Idaho Mining & Exploration 2001
Idaho 2000 Leading Commodities

- Phosphate Rock – fertilizer, Roundup
- Silver - film, jewelry
- Sand & Gravel – roads, houses
- Molybdenum – steel, lube
- Lead -- batteries
Zinc Resources may produce again
EPA seeks $359 million N. Idaho cleanup

Removal of mine waste may take up to 30 years

By Nicholas K. Geranios
The Associated Press

SPOKANE — The Environmental Protection Agency on Wednesday proposed a $359 million cleanup of toxic mining wastes that have accumulated for more than a century in Idaho’s Silver Valley. The work would take 20 to 30 years and create one of the nation’s largest Superfund sites.

Work would focus first on protecting people from lead, arsenic and other heavy metals left from the mining and smelting of silver and other metals.

Expanded federal efforts to clean up the northern Idaho valley are a raw-nerve issue with many area residents, who fear the impact of an expanded Superfund designation on efforts to lure new jobs and tourists.

Steve Allred, head of Idaho’s Department of Environmental Quality, said Wednesday that he had not yet seen the EPA’s proposal, a fact he characterized as “a lack of cooperation and partnership” with the federal agency.

What he had heard about the plan was discouraging, Allred said.

“I am unhappy, and I think the people of Idaho are go-

Inside
Highlights of the plan, what’s next and more, page 7

Proposed cleanup area

AMERICA TARGETS TERRORISM

OCTOBER 25, 2001
Idaho Mineral Value & Phosphate Processing

Thousands of dollars


Gold  Moly  Pb+Zn+C  Silver  Phos  Total
Elk at Thompson Creek mine
Beartrack - waste dump reclamation.
IDAHO TRAVERTINE
Bill Orchard, 2001
NEW JERSEY MINING CO. - 2001 Drilling at New Jersey mine, Coeur d’Alene District, Idaho
BLM Moran Tunnel, Champagne Cr.

Adding anaerobic tank to passive treatment system: buffer pH, lower Fe
CLAYTON MINE, Idaho

2001 Reclamation:
IDL Adit and Shaft Closure
EPA Tailings Stabilization
Lemhi Pass Th District

- Variant on Prot. Fe Ox.-Cu-U-Au-REE Deposits?
- Olympic Dam style? Precambrian Age!!
- Quartz Veins and Cataclasites with specular hematite, K-feldspar, biotite, thorite, monazite

"A tale of Sound" Yellow in hot Matsuda
2001 A Year of Evolution
Coeur d’Alene News 2001

- Sunshine mine -- Closed 2/16/2001
- Lucky Friday -- Layoffs
- Hecla Settles in NRDS
- EPA Basin Cleanup
  $359 million up to $1 billion
  State vs Feds
- New zinc plant??
Superfund Expansion

Map showing the Coeur d'Alene Basin Boundary and the Lower Basin in Washington and Idaho. The map highlights the Coeur d'Alene Tribe Reservation and other geographical features.
During the last ice age, a large lake formed in the region. Lake Agassiz flowed south from Canada during the last ice age. 11,000 years ago, a giant glacial lake surged over the dam, flooding the land. The lake contained 500 cubic miles of water, at its peak it was 300 feet deep, and its water level rose 50 feet in a single day. The dam eventually gave way, causing a catastrophic flood. The floodwaters flowed south, filling Lake Menomin, and created Lake Washburn. The floodwaters continued south, creating the Wisconsin River and Lake Winnebago. The floodwaters eventually reached the Gulf of Mexico. The floodwaters caused widespread damage, including the flooding of the Mississippi River. The floodwaters also created the Great Lakes, filling them with ice and water. The floodwaters eventually receded, leaving behind a landscape forever changed by the last ice age.
Idaho Rock

- Oakley Stone
- Table Rock Sandstone
- 3 Rivers Stone
- Lava Rock
- Pumice
- Travertine
- Gems

Examples of dimension stone used for construction in Home/Business
2001 Government News

- Power Cost Spike
- New 3809 Regulations
- EPA Superfund-Coeur d’Alene Basin
- ESA (Endangered Species Act) issues
- AML Gates, reclamation
NEWS FLASH

PRELIMINARY Radiometric Age Data for Lemhi Pass Thorium Mineralization: Lucky Horseshoe mine

- Monazite - high REE, some Th, U
- Electron Microprobe - Univ. of Massachusetts
- 900 Ma to 1 Ga range, with rims 200-400 Ma
- Precambrian Age, NOT Tertiary
Slides numbers in notes at the bottom of each slide correspond to descriptions in the following 12 pages of notes for 2001. Letter slides (MM, QQ, etc.) were in a second projector and are section headings.
Notes for Area Reports Talk, Northwest Mining Association Convention,
Wednesday, Dec. 5, 2001: 9:30am, 30 minutes, Spokane, WA.

