MINING AND MINERALS
IN IDAHO, 1990

PRELIMINARY DRAFT

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# CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>ACTIVE MINES AND PROCESSING PLANTS</strong></td>
<td>4</td>
</tr>
<tr>
<td>Coeur d'Alene Mining District</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Asarco, Inc.</td>
<td>4</td>
</tr>
<tr>
<td>Bunker Hill Mining Company (U.S.) Ltd.</td>
<td>7</td>
</tr>
<tr>
<td>Callahan Mining Corporation</td>
<td>9</td>
</tr>
<tr>
<td>Coeur d'Alene Mines Corporation</td>
<td>10</td>
</tr>
<tr>
<td>Hecla Mining Company</td>
<td>10</td>
</tr>
<tr>
<td>Star-Phoenix Mining Company</td>
<td>12</td>
</tr>
<tr>
<td>Sunshine Mining Company</td>
<td>13</td>
</tr>
<tr>
<td>Other Coeur d'Alene Mines</td>
<td>14</td>
</tr>
<tr>
<td>Other Producing Metal Mines</td>
<td>14</td>
</tr>
<tr>
<td>Cyprus Minerals Company</td>
<td>14</td>
</tr>
<tr>
<td>NERCO Minerals Company</td>
<td>15</td>
</tr>
<tr>
<td>Coeur d'Alene Mines Corporation</td>
<td>15</td>
</tr>
<tr>
<td>Alta Gold Company</td>
<td>16</td>
</tr>
<tr>
<td>Pioneer Metals Corporation</td>
<td>16</td>
</tr>
<tr>
<td>Hecla Mining Company</td>
<td>16</td>
</tr>
<tr>
<td>Idaho Gold Corporation</td>
<td>17</td>
</tr>
<tr>
<td>U.S. Antimony Corporation</td>
<td>17</td>
</tr>
<tr>
<td>Precious Metals Technology</td>
<td>17</td>
</tr>
<tr>
<td>Other Operations</td>
<td>18</td>
</tr>
<tr>
<td>Placer Mines</td>
<td>18</td>
</tr>
<tr>
<td>Phosphate Mines and Plants</td>
<td>18</td>
</tr>
<tr>
<td>Introduction</td>
<td>18</td>
</tr>
<tr>
<td>FMC Corporation</td>
<td>20</td>
</tr>
<tr>
<td>Monsanto Company</td>
<td>22</td>
</tr>
<tr>
<td>Kerr-McGee</td>
<td>22</td>
</tr>
<tr>
<td>Nu-West Industries, Inc.</td>
<td>22</td>
</tr>
<tr>
<td>J.R. Simplot Company</td>
<td>23</td>
</tr>
<tr>
<td>Rhone Poulenc Basic Chemicals Company</td>
<td>24</td>
</tr>
<tr>
<td>N.A. Degerstrom, Inc.</td>
<td>25</td>
</tr>
</tbody>
</table>
AEI Corporation ........................................ 25
Other Phosphate News ................................. 25

Industrial Minerals .................................... 26
Limestone .................................................. 26
Silica ....................................................... 28
Diatomite .................................................. 28
Pumice and Perlite ...................................... 29
Garnet ...................................................... 29
Clay ......................................................... 29
Scoria ....................................................... 30
Gypsum ..................................................... 30
Stone ......................................................... 30
Gemstones ................................................ 30
Aluminum Recycling Plant ............................ 30
Zeolites ..................................................... 31

EXPLORATION ................................................ 31
Introduction ................................................ 31
Coeur d'Alene District ................................ 31
Other North Idaho ........................................ 32
Salmon Area ............................................... 34
West-Central Idaho .................................... 37
East-Central Idaho ..................................... 37
South-Central Idaho ................................... 38
Boise Basin ............................................... 40
Southeast Idaho ......................................... 41
Southwest Idaho ........................................ 42

OTHER MINING RELATED NEWS ....................... 44
INDEX TO COMPANIES ACTIVE IN IDAHO IN 1990 . . . 48

LIST OF TABLES

Table 1. Non-fuel mineral production in Idaho: Preliminary figures for 1990 from the U.S. Bureau of Mines ......................... 3
LIST OF FIGURES

Figure 1. Location of selected cities and towns in Idaho ............... 2
Figure 2. Active mines (●), processing plants (○), and mines under
development (x) in Idaho, 1990 ........................................ 5
Figure 3. Coeur d'Alene Mining District, Idaho, 1990 ..................... 6
Figure 4. Phosphate mines and plants in Idaho, 1990 ...................... 19
Figure 5. Industrial mineral mines, plants, and exploration projects ...
in Idaho, 1990 ............................................................ 27
Figure 6. Exploration projects in Idaho, 1989 and 1990 ................. 33
MINING AND MINERALS IN IDAHO, 1990

INTRODUCTION

The purpose of this report is to summarize and describe all mining and mineral-related activity in Idaho for 1990. Sources used to compile this document include U.S. Forest Service and Bureau of Land Management mineral specialists in the state, the U.S. Bureau of Mines, numerous company geologists and spokespersons, and clippings from area and trade newspapers and periodicals. Production figures for the active mining operations in 1990 will be added to this report when available. This preliminary version is for the sole use of the U.S. Bureau of Mines, the Idaho Mining Association, the Idaho Geological Survey, and the state's Congressional delegation. Locations of selected cities and towns in Idaho are shown in Figure 1 for geographic reference.

Table 1 shows the preliminary non-fuel production figures for Idaho provided by the U.S. Bureau of Mines. There was a decrease in total value from $366 million in 1989 to $344 million in 1990. The value of gold, silver, and phosphate decreased while the value of some industrial minerals increased. Idaho ranked 31st in non-fuel mineral production in the 50 states.

According to the Idaho Department of Employment, about 4,000 people were employed in the mining industry in 1990, with approximately 2,700-2,900 of these jobs in metal mining. Wages as a whole decreased over 1989 but workers in the mining industry remain some of the highest paid of any industrial group. Idaho’s economy remained strong at year’s end in spite of recession fears in other parts of the country.

Data compiled by the U.S. Bureau of Mines and the Idaho Geological Survey indicate that Idaho has enjoyed a more or less constant non-fuel mineral production value of roughly $300 million for the past 30 years. In the past, when one sector of the industry has been in trouble, other commodities have been in demand and mines developed to exploit these commodities have offset losses. For example, as noted, gold production in Idaho decreased in 1990 as the Thunder Mountain mine was exhausted and low silver prices hurt the Coeur d’Alene mines. However, there are at least six new gold mines, Blackpine, Stone Cabin, Buffalo Gulch, Beartrack, Yellowjacket, and Grouse Creek (Figure 2), under active development. These should be in production within the next 18-24 months. In addition, several exploration projects hold promise for even more new gold mines. Interest in limestone deposits in Idaho is strong with the construction of two new filler lime facilities. The industrial minerals in the state are a valuable, although commonly overlooked, part of the state’s mineral sector.

The mining industry, important to the total economy of the state, is especially important to rural Idaho. Closure of the Star-Phoenix mine in Shoshone County and the Princess Blue Ribbon mine in Camas County caused dramatic increases in local unemployment and
Figure 1. Location of selected cities and towns in Idaho
### TABLE 1 -- NONFUEL MINERAL PRODUCTION IN IDAHO

<table>
<thead>
<tr>
<th>MINERAL</th>
<th>1989</th>
<th>1990⁰</th>
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<th></th>
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<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td>Value*</td>
<td>Quantity</td>
<td>Value*</td>
</tr>
<tr>
<td>Clay² --------------- metric tons</td>
<td>W</td>
<td>W</td>
<td>8,519</td>
<td>W</td>
</tr>
<tr>
<td>Copper³ -------------- metric tons</td>
<td>2,950</td>
<td>8,516</td>
<td>2,331</td>
<td>6,372</td>
</tr>
<tr>
<td>Feldspar -------------- short tons</td>
<td>12,800</td>
<td>720</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Gem stones --------------</td>
<td>NA</td>
<td>500</td>
<td>NA</td>
<td>500</td>
</tr>
<tr>
<td>Gold² ---------------- kilogramms</td>
<td>3,057</td>
<td>37,802</td>
<td>2,735</td>
<td>33,414</td>
</tr>
<tr>
<td>Phosphate rock -- thousand metric tons</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Sand and Gravel:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction -- thousand short tons</td>
<td>5,800*</td>
<td>18,900*</td>
<td>6,100</td>
<td>20,900</td>
</tr>
<tr>
<td>Industrial ---- thousand short tons</td>
<td>459</td>
<td>5,037</td>
<td>465</td>
<td>5,050</td>
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<tr>
<td>Silver³ -------------- metric tons</td>
<td>439</td>
<td>77,651</td>
<td>414</td>
<td>66,552</td>
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<td>Stone (crushed)- thousand short tons</td>
<td>3,298</td>
<td>12,609</td>
<td>4,000*</td>
<td>16,000*</td>
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<td>Combined value of antimony, cement, clays (bentonite, common, kaolin), garnet (abrasive), lead, lime, molybdenum (1989), perlite, pumice, stone (dimension), vanadium, zinc, and values indicated by symbol W -----</td>
<td>XX</td>
<td>204,775</td>
<td>XX</td>
<td>195,397</td>
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<tr>
<td>Total</td>
<td>XX</td>
<td>366,310</td>
<td>XX</td>
<td>344,185</td>
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</table>

* (in thousands)
⁰/Estimated. ²/Preliminary. NA/Not Available. W/Witheld to avoid disclosing company proprietary data: value included with "Combined value" figure. XX/Not applicable.
¹/Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
³/Excludes certain clays; kind and value included with "Combined value" figure.
²/Recoverable content of ores, etc.
Data from U.S. Bureau of Mines.
resulted in economic problems throughout the two counties. In spite of commodity fluctuations, the mining industry has been and will continue to be a stable part of the state’s economic base for the foreseeable future.

ACTIVE MINES AND PROCESSING PLANTS

Coeur d'Alene Mining District (Figures 2 and 3)

Introduction

For the first time since the discovery of the Tiger mine, the first silver/base metal mine in the district in 1884, every one of the operating mines in the Coeur d'Alene lost money in 1989. This was due to the low price of silver. Silver prices were even worse in 1990, reaching a new 17-year low of $3.90 per ounce in December. A partial offset to silver was improved base metal prices, with lead reaching an all-time high of 55 cents per pound in March and zinc selling in the 80-cent-per-pound range. Unfortunately, the price of these two metals also deteriorated at year’s end, dropping 20 percent in the Fall.

Although touted in recent years as a silver district, the wealth of the Coeur d'Alene district was traditionally in lead and zinc. Figures provided by Fred W. Brackebusch show that over the past 60 years (1930-1990), the district has produced lead, zinc, and silver worth $19.4 billion in 1987 dollars. This included $8.6 billion (44 percent) in lead, $6.5 billion (34 percent) in silver, and $4.3 billion (22 percent) in zinc.

Asarco, Inc.

Asarco, a major international mining company, operates the Galena mine (owned by Callahan Mining Company) and the Coeur mine (owned by Coeur d'Alene Mines Corporation). A combination of lower silver prices and lower ore grades caused both mines to lose money in 1990, following small losses last year.

In 1990 the Galena mine produced 3,195,000 ounces of silver from 174,000 tons of ore. This compares to 3,081,000 ounces from 201,000 tons last year. The Galena suffered from ground control problems in its main shaft, which was shut down in February for three months for repairs. The reduced hoisting capacity lowered mine production by 38 percent. The closure resulted in 10 workers being laid off in February, followed by another 42 in March. The mine ended the year with 194 employees.

The Coeur mine produced 2,162,050 ounces of silver from 147,883 tons of ore in 1990, compared to 2,198,465 ounces from 159,045 tons mined last year. About 150 people are employed at the mine.

Asarco signed a new labor contract in January with the United Steel Workers Union, which represents miners in the Galena mine. The new agreement grants a wage
Figure 2. Active mines (●), processing plants (○), and mines under development (x) in Idaho, 1990
Figure 3: Coeur d'Alene Mining District, 1990
increase of $1.05 per hour, with smaller raises in 1991 and 1992, and a substantial increase in the pension multiplier and a new 401K savings plan. This contract makes the miners at the Galena the highest paid in the district. Electrical workers from the Coeur and Galena mines, represented by the International Brotherhood of Electrical Workers, held a two-day strike in March before settling on a contract similar to the Steelworkers agreement.

In spite of problems in the Coeur d'Alene district, Asarco had a good year in 1990. This followed an outstanding year in 1989, when the company greatly expanded its copper mining capacity nationwide. Corporate profits were off some in 1990 due to lower copper and base metal prices.

Asarco announced plans to complete the American Silver Drive, a mile-long drift from the 3400 level of the Coeur mine. Plans called for continued drilling on the Wire Silver Vein and veins closer to the Coeur. A structure thought to be the Wire Silver vein was followed for 377 feet last year without finding the downwards continuation of the vein. The American Silver ground lies between the Coeur and Galena mines. Results from this year's work are being evaluated.

