What's on the horizon?

Virginia S. Gillerman
Idaho Geological Survey, Boise
WHERE HAVE WE BEEN?

Idaho Non-fuel Mineral Production (USGS)
2000 - 2012p

- Million $

Legend:
- Other
- Moly
- Silver
- Con. S&G
2011 a record!

IDAHO BY COMMODITIES

Idaho 2011: $1,287 million

Idaho 2012est: $824 million

2012 not so good!
GLOBAL TRENDS: METAL PRICES DOWN
INDUSTRIAL MARKETS STABLE TO IMPROVING

2013 from cnn.com article

Gold endures worst November since 1978
Mineweb.com

Au 5.9% drop in Nov. 2013

Silver ending Nov. at $19.93/tr.oz. -- 41% drop since Jan. 1, 2013

Ag 9.1% drop in Nov. 2013
HIDDEN HORIZON?

Still 2 BIG Idaho Districts –

- Silver Valley
- Phosphate Reserve

Also – small Au mines – ug and placers and recreational suction dredge miners.
Silver Valley: 1884-2012:

- One of Top 5 Global Ag Producers (1.2 billion tr. oz.)
- Wealth to Build Spokane
- Metals for War Efforts
- Labor and Mining History
- Silver is primary commodity

Silver: 38,267 metric tons (1,230,298,535 tr. oz.)

Lead: 7,653,169 metric tons
Zinc: 3,028,636 metric tons
Copper: 190,061 metric tons
Gold: 16.5 metric tons (529,955 tr. oz.)

From Wallace Mining Museum
Coeur d’Alene District

- One of world’s largest silver producers!
- > 1,230 million troy ounces Ag since 1884 (38,267 metric tons Ag)
- + Pb + Zn + Cu + Sb
- Quartz-siderite-sulfide veins in Precambrian Belt metasediments.
- Over a mile deep.

2 Operating mines in 2013: Lucky Friday and Galena

11/30/2012: Ag = $ 33.26/tr. oz.
8/14/2013: Ag = $ 21.74/tr. oz.
MSHA order to clean Silver Shaft after fatal accidents in 2011.

Mine fully rehabilitated and shaft cleaned in 2012.

**2013**

Production resumed in 1st Q 2013.

Costs high at lower production, but in Sept. to return to full production rate of 900 tpd.

Working Gold Hunter/LF Extension between 4900 and 5900 levels.

Using shadow stopes and geo-tech modelling to reduce strain around 30 vein.

Definition drilling to upgrade resource.

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**Lucky Friday Mine Shut Down all 2012 Re-opened Feb. 2013!**

2011 production: ~ 3 million ounces Ag  
2013 estimated production: ~ 1.6 million ounces Ag

- Removed loose material (cement) from Silver Shaft.
- Bypass on 5900 haulage.
- West bypass done; running East bypass around.

298 employees
HECLA MINING COMPANY – DEVELOPMENT AND EXPANSION

# 4 Shaft to extend from 4900 to 8800 level.
Access deep discoveries of 30 vein system.
Ramp up production: 5 million ounces in 2017.

Hecla, Nov. 2013

*Assuming prices of $20.00/oz silver, $0.90/lb lead, and $0.80/lb zinc
U.S. SILVER & GOLD

- Operates Galena mine complex (inc. Coeur mine, Caladay)
- U.S. Silver & Gold
  - Galena mine complex
  - Drumlummon mine, MT (closed)

2013:
- Reduced staff by 30%
- Implemented Small Mine Plan –
  - Reduced # of stopes/levels
  - Increased cut-off grade
  - Coeur on Care and Maintenance
  - Focus on reducing costs/operational improvements

2.1 million oz. Ag in 2013 – forecast
U.S. SILVER & GOLD
GALENA MINE COMPLEX

- Small Mine Plan Focus
- Reduced exploration/development
  - 58,511 ft drilled ug thru 3rd qtr.
- Caladay Zone
  - Production in 3rd Qtr.
  - Added cooling capacity
  - Potential for bulk mining
  - Known mineralization 4900 to 5200 levels
  - Silver/copper
  - Milkshake Vein assay: 10' width, 20 opt Ag

US Silver & Gold, Nov. 2013
Sunshine Silver Mines Corp.
(Silver Opportunity Partners)

2013:
Still Closed.
Very quiet. No word.

Silver Opportunity Partners
2010 bankruptcy purchase
Working on exploration and surface and underground refurbishing.
Late Dec. 2012 – filed notice with SEC of IPO intention - Postponed?