Tray 1 == Scenary and mine photo slides (audience right)
Tray 2 == LOCATION MAPS (audience left)

Slide No. Description

AA. IDAHO MINING AND EXPLORATION, 2001
1. Author. VSG, IGS. Good morning. Thanks to contributors.

BB. PIE CHARTS: INDUSTRIALS VS. METALS (USGS)
Note that the relative % of industrials has increased in last few years.

2. Idaho Raw Ore Production, 1997-2000 (USGS). In 2000, USGS prelim estimate of nonfuel mineral production in Idaho was $399 million. Slight decrease over past few years. Industrial minerals playing increasing part of that.

CC. 2001: YEAR OF EVOLUTION
Role of foreign imports, low metal prices, global economy, markets, regulations


4. 2000 Leading Commodities: Phosphate, silver, sand and gravel, Moly, lead

DD. CDA DISTRICT MAP. Famous Silver Valley. Over 1 billion ounces Ag and major historical role in Pacific Northwest economy and politics.

5. Hecla- Lucky Friday mine. 2 units - Lucky Friday and Gold Hunter. Hecla announced in July it would cut production at LF by year’s end to conserve resource in times of low silver price. Only 50 or so workers left of 190 normally. Will produce over 3 million oz. Ag, but much less next year. Hecla settled with EPA and Tribe in August over cleanup liability for entire CDA Basin, plus liabilities at Grouse Creek and Stibnite.

6. Sunshine mine, 2001 - empty parking lot. Friday, February 16, 2001, the famous Sunshine mine shut its doors and turned off the hoist. Reorganized in bankruptcy court last year, but low metal prices, exhausted reserves, and closure
of the East Helena smelter forced the closure. 130 miners out of work. Company also settled with EPA and Tribe over cleanup costs.

7. **Galena mine.** Coeur d'Alene Mines Corp. Ran the Galena mine at full production did settle with EPA for share of CDA Basin cleanup in March. -Cash plus future royalty dependent on silver price.

8. **Galena mine - load of square set timbers.** Major project was rehabilitating and retimbering Galena Shaft, which is within Polaris Fault zone.

9. **Galena mine - miners on the Silver vein, 5500 level.** In June two miners died in a rockburst, a hazard of these deep mines.

10. **Galena mine - geologist Mike Maslowski explaining something to miners.** Exploration focused on replacing mine reserves, esp. On high grade 117 vein.

11. **Galena mine - diesel mucker dumping muck.** Experimented with their first mechanized diesel production and a new cement plant.

**EE. CDA NEWS:**

12. **Evolution Headframe, Wallace City Park.** Local pride in spite of cutbacks. Looking to tourism.

13. **Rails to Trails Project.** The Taft Tunnel bike trail goes along the old railroad grades and has already had thousands of bike riders anxious to ride an old RR trestle and tunnel route.

14. **Canyon Creek Removal.** Many cleanup projects in Basin outside of Superfund box. Canyon Creek removal of old jig tails from this valley bottom. Phone poles were not moved and show height of old tailings.

15. **Bunker Hill Superfund Site.** Cleanup of BH Superfund nearing completion. Controversy over EPA’s mining of topsoil to cap the Central Impoundment.

16. **PAYDIRT Cover, October, 2001.** Sullivan Mining Company was formed with plans to construct hydrometallurgical zinc plant in Silver Valley and reopen Bunker Hill mine. Local businessmen.

17. **Old Bunker Hill Smelter.** Sullivan wants to build 45,000 tonne autoclave plant using new, clean technology on site of old zinc plant/smelter complex shown in this 1970’s vintage photo. Would also drive 7000-foot decline to access known
zinc resource in Quill orebody of Bunker Hill and eventually others. Build 3000-ton per day mill which would slurry tailings underground for disposal. Extensive pre-production study and permitting needed.