**Bunker Hill Mining Company (U.S.), Ltd.**

The Bunker Hill mine with 225 employees began the year with a new mine operator, Faucett Mine Services of Osburn, Idaho. Faucett has a two-year contract covering all mine operations. The new management had an immediate effect as production rose to over 2,000 tons per day early in the year. The mine opened last year and profited for the first half of 1990 from record high prices for zinc and lead. Mine reserves were 170,000 tons of 6 percent zinc, 2 percent lead, and 1.25 ounces of silver. The company's stock was listed on NASDAQ in May. Increased production came from the Quill orebody between the 9.5 and 14 levels. Exploration has extended the Quill to the 16 level. Expenditures included $600,000 for replacing 10,000 feet of track in the Kellogg Tunnel. Bunker continued to move towards automated bulk-mining methods. Company affairs looked so good early in the year that officials said Bunker would try to pay part of the $2 million in back property taxes owed to Shoshone County. The mine produced 23,012 tons of zinc, 8,938 tons of lead and 42,799 ounces of silver from 488,408 tons of ore in 1990. The company received a Certificate of Achievement in Safety from the Mine Safety and Health Administration for 86,683 employee hours worked without a major injury. Late in the year Jack Kendrick, president of Bunker Hill, was named Chairman of the Board. Alan Richardson, formerly with Butte Mining PLC, replaced Kendrick as president.

Unfortunately, lower metal prices forced a layoff of 45 miners in October, followed by another 20 at year's end. In December, the Washington Trust Bank of Spokane sued the company for failure to make payments on a $500,000 promissory note. Also, Building Mainence Supply sued the company for over $69,000 in back bills. Miners were concerned, since Kendrick and other Bunker principals were involved in the Star-Phoenix Mining Company, which was also in financial difficulty at year's end. Bonus checks for
work done in November were issued, somewhat alleviating employees' fears about the health of the company, but officials admitted that the company was going through difficult times. At year's end Bunker was trying to raise $10 million from European investors for mine improvements to lower production costs. Union representatives suggested that the employees might buy the complex under an Employee's Stock Option Plan (ESOP).

Controversy continued to plague the Bunker Hill 21-square-mile Superfund site, contaminated from 75 years of metal processing at the old Bunker Hill mining, smelting, and refining complex. Under Superfund guidelines, EPA asks the companies that are potentially liable for the cleanup efforts to submit proposals for parts of the cleanup and to help in the planning process. If the companies refuse, EPA will do the work and then sue for up to three times cleanup costs.

Early in the year, Gulf Resources and Chemical Company, former owner of the mining, smelting, and refining complex, agreed to pay the Environmental Protection Agency $1.4 million for costs incurred as part of the 1986 cleanup effort at the site. This work included replacement of metal-contaminated soil in public parks and along roadways.

More confusion resulted from charges in an EPA Inspector General's report in February that Robie Russel, the former regional administrator for EPA, mismanaged the cleanup effort. EPA also added the Union Pacific Railroad, Asarco Inc., Callahan Mining Corporation, Coeur d'Alene Mines Corporation, Harry Magnuson, Highland Surprise Consolidated Mining Company, Paula Harrison, and Silver Bowl, Inc., to the list of companies liable for the smelter area cleanup. The major companies began a soil sampling study of the Superfund area to determine metal levels.

Emergency work to mitigate an asbestos hazard, drain a leaking acid tank, cover the copper dross pile to prevent dust, and fence some hazardous areas was completed in February. In March, Gulf expressed interest in the 1990 soil removal program in Kellogg and invited the other companies to join in. Asarco, Inc., Callahan, Coeur d'Alene Mines, and Sunshine declined the offer, noting that their responsibility for the pollution of the area surrounding the smelter was negligible. However, in June, Gulf, Asarco, Callahan, Coeur d'Alene Mines, Hecla, Stauffer, Sunshine, and Union Pacific Railroad agreed to pay for the $3.18 million yard cleanup. In July, EPA asked Gulf, Hecla, Bunker, and Stauffer to submit a proposal to revegetate the hillsides north of the smelter beneath the new gondola. Hecla and Gulf agreed to plant a million trees on the hillsides in the Silver Valley. The project will cost some $5 million and take 5 years to complete.

Gulf's intentions about contributing to the cleanup efforts were in doubt in mid-year, despite company protestations, when Gulf moved some $200 million in assets out of the United States and into real estate investments in New Zealand. The company also owes lifetime pensions and medical benefits to some 2,000 former Bunker Hill employees.
By year's end, EPA had spent some $10 million on short-term fixes and cleanups in the area, including soil removal from about 200 homes and 16 parks. Gulf has paid about $1.4 million of this total and has contributed to an EPA supervised study of how the cleanup should be done. A Request For A Proposal (RFP) from EPA, the first major order from the agency for cleanup in the area, is expected next February. The order will call for cleanup of some 1,800 homes in the area and permanent dust control at several sites at a cost of some $20-30 million. The order for the removal of the smelter is not covered by this RFP but will be issued at a later date.

In December, most of the companies involved with the cleanup issued a master plan for cleaning up the 21-square-mile site. The $120 million program, funded by the companies, will take seven years to complete. Included in the conceptual plan is soil removal from at least 1,600 residential yards, cleaning the interiors of those homes, treating contaminated groundwater, demolishing the smelter, closing surface impoundments and waste piles, planting trees as part of a 3,000 acre revegetation program, controlling dust, and providing health screening for area citizens. Details about the plan are being worked out. EPA officials were evaluating the proposal at year's end.

In July, court records were unsealed from the 1982 Yoss vs. Gulf Resources suit. The Yoss family and two other families successfully sued the company, alleging that their children were permanently harmed by lead emissions from the smelter. The blood level of the children was the highest ever recorded in American children. The settlement was for $8.8 million. The court records show that Gulf ran the lead smelter in 1973 after a fire damaged the baghouse that normally filtered much of the lead from the smelter emissions. The smelter continued to operate without the bag house as lead prices were improving. As a result, Gulf made record profits in 1974. The records show that roughly 30 tons of lead fell per square mile in Kellogg and 25 tons per square mile in Smelterville over a year's time. Gulf calculated the potential liability for lead poisoning of about 500 children in the area at $6-7 million, based on a similar suit against a lead smelter in El Paso, Texas. Continued testing of blood lead levels in children in the Silver Valley still shows elevated levels. These are better than in the past, dropping from an average of 65 micrograms of lead per deciliter of blood to 14 micrograms. These levels are considered non-toxic.

**Callahan Mining Corporation**

Callahan lost $1 million in the first half of 1990, following a loss of over $13 million last year. Part of the red ink was the result of a $8.5 million write-down at the troubled Ropes Gold property in Michigan. The mine was closed last September due to low gold prices and ground stability problems near the main shaft. The company ceased exploration late last year at its $30+ million Caladay project located due east of the Galena mine. Depressed silver prices and lower ore grades hurt returns from the Galena mine, usually the company's major source of revenue. Callahan owns the Galena, which is operated on a long-term lease by Asarco. This was the first deficit year since the Galena mine was commissioned in 1953. Callahan's 80 percent interest in Livengood Placers, Inc.,
operated by Alaska Placer Development) in Alaska paid off; the property produced 4,510 ounces of gold in 1989. The company's manufacturing division, headed by Flexaust, had a 39 percent increase in pre-tax income in 1989.

Coeur d'Alene Mines Corporation

Coeur d'Alene Mines (Cda) turned a profit during the first two quarters of the year. However, earnings were down from the same period last year, in spite of record gold production (14,463 ounces) in the first quarter. This follows record production in 1989 of 96,325 ounces of gold, the greatest in the company's 61-year history. Lower silver prices reduced profits from the company's Coeur mine in the Coeur d'Alene district (operated by Asarco) and the Rochester mine in Nevada. The company purchased the 5 percent interest in the Coeur mine owned by Hecla Mining Company. The commissioning of a new leach pad at Rochester also affected earnings. Coeur d'Alene joined with Asarco in a 40 percent interest in the Consolidated Silver exploration venture leased last year by Asarco. The Rochester mine, Coeur d'Alene's main source of income, yielded 59,082 ounces of gold and 4,779,517 ounces of silver in 1990, compared to 78,837 ounces of gold and 4,628,944 ounces of silver last year. In April, the company was listed on the New York Stock Exchange, an upgrade from its former listing on the American Exchange. Coeur d'Alene Mines offered 2 million shares of stock for sale in September, bringing total shares to about 12 million. Part of the proceeds may be used to develop the Kensington Mine near Juneau, Alaska, with partner Echo Bay Mines, Ltd. Kensington will cost an estimated $75 million to put in production. Coeur d'Alene has spent roughly $15 million on its share of exploration and development at Kensington so far. The company announced in December it would spend an additional $30 million to bring the mine into production. Annual production is expected to be about 200,000 ounces of gold. Coeur d'Alene continued exploration on several properties in Chile which were obtained in a $5 million package purchased from Freeport McMoran, Inc., early in the year. Exploration concentrated on the Fachinal property. The company completed a new $140,000 hangar for the company plane at the Coeur d'Alene Air Terminal.

Hecla Mining Company

Hecla earned $7.1 million for the first three quarters of 1990. This compares to a $25 million dollar loss in 1989, which included an $8 million loss from mining operations and a $9 million write-down in the value of Sunshine Mining Company stock. Heckla received the stock a few years ago as payment for Sunshine's purchase of Hecla's share in the Sunshine mine. The red ink was caused by the company lumping four non-recurring write-downs into a single quarter. This was the worst loss since 1978, when the company lost $96 million. The company sold the Golden Dome property in Sierra County, California, for $2 million in 1990.

Another outstanding year for the Republic gold mine in Republic, Washington, tempered losses from low silver prices. The unit produced an estimated 82,204 ounces of gold in 1990, compared to 74,335 ounces last year. A 6,500 foot-long, $6.6 million, decline that
will extend to the No. 8 level is under way. The decline will access the Belligerent vein system in the Golden Promise zone. When completed, it will facilitate ore haulage from the Golden Promise zone by rubber-tired diesel equipment.

The Lucky Friday mine operated all year in spite of dismal silver prices. The new Lucky Friday underhand long wall (LFUL) mining method cut production costs to about $4.50 per ounce, allowing the mine to maintain a positive cash flow. Silver must reach $6.50 per ounce in order for the mine to become profitable. In 1989, the Friday produced 16,094 tons of lead, 1,904,038 ounces of silver, and 3,253 tons of zinc from 138,720 tons of ore milled. Estimates for 1990 are similar to last year’s production.

In June, miners in the Lucky Friday mine signed a new three-year labor agreement with Hecla management. The new contract calls for a 25-cent-per-hour raise in the second and third year of the contract and a $1,250 sign-up bonus. A federal negotiator was called in at the last moment to help with the settlement and avert a possible strike. Low silver prices forced the layoff of 10 workers in late November when Hecla closed down a silver-rich stope in the mine. The mine had not made money in several months but the company vowed to keep it open as long as it generated a positive cash flow. Unfortunately, with silver slipping below $4.00 per ounce in December, the mine was not cash positive. About 160 miners were still employed in the mine at year’s end.

Hecla enjoyed profits from its 28 percent interest in the Greens Creek mine located on Admiralty Island near Juneau, Alaska. Their operating partner is Kennecott Corporation, a subsidiary of Rio Tinto Zinc.

The company expanded its Canadian interests through Hecla Mining Company of Canada, a wholly-owned subsidiary. During the year, the company acquired a majority interest in Acadia Mineral Ventures, Ltd. The company was in a joint venture with Acadia at the Mooseland gold property in Nova Scotia, where a shaft was started and sank 410 feet before the project was suspended awaiting additional funding by Acadia. Hecla is also involved with Granduc Mines, Ltd., at the Sulphurets property in British Columbia and in a number of areas with Lucky Eagle Mines, Ltd., a joint venture with Agnico-Eagle Mines, Ltd., of Toronto.

Hecla also has a substantial investment in industrial minerals through its affiliates, Colorado Aggregate Company and Kentucky-Tennessee Clay Company. The company continued to diversify by purchasing late in the year a feldspar mine and processing plant in Spruce Pine, North Carolina, from Indusmin, Inc., (a subsidiary of Unimin Corp) for $8-10 million. Unimin purchased Indusmin from Falconbridge, Ltd., in September. This addition to Kentucky-Tennessee’s ball clay and kaolin plants brings Hecla one step closer to being a one-stop shop for ceramic manufacturers. The addition of a silica operation will complete this goal.

Preproduction was suspended at the Apex specialty metals project in St. George, Utah in August. Hecla purchased the mine and mill last year from St. George Mining Company
(a subsidiary of Musto Explorations, Ltd.) for $5.5 million. The plant was the world's first primary producer of gallium and germanium. Falling prices for both commodities forced the suspension. Ore production at the small Apex mine ended in April and stockpiled ore was used to test the refurbished plant. Plans called for producing 19 tons of germanium and 7 tons of gallium per year.

Hecla signed a letter of intent with Alta Gold Company, fueling speculation of a merger. Alta was formed last year from a merger between Pacific Silver Corporation and Silver King Mines. The company has holdings in Idaho, including the Copper Cliffs mine and mill at Cuprum and the nearby Iron Dyke mine in Oregon. Alta also has property in Nevada. The deal was called off at year's end.

Hecla picked up a bargain when it purchased the former Palisades Mining and Milling Company property located 18 mile south of Cataldo at a tax sale. The 40 acre parcel was purchased for $5,100.

The company won an environmental award for a precious metals exploration project at Flagstaff Hill in Baker, Oregon. The award was presented by the federal Bureau of Land Management.

The Environmental Protection Agency listed Hecla as a polluter of the South Fork of the Coeur d'Alene River. Hecla is accused of discharging more lead into the river from its Lucky Friday mill than permitted. The company intends to challenge the decision.

