

MINING AND EXPLORATION IN IDAHO, 2002

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Idaho Geological Survey

In spite of an upturn in precious metal markets and prices during 2002, the value of Idaho's mineral production continued its decline, a consequence of market conditions, depleted reserves, and decreasing interest in domestic mining. However, a small upturn in exploration interest for industrial minerals and precious metals was welcome news (Figure 1). The preliminary U.S. Geological Survey value for Idaho's nonfuel mineral production in 2002 is \$ 306.8 million, versus \$ 346.3 million (preliminary) in 2001. Final 2001 value was revised downward to \$ 288 million. Industrial minerals continued to be an increasing portion of Idaho's total mineral value, as compared to declining metallic mineral production in the state. In 2002, Idaho metallic minerals accounted for 28 % of the total value, a drop from 30 % in 2001, and down sharply from the 41 % in 2000. The Sunshine silver mine and several gold mines have closed in recent years, while the industrial mineral sector has been more stable, though it also suffered declines in both employment and production during 2002. Phosphate rock, construction sand and gravel, and silver continued as Idaho's leading commodities.

Metal Mining

Idaho's famous Coeur d'Alene District in north Idaho had only two operating large mines in 2002; the Sunshine mine having closed in 2001. The famous Silver Valley has supplied over a billion ounces of silver, plus significant lead, zinc and copper since the discovery of rich veins in the 1880's. The Sunshine mine was up for sale, but no deal had been struck by year's end for the venerable producer, formerly Shoshone County's largest employer. At one point during 2002, mining employment in the County was down to 319 jobs, the lowest level in more than 110 years, according to the Idaho Department of Labor.

Hecla Mining Company continued operating the Lucky Friday mine near Mullan at reduced capacity, and thanks to rising silver prices and cost-cutting measures, Hecla was able to add back about 40 jobs. Most of the 2.0 million ounces of silver produced was from the Gold Hunter orebody; still this was a significant drop from the 3.2 million ounces produced in 2001, although production costs were sliced significantly as well. Corporate-wide, the Idaho-based company made good progress in reducing its debt load, and produced more gold and silver than in any previous year in its history, largely due to its Alaskan and foreign ventures.

The Galena mine, operated by Coeur Silver Valley, was in full operation and achieved record production of 5.3 million ounces of silver during 2002, an 18% increase over 2001. Average total cash costs declined to \$ 4.25 per ounce, according to the company's report. Much of that reflects the successful introduction of mechanized mining to selected areas at the Galena, especially the deep 72 vein. Still, revision to the mine plan and silver price expectations led to a \$ 19 million write-down on the carrying value of Coeur Silver Valley in the 4th quarter of the year. The company maintained an aggressive exploration and development program at the

Galena, focusing on future longhole stoping of the upper portions of the Silver Vein. They rehabilitated the 2400 and 3000 levels, installing shaft stations, muck transfer points and driving a decline from the 2400 level to reach the vein.

In August, the Environmental Protection Agency (EPA) signed off on the Record of Decision for a basin-wide cleanup over 30 years of the entire Coeur d'Alene River basin, costing an estimated \$ 359 million. The negotiation process involved Idaho's governor and congressional delegation and resulted in a controversial new Coeur d'Alene Commission to oversee the cleanup. The Commission includes local county commissioners, as well as representatives from EPA, the Tribes, Idaho Division of Environmental Quality, and Washington State.

While the Sunshine mine closed in 2001, it was not forgotten. The National Institute for Occupational Safety and Health's Spokane office produced a moving documentary film on the 1972 Sunshine mine fire disaster, which killed 91 miners. The excellent NIOSH training film debuted in Wallace in August to an overflow audience filled with former Sunshine miners and their families.

Thompson Creek Mining Company's large open pit molybdenum mine near Challis in Custer County had a rollercoaster year due to price ups and downs. Production was about half of capacity, as approximately 100 employees shared mining and milling duties. Contractors stripped cover and laid back the high wall to ready the pit for Phase 5 mining as the price rose. But a Labor Day weekend fire broke out on the conveyor from the mine to the mill, melting 4000 feet of belt and idling operations for a month, by which time molybdenum prices had dropped back down. The mine produces a high performance grade product as well as a standard concentrate. Thompson Creek employees gave an excellent tour to a group of teachers and students in October (Figure 2).