Sunshine mine: 360 million oz. Ag
THOMPSON CREEK MINE 2013
MOLYBDENUM

- Producing from Phase 7 as planned through late 2014
- Suspended stripping for Phase 8
- No exploration planned
- New mine plan; cost reductions
- DEIS Phase 8 out in 2014

Economic mainstay of Custer County
Thompson Creek Metals Co. forecasting about 20 million pounds Mo production in 2013; considering options for future.
PHOSPHATE DISTRICT
Phosphate Rock

- Fertilizer
  - or

Elemental P

Monsanto Elemental P plant

Fertilizer also made at Simplot’s Don Plant, Pocatello

Price of Phosphate Rock Concentrate 30–32% $P_2O_5$ FOB Morocco and FAO Food Price Index (2002=100)

U.S. 21-Year Phosrock Concentrate History

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>46.3 mt</td>
<td>30.7% $P_2O_5$</td>
</tr>
<tr>
<td>2011</td>
<td>28.4 mt</td>
<td>28.7% $P_2O_5$</td>
</tr>
</tbody>
</table>

Stonegate Agricom, 2012

FAO Food Price Index

Phosphate Rock Concentrate Price
MONSANTO: BLACKFOOT BRIDGE MINE

Final production from South Rasmussen mine in May, 2013

South Rasmussen Mine: ultimate pit, 2013

Blackfoot Bridge mine, East Overburden Pile
MONSANTO BLACKFOOT BRIDGE MINE

New Mobile Tipple
Smoky Canyon Panel F (Manning Creek Lease). Constructing new haul road (on right) to connect Panel F to approved, unmined Panel G (Deer Creek Lease)
AGRIUM NORTH RASMUSSEN RIDGE MINE

Backfilling
Panel A

7/1/2013
AGRIUM: NORTH RASMUSSEN RIDGE MINE

New CAT Diesel Shovel

Reclaiming central Rasmussen Ridge mine. Working on water impacts.
PHOSPHATE – NEW MINE PLANS AND EXPLORATION  
(AS OF NOV. 2013)

- **Simplot:** Dairy Syncline (2133 acres of FS lands). Baseline data collection including drilling groundwater wells, proposed land exchange. DEIS 2015?
- **Agrium:** Rasmussen Valley (420 acres, mixed, S end of Rasmussen Ridge) Scoping, baseline data collection, modeling water quality impacts, wildlife impacts, DEIS in 2014. Additional drilling proposed.
- **Agrium:** Husky/N. Dry Ridge (1051 acres), Collecting and analyzing baseline data, drilling for geochemical characterization and groundwater characterization. DEIS 2016.
- **Agrium:** Freeman Ridge/Diamond Creek new exploration drilling plan
- **Monsanto (P4):** N. Caldwell Canyon, exploration drilling after EA approved May, 2013.
- **Paris Hills Agricom Inc.:** Extensive exploration drilling since 2010, groundwater monitoring wells, feasibility studies for underground mine, near Bloomington, Bear Lake County. Feasibility (Dec. 2012)
2013: In permitting stage

STONEGATE AGRICOM (PARIS HILLS AGRICOM)

Paris Hills: Phosphate Mineralization
Cross Section, Looking West

- Deposit is uniform and predictable – Strike length of >3.2km
- Mine plan: Room-and-pillar, cross-seam mining
- Mining equipment: Continuous miners typically used for coal seams

Lower Phosphate Zone
Mineral Reserves*

<table>
<thead>
<tr>
<th></th>
<th>Tonnes (millions)</th>
<th>Grade (% P₂O₅)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven</td>
<td>5.2</td>
<td>30.0</td>
</tr>
<tr>
<td>Probable</td>
<td>4.8</td>
<td>28.8</td>
</tr>
<tr>
<td>Reserves</td>
<td>10.0</td>
<td>29.4</td>
</tr>
</tbody>
</table>

*Source: Mineral Reserves for the Lower Phosphate Zone were prepared as of March 26, 2012 by Agapito Associates Inc., an independent geological and mining engineering consulting firm based in Grand Junction, Colorado. Leo Gilbride, P.Eng., Vanessa Santos, P.G., and Gary L. Skaggs, P.Eng., are the qualified persons as defined in National Instrument 43-101. Additional information is available in a Technical Report on the Paris Hills Phosphate Project filed on SEDAR by Stonegate on March 26, 2012. Additional details are shown on the following pages of this presentation.

TSX: ST, ST.WT
INDUSTRIALS

More stable markets

Correlation to economic upturn

Construction use

Numerous aggregate (sand and gravel and crushed stone) pits not shown on map

2013 – a better year than last
I-MINERALS: HELMER-BOVILL PROPERTY, LATAH COUNTY

- Historic Clay Pits
- Multi-commodity
- Clay (halloysite)
- Feldspar
- Quartz

Exploration Drilling 2013
Kelly’s Hump area, 17 holes
Metallurgical separation/halloysite concentration at UI.

Bulk sample to Georgia
I-MINERALS: HELMER-BOVILL PROJECT 2013

- Consolidated leases with State
- Acquired new mineral lease with State of Idaho
- Mining tailings from former Simplot clay operation
- Trucked to Lewiston
- Local pottery and ceramics use
- Upgrade reserves from probably to proven reserve category
- Challenges of financial markets

WBL Tailings: In Production

Tailings are a fine grained, direct ship quartz and K-spar product for use in ceramic bodies

Permitted under Mine Plan of Operations September 2012 first production October 2012

No CAPEX operating costs consist of screening and trucking

Increased production expected as product gains acceptance
EMERALD CREEK GARNET

New Owner in July, 2012:
Opta Minerals Inc.