FF. CDA BASIN MAP.

18. EPA Headline in Statesman. In October, EPA announced their new and very pricy cleanup plan for entire CDA Basin, which apparently includes downtown Spokane where we are now. Brought an uproar from Idaho state officials who were working on their own plan and may not have been consulted by EPA. Also friction between Idaho and downstream folks. Lots of questions and debate will be forthcoming. Most Silver Valley residents are worried about the stigma of expanded Superfund designation, and feasibility of billion dollar cleanup proposal.

GG. ROY BRECKENRIDGE - BORN OF ICE.

19. Farragut State Park - IGS geologist Roy Breckenridge assisted with new display on the Missoula Floods at Farragut State Park on Lake Pend Oreille, site of the large ice dam. Some folks are born for this kind of work.

HH. PHOSPHATE MAP.
Southeastern Idaho Phosphate Reserve. Most valuable and widely used commodity mined in the state. Includes chemical processing to make fertilizer to herbicide to food additives. Around 6 million tons per year.


Added in an estimate of value for phosphate processing and jumps Idaho’s nonfuel mineral production to around $ 750,000 dollars in 1999, and the processed phosphate makes up the lion’s share of the total value. Metals are down at bottom, less that $ 100 million each.

In the past few years, mitigation for selenium problems, associated with the middle waste shales, have been a big issue. All companies have supported studies of the selenium problems and best management practices to avoid it. Idaho DEQ is the lead on the CERCLA area wide risk assessment which will be done next year.

21. Smoky Canyon mine, looking N. J.R. Simplot Company runs the largest phosphate mine, Smoky Canyon near the Wyoming border. Mining in E panel and put out over 3 million tons in 2001 - the most ever.

22. Smoky Canyon mine, drill rig on south end. Working to permit B and C panel to north and did extensive exploration drilling on Manning Creek lease, acquired
last year, which is south of current operation. With other companies, Simplot is working on ways to avoid selenium contamination from the old waste dumps. 150 sheep died in July after drinking from a spring tainted with selenium near the old Woodall Mtn. Mine at Conda.

23. Simplot, Don Plant at Pocatello. Smoky Canyon ore is slurried year round to Fertilizer plant in Pocatello. Produce 350,000 tons of liquid phos acid fertilizer and 500,000 tons of dry a year when running at full capacity.

24. Simplot, # 3 Acid Plant. In 2001, company upgraded the # 3 sulfuric acid plant ($13 million) to lower emissions.

25. Agrium, Central Rasmussen Ridge mine. Agrium Inc. owns the Rasmussen Ridge mine and employs Washington Group International as mining contractor. Mined some 1.5 million tons in 2001 plus reclaimed 50 acres on the South Rasmussen Backfill area (former pit in foreground of photo). Transplanted aspen and other native species. BMPs only put low Se material in external dumps. Working on permitting for next phase to north.

26. Agrium Fertilizer Plant, aerial overview. Agrium ships ore by rail to fertilizer plant at Conda. Fertilizer markets and production were down some.

27. Astaris Dry Valley mine. Astaris, formerly FMC, mines phos rock from the Dry Valley mine. Mined in Panel 1 of new C and D pit, but did much environmental work including stream diversions and reclamation of 42 acres. Production, formerly about 1 million tons, was cut drastically due to furnace closures at the plant. (PPA plant will need about 1/3 of former production).

28. Astaris, Elemental P plant, Pocatello, aerial. Astaris elemental phos plant in Pocatello was one of the largest with a capacity of 270 million pounds of P. In Feb. Astaris announced it would shut down 2 of the 4 electric furnaces due to power costs and about half of the over 400 employees were laid off.

29. Astaris, Anderson Filter. The company has spent over $200 million on environmental improvements since 1998. This Anderson filter was installed to help clean up the final exhaust.

30. Astaris, Furnace Bays. This shows the four furnace doors. The third one was shut down later, and in October, the company shocked everyone by announcing that the whole plant would close permanently by year's end.

31. Astaris Slag Ladle. The final molten phosphorus pour from the one furnace will be this month. Slag goes into these giant ladles which hauled by special loaders
to the dump. The remaining 200 some employees will loose their jobs in a big blow to the Pocatello area.