Idaho has very few active major metal mines since most of the gold mines are closed and in reclamation. Meridian Gold's Beartrack mine was the only one still recovering gold, from rinsing of its heap leach pad in Lemhi County. The company produced 8,653 ounces of gold in 2002 and made good progress on reclamation work. U.S. Antimony completed their planned closure and reclamation work at the Yellowjacket mine in Lemhi County, and bankrupt Pegasus turned the reclaimed Black Pine mine site in Cassia County back to the agencies. In central Idaho, Hecla was working on ways to discharge the millions of gallons of water left in their Grouse Creek tailings impoundment. At the small, underground Rescue gold mine in Warren, Barramundi Gold had a bad year, starting with a heavy snow load that collapsed the roof of the mill building in February. The company made good progress at cleaning up and rebuilding the roof. PacRim Resources Ltd. is the parent company.

Phosphate Industry

Idaho's southeastern corner is the location for the state's largest mineral industry (Figure 1), but poor market conditions in the fertilizer business and last year's closure of the Astaris

plant in Pocatello have resulted in several hundred jobs lost since the end of 2001. Idaho facilities process phosphate rock into phosphoric acid fertilizers, purified phosphoric acid for other uses, and elemental phosphorus.

J.R. Simplot's Smoky Canyon mine was the largest producer, extracting over 2 million tons of ore, largely from Panel E. In July, the Bureau of Land Management approved their Supplemental Environmental Impact Statement for mining of the B and C panels further north, and the company started pre-mining activities on the tract which will provide at least 5 years of production. Simplot had an aggressive exploration and development program, with drilling on the Manning Creek and Deer Creek leases. Ore from the mine goes through an 87-mile long slurry pipeline to the Don Plant in Pocatello. Weak market conditions prompted Simplot to eliminate 85 jobs at the plant and discontinue ammonia production there.

The Astaris elemental phosphorus plant closed in 2001 and the plant reverted to FMC, who is responsible for cleanup at the site. Astaris' Dry Valley mine ceased operations temporarily at year's end due to the plant closure and a large stockpile. The stockpiled ore is being sent to the new Agrium-Astaris joint venture Purified Phosphoric Acid (PPA) plant at Conda. Agrium entered into a 20-year contract to supply the super phosphoric acid feed for the PPA plant from their fertilizer plant at Conda, which had to layoff some 40 employees due to market conditions. Agrium also mined approximately 1.5 million tons from the Central Rasmussen deposit. Agrium worked on reclamation of the South Backfill area and a new mine plan for the North Rasmussen expansion.

Monsanto was mining the final portion of their South Pit at the Enoch Valley mine and started transitioning over to their new South Rasmussen Ridge property, which supplied about a third of their 1 to 1.5 million tons of ore mined. Exploration work on their Trail Creek lease and reclamation were ongoing. The Monsanto plant in Soda Springs is the only domestic producer of elemental phosphorus, and the company celebrated its 50th year of operation and the grand opening of a new Plant Administration building in July.

All five companies (Simplot, FMC, Agrium, Monsanto, and Rhodia) involved in Idaho's phosphate industry worked with the agencies on the regional selenium investigation, risk assessment, and detailed site investigations at reclaimed mine sites. Scientific studies by the University of Idaho and the U.S. Geological Survey have helped identify where the selenium is hosted in the mine stratigraphy and some possible ways of minimizing its mobilization from old waste dumps.

Other Industrial Mineral Production

Markets for decorative stone market and other construction materials continued to be strong. Many industrial mineral operations are important employers in rural areas of Idaho (Figure 3).

Emerald Creek Garnet, in Benewah County is north Idaho's only major industrial mineral mine, outside of aggregate producers. The company permanently laid off 17 persons, a third of its work force, in November due to poor market conditions, resulting in a 16 percent decline in tons shipped. Emerald Creek's parent company, Western Garnet International Ltd., announced in late November that it would change its name to WGI Heavy Minerals, Incorporated. Though Emerald Creek has done award-winning reclamation, the company has suffered major permitting delays from the Corps of Engineers on their proposal to mine in the floodplain of the St. Maries River. WGI has major operations in India, as well as at Emerald Creek. Next door, the U.S. Forest Service also had to go through the full NEPA process to expand their recreational dig site for star garnets. The site gets 2000 visitors each summer; the expansion was opposed by several environmental groups.

