



Annual Report of the Chief Inspector of Mines 2009



Ministry of
Energy, Mines and
Petroleum Resources



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1 Principal Mining Functions

1.1 Mining Health and Safety Function

1.1.1 MANDATE/ACTIVITIES

The Mining Health and Safety Function derives its mandate from the Mines Act and its accompanying Health, Safety and Reclamation Code for Mines in British Columbia (the Code).

The Code is reviewed on an ongoing basis by the Code Review Committee comprising representatives from labour, industry and government. The Chief Inspector of Mines chairs this committee, which ensures that the Code remains current as new technology, mining practices and health and safety concerns emerge. The latest version of the Code was released in December 2008.

With respect to mine health and safety, the key mandate of the Government of British Columbia is to ensure the health and safety of workers and the public. In keeping with this mandate, the Mine Health and Safety Function's responsibilities include the following:

- review of aspects of mining and exploration proposals related to health and safety;
- mine inspections and the monitoring of mining activity for compliance with the Mines Act and the Code;
- the approval of mine plans with regard to health and safety concerns;
- the completion of audits to evaluate how well a health and safety program has been implemented at a mine;
- the collection of data and maintenance of records with respect to accidents, dangerous occurrences, inspection frequencies and audiometric (hearing test) data; and
- participation in relevant research and development projects to enhance procedures, technology, and practices in mine health and safety.

Additional guidance for government activities is derived from the British Columbia Mining Plan, which is based on four Cornerstones:

- Focus on Communities and First Nations;
- Protecting Workers, Protecting the Environment;
- Global Competitiveness; and
- Access to Land.

1.1.2 MINE RESCUE STATIONS

Regional mine rescue stations were consolidated in 1999. All mine rescue equipment is now located in a single centrally located station in Kamloops. This station is under the supervision of the Inspector of Mines, Health and Safety based in Kamloops, and the Deputy Chief Inspector of Health and Safety in Victoria.

1.2 Mining Administration Function

1.2.1 MANDATE/ACTIVITIES

The Province administers and regulates the full mining cycle, including exploration, development, production, reclamation and closure for metal, placer, industrial mineral and coal mines, and gravel pits and quarries located in British Columbia. This mandate includes the following:

- the review of applications and issuance of permits under Section 10 of the Mines Act for all mining activities taking place in B.C., including major mining projects subject to the Environmental Assessment Act;
- the establishment of geotechnical and reclamation standards and security levels;
- participation in regional and sub-regional planning; and
- reviews of draft legislation and policies being developed by other agencies.

Provincial staff also provide guidance and assistance to companies and individuals exploring for minerals, and monitor exploration and mining activities in order to provide policy advice to government.

Despite the economic slowdown, the total value of mineral production in B.C. held steady at \$5.7 billion in 2009, and mineral exploration investment reached \$179 million (according to Natural Resources Canada). 2009 was also a busy year for mine development, with anywhere between 20 and 30 large projects moving through the permitting process at any given time.

In addition to health and safety functions, Inspectors of Mines address the environmental and social sensitivities of proposed and permitted mines. The process for reviewing Mines Act permit applications includes consultation with other government agencies and affected stakeholders, including First Nations, to identify concerns to be addressed through site-specific permit conditions. Inspectors monitor mining activities to ensure compliance with these permit conditions and take enforcement actions if necessary.



2 Health & Safety

2.1 Occupational Health Section

2.1.1 ROLES AND RESPONSIBILITIES

The Occupational Health Section assists the anticipation, recognition, evaluation and control of health hazards. The section provides materials for health and safety education and training, and sets standards for the inspection and enforcement of occupational health issues at mines in British Columbia.

The Health, Safety and Reclamation Code for Mines in British Columbia requires that mine managers develop and implement a written occupational hygiene-monitoring program. Larger operations in particular are required to establish procedures and to perform their own measurements of chemical and physical hazards to which workers are exposed in the workplace. These hazard could include, among others, dusts, silica, respirable combustible dust, noise, gases and fumes, radiation (ionizing and non-ionizing) and heat/cold stress. The Occupational Health (OH) section also makes comparative measurements to ensure companies follow proper methodology and obtain accurate results.

Medical Surveillance and Workplace Hazardous Materials Information System (WHMIS) programs are also included in the OH section's responsibilities. OH staff provide assistance in program development and also periodically schedule audiometric technician training as needed.

A written, preventative training program to educate mines' Occupational Health and Safety Committee members in the recognition, evaluation and prevention of adverse health effects resulting in musculoskeletal disorders is also a requirement of the Code. Such musculoskeletal disorders may consist of lower back injury, repetitive strain, overexertion or vibration-induced injuries. Training must include a practical component using tools to identify and objectively evaluate risks and develop practical solutions. The OH group assists mines in supplying this training by providing information and assistance as needed.

2.1.2 STRUCTURE AND ORGANIZATION

During 2009, there were two people in the OH group with specialties in industrial hygiene and human factors/ergonomics.

2.1.3 SUMMARY OF ACTIVITIES

In 2009, the OH group

- conducted frequent on-site inspections of mines to fulfill their mandate to monitor workplace conditions;
- led and organized health and safety audits and mines;
- responded to worker concerns regarding exposures to gases and respirable silica;
- delivered MSD Prevention training to safety representatives from B.C. mines; and
- organized the Open Pit and Small Underground Awards Competition and Awards Dinner.

2.2 Mechanical and Electrical Engineering

2.2.1 ROLES AND RESPONSIBILITIES

Mechanical and electrical inspectors ensure that all mechanical and electrical equipment installed and used at mines complies with the Mines Act and the applicable codes and standards, and that the equipment is maintained and operated in acceptable condition so that its operation causes no hazard to people or property.

2.2.2 STRUCTURE AND ORGANIZATION

There is a Senior Inspector of Mines, Mechanical, based in Fernie and a second Inspector of Mines, Mechanical based in Prince George. There is also a Senior Inspector of Mines, Electrical based in Cranbrook.

Once again in 2009, there was a great deal of activity with new and re-opened mines, and there was a large demand on the mechanical and electrical engineering section to keep up with the design, approval and construction plans of the new mines, as well as rehabilitation and improvement plans of existing operations. The section also worked with the provincial audit group and participated in or provided input for two new audits and three follow-up audits in 2009.

2.2.3 SUMMARY OF ACTIVITIES

Mechanical Engineering

Delivery of new machinery and equipment to mines, together with the steady upgrading of the existing items, enables mines in British Columbia to maintain their competitive capabilities. At the same time, safety systems of new and upgraded

equipment are usually enhanced, often as a result of new technology employed in such systems. The highly automated and complex control systems found on new equipment demands a high level of skill from those who operate and maintain the equipment. Provincial staff are involved in reviewing engineering drawings associated with the safety systems on such equipment, as a precursor to installation and field inspections on the items. Staff endeavour to keep abreast of the many changes and innovations. In addition, inspectors, in collaboration with the mines, have to ensure that people operating equipment are aware of how equipment modifications may affect its operating functions, and ensure operators, maintenance and supervisors understand the consequences of failures occurring in installed control or sensing systems.

