are not stirred up in the process.

Miscellaneous Dust Control

- Teck Cominco accompanied the BC Ministry of Water, Land & Air Protection on an inspection of the Trimac reload centre in Waneta in May 2001. The Ministry was pleased with site housekeeping and new measures in place for cleaning trucks and controlling dust.

Smelter Buffer Zone

- In May 2001, Teck Cominco planted 80 evergreens trees (12-16 feet tall) in the area near the old training centre, in the vacant lot at 303 Kootenay Avenue and along the southwest boundary of the Tadanac soccer pitch, following consultation with the Tadanac Residents' Association.
- In 2002, 29 additional trees were planted to complete the strip along the Tadanac Soccer Pitch boundary with Maple Road.

Work Project Assistance Program

- Cheryl Yates and Steve Hilts traveled to Idaho in April 2001 and Missouri in June 2001 to study the approaches being taken to remediation and risk management at both inactive and active smelting and mining sites.
- No progress was made toward the WPAP in 2001 – 2003, due to time constraints. Follow-up services in association with the case management program assisted families with contaminated yard materials disposal and assistance/advice were provided to people doing work projects on an ah-hoc basis.

Case Management

Follow-up Blood Testing, Home Visits, Environmental Assessments

- Interior Health conducted follow-up winter blood testing clinics in February 2001, 2002 and 2003, doing repeat lead testing on children with elevated or rising blood leads from the previous fall clinic. Also invited were infants between the ages of 6 – 11 months, who had not previously been tested.
- Beginning in 2002, children included in the case management group were those with lead levels ≥ 10 $\mu\text{g/dL}$, and for children younger than 12 months of age, those with lead levels > 7 $\mu\text{g/dL}$. The case management group also includes those children whose lead levels have been noticeably increasing (BLL change greater than 3 $\mu\text{g/dL}$) from one year to the next.
- Follow-up home visits and in-home environmental assessments were offered to all families with children who have elevated or increasing lead levels. Home visits and environmental assessments were done primarily within a week of reporting an elevated or rising lead level to a parent. In 2001, 12 home visits were conducted. In 2002, 17 home visits were done in Trail. In 2003, 14 home visits were carried out.

Services/Assistance

- Interior Health determined appropriate and required assistance to be offered in terms of addressing house dust, bare soil, or deteriorating lead-based paint. Throughout 2001 - 2003, 75 families benefited from assistance to reduce indoor dust, cover bare soil, and clean up lead-based paint.
- Money spent in 2001-2003 for services/assistance through the case management program was approximately \$60,000, shared between Interior Health and Teck Cominco.
- The case load, funding levels and assistance policies have been reviewed by Interior Health and Teck Cominco and the Trail Health and Environment Committee as well.

Results

- In general, the follow-up winter clinics saw reductions in individual children's blood lead levels from September to February. This is an expected outcome, due

to seasonal variation in weather, less outdoor play and reduced indoor lead dust levels in Trail in winter.

- The table below provides results of 1-year repeat testing for the 10 children who had elevated blood lead levels in Fall 2002 and who were tested again in Fall 2003. The other 3 children with elevated blood lead levels in Fall 2003 had moved out of the area by Fall 2003. The table shows that 8 of the 10 children's blood lead levels declined from 2002 to 2003. It is particularly difficult to achieve 1-year declines in blood lead levels for children under 2 years of age because blood lead levels tend to peak at 2-3 years of age, due to a peak in hand-to-mouth behaviour. The table also describes the case management services provided to families, as well as comments about changes in lead levels from 2002 to 2003.

Neighbourhood	Age (Sept 02)	2002 Pb level	2003 Pb level	Change in Pb level	Comments
East Trail	3 years	16.7	11.8	-4.9	Rock/grass seed/fertilizer provided for back and side yard. Child's BLL possibly declined due to age.
East Trail	2 years	13.9	8.2	-5.7	Paint abatement on fence and garage with high concentrations of lead. Removal of old varnish and sanding, refinishing of living room floor. Provided with vacuum cleaner (2002)
East Trail	2 years	22.8	19.7	-3.1	Replaced old carpet with solid surface flooring in living/dining room (2001). Replaced most backyard soil and sod with new topsoil, sod, concrete (2002). Family covered remaining bare soil area (2003). Two large dogs continue to dig holes in barrier. Father works for Trimac. Child suffers from anemia.
West Trail	2 years	15.1	11.6	-3.5	Replaced topsoil for large garden (2003). New solid surface living room floor provided, replacing old carpeted surface (2002). Given new vacuum cleaner (spring 2003), and sandbox with lid.
West Trail	1 year	15.7	10.5	-5.2	Clean topsoil, sod and concrete to completely cover bare backyard (spring 2003). Carpets steam cleaned (2002), provided vacuum cleaner (2003).
Glenmerry	1 year	10.2	14.1	+3.9	Vacuum cleaner provided (2002). Solid surface floors/ good ground cover in yard/paint in good condition. Child sucks his thumb, family difficult to contact.