Most of Idaho's industrial minerals are located in southern Idaho, including the Ash Grove cement plant at Inkom. It ships about 250,000 tons of clinker a year. Ash Grove agreed with the state to install air pollution equipment and make other improvements. At Malad, Hess Pumice had a good year though they did note a slowdown in demand for their ultrafine, ultrapure pumice powder used to grind television screens. Their Idaho Minerals perlite expansion plant operated sporadically, and the grout business reflected a slowdown in heavy construction projects. Hess employs 65 people at the Malad facility.

Several small calcium carbonate mines operate in southern Idaho. At Dubois, the newly renamed Thermocal Mines of Idaho, LLC, formerly Wilson and Sons, mines travertine from a deposit at Lidy Hot Springs. The high purity product is an excellent feed grade cattle supplement. The company ships about 15,000 tons per year and is seeking new markets. They also produce bentonite.

U.S. Antimony is a major owner of Bear River Zeolite, Co. Inc., which opened a mine near Preston in the southeastern corner of Idaho last year. They added a new screening and grinding facility this year. Sales were picking up, and Bear River was aggressively expanding from wholesale into retail markets for the high-potassium clinoptilolite. The product is excellent for soil amendments and filtration uses, and as an odor control agent for CAFO's.

Business was good in the stone markets, especially for higher end dimension stone. L and W Stone shipped over 25,000 tons of prized, multi-colored argillaceous quartzite from their Three Rivers quarry near Clayton in central Idaho (Figure 4). Trucks transport the pallets of split rock to the plant in California. Approximately 50 employees worked at the expanding site, for which the BLM was requiring that a formal Plan of Operations be written.

At least three companies, Northern Stone Supply, Oakley Valley Stone, and American Stone, produced Oakley Stone from near Middle Mountain in south-central Idaho. The micaceous quartzite is well-suited as a building material since it splits into very durable, thin slabs for facing and paving stone.

Table Rock Sandstone, the silicified sandstone from the historic quarry above Boise, was mined for landscaping rock, but some material quarried last winter will go to the newly

remodeled Boise Airport. Cutting was done by Idaho Travertine in Idaho Falls, which was also cutting 100 million pounds of Alabama limestone for the LDS Temple in Nauvoo, Illinois. International Stone of Boise mined local “Wind Drift” sandstone for landscaping purposes, and Mountain West Products of Rexburg produced red, black and gold pumice for landscaping use.

Consolidations and corporate sales continued to change Idaho’s aggregate business. In Boise, the large Monroc operation, which included several gravel pits and a concrete plant, was sold in February to Staker and Parsons of Ogden, Utah, who renamed it the Idaho Concrete Company (ICCO). They are part of the Oldcastle group, an Irish construction conglomerate. Oldcastle already owns several aggregate producers in southern Idaho and in the Rathdrum-Coeur d’Alene region of north Idaho. The latter area is underlain by large gravel deposits from the Missoula Floods.

Exploration

The rise of precious metal prices and the attractiveness of industrial minerals in today’s market prompted a significant increase in exploration, primarily for gold (Figure 1). Junior companies and prospectors were the most prominent. J.R. Simplot Company was the most active explorer in the phosphate field. At another ongoing industrial mineral project, Alchemy Ventures hired a new president, Roger Kaufman, with industrial minerals experience, and Alchemy spent the year regrouping. They hold 14 state lease applications in Latah County and continued testing of both the feldspar resource and the clay, which has been mined previously for fire bricks.

New Jersey Mining Company (NJMC) had several exciting projects in north Idaho, centered on the Coeur d’Alene District. They drilled 1700 meters of core in 13 holes to test the Coleman gold-quartz vein system at the New Jersey mine near Kellogg (Figure 5). The best intercept, 40 feet of 0.08 ounces per ton gold, was north of the pit area; the veins extend several hundred meters along strike and down dip. The company also drilled, from underground, the high-grade silver-gold veins hosted in Revett quartzites at the Silver Strand mine. All five holes, totaling approximately 250 meters, intersected the well-mineralized vein. The best intercept was in DDH02-03 which cut 1.61 meters of 15.6 grams per tonne gold and 316 grams per tonne silver. The vein is open to the east and at depth. NMJC is initiating the permitting process for a seasonal operation with ore to be shipped to the New Jersey mill at Kellogg. The company also ran a geophysical survey at a third property.