Electrical Engineering

The inspectors performed electrical inspections at major mines, including the larger sand and gravel operations as well as some of the smaller sand and gravel/quarry operations. Several new operations required extra inspections and review of engineering specifications and drawings, and a number of new projects were reviewed initially for compliance. All of these operations also required considerable time in the review of their new equipment and installations to ensure compliance with the necessary B.C. and Canadian code requirements.

2.3 Competitions and Awards

2.3.1 ROLES AND RESPONSIBILITIES

The primary mandate of the Mining Health and Safety Function is to ensure worker health and safety, public safety and suitable reclamation and protection of the land and watercourses affected by mining and exploration in B.C.

The Mines Act and the Health, Safety and Reclamation Code for Mines in British Columbia stipulate the legal responsibility of provincial mining companies in meeting this mandate; however, many B.C. mining companies and their individual workers voluntarily and consistently exceed these legal requirements. Through the efforts of these individuals, companies and staff of the Province of British Columbia, mining is one of B.C.'s safest heavy industries.

Mine rescue competitions, first aid competitions and safety awards all serve as a means to promote safety at B.C. mines. Reclamation awards acknowledge those companies that go beyond what is called for in their mining plans by conducting superior research and introducing innovative techniques to restore the land.

2.3.2 MINE RESCUE COMPETITIONS

The 54th annual Provincial Mine Rescue and First Aid Competition was held at the British Columbia Museum of Mining (near Squamish) on June 6, 2009. The various components of this yearly event are judged by mines inspectors and industry personnel who are responsible for all aspects of worker and public safety in B.C.'s mining industry.

Underground Mine Rescue – Overall Winner

The overall winner of the Underground Mine Rescue trophy in 2009 was Quinsam Coal Corporation.

Surface Mine Rescue – Overall Winner

The team from Teck Coal's Greenhills Operations won the overall Surface Mine Rescue trophy in 2009.

Surface Bench Competition

The surface bench competition originated in 1995. The Maurice Boisse Memorial Trophy is awarded to the surface mine rescue team that excels at the practical bench competition. The practical bench task is designed to test individual team members on their knowledge and practical skills in mine rescue equipment and techniques. This competition is held in memory of Maurice Boisse, Mine Rescue Team Coach, Island Copper Mine. In 2009, the mine rescue team from Teck's Highland Valley Copper won the award for best bench for a surface team.

Underground Bench Competition

The underground bench competition originated in 1978. The competition is held in memory of the late Barry Abbott, Captain of the Cominco HB mine rescue team, who won the Canadian Championship in 1976. In 2009, the Barry Abbot Memorial Trophy was won by Quinsam Coal Corporation's mine rescue team.

Obstacle and Recovery

Quinsam Coal Mine provides this award in recognition of the contribution made by Keith Bracewell to the underground mine rescue competition. This award recognizes the winning team in obstacle and recovery, the largest task in the underground competition, an area that Keith worked hard to develop and improve upon. In 2009, New Gold Inc.'s New Afton mine rescue team won the Keith Bracewell Memorial Award.

2.3.3 FIRST AID COMPETITIONS

There are two separate competitions in the first aid category: the three-person miners' first aid competition, and the first aid components of the underground and surface mine rescue competitions.

Underground First Aid

This award was originally introduced by Cominco Ltd. to recognize the best first aid by an underground mine rescue team. The award, known as the "Sullivan Cup", was presented to Quinsam Coal Corporation's mine rescue team at the 2009 competition.

Three-Person Miners' First Aid

The first provincial miners' three-person first aid competition was held in 1978. After doing a short written exam, the three team members render first aid. The St. John Ambulance standard-level first aid course is the training standard, and only those who work at a mine are permitted to enter this competition. The three-person first aid competition is designed to be an extension of training in basic first aid skills and is a unique way for teams to prepare to assist their fellow workers in the event of an injury or medical emergency.

The 2009 Three-Person First Aid winning team was from Fording River Operations. Joel Letourneau of Fording River Operations won the Kathy Lofstrom Memorial Trophy for Best Coach of a First Aid Team.

2.3.4 48TH ANNUAL MINE SAFETY AWARDS

The 48th Annual Mine Safety Awards were handed out to 12 mines and quarries that accumulated 15,000 or more worker or contractor hours and had no fatalities between the period of January 1 and December 31, 2009. Recipients were celebrated at a banquet in Fernie, B.C. on June 5, 2010. Awards were presented in the following five categories:

Small Underground Mine Safety Award

This award was donated by the West Kootenay Mine and Industrial Safety Association in 1951 to encourage and promote safety in small underground mines. Since 1956, the competition has been open to qualifying mines throughout B.C. The award is given to the mine having the lowest compensable accident rate after logging between 20,000 and 240,000 worker hours, one-third of which were underground. The mine must have operated for at least nine months during the calendar year, and a fatality automatically disqualifies a mine for that year. There was no recipient of this award in 2009.

John Ash Award (Open-Pit Mines and Quarries)

This award is presented to the mine that has worked a minimum of 1,000,000 hours in a year and attained the lowest compensable injury-frequency rate. The 2009 recipient was Teck Coal's Fording River Operations.

Edward Prior Award (Open-Pit Mines and Quarries)

This award is presented to operations that logged between 200,000 and 1,000,000 worker hours and had the lowest compensable injury-frequency rate. The 2009 recipient was Teck Coal's Greenhills Operations.

Stewart-O'Brian Safety Award (Open-Pit Mines and Quarries)

This award is presented to operations that logged between 35,000 and 200,000 worker hours and had the lowest compensable injury-frequency rate. The 2009 award was shared by five mines:

- Central Aggregates (Lafarge Canada Inc.)
- Coquitlam Sand and Gravel (Lafarge Canada Inc.)
- Earle Creek (Lafarge Canada Inc.)
- Pit D (Allard Contractors Ltd.)
- Pit River Quarries (Division of Lafarge Canada Inc.)

2.3.5 CERTIFICATES OF ACHIEVEMENT

Certificates of achievement are presented to mines with a minimum of 15,000 worker hours and a compensable injury-frequency rate of zero. In 2009, there were a total of four mines that qualified for certificates for work conducted in 2008:

- Harper Ranch Quarry (Plateau Construction Ltd.)
- Steelhead Skway (Lehigh Hanson)
- Treat Creek, Jervis Inlet Mine (Jack Cewe Ltd.)
- Ward Road Quarry (Summit Crushing)
- Windermere Mining Operation (CertainTeed Gypsum Canada Inc.)

2.3.6 NATIONAL SAFETY AWARDS – JOHN T. RYAN TROPHIES

John T. Ryan trophies are provided by Mine Safety Appliances Canada Limited as a memorial to the founder of the company. The trophies are awarded by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) to the metal mine, the coal mine and the select mine which, in the previous year, experienced the lowest reportable injury frequency per 200,000 employee hours in all of Canada. There are two trophy categories:

Canada and Regional. No trophies were awarded in the British Columbia and Yukon regional category in 2009 (for 2008 performance) or in 2010 (for 2009 performance).