**Star-Phoenix Mining Company**

Mining resumed at the Star mine in February. The property was operated by the Star-Phoenix Mining Company, who had a lease and option to purchase the mine from the owners, Bunker Limited Partnership and Hecla Mining Company. There was bad news at year's end, when Hecla announced it would not renew Star-Phoenix's lease on the mine because Star-Phoenix was insolvent. Washington Water Power had not been paid in nine months. Other unpaid bills included back wages owed to the 120 miners whose jobs were lost. Hecla has no plans for continued operations at the mine. About 100 Star-Phoenix employees filed a $500,000 lawsuit against the company in December, seeking back pay and wages. The company was trying to find investors to make good on its debts and continue operations. The closure raised unemployment in Shoshone County to 13.6 percent and unemployment in the Panhandle to 9.1 percent, the highest in three years.

Star-Pheonix planned to mine the Star for zinc and needed a rough break even cost of 50 cents a pound. The completely refurbished mill was operating at about 80 percent capacity and approximately 500 tons of zinc ore were mined each day. Old flotation cells were removed from the mill and new ones installed. The plant also utilizes column cells, the largest in the district. The new cells allow for a cleaner concentrate, thereby reducing smelter costs and increasing profits. All of the production came from the upper part of
the mine, above the 2000 level, which contains an estimated 2 million tons of ore. To facilitate mining the upper workings, the shaft from the No. 5 hoist was extended upward from the former 1150 station to the 850 level, where it connects with a ramp that exits through a long tunnel at the 700 level in Grouse Gulch near Mullan. The shaft was extended using a five-foot-diameter borehole that opens a 1,300 foot vertical area upwards from the 2000 level where the hoists are located. The Star was originally mined upside down, with miners raising up on the orebody instead of sinking on the veins. This necessitated hoisting the ore down from the upper workings. The borehole eliminates the hoisting problem by letting gravity do the work. The hole acts as a chute that feeds the ore to an ore pocket. The ore is then hauled from the pocket to the mill at Burke by train through the 2-mile-long Star Tunnel. The mine and mill employed about 125 people. Concentrates from the mill were sent to the Cominco smelter at Trail, B.C. Star-Phoenix spent about $2 million on refurbishing the mine and mill. Plans called for reconditioning the huge 2,500-horsepower, No. 4 double drum hoist which is capable of going to a depth of 9,100 feet. The lowest level in the mine before it closed in 1982 was the 8100 level. After the hoist was made operational, plans called for dewatering the mine from the 2500 to 6900 levels.

Sunshine Mining Company

The Sunshine mine, greatest silver-producing mine in the world, maintained full production all year. In spite of this success, the company announced a net loss of $19.6 million for the first six months of 1990. The mine produced 5,260,452 ounces of silver from 235,071 tons of ore. This compares to 4,836,359 ounces of silver from 230,837 tons of ore in 1989. The company operates its own silver refinery on Big Creek and its own mint in Hayden Lake. A contract from the United States mint for 200,000 silver blanks for Silver Eagles, a 1-ounce coin, boosted the mint’s business this year. A new bill passed by Congress allows the U.S. mint to sell collector versions of legal tender coins. The company may get part of this contract. Sunshine also mines silver/gold/copper ore from the Trixie mine in Utah.

Early in the year it was announced that Sunshine would buy the 45 percent share of the huge Montanore project located south of Libby, Montana, owned by Montana Reserves Company. The mine will be the largest silver/copper mine in the world. The cost of the buy out was estimated at $90 million and would have been paid for by stock. Later in the year, the deal was withdrawn.

Exploration continued on a property held with Bond International Gold in Nevada. Preliminary exploration results from the gold play were encouraging.

The Supreme Court ruled that families of four men killed in the Sunshine fire in 1972 cannot sue the United Steel Workers Union which represented the workers. The decision overturned a state Supreme Court decision passed in 1986. The tragic fire cost the lives of 91 miners. The families said the union was negligent and that a union member who
served on the mine safety committee failed to report safety violations. The court said that such suits were preempted by federal labor laws.

Other Coeur d'Alene Mines

The Silver Corporation of America dewatered and retimbered the adit at the Bunker Chance Property located east of the Bunker Hill mine.

The old Dayrock mine on Ninemile Creek was sold by Hecla Mining Company to Aqua-Tech, Inc. last December. The company will employ 25 people to operate the Dayrock mill as a custom mill and precious metals recovery plant for small mines in the area. The company will also conduct research on a new electro-chemical extraction technique called Bio-Gen for recovering precious metals. The process does not use any cyanide. Aqua-Tech was formed 11 years ago as an industrial chemicals manufacturer and water treatment specialist.

Sidney Mining Company completed rehabilitation of the Red Cloud drift and Six-Level drift at its mine on Pine Creek. Faucett Mine Services did the work under contract. The company gave no information as to when mining would start at the Sidney mine, a former zinc producer.

OTHER PRODUCING METAL MINES (Figure 2)

Cyprus Minerals Company

Cyprus regained full production at the huge Thompson Creek molybdenum mine in January and operated all year. In a corporate reorganization, the mine was moved out of Cyprus Copper Company and placed in a special molybdenum division. Moly has become an important commodity, earning about $25 million in profits in recent years for the company. About 400 employees work at the Thompson Creek mine. The mill processed over 26,000 tons per day. Over 40,000 tons of ore are mined daily, using 18 170-ton trucks, five electric shovels (the largest with a 28-yard bucket), and three blast-hole drills. The ore contains 0.11 percent MoS2. The company plans on moving 50 million tons of rock per year for the next two years. Work continued in stripping the high wall for future mining. The high wall will move back about 1,200 feet from its 1990 position and the pit will eventually be 600 feet below its current level. Cyprus won an award for reclamation activities at the mine. The award was presented by Governor Cecil D. Andrus on behalf of the Department of Lands.

Cyprus continued to expand into the lubricants market. The new High Performance Plant which produces lube-grade moly was completed in 1989 and is working well. The circuit removes water and oil from mine-run MoS2. To prevent oxidation, the process is carried out in a nitrogen atmosphere. After drying and de-oiling, the moly is crushed in an air mill to 2-10 microns. About 75-80 percent of the mine's production is exported to Europe.
Nerco Minerals Company

Nerco Minerals Company operated its counter-current decant mill at the Delamar Silver mine in Owyhee County all year. The mill is being expanded from a capacity of 850,000 tons to 1.2 million tons per year. The heap-leach plant was closed down when part of the leach pad become unstable and began to slide towards the tailings pond. The company off-loaded the pad in order to correct the problem. Most production came from the Glen Silver and new South Wahl pits. The South Wahl has reserves of 2.5 million tons of 2.0-ounce-per-ton silver and .04-ounce-per-ton gold. Some low-grade ore was mined from the old Sommercamp pit. Production at Delamar in 1990 was 1,374,028 ounces of silver and 30,409 ounces of gold from 828,854 tons of ore milled compared to 1,863,362 ounces of silver and 34,018 ounces of gold from 840,441 tons last year. The lower production was caused by the shut down of the heap-leach pad. Late in the year the U.S. Fish and Wildlife Service discovered somewhere between 14 and 23 dead water fowl on the tailings pond. Cyanide poisoning was suspected and Nerco has developed a plan to mitigate the problem.

Nerco continued the permitting process at the Stone Cabin mine located on Florida Mountain. The new mine is scheduled to come on line in 1991-92 and will have at least a 10-year life. An additional 120 people will be added to the 160 employees currently employed at Delamar. Low grade ore crushed at the Stone Cabin mine will be transported by a long conveyor belt to a heap leach site west of the mine at Jacobs Gulch. High grade ore will be transported to the Delamar mill by truck. Reserves at the new mine are 22 million tons of .03 gold and 0.60 silver (at least 581,000 ounces of gold and 7.2 million ounces of silver). Exploration continued on Florida Mountain with 56,000 feet of new reverse circulation drilling and 2,100 feet of core drilling in over 200 holes.

Sidney Mining Company of Kellogg leased its property, consisting of 227 claims near Florida Mountain, to Nerco. Nerco also has substantial holdings obtained last year from War Eagle Mining Company near Silver City.

Coeur d'Alene Mines Corporation

Coeur d'Alene Mines Corporation's heap leach gold mine at Thunder Mountain in central Idaho produced 17,315 ounces of gold and 22,744 ounces of silver from 583,751 tons mined in 1989. All mining in 1990 was in the Lightening Peak open-pit. This will be the mine's last year of production and reclamation started even before mining ceased. Waste rock was used to stabilize the Sunnyside mine dump, water was pumped out of the lower Sunnyside pit, and the walls and benches of the Lightning Peak pit were contoured. Reclamation will require another two to three years for completion. The Sunnyside mine was mined out last year. The company received another award from the Department of Lands for reclamation efforts at Thunder Mountain, the second such award in as many years. The mine was leased from Thunder Mountain Gold, Inc. Argee Corporation was the mining contractor and about 100 people were employed during seasonal operations.
Alta Gold Company

Alta Gold Company’s Copper Cliff Mine at Cuprum ceased operations in mid-summer. About 50,000 tons of Cu-Ag ore were stockpiled for later processing. The open-pit mine is almost exhausted but the company is looking for new ore reserves. The state Dam Safety Bureau sent a letter notifying Alta that modifications were needed for the tailings dam at the mine and asked for a November 5 reply or the state would close the mine down. The original certificate of approval for the dam expired November 1.

Pioneer Metals Corporation

Pioneer Metals operated its seasonal heap-leach gold mine at Stibnite. The mine should produce about 30,000 ounces of gold this year. A new pit will be opened on Forest Service land next year. Two years ago Pegasus Gold Corporation bought $12 million in Pioneer debentures convertible to common stock. Pioneer defaulted on interest payments last fall. Pegasus sued and announced plans to take over the Stibnite property, which was offered as collateral for the loan. Pegasus wrote off $3.7 million on the investment last year and another $1 million in 1990. The Supreme Court of British Columbia ruled in August that Pioneer was in default on the loan agreement and placed the company one step closer to bankruptcy. The case will now be heard by a court in Idaho. Pioneer faced up to $30,000 in fines and penalties for a cyanide leak at the mine site. The state Department of Health and Welfare detected low levels of cyanide in Meadow Creek, a tributary of the East Fork of the South Fork of the Salmon River, in April. The cyanide was supposedly coming from leached ore that had not been fully neutralized. The company also had a diesel fuel leak at the site that was included in the citation. This is the first time the company has had a problem since mining started in 1982. The mine employs about 90-100 people.

Hecla Mining Company

Production resumed at Hecla’s Yellow Pine mine, located east of the town of Yellow Pine in Valley County. Last year about 21,000 ounces of gold were processed before a dispute with Pioneer Metals over use of Pioneer’s heap-leach facility ended production. Hecla’s new $4.5 million seasonal heap-leach gold mine produced an estimated 57,747 ounces of gold this year. About 5,000 tons of ore per day (averaging .08 ounces of gold per ton) was mined from the Homestake open pit. Over 900,000 tons of ore were processed. The ore is hauled to an agglomerator using seven 35-ton trucks. The agglomerated ore is then piled on a leach pad that will be 120-feet high when mining is finished. Existing reserves include 20,000 ounces of gold in oxide ore that will be mined next year. The mine employs 94 people during the mining season with a payroll of $340,000. The property also contains substantial sulfide reserves estimated at 15-20 million tons containing 0.10 ounce of gold per ton, most of which is in the old Meadow Creek mine. The company did considerable testing of the sulfide zone this year and is looking at ways to process the refractory ore. This year’s production from Hecla and Pioneer Metals pushed the total gold production from Stibnite to over 500,000 ounces, making the area the sixth largest gold-producing district in the state.
Idaho Gold Corporation

Idaho Gold Corporation (a subsidiary of Bema Gold Corp.) completed its first full year of mining at the Champagne mine located 20 miles west of Arco. Glamis Gold is a 15 percent partner in the venture. Production was 32 percent ahead of schedule in mid-year, with lower than anticipated costs ($148 per ounce of gold rather than $183). The open-pit, heap-leach mine should produce about 25,000 ounces of gold in 1990 from 2.7 million tons of ore. The mine produced 12,400 ounces of gold and over 60,000 ounces of silver from August to year's end in 1989. The company has reserves for one more year of production and is exploring in the St. Louis and Poison Gulch areas for additional reserves. Four 30-ton trucks haul about 15,000 tons of ore per day to the continuous lift pad, which will be 120 feet high when mining ends. Reserves at the mine prior to active mining were estimated at 3.3 million tons of .033 ounce per ton gold equivalent (includes silver). Grades in 1990 ran .02 to .024 ounces of gold per ton. The mine was brought on line for about $2 million.

Permits for a new heap leach mine located at Buffalo Gulch near Elk City in Idaho County were approved by the Bureau of Land Management in September. The mine will operate for 6 years and employ about 50 people with an annual payroll of about $1.2 million. Production is estimated at 20-30,000 ounces of gold per year. The ore at Buffalo Gulch contains a lot of clay and will be agglomerated before leaching. The company is in the permitting stage for a second heap-leach mine at Erickson Reef, about 6 miles northwest of Elk City.

U.S. Antimony Corporation

U.S. Antimony Corporation (USAC) operated its flotation and vat leach mills at Preacher's Cove on the Yankee Fork all year. About 3,500 ounces of gold were obtained from the Custer mine near the mill. A 50-ton ore sample was milled from the Specimen mine, located near Lowman, before USAC dropped the property. A small shipment of ore was custom-milled from the Lost Packer mine.