Idaho Consolidated Metals Corporation changed its name in July to Beartooth Platinum and made an agreement on their Petsite gold property with Camden Capital Corporation. Camden drilled five core holes at the Orogrande site and did hit the high grade zone identified by Cyprus Amax in 1997. Camden intersected the vein at fairly shallow depth on patented claims on the Friday-Petsite property.

Near Gibbonsville in Lemhi County, prospector Kent Roche used an underground drill from the surface to test for gold mineralization at the Moon Adit. Results were somewhat

disappointing so he moved northward to Johnson Gulch, where Gradient Geophysics ran an IP/Resistivity survey, outlining a large anomaly. Roche drilled 4 core holes, some to considerable depth and exposing much brecciated rock. Limited geochemical results were available; the area is near the Ditch Creek project that AGR drilled several years ago.

In the Blackbird District southwest of Salmon, Formation Capital Corporation continued permitting studies for an underground cobalt-copper-gold mine at their Idaho Cobalt Project. The proposed mine plan calls for producing 3.3 million pounds of cobalt per year and would be the nation's only cobalt mine. Formation bought the Big Creek hydrometallurgical facility near Kellogg from bankrupt Sunshine Mining at a bargain price. The Big Creek plant operated successfully for 12 years, using a variety of leach processes on the Sunshine silver-copper ore, and could be adapted to treat the cobalt ores.

American Independence Mines and Minerals submitted a Plan of Operations to reopen the Golden Hand mine, near Edwardsburg in central Idaho. The mine is a cherry stem into the Frank Church River of No Return Wilderness, and the proposal is generating some concern from environmental groups. The Payette National Forest is preparing the EIS, due out in 2003.

At Florence, Windjammer Gold excavated a small pit to explore for a lode gold source of the million-ounce placer gold production from the district. The area was drilled by Gold Fields in 1990. Another placer gold project was that of Juniper Rose, LLC, who applied to reopen the Rose Hill mine at King Hill on the Snake River. Previous mining during the 1940's worked a high gravel terrace. The company did some test sampling at the Elmore County site. Also in the Snake River Plain country, a private company, Portuguese Creek Management, LLC, drilled 12 shallow core holes looking for gold in the Tertiary rhyolites near Gooding. Terrain there is similar to and nearby the ill-fated Blackhawk project of a few years ago.

Southwestern Idaho also saw renewed activity. Nevada Contact, a subsidiary of Agnico-Eagle, picked up the War Eagle property in Owyhee County. The land is along the extension of the rich, epithermal precious metal veins of the DeLamar District. Geologists conducted mapping and sampling at War Eagle Mountain and also conducted reconnaissance work elsewhere in the state.

Atlanta Gold, a wholly owned subsidiary of Twin Mining, drilled 4000 feet of HQ core in 13 metallurgical test holes at their Atlanta project in Elmore County. Results are being incorporated into a final feasibility study for the proposed gold mine, where previous drilling has outlined about a million ounces of gold in two open pits, plus a significant underground resource on patented claims.

State Mapping Activities

The Idaho Geological Survey (IGS) released several new color surficial and bedrock geologic maps, including compilations for the Hamilton, Coeur d'Alene, and Missoula West 1 x 2 degree sheets. IGS has additional projects near Kooskia and Orofino in north Idaho, the Wood

River valley, and the Twin Falls region. Mapping has been part of the Statemap cooperative program with the U.S. Geological Survey. Many of these maps are available as digital files on the IGS website (www.idahogeology.org). Inventories of selected abandoned and inactive mine sites in Idaho were completed in the Challis region and Boise National Forest during the year. IGS geologists also taught a summer teacher workshop in the Salmon area, where a day was spent looking at the thorium and copper deposits near Lemhi Pass. Recent age dates, reported by an IGS geologist (V.S. Gillerman) and colleagues at the Geological Society of America 2002 Annual Meeting, have shown that the mineralization is Precambrian in age but has seen subsequent Paleozoic to Mesozoic reworking. Salmon area geology and ore deposits will be featured at the joint meeting of the Belt Association and Tobacco Root Geological Society to be held in Salmon, Idaho, in August, 2003.