2.4 Examinations and Certifications

Section 26 of the Mines Act states that every person employed at a mine must, if required by the regulations or the Code, be under the daily supervision of a person who holds a valid and appropriate certificate as required by the regulations or the Code. The appropriate certification is specified in Part 1.12 of the Code. Recipients of a valid permanent certificate require re-examination every five years to ensure that their knowledge of the Code remains current.

2.4.1 BOARD OF EXAMINERS

The Board of Examiners comprises the Chief Inspector of Mines as chair and other inspectors appointed by the Chief Inspector. Board members were A. Hoffman, E. Taje and D. Howe in 2009. The Board is responsible for the following:

- examination of applicants for shiftboss certificates and certificates of competency;
- issuing certificates;
- conducting a review of all suspended certificates; and
- administering blasting certificates.

2.4.2 SHIFTBOSS CERTIFICATES

The following table summarizes shiftboss certification activity in 2009:

Activity	New Certificates
Examinations written (surface)	38
Examinations written (underground)	17
Number passed (surface)	38
Number passed (underground)	17
Total permanent certificates issued	55

2.4.3 TOTAL UNDERGROUND COAL FIREBOSS CERTIFICATIONS

Two underground coal fireboss first-class competency certificates were issued in 2009.

2.4.4 BLASTING CERTIFICATES

Blasting certification is required under Part 8.2.1 of the Code. Types of blasting certificates include the following:

- Basic
- Exploration
- Surface
- Underground
- Underground Coal (Shotfirer)
- Electrical
- General (which includes all categories except for Underground Coal)

A total of 106 blasting certificates were issued in 2009.

2.4.5 MINE RESCUE CERTIFICATIONS

To qualify for mine rescue certification, mine employees must complete approved training and must pass written exams developed for various types of mining, as per Part 3 of the Health, Safety and Reclamation Code for Mines in British Columbia.

The Province is responsible for certifying miners in several categories of mine rescue, as listed below. The following mine rescue certificates were issued in 2009:

Type	Number Issued
Underground mine rescue	49
Surface (open-pit) mine rescue	212
Gravel pit mine rescue	37
Total certificates issued	298

2.5 Accidents and Incidents

2.5.1 DANGEROUS OR UNUSUAL OCCURRENCES

Inspectors of Mines are responsible for determining which incidents should be included in the Mines Management System (MMS). These decisions are influenced by workload and staffing levels. In the past few years, the Occupational Health and Safety Committees at the mines have been the primary incident investigation tool, requiring less involvement from inspectors and consequently fewer incidents entered into MMS.

There were 157 dangerous occurrences entered into MMS in 2009, compared to 145 dangerous occurrences entered in 2008.

Location of Incident	Number of Incidents Reported	% of Total Incidents Reported
Pit	74	47.1
Plant/Mill	11	7
Maintenance (Shop)	13	8.3
Maintenance (Field)	3	1.9
Highwall	1	0.6
Dump	5	3.2
Tailings Pond	5	3.2
Office	0	-
Dry	1	0.6
Underground General	5	3.2
Underground Face	2	1.3
Underground Outbye/Haulage Drift	3	1.9

Work Practice Contributing to Incident	Number of Incidents Reported	% of Total Incidents Reported
Equipment Failure	33	21
Inadequate Planning	17	11
Inadequate Management	18	11
Inadequate Equipment	5	3
Poor Work Standards	45	29
Abuse or Misuse	0	-
Training	26	17
Not Following Work Procedures	36	23
Operator Error	42	27

Equipment Involved	Number of Incidents Reported	% of Total Incidents Reported
Haul Truck	35	22.3
Grader	6	3.8
Loader	7	4.5
Shovel	13	8.3
Dozer	10	6.4
Drill, Surface	6	3.8
Drill, Underground	1	0.6
Pickup	11	7.0
LHD	0	-
Conveyer	5	3.2
Electrical	11	7
Explosives	7	4.5
Excavator/Backhoe	9	5.7
Crane	4	2.5
Forklift	0	-
Water Truck	1	0.6
Scraper	0	-
Service Truck	14	8.9

Note: The numbers in the tables shown above are not intended to add up to 100% as there may be several preventative actions, locations, work practices or equipment involved for a single incident.

General Incident Information	Number of Incidents Reported	% of Total Incidents Reported
Number of Persons Involved	226	n/a
Number of Persons Injured	36	n/a
Average Time Into Shift (minutes)	78	n/a
Near Miss	22	14
Fire	10	6
Geotechnical	11	7
Fatality (Mining Related)	0	-
Fatality (Non-mining)	0	-

2.5.2 INJURY RATES FOR OPEN PIT COAL, OPEN PIT METAL AND UNDERGROUND MINES

According to WorkSafeBC data, the 2009 estimated injury rate (weighted average) at open pit coal, open pit metal and underground mines in British Columbia was 1.28. This is a decrease from 2008's estimated injury rate of 1.57 (which was reported as 1.7 in the 2008 Annual Report of the Chief Inspector of Mines). The unit for the injury rate statistic is the "number of claims per 100 estimated person-years of employment", where the number of claims are those that received standard, limited or survivor benefits in the year of injury or in the first quarter of the year following the year of injury. The estimated injury rates are adjusted on an ongoing basis to match claims data, which explains why numbers for 2008 reported in last year's Annual Report of the Chief Inspector of Mines may be different from those reported for the same year in this document.

The estimated injury rate for open pit metal mines remained at 1.9 in 2009 (no change from 2008), but the estimated injury rates for both open pit coal mines and underground mines decreased. In the 2008 Annual Report of the Chief Inspector of Mines, the estimated injury rate for open pit coal mines was reported as 1.0; the most recent data indicates that the estimated injury rate for this year was actually 0.6., which means that 2009's rate of 0.5 represents a slight decrease. The rate for underground mines also decreased from 3.7 in 2008 to 3.6 in 2009.

