Coeur d’Alene District (1884 - 1996)

- Silver: Over 1 billion ounces
- Lead: > 8.1 million tons
- Zinc: > 3.2 million tons
- Copper: > 191,400 tons
- Antimony, Gold
- Veins in Precambrian Belt Basin Sediments
Silver Valley: 1996 Silver Production

- Production Up
- 190 Metric Tons
- 6.1 million tr. oz.
Idaho Phosphate Reserve

- Pennsylvanian-Permian Phosphoria Formation

- 2 Major Products:
  - Phosphoric Acid - Fertilizer
  - Elemental Phosphorus

- Only U.S. Producer of Elemental Phosphorus
1997 Active Metal Mines

- Highlights:
  - Silver Valley
  - Phosphate

- Challenges:
  - 2 closures
  - Gold price
  - ESA and NMFS issues
SPEED LIMIT 10 MI. PER. HR.

HEAVY FINE FOR KILLING CATS, DOGS, KIDS, ADULTS OR EVEN OLD TIMERS

WARREN IDAHO
Since 1862
125 YEARS OF America
FIGURE 2A - TAILINGS DEPOSITION AREAS
Talache Mine Tailings, Atlanta, Idaho
Award-winning Projects - 1996

- Beartrack Mine - Napias Creek Wetlands
- Thompson Creek Mine - overall excellence
- DeLamar Mine - final reclamation
- W. Fork Warm Springs Creek exploration
- Beartrack Mine - Copeland Construction
- West Fork Emerald Creek Project
IDAHO NONFUEL MINERAL PRODUCTION ($ 000’s)
1996 Idaho Reclamation Awards

- Special: Meridian Gold
- Hard Rock Operations: Thompson Creek Mining
- Hard Rock Reclamation: Kinross DeLamar
- Exploration: Bio-Myne
- Contractor: Copeland Construction
- Placer Reclamation: Emerald Creek Garne
- Agency Recl.: Ray Henderson, USFS
- Envir. Coord.: John Lawson, Meridian
1. **IGS Logo.** Good morning. Thank Earl Bennett and various company agency personnel for helping with the presentation.

2. **Nonfuel Mineral Production Graph (1992-95)**
   - Including value of processed phosphate, minerals are around a billion dollar industry. Value down some in 1996, due to decrease in price of moly, according to USGS. Final USGS 1996 Total Value = $449 million, down $60 million from 1995. Moly value down, phosphate value up, from 1995. (Process P adds $500)

3. **1996 Record Idaho Gold Production.** Last year’s gold production in Idaho was new record - 347,470 troy ounces, with Meridian’s Beartrack mine being top producer with 108,495 ounces.

4. **Coeur D’Alene District Map**
   - Production Stats (1884-1996) compiled by Don Springer. Over a billion ounces of silver produced and $5.4 billion dollars value. One world’s great mining districts.

5. **1996 Silver Production.** 6.1 million troy ounces as mines reopen and return to full production. Costs down. Silver prices erratic but doing ok.

6. **Sunshine mine, surface view.** Reached full production in 1997, should dig out 4 million oz. this year. 291 workers, Sunshine Mine.

7. **Underground LHD mucker.** Cash costs down to $4.07 per ounce in 3rd quarter, partly due to conversion to diesel equipment and ramps a few years ago.

8. **Sunshine core, West Chance Vein.** Resource in West Chance vein orebody estimated at 68 million ounces of silver. High grade Ag-rich galena with some core intercepts over 200 oz./ton. Sunshine geologists reexamining structure and stratigraphy with aid of new computer technology.
8. **Hecla Lucky Friday mine with Gold Hunter Project construction.** Hecla’s Board approved expenditure of $16 million to develop Gold Hunter orebody and expand mill. Grade of new deposit estimated to be 18 oz/ton. Will at least double production from Lucky Friday. Development drift on 5100 level completed.

9. **Coeur mine.** Silver Valley Resources, a joint venture between Asarco, Inc., and Coeur d’Alene Mines, operated the Coeur mine which produced 1.6 million ounces in 1996. And the Galena mine:

10. **Galena mine. Headframe.** Reached full production of 600 tpd in May.