Figure 1. 2002 Exploration map for Idaho



Figure 2. Thompson Creek environmental coordinator, Bert Doughty, explaining reclamation to a teacher



Figure 3. 2002 Industrial mineral map of Idaho

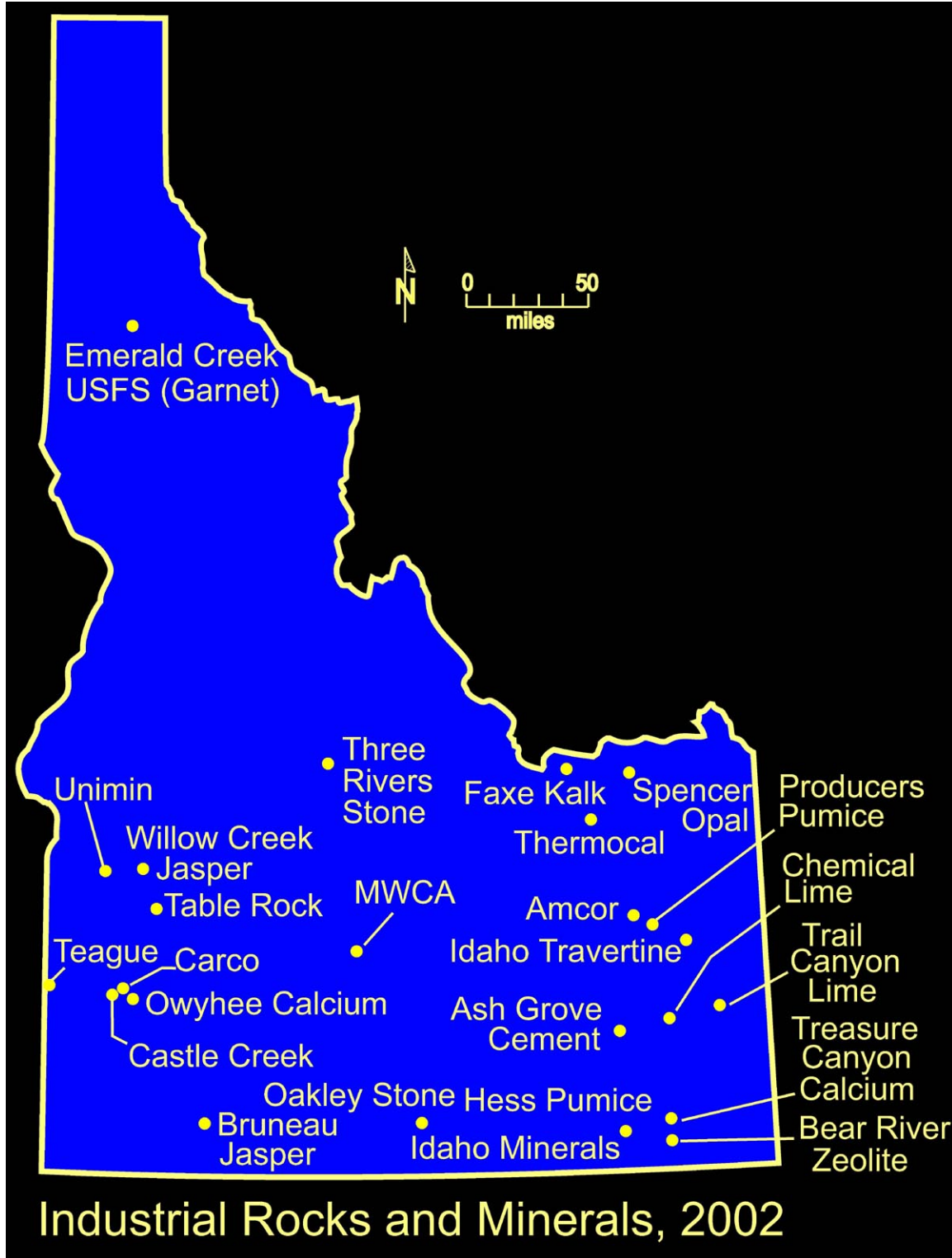


Figure 4. L and W Stone's 3 Rivers Quarry



Figure 5. Drilling at New Jersey mine

