Idaho Mining & Exploration
2004

Virginia S. Gillerman
Idaho Geological Survey
Idaho Non-fuel Mineral Production

(USGS Data)

2003: $268.76 million

Industrials = 70.5%
HEADLINE NEWS: December 2, 2004

Gold hits new 16-year highs
Peaks near $460 an ounce !!

SILVER NEAR $8 an ounce !!
Plus Mo, Co, Cu, building stone prices also on the rise !!
Over 1.1 billion ounces of silver since 1880’s

SILVER VALLEY

[Map of Silver Valley with locations such as Enaville, Pinedale, Kellogg, Warden, Osburn, Gem, Mullan, and Wallace marked on the map.]
Hecla - Lucky Friday Mine

- 2003: 2.25 million oz. Ag, + Pb, Zn
- 2004: $8.5 million development drift from 5900 level Silver Shaft to Gold Hunter ore body
- Added 50+ employees this year

Mullan, Idaho
Lucky Friday:  2004

- 5900 Drift - 4000’ of 4800’ completed
- 8 DDH to test ore on 5600 and 5900 levels
- Extended known strike of Gold Hunter veins
- Expand by end 2005
Lucky Friday mine

Hecla – Mining sets of narrower veins in Gold Hunter system as 30” slusher stopes

Miner Walt Lambott – typical of Hecla’s very experienced and hard working employees
Coeur d’Alene Mines – Galena Mine

- 2003: 3.7 million ounces Ag; 2004 about 3.5 million
- Mining 72 vein from 5200 to 5700 levels, Upper Silver vein and 117 vein
- Major Development Project Ongoing
Galena mine – replacing reserves

Mucking Waste, 2400 level

72 vein in Polaris Fault, 5500 level
Galena Mine: Development & Exploration

Development Plan into 2007

- Drifting to west on 3400 level towards 117 and 215 veins
- Polaris Fault and 72 vein below 5500
- Drilled 40,000 feet of core this year
Sterling Mining – Sunshine Mine

- Closed in 2001 after over 360 million ounces Ag produced; some reserves left
- Sterling Mining Company acquired property 2003
- 2004 Infrastructure rehabilitation; data review
- 2004 Exploration and land acquisition in district
Sunshine mine – Jewell Shaft

Double drum hoist – critical to returning mine to production

Sterling President Ray De Motte, Shaft inspection in April, 3100 level; Water at 3600 level
Sunshine mine - Exploration

- Geophysics: IP Resistivity/Chargeability – structures and near surface veins
- 3 DDH for 2473’
- Hole 3 encountered 7 veins with Ag-Cu-Pb
- inc. 0.1’ (134-138’) of high grade Ag (1530ppm) with Cu,Pb ore [i.e. 44 opt Ag]
Formation Chemicals, Inc. - Sunshine Refinery

- Opened June 1, 2004
- 3 months startup: recertified and installed new equipment
- Input is impure precious metal-bearing material
- Output is Ag and Au bullion grade material
- Can do custom work

Typical Feed: impure but high metal content product
17th Coeur d’Alene Mining Competition, 2004

Chris Neville, Lucky Friday miner

Doug Bayer, Hecla

Senator Crapo and kids

Mike Weaver, Idaho Mine Safety Specialist

Lavon Fausett Scholarship Award
Phosphate in Idaho?

- Idaho’s Largest Mineral Industry
- From 1997 – 2003, raw ore value of about $ 70 million to $ 105 million annually.
- Value of in-state, processed phosphate products estimated at $ 300-400 million per year.
- Over 1300 employees in SE Idaho.
- Idaho is 3rd after Florida and NC in domestic production.
- Total Western Phosphate Production estimated at 230 million tonnes since 1911 with reserves estimated at 1.6 billion tonnes (24 % $P_2O_5$) by USGS.
Southeastern Idaho

PHOSPHATE DISTRICT

- Simplot
- Astaris
- POCATELLO
- Blackfoot Res
- Rasmussen Ridge
- Enoch Valley
- South Rasmussen
- Dry Valley
- Agrium
- Monsanto
- SODA SPRINGS
- Smoky Canyon

[Map of Southeastern Idaho with phosphate district locations marked]
The Phosphate Cycle

- **Mineral:** Apatite $\text{Ca}_5(\text{Cl,F})(\text{PO}_4)_3$
- **Rock:** Permian Phosphoria Formation (265-275 million years old).
- **Mining:** large, open pit mines with ore assaying about 25-30 % $\text{P}_2\text{O}_5$.
- **Processing:** Phosphoric Acid for fertilizer, and Elemental Phosphorus for chemicals, foods, herbicides, and other high purity uses.
Simplot – Smoky Canyon mine

- Largest mine
- Mining panels E & C; reclamation backfill A
- Initiating an EIS for expansion to south at Manning and Deer Creek areas
- Drilled 60+ exploration holes at Dairy Syncline

Panel E North, October 2004

Panel C, September 2004
Ore goes via 87-mile long slurry pipeline to:

Simplot’s Don Fertilizer Plant - Pocatello
Agrium – Rasmussen Ridge mine

- Mined out central Rasmussen Ridge
- Extended north Rasmussen pit 1200’ strike length
- Cent. Ras. Backfill with cap limestone, growth
- Purchased Astaris’ leases at Dry Valley
- Will move operations to Dry Valley; mothball RR