32. **Agrium/Astaris JV New Wet Purified Phosphoric Acid Plant (PPA), aerial.** (From left to right: solvent extract, tall evaporator, H2S room, filter room)
However, Astaris is not getting out of the business all together. In May a joint venture of Agrium and Astaris opened this new PPA or wet process purified phosphoric acid plant, adjacent to Agrium’s phos acid fertilizer plant at Conda. The plant cost about $80 million and employs about 25 persons. It is still in the shakedown testing and startup mode, but production levels are increasing with time.

33. **PPA Plant. 120-foot tall evaporator tanks.** Uses green phos acid with 27% P2O5 from Conda plant as feed. Combine phos rock and acid and desulfate it to make gypsum byproduct, then evaporate the acid in these tall steam evaporators to raise concentration to 52%.

34. **PPA Plant, Rotary Filter.** The concentrated acid is filtered in these large rotary filters to remove byproduct gypsum. Uses diatomaceous earth from neighboring Nevada.

35. **PPA Plant, Sulfidizing Reactor Tank.** The filtered acid is treated with H2S to remove heavy metals like arsenic and cadmium as sulfides, which are filtered out. The H2S is very toxic and this requires elaborate safety precautions.

36. **PPA Plant, Solvent Extraction line.** The acid is then passed through a solvent extraction process to remove remaining metals and impurities which color it green. The clean, pure acid is colorless. It is then concentrated again by evaporation and oxidized to remove organics.

37. **PPA Plant, Truck loadout.** The product is shipped by truck, mostly to Green River, WY, to make Trisodium polysulfate. (Astaris/FMC plant)
The PPA acid can not be used for all uses and Astaris imports some elemental phosphorus from China for those customers.

38. **Monsanto, Enoch Valley mine, overview aerial.** Monsanto mined at Enoch Valley mine, which is nearing the end of its life.

39. **Monsanto, South Pit at Enoch Valley.** Mining was principally in the South Pit, and backfilling and reclamation started in the North Pit. The company was doing prestripping and preparation at their new South Rasmussen Ridge property which is now fully permitted.
II. MONSANTO PARTY: DAVE FARNSWORTH, DEAN EARL BENNETT WITH CHECK, AND LYNN BARTH OF MONSANTO FOUNDATION

40. Monsanto, Elemental Phosphorus Plant. Monsanto produced elemental phosphorus at their plant near Soda Springs. Approximately 60% of the product goes into the popular RoundUp herbicide. The company recently completed a new truck dump and conveyor to transport ore under the highway.

Dean Bennett is always delighted when companies support the College of Mines and Earth Resources at the Univ. of Idaho. Lynn Barth of the Monsanto Foundation presented him with this check for the scholarship fund.

JJ. ACTIVE MINES MAP. Very few other active mines left, a number of properties are in the reclamation and closure phase.

41. Thompson Creek mine, aerial. Due to low metal prices, the Thompson Creek molybdenum mine went on a reduced work schedule in January. The workforce was down to only 72 employees, with a maintenance crew and crews who worked alternate weeks in the mine and the mill. The company was mining ore from the bottom of the pit, but not doing any stripping. Production was about a third of capacity with as much of that being the lube grade moly as possible.

42. Thompson Creek mine, tailings dam with elk. The mine was in survival mode, not doing as well as these elk in front of the tailings dam. The company gave a very appreciated tour to the Idaho Gem Club. The only environmental project was installation of a hydrostatic bulkhead in one of the old exploration adits intersected in the bottom of the pit.

43. Rescue mine portal. At Warren, Barramundi Gold continued work at the small underground Rescue gold mine. They covered the mill and added a gold wheel and Wiffley table to the circuit. A 6-man crew supervised by young Jim Striker did development work in the mine, adding over 400 feet of drift and raises on the lower levels and mining some of the high grade gold-quartz vein as well as making MSHA safety improvements. Financial problems terminated the Barramundi work this fall.

44. Beartrack, North Pit backfilled. Idaho's other gold mines were in closure. Meridian Gold's Beartrack mine near Salmon was still getting gold (17,500 oz. in 2001) from the 23 million ton heap which was last loaded in March, 2000. The Green World Science bacterial process was being tried to assist with neutralization. The North pit was backfilled and reclaimed.

