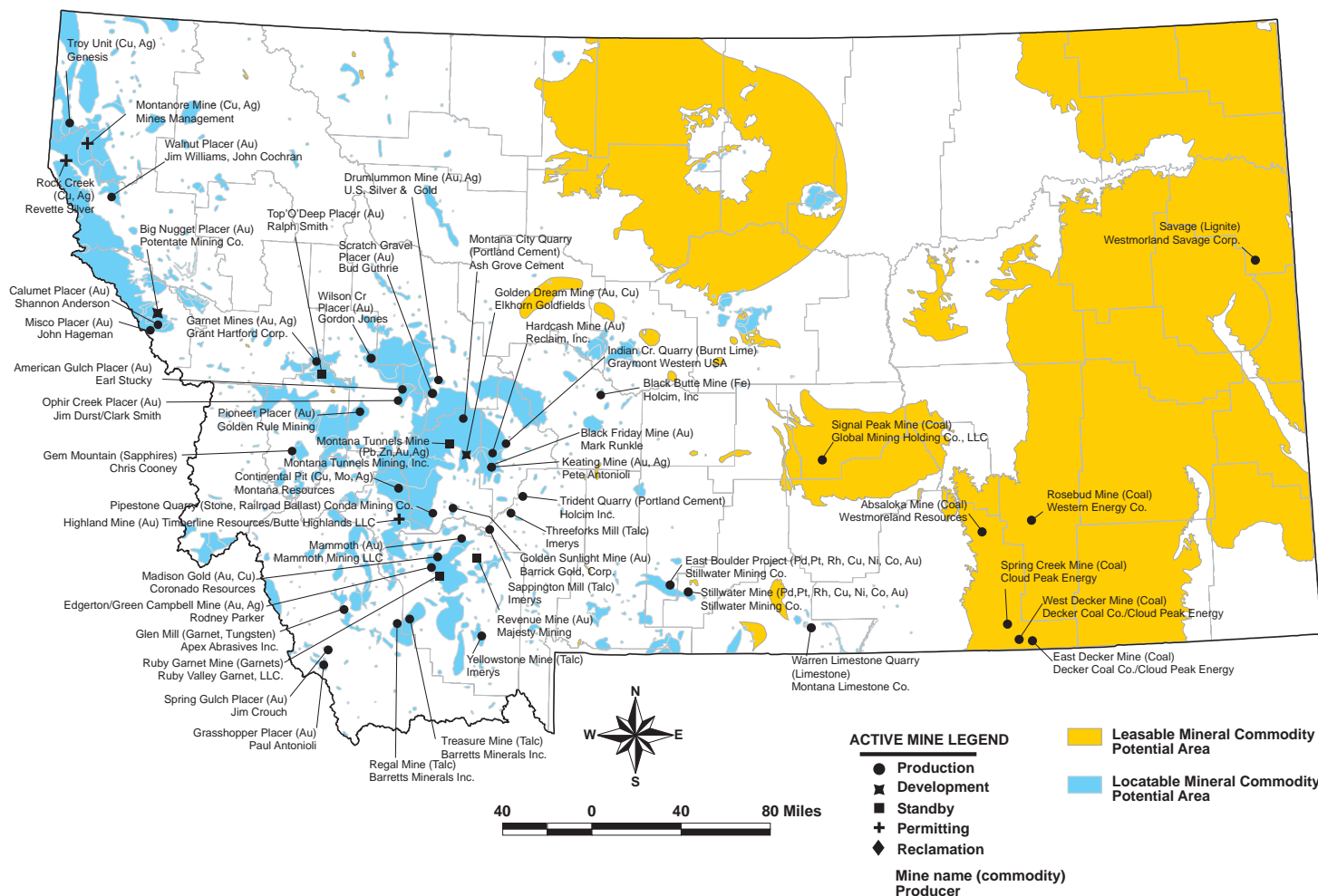


# MINES AND EXPLORATION IN MONTANA—2012

ROBIN McCULLOCH, MINING ENGINEER

In 2012 metal prices were steady and high; industrial commodities showed increases that mirrored the economic recovery rate. Venture capital was difficult to raise for most small to medium companies, hence exploration was very limited.