End Wall of North Rasmussen, May 2004
2004 Florida hurricanes help Idaho fertilizer producers!
Monsanto – South Rasmussen mine

- Completion of Enoch Valley mine (> 17 million tons since 1990)
- 90% of ore from new South Rasmussen mine
- Major effort in mitigation of selenium
Monsanto – Reclamation/Se Mitigation

- South Rasmussen overburden area (formerly waste dumps)
- Encapsulation under packed clay “shingles”
- Se material in core of impermeable, gentle overburden pile
- GPS-guided precision construction

Compacting clay for shingle

Straw Wattles and lodgepole pine seedlings being planted on 2003 reclaimed areas
2004 Reclamation Awards – phosphate miners shine!

- Agrium – RR mine
- Simplot – Exploration
- Ron Sali – Gravel
- Ben Gomm – agency
- Monsanto – special project, S. Rasm.
- Astaris – special project, U. Dry Valley Creek restoration
Other Metal Mining

- Gold mines – several small producers, ug and placer
- Reclamation work on larger mines (DeLamar, Beartrack, Black Pine)
- USAC Preachers Cove millsites
Thompson Creek Mine - Mo

Mo prices over $20 per pound! WOW

Mining Phase 5 - quartz-moly vein stockwork in granodioritic stock

Reclaimed waste dump, Pat Hughes drainage

Concentrates plus HPM
Reclamation 2004

Sommercamp pit

USAC - Preachers Cove mill, Yankee Fork

Kinross DeLamar mill dismantled
AML Projects and Clean up - 2004

BLM – Ima Millsite

Copper Queen Mine – shaft area

Bat Gate

Jeff Gabardi, FS – Bassett Gulch Mill

Crew from Sawtooth Forest
Emerald Creek Garnet (WGI)

- North Idaho alluvial garnets – 3 washing plants operated
- Corps near end for permitting St. Maries reserves (15 yr)
- Markets very good, esp. finer-sizes, water jet cutting.
Ash Grove Cement - Inkom

75th year of production

- 2004 Production up – ship 275,000 tons clinker
- 2 rotary kilns, minor upgrades
- 71 employees
- Title 5 air quality permit since 2002
Hess Pumice
Idaho Minerals (perlite) - Malad

- China competition for TV screen abrasives
- Hess transitioning to construction markets – more tons, less $ value per ton
- New culture stone facility
- New UK office/warehouse
- Idaho Minerals – horticultural perlite contract
- New expander plant
Bear River Zeolite – Preston, Idaho

- Opened in 2001; USAC major owner
- Sales/tons increasing
- Adding new screens to up mill capacity
- Aggressively pursuing new markets, uses
- Uses: water filtration & remediation, animal nutrition, odor control, soil amendments, etc.

Crushing plant, Preston

Superior grade natural K-clinoptilolite
Unimin – Emmett, Idaho

- Mine feldspathic sand in foothills W of Boise
- Volume same
- Less glass sand, but more golf course sand
- Supplied new Tamarack Resort and most western states, BC
- 8 year safety record

New fall protection system
Oakley Stone Quarries - Middle Mountain

- Northern Stone Supply
- Oakley Valley Stone
- Scrivanich Natural Stone
- American Stone
- Market insatiable;
  Production up.
- Sheets, tiles, tumbled
  products
- Unique, durable flagstone
Challis area: 3 Rivers, Ramshorn

- L & W Stone Corp. -> 34,000 tons prized flagstone; Challis regional distribution center
- BLM approved new POO in July; appealed by WWP. Restraining order allows quarry operation.
- Ramshorn quarry – small producer
- Exploration in Challis area
U.S. Geothermal - Raft River KGRA

- Production well test program, April-August
- DOE grant assisted
- 5 existing wells cleaned and re-entered; ~6000’deep
- Flow tests; T~285°F
- 10-15MW power plant construction planned
12/6/2004:
Ag near $8/oz.

Au: $453/oz.

Silver
Atomic Number: 47
Atomic Mass: 107.87
New Jersey Mining Company - 2004

- Fred Brackebusch - talk on Thursday
- Silver Strand mine – final permitting stage for ug high grade AuAg vein
- New Jersey Mill – installed new flotation circuit and tested ore from Golden Chest
- Drilling NJ, Enterprise, Scotch Thistle
- New grass roots Ag discovery
New Jersey Mining - Golden Chest

2004: Ramp from surface to intersect Katie-Dora vein. Drifted along vein.

Drilled 4 DDH for 3900'
DDH04-6: 17.6m of 4.83 g/ t, inc. 5.9m of 10 g/ t Au (Idaho vein)
Beartooth Platinum (formerly ICMC) drilled 4 core holes **Buffalo Gulch**, 4 at **Friday-Petsite** - confirmatory.