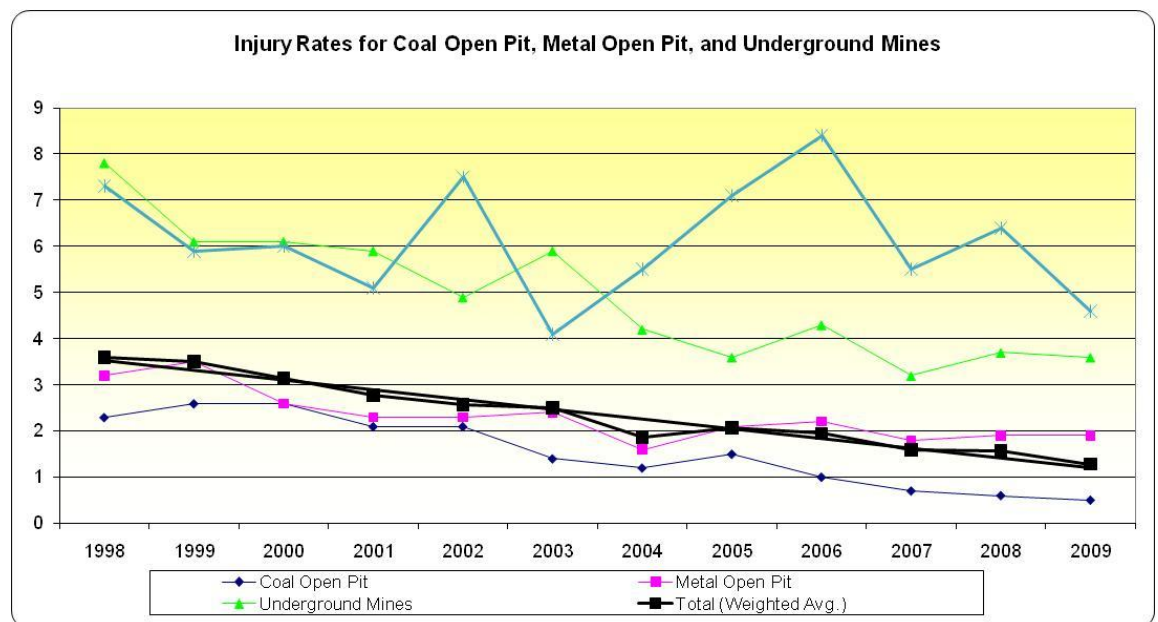


Figure 1: Injury Rates for Open Pit Coal, Open Pit Metal and Underground Mines in British Columbia, 1998–2009

To date, WorkSafeBC has accepted a total of 116 short-term disability, long-term disability and fatal claims for 2009, down from 160 for 2008. 10,311 worker days were lost in 2009, compared to 14,654 in 2008.

2.5.3 FATALITIES

There were four fatalities at mining operations in B.C. in 2009, but only one of these was directly related to mining activity.

- January 7, 2009: A worker suffered a heart attack at a coal mine.
- September 1, 2009: A watchman at a metal mine passed away due to an extremely aggressive form of leukemia. While this fatality occurred while the worker was on shift, his death was not related to the work environment.
- September 22, 2009: An experienced dozer operator working at a developing gravel operation reversed parallel to a large trench, and in the process the dozer slipped into the trench. The operator was trapped beneath the dozer and killed.
- October 16, 2009: The rider of a dirt bike died as a result of a crash at a sand and gravel pit. The rider had accessed the pit without authorization.



3 Administration

3.1 Summary of Mine Production

The tables below summarize production and average employment at major British Columbia mine sites in 2009.

2009 Production: Coal Mines	Annual Rated Plant Capacity (Tonnes)	Actual Tonnes Produced	% of Capacity	Days Mill Operated	Average Employment ¹	Contract Employment
Coal Mountain	3,500,000	2,363,000	68%	220	206	-
Elkview	7,000,000	4,800,000	69%	273	809	-
Fording River	10,416,000	6,037,000	58%	257	993	-
Greenhills	4,375,000	3,450,000	79%	272	490	-
Line Creek	3,600,000	2,021,000	56%	213	337	-
Quinsam Coal	1,560,000	700,000	45%	340	120	20

2009 Production: Metal & Precious Metal Mines	Annual Rated Mill Capacity (Tonnes)	Actual Tonnes Milled	% of Capacity	Days Mill Operated	Average Employment ¹	Contract Employment
Endako	10,980,000	9,759,000	89%	365	277	15
Gibraltar	16,790,000	12,976,000	77%	342	389	10
Highland Valley Copper	49,640,000	44,888,000	86%	365	1,112	152
Huckleberry	7,000,000	6,134,600	88%	365	231	-
Kemess South	18,650,000	18,353,000	98%	365	331	-
Mount Polley	7,000,000	7,046,000	101%	365	361	-
Myra Falls	1,460,000	450,000	31%	300	210	-

Source: PricewaterhouseCoopers, The Mining Industry in British Columbia 2009 (Mining Industry Survey)

1. Average number of employees actually working during fiscal year.

3.2 Mine Visits

The Mines Management System (MMS) allows for the tracking of mine visits and issuances of orders at mines. When an inspector visits a mine, he or she passes on information on issues to which staff from other areas of government may need to attend.

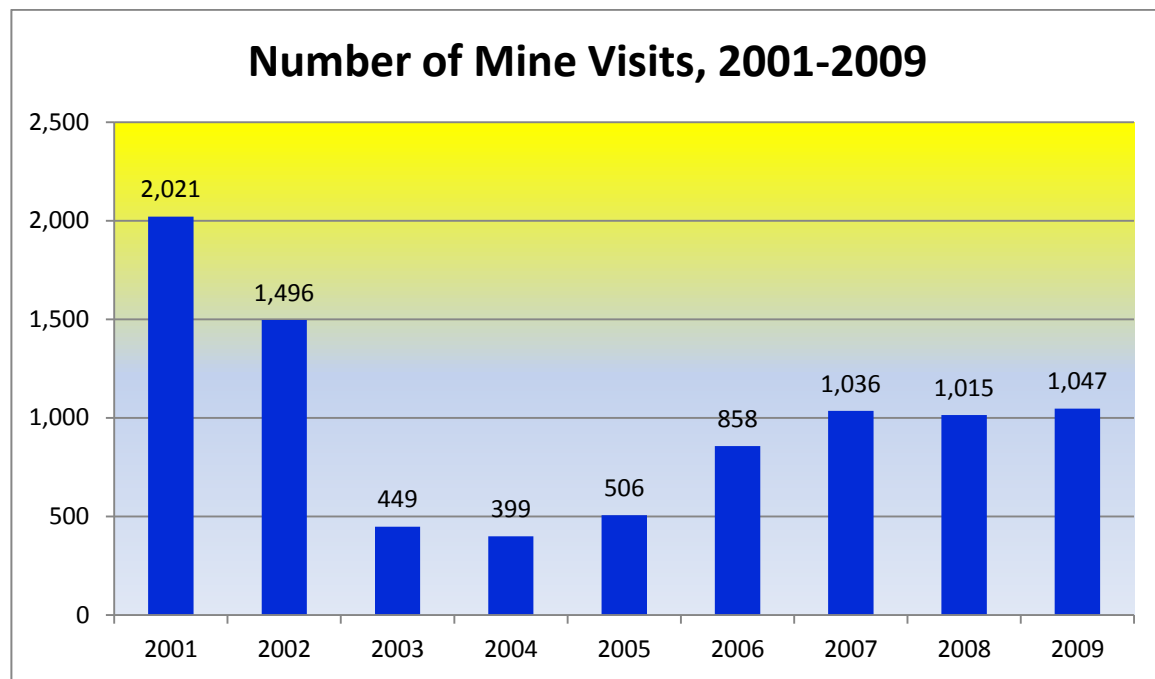


Figure 2: Number of Mine Visits, 2001–2009

In 2009, Inspectors of Mines made 1,047 visits to mines, conducted 793 inspections, issued 2,430 health and safety orders, and shut down 90 pieces of equipment. Inspectors also issued 119 environmental orders during the year. The following table provides a summary of MMS data on visits to mines made in 2009 by mine type.