Precious Metals Technology

In March, a flood destroyed the tailings dam at the Princess Blue Ribbon mine (operated by Precious Metals Technology) in Camas County. The failure washed debris into Big Beaver Creek, Willow Creek, and Camas Creek. The dam was rebuilt and another dam added upstream, but these were not approved by the state Department of Environmental Quality (DEQ), which had questions about the dams. This sparked a disagreement between the mine owner and the state agency as to how the dams would be built. Although a small operation, employing only 30 people with a monthly payroll of $120,000, the mine was the largest employer in the county. Layoffs associated with the dam failure were a decided economic hardship for the county and its residents; the County Commissioners declared an economic emergency in June. The mill at the Blue Ribbon site processed ore from a mine in the Camas district 13 miles away. Precious Metals
announced in March that they intended to move the mill to the Camas mine site. However, permits for the new mill site would have to come from the DEQ and federal agencies which were in dispute with the company, making any move difficult. The mine remained closed at year’s end.

Other Operations

About 1,300 tons of lead-zinc-copper-silver ore from the Phi Kappa mine located near Trail Creek Road, east of Sun Valley, was shipped to the Clayton mill (owned by Clayton Silver mines). Sandy Sims also sent a few batches of ore from the Democrat mine to Clayton for testing. Clayton is interested in custom milling for other small operators in the area.

Placer Mines

Cimco Mining did not operate its placer mine on East Eagle Creek. The China National Nuclear Industry Corporation is a partner in the venture. This is the first Chinese venture in the district. The company has enough placer ground to last about 5-7 years.

Golden Chest, Inc., conducted bulk testing at the Butte Creek Placer Project near Murray. The property is also known as The Nugget Factory. The placer produced 1,000 ounces of gold in 1983 and 1984, with much of the production being jewelry-sized gold nuggets. The largest was the size of a golf ball.

A number of other placers were active in the state. A and T Mining continued to operate its placer near Lucille. G and G Mining installed a large trommel at placer claims near Moose Basin in Clearwater County. Many small recreational suction dredges were operating throughout Idaho.

PHOSPHATE MINES AND PLANTS (Figures 2 and 4)

Introduction

Production of phosphate rock increased nationally by 7 percent to 46.4 million metric tons in Crop Year 1990, according to the U.S. Bureau of Mines. The average price per ton was $19.62 for the year. Idaho producers do not ship raw ore but process phosphate into either phosphoric acid for fertilizer production (J.R. Simplot, Nu-West Industries) or elemental phosphorous (FMC, Monsanto, Rhone Poulenc) which has a wide variety of uses. Two plants, J.R. Simplot and FMC in Pocatello, directly or indirectly account for almost 4,000 jobs in Bannock County, according to the Bannock Development Corporation. Jobs at FMC and Simplot support more than 10 percent of the Pocatello-Chubbuck population.
Figure 4. Phosphate mines and plants in Idaho, 1990
About 90 percent of the elemental phosphorous now produced by Monsanto and FMC is used internally by other company subsidiaries. About 40 percent of FMC’s elemental phosphorous is used in detergents compared to 20 percent for Monsanto. Monsanto also uses the phosphorous to make Round Up and other agricultural chemicals. Monsanto sells a limited amount of phosphorous to other companies, including Lubboil, Coca Cola, and Kraft.

A major concern in Pocatello and Soda Springs involves environmental problems associated with the phosphate plants. In June, EPA released a federal study showing a significant health risk from radionuclides in slag produced by FMC and Monsanto’s elemental phosphorous plants. Cancer was the main health concern, although Caribou County (Soda Springs) has the lowest cancer rate in the state and only half the national average. The agency recommended a ban on using the material for paving purposes, noting potential dangers also exist for other uses of the material. The slag has been used as a paving aggregate for streets and highways, railroad ballast, and other construction purposes, including basements. Pocatello, Soda Springs, Chubbuck, and the Shoshone-Bannock Tribes temporarily banned the material, although Blackfoot did not join the ban. Governor Cecil Andrus and Idaho’s senators questioned the validity of the EPA study. FMC voluntarily stopped selling slag to the Bannock Paving Company, which placed the future of the contractor in doubt. A congressional subcommittee meeting was held in Soda Springs in August. Monsanto donated $25,000 (with no strings attached) to help establish a citizen’s advisory group in Soda Springs to look into the slag problem.

In July, EPA placed the Michaud Flats area (Simplot, FMC) and Monsanto’s plant site in Soda Springs on the Superfund list, although major steps have been taken to clean up recognized environmental problems (most dealing with groundwater contamination) in these areas. The companies expressed dismay by the Superfund designation.

A trend to ban phosphate-based detergents that started last year in north Idaho continued into 1990. Cities in Bonner County, and the county itself, were joined by Coeur d’Alene, Post Falls, and Rathdrum in Idaho, and Spokane and Liberty Lake in Washington. Missoula, Montana, was the first city in this area to prohibit the use of these detergents. The detergents are perceived as an environmental problem responsible for algal blooms in north Idaho lakes and rivers. Although Spokane County did not ban the detergents, three out of four of the area’s largest wholesalers discontinued selling the detergents in the Inland Northwest.

**FMC Corporation**

FMC operates the largest elemental phosphorous plant in the world at Pocatello. The company ran into problems in 1990 meeting new air quality emission standards. The new $10 million stacker/reclaimer installed last year at the Pocatello plant has helped by cutting dust emissions from the ore stockpile considerably. Ore for the plant is obtained from the Gay mine on the Fort Hall Indian Reservation. The Gay mine started in 1946.
and will be mined out in 1993. J.R. Simplot does the mining for FMC at the Gay, employing about 110 workers. The Pocatello plant processes about 1.5 million tons of ore per year and employs 550 people with a payroll of $30 million. The facility pumps about $75 million into the region's economy each year. FMC will start a new mine at the head of Dry Valley near Soda Springs and do its own mining. The new mine should supply FMC's needs for about 10 years. Stripping of waste at Dry Valley should start in 1992, with ore production in 1993. Ore from the new mine will be shipped to Pocatello by rail.

The Gay mine and the phosphorous plant are on land in the Fort Hall Indian Reservation. The 9th Circuit Court of Appeals found in favor of the Shoshone-Bannock tribe regarding employment practices at the Pocatello Plant. This decision reversed a 1988 decision by the U.S. District Court. The three-judge panel ruled that the tribe could regulate employment practices at the plant. FMC will reappeal the case or take it to the Supreme Court. The company has a 1981 agreement with the tribe to hire and promote more Indians. The tribe also announced plans to start taxing operations at the Pocatello plant next year. FMC believes the new tax violates a 1985 agreement with the Indians.

In April, FMC dedicated a 20-acre tract located west of its plant as a wildlife habitat and tree farm. Half of the area will be devoted to providing nesting cover for wildlife and the other half to a tree farm for community projects. The company also donated $5,000 to the Boise River Educational and Research Observatory in honor of the state's centennial.

New standards for radionuclide emissions by the Environmental Protection Agency affected FMC's Pocatello plant. The company announced serious reservations about being able to comply with the new standards. Both Idaho senators, James A. McClure and Steven Symms, spoke out against the standards, stating that they were unrealistic, ineffective, and a danger to the future operation of the plant. Under the Clean Air Act, the company would have 90 days to comply with the standards or face fines of up to $25,000 per day. FMC signed a consent order with the Department of Health and Welfare in April and announced that it will spend about $20 million over the next three years to reduce emissions in the Pocatello area by 70-80 percent. The company will have 21 months to comply with the new standards. The new equipment will include scrubbers to reduce radionuclide emissions from the electric furnaces during periodic shutdowns and emissions from calciners. Equipment to solve the emission problems will use 8 megawatts of electricity or enough to serve 15,000 people. In addition, this electricity will not be available for the elemental phosphorous process (FMC is Idaho Power Company's largest customer). A new water spray system will reduce dust emissions from slag handling at the plant. The cost for maintaining the new equipment is estimated at $3 million per year. FMC has spent about $40 million to comply with air quality standards since 1978. New scrubbers installed on the calciners from 1986-1988 cut particulate emissions by half but did little to mitigate the radionuclide problem. FMC also paid $10,500 in fines to settle six air-quality violations cited by the state last year.
Pocatello issued its first air quality advisory in history in February when an inversion trapped air from the Simplot and FMC plants over the city. Poor visibility caused traffic accidents on I-86 west of town and affected air traffic at the Pocatello airport.

**Monsanto Company**

Monsanto operates an elemental phosphorous plant at Soda Springs and mines about 1 million tons of ore per year from the Henry mine. The company received a Governor’s award for reclamation efforts at the Henry mine, the second such award in two years. Since the late 1960’s, the company has reclaimed over 750 acres disturbed by phosphate mining. A new mine located in Enoch Valley, four miles east of the present mine, will replace the Henry this year. A haul road to the new mine is completed and stripping will begin this winter. The new mine has about 11-14 years of reserves at current mining rates. Dravo Soda Springs, the mining contractor at the Henry, employs about 100 people. Monsanto uses about 200,000 tons of quartzite a year, mined from its own quarry west of the plant. The quartzite is used for slag in the electric furnaces.

The Soda Springs elemental phosphorous plant employs about 400 people. One of the electric furnaces used to separate elemental phosphorous from the ore was rebuilt during the year. Monsanto is experimenting with Demming statistical methods for process control throughout the plant. The company upgraded and strengthened the railroad cars used to transport elemental phosphorous. The first 28 of the new Supercars arrived late last year. Eventually, Monsanto will lease about 85 of the new cars. About 5 or 6 cars leave the plant each day. Each car carries 200,000 pounds of elemental phosphorus.

**Kerr-McGee**

Kerr-McGee operated its vanadium extraction plant across the road from Monsanto’s elemental phosphorous plant near Soda Springs all year. The plant underwent a 30 percent expansion last year, enabling it to produce over 4.0 million pounds of vanadium. The vanadium is extracted from ferrophosphorous metal, a byproduct of the elemental phosphorous process. Much of the vanadium is used to make industrial catalysts and in specialty steel. About 60 people work at the plant, which is the largest producer of vanadium in the United States. Kerr-McGee’s waste goes to *Evergreen Fertilizer*, which makes specialty fertilizers, including a Zn-rich type that is superior to other fertilizers for growing corn.

Ferrophosphorous from FMC’s plant is used by another company, *StratCorp*, as a source of vanadium. Also some of FMC’s ferrophosphorous is sent to Kerr-McGee. FMC has a large stockpile of this material.

**Nu-West Industries, Inc.**

Nu-West announced plans to sell its Florida mine and refining plant (Nu-Gulf) for $17 million to Gulf Atlantic Corporation. Another subsidiary of Nu-West, Nu-South, filed for
bankruptcy after losing money at its Pascagoula, Mississippi, fertilizer plant. The bankruptcy resulted in a loss of $41.9 million in the second half of 1989, with $40.4 million attributable to Nu-South. The company added new markets and increased sales by 9 percent in the 1989-90 agricultural season, in spite of low prices. The Conda plant increased shipments of fertilizer over 300 percent and operated at full capacity early in the year, although fertilizer prices were at a 20-year low. Markets in Canada were expanded and the company continues to aggressively seek new Canadian customers.

Nu-West started the year by announcing a $45 million expansion for the Conda fertilizer plant. Plans call for hiring an extra 100 people during the 18-month construction phase. The expansion includes a new 2,500 ton-per-day sulfuric acid plant and a cogeneration plant that could produce up to 26 megawatts of electricity by using waste heat from the new acid plant. The electricity would save the company up to $8 million per year in power costs. The new acid plant will replace two current plants. Nu-West is also looking at extraction techniques for high purity silica and fluorine, and possibly, vanadium and yttrium, as well. The expansion will be completed in 1992. The company was honored by the Fertilizer and Agrichemicals Section of the National Safety Council for its outstanding safety record, having worked 808 consecutive days in 1987, 1988, and 1989 without a lost-time accident.

Nu-West gets its ore from the Mountain Fuels lease in Dry Valley, mining about 1.6 million tons of ore per year. Reserves at the lease will last another 2-3 years. Company geologists added about 2.5 million tons of ore to reserves by discovering an eastward extension of the known deposit. The mining contractor is Conda Mining, a subsidiary of Washington Construction Company. Nu-West is partners in the mining venture (known as the Conda Partnership) with Western-Cooperative Fertilizer Company of Calgary, Ontario. Western owns two large calciners adjacent to the Conda fertilizer plant.

Nu-West received a one-year favorable power rate from Utah Power and Light Company. The company is Utah Power's second largest customer after Monsanto's elemental phosphorous plant at Soda Springs. Nu-West will sell ore to, and provide a location for, American Dical Corporation's new plant, which will produce dicalcium phosphate. Nu-West will not own any of the venture.

J.R. Simplot Company

J.R. Simplot Company operated its fertilizer plant in Pocatello. The company employs about 500 people at its Pocatello facility, with 110 more in administrative offices. Another 120 work at the Smoky Canyon mine, 40 at Conda, and 95 at the Gay mine (which is scheduled to be closed in 1993).