Valencia Ventures signed option in August; geologic compilation and plans for drilling next year. Aim to expand resource, esp. near-surface system at **Buffalo Gulch** (permitted in early 1990’s)

Beartooth drilling on Petsite Property, June, 2004
Kimberly Gold Mines - 2004

- Affiliated with Sterling
- Purchased Rescue Gold Mine, Warren
- Extensive site clean up and installed new roof on mill
- Repaired main Rescue decline, retimbered, safety compliance

No work on other Kimberly properties
Other Central Idaho Properties

- Vista Gold – 2 M oz. Au makes Stibnite a “hold”; but more Meadow Creek restoration again.
- Thunder Mountain Mining – Dewey mine appraisal agreed on with FS, but no $ yet.
- Jack Walker, AIMM – continuing legal actions; some surface geochemistry at Golden Hand mine. POO in progress.

SALMON REGION: Nevada Contact drilled 7 RC holes at Iron Creek, but returned property.
Wave Exploration – 2004

**MUSGROVE CREEK PROJECT**

- **2003**: Lease to acquire 100% Musgrove property
- Newmont data ~ 300,000 ounces Au, 0.036 opt grade
- Drilled 4 RC DH – 2 into known resource, 2 extensions, 1 ended in ore (0.066 oz/ton Au)
- Soil sampling – large anomaly untested

www.wave-corp.com
Formation Capital Corp. – Idaho Cobalt Project, Lemhi County

- EIS in progress to open underground Co-Cu-Au mine, Blackbird Dist.
- 24,500’ of DDH this year to expand RAM deposit
- New geo. Mapping
- Hatch Ltd. to do 43-101 feasibility study
Idaho Cobalt Project – cont.

- **R04-10, -66o, 623-652’, tw=26’:**
  - 0.68% Co, 1.99% Cu, 0.0262 opt Au

- **R04-15, -77o, 1308-1329’, tw=10.5’:**
  - 0.67% Co, 0.01% Cu, 0.008 opt Au

**Drill Results:** Confirmed down dip extension and lengthened known strike length of ore zone to about 2500’. 
March 2004: Trio Gold and Sultana Resources LLC signed agreement to explore/develop Empire Mine.

Polymetallic skarn: 1997 Cambior oxide copper resource of 27Mt at 0.42% Cu, from 47 DDH, also Ag Au and some Zn.

No apparent on-the-ground work and Historical Society, City, FS and BLM are putting together Mine Hill Tour promotion for tourism.
Kilgore Minerals Ltd. – Kilgore Gold Project, eastern Idaho

- 100% owned Kilgore project, Clark County
- Large epithermal Au system, drilled by Kennecott, Placer Dome, Echo Bay in 90’s
- Resource ind+inf of ~487,000 ounces Au in volcanics; other soil anomaly targets
Kilgore Gold - 2

- 2003 – claims, geochem, mapping
- 2004 – 6 DDH, drilling problems.
- Dog Bone Ridge target area SW of known resource, stepouts
- Structural intersections
- 170' of 1.25 g/t Au, inc. 10' of 0.46 opt Au
- Lots of interesting rocks and alteration to work on

Company also has claims at Arnett Creek near Beartrack mine.
Blacksheep
Owyhee County, Idaho

AGNI CO-EAGLE: Nevada Contact

Property Boundary
Gold anomalies

3.2 km

Delamar Mine
Atlanta Gold Corporation
(Twin Mining)

- Plans for open-pit, heap leach gold mine near Atlanta, the old Monarch shaft area is one of two pits
- EIS proceeding with Boise NF; Tetratech is doing EIS
- Fish and water surveys, geotech, monitoring wells, cultural clearances, etc.
- 6 year mine life, 13.7 Mt mineable reserve for 525,000 ounces recoverable
Atlanta Gold - 2

- Dedicated field crew sampling old ore piles for geochem characterization
- New optimized mine plan
- Real Gold: Behre Dolbear estimates cost at $188/oz and internal ROR of 25%
Idaho Geological Survey
www.idahogeology.org

- Technical aid for the prospector and public
- Resources for the mining/environmental professional
- > 60 NEW digital geologic maps on web
- Download maps and some publications
- Mines & Prospects Search

DWM-25: Geologic Map of the Clark Fork Quadrangle, Bonner County, Idaho
Slide 1

Idaho Mining & Exploration
2004
Virginia S. Gillerman
Idaho Geological Survey

Slide 2

Idaho Non-fuel Mineral Production

<table>
<thead>
<tr>
<th>Year</th>
<th>Con. S&amp;G</th>
<th>Silver</th>
<th>Total</th>
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<td>2003</td>
<td>$268.76M</td>
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<td></td>
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<td>Industrials = 70.5%</td>
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Slide 3

HEADLINE NEWS: December 2, 2004

Gold hits new 16-year high
Silver near $8 an ounce!!
Plus Mo, Co, Cu, building stone prices also on the rise!!
Over 1.1 billion ounces of silver to this world-class district. Rich quartz-siderite-tetrahedrite and galena-rich veins in metaseds of Belt.

Since 1997, mining Gold Hunter deposit, about 1 mile north of Friday vein portion of mine. Were using 4900 level drift from Silver Shaft as sole access. 2004 production about same as 2003. Hecla celebrated 40 years of being listed on New York Stock Exchange by having current and former CEOs and Chairmans, Phil Baker, Art Brown, and William Griffith ringing the closing bell on Wall Street.
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Lucky Friday, 2004

- 5000 Chut - 4000' of 5000 completed
- 8 DDH to test ore on 5000 and 5500 levels
- Extended known strike of Gold Hunter veins
- Expanded by end 2005

Economic length of known Gold Hunter veins increased 5-10%. Expansion should be done by end of 2005 and production increased. Also looking at project to update the mill.