Leases on Emerald and
Carpenter Creek and St.
Maries River floodplain

Use jig system in field to
concentrate garnets and send
to main jig plant to wash

Minor exploration in 2013
DIMENSION STONE

TABLE ROCK SANDSTONE

Quarry at Boise, Nov. 2013

IDAHO TRAVERTINE

Plant in Idaho Falls

Continental Buff Travertine
Potter County Courts Bldg., TX
OAKLEY STONE QUARRIES: NORTHERN STONE SUPPLY, OAKLEY MOUNTAIN CORPORATION, SAWTOOTH STONE, OAKLEY VALLEY STONE

Oakley Mountain Corp. (Scrivanich)

2013 – A Good Year!
HESS PUMICE PRODUCTS (US GROUT, IDAHO MINERALS)

Continued growth in 2013

Ultrafine cementitious grouts

JV with Creative Mines – crafted stone product; work on mortar/plaster veneer finishes

Research with U. Utah – ASR and pumice pozzolan study

Wrights Creek mine and plant at Malad
SAND AND GRAVEL/AGGREGATE

- **IGS Study for ITD:**
  *Lithological characterization of active ITD aggregate sources and implications for aggregate quality*
- Concrete Ready-mix Use Up in Boise Valley: Much better in 2013
- Public Works, Commercial
- North Idaho Area – new pits
- Hwy. 95 big user
ENERGY: GEOTHERMAL EXPLORATION

IGS Thermal Gradient Wells being logged near Soda Springs, 2013

= geothermal project

= oil and gas
GEOTHERMAL EXPLORATION:
WALKER RANCH LLC

Walker Ranch LLC (Agua Caliente) – Raft River Area, 2013
ENERGY: OIL & GAS EXPLORATION
ALTA MESA SERVICES LP (ALTA MESA IDAHO)

Smoke Ranch Well with Yanke rig made in Boise
ML Investments 2-10
2 new wells drilled in 2013, New Plymouth
3D seismic survey to start
2 fields: Willow and Hamilton
Partner with Snake River Oil and Gas
Working on permits for pipeline and other facilities
CUP approved by Payette Co. P & Z for hydrocarbon liquid treatment facility and dehydrator, adjacent to existing Idaho Power gas-fired power plant
JULY: NEW IDAHO OIL & GAS CONSERVATION COMMISSION APPOINTEES
Possible commercial production by end of year from State 1-17 well
Other companies leasing and exploring region

Flare from State 1-17 Well Test, 2010
EXPLORATION 2013

Looks good – but ???

Overall Concerns:
Financing, Lack of Investors
Costs Up
Metal Prices Down
Permits/Timelines

General Regulatory Issues:
Exploration Drilling Impacts to Ground Water?
NPDES for recreational suction dredge miners?
Government slowdowns
EXPLORATION 2013 ACTIVE

THE TRUTH IN ADVERTISING MAP

Some great projects – but few had the resources to do much on the ground.
Star 2000 Level drilling plan

- Star 2000 level
- Morning Stoping
- Noonday North Split Vein Surface
- Noonday Vein Surface
- Noonday Resource
- Star 2000 Exploration Drift
- Upper You Like Stoping
- Wilkie Stoping
- Diamond Drill Station
- Diamond Drill Holes
Star/Morning and Lucky Friday Mines

Star/Morning
- Noonday Resource
- 2000 Level
- 2500 Level
- 7300 Level
- 8100 Level

Gold Hunter
- Silver Shaft
- 4900 Level
- 5900 Level

Lucky Friday
- Lucky Friday Expansion

Resource outlines (colored blocks)
Stopes
Star 2000 Level drilling – Noonday drill core

5.3’ @ 8.1 oz/ton silver, 7.4% lead, 7.9% zinc
UNITED SILVER CORP.
CRESCE MINE

Filed PEA and new 43-101 resource: 6 million oz. Ag, with IRR sensitive to Ag prices.

Great Address between Sunshine mine and Bunker Hill mine
NEW JERSEY MINING: GOLDEN CHEST MINE

JV with Marathon Gold Corporation

Murray, Idaho

January, 2013: New 43-101 report, based on 24,140 meters drilling. New resource is 477,000 ounces, a 25% increase from prior estimate. Grade increased to 1.71 g/t. Open-pit and ug.