45. Beartrack, Ray Henderson of Salmon Forest. Ray Henderson of the Salmon
Forest reviews some of the waste dump recontouring and revegetating. The South pit will be left as a lake.

U.S. Antimony was doing a nice job and has nearly completed reclamation at the Yellowjacket mine in southern Lemhi County.

46. Stibnite mine, mulcher. At Stibnite in central Idaho, the Forest Service and State were nearly completed with haul road reclamation and replanting areas left by Dakota Mining who forfeited their bond. In spite of the excellent work done by Mobil Oil on reclamation of the historic Meadow Creek tailings site, water quality issues and T and E species were cited by the Idaho Division of Environmental Quality in their request for listing the historic district as a Superfund site late in the year.

47. Black Pine mine, regraded heap. In the desert in Cassia County, Black Pine Mining, a Pegasus-related company, has gotten only praise for their efforts in the planned closure of the Black Pine gold mine. 630 of 650 acres have been reclaimed and the bacteria have been used to treat the heap. This year, the company installed an innovative passive water treatment system to treat the leachate from the valley fill pad. A series of Hickenbottom drains was put in to the dam. Their orifice-controlled pipes limit discharge to the treatment cells which contain iron filings that react out any metals in the water.

KK. INDUSTRIALS MAP, 2001. Increasing number of small to medium-size operations in rural areas.

48. Emerald Creek Garnet. In north Idaho, Emerald Creek Garnet, a subsidiary of Western Garnet, extracts placer garnets for industrial uses like water jets, filtration, and abrasives. Dry wash plant is one of five. Business was steady.

49. Emerald Creek Garnet, Main Stem, Emerald Creek reclamation. Company is focusing on reclamation projects like this channel rebuilt 2 years ago. In spite of much excellent reclamation work, permitting is near a standstill on their application to the Corps to mine in the floodplain of the St. Maries River. The company is having better luck with the EIS process for mining some upland areas.

50. Ash Grove Cement, aerial. In southeast Idaho, Ash Grove Cement is having an excellent year at their cement plant in Inkom. Limestone is mined from behind the plant and silica brought in from Monsanto's quarry in Soda Springs. The rotary kilns are fed a wet slurry and should produce about 260,000 tons of clinker this year. Approximately 70 persons work at the plant, which is computer controlled.

7
51. **Hess Pumice, plant in Malad.** Hess Pumice continued to produce pumice at
the mine and plant in Malad. Business was OK, as he has a worldwide market
for polishing media for television screens. They are trying to expand the US
Grout market, an ultrafine pumice grout product, useful in mining applications.
Hess also bought the perlite processing plant, but the perlite is proving a tough
market to break into.

52. **Lottery lines at Malad.** The odds of making money in mining are not nearly as
bad as some people stand in line to get. These Utah residents drove up to Idaho
to buy lottery tickets when the Powerball jackpot went up to $200 million last
summer.

53. **Bear River Zeolite, Bag with logo.** Idaho has a new zeolite mine. It is Bear
River Zeolite, located just outside of Preston in far southeast corner of Idaho.
Company is a subsidiary of U.S. Antimony Corp., which shifted from metals to
zeolites. HMMM - a trend? Don't they have a great company design?

54. **Bear River quarry with landowner Dennis Web.** The quarry accesses a very
large deposit of K-rich clinoptilolite that is estimated at 200 million tons of zeolite.

55. **Bear River, crushing and screening plant.** The zeolite is crushed with jaw and
cone crushers, sized and bagged on site. It can be used in water filtration, soil
amendments as a time release medium, environmental cleanup and many other
markets. Mill construction started in February and the operation really started
going this fall and is shipping to customers.

56. **Three Rivers Stone Quarry, Clayton, overview looking at Salmon River.** L
and W Stone Corp. of California bought the 3 Rivers Quarry near Clayton in
1996. Underwent significant expansion last year and supplies one of the
nation's premier stones. Shipped largely to California, but some even to Japan.

57. **Three Rivers Quartzite.** Large piece shows off popular color patterns.
Production this year was some 22,000 tons, as quarry is seasonal operation.
Rumored to have as much as an 18 month backlog of orders.