Sunningdale	1 year	20.9	19.0	-1.9	Replaced bare soil in gardens/flower beds and bare areas of yard. Sod over bare areas (spring 2003). Vegetable garden has fence around it. House has mainly solid surface flooring and kept very clean. Child eats dirt on regular basis, has many hand-to-mouth behaviours. Father works in lead smelter.
Sunningdale	1 year	14.4	12.4	-2.0	Replaced bare soil in gardens/flower beds and bare areas of yard. Sod over bare areas (spring 2003). Vegetable garden has fence around it. House has mainly solid surface flooring and kept very clean. Child has fewer hand-to-mouth behaviours, does not eat dirt in yard. Father works in lead smelter.
West Trail	< 1 year	14.0	8.9	-5.1	Provided vacuum cleaner (2002). Shag carpets steam cleaned (2002).
West Trail	< 1 year	10.9	13.5	+2.6	Moved from house up higher in West Trail with solid surface floors to house on Rossland Ave, more carpeted floors, dusty (spring 2003). Lived on Rossland Ave during 2003 road work.

Education

Community Education & Awareness

- In the spring of 2001, Interior Health and Teck Cominco, with input from the City of Trail, developed a new full-colour brochure outlining what services are available and who to contact about them. The brochure was very well received by the community.
- Also in 2001, a new logo was created for the Trail Health and Environment Committee. This logo became the foundation for an annual newsletter mailed to every household in Trail.
- Interior Health ran a radio and newspaper educational campaign throughout the spring, summer and fall of 2001 through 2003 on topics such as: lead and pregnancy, blood lead testing, the importance of frequent hand washing and reducing lead in the home and yard.
- In 2002, a new Lead Health brochure was developed which combined and updated the information found in the original series of Task Force brochures. This new brochure is available through the Trail Health Center, medical clinics, city hall and Trail Regional Hospital maternity ward. Brochures are also mailed to new families when they are invited to have their children tested.

Early Childhood Education

- Interior Health staff offer presentations to groups such as Mom & Me, day cares, nursery schools and the Building Beautiful Babies.
- Storybooks aimed at preschoolers are distributed through day cares and preschools, as well as materials, such as soap and stickers, to go with the storybook program.

Oversight and Coordination

- The Trail Health and Environment committee met for the first time on July 11, 2001. At this meeting, the committee:
 - made some slight modifications to the terms of reference drafted by the Lead Task Force and adopted them
 - discussed whether the scope of issues dealt with by the committee might include socio-economic issues
 - decided to invite the business community to appoint a representative to the committee
- At subsequent meetings, the committee has heard reports from the Interior Health Authority and Teck Cominco on their implementation of Task Force recommendations and has made requests for additional information or action.
- The committee recently decided that it would like to hear informally about any environmental issues affecting Trail that the City, Province or Teck Cominco might become aware of from time to time.

2004 PROGRAMS/SERVICES

This section provides information on how each of the Trail Community Lead Task Force's recommendations will continue to be addressed in 2004.

1. Source Reduction

1.1 Teck Cominco Emissions Control and Reduction

Purpose:

- Emission reductions are still believed to be the single most effective way to:
 - further reduce children's blood lead levels
 - further reduce possible health risks from other smelter contaminants

Description:

- The Task Force recommended that:
 - Teck Cominco should regularly (at least semi-annually) communicate the following to the public:
 - The process by which opportunities for further emission reductions are being explored
 - Goals, projected timelines and progress on emission control projects (including plans for reducing stack emissions, fugitive plant emissions and materials handling losses).
 - Teck Cominco should ultimately include its goals and timelines for emission reductions in the final remedial plan for the area

Implementation/Responsibilities:

- Teck Cominco will continue to report regularly to the Trail Health & Environment Committee on its plans and progress for further emission reductions
- Teck Cominco will also report on emission reduction plans and progress in media advertisements and in the joint Trail Health and Environment Committee newsletter

Stack Emissions

- Teck Cominco will continue to optimize the operation of its stack emission control systems, as described in the Status Report section, and to replace equipment and instrumentation as needed.