Popcorn Vein: 22.8 gpt Au 0.5 m thick
Golden Chest mine, Murray, Idaho

Fred Brackebusch retired
EXPLORATION
2013

Precious Metal Projects:

Tara Minerals reported bulk sample on Ponderosa project near Dixie

Black Mountain Resources reported some very high grade Ag intercepts from 2012 drilling on Conjecture Silver project/adit rehab

Shoshone Silver/Gold maintained property positions at Rescue mine

Premium Exploration quiet at Orogrande/Petsite property – management/financing concerns
PREMIUM EXPLORATION: IDAHO GOLD PROPERTY

New Resource

Friday Zone (4/2013):
- Indicated 647,000 oz. Au (20.1 Mt @ 1.0 g/t)
- Inferred 590,000 oz. Au (20.9 Mt @ 0.88 g/t)
LEMHI GOLD TRUST (ISGC)
Lemhi Project

2013: Northern Vertex sold 51% interest to Idaho State Gold Corp.

Large Private Property Footprint
Environmental baseline studies
Monitoring well set completed

2012 and prior 34,000' in 40 core holes, 14 RC holes
Previous work (277 holes)
MERIDIAN GOLD: BEARTRACK MINE #2
TRGS TOUR AT BEARTRACK MINE (AUGUST, 2013)

Mark Hawksworth

Drill by North Pit, Beartrack mine reclaimed overburden pile and pit.
Critical materials for high tech lifestyle and defense.

U.S. RARE EARTHS: LAST CHANCE MINE (MT)

LEMHI PASS DISTRICT, ID and MT; NORTH FORK AREA, ID and MT

13,000 acres of mining claims in Lemhi Pass region

CREOs: Nd, Eu, Tb, Dy, Y
Last Chance vein: Fe-REE-Th

NOVEMBER: More drilling at Last Chance and at North Fork (TREO to 10%; Critical REO > 1 % at North Fork). Analyses by Act Labs.
MIDAS GOLD, INC: GOLDEN MEADOWS PROJECT
Historic Stibnite Mining District – under single ownership

- RESTORE THE SITE
- 100 years of mining impacts, plus fires
- Considerable reclamation to date
- Exploration/Development:
  - 123 drill holes, 11,650 m
  - PQ diameter metallurgical holes, 18 metric tons of samples to lab
  - Resource from drilling historic tailings pile (> 1 g/t Au + Ag)
- Drill Highlights include:
  - YP: 109 m @ 3.28 g/t Au, 18.7 g/t Ag
  - HF: 101 m @3.1 g/t Au, + Ag, Sb
GOLDEN MEADOWS DEPOSIT CROSS SECTIONS

Yellow Pine

West End

Hangar Flats

MIDAS GOLD
The Ultimate Brownfields Site
Bradley mine, 1943

Stibnite: How times change!
Core shack crew

2013 meteorological station

Counting fauna/bugs

Midas’ Activities, 2013
**Otis Gold:** Kilgore Project, Clark Co. Submitted Plan for 1550m of road to access area of good 2012 results (121m of + 1 g/t Au). JV with Lateral at Oakley. Cost-cutting. Epithermal.

**Atlanta Gold:** Soil sampling over Main Shear, Au for gravity separation. HydroClean LLC Water Resources – registered in November. Arsenic removal system works great.

**Terraco Gold Corp.:** Working quietly on Idaho Almaden/Nutmeg Mountain gold deposit.
In Memoriam:
Nick Garshelis (1979-2013)
IDAHO STATE GOLD CO. /GOLD HILL MINING
GOLD HILL MINE, BOISE BASIN

Dump/Stockpile Removal – nearly complete

Custom Placer Mill
- Screens, jigs, screws - gold

Green Mining plus Hard Rock Exploration in 2013
Underground Development:

Two levels – Laxey and Sonneman

Widman Mining Contractors

Drilling Now and over winter

Cleared mill site; did ground magnetics

Massive sulfide skarn/replacements; 9 zones

JV with ISR
NEW
Idaho Geological Survey NEW state geologic map:
• 1:750,000 scale
• 2012
• First-class map for first-class rocks.

Dec. 2013 – Search for new State Geologist and Survey Director

www.idahogeo.org

Thank you.
Slide 1

IDAHO MINING AND EXPLORATION, 2013

Virginia S. Gillerman
Idaho Geological Survey, Boise

December 4, 2013

Slide 2

WHERE HAVE WE BEEN?

Idaho Non-fuel Mineral Production (USGS)

2000 - 2012p

Other
Moly
Silver
Con. S&G

Slide 3

IDAHO BY COMMODITIES

2011 a record
2012 not so good
Other metal prices not good either. Predictable chilling effect on exploration and metal mining. Molybdenum oxide at under $10/pound. In contrast stock market doing amazingly well. S and P 500 up 26% year to date. Layoffs reported in 2013, and state forecaster revised downward their predictions of Idaho mining payrolls for the next couple of years. Luckily a bit more optimism for industrial minerals sector.

The future of mining in US is big topic, so I’ll just confine my remarks to Idaho. As usual, will start in the north in Coeur d’Alene District (aka Silver Valley).

One of top silver producers in world. Mexico, Bolivia, Peru other historic top producers. More recently big mines in Australia, Canada, US as well. Silver Institute estimates 2012 global silver production at 787 million tr. ounces, with much byproduct production from Pb-Zn mines.