58. **Three Rivers, pallets in yard.** L and W expanded to a second pit and put $1.5
million into new haul trucks and excavators. Further expansion plans are
requiring an update of their Plan of Operations under the new 3809 regulations
of the BLM.
59. **Northern Stone Quarry splitter.** Idaho's popular Oakley Stone was quarried in at least four operations, the largest being that of Northern Stone Supply on Middle Mountain south of Oakley. The gray to gold-colored micaceous quartzite is extremely durable and splits readily into thin sheets for use as a paving or facing stone. Northern Stone reported a good year and put money into infrastructure and pay improvements. Other Oakley Stone producers included Oakley Valley Stone, Snake River Quartzite, and American Stone's Fish Creek quarry.

60. **Overman's Western Stone, Clark Fork River, ID.** This quarry of Overman's Western Stone, is in northern Idaho. They mine Belt-age metasediments.

61. **Idaho Travertine, Idaho Falls.** Idaho Travertine has one of the largest cutting plants in the West. They reopened an old quarry in Medicine Lodge country to supply travertine for a building at BYU-Idaho, formerly Ricks College. They also will be cutting newly mined Table Rock Sandstone from Boise for the Boise Airport remodeling. Owner Ted Orchard retired and turned the business over to his son, Bill.

**INTERNATIONAL TUMBLESTONE SIGN, Hayden.**

62. **International Tumblestone yard, at Hayden.** Most attractive stone award goes to a north Idaho business, just north of Coeur d'Alene. International Tumblestone takes large rocks and sculpts them into works of art and functional furnishings and decorative landscaping pieces. Rock is both local (glacial erratics and basalt) and imported. One job is the basalt column sculpture at entrance to Spokane Airport. A custom-made saw cuts in 3-dimensions to effect curves. Note great winerack.

63. **Rockworks, Challis.** The most innovative award goes to this tough lady, working near Challis for Rockworks. The company also mined Ramshorn Slate from near the old mine and has applied to open a quarry south of Challis. But here, along the highway, Kathy and a young assistant were mining talus. They constructed this metal slide to help get the rock down without scarring the valuable lichen cover. Is this survivalist mining??

**EXPLORATION 2001 MAP.** Not much here folks. It was a slim year.

64. **Alchemy Ventures, drill rig in snow, NW Kaolin Conference.** Alchemy Ventures and their subsidiary, Alchemy Kaolin Corp., had a winter drilling program on their clay project in Latah County near Bovill. The company
has been evaluating the Helmar-Bovill clay district and has 16 exploration leases from the state. Alchemy drilled 41 core holes totaling 7000 feet.

65. **Helmar Clay Pit with Hammond’s loader.**
Jack Hammond has been mining small amounts of clay for a Lewiston pottery firm. Historically, the Latah County clay has been mined for the brick industry. Alchemy took a 4000 pound bulk sample and is evaluating the clay but also the potassium feldspar and silica content of the rock. N.A. Degerstrom is doing the work at their Spokane facility. Alchemy has a Conditional Use permit from the county and wants to build a pilot plant. But the State Dept. of Lands first wants a study of the value of the timber resource versus the clay on the State Land.

66. **New Jersey mine, drill rig.**
New Jersey Mining Company, part of Mine Systems Design, drilled a gold target at the New Jersey mine (Au-Quartz veins) in the Coeur d’Alene District. They drilled 2 core holes to test an IP/Resistivity target and intersected a new silicified zone with gold values to 2.1 grams per ton.

67. **Formation Cap Tour - Blackbird 6930 Portal of Noranda.**
Early in the year, Formation Capital Corporation submitted a mine plan to the US Forest Service to start the NEPA process on their Idaho Cobalt Project. Plans call for mining 280,000 tons a year from a new underground cobalt-copper-gold mine on about 100 acres southwest of Salmon in the old Blackbird District of Lemhi County. Formation was giving a tour of available underground exposures, including this new drainage adit, for various consultants working on the EIS.

68. **Formation Capital. Fire Damage** at Idaho Cobalt Project/Blackbird.
The surface was intensely burned during last summer’s Clear Creek Fire. Hydrometrics is the 3rd party contractor on the EIS, and a full slate of environmental baseline studies and modeling. Formation has also hosted numerous public meetings, and is pleased with progress to date. They hope to have a draft document by late spring, 2002.