Slide 8

Lucky Friday mine

Hecla - Mining sets of narrower veins in Gold Hunter system as 30” slusher stopes.

Miner Walt Lambott - typical of Hecla's very experienced and hard working employees.

New engineering and mine development techniques. Mill $2-4 million project to improve across the board grinding and flotation cells to improve quality of concentrate. Improve recoveries of Ag and Pb and increase Zn recoveries.

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Coeur d'Alene Mines - Galena Mine

- 2003: 3.7 million ounces Ag, 2004 about 3.5 million
- Mining 72 vein from 5000 to 5700 levels: Upper Silver vein and 127 vein
- Major Development Project Ongoing

Coeur had corporate loss. Partly due to unsolicited (hostile) offer to buy Wheaton River Minerals. Developing Kensington gold mine in Alaska, and San Bartolome silver project in Bolivia.
MINING by mostly mechanized cut and fill (overhand and underhand) some conventional slusher stoping and longhole blasting. 72 vein is siderite-quartz-tetrahedrite-py-cp New ore from ore shoot on 215 vein in west 3700 level, new ore shoot on 288 vein in west 4000 to 3700 levels, deep extension of 72 vein below 5800 level and from infill drilling of 4300 to 4600 Silver Vein.

Hope for lots more exploration in 2005. [inc. deep Coeur targets] Hired exploration geologist in Oct. 2004 to focus on structure and develop big targets.

Sterling Mining - Sunshine Mine
- Closed in 2001 after over 360 million ounces Ag produced (some reserves)
- Sterling Mining Company acquired property 2003
- 2004 Infrastructure rehabilitation, data
- 2004 Exploration and feasibility study
Objective is to return Sunshine to operational status. Shaft inspection in April – men down to 3100 level and inspected ventilation and other critical systems. Great shape. Water at 3600 level.

Geophysics was 1996 suggestion of Cole Carter, Sunshine mine geologist – never followed up. 3rd hole intersected the Sunshine vein zone and new vein structures. Dwight Juras is structural geologist consultant. 3rd hole targeted overlapping resistivity and chargeability anomalies. Intersected 7 veins. At 134' had 0.1 foot of 1530ppm Ag (= 44.6 opt Ag) and high Cu and Pb. Sterling looking “outside the box” to define targets not followed up by old Sunshine Mining Company as old corporation died.
Formerly the Big Creek Refinery of Sunshine Mining Company. Purchased by Formation Capital Corporation last year. Prior to opening, 3 months startup – recertified bullion scales, purchased and installed new state of art analytical instruments, revamped security systems, reconditioned refining equipment and changed offices. Capabilities are receive impure precious metals material; process it and refine the contained silver and gold to bullion grade products. Do production type feed stocks as well as special projects material. Including having a thumb refining cell.

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Mike Weaver and CDA Mining Competition – CDA District has rich underground mining tradition. Continued and fostered by annual mining competitions, held with assistance of Central Mine Rescue. Featured miners from Idaho, Washington, and Montana plus their families. Competitions for kids as well as serious mining. Good fun, good training, and good cause. Inc. the Lavon Fausett Memorial Scholarship Award.
**Slide 17**

**Phosphate in Idaho?**
- Idaho's largest mineral industry
- From 1997 - 2003, raw ore value of about $70 million to $105 million annually.
- Value of in-state, processed phosphate products estimated at $300-$400 million per year.
- Over 1300 employees in SE Idaho.
- Idaho is 3rd after Florida and NC in domestic production.
- Total Western Phosphate Production estimated at 230 million tonnes since 1911 with reserves estimated at 1.6 billion tonnes (24% P₂O₅) by USGS.

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**Southeastern Idaho**
Squares are plants; Black is the closed Astaris/FMC plant at Pocatello; red ovals are the active open pit mines. Ore is in Early Permian Phosphoria Formation – black, organic-rich shales and phosphorites. Can see trends of overthrust belt in alignment of mountain ranges.
Thanks to Loudon Stanford, IGS cartographer, for new maps.

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**The Phosphate Cycle**
- Mineral: Apatite Ca₅(PO₄)₃Cl
- Rock: Permian Phosphoria Formation (265-275 million years old)
- Mines: Large, open-pit mines with ore assaying about 25-30% P₂O₅.
- Processing: Phosphoric acid for fertilizer, and elemental phosphorus for chemicals, foods, herbicides, and other high purity uses.

Crustal Abundance of P₂O₅ is only 0.23 %, so the ore is enriched by factor of 130x typical crustal rock.
Simplot – Smoky Canyon mine

- Largest mine
- Mining panels E & C
- Initiating an EIS for expansion to south at Manning and Deer Creek areas
- Drilled 60+ exploration holes at Dairy Syncline Panel E North, October 2004; Panel C, September 2004

Will probably mine over 2 million tons. Same as last year. Working 24-7. New ore in panel E but high wall stability problems. Plan to mine panel B in summer 2005. May have issue with Se in groundwater. EIS for south expansion across South Fork of Sage Creek to Manning and Deer Creek areas, panels F and G, respectively. Contentious as it is part of roadless area. DEIS in May, 2005; exploration permits appealed by GYC Greater Yellowstone Coalition. Last year, Simplot purchased Farmland Industries with phos plants in Utah and Wyoming.