In comparison, Comstock Lode (Virginia City, NV) produced about 200 million tr. ounces of silver, but 8.3 million ounces gold (1859-1986, mostly pre-1880). Again, lots of production in earliest years.
Coeur d'Alene District

• One of world's largest silver producers!
• > 1,230 million troy ounces Ag since 1884 (38,267 metric tons Ag)
• + Pb + Zn + Cu + Sb
• Quartz-siderite-sulfide veins in Precambrian Belt metasediments.
• Over a mile deep.
• 2 Operating mines in 2013: Lucky Friday and Galena

2013 – no exploration, definition infill drilling. Working between 4900 and 5900 levels on GH vein set.

Hecla and their contractor spent all 2012 powerwashing the Silver Shaft – about 6000 feet deep. Followed rock burst in main access tunnel in December, and two fatalities in accidents earlier in year. MSHA ordered mine shut down in order to remove all loose material from shaft. Primarily cement leaked out of paste fill system. 110 miners laid off. A big blow to local residents in the Silver Valley. Several subprojects for safety.
Working hard on shaft sinking. Lots of deep ore, hope metal prices up by the time they complete shaft.

2013: Resumed sinking of #4 shaft a $200 million project. Collared on 4900 level. 18’ diameter cement-lined shaft, slow (6-8 feet/day advance). 100 contractors on project. Total project about 40% complete.

Completion of Silver Shaft clean up and installation of new power cable in early 2013, recommence #4 development work. Several other projects under scrutiny (ventilation improvements, mill improvements, Star mine exploration, using 3rd compartment on Silver Shaft for hoisting).
2013 update: Lay off of 100 employees due to high costs and lower prices. Nov. 2013 corporate presentation: Employees cut to 255. 3rd Quarter update: 464,850 ounces Ag at average mill feed grade up 18% Seeing results of cost-cutting measures.

Everyone is at limit of silver prices. Prices down but basic costs not. Need extra effort and planning to keep up. Higher grade (tetrahedrite-rich) zones/veins help.

In “Quiet Period” with hopeful IPO when market improves. In 2012 may have had about 40 people working there.
Thompson Creek mine is major economic driver for Challis and Custer County. 2012 production about 16 million lbs. Mo. Hit hard by moly prices declining from the $12 a pound range to below $10 per pound (Moly oxide). Had to lay off about 100 workers. Bad timing – need a few permits for Phase 8, but mostly it requires large amount of stripping to deepen pit and push back high walls, would expand mine life, but stripping also increases cash costs. Proven and Probably TC mine Reserve: 203.3 million pounds Mo at grade of 0.077% based on long-term price of $12/lb.

Economic underpinnings of southeastern Idaho and an important asset for agriculture in Pacific Northwest. Green are closed mines in reclamation mode. Squares are plants. Red blobs are operating mines.
Though slightly lower than a year ago, phosphate fertilizer prices remain strong – and as long as world food production is a priority, phosphate, an essential ingredient of fertilizer looks good.
Mines: leases from feds and state, as well as private land.
3 companies, 3 plants: 2 fertilizer, 1 elemental (Monsanto, Roundup).
Plants employ 400 people each approximately.
Monsanto plant running at near-capacity, so demand pretty good.

2013 transition for Monsanto:
Concurrent mining (first 5 months of year) at South Rasmussen (10 years operation) and Blackfoot Bridge mine – newly permitted and still finishing construction. About 2/3 ore feed from S. Ras; 1/3 from BFB (higher strip ratio).

Overview (upper left); Start of mining at North Pit (lower left); water management pond (upper right); new mobile tipple (low right) – for ore processing and load out). Mobile by design – can easily be relocated to site of mining as it progresses along strike of orebody.
Also did environmental mitigation:
2600’ of stream bank restoration, and wetland pond creation
Optimized design of GCLL cover system for capping overburden piles and construction of 2 lysimeters for
testing performance of cover systems (designed to prevent storm water percolating into overburden piles).

Slide 18

Simplot mining in panel B and F. Backfilling panel E with waste rock from F (shown in photo). Also constructed Dinwoody engineered cover system over backfill at panel E and put in large-scale lysimeter at Panel E. Ore through slurry line to plant in Pocatello.

Slide 19

Agrium backfilling Panel A – note geology, black phosphatic shale deposited on Permian seabed. Hint of structure. Mining at North Rasmussen since Dry Valley mine (purchased from FMC) was depleted in 2011.
AGRIUM: NORTH RASMUSSEN RIDGE MINE

Mining Panel B
New CAT Diesel Shovel
Reclaiming central Rasmussen Ridge mine. Working on water impacts. (Also NuWest Industries). Ore goes on 13 mile haul road to the old tipple/loadout where it is loaded on rail cars for trip to phosphoric acid plant at Conda. Full Rasmussen Ridge mine started in 1991 and in 1998, Agrium became lease holder. Extension to North Ras approved in 2003 with agreement/ROD that Agrium would address reclamation on South and Central Rasmussen Ridge mines.