Simplot obtains about 1.5 million tons of phosphate ore per year from the Smoky Canyon mine, located near the Idaho-Wyoming border. Ore will be mined next year from the South Pole Canyon area of the mine. Slurried ore from the mine is piped 27 miles to a plant at Conda. A new 58-mile-long, 8-inch-diameter pipeline will soon connect the
plant to Pocatello, allowing direct pumping from the mine. A bonus will be greatly reduced dust emissions at the Pocatello plant. The new pipeline will cost about $20 million. Kelly Pipe Company of Post Falls was awarded the pipeline contract in March.

Over the past 10 years, the company has invested over $100 million in modernizing its phosphate facilities. These improvements include developing the Smoky Canyon mine, increasing capacity at the Pocatello fertilizer plant by 35 percent, and adding a 15 megawatt cogeneration plant. The cogeneration plant has been so successful that Simplot plans on building more, starting with a food processing plant in Caldwell. Simplot achieved a giant step towards reducing particulate emissions by 60 percent when it closed down its calciners at the Pocatello plant in July. The calciners, which remove water and impurities from the phosphate ore, were replaced by new proprietary technology developed by Simplot at a cost of over $2 million.

A new 3-year labor contract was ratified with the Oil, Chemical, and Atomic Workers Union, Local 2-652, which represents workers at the Simplot plant. A major pay increase was part of the package.

The Idaho Bureau of Air Quality and the federal Environmental Protection Agency cited Simplot last November for 30 air-quality violations. A $175,000 fine was levied against the company by the Idaho Department of Health and Welfare. This was the largest sum of money ever collected for a pollution case in Idaho. In spite of the citations, the state issued the company an operating permit, which was protested by citizen groups in the area. The permit required emissions to be reduced by 4,000 tons per year. The new plant improvements and the pipeline should enable the company to meet these standards.

Rhone-Poulenc Basic Chemicals Company

Rhone-Poulenc neared completion of a new loadout and mill at the Wooley Valley mine at year's end. In the mill, phosphate ore is ground, sized, and dried for shipment to the company's elemental phosphorous plant at Silver Bow, Montana. The mill was previously in service in Wyoming before being dismantled and shipped to Idaho. Cost of the new facility is $3 million. The new plant can load 10 rail cars per hour. About 460,000 tons of phosphate ore will be shipped to Montana this year, followed by 600,000 tons per year for the next two years. A separate line will load ore for shipment to FMC's plant in Pocatello. Plans call for shipping about 1 million tons to FMC over the next three years. The ore will supplement production from the Gay mine until FMC's new mine in Dry Valley is completed in 1993. Rhone Poulenc's Wooley Valley mine is nearly exhausted and will close this year. A new mine on 194 acres on Rasmussen Ridge, east of the present mine, with reserves of 30 million tons will replace Wooley Valley. The new mine will be in production next year and will be completely reclaimed when exhausted in 60 years. Circle A Construction is the mining contractor.
N.A. Degerstrom, Inc.

N.A. Degerstrom is nearing completion of its silver-gallium extraction plant in Soda Springs. The plant will extract the metals from treater dust, a waste product of the elemental phosphorous process. The dust will come from Monsanto’s plant in Soda Springs. The extraction plant will process about 800 tons of dust per month, or about 22-24 tons per day. Plant capacity is 10,000 tons per year with 9 years’ reserves at Monsanto’s plant. Gallium will be won by solvent extraction and silver in a cyanide-leach circuit. The remaining waste phosphorous can be used to make a Zn-rich fertilizer that is especially good for growing corn. CONFIDENTIAL The cost of this plant was about $[Redacted].

AEI Corporation

AEI Corporation, located across the road from FMC’s plant, manufactures fertilizer and also is trying to extract silver from treater dust. The Department of Health and Welfare sought an injunction against the company, claiming it was operating without a state-approved air pollution permit.

OTHER PHOSPHATE NEWS

Alumet spent much of the year in court fighting complaints about using the existing road along the Blackfoot River to haul phosphate from the Lanes Creek mine. The company would like to mine about 250,000 tons of phosphate ore per year. Alumet drilled eight holes on federal prospecting leases at the confluence of Johnson Creek and Slug Creek. Results were encouraging.

Chevron Chemical Company announced that its phosphate mine (120 employees) at Vernal, Utah, and fertilizer plant (190 employees) at Rock Springs, Wyoming, were for sale. The plant is a competitor for Idaho fertilizer producers.

A possible threat to the elemental phosphorous business (Monsanto, FMC) is from purified phosphoric acid which can be used in many applications now filled by elemental phosphorous. FMC produces about 250 million pounds of elemental phosphorous per year and Monsanto about 210-215 million pounds per year. Rhone-Poulenc is building a purified acid plant north of Baton Rouge, Louisiana, at a cost of $60 million. Monsanto has had a pure acid plant operating in Brazil for the past 10 years (PhosBrazil). Albright Wilson has started a plant at Lees Creek, North Carolina. Texas Gulf Sulfur is a partner in this plant, which came on line the first quarter of 1990.

Researchers with EG&G at the Idaho National Engineering Laboratory experimented with a new technology for producing elemental phosphorous. The ore is processed through a very high temperature cyclone plasma reactor. The process is less energy intensive than current methods and can be carried out in a sealed system, reducing environmental problems.
INDUSTRIAL MINERALS IN IDAHO (Figure 5)

Limestone

*Idaho Travertine* did not mine any new rock from their quarry located east of Idaho Falls but did cut stone from stocks and imported material. Mining will resume next Spring. About 25 people are employed at the plant in Idaho Falls. Facing stone was cut for a police station in Honolulu, Hawaii, and for a new building constructed for Chrysler Corporation near Auburn Hills, Detroit, Mich. A new quarrying operation (part of a $600,000 contract) will provide rock from the old Table Rock sandstone quarry near Boise for construction of the new Athletic Complex and Business School at the College of Idaho in Caldwell. Many of the older buildings in Boise, including the State Capitol, are constructed of Table Rock sandstone.

*Owyhee Calcium Products* mined about 6-10,000 tons of oolitic limestone from a quarry near Grandview. The lime is used as an animal feed supplement. Four people are employed in the mining operation. According to a company spokesman, oolitic lime is superior to crystalline limestone in cattle feed.

*Ash Grove Cement* continued full operations at Idaho's only cement plant located near Inkom. The plant produced about 200,000 tons of cement in 1990. A new stacking and reclaiming system was installed at a cost of $300,000 to handle clinker. The plant employs about 70 people. The company mines silica and limestone from nearby quarries.

*Chemstar Lime Company* (member of the Chemical Lime Group) drilled a high-calcium limestone deposit near Tenmile Pass, northwest of Soda Springs. The property is being evaluated for quality and quantity of limestone. Chemstar operates plants and mines in Utah, Nevada, Arizona, and California which produce various types of hydrated lime. The company is the largest producer of lime products in the United States.

*Continental Lime* (a subsidiary of Steel Brothers Canada, Ltd.) explored for limestone near Tenmile Pass northwest of Soda Springs on state and BLM leases.

*West One Minerals* quarried and crushed about 17,000 tons of limestone from a pit at Leslie Butte, 20 miles north of Arco. A 5,000-ton batch and a 2,000-ton batch were trucked to Amalgamated Sugar's plant at Nampa for testing. Both tests were encouraging. Amalgamated uses a large quantity of limestone in processing sugar beets. All of the lime currently used by Amalgamated is imported from near Derkey, Oregon.
Figure 5. Industrial mineral mines, plants, and exploration projects in Idaho, 1990
Faxe Kalk, who bought E.J. Wilson and Sons’ White Rock limestone deposit, continued to study the U.S. market for filler lime. They plan on using the travertine as a filler for high-grade computer paper. Several companies are interested in buying the crushed lime and processing it further in their own plants. E.J. Wilson shipped some lime and some gypsum from another property, the Morning Glory Claim, located near Lidy Hot Springs.

Idaho Lime began operations at the new $2.5 million filler lime plant in Grangeville. The company is looking for additional sources of high grade limestone to supplement reserves from a quarry on Slate Creek near Lucille. They have done a lot of drilling.

The Nez Perce Indians continued operation at the Mission Creek limestone quarry near Lapwai. About 12-13,000 tons of lime were shipped to Potlatch Paper Company’s paper mill in Lewiston. In addition, about 3,000 tons of lime were used for agricultural purposes, a market the tribe is interested in expanding. Three to five men are employed in the mining operation.

Treasure Canyon Calcium shipped about 20,000 tons of limestone to J.R. Simplot’s phosphate plant at Pocatello. The company also sold some lime for a feed supplement. About 13 people work at the plant and the Treasure Canyon No. 2 lime quarry in Franklin County.

Silica

Unimin Corporation contracted with City Transfer to mine sand from a pit near Pearl and haul it to the company’s plant at Emmett. About 100,000 tons of finished product were shipped in 1990. Unimin employed 16 people in the plant. About 50% of the sand is processed in a washing and chemical treatment plant and sold for glass production. Unimin is developing and marketing a new product, white sand for golf courses.

Diatomite

Grefco, Inc., drilled their Deep Creek diatomite deposit in Owyhee County and staked many new claims. About 7 standard rotary holes and a 36 inch-diameter hole were drilled. The large diameter hole has a special use. Rather than using core to evaluate a diatomite prospect, Grefco drills large holes and then lowers a geologist down the hole to examine the deposit.

Grefco reportedly did more testing at American Diatomite’s Clover Creek diatomite deposit near Gooding.

The All American Soil Company was sued by the state for misrepresenting the value of a diatomite claim north of Weiser. The company said the property was worth $300 million when in fact the property cost $5,000. The suit asks that the owner of the company repay investors and pay a fine that may be as much as $100,000. Apparently, 20 Idaho residents invested a total of $75,000 with the company. All American made news last
year when the company offered to provide 50,000 tons of diatomite (called Idasorb) to help clean up the Valdez oil spill in Alaska.

**Pumice and Perlite**

_Hess Pumice_ shipped 15,000 tons of pumice in 1990. About 400 tons went to Japan, where Hess is trying to develop a new market. Thirty people are employed at the pumice plant in Malad and the Wrights Creek pumice mine north of town.

_National Perlite_ (a subsidiary of _Oglebay Norton_) operated at capacity and shipped over 32,000 tons of perlite (a 16% increase over last year) from their plant at Malad. An improved fire box and burner assembly on a dryer effectively doubled plant capacity. The operation employs about 25 people. The company is aggressively seeking new markets and intends to increase capacity again next year. A higher grade perlite has enabled the company to enter some new markets.

_Producers Products_ (a subsidiary of _Builders Masonry Products_) mined about 18,000 tons of pumice from the Rock Hollow mine near Idaho Falls. All of the material is used for light-weight aggregate. The company uses 2-3 men in a seasonal mining operation.

_Amcor, Inc._, mined 10,757 tons of pumice in a ten week period from the Sunnyside Pit near Idaho Falls. The pumice is used for light-weight aggregate.

**Garnet**

_Emerald Creek Garnet_ maintained its position as the largest producer of garnet in the United States, shipping some 27,000 tons of finished garnet product. Five washing plants are used to extract placer garnets from Emerald and Carpenter Creeks. The mining operation, jig plant, and sizing and bagging plant employ about 36 people. The oil industry is a major customer. Garnet is used to prepare oil well casing for application of a protective coating that makes the casing last much longer. Garnet is also used as a general abrasive and for filtration.

**Clay**

_A.P. Greene_ announced the closure of its refractory brick plant near Troy, Idaho. About seven employees worked at the facility, which made refractory bricks for the aluminum and forest products industries. Plans for the closed plant are uncertain.

_Clayburn Industries_ employed 8 men operating the kiln at the old Simplot clay plant near Deary. The calcined clay is shipped to Clayburn's refractory brick plant near Abbotsford, British Columbia. Approximately 662 tons of clay were shipped in 1990.

_Castle Creek Clay_ reportedly mined some bentonite from a deposit near Oreana in Owyhee County.
Scoria

*Mountain West Bark* operated all year, but changed owners. The company mined 42,000 to 45,000 tons of scoria from pits near Rexburg and Soda Springs. Most of the material is used for landscaping. The company subcontracts crushing and employs 2 people in mining. The company's major business is selling bark for landscaping.

Gypsum

*Silver Still Mining Company* reportedly mined some gypsum from the Iron Mountain deposit near Weiser. The rock is used for agricultural applications.

Stone

Three companies continued to market decorative Oakley Stone quarried south of Oakley. *Northern Stone Supply* operated the Rocky Mountain Quartzite quarry. *Idaho Quartzite Corporation* obtains rock from several quarries and offers a variety of colors. *Oakley Valley Stone* also sold rock during the year. The slabs of quartzite are used as paving or facing stone or can be cut into decorative tiles.

Gemstones

Gemstone production in Idaho included several mines worked for Bruneau Jasper, the *Willow Creek Jasper* mine located north of Eagle, and the *Spencer Opal* mine, north of Idaho Falls. The U.S. Forest Service sold 2,120 permits to rockhounds for digging star garnets, the state gemstone, at the U.S. Forest Service fee collecting area near Emerald Creek.