On-site Dust Control

- The next on-site dust control action to which Teck Cominco has committed is installing a \$500,000 geomembrane cover on the large ETP residue pile.

Estimated Expenditures: (considered external to the three-agency action budget)

	<u>Teck</u>	<u>Cominco</u>
Emission control systems operation and improvement	>\$250,000	
Dust control procedures/systems improvement	~\$500,000	
On-site greening projects (undetermined – budget for riverbank not set)		\$?

2. Community Monitoring

2.1 Blood Lead Testing

Purpose:

- to identify children with elevated or rising blood lead levels
- to assess community-wide impact of remedial actions
- to determine whether the blood lead goals have been reached

Description:

- Regular annual blood lead testing in late summer/early fall will be recommended for children aged 6-36 months. Any children who had an elevated blood lead level on their previous test will also be invited, and in addition, older children whose parents are concerned will not be denied testing.
- Follow-up blood testing will be recommended for children with blood lead levels of 10 µg/dL or higher, and for children under 12 months who have blood lead levels over 7 µg/dL.
- A complete blood lead survey of children aged 6-72 months will be conducted in September of 2005, then every 5 years.
- Blood samples will be collected by venipuncture and analyzed for lead. In 2004, a portable blood lead analyzer will be purchased and used during testing clinics. This will allow Interior Health staff to report blood lead results to families while they are on site. Blood testing results will be provided to family physicians, if requested.
- Summary results will be presented to the Trail Health and Environment Committee in November 2004.
- A rigorous quality control program will be followed to ensure accurate and reliable results, using BC Children's and Women's Hospital laboratory.

Implementation/Responsibilities:

- Interior Health will conduct the blood testing clinics, arrange and pay for laboratory analyses and report the results.

Funding committed:

	<u>Interior Health</u>
Equipment, Supplies and Services	\$500
Annual Fall Clinic	\$6,500
Annual Winter Clinic	\$1,500
Support staff	<u>\$2,500</u>
	\$11,000

2.2 Environmental Monitoring

Purpose:

- To assess the collective, community-wide impact of remedial actions (e.g. emission reductions, street washing, greening, soil barriers, dust suppression)

2.2.1 Ambient Air Monitoring

Description:

- Ambient (community) air monitoring is one of the best measures for monitoring changes in community conditions. Teck Cominco operates two main ambient air monitoring stations that measure metals (lead, zinc, arsenic and cadmium) in the air. These two stations (at Butler Park and Genelle) sample the air for 24 hours once every 2 days. In addition, Teck Cominco is continuing to operate its ambient air monitoring station at West Trail until the June 2004 and its stations at Columbia Gardens and Northport at least until 2005. Data from the West Trail station have been relied upon by the Lead Task Force and Trail Health and Environment Committee for the past 6 years or so. However, the Butler Park station, which has a long history of operation by the Province, produces ambient air metal results that are not significantly different from those recorded at the W. Trail station.

Implementation/Responsibilities:

- Teck Cominco Environment will collect and analyze samples, with review by the BC Ministry of Water, Land & Air Protection and Trail Health & Environment Committee.

2.2.2 Dustfall Monitoring Network

Description:

- Dustfall (a measure of particles settling out of the air) is another excellent means of monitoring changes in community conditions and assessing current rates of contamination. Teck Cominco has operated a regular network of about 15 dustfall stations in the community for several decades. From 1992 to 2000, Teck Cominco operated additional stations for the Lead Task Force, bringing the total network to about 38 stations.
- A memo to Teck Cominco from Trail Lead Program staff on October 5, 2000, recommended that 6 of the special dustfall stations operated for the Trail Lead Program be retained and added to Teck Cominco's regular dustfall monitoring network.
- Dustfall jars are changed monthly and analyzed for total dustfall and loading ($\text{mg}/\text{dm}^2/\text{month}$) of lead, arsenic, cadmium and zinc.