Simplot’s Don Fertilizer Plant - Pocatello

Ore goes via 87-mile long slurry pipeline to:
2004: Mined approx. 2.2 million tons of ore and shipped 1.949 tons to plant via rail. Shipping season was April 6 to Nov. 8.

Big News from Agrium is move to Dry Valley and mothballing of Rasmussen Ridge mine. Evaluating new mining contractor (Washington Group International was old one with just over 100 employees. Ore by rail to the Fertilizer plant at Conda. PPA plant remained closed. Markets pretty good for fertilizer. Assisted by multiple hurricanes that hit Florida this year, shutting down their phosphate operations for quite a while. Shorted the market for a while. Crops and ag markets good.

Mined over 1 million tons with 9.2% from Enoch Valley and rest from new South Rasmussen mine.
Monsanto also drilled 12 core holes on Blackfoot Bridge property and 8 holes around the South Rasmussen mine, some for geotechnical data. Ore all goes to Soda Springs elemental plant. Largest elemental plant in world. Will produce over 230 million pounds of phosphorous in 2004. Has 623 full-time and contract workers, working 24-7. 2004 became first and only phosphorous supplier with quality control system certified under new ISO 9001-2000 standard. Received regulatory approval for construction of new sulfur dioxide reduction system that will make it the “best in the world” standard for air pollution control. Virtually all their production goes to manufacture Monsanto’s RoundUp herbicide.
Biggest environmental issue in phosphate patch is Selenium, which naturally concentrates in center waste shale and can be released into the environment through oxidation and leaching. CERCLA investigations and agreements were ongoing for old mines and new ones. Two reposts of the Area Wide Investigation is complete with issuance of two reports on addressing impacts from historic phosphate mining and screening of the orphan mine sites. Much of reclamation effort in last few years has focused on new ways to minimize and prevent selenium release into surface and groundwater. It is fitting that all the phosphate companies were recognized for the improved reclamation procedures and excellent projects completed in last couple of years. Awards given out by Idaho Dept. Of Lands in conjunction with BLM, FS, DEQ, IDFG to recognize excellence in reclamation work in mining industry.

Winners: On-going operations: Agrium for Rasmussen Ridge mine (Rob Squires = env. Coord.)

Exploration Reclamation: Simplot for Wells Canyon, Manning Creek, and Deer Creek leases (Dennis Facer, mine manager)

Sand and Gravel: Ron Sali, Moon Lake Ranch, Eagle

Outstanding Agency Reclamation Coordinator: Ben Gomm, retired IDL (represented by his daughter)

Special Project Award: Monsanto for vegetative management and development of first panel at South Rasmussen Ridge (Randy Vraines and Mike Vice)

Special Project Award: Astaris for stream relocation and restoration of Upper Dry Valley Creek (James Williams and Mark Kroll) NOTE: Astaris got out of the phosphate industry last year.
Other Metal Mining
- Gold mines – several small producers, nugget and placer
- Reclamation work on larger mines (DeLamar, Beartrack, Black Pine)
- USAC Preachers Cove mill site

Thompson Creek Mine - Mo
Mo prices over $20 per pound! WOW
Reclaimed waste dump, Pat Hughes drainage
Concentrates plus HPM
Will produce about 15 million pounds Mo this year. Up to 160 employees. Last year’s stripping done and are mining in Phase 5. Moly prices way up due in large part to Chinese consumption of raw materials. Steel shortage, also in US, Europe. Concerned about byproduct production and whether high price is sustainable. Considering Phase 6, which would require significant investment in new equipment. Premature – not at decision point yet. Wait and see.

Reclamation 2004
Considerable reclamation done at mines and millsites closed in the 1990’s.
New owner Stan Quimby took down the mill buildings at Cupruum, the old Copper Cliffs copper mine. Quimby had purchased it from Alta Gold for timber resource. About ½ million tons of stockpiled ore left. Kinross initiated final reclamation and closure plan at the DeLamar and Stone Cabin mines in Owyhee County. Mill and AVR plant dismantled and sold. #1 waste
dump capped and backfill to cap sulfides started in Sommercamp-Regan pits, and other work. About 2-4 years of gold-silver reserve were left in the Stone Cabin Mine on Florida Mountain. US Antimony completed physical reclamation at the Preachers Cove mill on the Yankee Fork. All buildings removed and a capped impoundment, with ground calcite added for pH control, was constructed to hold the neutralized waste. Site won high praise from Forest Service. Old ponds favorites of elk and deer due to sodium. Wolf tracks seen on site after early fall snowstorm.

