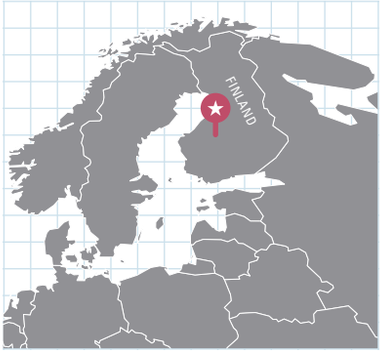
Pyhäsalmi

is an underground copper and zinc mine located on the shore of Lake Pyhäjärvi in central Finland. It produces three concentrates: copper, zinc and pyrite.



Type of mine	Underground
Ownership	100 percent
Inmet's revenue	23 percent
Opened	1962
Expected closure	2018
Land owned	442 hectares
Land disturbed	275 hectares
Distance from nearest town	0.5 km from Ruotanen, Finland and 4 km from Pyhäsalmi, Finland.
Main activities in surrounding area	Agriculture, small industry, residential and recreational.
Employees	219
Unionized employees	100 percent
National employees	219
Female employees	29
Donations to the local community	$34,000
Proportion of spending locally[1]	90 percent (within Finland), 12 percent Pyhäjärvi
Methods of waste disposal	Tailings disposal in one of three impoundments, all waste rock and 10 percent of tailings used underground for backfill.
Emergency Preparedness and Response Plan	Yes (working to upgrade to MAC[2] guidelines).
Tailings management system	Tailings management system was improved to meet MAC TSM standards.
Tailings Operations, Maintenance and Surveillance (OMS) Manual	A manual consistent to MAC standards was completed early in 2008; the site continued to improve the manual during the year.
Status of closure plan	Submitted in 2004 with permit application. Review/revision scheduled to begin late in 2009.
Community relations committee	No
Foundation (community development)	No

1 Contributions to the local economy include the local purchase of goods and services, and total payroll (G3 Indicator EC6).

2 MAC is the Mining Association of Canada.

As of the end of 2008, Pyhäsalmi had decided to increase SECA resources, recognizing the importance of additional help to improve the site's safety and environmental performance.

Pyhäsalmi's performance

PYHÄSALMI'S 2008 PERFORMANCE AT A GLANCE

	2008 target	2008 results	2009 objective
Lost Time Injury Frequency (LTIF)	1.0	1.8	0
Accident Severity	67	60	25
Reportable environmental incident intensity	0.10	0.29	0.15
Notices of Violation or warnings	0	0	0
Percentage of after-tax profits for community support	0.5	0.1	0.5
Ore production (000s tonnes)	1,370	1,406	1,370
Net income ($000s)		70,679	

Operate safely

After recording the best LTIF performance in its history in 2007, Pyhäsalmi's 2008 safety performance was unacceptable. All of the key trailing safety indicators that we use to evaluate safety performance increased substantially. LTIF was nearly three-fold, injury severity increased more than two-fold, DIF increased nearly six-fold and TIF increased by more than 100 percent. Some of the increase was attributable to summer vacation period changes which left the supervisory function understaffed. The Pyhäsalmi leadership team has committed to turn this performance around in 2009.

Pyhäsalmi did, however, make considerable progress in implementing the Working at Heights HCP and in moving forward with several other aspects of its safety and health management system. Pyhäsalmi identified gaps in conformance of safety management systems with Inmet's SECA Standards and prepared a plan to bridge them. The plan includes training the entire workforce on our SECA Standards and HCPs beginning in 2009. The site established a system of tagging, labelling, inspection and maintenance of fall protection and lifting equipment. Lifting and rigging risks were identified as a ninth high consequence activity during 2008; Pyhäsalmi is leading our organization in the development of protocols for lifting and rigging, and will share its experience with our other majority-owned operations.

The site continued to use ELMERI, a workplace safety inspection system developed by the Finnish Institute of Occupational Health, as a primary workplace inspection tool (access information on ELMERI at www.ttl.fi/Internet/English/Advisory+services/Occupational+Safety/). ELMERI inspections are conducted monthly and corrective actions are implemented as needed. Employee and contractor safety training continued at the same level as in 2007.