Implementation/Responsibilities:

- Teck Cominco Environment will collect the samples from the network and samples will continue to be analyzed at Teck Cominco Analytical Services, with review by BC Ministry of Water, Land & Air Protection and Trail Health & Environment Committee.

2.2.3 Street Dust Monitoring

Description:

- Lead in street dust was monitored by the Trail Lead Program as part of the Sentinel Homes project. Street dust lead loadings declined by about 50% after 1997.

Implementation/Responsibilities:

- Street dust sampling will be conducted at a density of one sampling station per neighbourhood, except there will be 2 stations in East Trail. Street dust sampling stations are located near dustfall monitoring stations.
- Teck Cominco Environment will collect and analyze the samples, with review by the Trail Health & Environment Committee.

Funding committed:

	<u>Teck Cominco</u>
Ambient Air Monitoring	\$22,000
Dustfall Monitoring	\$15,000
Street Dust Monitoring	<u>\$3,000</u>
	\$40,000

COMMUNITY MONITORING TOTAL:

\$51,000

3. Community Exposure Reduction

3.1 Dust Control

Purpose:

- to further reduce children's blood lead levels by reducing dust movement and accumulation in the community
- to further reduce possible health risks from other smelter contaminants

Description:

Greening:

- The Task Force stated that greening of bare areas is a high priority, and recommended that Teck Cominco and the City communicate their plans for this.
- An inventory of remaining bare areas will be prepared and used to set priorities for action. Areas where action is taken will be monitored to ensure success.

Dust Suppression on Roads:

- Dust suppressant will continue to be applied to alleys and other unpaved areas in Trail at least once per year.

Street Cleaning:

- The Task Force recommended that street flushing and sweeping be performed according to the correct procedure and at the current frequency in the City of Trail and Rivervale (highways maintenance contractor responsibility in Rivervale and on highways through Trail).

Miscellaneous Dust Control

- Trucks transporting concentrates to Teck Cominco from Waneta reload station should be required to take appropriate steps to reduce losses along the route.

Implementation/Responsibilities:

- Teck Cominco and the City of Trail, with assistance from the Trail Health & Environment Committee, will identify and prioritize candidate areas for greening.
- The City of Trail will arrange and supervise the spraying of magnesium chloride.
- Teck Cominco will monitor and report on the steps that are being taken by Trimac.
- Teck Cominco will also continue greening on its own properties.

Funding committed:

	<u>Teck Cominco</u>	<u>City of Trail</u>
Greening city lands	\$10,000	\$
Dust Suppression on Roads	\$5,000	\$4,400
Street Cleaning (hard to say how much is extra)	_____	<u>\$25,000?</u>
	\$15,000	\$29,400

3.2 Smelter Buffer Zone

Purpose:

- to reduce the exposure of residents to dusts from Teck Cominco emissions (primarily from the intermediate product stockpiles)

Description:

- Teck Cominco will develop, communicate and implement a plan to expand/enhance the vegetative buffer within and adjacent to the property boundary (e.g. more trees, earth mounds), commencing in Spring 2001 and continuing as stockpiles are consumed.
- Teck Cominco will endeavor not to remove any additional structures from this zone until the vegetative buffer is well established and has reached a height of at least 20 feet.

Implementation/Responsibilities:

- In May 2001, Teck Cominco planted 80 evergreens trees (12-16 feet tall) in the area near the old training centre, in the vacant lot at 303 Kootenay Avenue and along the southwest boundary of the Tadanac soccer pitch, following consultation with the Tadanac Residents' Association.
- In May 2002, Teck Cominco planted 29 additional large evergreen trees to complete the strip along the Tadanac soccer pitch boundary.
- The vegetative buffer strip will now be monitored by Teck Cominco, with replacement of dead or diseased trees as needed.

Funding committed:

	<u>Teck</u>	<u>Cominco</u>
Tadanac buffer strip trees replacements for 2004		\$?

3.3 Work Project Assistance Program

Purpose:

- to encourage homeowners and contractors to follow precautions when undertaking excavation, construction, demolition or renovation projects, in order to minimize dust exposure to workers and residents.
- to provide assistance to people who need to dispose of contaminated soil or dust.
- this program is not meant to encourage people to undertake projects such as soil replacement. Instead, it is intended to make it safer and easier for people who, on their own, have decided to do some work on their properties.