Aluminum Recycling Plant

*IMSAMET, Inc.*, (a division of Envirosource, Inc.) completed the first full year of operation at its aluminum recycling plant near Hauser Lake. The plant processes 80 million pounds of aluminum cans and 40,000 pounds of other aluminum scrap per year. The aluminum is shipped to Kaiser Aluminum's Trentwood plant near Spokane. About 75 people are employed at the operation. Improvements made during 1990 included adding a new automated sow casting plant. A breakthrough in recycling salt cake (a waste product) using solar evaporation holds promise. Land is being acquired in Utah for a pilot plant. If successful, this will be the first practical solution to a waste problem that has been studied throughout the industry. Salt and potash, which are contained in the salt cake waste, will be recycled as a result of the new process. Late in the year the company was notified by the State Air Quality Bureau that it was facing possible fines of up to $168,000 for violating emission standards for fluorides, particulates, and organic gases. The company will cooperate in bringing the plant into compliance and will pay $86,000 in fines for past infractions.
Zeolites

Teague Mineral Products continued to mine and explore for zeolites in southwestern Idaho. The mineral is processed at Teague's plant in Adrian, Oregon. Most of the product is used as a fungicide carrier, in odor control, and as an animal feed supplement. The company has an active research program under way to discover new uses for zeolites it mines near Jordan Valley, Oregon.

EXPLORATION (Figure 6)

Introduction

Exploration for precious metals increased in Idaho during 1990 to its highest level since the Great Depression in the 1930's. Several companies actively pursued base metals and a number of firms explored for industrial minerals. The number of exploration projects in Idaho increased from 82 last year to 99 in 1990. Companies spent about $25 million on exploration, assuming expenditures averaging $250,000 per project. Activity was spread across the state, with several of last year's prospects moving into development and a number of new projects started. Beartrack, the largest gold discovery in the state's history, continued to draw companies to the Salmon area. Exploration for disseminated gold deposits increased in the southwestern and southeastern parts of the state on both sides of the Snake River Plain. The Stibnite, Yellowpine, and Big Creek areas of Valley County received attention as did several deposits near Elk City and Florence. A few companies were active in the Panhandle. Exploration in Idaho has probably peaked after a steady increase over the past few years. It is estimated that the same or a slightly lower level of activity will continue for the next year or two.

Coeur d'Alene District

Underground exploration is part of normal operations in all of the active mines in the Coeur d'Alene district. In 1990, underground exploration in the Sunshine mine was especially productive. Company geologists discovered a new vein called the Silver Line vein, 2,200 feet due north of the Jewel Shaft. The vein has a different mineralogy from other veins in the mine and contains some gold and ruby silver minerals.

Hecla Mining Company plans on drilling this winter from the surface at the Snowstorm mine, east of Mullan. This program has been under way for several years.

Low silver prices forced Callahan Mining Company to defer further exploration at the Caladay project. The company has invested over $30 million in this program.

Asarco finished the American Silver drive from the 3400 level of the Coeur mine and is evaluating results of drilling in the Wire Silver Vein area.
Asarco and partner Coeur d'Alene Mines Corporation did not do any new work in the Silver Summit mine. The companies obtained a lease on the property last year after Hecla Mining Company and others (Consolidated Silver Corporation) invested $17 million in a major underground exploration program several years ago.

Golden Chest, Inc., announced that initial drill results on the Golden Chest mine near Murray indicate reserves of 4.8 million tons averaging .043 ounce-per-ton gold. The ore can be mined by open-pit methods. The property was drilled by Newmont Mining Corporation and was returned to Golden Chest this year.

International Basic Resources noted that Newmont had returned the Mother Lode mine on Ophir Mountain to them after finding a bedded gold vein on the property. The Mother Lode is located across a canyon from the Golden Chest mine.

Other North Idaho

Shoshone Silver drove about 350 feet of new drift at the Keep Cool mine in the Lakeview district. The company is stockpiling lead/silver ore, waiting for more favorable prices. Three men were employed at the mine.

Kennecott Corporation did surface work and plans on drilling four 500-foot deep holes near the old King David mine on Ruby Creek, east of Bovill. The mine site is on private land. The King David was in operation from 1922-1930. Kennecott is interested in the property as a zinc/lead/gold prospect.

Cominco, Ltd., drilled two holes at the Buckhorn mine located on Scout Mountain on the Idaho-Montana border. A number of holes were drilled at this underground polymetallic mine last year. The company drilled another hole on their Brush Creek prospect east of Avery. The target is a Sullivan-type deposit in high grade metamorphic rocks.

Gold Fields Mining Corporation (Gold Fields) completed a drilling program in the peat bogs at Florence. The company is evaluating the old placer camp for lode gold deposits. Last year the company conducted geologic, geochemical, and geophysical surveys in the area.

Newmont Gold Company applied for permits to drill 4 holes along the Blanco shear zone near the Red River Ranger Station located east of Elk City. The property was later dropped. The company has substantial holdings near Golden, including the New York mine, and has been conducting exploration in the area for several years. This year’s program included drilling and road construction in the Fall Creek and the Little Leggett Creek areas, as well as surface sampling and mapping.

NJB Mines, Inc., applied for permits to open a small open-pit mine on the Ko-Dan claims located north of the Red River Ranger Station. The company plans on building a small mill this winter and to begin mining next year.
Figure 6. Exploration projects in Idaho in 1989 and 1990
Cominco trenched the AHP property near the Red River Ranger Station, east of Elk City, and subsequently terminated the lease agreement.

John Haydn reportedly did some work at the Gold Dust mine in Mountain Gulch near Potlatch.

The Robinson Dyke mine reverted from Canyon Resources Corporation back to the owners, who are interested in selling it. An area has been clearcut at the mine site for a leach pad and numerous holes have been drilled on the property over the past few years to evaluate the shallow heap-leachable gold deposit.

SM and S Nielson Mining, Inc., applied to the State Department of Lands for a permit to operate an open-pit at the patented Blue Jacket Mine west of Cow Creek Saddle in the Hells Canyon National Recreation Area. The proposal included transporting the ore from the mine to Council on US 95 and then up to Cuprum for processing at a mill owned by Alta Gold Company. The State denied the permit based on a lack of information about the environmental consequences of the operation and remediation/reclamation measures.

Salmon Area

In April, FMC Gold Company (FMC) purchased Meridian Minerals, a subsidiary of Burlington Resources, Inc. Included was the Beartrack gold deposit located near Leesburg in Lemhi County. Beartrack is the largest gold discovery in the state's history. The deposit contains nearly 3.0 million ounces of gold (37 million tons of .055 gold) in oxide and refractory ores. The mine site will occupy about 705 acres and contain two open pits, a cyanide heap-leach pad, waste rock dumps, and other facilities. Approximately 100-150 people will be employed at the mine, with an annual payroll of $4 million. About 25 million tons of ore and 50 million tons of waste rock will be moved and 600,000 ounces of gold recovered during the seven-year life of the mine.

Work on the Beartrack project in 1990 included permitting and preproduction work on the oxide deposit and metallurgical testing of the sulfide ores. The company drilled 64 holes in the South orebody (40,000 feet total) and approximately 15,000 feet of reverse circulation holes to delineate the North ore zone. Metallurgical studies completed on the oxide ore samples suggest good recovery using cyanide leaching. Indicated geologic reserves are 45 million tons, containing 1.0 to 2.1 million ounces of gold, depending on what cutoff grade is used. Revised reserves incorporating this year's drilling are being calculated. The Draft Environmental Impact Statement for Beartrack was released to the public in October, 1990. The Final EIS is expected to be completed in March, 1991, and construction could begin in June, 1991.

Late in 1989, Meridian signed an agreement with American Gold Resources Corporation (AGR) for an exploration program on 17,000 acres adjacent to Beartrack. FMC will continue this venture. AGR drilled the Haidee mine on Arnett Creek last year and started
a new program near the Little Chief mine this year. In 1990, the joint venture drilled 96 reverse circulation holes totaling 35,000 feet and opened up some of the old underground workings. AGR anticipates a similar-sized program next year. The company received an award of recognition from the Department of Lands for reclamation work at the Arnett Creek site. AGR is also involved with ASARCO on a 25,000 acre claim block due south of Arnett Creek.

Placer Dome, (U.S.), Inc., picked up 50,000 acres of AGR's Leesburg package. Placer ran surface geophysics and geochemical surveys prior to a modest reverse circulation drilling program. The joint venture includes claims along the Coiner fault, at Bird Creek (Wickham mine), Moose Creek, and other areas in an arcuate band surrounding Beartrack.

Golden Chest, Inc., obtained a 100-percent interest in the Freeman Creek property (23 claims) located about 10 miles north of Salmon in Lemhi County. The property was explored by FMC Gold and Bond Gold (formerly St. Joe American) over a four-year period. Reserves are estimated at 20,000 ounces of gold that are amenable to heap leaching.

Hecla Mining Company continued exploration on its Bowman joint venture with Formation Capital. The property is located southeast of Leesburg near Williams Pass.

Formation Capital Corporation was joined by Teck Resources, Inc., in a joint venture to explore the 5,000-acre Morning Glory property adjacent to Beartrack. Teck did mapping, sampling, and geophysics prior to drilling several holes in the fall. Formation also acquired the King Solomon, Wallace Creek, and Silverton mines located 4.5 miles east of Beartrack. Nine gold-bearing zones have been identified on these properties. Formation has an interest in the Bobcat/Redrock property being explored by Gold Fields, also close to Beartrack. Last year, Gold Fields replaced Corona Gold as the project partner. The company did surface mapping and an aeromagnetic survey on the Wallace Creek claims between Salmon and Leesburg and drilled about 45 reverse circulation holes in the area.

Teck Resources Inc. leased the St. Claire mine on Owl Creek. Results of mapping and sampling were being evaluated at year's end.

Meridian drilled 16 holes at the Lick Creek property near Gibbonsville and then dropped their interest.

FMC Gold Company would again like to joint venture the Ditch Creek prospect near North Fork. The company drilled the property two years ago and discovered gold mineralization. The property was offered as a joint venture, but FMC decided last year to do more work and try to increase reserves.

At Kinney Creek, Placer Dome, Inc., and venture partner Broken Hill Proprietary Company drilled some 6 to 8 holes. Corona Corporation, a former partner, drilled 4 holes
on the property last year and then dropped out of the project. Corona is also trying to sell the Wimpey Creek property, where they drilled about 20 holes last year.

Montana-based ECM, Inc., leased the Pine Creek property to Gwalia (USA), Ltd., an Australian firm, who mapped, sampled, and trenched the property. A drilling program is planned for next year. The property is near Shoup and was drilled in 1989 by Sovereign Exploration, Inc. (Total Energold Corporation).

ECM's Lick Creek property near Gibbonsville was leased to FMC. The lease was dropped after FMC drilled 9 holes.

GEXA Gold Corporation did some geochemical sampling and mapping, but no drilling, on Musgrove Creek this year.

AMAX Gold Inc. dropped their interest in the Rabbitsfoot mine after drilling last year.

Centurion Gold Ltd. drilled one hole for assessment work on the Iron Creek copper-cobalt-gold property located south of Salmon.

West Fork Gold reportedly drilled more holes on a gold project on the West Fork of Indian Creek, south of the old Ulysses townsitie.

Charles Duus built an access road to two drill sites at the Monitor Mine, located near the Idaho-Montana border north and west of Shoup.

Sandy Sims mined a small amount of silver-lead-zinc ore at the Democrat mine and hauled it to the Clayton Silver mine for mill tests.

The U.S. Geological Survey announced that gold had been found in several creeks south of Salmon in Lemhi County during a survey to evaluate the mineral potential of the area. The gold particles were too fine to be seen using conventional panning techniques. Mechanized pans were used to concentrate gold-bearing black sands. The black sands were then examined under a microscope to find the small flakes of gold. Of 38 creeks studied, four samples from Allison Lake, Mulky Creek, and Poison Creek, contained the fine gold.

The impending sale of the Blackbird mine (cobalt/copper) to New York investor Chalmers Dale created a stir in Idaho mining circles last year. Dale announced plans to reopen the mine and build a cobalt refinery in Custer or Lemhi County. The refinery would employ 250 people, with another 150 working at the mine. The property is owned by Noranda Mining Company and M. A. Hanna Company, and has water quality and other environmental problems. The deal has apparently fallen through; there was no new activity at the property this year. Dale's company reportedly had trouble raising the $7 million security bond required by the state before operations can proceed at the mine.
Idaho Energy Resources reclaimed last year's exploration sites on thorium prospects near the Wonder Lode and Caga mines in the Lemhi Pass thorium district. Most of the work was on the Montana side of the district.

West-Central Idaho

Kennecott Corporation drilled in the Moore Creek drainage which joins Logan Creek about five miles above the confluence with Big Creek. The company built 1,000 feet of new road and widened 6,000 feet of existing road to reach the old Moscow mine. The Columbia River Intertribal Fisheries Council appealed the Forest Service permit, claiming the project would adversely affect the local fishery. To mitigate the problem, Kennecott constructed a large log bridge across Logan Creek. Kennecott reported encouraging results from some of the 6 core holes drilled on this bulk-tonnage gold target.

Placer Dome U.S., Inc., drilled 4 core holes and 5-6 reverse circulation holes and built 1.1 miles of road in the Quartz Creek (Red Mountain) area near Yellowpine. The company also asked to build a storage shed and rebuild an old bridge.

Independence Mining Company (formerly Freeport-McMoran Gold Company) drilled 12 holes on Logan Creek near the old Independence mine. The drill roads will be reclaimed next year. Independence continued a drilling program in Smith Creek about 3.5 miles east of Big Creek. The company drilled 15 holes last year and built 1.5 miles of road. Plans called for extending the road .8 miles to do more drilling and gain better access to approved drill sites at the McCrae mine.