11. **Galena - Hoist area, 4900 level.** Exploration discovered -

12. **Galena, 123 Vein, 118 West Drift.** New 123 vein is tetrahedrite-siderite. Also 258 vein. Costs in 2 mines reduced below $4.00 per ounce. 170 workers.

13. **Galena mine computer.** Silver Valley is using GEMCOM software to incorporate gigabytes of historical mine records into a 3D computer model to assist exploration and mining.

**DD. KELLOGG YARD CLEANUP.** Cleanup work associated with the Bunker Hill Superfund site continued, Inc. yard replacement, 200 home improvements, Silver Valley tailings trussing, trucking them to re-sepation at BH impound.

14. **Removal of smelter slag from Bunker Hill site.**

15. **Bunker Hill smelter site - no stacks, demolished last year.** Reclamation work underway. At Bunker Hill mine, owner Bob Hopper was refurbishing the No. 2 hoist to access deeper levels of the mine. A buyout agreement with Royal Silver Mines fell through due to the federal lawsuit affecting financing.

16. **EARL BENNETT w/ VIDEO CAMERA, AMLS.** Earl Bennett looking at map. The Forest Service contracted IGS to do an Abandoned Mine Inventory of the northern forests. Earl Bennett was busy videoing the old properties for the historical and environmental record. Hard to find some of them in the woods, but not challenging enough for Earl. He was appointed Dean of the College of Mines at University of Idaho in August. We wish him well finding his way in the academic forest.

17. **PHOSPHATE DISTRICT MAP.** SE Idaho.
so le U.S. supplier of elemental phosphorous, used in food additives, herbicides and many industrial uses. 6 million tons/year. Good year overall, with stable markets. Some concern over possible selenium poisoning of horses; companies participating in a Se working group to study problem.

18. FMC Dry Valley mine. B pit. FMC should extract about 1.7 million tons of ore this year. Mined B Pit. Added new shovel. Will be submitting mine plan for south half of mine soon.

19. FMC Rail car tipple. Shipments of ore were slowed by the Union Pacific problems this fall, and mine ended shipping a month earlier than usual.

20. FMC Elemental Phosphorous Plant. Ore is transported to FMC’s plant in Pocatello. One of largest elemental plants in world, with about 500 workers.


22. Simplot Smoky Canyon mine. Simplot will mine about 2.5 million tons of phosphate ore at its Smoky Canyon mine this year. Permitting was completed and construction started on the Sage Creek crossing to access E panel ore to the south. The company drilled 95 exploration holes on the Boulder Creek Anticline and this fall increased its reserves substantially by acquiring Alumet’s assets and phosphate reserves scattered about SE Idaho.

23. Rhone-Poulenc’s Rasmussen Ridge mine. Rhone-Poulenc will mine more than 1.7 million tons from their central Rasmussen Ridge mine this year. Ore goes to feed Agrium’s fertilizer plant at Conda. In November, both companies announced a letter of intent for Agrium Inc. to purchase Rhone-Poulenc’s mine. The transaction is expected to be completed in the next couple of months subject to the usual due diligence agreements and lease transfers.

24. Agrium Fertilizer plant, Conda. The purchase will secure the ore feed for Agrium’s fertilizer plant. Agrium’s facility enjoyed a record year with good markets for phosphate fertilizer. They were also impacted by the UP slowdown. The Canadian company announced plans to develop an igneous phosphate deposit in Ontario, as well as purchase the Rasmussen Ridge operations.

25. Monsanto Elemental Phosphorus Plant. This is last year’s slide. In midyear, Monsanto spun off their chemicals division, which includes the phosphate operations, and renamed it Solutia Inc. The Solutia plant had a record year producing elemental phos. Ore is from the Enoch Valley mine, which has a few years of reserves left. Permitting continued for the South Rasmussen Ridge deposit which will be mined in the next millenia.
Kerr-McGee continued to extract vanadium from the ferrophosph slag of Solutia’s plant.