## Active Mines in Montana—2012

### NORTHWESTERN MONTANA

#### Troy Mine (Cu, Ag)

In northwestern Montana, the Troy mine (Genesis, Inc.), a wholly owned subsidiary of Revett Minerals, Inc., maintained continuous production through November 2012. The company continued development on a decline to the “I” beds (a 2-year project) while driving north to the “C” bed deposits. Grades were steady, as were shipping and labor costs. In an effort to meet changing diesel particulate standards, the company has been replacing rolling stock and is utilizing B75 biofuel, which has lower carbon emissions but is tough on fuel systems.

Pillars in inactive portions of the main haulage failed, and mine access to the new workings was lost.

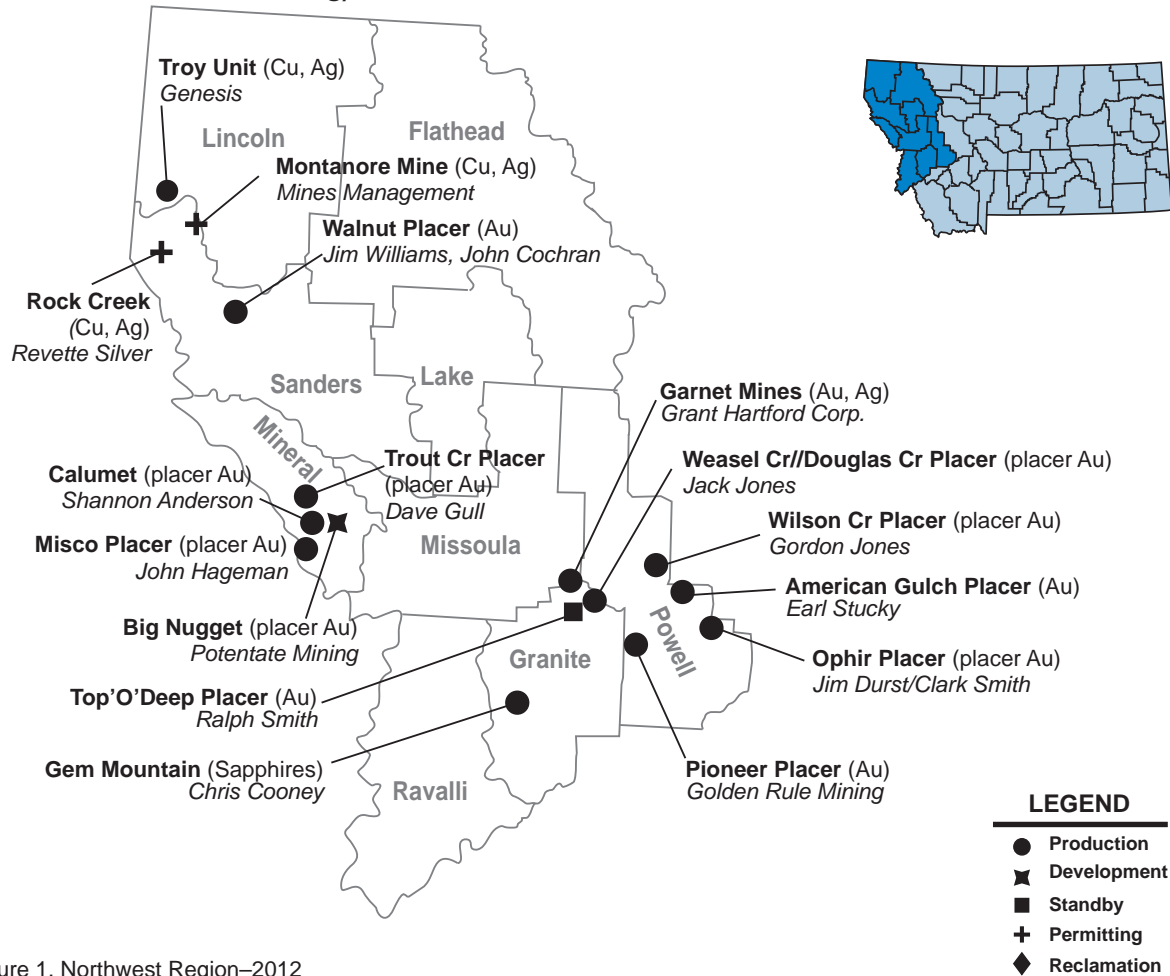


Figure 1. Northwest Region–2012

Early in 2013, a development drift established for inspection of the lower workings was completed. Minimal damage was reported in the active mining areas, and plans are reportedly in preparation for Mine Safety Health Administration (MSHA) approval to reroute utilities, reestablishing full mine ventilation and a secondary escape way. The company hopes to resume operations in April 2013.