Jack Walker received a Forest Service permit in October to build a 50 ton-per-day mill on Logan Creek near Big Creek. Construction will begin this winter and be completed next summer. The plant will serve as a custom mill for several small mining operations in the area. During 1990, a crew mined and stockpiled about 1,500 tons of ore at the Fourth of July mine.

At the Franklin D. mine on Pistol Creek Ridge, Stow Resources drilled 7 core holes. Citing negative results, Stow returned the property to its owner, Pistol Ridge Mines, Inc.

East-Central Idaho

U.S. Antimony Corporation (USAC) continued to develop the Yellowjacket open-pit mine in Lemhi County. The company plans to build a flotation mill at the site and to mine about 250 tons-per-day. Final concentrates will be leached at USAC's mill at Preachers Cove. Reserves are 312,277 tons of .14 oz gold, for a total of 41,279 ounces. The property was drilled last year (59 reverse circulation holes) by Western Gold Exploration and Mining Company Partnership (WestGold), who has returned the mine to USAC. Cyprus Minerals explored the property in 1976. The Yellowjacket property is owned by Myrna Lee Steen, whose family has owned the mine on and off since 1887.
WestGold mapped, sampled, and prepared drill sites at Estes Mountain, across the valley from the Sunbeam mine. Late in the year, the project was put on hold when the company announced it was phasing out all of its U.S. operations.

Grouse Creek Mining, a subsidiary of CoCa Mines, Inc., drilled 34 holes into the Grouse-South deposit at Jordan Creek on the Yankee Fork in Custer County. The company did geotechnical work on the waste dump and plant sites and reclaimed the old Sunbeam test heap-leach pad. The property was obtained last year in a merger with Geodome Resources, Ltd. Grouse Creek is an extension of the deposit discovered by Geodome (Sunbeam Mining Company). The property contains 3.2 million tons of .082 gold at the old Sunbeam mine and 4.9 million tons of .044 gold at Grouse Creek. Construction costs of the open pit mine and mill will be about $46 million. The company sold 752,835 shares in Equity Silver Mines, Ltd., to raise capital for developing Grouse Creek. Annual production is projected at 75,000 ounces of gold and 350,000 ounces of silver per year during the first three years of operation. Mining will be at 3,000 tons-per-day from an open pit with a 4:1 strip ratio. CoCa will build a conventional countercurrent decant mill with zero discharge instead of the vat leach process originally proposed by Sunbeam Mining. The Grouse Creek Supplemental EIS is expected in December. Several alternatives are being suggested to mitigate the impact on the Pinyon Basin wetland, which was a major problem for Sunbeam Mining.

Hugh Johnson continued development work at the Last Chance mine on the Yankee Fork.

Umont Mining drilled 2 holes in the Bayhorse area.

Cyprus Minerals drilled a prospect on Upper Bruneau Creek north of the Thompson Creek molybdenum mine.

Yanke Machine improved the mill at the Greyhound mine and is trying to patent the property.

Sunshine Mining Company drilled 8-10 holes at the Buckskin mine on Valley Creek west of Stanley. Last year, they opened an adit on the patented claims. The company also drilled 4 more holes in Washington Basin.

Shama Minerals, at one time the largest mining claimant in Idaho, was in bankruptcy court. The bankruptcy proceedings included an auction of the company’s fluorite mine near Challis in October.

South-Central Idaho

Westmont Mining had an active year at the DSA polymetallic prospect located near the headwaters of the North Fork of the Lost River. The company finished detailed mapping
and soil sampling, and drilled 8 diamond drill holes totaling some 4,000 feet. The program will continue next year.

Bob Fletcher drilled one core hole on the Lowboy claims near the Lead Belt mine at the south end of the White Knob Mountains.

Plexus Resources Corporation took over Sovereign Exploration, Inc., including a prospect near Coyote Creek in the Mackay area. The company drilled 18 reverse circulation holes on the Navarre property and did some trenching and ground geophysics. They also staked more claims north of the Champagne mine in the Lava Creek district.

Homestake Mining Company maintained their unpatented claim group in the Alder Creek district west of Mackay with nominal surface work.

Early in the year, Cominco reclaimed a project in Lehman Basin and returned it to the owner. The company drilled the property last year.

Hecla Mining Company continued exploration activity at Muldoon Canyon (near the Eagle Bird mine) in Blaine County.

Independence Mining drilled 8 holes at Bartlett Point, west of Thousand Springs in Custer County, and then returned the claims to the owner.

Manville Sales Corporation drilled 6 core holes on the Pioneer Project near the old Paymaster mine in the Lava Creek District.

Earl Waite continued work in the Webfoot mine in the Vienna district in Blaine County.

Canyon Reserve mapped surface geology and underground workings at the Hoodoo Mine on Slate Creek in Custer County. The Hoodoo was operated as a zinc mine in the early 1970's and reportedly has substantial reserves.

BioMyne of Princeton, N.J., applied for permits to drill four or five holes in the Bassett Gulch, Moonlight Gulch, and West Fork of Warm Springs Creek area near Ketchum. The company is looking for precious metals.

Noramco Exploration, an affiliate of Breakwater Resources, dropped the Sheppard option near Gilroy Butte but maintained their unpatented claims west of Bellevue near the West Lake mine by trenching and reclamation work.

Westgold reclaimed drill stations from last year's program at a copper/gold skarn in Copper Basin. As noted, the company is shutting down its U.S. projects.

Atlanta Gold Corporation continued to seek a joint venture partner or the sale of its gold property near Atlanta. The mine contains one million ounces of minable gold in the East
and West pit zones. A feasibility study completed last year by Behre Dolbear-Riverside, Inc., and Bateman Engineers concluded that the east pit contains 8.27 million tons of .087 gold that could be mined profitably at $250/ounce gold. The study suggested using bioleaching and cyanidation. Cost of the mine and mill was estimated at $47.5 million. Atlanta completed a placement in Europe of 1.25 million shares at $1 per share and 1.25 million warrants for an additional 1.25 million shares at $1.25 per share. The money will be used to replenish working capital that was exhausted last year by a court fight with U.S. Gold for control of the company.

Late in the year it was announced that Newmont signed an agreement with Atlanta. Newmont may earn a 51 percent interest in the Atlanta properties in Elmore County by making cash payments totalling $5,000,000 to Atlanta Gold and spending $10,000,000 on exploration and development. Newmont will be the operator on a first-phase drilling program totaling 15,000 feet in early 1991. The program will test the high grade, deep potential of the property.

Newmont drilled about 30 reverse circulation holes and did surface mapping and sampling at Rocky Bar, the 5th year of a GEXA-Newmont agreement. The company built 7 miles of new roads.

Cactus West Exploration, Ltd., was active in the Rocky Bar area and is examining the Bonaparte mine near Cayuse Creek.

A number of smaller exploration projects were under way in the Rocky Bar area. RST Mining did some drilling on a site near the James Creek road, north of Rocky Bar. Fritz Trudeau drilled two holes in Hardscrabble Gulch. Bob Romik was working in Spanishtown, and John Caldwell opened some adits in Wide West Gulch.

Centennial Resources obtained a state permit early in the year for a cyanide heap-leach gold mine in the Neal district on Blacks Creek, east of Boise. The company did considerable drilling last year. Centennial dropped plans for the mine after evaluating the drill data and coming up short on reserves.

Boise Basin

Pegasus Gold, Inc., entered into a joint venture with Cactus West on the Century claims by the Gold Hill mine near Quartzburg. In addition to surface work, Pegasus drilled 8 holes and Cactus West 4 holes.

Independence Mining mapped and sampled, and then drilled 10 holes, in the Alder Creek drainage above Placerville during the fall.

Rhino Resources put down 6 core holes at the Giant mine on Shaw Mountain.
Frontino had a mapping and sampling program and prepared new drill sites on the Ophir Creek property. The company collaborated with investors in Tucson, Arizona, to raise money for a drilling program in 1991. The new group is called Mineral Mountain Limited Partnership.

ABC Mining opened an old adit near their placer mine on Buckskin Creek.

Cactus West dropped their option on the Missouri mine located 15 miles north of Idaho City. The company completed a drill program near the mine last year.

CONFIDENTIAL: had a drilling program northwest of Boise in the area.

Kennecott started a sampling program at the Boise Queen Mine near Lucky Peak Reservoir.

Southeast Idaho

Placer Dome drilled 7 holes and built 2,000 feet of road on claims about five miles northwest of Kilgore near Dubois. Kennecott drilled the site about 5 years ago.

Gold Fields drilled 6 reverse circulation holes in South Heglar Canyon northeast of Sublett on private land adjacent to the national forest. The target was a sediment-hosted gold deposit.

Atlas Corporation sampled claims staked last year in the Magpie Basin and Rock Creek areas in the South Hills, south of Twin Falls.

Cordex Exploration Company drilled 22 holes in Valve House Draw and Box Canyon (Mink Creek). The prospect is located 15 miles south of Pocatello on about 300 acres. The claims were obtained from Meridian Gold Company, who actively explored the area for precious metals from 1986-1989. Meridian received an award from the Department of Lands for their reclamation work at the Mink Creek prospect.

Gold Fields picked up the Cherry Creek property near Malad. Freeport built roads to some drill sites in this area in 1987-88.

Oglebay Norton Company drilled 2 core holes looking for precious metals in the Wrights Creek area near their perlite mine just north of Malad.

WestGold reclaimed drill sites at their Oakley project on the west side of Middle Mountain in Cassia County and dropped the claims. The claims, called the Blue Creek Hill property, were re-staked by Placer Dome.
Several individuals were working in the Albion Range area. These included Allen Hardinger, who drilled a hole near Cache Peak to see what was there, and Neal Twitchell, who was driving an adit near the Melcher mine on Conner Creek.

**Independence Mining Company** (formerly Freeport-McMoran Gold) dropped plans to drill 12 exploratory holes on Caribou Mountain in Bonneville County, electing to do only surface sampling. In a surprise move, **Newmont** entered a joint venture with Independence and announced that the drilling plans would proceed. The company collected and analyzed 1,300 soil samples and did some geophysics and surface mapping. They permitted 15 drill holes and finished 6, constructing 2.1 miles of new road. Road building has been a sticky issue with environmental groups in the area. After Newmont started work, the Idaho Conservation League, Greater Yellowstone Coalition, and Wilderness Society appealed the Forest Service permit on the grounds that the operation would adversely affect endangered species. Forest officials and environmentalists are negotiating to avoid a legal battle. Newmont plans on asking for an extension of the permit to drill 5 more holes on existing roads.

**Noranda** completed permitting the Black Pine mine but held off mining due to low gold prices. In June, **Pegasus Gold, Inc.**, announced it had purchased the 10,500 acre property for $6.4 million ($4.5 in cash and the rest in stock). Noranda can buy back into the mine for $4 million after Pegasus has recovered 500,000 ounces of gold. Pegasus will spend $250,000 a year for two years, exploring for additional reserves. Work this summer was supervised by Noranda and included constructing 2 miles of road in the Silver Hills area. Pegasus started construction on the access road from Interstate 84 and the processing facilities and office buildings in October. The project has minable reserves of 7.7 million tons of oxide ore grading 0.042 ounce-per-ton gold, with a projected recovery rate of 75 percent. There are also 8.1 million tons of low-grade reserves averaging 0.014 ounce-per-ton gold. Production is scheduled for mid-1991. The open-pit heap-leach mine will produce 80,000 ounces per year by 1993 but will have a 6-year mine life average of about 50,000 ounces per year. The operation will employ 100 people and require an investment of $16 million. A memorandum of understanding has been reached over an environmental appeal concerning potential harm to wildlife. Pegasus has agreed to build a new wildlife pond and install netting over the cyanide pond to keep aquatic birds out. The company opened a project office in Burley.

**Southwest Idaho**

**ASARCO** drilled two reverse circulation holes in the Jasper Basin area south of Pearl. They subsequently returned the property to the owner.

Jack Walker purchased an interest in the old **Gem State mine** in the Pearl district and retimbered some adits later in the year.
Cyprus Minerals drilled several holes at the Consolidated Mercury property on the north side of Crane Creek north of Weiser. They returned the property to Western Epithermal who plan more drilling next year.

Manville Sales Corporation drilled 2 core holes at Thirsty Mountain and then leased the property to American Barrick Resources Corporation. Barrick drilled two additional holes and returned the prospect to Manville.

AMAX drilled 6 reverse circulation holes south of Jordan Valley on the north edge of South Mountain. The host rocks are well-altered rhyolite flow breccia, though the area is shown as basalt on existing geologic maps.

Nerco Minerals Company did exploration work on Tennessee Mountain, War Eagle Mountain, Twin Peaks, and the Milestone deposit, in addition to development work at the Stone Cabin mine in Owyhee County.

Ican Minerals, Ltd., drilled four holes at the Idaho Almaden epithermal gold project northeast of Weiser, including two 700-foot-deep holes to test for a feeder at depth. The main zone in the deposit (250 feet deep) contains 40 million tons of .025 ounce-per-ton gold.

Battle Mountain Gold Company generated a lot of press as a result of an exploration program on Indianhead Mountain located west of Weiser. About 4,000 feet of drill roads made a scar on the Indian’s forehead and there was fear that he might lose his nose. Protests were lodged by the mayor of Weiser, the city council, and concerned citizen groups. Battle Mountain reclaimed the roads and reseeded the famous local landmark after their drilling program was completed. The company has since dropped the lease (with Manville Sales Corporation) and the Indian is reported in good shape.