Mine Type	Inspections	H&S Orders	Equipment Shutdowns	Environmental Orders	Dangerous Occurrence	Investigations	Training	Other
Abandoned	2	0	0	0	0	0	0	0
Custom Mill	4	15	1	0	0	0	0	0
Coal - Surface	49	198	3	0	82	3	0	1
Coal - Underground	6	15	0	0	3	0	0	0
Coal - Exploration	7	33	2	2	0	0	0	0
Exploration - Surface	71	132	8	40	5	0	0	0
Exploration - Underground	11	27	0	0	0	0	0	0
Industrial Minerals - Surface	46	205	8	2	2	5	0	0
Industrial Minerals - Underground	2	0	1	0	0	0	0	0
Metal Leach - Surface	0	0	0	0	0	0	0	0
Metal Mine - Surface	60	268	6	0	52	0	0	1
Metal Mine - Underground	31	141	3	3	6	1	1	1
Non-Assignable/ Unidentified	1	0	0	0	1	0	0	0
Placer - Surface	49	124	9	20	0	0	0	0
Placer - Underground	0	0	0	0	0	0	0	0
Rock Quarry	79	250	2	9	2	2	0	1
Sand/Gravel Pit	375	1,022	47	43	1	2	0	2
TOTALS	793	2,430	90	119	154	8	1	5

3.3 Audit Program

The health and safety audit program is designed to investigate how well a health and safety program has been implemented at a mine and its compliance with the Health, Safety and Reclamation Code for Mines in British Columbia. The audit program has been revised to reflect the 2008 version of the Code and to put more emphasis on the findings of Provincial staff. Audit reports reflect the findings of staff, who base their conclusions on field observations, interviews with mine management and staff, and research of mine records.

In 2009, five initial audits were conducted at the following mines: Western Canadian Coal – Wolverine, Western Canadian Coal – Brule mine, Teck Coal – Line Creek Operations, Imasco Minerals Inc. – Crawford Bay quarry/Sirdar plant and Construction Aggregates – Sechelt quarry. Two follow-up audits were also conducted at Mainland Sand and Gravel – Cox Station and Teck Coal – Line Creek Operations.

3.4 Notices of Work

The following Notices of Work and permit information were entered into MMS in 2009.

Type	Notice of Work Applications	Permits Issued	Average # of Days To Issue
Mineral/Coal (Exploration)	480	279	66
Mineral/Coal (other)	71	41	80
Placer	349	208	61
Sand & Gravel	199	94	120
Total	1,099	625	73

The breakdown of the 2009 Notices of Work by area is as follows:

Region	Placer	Sand & Gravel	Mineral & Coal	Total
Central/Northeast	51	52	96	199
Northwest	82	18	133	233
South Central	171	52	142	365
Southeast	36	33	139	208
Southwest	9	45	40	94
Total	349	200	550	1,099

The breakdown of the 2009 Notices of Work by month is as follows:

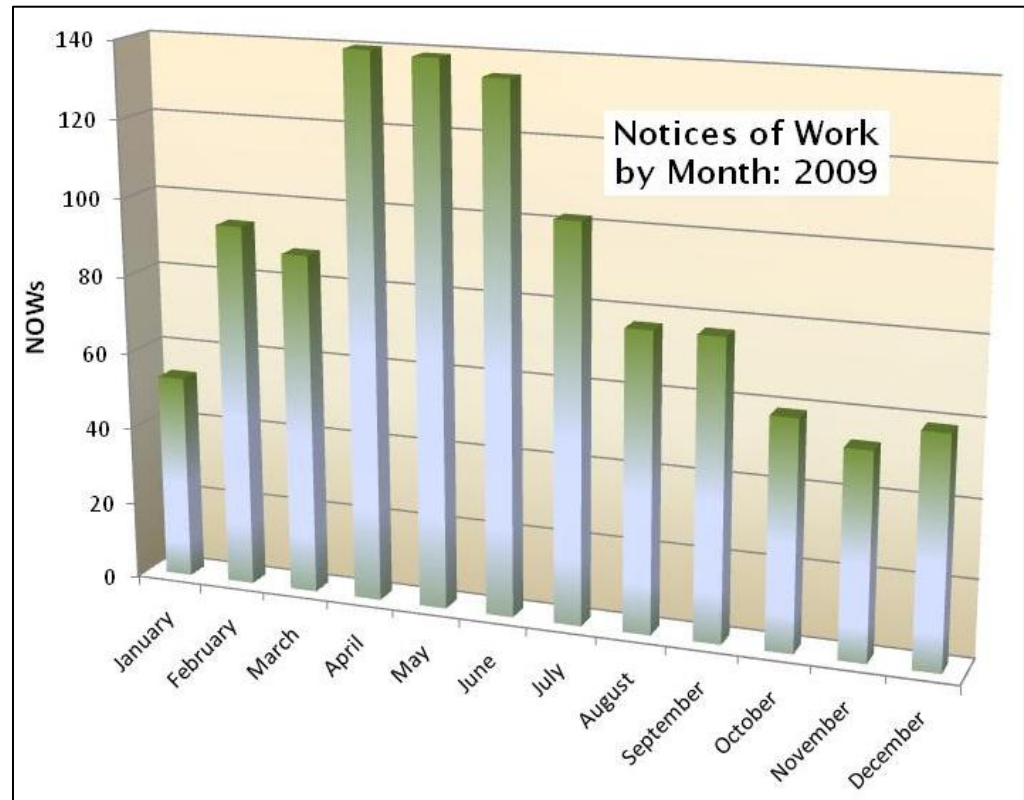


Figure 3: 2009 Notices of Work by Month

The areas covered by the regions are as follows:

- Central/Northeast = Kamloops, Okanagan and Thompson areas
- Northeast = Prince George, Omineca, Horsefly and Valemont areas
- Northwest = Smithers, Skeena and Queen Charlotte Islands areas
- Southeast = Cranbrook, Fernie and Elk Valley (Kootenay) areas
- Southwest = Lower Mainland and Vancouver Island areas



4 Reclamation

4.1 Roles and Responsibilities

Reclamation and environmental protection are a major component of all mineral exploration and mine development activities in British Columbia. Since 1969, mining companies have been required by law to reclaim all lands disturbed by mining. B.C. was one of the first jurisdictions in Canada to enact mine reclamation legislation, and the first to extend this policy to exploration sites.

Prior to starting any work, mining companies are required to obtain a permit approving the mine plan, the program for protection of the land and watercourses, and the reclamation program. Mining companies must also place a security deposit with the province to ensure that the reclamation obligations are completed.

The environmental protection and reclamation objectives of the Mines Act and the Health, Safety and Reclamation Code for Mines in British Columbia are to ensure the following:

- land and watercourses on mine sites in B.C. are reclaimed to a level equal to that which existed prior to mining;
- disturbed lands and watercourses are re-integrated into the surrounding landscape; and
- mining and mitigation requirements associated with metal leaching and acid rock drainage (ML/ARD) are conducted in a manner which prevents significant impacts to downstream or on-site biota and minimizes any reduction in post-mining productive capability of the site.