26. Gordon Aland, Acknowledgement of Service. Long-term Monsanto legislative affairs director, Gordon Aland, received a special Acknowledgement of Service award from the Idaho Mining Advisory Committee for his work on the MAC and drafting the state’s Surface Mining Act.

27. Highlights and Challenges. Silver mines and phosphate operations enjoyed reasonable metal prices and market conditions. As you know, international gold prices have plummeted since July. Spot price Au fell below $300/oz. the day before Thanksgiving. Didn’t give many companies much to give thanks for, and is certainly hurting Idaho operations.

28. Thompson Creek mine, SE part of pit. Thompson Creek, the state’s molybdenum mine near Challis had a record year of production for the property, producing 20 million pounds of molybdenite concentrate. A new fleet of CAT trucks was added to the pit operations. In June, Thompson Creek Mining also announced the acquisition of the Endako project in British Columbia, with 25% partner Nissho Iwai Corp.

29. Thompson Creek tailings dam. The company had an aggressive environmental program as it worked on a Supplemental Plan of Operations to protect long-term water quality at the site. Here, Falma Moye explains the tailings dam to a tour group. The pyrite extraction plant, completed last year, is working well to decrease sulfide contents in the tailings. The company received the state’s Excellence in Operations award for its environmental practices.

30. Thompson Creek Steelhead Acclimation Pond. In August, a group of local and state government reps, Idaho Fish and Game, fisheries groups, Forest Service rangers, and company manager Guy Granger broke ground on a steelhead-rearing pond along Squaw Creek, below the mine. Idaho Fish and Game will stock the pond with steelhead smolts next spring. The fish require cool, clean water to thrive, and the Thompson Creek pond will help mitigate the loss of fish due to downstream hydroelectric dams. The pond will support over 6 million smolt and thousands of adult fish.

31. Unloading Steel balls, Thompson Creek mill. A couple of years ago, I reported on my ball survey of Idaho mines. Last year was pretty soft, but I’m happy to say this year looks better. This new crop of hard steel balls are being unloaded for the Thompson Creek mill.
32. **Stibnite mine overview.** Dakota Mining had a rough year at their Stibnite mine in central Idaho, due in part to the slumping gold price, and environmental issues from previous mining in the historic district.

33. **Stibnite Pit, with dog.** Dakota mined some 350,000 tons grading 0.044 opt Au from the Stibnite Pit during June through September. (Quartz-Ferric oxide veins-in-biotite schist.), including a small amount from the Garnet Creek Pit, and drilled some 68 RC exploration holes. The company took a $2.6 million dollar write off on the mine in the third quarter of the year.

34. **Stibnite, Meadow Creek tailings project.** Environmental coordinator Dave Landis looking at last year's Meadow Creek tailings stabilization project. Much of the grass and seedlings were doing well and sediment input into Meadow Creek was much better. Under an AOC (Administrative Order and Consent) Dakota is constructing a new Bypass diversion channel for Meadow Creek through the old tails. Difficult construction project.

35. **Warren, Idaho - sign, 125 years of America.** Warren is another old Idaho gold-mining town. Somewhat removed from the 1990s and proud of it.

36. **Rescue mine - underground, Jim Striker.** CSC Mining operates the small Rescue mine at Warren. Jim Striker and his boys worked all summer putting in 700 feet of new drift and 200 feet of raise, developing ore bodies on the high grade vein.

37. **Rescue mine - quartz-gold vein.** In June they received a permit for a 2nd settling pond for the gravity mill and sandfill operation. Unfortunately, gold prices didn't cooperate, and by fall, they figured it was better to leave the ore in the ground for now and take a Forest Service contract for roadwork this fall.

38. **Hecla Grouse Creek mine.** Hecla Mining stopped production from their Grouse Creek mine in Custer County in April. The company announced last year that the precious metal mine would be closed due to disappointing production and errors in calculating reserves. Mill has been mothballed and 5 miles of old drill road reclaimed.