PHOSPHATE – NEW MINE PLANS AND EXPLORATION (AS OF NOV. 2013)

- Simplot: Dairy Syncline (2133 acres of FS lands). Baseline data collection including drilling groundwater wells, proposed land exchange. DEIS 2015?
- Agrium: Husky/N. Dry Ridge (1051 acres), Collecting and analyzing baseline data, drilling for geochemical characterization and groundwater characterization. DEIS 2016.
- Agrium: Freeman Ridge/Diamond Creek new exploration drilling plan
- Paris Hills Agricom Inc.: Extensive exploration drilling since 2010, groundwater monitoring wells, feasibility studies for underground mine, near Bloomington, Bear Lake County. Feasibility (Dec. 2012)

Have not done full update for 2013, but overall, agricultural commodity prices more steady than metals. Stable industry. Also major legacy issues due to selenium – another problem not realized 30 years ago and made worse by historic practices (approved by government).

STONEGATE AGRICOM (PARIS HILLS AGRICOM)

2013: In permitting stage Near Bloomington in Bear Lake County, further S than 3 big mines, but same Phosphoria Formation. Project on private plus State lands and minor split estate. Issued federal exploration permits in 2011 and drilled 4 holes. For 2013, Paris Hills Agricom installed aquifer pump test well as part of data gathering for groundwater monitoring. Possible construction of facilities could start in late 2014 on private and State lands. Would be first underground phosphate mine in many years.

Near Bloomington. Paris Hills geology: Phosphoria (Meade Peak member,
same as in north), on overturned limb.
Two zones. Lower one is higher grade.
No longer looking at V zone.
Evaluating underground mine scenario
– 14 year mine life at 10 million tons.
Grade 29.4% P2O5.
2012 – drilling geotech holes and
monitoring wells. Open house
information meetings for locals.

Slide 23

Consistency – small operations,
important locally. This map has not
changed in quite a while. 2013
operators reported a better year with
markets and business up 5-10%. Not a
barnburner year, but had buyers
walking through the door.

Slide 24

i-Minerals continued to work on their
Helmer-Bovill property in Latah
County in northern Idaho. Was major
clay producer in first half of 20th
Century. Land position includes
private and state leases. Completed
first 17 holes in Kelly’s Hump area this
fall, intersecting thick zones of
halloysite in nine of them. (19.7 ft
thick at 13.7% halloysite). Halloysite
clay (same composition as kaolinite)
has unique nanotube structure with
some very high tech applications. Sort
of like nanometer sized sausages you
can stuff with pharmaceuticals,
pesticides, cosmetics, and coat with
various media to enhance their functions as extended release capsules on micron scale. Bulk sampling, will be updating the prefeasibility study. The functional characteristics desired for specific applications can be controlled through selection of nanotube diameter and length. Diameters typically range from about 40nm to 200nm and in a variety of lengths, allowing for a wide range of applications. Halloysite nanotubes can be coated with metallic and other substances to achieve a wide variety of electrical, chemical, and physical properties. They can be filled with such things as active ingredients including many that are used for cosmetics, household and personal care products, pesticides, pest repellents, pharmaceuticals and other agents that could benefit from extended release.
Mid-2012, WGI Heavy Minerals Inc. was acquired by Opta Minerals, an international, vertically integrated industrial minerals company based in Canada. Opta provides materials and process solutions for steel, foundry, abrasive and filtration industries.

2013 – Emerald Creek operated one wash plant on Emerald Creek to extract garnet sands. Reclaim ponds immediately. About 15-20 acres/year. Business good. Emerald Creek is first operating mine for Opta.

USFS – operated tourist garnet digs. So popular, having to limit number of visitors. Open during summers only. Star garnets are prize.

Housing and commercial construction picking up and that is good for Idaho’s dimension stone industry. Table Rock Sandstone was mined from historic quarry above Boise by Gerhard Borbonus Landscaping.

In eastern Idaho, Idaho Travertine’s 10 employees were cutting travertine from their Fall Creek and Medicine Lodge quarries for various jobs from Hawaii to Montana. They have a decent year with the reduced crew. Cutting and finishing plant in Idaho Falls has gang and wire saws and polishers designed for the very large slabs of stone. Custom exterior and interior.
Northern Stone Supply is the largest of 4 producers of Oakley Stone in south-central Idaho. Durable micaeous quartzite flagstone. Demand much better this year. Up about 10% estimated. Weather also good so could work quarries from April 1 to Nov. 15. Comes in colors from gray to gold. Splits into large sheets.

However, another key Idaho quarry, Three Rivers stone in Custer County was inactive as owner L & W Stone was in bankruptcy proceedings.

Hess Pumice has a variety of products companies and researches new uses and markets. Paint industry a major market for pumice; Idaho Minerals produces perlite.