Description:

- A program should be set up to provide assistance with excavation, construction, demolition or renovation projects.
- The assistance for such projects should address dust control, worker exposure, resident exposure, neighbours' exposure, and disposal of contaminated materials (e.g. soil, dust, paint chips, painted materials).
- Assistance offered through the program may include:
 - Advice concerning steps to take to minimize exposure to contaminated soil and dust
 - Free disposal of contaminated soil or dust
 - Free clean soil to replace the volume of excavated contaminated soil, if necessary.
 - An education program should be set up so that the community (including contractors) is aware of the WPAP and how it works.
 - A training program should be set up for contractors and public works employees so that they competent in the control of dust and disposal of contaminated materials.
 - Bunker Hill Superfund Site has set up a comprehensive program that has been studied as a possible model for some elements of Trail's program.

Implementation/Responsibilities:

- Teck Cominco will develop and fund this program. A contractor has been hired to lead program development. Program implementation will begin in 2004.

Funding committed:

	<u>Teck Cominco</u>
Program development	\$20,000

COMMUNITY EXPOSURE REDUCTION TOTAL:

\$64,400

4. Case Management

Purpose:

- to reduce higher-risk children's exposure to lead in dust, soil and paint.

Description:

- The following services will be provided for families of children with blood lead levels of 10 µg/dL or higher, and families of children under 12 months age with blood lead levels greater than 7 µg/dL:
 - *Home visits* to provide counseling/advice on reducing lead exposure
 - Blood and environmental results (if samples taken) will be reviewed with the family, an exposure and child behaviour assessment completed, and practical advice to lower lead exposure given.
 - *In-home environmental assessment*
 - To determine which areas should be targeted for lead hazard control (dust, soil, paint)
 - *Assistance* in addressing bare soil, house dust, or deteriorating lead-based paint
- Follow-up *monitoring* of blood lead levels
 - Children's blood lead results will be reviewed at subsequent clinics (winter or spring) and further assistance/services will be offered if required.
- Assistance to day care and preschool centres in addressing bare soil or indoor dust.

Implementation/Responsibilities:

- Interior Health will conduct follow-up for families of children who have elevated or rising blood lead levels. Interior Health, with input from Teck Cominco, where requested, will determine the appropriate and necessary assistance to be offered. Interior Health and Teck Cominco will each provide up to \$18,500 for the 2004 case management program.
- Teck Cominco will provide additional funding if required to address urgent needs of any child found to have a blood lead level of 25 µg/dl or higher.

Funding committed:

	<u>Interior Health</u>	<u>Teck Cominco</u>
Case management materials/services	\$18,500	\$18,500

5. Education

5.1 Community Education and Awareness

Purpose:

- To inform the public (particularly new parents and new residents) about what they can do to keep children's blood lead levels low, and to let people know about available services

Description:

- The following community education program elements will be provided:
 - brochures
 - information for families new to Trail
 - display stand at community events such as Teddy Bear Picnic
 - radio and newspaper advertising
 - newsletters
 - information for pregnant women and new mothers

Implementation/Responsibilities:

- Interior Health and Teck Cominco will work together with the Trail Health & Environment Committee to develop materials and campaigns. Funding will be provided by Interior Health and Teck Cominco as outlined below.

Funding committed:

	<u>Interior Health</u>	<u>Teck Cominco</u>
Newsletter	\$1,500	\$1,500
Work Project Assistance Program Brochures		\$3,000
Advertising	\$4,000	
Community projects	\$1,000	
	<hr/>	
	\$6,500	\$4,500

5.2 Early Childhood Education

Purpose:

- To encourage pre-schoolers to adopt healthy behaviours in order to:
 - keep their lead exposure risk and blood lead levels low
 - keep them in good general health

Description:

- The following early childhood education program elements will be provided:
 - visits to day cares, nursery schools, Building Beautiful Babies program, Mom and Me
 - provision of storybook to new child care providers
 - provision of materials to go with storybook program (e.g. soaps, stickers)
- This opportunity to reach pre-schoolers will also be used to present other hygiene, nutrition and health messages.

Implementation/Responsibilities:

- Interior Health will work together with the Trail Health & Environment Committee to develop materials and campaigns. Funding will be provided by Interior Health.