Emergency response simulations

Pyhäsalmi conducted surface emergency training drills in coordination with the local Red Cross. Three separate incidents were simulated to help first aid teams and emergency responders practice under high stress conditions not normally present during first aid training. The teams welcomed the opportunity to practice and requested more frequent simulations. Mine rescue training and first aid training with breathing apparatus was also completed.

Applying the new Exploration SECA Guide

Surface exploration within the area of the mine is managed by the Pyhäsalmi Geology department which has worked to incorporate the new Exploration SECA Guide into its drill contractor management. Drilling is done with semi-automated and fully automated drill rigs that allow the driller to work in a cabin away from moving equipment, one of the many new steps taken to protect workers.

Inspecting and testing a new safety shower near the chemical handling facilities at the Pyhäsalmi concentrator.

Occupational exposure assessment and protection
Pyhäsalmi made progress in improving its occupational health management. Monitoring and assessments were undertaken for exposure to dust, noise, vibration and chemicals in the mill and reagent mixing area. Pyhäsalmi subsequently improved the reagent mixing area to reduce the direct exposure workers have to chemicals. As a follow up to dust exceedances in the mill, Pyhäsalmi improved the dust collectors, increased and improved hazard warning signs and strengthened its requirement for using protective equipment in specific areas.

Pyhäsalmi measured vibration in three different types of heavy equipment. There was one exceedance of the action limit and Pyhäsalmi is developing a plan to minimize the risk. In the meantime, Pyhäsalmi established a revised procedure that requires:

- Proper road maintenance
- Proper equipment suspension and seat maintenance
- Moderate driving practices
- Maximum use of automated loading

To protect workers from periodic hazardous noise levels in the mine and mill, Pyhäsalmi has identified areas where workers must use their hearing protection, follow up with workplace inspections, and conduct regular worker hearing tests. Elevated noise levels in the mill originate from the blower which introduces air into the flotation cells. Pyhäsalmi has studied ways to minimize the noise and will evaluate mitigation measures.

Protect the environment

Pyhäsalmi environmental highlights for 2008

- Recycled 36 percent of solid waste (metal, wood, paper, plastic)
- Audited by an independent consultant for compliance with environmental regulations and company standards
- Had nine spills, mostly hydraulic oil in the mine, none of which resulted in environmental damage
- Took steps to eliminate exceedances of pH limits and water intake quantity permit levels
- Recycled 17 percent of process water
- Had eight exceedances of permit limits in 2008

Pyhäsalmi had 15 reportable environmental incidents during the year, including eight water permit exceedances and seven spills. The permit exceedances were disappointing and were the result of Pyhäsalmi adjusting to a regulatory regime introduced in 2007 and a new control system for its water discharge to Lake Pyhäjärvi. Seven of the permit exceedances involved water; five were related to exceedance of the upper pH limit of 9.5 and two were related exceedances of the average hourly water withdrawal limit, calculated from the monthly total withdrawal. The pH exceedances result from the way the metal recovery process operates. As water exits the process the pH is raised with lime used to reduce the concentration of metals. Water then flows to the tailings and water decant ponds where oxidation and mixing act to reduce pH. Most of the time these processes operate well, but at certain times they do not so that pH is not reduced sufficiently before discharge.

In response to the water-related permit exceedances, the mill operations team developed and implemented new pH control procedures to help ensure that pH remains within the permitted range.

Testing the fit of fall protection equipment during training.

Six of the seven reported spills involved oil from broken hydraulic hoses on underground heavy equipment. The other spill involved diluted cyanide solution which was released into secondary containment in the basement of the mill building after an operator inadvertently overfilled the tank with water. This material was immediately treated with lime. Since the solution was diluted and contained within the building, there was no danger to the environment or to personnel.

ENVIRONMENTAL MANAGEMENT

The environmental permit issued to Pyhäsalmi in 2007 incorporates the requirements of the Finnish Environmental Protection Act. To meet the conditions of the permit, Pyhäsalmi undertook studies to better understand the groundwater hydrology around its tailings facility and possible impacts on nearby Lake Pyhäjärvi. The mine is currently assessing a number of process water recirculation, water recycling, and water conservation options to reduce its water consumption and dissolved solids loading to the lake.