Rock Creek Mine (Cu, Ag)

Revett Minerals’ Rock Creek project continues in their 29th year of permitting. The supplementary EIS is in progress and is expected to be completed early in 2013. The company has won many of the critical court challenges and hopes the process will be completed by the end of the year.

Montanore Mine (Ag, Cu)

On the east side of the Cabinet Range, Mines Management, Inc. continues repermitting of the Montanore mine. They are currently focused on the permit’s biological opinion, which is the last step prior to the Record of Decision. With permits in hand, the company will complete pumping of the decline, perform maintenance, and then extend the decline to the original target. That will be followed by an extensive drifting and drilling program to aid in reserve definition and mine feasibility. Development and operations will follow those activities.

Walnut Placer (Au)

Jim Williams and John Cochren operated their placer below Lyon’s Gulch on the Vermillion River near Trout Creek. Their progress was delayed while testing a property in Alaska, but they returned to finish out the year. The pay grades have been steady.

Trout Creek Placer (Au)

Dave Gull successfully mined the remaining reserves downstream from his house. Operations will be moved across the creek after reclamation of most of the existing disturbance. The placer contained bedrock of varying elevations and potholes. Contrary to basic assumptions, the gold appears to be lying above the iron-rich red gravels.

Calumet Placer (Au)

Near Superior on Quartz Creek, Shannon Anderson maintained sporadic work on the Calumet placer but has yet to initiate significant reclamation or pre-stripping activity.

Misco Placer (Au)

Downstream on Quartz Creek, John Hageman mined steadily on the upper bench. Overburden depth is increasing, but John has a good sequence that facilitates concurrent reclamation while allowing steady production. The deposit has yielded some nice specimens of coarse gold.

Big Nugget Placer (Au)

Operations have been put on hold at the Big Nugget mine in Meadow Creek until the new company, Potentate Mining, completes their reserve definition plan. Preliminary results have revealed multiple previously unknown targets.

Garnet Mines (Au)

In the Garnet Mountains near Drummond, Grant Hartford Corporation steadily shipped screened dump material from the Lead King mine most of the year.

They plan to develop the Nancy Hanks mine from the bottom of their decline. Much of the necessary infrastructure, including a surface shop, has been completed.

The Top O'Deep Placer (Au)

The Top O'Deep placer was mothballed during the season while the owner and operator tested other properties.

Douglas/Weasel Creek Placer (Au)

East of Top O'Deep, Jack Jones mined in lower Weasel creek most of the summer. He had good recovery last year and found higher grades in the fractured marble below last year's excavation, but was limited by equipment capability. He is reportedly re-mining the same ground with a larger excavator. Operations were curtailed when a forest fire forced evacuation of the drainage.

Pioneer Placer (Au)

In the Gold Creek drainage near Garrison, mining continued through the summer and fall. Golden Rule Mining Company had a spectacular year. Following a year with MSHA compliance issues, the manager brought the company into compliance and maintained production. The wash plant was upgraded, the recovery circuit was fine-tuned, the stripping cycle was changed to cheaper methods, and a resource definition program was initiated.

Ophir Placer (Au)

Multiple placer operations continued in both the Finn and Ophir Creek mining districts. Jim Durst

worked with Clark Smith on the Ophir Creek placer north of Avon. An initial testing program on the “mined out” ground showed the property to be pre-stripped to the top of the pay gravels. The gold is typically crystalline in nature, some from the bedrock skarn and some from the skarn upstream. A middle portion exhibited native silver annealed on the gold crystals. The deposit was heavily drifted, yielding numerous 36-in-long posts. The most curious discovery was a 30-in-diameter and 22-ft-long fir log found buried in the center of the pay gravels. Extensive work is planned for the coming year.

### American Gulch Placer (Au)

The American Gulch placer on the Stucky Ranch operated with steady success. Mid-summer results were poor until exploration redefined the paleochannel. Old shafts and header piles from underground drift mines were important indicators of the high value areas. Operations are expected to continue for some time.