In order to achieve these objectives, the reclamation section:

- conducts detailed technical reviews of new projects or project revisions under the Environmental Assessment Act;
- conducts detailed technical reviews and issues permits for operating and closed mines with outstanding reclamation responsibilities under Section 10 of the Code;
- inspects mine reclamation activity;
- administers reclamation security deposits on behalf of the Province of British Columbia;
- organizes and participates on/in a number of provincial committees and activities which conduct technology transfer, review Ministry practices, and enhance government/industry/public/academia co-operation, including the Technical and Research Committee on Reclamation, the

Annual Mine Reclamation Symposium, the Selenium Task Force and the Annual ML/ARD Workshop; and

- participates on national and international committees conducting research and technology transfer, including the national Mine Environment Neutral Drainage (MEND) Committee and the National Orphaned and Abandoned Mines Initiative (NOAMI) committee.

4.1.1 STRUCTURE AND ORGANIZATION

The reclamation section has expertise in the technical areas of soil restoration, re-vegetation, land capability, erosion control, geology, geochemistry, and ML/ARD. Technical assistance is provided from other areas of government on geotechnical and mining issues, biological and effluent discharge, and offsite requirements.

4.2 Summary of Activities

4.2.1 PERMITTING

The reclamation section enforces the reclamation provisions of the Mines Act through permit conditions and detailed technical reviews aimed at finding environmentally sound, economically viable solutions that enable industry to remain internationally competitive without compromising the province's rigorous environmental standards.

During 2009, permitting activity remained constant. Two new permits for major projects, Mt Milligan and Yellowjacket, were issued, along with several permit amendments for mine expansion projects. In addition, 22 amendments were made to existing permits.

Type	Permits	Amendments	Total
Metal	2	10	12
Coal	0	11	11
Quarries/Sand & Gravel	0	0	0
Total	2	22	23

Permit amendments were made for Myra Falls, Highland Valley Copper, Mount Polley, Kemess South, Endako, Huckleberry, Britannia, Coal Mountain, Elkview, Fording River, Greenhills, Line Creek and Willow Creek Mines.

Under the Environmental Assessment Act, reviews were conducted for the Davidson, KSM (Kerr-Sulphurets-Mitchell), Morrison, Prosperity, Roman Coal, and Schaft Creek projects. The reclamation section also organized and/or participated on public committees reviewing activities at the Brenda, Quinsam, and Sullivan mines.

4.2.2 CO-OPERATION AND CONSULTATION WITH STAKEHOLDERS

The reclamation section works closely with industry, other government agencies, First Nations and the public to inform them of our activities and ensure that all concerns are considered. For mine applications involving mechanical disturbance of the land surface and/or watercourses, applications are referred to other government agencies, the public, and First Nations where their interests are affected. Additionally, the reclamation section provides regular information and assistance to the Ministry of Environment, Ministry of Transportation and Infrastructure, Environment Canada, First Nations and the public on technical issues involving reclamation.

Co-operation facilitated by the reclamation section between industry, the public, government, and the academic community continues to result in a constructive climate for exchanging and disseminating new technology.

4.2.3 METAL LEACHING AND ACID ROCK DRAINAGE (ML/ARD)

A provincial ML/ARD policy, a more detailed set of ML/ARD guidelines, and a manual of recommended methods for the prediction of ML/ARD indicate what constitutes acceptable mine design and adequate technical evidence. These documents provide a checklist for industry and also inform the public of regulatory conditions and environmental-protection requirements.

4.2.4 RECLAMATION SECURITIES AND FUNDS

All mines operating in B.C. must deposit security with the government to ensure that reclamation costs do not fall on provincial taxpayers (e.g., if a mining company goes bankrupt). In the past few years, the value of security deposits has increased to reflect more closely the true costs of reclamation. The total value of securities held by the province rose from \$10 million in 1984 to more than \$332 million by the end of 2009.

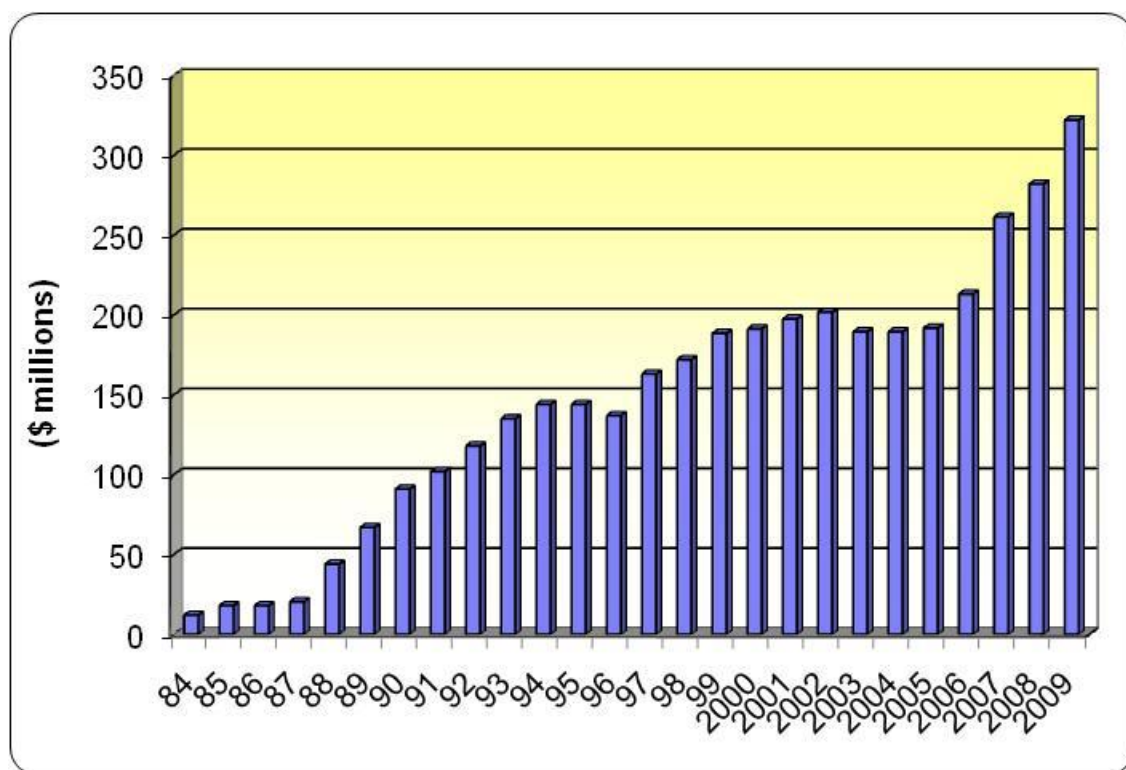


Figure 4: Reclamation Security Deposits Held by the Province (Initiation to 2009)

4.2.5 TECHNICAL AND RESEARCH COMMITTEE ON RECLAMATION

The Technical and Research Committee on Reclamation has been actively promoting and fostering reclamation research and information exchange for more than three decades. Members are drawn from the Ministry of Energy, Mines and Petroleum Resources, the Ministry of Environment, the Environmental Assessment Office, mining companies, the Mining Association of B.C., Natural Resources Canada, the University of British Columbia and Thompson Rivers University. This committee has been responsible for the organization of the annual B.C. Mine Reclamation Symposium since 1977.