Funding committed:

Educational and promotional materials	<u>Interior Health</u> \$1,000
EDUCATION TOTAL:	\$12,000

6. Oversight and Coordination

Purpose:

- to ensure that the goals are attained in a timely manner
- to ensure effective monitoring, coordination and evaluation of progress toward the goals
- to ensure effective oversight by, and communication with, the community

Description:

- A committee has been established to ensure that the program does not suffer from fragmentation or loss of credibility and to facilitate public communication and oversight.
- The committee will ensure that there is no discontinuity of service between dissolution of the Trail Community Lead Task Force and implementation of the final remedial plan for the area.
- The committee includes representatives from the City of Trail, Interior Health Authority, BC Ministry of Water, Land & Air Protection, Teck Cominco, United Steelworkers of America, the Greater Trail Community Health Council and the community (similar to the current Task Force).
- The committee has been appointed by City of Trail.
- At its first meeting the committee should review the Draft Terms of Reference that was been prepared by the Trail Community Lead Task Force.
- The initial mandate of the committee should be to monitor, coordinate and advise on the implementation of the Task Force's recommendations and to participate directly in development of the final remedial plan. Once the remedial plan has been approved, the role and reporting responsibility of the committee should be re-evaluated.

Responsibilities/Actions:

- The Trail Health & Environment Committee operates as a committee of the City of Trail.

Membership:

Chair: Dieter Bogs	Mayor, City of Trail
Ames, Dr. Nelson	Interior Health Authority
Davies, Kate	Community Representative
Graham, Al	Councillor, City of Trail (alternate)
Dimock, Dr. Barss	Community Representative
Hilts, Steve	Teck Cominco Metals, Ltd.
Johnson, Carl	BC Ministry of Water, Land & Air Protection
Joseph, Ron	Community Representative
Kenyon, Graham	Community Representative
Horney, Ralph	Councillor, Village of Warfield
Rakuson, Marylynn	Greater Trail Community Health Council
Rostek, Tina	Community Representative
Yates, Cheryl	Interior Health Authority
Wynn, Tom	United Steelworkers of America, Local 480
Whitlock, Rosemary	Recording secretary

TECHNICAL COMMITTEE

Role: Terms of reference yet to be established.

Meetings: This committee will meet as needed.

Members: **Dr. Nelson Ames –Interior Health Authority - Chair**

Nelson was involved with the original Trail Lead Study in 1989 as a masters student with UBC and served as a member of the Lead Task Force throughout its duration. Nelson is Medical Health Officer for Kootenay Region for Interior Health Authority.

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E-mail: nelson.ames@interiorhealth.ca

Cheryl Yates –Interior Health Authority

Cheryl served as the research nurse with the original Trail Lead Study in 1989. Cheryl was Health Coordinator for the Trail Lead Program. Cheryl is now the public health nurse in charge of Lead Health Services for the Interior Health Authority.

Phone: (250) 368-LEAD (368-5323)

Fax: (250) 364-0580

E-mail: cheryl.yates@interiorhealth.ca

Steve Hilts – Teck Cominco Metals, Ltd.

Steve was Environmental Coordinator for the Trail Lead Program and is now Superintendent of Environmental Remediation for Teck Cominco Trail Operations.

Phone: (250) 364-4385

Fax: (250) 364-4144

E-mail: steven.hilts@teckcominco.com

Kate Davies – Community Representative

Phone: (250) 368--6078

Fax:

E-mail:

SUMMARY OF 2004 FUNDING COMMITMENTS

	Interior Health	Teck Cominco	City of Trail	Total
SOURCE REDUCTION				
Teck Cominco Emissions & Dust Control		>\$500,000 (not included in totals)		
COMMUNITY MONITORING				
Blood Lead Testing	\$11,000			\$51,000
Environmental Monitoring		\$40,000		
COMMUNITY EXPOSURE REDUCTION				
Dust Control		\$5,000	\$29,400	\$64,400
Greening projects		\$10,000		
Work Project Assistance Program		\$20,000		
CASE MANAGEMENT				
	\$18,500	\$10,000		\$28,500
EDUCATION				
Community Education & Awareness	\$6,500	\$4,500		\$12,000
Early Childhood Education	\$1,000			
2004 TOTALS	\$37,000	\$89,500	\$29,400	\$155,900

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