### Wilson Creek Placer (Au)

Gordon Jones continued to mine a lag deposit from a skarn on granite gneiss. The deposit has variable thickness with limited overburden. The operation is east of Helmsville.

### Gem Mountain Sapphire (sapphire)

Chris Cooney maintained commercial production from the Anaconda bench. The company maintains both commercial production and a hobby facility for the public. They have an outlet for sapphires in gravel along with heat-treated and cut sapphires for retail sales.

## BUTTE–ANACONDA AREA

### Continental Pit (Cu, Mo, Ag)

In the Butte–Anaconda area, mining was steady and prosperous. Montana Resources was impaired briefly by a failure in the Berkeley Pit wall near the main haulage road. Operations added a third 40 Icy, Bucyrus Erie BE-495HD shovel to their fleet and improved their dust collection system at the crusher. Labor has been steady at 350 employees, with the exception of some retirements. Production and grade have been steady.

Their reserve definition project has been very successful in adding 30 years to their reserve base. The new reserves are located between the present pit and I-15. Drilling has been expanded into a 7-year program as they continue to define the faulted blocks of ore in the target area.

### Butte Highland Mine (Au)

Highland Mining, LLC. sold their 50 percent interest in the Butte Highlands Joint Venture, LLC to Montana State Gold Co., LLC. (MSGC) for \$24 million. MSGC will fund the remaining exploration and development until production commences.

The status of the operation is:

- (1) Permitting is complete for surface facilities construction, underground drilling and development, and a 10,000-ton bulk metallurgical sample;
- (2) The infrastructure for production is complete;
- (3) Approximately 4,000 ft of workings have been completed;
- (4) The drill program has been designed and is waiting for dewatering for access;