Gold Canyon Resources signed an agreement with Noranda for exploration at the Blue Dog prospect in Washington County. Gold Canyon obtained a 100-percent interest in the property after issuing stock to its former partner, Bradner Resources. Several new holes were drilled this year. Gold Canyon also renegotiated an agreement with Homestake Mining Company, enabling Gold Canyon to gain a 100-percent interest in Blue Dog. The property has reported reserves of three million tons of .05 ounce-per-ton gold. Recent work has identified a second silicified zone southeast of the main orebody. Bradner and Gold Canyon entered into an agreement with Silver Standard Resources (associated with Teck) and Carlin Resource Corporation to explore the 1,150 acre Chandler property adjacent to the Blue Dog. Each company has a 25 percent interest, with Silver Standard assigned as manager.
OTHER MINING RELATED NEWS

Goldsil Mining and Milling Company settled claims for a cyanide leak at the Comeback mine near Pioneerville for $9,000 and a release from further liability. GoldSil was not the operator at the time of the incident but had bonded the property. GoldSil’s insurance carrier, Allied Fidelity Insurance Company, went bankrupt, leaving GoldSil responsible for the reclamation bond. The Diamond Hill Mining and Milling Company was working the site when the spill occurred. The company had a cyanide problem at the small heap-leach mine in 1986, when water from the Spring runoff activated one of the leach pads and cyanide-contaminated water overflowed the containment ponds. The creek was not adversely affected but the incident prompted the state in 1988 to pass the first comprehensive rules in the United States regulating heap-leach cyanide operations. The $9,000 should be adequate to reclaim the site, according to state officials.

A company specializing in manufacturing drilling tools for the mining industry opened a shop in Rexburg. Tennessee-based Matrix Drilling Products employs about 10 workers at the new facility, which serves as a distribution site as well as repair facility for the company’s western customers.

Boise Cascade Corporation completed a mineral evaluation of its lands and closed down its exploration department. Bernard J. (Barney) Guarnera, manager of exploration for Boise Cascade, formed a new company, Westchester Mining Corporation.

Water continued to be a major concern in Idaho. The legislature passed the Antidegradation Act last year. It was put together by a coalition of government, industry, and environmental groups. The act allows citizens to nominate stream segments for designation as Outstanding Resource Waters (ORW). Designation as a ORW would add protection to the water quality of the stream. The mining industry objected when the Idaho Conservation League proposed protecting the entire Middle Fork of the Salmon River and 27 tributaries, or some 8,000 square miles, under the act. Industry spokesmen objected that protecting such large areas were not the intent of the act. All of the nominations were under consideration by the Division of Environmental Quality (Department of Health and Welfare), who will make a recommendation to the state legislature next year. Part of the act called for monitoring the water quality of nominated stream segments. Funds for hiring professionals for the monitoring program were cut back by the legislature; however, federal funds will replace some of the non-appropriated funds.

The Mining Law of 1872 was under attack again in 1990. Rep. Nick Rahall, Chairman of the House Mining and Natural Resources subcommittee, introduced a bill calling for an annual acreage rental fee on mining claims. Senator Dale Bumpers introduced a bill that would impose an 8 percent royalty on mining production and levy higher fees for holding claims. Neither bill went anywhere; Senator James A. McClure was successful in stopping the Senate move and Rep. Larry Craig helped block the House bill. In October, the Senate narrowly defeated (50-48) a proposal by Bumpers to declare a one-year

44
moratorium on patenting mining claims. A similar moratorium was approved by the House. Undoubtedly an attempt will be made to change the bill next year especially with the retirement of Senator McClure, long-time champion and protector of the mining law.

The Idaho Wilderness bill was in the news again in 1990. A bill calling for 1.4 million acres of new wilderness was put together by Senator James A. McClure and Governor Cecil Andrus. The bill was opposed by wilderness activists from the start. Governor Andrus withdrew all support for the bill in February. The bill got as far as passing the Senate Natural Resources Committee. Again, with McClure's retirement, the bill is assumed to be dead. The conservation groups in Idaho supported their own bill, which was championed by Rep. Peter Kostmayer and which proposed about 4 million acres of new wilderness. This bill was not heard in committee and was given no chance of success. The Idaho legislature got into the act and tried to break the wilderness stalemate, passing legislation calling for professional mediation to solve the wilderness issue. Some $150,000 was budgeted for the process, which started in December. Regional groups composed of interested parties will be established to examine the state once again for areas appropriate for wilderness protection.

Rules and regulations were promulgated regarding the state Nutrient Management Act passed last year. The bill, supported by the phosphate industry, was an attempt to override local ordinances banning phosphate detergents in north Idaho. The rules call for the identification of nutrient sources and how nutrient problems would be remediated. In other words, in the future, facts must back decisions in regards to phosphate and other algal nutrients. However, in spite of the rules and regulations, it is doubtful that the state will overturn local bans.

President Bush fulfilled a campaign promise and signed into law a new federal Clean Air Act that will tighten regulations concerning air pollution in the United States. The bill updates the 1977 Clean Air Act. It was approved 89-10 in the Senate and 401-25 in the House. The bill will seek by the turn of the century to halve sulfur dioxide emissions, achieve a 75 percent or greater reduction in 189 cancer-causing chemicals now produced by 250 different industries, eliminate chlorofluorocarbons (thought responsible for destruction of the ozone layer), and clean up air pollution in our major cities. The bill is expected to cost about $25 billion per year when fully implemented by 2005.

The state's mining industry continued a long tradition of supporting the College of Mines and Earth Resources at the University of Idaho. The college was successful in raising $11.8 million for a new 40,000 plus-square-foot Earth Resources Building. The industry pledged $1 million, the state contributed $2 million, and the federal government provided $8.8 million. Senator James A. McClure was instrumental in helping obtain the federal funds. Ground breaking for the new facility should be in the Fall of 1991 or Spring of 1992. The new building will be built adjacent to the old Mines Building, which will be retained by the college.
The U.S. Geological Survey announced that all of Idaho was finally covered by topographic maps at a scale of 1:24,000. A celebration was held in Boise and a certificate was presented to Lt. Governor Butch Otter by the USGS. There are 1,693 1:24,000-scale topo maps that cover the state.

A new national policy by the Bureau of Land Management limits the use of PVC plastic pipe for staking claims. Birds and small animals were found dead in the pipe after entering through the top and being trapped. The pipe should be capped or replaced with some other monument, such as wooden 4x4 stakes.

The BLM offered 59 people who have homes in historic Silver City in Owyhee County a chance to buy their lots in January by non-competitive bidding. The lots were sold at market value and were appraised at between $350 and $700. Although many of the mines in the Silver City area were patented, the town fathers never patented the townsite, so all of the buildings were built on federal land. Property owners who did not buy their lots were in trespass after January.

The city of Kellogg received a boost when the new gondola, which goes from the city to the Silver Mountain ski area, was dedicated in August. The tramway, longest in the world, was built at a cost of $18 million. On hand was Senator James A. McClure, who helped get a $6.4 million federal grant for the project. The gondola is the centerpiece of local efforts to attract tourists to the Silver Valley. Mining, the traditional major employer in the area, has suffered difficult times over the past 10 years and local officials are looking at tourism as an alternate economic opportunity.

Idaho enjoyed its biggest birthday party ever as the state celebrated its centennial (July 3, 1990). Celebrations were held all over the state during the year-long event.

The state got into the mining game during the year, but removed some of the normal uncertainty of what is often a huge gamble. The state lottery started a new scratch game called Silver and Gold, where one could win silver and gold coins in addition to cash. The game was designed to promote north Idaho mining while making a few dollars to help fund education in Idaho. The 63 one-ounce gold and 420 one-ounce silver coins were minted by Sunshine Mining Company.

Progress was slow at the end of last year in establishing a centennial state park. Problems arose with the preferred site at Bayhorse when mine owners wanted too much for their property. A new interpretive site located two miles south of Challis near the junction of Highway 75 and U.S. Highway 93 will be constructed in 1991. Its theme will be mining in the Yankee Fork Country. The center will have exhibits and will promote the history of mining in the Yankee Fork, Challis, and Bayhorse areas.

Precious metals may not have enjoyed as high prices in 1990 as in earlier years but the price of gold was still high enough to encourage swindlers to take advantage of the public. A California-based company, Morgan Whitney Trading Group, used boiler room tactics to bilk Idaho investors of some $315,000 by illegally selling gold, silver and platinum.
INDEX TO MINING COMPANIES ACTIVE IN IDAHO IN 1990

AEI Corporation 25
A and T Mining 18
A.P. Greene 29
ABC Mining 41
All American Soil Company 28
Alta Gold Company 16
Alumet 25
Aqua-Tech Inc. 14
AMAX 36, 43
Amcor Inc. 29
American Barrick Resources Corp. 43
American Diatomite 28
American Gold Resources 34
Asarco 4, 31, 32, 35, 42
Ash Grove Cement 26
Atlanta Gold Corporation 39
Atlas Corporation 41
Battle Mountain Gold 43
BioMyre 39
Blackbird mine 36
Broken Hill Proprietary Company 35
Bradner Resources 43
Breakwater Resources 39
Builders Masonry Products 29
Bunker Hill Company, Inc. 7
Cactus West Exploration, Ltd. 40, 41
Callahan Mining Corporation 9, 31
Canyon Reserve 39
Canyon Resources Corporation 34
Carlin Resources Corporation 43
Castle Creek Clay 29
Centennial Resources 40
Centurion Gold Ltd. 36
ChemStar Lime Company 26
Chevron Chemical Company 25
China National Nuclear Industry Corporation 18
Cimco Mining Corporation 18
Clayburn Industries 29
Clayton Silver Mines 18
CoCa Mines 38
Coeur d'Alene Mines Corporation 10, 15, 32
Cominco Ltd. 32, 34, 39
Conda Partnership 23
Continental Lime 26
Cordex 41
Corona Corporation 35
Cyprus Minerals Company 14, 38, 43
Democrat Mine 18, 36
Diamond Hill Mining and Milling Company 44
ECM Inc. 36
E. J. Wilson and Sons 28
EG & G 25
Emerald Creek Garnet 29
Evergreen Fertilizer 22
Faxe Kalk 28
FMC Corporation 20, 34, 35
Formation Capital 35
Fourth of July mine 37
Freeport McMoran Gold Company 37
Frontino 41
Gem State mine 42
GEXA Gold Corp 36
G and G Mining 18
Gold-Sil Mining and Milling, Inc. 44
Gold Dust mine 34
Gold Canyon Resources 43
Golden Chest, Inc. 18, 32, 35
Gold Fields Mining Corp. 32, 41
Grefco Inc. 28
Grouse Creek Mining Company 38
Gwalla (USA) Ltd. 36
Hecla Mining Company 10, 16, 31, 35, 39
Hess Pumice 29
Homestake Mining Company 39, 43
Ican Minerals 43
Idaho Lime Company 28
Idaho Energy Resources 37
Idaho Gold Corporation 17
Idaho Travertine 26
Idaho Quartzite Corporation 30
Imsmet, Inc. 30
Independence Mining Company 37, 39, 40, 42
International Basic Resources 32
J.R. Simplot Company 23
Kennecott Corporation 32, 37, 41
Kerr-McGee 22
Last Chance mine 38
Lead Belt mine 39
Lucky Eagle Mines Ltd. 11
M. A. Hanna Company 36
Manville Sales Corporation 39, 43
Matrix Drilling Products 44
Meridian Minerals Company 34, 35, 41
Mineral Mountain Ltd. Partnership 41
Mission Creek Quarry 28
Monitor Mine 36
Monsanto Company 22
Mountain West Bark 30
N.A. Degerstrom, Inc. 25
National Perlite 29
Nerco Degerstrom, Inc. 15, 43
Newmont Gold Company 32, 40, 42
Nez Perce tribe 28
NJB Mines, Inc. 32
INDEX CONTINUED:

Noramco Exploration  39
Noranda  36, 42, 43
Northern Stone Supply  30
Nu-West Industries, Inc.  22
Oakley Valley Stone  30
Oglebay Norton  29, 41
Owyhee Calcium Products  26
Pegasus Gold, Inc.  40, 42
Phi Kappa mine  18
Pioneer Metals Corporation  16
Placer Dome  35, 37, 41
Plexus Resources Corporation  39
Precious Metals Technology  17
Producers Products  29
Rhino Resources  40
Rhone Poulenc Basic Chemicals Company  24
RST, Inc.  40
Shama Minerals  38
Shoshone Silver  32
Sidney Mining Company  14
Silver Corporation of America  14
Silver Standard Resources  43
Silver Still Mining Company  30
SM and S Nielson Mining Inc.  34
Sovereign Exploration, Inc.  39
Spencer Opal  30
St. Claire Mine  35
Star-Phoenix Mining Company  12
Stow Resources  37
Stratcorp  22
Sunshine Mining Company  13, 31, 38, 41, 46
Teague Mineral Products  31
Teck Resources Inc.  35
Thunder Mountain Gold, Inc.  15
Total Energold Corporation  36
Treasure Canyon Calcium Company  28
U.S. Antimony Corporation  17, 37
Unlmin Corporation  38
War Eagle Mining  15
Webfoot mine  39
Westchester Mining Corporation  44
Western Epithermal  43
West One Minerals  26
West Fork Gold  36
Western Gold Exploration & Mining Co.  37
   also (Westgold)  38, 39, 41
Westmont Mining  38
Willow Creek Jasper  30
Yanke Machine  38

48