BLM had major cleanup of the Ima Millsite, Lemhi County. Old tungsten mine. Jeff Gabardi and crews from Sawtooth Forest inspect the old Bassett Gulch mill on Warm Springs Road, just west of Ketchum, before doing extensive clean-up. Was funded by LDS Church, who had received the property via donation [I think]. Gabardi’s accomplished crew also had a bit of mountaineering practice installing bat gates in these dangerous open stopes at the Copper Queen mine off Agency Creek in Lemhi County. Joint BLM-FS project.
Idaho has many small to medium-sized industrial mineral operations located in rural portions of the state. These are important economic contributors to the rural economies. Hottest commodity in 2004 was STONE. Special rocks are as good as gold these days. Construction materials in general were good. Significant trends this year for industrials are increasing competition from lower cost suppliers in China and newer technology requiring lower specs. Companies required to be both more creative and more aggressive in marketing their products. [Producers Pumice in Idaho Falls closed due to increased depth and stripping ratio in pit. Phone disconnected.]

Industrial garnet demand has picked up considerably in last couple of years. Emerald Creek produces variety of size fractions from its washing plants and jig processing. Water jet cutting, precision cutting in metal fabrication for airplanes, plus steady sandblasting markets. 35 employees. No new changes. Trying to wrap up permit to mine new areas in floodplain of St. Maries River. Permitting started in 1998; Corps of Engineers lead agency. Now in final comment period and working on final stipulations. Hopeful. Has done excellent stream restoration work.
American-owned family company since 1882, based in Overland Park, Kansas. Stable workforce with ownership in operations. At Inkom, have 2nd generation employees. Pretty good markets this year. Sell mostly to northern and eastern Idaho, esp. Idaho Falls. Also supply mining operations in Elko, Nevada. Quarry has 50-year supply. Production is about 300,000 tons cement a year. Tire burner – burns all of Bannock Co. tires. Summer intern program for college-age kids of employees.

Hess Pumice main market was ultrafine, ultrapure pumice used for polishing television screens in Japan and elsewhere in Pacific Rim. That market now going to China which uses its own raw materials. Last 2 US TV manufacturers finally gave up this past year and moved to China. Hess trading tons for dollars – mining more pumice (150,000 tons this year) but value is only $10/ton vs. $200/ton. Using it in building products. Deal with Owens-Corning to make their culture stone products. Building 60,000 sq.ft. facility to do construction materials. Idaho Minerals Inc. – perlite. Obtained large contract with Canadian horticultural distributor to supply horticultural perlite. Building new expander facility in existing building next to plant. Owned by Hess, will use Idaho Minerals name. Want to keep production in Idaho. Aggressively pursuing new markets.
US Antimony Corp. of Montana is 75% owner of BRZ (and essentially operator). 15 employees working 24-7. Production for 2004 around 10,000 tons a year. Sales in 2003 up 120% over 2002 and prices up as well. Major markets: water filtration and remediation, animal nutrition, odor control for animals (CAFOs etc.), animal litter, household odor control; wastewater treatment, [confidential], soil amendments. Hope to double sales next year. [Drinking Water filtration for municipal water supplies represent large potential market.]
Unimin – Emmett, Idaho

- Mine feldspathic sand in foothills W of Boise
- Volume same
- Less glass sand, but more golf course sand
- Supplied new Tamarack Resort and most western states, BC
- 8 year safety record

New fall protection system
Company holding their own. Volume about same as before but significant shift away from container glass (wine and beer bottles). Erosion in melting sand markets as increased use of recycled glass and changes in furnace technology allow use of local, lower grade products in Seattle, etc. For golf courses – both bunker sand and construction of tee boxes, Unimin’s Idaho sand has optimal angularity. Use UNIPAR label also work with Grass Roots, distributor. Eclipsed 8 years with no lost time accident mark and installed new protection system to prevent accidents in truck loading area. Finalized purchase of 86 acres for mine expansion of Zierwold Pit (off Pearl Road, named for mining lawyer Art Zierwold who died a few years ago in accident.

Oakley Stone Quarries – Middle Mountain

- Northern Stone Supply
- Oakley Valley Stone
- Scrivanich Natural Stone
- American Stone
- Pellet Stone Inc.
- Frable Stone
- Sheets & Tumbled
- Unicard

They couldn’t mine it fast enough. Very durable micaceous quartzite flagstone, with silver to grey colors and gold. Splits into thin (1/2”) sheets, can cut into tiles. Thicker material stacked ledgestone.
L and W Stone Corp. received approval for new Plan of Operations with BLM on July 29, 2004. BLM was sued by John Marvel’s group, Western Watersheds Project (WWP) who appealed in federal district court. Temporary restraining order issued in November (allows quarry to operate). Hearing in November with decision expected but not happened as of Dec. 3. Top price of Three Rivers said to exceed $500 per ton. Average price may be closer to $200 per ton. POO issues are large waste dump and state highway that goes by the flat below quarry and dump.

Ramshorn Quarry, above Bayhorse Creek on old Ramshorn mine private property, produced 500 tons of flagstone. Wants to expand to public land. Other companies exploring in Challis area for decorative stone. Other decorative rock quarries doing well. Much for landscaping rock.

Raft River KGRA drilled in 1980’s and old DOE wells used. About a $1 million project to re-enter the 5 old wells, clean them out, install new equipment for flow testing. DOE grant under GRED-II paid about 80% of it. Tested at artesian flow conditions 4 holes commercial with 370-540 gpm stabilized flow with stabilized down hole temperatures of 270-299 degrees F. Pursuing permits and contracts needed to construct 10-15 MW geothermal power plant. Hope to be producing power from binary cycle power system in 2006. Lang Exploratory Drilling was drilling contractor. GeothermEx the geothermal engineering contractor. Biggest headache is negotiations with Idaho Power to buy the geothermal power.