4.2.6 NATIONAL ORPHANED/ABANDONED MINE INITIATIVE (NOAMI)

The National Orphaned/Abandoned Mines Advisory Committee was formed in March 2002 at the request of Canadian Mines Ministers. The Advisory Committee was asked to study the issue of orphaned/abandoned mines and to develop initiatives and partnerships to implement remediation programs across Canada.

The Advisory Committee takes direction from Mines Ministers and reports back to them through the Intergovernmental Working Group on the Mineral Industry (IGWG). The Advisory Committee consists of representatives of federal/provincial/territorial governments, the Canadian mining industry, environmental non-governmental

organizations and Aboriginal peoples and their communities. Committee members are responsible for communication with their constituencies. The Ministry represents the Province of British Columbia on this Advisory Committee.

4.2.7 MINE RECLAMATION SYMPOSIUM

The 33rd Annual Mine Reclamation Symposium was held from September 14 to 17, 2009 in Cranbrook, B.C. This year's theme was "Selenium, Reclamation of Coal Mines and General Aspects of Mine Reclamation". Delegates had the opportunity to tour the Sullivan, Greenhills and Line Creek Mines.

4.2.8 THE ANNUAL BRITISH COLUMBIA MINE RECLAMATION AWARDS

The annual Mine Reclamation Award and up to five citations are awarded for outstanding achievement in mine reclamation and have been presented at the British Columbia Mine Reclamation Symposium every year since 1977.

The 2008 British Columbia Jake McDonald Mine Reclamation Award was presented at the 33rd Annual Mine Reclamation Symposium in September 2009 to Teck Highland Valley Partnership for their outstanding reclamation achievements at the Highland Valley Copper Mine.

Five citations were also handed out at the 2009 Mine Reclamation Symposium:

- the Mineral Exploration Citation was awarded to Selkirk Metals Corp. for their work on the Catface property;
- the Coal Mining Citation was awarded to Teck Coal Ltd. for their work at Coal Mountain Operations;
- the Metal Mining Citation was awarded to Northgate Minerals Corp. for their work at Kemess South;
- a Special Citation was awarded to Ministry of Agriculture and Lands for their remediation work on the historic Yankee Girl tailings; and
- a Special Citation was awarded to the Ministry of Energy, Mines and Petroleum Resources for their remediation work at the Lakeview Dividend Mine.

4.2.9 METAL LEACHING AND ACID ROCK DRAINAGE WORKSHOP

The 16th annual Metal Leaching and Acid Rock Drainage Workshop was held in Vancouver on December 2 and 3, 2009. This year, the workshop's theme was "Soil, Geomembrane and Non-Traditional Dry Covers". The workshop was organized by the Ministry of Energy Mines and Petroleum Resources, Natural Resources Canada and the

Mine Environment Neutral Drainage (MEND) Program in association with TRCR and the International Network for Acid Prevention (INAP).

4.3 Industry Reclamation Record

Since the late 1960s, land occupied by the mining industry has steadily grown. Major coal and metal mines, which occupied less than 1,000 hectares in 1969, had, by the end of 2009, expanded to cover 45,412 hectares. Reclamation (where revegetation has been successfully established for one year or more) has occurred on over 42% of this disturbed land, or 19,422 hectares (Figure 5).

Metal mines have disturbed 23,406 hectares, and 10,692 hectares (or 45%) of this land have been reclaimed (Figure 6). Coal mines have disturbed 22,006 hectares, and 8,730 hectares (or 39%) have been reclaimed (Figure 7). A sharp increase in disturbance and reclamation at mines reflects the construction and development of new mines and the closure and commencement of mine reclamation at others.

The data presented in Figures 5, 6 and 7 indicate that disturbance has been increasing at a faster rate than reclamation. This can largely be explained by the expansion of the mining industry during the past four decades.

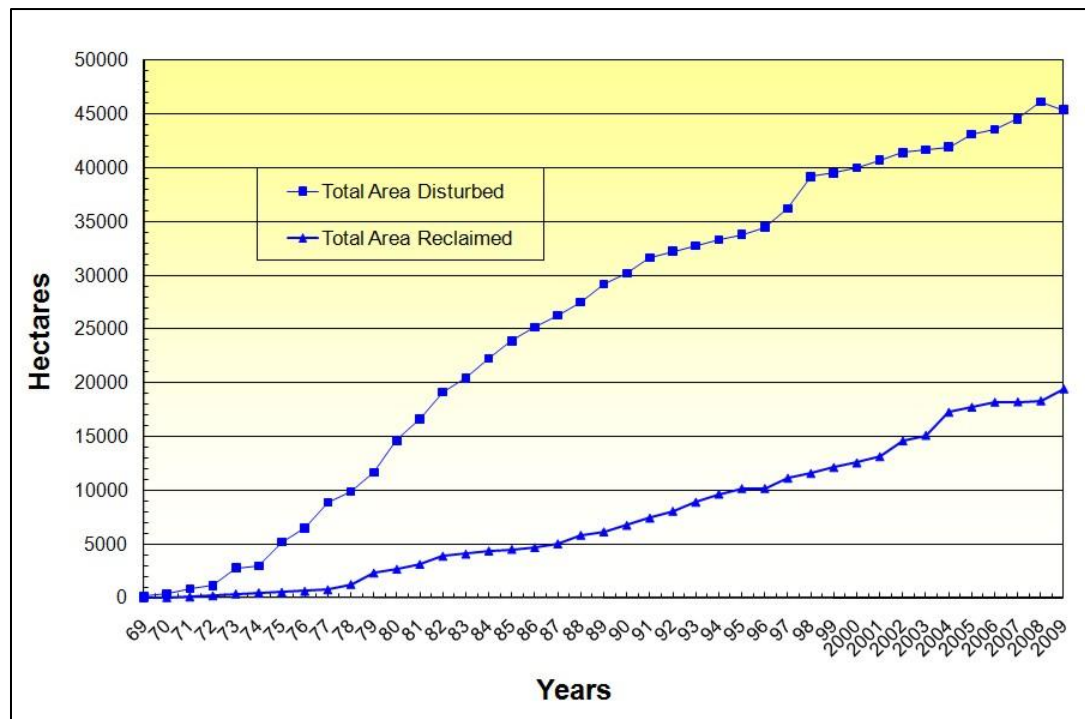


Figure 5: Area Disturbed and Reclaimed by Metal and Coal Mines in B.C., 1969–2009