Unimin – silica sand plant at Emmett reported a good year. Volume up a bit, and especially construction/wallboard uses.
Increased construction in residential, commercial and transportation infrastructure is a positive for aggregate producers and concrete producers. Idaho aggregate is largely gravel with local use of crushed stone in some places. Some sizeable highway projects – esp. Hwy. 95 widening between Coeur d’Alene and Sandpoint using millions of yards. In Boise Valley – commercial construction and Hwy. 44 near Star. IGS project nearly done. Report on ITD and IGS website by early 2014: Lithologic characterization of aggregate and its susceptibility to alkali-silica reactivity or ASR. Very interesting mix of engineering and geology.

Project progress summary (early 2013). December 2013 – final report revisions
1. Sampled 37 concrete-certified sources in Idaho (shown on map)
2. Identified and inventoried lithologies present in each source.
3. GIS analysis
4. Mortar bar tests and petrographic analysis
5. Gel pat test (started)
2013 saw more activity on geothermal projects. As reported last year, the Idaho Geological Survey, along with other western surveys is participating in a DOE-funded geothermal database compilation and drilling program. John Welhan, IGS hydrogeologist in Pocatello office is leading Idaho’s project which is ending this year. Finished up with thermal gradient logging on 4 holes drilled last year near Soda Springs.
Commercial geothermal drilling was done in Raft River area where US Geothermal operates a 10 MW binary power plant. A private company, Walker Ranch LLC, drilled 2 wells, reported to be successful. View looking west at Black Pine Range, from Raft River Valley. Two wells drilled, about 4-5000 feet depth. “Successful”

Alta Mesa Services, (a Houston-based private company) drilled 2 of 3 permitted wells near New Plymouth in Payette County. Both are on leases acquired from Bridge Energy who drilled 11 holes in 2010 and discovered commercially viable natural gas deposits, along with some condensate. The holes were around 5-6000 feet deep. Some of the wells require vertical well stimulation – which some protesters have likened to “fracking” and the project has been controversial. Idaho has not had any previous hydrocarbon production.
Idaho has revamped its regulatory apparatus. Modernized rules for hydrocarbon production and exploration, including rules applicable to fracking, should it occur. New Oil & Gas Conservation Commission members represent oil/gas professionals plus landowners, not political entities. IDL has new experienced oil/gas program manager.

I apologize if I left out someone. This is an approximation of which projects for were most active in 2013. Already covered industrials and energy exploration. Will only cover a few projects – starting in the north.
Silver Valley – Hecla Mining has large land package. Past few years 3D digital database for many old mines on land, focused Star mine area last couple years – see inset for Lucky Friday/LF extension and Star locations. 2013 – exploration drilling Jan. – April, 2013. Two parallel veins targeted: Noonday and You Like It veins. Subparallel to huge Morning veins worked historically.

Cross-section View: Mining is occurring at the Lucky Friday expansion area below the old Gold Hunter Mine. Silver occurs in veins with lead and zinc. The veins are nearly vertical and extend to great depths … 2-3 kilometers. The gray areas are mined out and the colored areas show veins with existing silver reserves and resources. 1st Qtr. 2013 Exploration drilling: 19 holes drilled underground from Star 2000 level on Noonday and As You Like it structures.
Some of the typical, undistinguished Belt rocks, laden in mysterious fashion with high grade Ag-Pb-Zn veins. Total of 19 holes for 10,700’ drilled in 2013.

United Silver had announced plans earlier to reopen Crescent mine of which it is 80% owner. Work last couple years on driving new Countess Portal from west side of mountain to explore the 2 veins: Alhambra and South vein with considerable drilling the past few years. In 2013: not much work underground as focused on updating 43-101 resource, prepared by SRK Consulting. Filed in September, the report and preliminary economic assessment (PEA) noted a resource of 6 million ounces Silver, economic at $20 per ounce over 6-year mine life.
2013: Fred Brackebusch retired. New Management. Del Steiner = CEO
Jan. 2013 updated 43-101 resource on Golden Chest, based on 24,140 meters drilling plus ug sampling. Otherwise – pretty quiet

2012 Drilled till June; Stopped by lack of funds
HIGHLIGHT: 7 m true thickness of 10.8 g/t Au in hole GC 12-134. 25 m centers.

Orogrande Shear Zone near Elk City, Idaho. No new drilling in 2013, some assays and resource estimates updated from prior drilling. Financing and management shifts. Like many companies, the first quarter of 2013 was more active but as financing dried up and metal prices declined, less action.
FORMATION CAPITAL CORPORATION: IDAHO COBALT PROJECT

FRUSTRATING YEAR – looking for financing to finish construction on permitted Idaho Cobalt Project, underground Co-Cu-Au mine in Lemhi County. Officially put it on “care and maintenance” by November and got it “buttoned down” for winter. Much progress on pre-development including all environmental permits, and purchases of crushers, mill components, etc. Transportation routes in place and earthworks, as in photo. Pads, etc. May 2, 2013 announcement to defer underground development - due to declining cobalt and other prices and lack of financing. Also sold the precious metals refinery at Kellogg during year and downsized staff.