Exploration was very active this year, thanks to higher metal prices, a lot going on. Before going to metals I want to mention a couple of industrial mineral projects. Alchemy, should be i-minerals, inc., maintained their Latah County leases at the Helmar-Bovill clay pits and did test geochemistry and process testing on core from last year’s drilling. Main target is not clay but the feldspar with a quartz byproduct. Minerals Research Lab did the industrial bench test work. Geothermal work by US Geothermal was just covered. Idatherm also had geothermal leases in eastern Idaho. But for METALS: A number of new projects this year. North Idaho and greater Coeur d’Alene District especially hoping. Already covered Sterling
Mining Company’s activities at the Sunshine mine property. They also acquired several land packages in the district.

Also in north Idaho: small underground exploration projects by Larson Group near Powell and Dan Vaughn at Pierce. Lots of small miners left in Idaho’s backcountry.

New Jersey is small local company. Catch Fred Brackebusch’s talk tomorrow to learn more of their exploration strategy. Very busy year. Awaiting final stages of permitting with Forest Service on plan to open the Silver Strand mine, underground high grade veins. Added flotation circuit and finetuned New Jersey mill at Kellogg, drilled at their New Jersey mine, and other properties, and added a new Silver discovery, they call the Silver Button. Major emphasis though was the Golden Chest mine at Murray. Also drilled 3 holes at New Jersey mine itself 2 holes at Enterprise, stratabound Ag target and 1 at Scotch Thistle New discovery, Silver Button, with multi-ounce Ag on surface
Golden Chest was largest lode producer in Murray district, north of Wallace, Idaho. Drilled by Newmont Exploration in late 1980’s who drilled 30 holes and identified open pit resource of 230,000 ounces, with one RC hole intercept of high grade. New Jersey acquired an exploration lease and mining option on the private Golden Chest property last year. Targeting ug high grade as well as open pit ore. Major activity was developing a surface ramp down to intersect the historic Katie-Dora vein and do test mining of vein. Drilled 4 core holes for 3900’ with nice results, deeper than the ramp level. Hit second vein (Idaho vein?) from drilling, with ore grade intercept of 4.8 g/t some 600’ below surface. Lots of room to add reserves. Mined some ore from ug ramp and shipped it to New Jersey mill in Kellogg.

Beartooth Platinum (formerly Idaho Consolidated Metals Corp.) drilled their gold properties in Elk City area in northern Idaho. Buffalo Gulch property, near Elk City, was permitted in early 1990’s by BEMA as heap leach operation but never mined. The Friday-Petsite property is near Orogrande, historic Au district. Explored and drilled by several companies in 1990’s with discovery of extensive low grade resource and tantalizing high grade intercepts. Valencia, a Toronto-based company, announced Aug. 28, 2004, it had signed an option agreement with Beartooth to earn 51% in Idaho Gold Project (Buffalo Gulch). Since then,
Valencia has had its geologists going through the extensive data package, especially focusing on structure and untested geochem anomalies. Beartooth drilled 412 meters (1351’) at Buffalo Gulch in 4 angle holes (HQ) to test earlier 150 RC holes. Got slightly higher grades, inc. BBD-11 with 0.72 g Au/t over 32 meters true width. Consultant engineer – Buffalo Gulch indicated resource of 5 million tons averaging 0.023 oz./ton Au.

Kimberly Gold Mines purchased the Rescue Mine and Mill at Warren, central Idaho. Rescue has a real nice quartz-gold vein system in granodiorite. Somewhat abused by previous owner and site a bit of mess with roof caved in a year or two ago. Kimberly stepped in and made the Forest Service and State very happy with great environmental cleanup of site. Did some repairs and development work in mine as well as the surface cleanup and mill building repair. Should be ready to mine ore next year. Other mines in Warren District are along veins that are probably extensions of the Rescue. Ray Bohn and Unity Gold-Silver Mines kept up their Unity mine and Charity portals, consolidating their land position; Sidney Resources worked claims to the west of Charity.
Other Central Idaho Properties

- Vista Gold - 2 M oz. Au makes Stibnite a "hold"; but more Meadow Creek restoration again.
- Thunder Mountain Mining - Dewey mine appraisal agreed on with FS, but no $ yet.
- Jack Walker, AIMM - continuing legal actions; some surface geochemistry at Golden Hand mine. POO in progress.

SALMON REGION:

Nevada Contact drilled 7 RC holes at Iron Creek, but returned property.