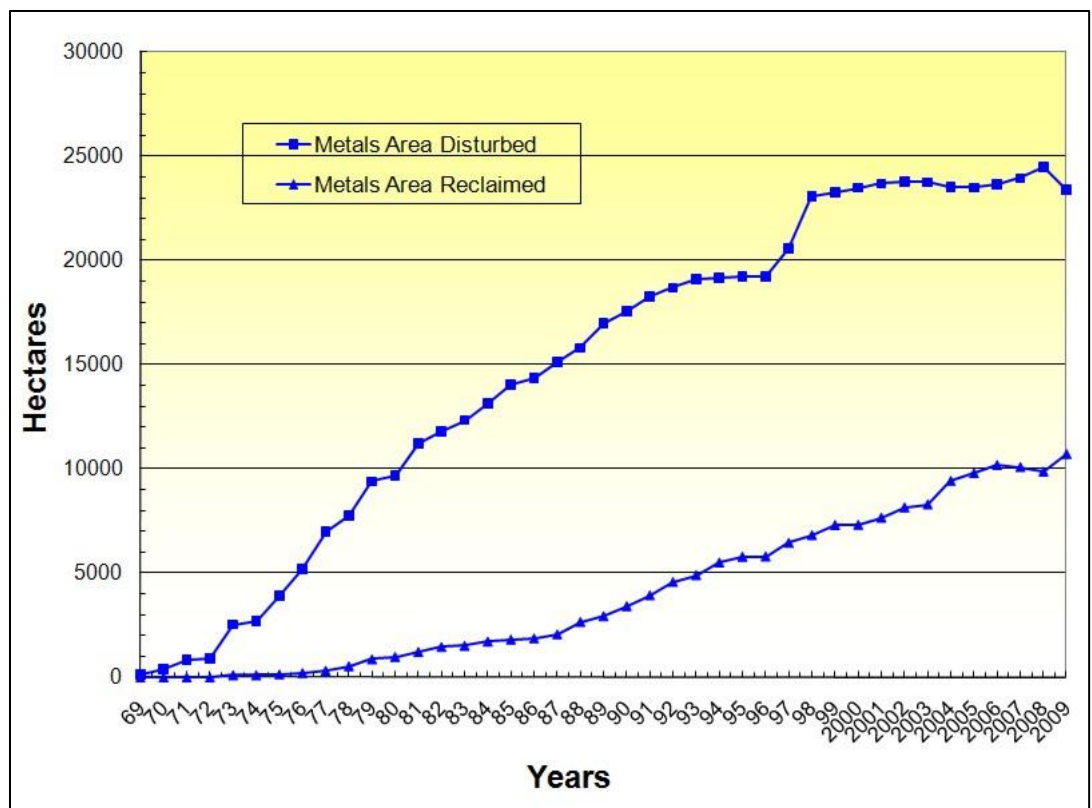


Figure 6: Area Disturbed and Reclaimed by Metal Mines in B.C., 1969–2009

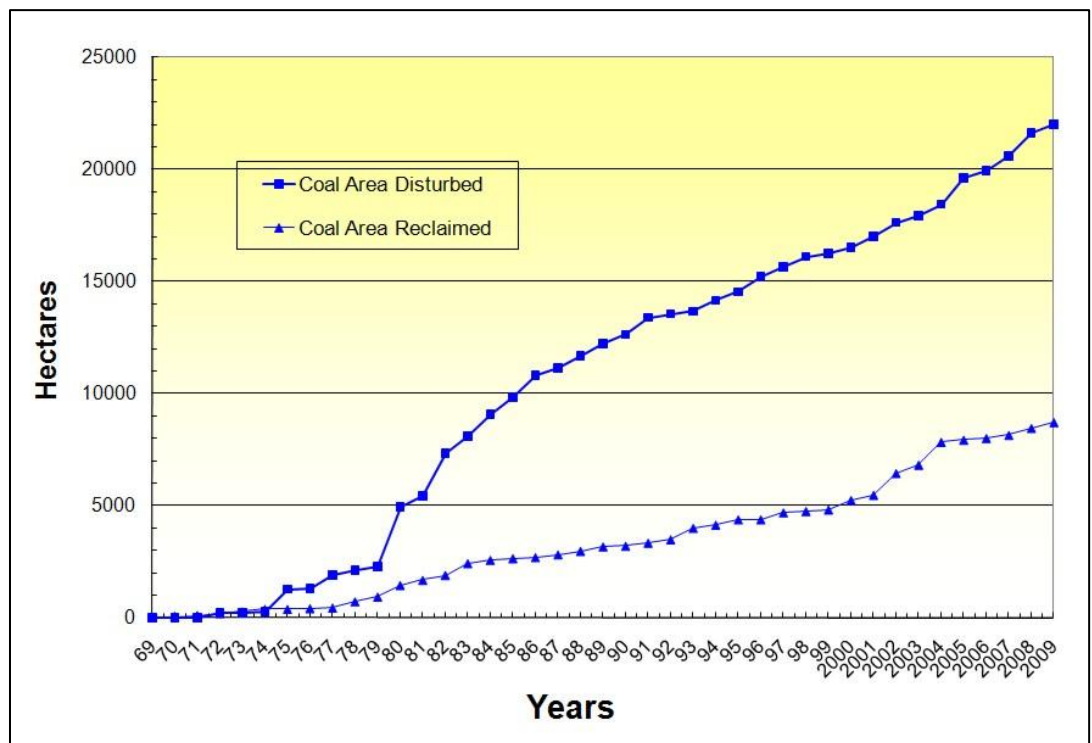


Figure 7: Area Disturbed and Reclaimed by Coal Mines in B.C., 1969–2009

4.4 Geotechnical

4.4.1 ROLES AND RESPONSIBILITIES

The geotechnical section is responsible for completing inspections at operating and closed mines with the focus on performance of tailings dams, waste dumps, excavations and foundations. Mining projects are reviewed for public health and safety, the safety of mine workers and for protection of land and watercourses.

The geotechnical section provides technical review of proposed mine developments for project approval under the B.C. Environmental Assessment Act and technical review of applications for approval under the Mines Act. The section also tracks geotechnical incidents and carries out follow-up reviews, and responds to mine road enquiries.

The geotechnical section provides geotechnical advice and develops policy for the following:

- Tailings impoundments and dams, sediment control structures, waste rock dumps, and soil overburden dumps;
- Open pits and underground developments;
- Mine roads;
- Risk evaluation for worker protection and public health and safety; and
- Environmental impact of geotechnical projects.

4.4.2 SUMMARY OF ACTIVITIES

In 2009, the geotechnical section

- co-ordinated inspections by Ministry staff and contractors;
- issued permits or permit amendments for construction and operation of major structures associated with tailings impoundments and waste rock dumps;
- undertook environmental assessment reviews for several new mine projects; and
- provided input and data for the Audit Teams to follow up at the mines audited.



5 For More Information

Ministry Resources

Information about the Ministry of Energy and Mines and copies of Ministry publications are available via the following:

MINISTRY WEBSITE

www.gov.bc.ca/em

QUEEN'S PRINTER PUBLICATIONS INDEX WEBSITE

www.crownpub.bc.ca

Enquiry BC

Enquiry BC is a provincial call centre that provides services to all British Columbia residents, on behalf of provincial government ministries, Crown corporations and public agencies. Hours of operation for Enquiry BC are 7:30 a.m. to 5 p.m., Monday through Friday.

- In Victoria: 250-387-6121
- In Vancouver: 604-660-2421
- Elsewhere in British Columbia: 1-800-663-7867
- Outside British Columbia: 1-604-660-2421
- Email address: EnquiryBC@gov.bc.ca

Mining Operations

Further information on the activities of the various mining companies can be found in the Canadian and American Mines Handbook, which is published annually by Northern Miner Press at www.northernminer.com, or from individual mining operations.

In addition, you can contact the Mining Association of British Columbia (www.mining.bc.ca) and/or the Coal Association of Canada (www.coal.ca) for annual reports on the status of those sectors.