39. **Pegasus Black Pine mine, C expansion pit.** Pegasus Gold Corporation's Black Pine mine in Cassia County has been doing better. They keep finding small ore pods to extend the mine life, but this time it looks like mining will finish in December, 1997. Mining started in 1991. Mining in the C expansion pit this year had to put a fence up for protection from a nasty slip face. Production from the NE Talman and C/D pits this year should total about 3 million tons of ore, containing some 40,000 ounces of gold.
40. **Pegasus Black Pine mine, hydroseeding by helicopter.** In preparation for mine closure, Black Pine, began reclamation efforts, like this aerial hydroseeding of a waste dump last year.

41. **Black Pine reclamation.** As usual, Pegasus and their contractors are doing excellent job of road reclamation for mine closure.

42. **Beartrack mine, South Pit Highwall.** Meridian Gold’s Beartrack mine in Lemhi County had good year, putting 4 million tons of ore on the pad, and estimated production near 115,000 ounces gold this year. Mining mostly in North Pit and doing laybacks on South Pit. Recognized as one of 6 safest mines in country by MSHA. Catch Their Core Shock Display

43. **Beartrack, Conveyor to Leach Pad.** Expanded the leach pad significantly. 160 employees are obviously concerned about gold prices. Drilled about 40 exploration holes in the mine area and purchased regional exploration properties from Atlas and Ashanti.

44. **Kinross, DeLamar mine, Sommercamp pit.** In southern Idaho, Kinross had a good year. Final stages of mining the DeLamar mine. Production from Sommercamp and Glensilver pits.

45. **Kinross, Tip Top pit, Stone Cabin mine.** Production shifted to Kinross’ Stone Cabin mine: producing from Tip Top and Stone Cabin pits. Estimated 1997 production is 47,900 ounces gold and 1.2 million ounces silver. Kinross received reclamation award.

46. **Kinross Mill, New Steel balls.** Also happy to report the company hosted a teacher workshop for mine and mill tour last summer. Showing off their new steel balls.

**INDUSTRIALS MAP, 1997.**

Numerous small and large industrial mineral operations around state.

47. **G and B Redimix, Star. Dredge.** Development fueled an active construction industry. State’s most unique sand and gravel pit is G and B Redimix’s mine in Star, Idaho, near Boise. Located near river, environmentally advantageous to extract gravel using floating dredge. Pipe carries gravel to shore.

48. **G and B Redimix. Dredge.** Front view of dredge showing giant claw which turns and sucks up the gravel. Pond open for a couple of years.

49. **G and Redimix. Claw closeup.** Closeup view of claw with a few of the larger cobbles found in the mined terrace gravels.
50. **Emerald Creek Garnet.** In north Idaho, Emerald Creek uses 5 washing plants to mine industrial garnets. Produces some 27,500 tons of garnets yearly for abrasives and water jets. Won a reclamation award for stream reconstruction on W. Fork of Emerald Creek.

51. **Chemical Lime, Bancroft.** Idaho has several limestone producers, including Chemical Lime in southeast Idaho. Maerz kiln running well, but only at about half capacity due to market conditions. In north Idaho, Idaho Lime was permitting their Lime Mountain quarry near Orofino, and hopes to start production next year for the industrial paper and plastics market. Have a plant at Grangeville.

52. **Ash Grove Cement.** Ash Grove Cement quarries limestone and produces cement at Inkom, southeast Idaho. Excellent year-production up 10% to 22,900 tons/day at Elek Lime plant. 4500 tons/day at Agildon plant.

53. **Hess Pumice plant, Malad.** Hess Pumice operates these two grinding plants in Malad. Demand for their special low heavy mineral pumice, used for polishing television screens was a bit soft in part of the year but rebounded by late fall. In process of modifying old plant to increase production of the specialty pumice. Idaho Minerals hit some roadblocks on their proposed new perlite crushing and drying plant at Virginia, near the railhead. But expect to start construction next spring. Perlite markets are good.

54. **Rodriguez’ Oakley Stone quarry.** After years of legal wranglings, the Rodriguez Oakley Stone quarry finally reopened in southern Idaho. Demand for the decorative paving and facing stone is quite good. Other Idaho producers are Oakley Valley Stone and Northern Stone Supply.