Wave Exploration - 2004

- 2003: Lease to acquire 100% Musgrove property
- Newmont data ~ 300,000 ounces Au, 0.036 opt grade
- Drilled 4 RC DH - 2 into known resource, 2 extensions, 1 ended in ore (0.066 oz/ton Au
- Soil sampling - large anomaly untested

Moving on to the Salmon Region -- Wave Exploration, a Vancouver Junior company, acquired the Musgrove Creek property last year. Wave Exploration had a sizeable drilling program at the Musgrove Creek property, which they optioned in 2003. Had been discovered and drilled in the late 1980’s and early 1990’s by Atlas Precious Metals, and then Newmont. Extensive Data Package. Epithermal system hosted in Precambrian Yellowjacket metasediments; very steep terrain just off to the Panther Creek Fault system southwest of Salmon. 2004 WORK: 971 acre property, NI43-101 compliant resource calculation of Newmont data had indicated resource of 314,000 ounces gold grading 1.22 g/t or 0.036 opt Au. Summer 2004: 4 rotary RC holes, totalling 762 m, or 2500’. 2 holes in existing Johnny’s Point mineral resource to confirm. 2 exploration holes drilled to northwest to test extension. Also rock and soil geochemistry. Au in rocks 0.5 to 2,479 ppb with anomalous As, and soils grid with Au up to 441 ppb. Anomaly open to NW.
Formation Capital Corporation, a Vancouver-based company, had another aggressive and active year of exploration on their Idaho Cobalt property in the historic Blackbird Mining District in Lemhi County. FCC applied in 2001 to Salmon—Challis National Forest to open an underground cobalt mine, based on their discovery of the RAM deposit. Lean years slowed the project down but Company of course was avid watcher of rising cobalt prices this year. By fall, the cobalt price had doubled and was over $20 per pound.
Permitting Schedule recently revised: last 2 years, extensive baseline studies in wildlife, hydrology, geology and geotechnical work, transportation, etc. But slowed down by funding problems and changes in consultants to EIS process, plus need for more data. Also effect of Clear Creek fire in 2000. Recent meetings of all parties with FS and EIS team suggest DEIS expected to be completed April 2005, with Final EIS and required changes to Operating Plan to come out later in the year. Permitting is moving ahead. Complex process and company (and agencies) are committed to “science-backed” plan of operations for the Idaho Cobalt Project and development in environmentally sound manner. Also seeking to drive decline for metallurgical sample. Comments to FS.

Need to follow up on this. Trio did not return call. March 26 press release that Trio Gold Corp. had signed deal with owner Sultana Resources LLC to explore and develop the Empire Mine. Located 5.5 km SW of Mackay in Custer County. 23 patented claims, 6 millsites, 21 unpatented claims. Agreement subject to due diligence by Trio and payment of $ 50,000 USD cash to Sultana on final signing, plus shares or cash. Cambior Exploration USA had big project in 1997 reported drill-indicated oxide copper resource of 27 Mt at 0.42% Cu based on 47 core holes. “The present oxide resource estimate using .15% Cu cutoff, stands at 18 million tonnes at 0.49% Cu, 0.19% Zn, 13.5 gm/T Ag and 0.48 g/T
Au, with additional 9 million tonnes of material grading 0.29% Cu and 0.31% Zn with no precious metal values. The deposit is amenable to mining by open pit methods with a relatively low strip ratio." July 2001 engineering reports said flotation milling and heap leach processing would work.


Drilling problems, only 6 holes drilled and lots of steel left in holes. Main target – Dog Bone Ridge, SW of main resource area of previous drilling. One intercept of 170’ of 1.25 g/t Au with narrow high grade, and Hole 5 to NW with lots of realgar and stibnite.
Smaller projects to mention: Portuguese Creek took bulk sample of rhyolite from gold property near Gooding. Juniper Rose placer gold permitting stymied when operator did not post bond. Desert Mineral Mining plans to test new processing and open the Centennial Mine east of Boise in the Blacks Creek District. Some NON-GOLD interest. Mosquito Consolidated acquired the Cumo property northwest of Idaho City. Discovered by AMAX in the 1970’s, it is very large, but deep copper-moly system. Reviewing old data and planning for next year.

Blacksheep is located 50 miles southwest of Boise, Idaho. The claims are contiguous with the Delamar mine. The geology at Blacksheep consists of a section of Tertiary volcanic rocks deposited in a basin formed along a deep-seated northwest trending fault. The fault, known as the Milestone fault acted as a feeder for gold, silver and mercury mineralization. Several gold rich mercury prospects occur on the north end of the property. On the south end of the property is
a small gold-silver resource known as Milestone.

Major mine development at Atlanta, tiny historic mining town along the Middle Fork of the Boise River. Database included 200,000 feet of past drilling. Behre Dolbear of Denver has done feasibility and reserve calculations. Mineable reserve of 13.7 million tons at 0.06 oz/ton (= 822,000 ounces), in two pits Monarch and Idaho pits. Strip is 3.5/1 and 5.5 year mine life (not inc. inferred resource). Leach pad with conventional cyanide leach has recovery of 64% Au and silver around 50%.
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Atlanta Gold - 2

- Dedicated field crew sampling old ore piles for geochem characterization
- New optimized mine plan
- Real Gold - Behre Dolbear estimates cost at $188/oz and internal ROR of 25%

Slide 15

Idaho Geological Survey
www.idahogeology.org

- Technical aid for the prospector and public
- Resources for the mining/environment professional
- > 60 NEW digital geologic maps on web
- Download maps and some publications
- Mines & Prospects Search

Thanks to Loudon Stanford, Mike Weaver, and Earl Bennett for assistance with this talk. Urge you to check out the new features on the IGS website.