Slide 45

Feb. 2013: Northern Vertex sold interest for $7.65 million to private company, Idaho State Gold Corp., who is operator.
Baseline studies
Site of Beartrack heap leach mine, operated from 1994-2000, producing over 600,000 troy ounces. Closed at time of record low Au prices. 2012: drilled 21,000’ in 13 holes below reclaimed pit. Back in 2013 for additional drilling. Won BLM’s national Hard Rock mine reclamation award. Trying to see what was left below pit. Active all summer. Deposit mined in two main pits, along Panther Creek Fault zone. Stockwork mineralization, mostly oxidized with a lot of silicification.

Gave a fantastic overview of geology and mineralization, as well as tour of award – winning reclamation. Panther Creek Fault zone.

U.S. Rare Earths started an evaluation of their substantial property position in Lemhi Pass District, which straddles state line Idaho/Montana in Beaverhead Mtns., southeast of Salmon, as well as the North Fork area. No Montana representative today, so Idaho will adopt their project at the Last Chance mine, one of larger and better known veins in district. Mine is only a half mile from Idaho border. Lemhi Pass known as unusually high in Nd (neodymium)
2012 – had done a short drill hole in snow but 2013 started with systematic trenching and channel sampling in Phase I program. 9 separate channel samples totalling 202 feet, and continued with drilling. New management and resources from Texas.

June, 2013 drilling several holes through Last Chance vein, one of largest in Lemhi Pass District. In November, company reported favorable results from the 1500 feet of core drilling and announced a Phase II program for additional holes at the Last Chance, plus new drilling on an area up at North Fork, identified after a summer of mapping and sampling.

Reduced drilling program from 2012 but still very active as move into development and permitting stage. Heavy emphasis on public relations, opportunities for environmental restoration, etc. Complex geology, 3 main deposit areas – Yellow Pine (aka old Bradley pit or gloryhole), West End, and Hangar Flats. Many smaller deposits and exploration areas, shown in blue. Check their website for latest.
Slide 51

Mineralization is proximal to Meadow Creek Fault. Hosted in granodiorite, granitics, and metasedimentary rocks of roof pendant.

Slide 52


Slide 53

Stibnite: How times change!
Kilgore: Otis Gold. 2012 drill results included hole 12 OKR-292 with 121.9 m of 1.04 g/t Au.


Atlanta Gold: Did soil samples on top of disturbed main shear zone and obtained some very anomalous soils (30 samples average 0.075 ppm). Look at bulk sampling next year. Amenable to gravity separation? Also going into water remediation business. Registered a new company, HydroClean LLC Water Resources late in year. Their proprietary system for removing As takes the 900 level tunnel mine effluent containing 2000 ppb As inside the tunnel to single digit ppb As on the other side of the weir, better than drinking water quality.
New Management (after 2 years of conflict at Mosquito) focused on rebranding the company with its new name and focus on the very large porphyry (+2 billion ton) molybdenum and copper deposit in Boise County, drilled for last few years. In August, the USFS released Supplemental EA with stipulations and procedures for avoiding ground water quality impacts during drilling. The SEA resulted from court decision after litigation by environmental groups challenging the original FS decision. On a sad note, geologist, project manager, and great guy, Nick Garshelis died in auto accident in September. See Booth.

Innovative waste dump reprocessing at Gold Hill mine continued. ISGC and Gold Hill in joint venture. Completed waste dump reprocessing and looking at exploring lode targets on the private ground. One of most innovative projects in state. Near Boise, in Boise Basin. Gold Hill mine was largest lode producer. Shut down in 1930’s. Conical cable-tram dumps removed and reprocessed. Free gold and sulfides. Custom placer mill with variety of high tech screens, sluices, centrifugal concentrators, etc. Seasonal operation. Evaluating exploration of hard rock opportunities.

ISGC also has mineral rights to nearby Belshazzar mine. Boise Basin historic production ~ 2.7 million ounces Au, mostly placer.
Thunder Mountain Gold has large private parcel in historic South Mountain District. High grade, polymetallic zinc skarn with significant precious metal credits. Spent busy year driving drift and putting in drill stations etc. on two levels, drilled in past by DMEA. About 2400’ into mountain on Sonneman level (6800’). Laxey is 300’ above. Have 12-16 miners, working 2 shifts.

About 2000 feet in on Sonneman and 600 feet in for rehabing Laxey. Loading DMEA ore to take to stockpile. Working on underground drilling this winter.

Announcement: IGS has advertisement for search for new Survey Director and State Geologist - check with University of Idaho HR openings for details

Reminder: Check www.idahogeology.org to order your copy of Idaho’s new state geologic map. Also find out about other mapping projects, look for oil and gas and mine records, past mining reports, and see who to contact about geology, geothermal, aggregate, mineral deposits and other topics in your area.
Thank You.