Pyhäsalmi continued to monitor and assess the impact of seepage from its tailings management facility. In 2008, experts from the Geological Survey of Finland conducted follow-up field work and assessment of the seepage and its impact on local soils and the lake. Based on their 2006 and 2008 surveys and data reviews, they concluded that the seepage is not impacting the lake. Four new groundwater monitoring wells were installed between dams and the lake. The recent study results and assessments will be incorporated into the closure plan revision due to be completed in 2010. The existing tailings management system conforms to Finnish standards and in 2008 incorporated guidance contained in the Mining Association of Canada's tailings management documents. The requirements of Pyhäsalmi's tailings operations, maintenance and surveillance manual were implemented early in 2008. Several areas for improvement were identified and implemented, specifically in the monitoring and process control of water and wastewater.

To improve the management of fugitive dust from its concentrate stockpiles, the mill yard was paved with asphalt and precipitation runoff collection systems were installed. These improvements, which will help Pyhäsalmi reduce dust emissions and product losses, will be completed in 2009.

An independent consultant, along with a representative of Inmet Mining's SECA department, completed an environmental compliance audit. This was the first such audit for Pyhäsalmi since being acquired by Inmet in 2002, an exception to Inmet's normal biennial audit frequency due to the lengthy period of regulatory review and final issuance for the 2007 environmental permit. The audit was designed to evaluate the mine's compliance with the new permit, environmental legislation, EU directives, Inmet policies and standards and good management practices. There were 24 exceptions to legislation, permits, Inmet policy and standards and 16 non-conformances with international good management practices. Pyhäsalmi has prepared an action plan to address all audit findings.

Ongoing landscaping of the mine area includes planting and tending of gardens as well as some re-vegetation. The landscaping is for aesthetic reasons and is associated with work on monitoring dust and its possible impacts.

Water management

Pyhäsalmi renewed its efforts to find methods to re-circulate, recycle and conserve fresh water to reduce its consumption of fresh water and associated discharge of effluent to Lake Pyhäjärvi. The southern part of the lake includes a national Natura conservation reserve (visit www.natura.org) established as part of European Union efforts to increase ecosystem conservation areas (visit www.ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf). Pyhäsalmi has recently increased its efforts to work with the town of Pyhäsalmi and the local fishing association to assess lake improvement alternatives and an application for European Union funding has been submitted for this joint project. Pyhäsalmi's total water consumption represents less than five percent of the annual lake outflow.

A leader in energy management

The high level of performance in energy management was one of the reasons Pauli Koistinen, Pyhäsalmi's Maintenance Manager, was one of five people within Inmet to be recognized with a leadership bonus in 2008.

Fall protection training at our sites has included our personnel being suspended in their full gear. Retrieving personnel from being suspended after a fall is a priority for our working at heights training, to ensure people can be rescued quickly if they fall.

Energy management
Energy management has been integral to Pyhäsalmi's operations for nearly two decades. Pyhäsalmi's energy conservation focus is comprehensive and provides Inmet with excellent examples of practical measures for controlling energy consumption, costs and greenhouse gas emissions that can be applied at our other majority-owned operations. For example, most of Pyhäsalmi's motors have super high efficiency ratings and more than 100 have variable speed controllers that deliver only the energy required to do the task. The site also uses automatic shutoff valves, motors, light switches, fans, compressors, heaters and lights, re-circulates cooling water for heating systems and continuously monitors energy consumption per tonne of ore fed to the mill. These already energy-efficient measures make further improvements a challenge.

Reaching out to our communities
50th anniversary celebration
In 1958, a farmer accidentally found copper-rich rock in the area of the current Pyhäsalmi mining operation. The mine celebrated the 50 year anniversary of its discovery with the Geological Survey of Finland along with colleagues from Outokumpu, the former owner, which also celebrated its 100th year anniversary. Since its discovery in August 1958, Pyhäsalmi has produced enough copper for 900,000 kilometres of housing water pipe, enough zinc for 70 million cars and sulphur from pyrite used to produce fertilizer.