55. **Williamson Diatomite deposit, Weiser.** Owners of this diatomite deposit near Weiser on the Williamson ranch are seeking someone to evaluate it and hopefully put it into production. The high quality diatomaceous earth makes an excellent organic pest control. See me for contact information.

56. **CARCO BenJel Clay pit.** CARCO dug a new pit at their BenJel bentonite deposit in Owyhee County. OK year.

57. **Teague Minerals, stockpile.** Teague Minerals mined about 2000 tons of zeolite from the Chrisman Hill pit near Sheaville to stockpile and ship to their Adrian, OR crushing plant. Clinoptilolite used for animal feed, soil additives.
II. TALACHE MINE TAILINGS IMPOUNDMENT BREACH

58. Terracon Map, Talache Mine Tailings. A mine-related news story hit the press in May when heavy spring moisture helped lead to the catastrophic breach of the old Talache mine tailings impoundment near Atlanta, Idaho. Some 17,000 cubic yards of material gave way, with only about 1000 cubic yards reaching the Middle Fork of the Boise River. Resulting media coverage of a rather spectacular mudslide was not pleasant. Property owner, Monarch Greenback, hired consultant Terracon to address the problem. Arsenic concern.

59. Terracon New Talache Embankment. After initial emergency mitigation efforts to divert water and contain sediment, Terracon (in consult with state DEQ and FS and EPA) conducted water sampling, geotech drilling of old dam, sediment removal, and construction of sediment ponds and this 28' high embankment below the lower tailings impoundment to prevent further material escaping the site.

JJ. 1996 IDAHO RECLAMATION AWARDS

60. Award-winning Projects, 1996. In part to prevent future such incidents, the State Land Board and cooperating federal land managers, recognize mining companies and personnel doing a good job to protect the environment. For 1996 work, winners are: Meridian Gold for wetlands restoration; Thompson Creek Mining for overall excellence in hard rock operations; Kinross Delamar for hard rock reclamation; BioMyne for reclamation of exploration project; Copeland Construction for contractor; Emerald Creek Garnet for reclamation at placer mine; Ray Henderson as outstanding agency reclamationist; and John Lawson of Meridian’s Beartrack mine as outstanding environmental coordinator.

KK. GROUP PHOTO, RECL. Awardees.

61. Gov. Batt w/ Steve Mooney, TC. Group picture of all awardees, and Gov. Batt giving the overall excellence award to Steven Mooney of Thompson Creek Mining.

LL. EXPLORATION MAP, 1997.
(Most active area- Salmon. Base metals interest. Au price down.)

62. Orogrande, Cyprus Amax, RC rig. Renewed interest in gold in Elk City/Orogrande area in north Idaho. Cyprus Amax had big program at Petzite property at Orogrande. Drilling until mid-November with as many as 5 rigs. Drilled 90 RC holes at Petsite, located along the Orogrande-Frisco shear.
63. Orogrande, Cyprus Amax, core rig. Cyprus also put down 11 core holes, some with this backpack portable core rig. Idaho Consolidated Metals Corp. of Lewiston, owner and JV partner announced results including PZ80 with 240 feet of 1.6 g/tonne (ppm), inc. 90 feet of 2.2 g/tonne. Many of the holes contain intervals grading over 1 ppm Au. Cyprus also drilled 14 holes at Deadwood, another JV property near Ekl City.

Idaho Consolidated Metals holds 100% interest in the Buffalo Gulch deposit, permitted by Bema a few years ago. ICMC completed 24 line miles of IP/Resistivity and some geochemistry with some encouraging results to follow up.

64. Dewey Dome, Thunder Mountain Dist. Early in the year, Dakota Mining and USMX completed a merger with Dakota taking over USMX’s properties including the Dewey project in the Thunder Mountain Mining District, 20 miles east of Stibnite. Permitting work continued for the Thunder Mountain mine, which will be the focus of Dakota’s future production in the area. They hope to have the EIS completed next year.