69. **Blackbird 7100 Portal Underground, Cu oxides.**
Formation obtained - at a bargain basement price - a purchase option on the Sunshine Mining Co. silver refinery in Kellogg. The cons would be trucked to the modern Kellogg facility which uses a pressure leach technology. The proposed mine would employ 120 workers with another 30 at the refinery. Total measured resource at the RAM and other zones is over 5 million tonnes, with lots of untested targets.
70. **Daddy Del Placer, sampling.** South Fork of the Salmon River. The Forest Service approved additional work on the Daddy Del Placer project on the South Fork of the Salmon River west of Yellow Pine. The operators dug five exploration pits in September on the high bench gravels. They are evaluating the results, but plan more work next summer.

**GOVERNMENT NEWS**

Seems like a bigger topic each year. (Power costs, new 3809 regs, EPA and CDA Basin, Endangered Species, and AMLs)

71. **Missouri Mine Repository construction, Boise National Forest.** The Boise National Forest was working on AML cleanup at the Missouri mine. To alleviate acid drainage and heavy metal contamination, the adits and shafts were dozed shut, and tailings placed in this repository with a 7-layer cap over them.

72. **BLM Moran Tunnel passive treatment cell.** The BLM was also doing remediation work, including adding anaerobic tank to passive treatment cell at Moran Tunnel near Champagne Creek. Also doing field inventories of environmental and safety hazards in Salmon-Challis area.

73. **Clayton Mine Remediaion.** State of Idaho did shaft and adit closures at the Clayton Silver mine, and EPA did an emergency stabilization of old tailings at the site.

74. **IGS Earth Science Teacher Workshop.** Mission of Idaho Geological Survey included education and we continue to offer very popular, field-oriented summer workshop for teachers.

75. **IGS Geologic Mapping Program.** Reed's rock. We also do new geologic mapping. This year Reed Lewis was working on some rocks near Orofino which he thinks may be pre-Belt in age and are similar to rocks of BC and Australia that host massive sulfides. Also mapped in the Boehl's Butte anorthosite complex.

**LEMHI PASS NEWS FLASH.** (First radiometric age date. Reinforces field evidence for Precambrian age to thorium mineralization. Preliminary and hot off the press, more work needed.)

On another fun subject, I would like to report some very preliminary data from the Lemhi Pass Thorium District south of Salmon. The new electron microprobe chemical age
date on monazites from one of the thorium pits gives 900 million years to 1 billion year
dates, strongly reinforcing field relations suggesting a Precambrian age for the
deposits. No evidence for Tertiary age cited in old USGS studies.

76. **Lucky Horseshoe Mine, Lemhi Pass/Agency Creek area.**
    Monazite was from this open cut. In specularite-rich deformed rock.

77. **Lemhi Pass Thorium District Characteristics.**
    Important to constrain the date of mineralization to work out geologic history.
    Rocks are very similar to Olympic Dam style Fe-U-Cu-Au mineralization, also
    Precambrian in age. Host rocks in Idaho are Apple Creek metasediments and
    whole basin may be prospective for these types of deposits. Hope to continue
    with work.

QQ. **WAGON DAYS - KETCHUM, ORE WAGONS.**

78. **Wagon Days, pulling mules around a turn with jerkline.** Mules actually jump
    over chain as they go around turn.

    Even Idaho's most famous resort, Sun Valley and Ketchum, celebrates Idaho's
    mining heritage during the Wagon Days parade. These huge ore wagons used
    to carry lead and other ores down the mountains of central Idaho to the smelter
    at Ketchum. This year, they brought up a team of mules on a genuine jerkline
    hitch. To turn a corner, the mules pull in different directions and the mules
    actually jump across the center chain as they round the turn. Imagine that going
    down a steep mountain road with wagons loaded with galena.

THANK YOU.
Slide 73

Slide #75

Slide 74

Slide #76

Slide 75

Slide #77

Lemhi Pass Th District

- Variant on Prot. Fe Ox - Cu-U-Au-REE Deposits?
- Olympic Dam style? Precambrian Age!!
- Quartz Veins and Cataclasites with specular hematite, K-feldspar, biotite, thorite, monazite
2001 A Year of Evolution

Slide 80

Coeur d'Alene District

Slide 81

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- Travertine
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Examples of dimension stone used for construction in Home/Business

[Image of a building with rocks and plants outside]

[Map of a region with various locations marked]
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