The mine and nearby town are host to the Centre for Underground Physics in Pyhäsalmi (CUPP). CUPP's sensitive neutrino experiments are conducted underground in an older part of the Pyhäsalmi mine. The research is focused on advancing understanding of the sun's energy and represents a test case for advancing Europe's particle physics research along the lines of experiments conducted at underground mines in Sudbury, Canada.

Treat people and communities well

Pyhäsalmi has been part of the local community for 50 years and has grown up with the nearby villages and towns. The great majority of its employees and contractors are from the local area and as such Pyhäsalmi has good relationships with and it believes it has a good reputation within the community. Because of this long standing relationship, Pyhäsalmi has not felt a great need to establish the type of community affairs engagement strategies that have been developed at our other operations. We continue to work with Pyhäsalmi to build a better understanding of the need for a broad-based community engagement strategy. As in previous years, the mine hosted a week-long training course for university geology students. As part of its environmental permit requirements, Pyhäsalmi hosted several meetings and site tours with the town and met with the local fishing association to agree and act on lake monitoring programs and options for lake fish habitat improvement.

Sponsored local students so they could attend mining exhibition
Finnmateria is a special exhibition dedicated to the Finnish mining industry that took place in November. As part of its display presenting modern mining practices, Pyhäsalmi invited local senior high school students from Pyhäjärvi and Kiuruvesi to visit the exhibition and hosted their guided bus travel. The effort was part of the mine's ongoing program to promote mining and Pyhäsalmi as a positive career opportunity.

Hands-on learning about mining
Teknokas is a hands-on science centre operated by the University of Oulu and partly funded by Pyhäsalmi. Children learn about science and technology with active participation in displays such as the gold panning exhibit. The gold is actually "fool's gold", known as pyrite, that is supplied by the mine. For more information visit the website at www.teknokas.fi.

Socio-economic assessment
Two Pyhäsalmi employees participated in SEAT training. Site personnel are committed to assessing community needs and mine impacts and working to manage them in a manner designed to help the community realize its objectives. By year end, Pyhäsalmi had completed many of the site and community profiles needed for a socio-economic assessment. The site is on track to complete its report action plan and community engagement plan in the first half of 2009 and will use it to develop its community development strategy.

Inspecting and maintaining fall protection equipment at Pyhäsalmi.

Employee relations
A recent salary survey in Finland provided a basis for improving the mine's employee compensation and benefits package. These improvements, together with other human resource initiatives, will help Pyhäsalmi retain and attract productive and motivated employees. The mine is an active participant in Inmet's Human Resources Task Force and participated in the training for the new employee development program, which will roll out in 2009. Pyhäsalmi also assisted in the development of progressive employee retention and recruiting programs in the face of a skills shortage and the growth in mining projects in Finland.

Christmas donation to six local non-profit organizations
Pyhäsalmi's employees volunteered to donate the money reserved for their company Christmas presents to six local non-profit organizations, including: Pyhäjärvi church welfare work, disabled war veterans, Karpalokoti (a nursing home for people suffering from dementia and other memory failures), Kaislaranta (a nursing home for disabled people), the youth club of the volunteer fire-brigade, and the scout troop Salmen Samoajat.

Pyhäsalmi's performance on 2008 SECA objectives

2008 SECA OBJECTIVES	2008 PERFORMANCE
1. Complete High Consequence Protocols (HCPs) and develop implementation plans.	☑ Developed HCP implementation plans.
2. Develop implementation plans for the SECA Standards at our majority-owned operations.	☑ Developed an implementation plan to ensure that all of the Standards will be met within a reasonable timeframe.
3. Increase community affairs resources at our majority-owned operations.	☒ Although Pyhäsalmi increased resources within its Safety and Environment department, it did not specifically increase its community resources.
4. Conduct a socio-economic assessment at each majority-owned operation.	~ The socio-economic assessment was begun. Operation and community profiles were initiated.
5. Develop energy and water conservation plans at each majority-owned operation.	☑ Pyhäsalmi drafted energy and water conservation plans. Pyhäsalmi continues to play a leadership role within the company by diligently tracking, assessing, selecting, and implementing energy conservation measures.

Student visitors to Pyhäsalmi's display at Finnmateria, a mining industry exhibition. The mine hosted students from the community to promote mining as a career opportunity.