65. Ed Fields and Thor Kilsgaard, Atlanta. Thor Kilsgaard (gentleman on the right), retired emeritus USGS geologist, lead a field trip (organized by Ed Fields) up to Atlanta, NE of Boise, last year. Thor is well-known for his excellent mapping in central Idaho (watch for it soon). In a deal with Quest International, the Atlanta property, with both open pit (15 mt of 0.07 opt Au) and underground gold (784,000 tons of 0.31 opt Au) reserves, was taken over by Twin Gold, a new company formed between Atlanta Gold and Voisey Bay Resources. Twin is seeking financing for additional underground work.

66. Empire Copper Mine, Mackay. (Skarn in trees.) Cambior completed 22 additional core holes on their Sultana Cu-Au project at Mackay this year, shutting down the operations in July. With last year’s ambitious program, they drilled 7350 meters in 47 core holes into the copper-gold skarn. The project was actually run by subsidiary, Exploration Cambiex, which announced an increase in the geological resource estimate to 17 million tonnes at 0.49% Cu, 0.19% Zn, 13.5 g Ag/t, and 0.48 g Au/t, with additional 9 million tonnes of Zn-Cu mineralization. Oxide ore. Evaluating their options.

Phelps Dodge drilled 4 holes in Copper Basin, southwest of Mackay.

67. Blue Jay prospect, Eightmile Creek, Lemhi Range. BHP drilled 4 holes on the Blue Jay porphyry copper target in the Leadore District in eastern Idaho’s Lemhi Range. Old Blue Jay mine is clearing below oval snowpatch in left-center of slide. Drill sites in forested areas SW, SE, and NE of mine.

68. Kilgore, 1996 drill on talus slope. Echo Bay did much work at the Kilgore precious metal deposit last year, but pulled the budget this year. They did a
69. Musgrove Creek property, Johnny's Point. Some hot action on the Salmon Forest this year. Meridian Gold purchased the Musgrove property from Atlas for $200,000. Newmont drilled it a few years ago, and it is estimated to contain a 340,000 ounce resource. Meridian drilled 13 RC holes this year. Meridian also purchased the Arnett Creek and Humbug properties from Ashanti Goldfields, and drilled 11 core holes at Arnett Creek, drilled extensively by AGR. Phelps Dodge drilled 6 holes on a copper target at Indian Creek, and Palouse Resources was active in the Sage Creek area.

70. Formation Capital, Sunshine Lode, Blackbird - overview. Probably most exciting project was Formation Capital's Sunshine Project near the Blackbird mine in the Idaho Cobalt Belt. Cobalt prices are still over $20/lb. Work last year included a major recce effort on the sizeable acreage.

71. Formation Capital, rock with cobaltite seams, RAM prospect. This cobaltite in a large soil geochem anomaly (over 2,600 feet long and 800 feet wide) called the RAM zone was drilled this year.

72. Formation Capital, Sunshine field camp. By November, the company had completed 16 new diamond drill holes, finding Cu-Co-Au mineralization over 600 feet of strike length and to 450 feet depth, with the zone open in both directions.

73. Formation Capital, Target Drilling. RAM drill intercepts reveal multiple ore horizons. Hole R-97-12 intersected 3 ore grade horizons, each of 14' core length and over 0.45% Co, 0.3% Cu, with 0.01 opt Au. R097-03 intersected a 9 foot section grading over 1.2% Cobalt.

74. Formation, Reclamation map review. Geologist, Rick Honsinger, and Environmental Coordinator, Gerry Hamilton, review reclamation plans. The company has been good about its reclamation work, and cooperating with Noranda's contractor constructing the massive reclamation program on the Blackbird patented property.

75. Formation, Bill Scales and driller w/core. Geologist Bill Scales ponders the core. Mineralization is continuous between drill holes, and it is possible that the RAM zone is the folded equivalent of the main Blackbird Mine series. A resource of 2.8 million tons has been calculated on 2 of the 25 target zones at Sunshine project, with about 300,000 tons of proven reserve. More work is planned!

Thank you.

I have some handouts on Exploration Map if you want to catch me at The session...