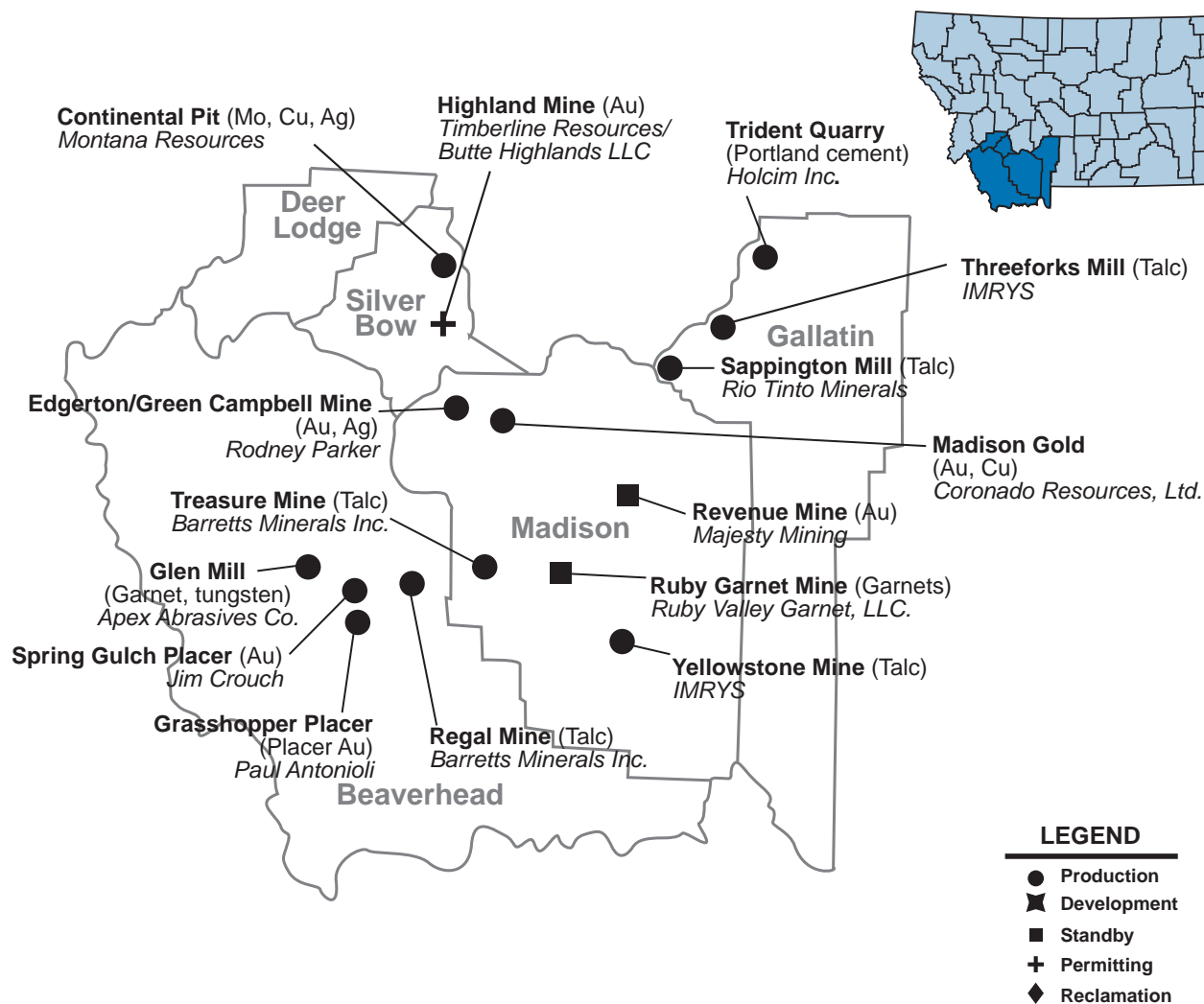


Figure 2. Southwest Region–2012

- (5) The discharge permit for dewatering has been applied for;  
 (6) The modification of the U.S. Forest Service road permit is working through the system; and  
 (7) The DEQ hardrock permit is expected during 2013.

The operation is very well designed and should go through permitting easily. The company should be hauling ore to the Golden Sunlight mill by late 2013 or 2014.

### Madison Gold (Cu, Au)

West of Silver Star, Coronado Resources, Ltd. maintained campaign mining the last of their known gold and copper reserves at the end of the summer. Operations were then closed and the property was sold to Lynx Gold.

### Edgerton/Green Campbell Mine (Au)

Rodney Parker mined dumps at the Green Campbell mine complex for shipping to the Golden Sunlight mine. Grades were quite high in some areas.

### Glen Mill (garnet, tungsten)

South of Melrose, Apex Abrasives, Inc. completed resizing inventory to meet the needs of their customers. By fall they had completely sold all available inventories.

### Ruby Garnet Mine (garnet products)

Garnet USA worked diligently to define their reserves and plan quarry boundaries for the new pit. The mill was reconfigured for the transition from placer to lode source garnet resources. Start-up operations are not scheduled at this time.

### Regal and Treasure Mines (talc products)

Barretts Mineral, Inc., a subsidiary of Specialty Minerals, Inc., continued talc production from two open-pit mines east of Dillon. The company continued to expand their reserve base at both the Treasure Mine and the Regal Mine and drilled 20 holes on two prospects.

At the plant at Barrett's Siding, an air classification mill was added. The company experienced a 10% growth and labor was up 5%. There has been some turnover in staff due to retirements.

### Yellowstone Mine (talc products)

South of Ennis, Imerys maintained steady production of talc for various talc products from the Yellowstone deposit. Labor has been steady, as has the market. The company has continued to increase efficiencies and optimize processes to minimize energy consumption. There has been no construction at any of the Montana Imerys operations.

### Spring Gulch Placer (Au)

Jim Crouch mined placer gold in Spring Gulch, north of Argenta, producing some nice crystalline nuggets. The deposit is a placer overlying a lode gold skarn; values tend to be localized and process water is minimally available in this area.

### Grasshopper Placer (Au)

Paul Antonioli mined gravels on the south side of Grasshopper Creek below Bannack. Overburden ranged from 48 ft to over 70 ft. The pay zone was about 4 ft thick on an uneven, pocket-ridden bedrock.

## HELENA REGION

### Drumlummon Mine (Au, Ag)

U.S. Silver and RX Gold and Silver merged to form U.S. Silver and Gold, Inc. The company has discovered the Frankie vein, a 1.4- to 8-ft-wide vein grading 0.116–0.676 opt (ounces per ton) Au and 2.0–56.19 opt Ag. High-grade intercepts were also found in the New Year, St. Louis, and Pixley veins. Future drilling will also explore the North Star vein.

The company has expanded exploration within the district and has identified potential resources at the Belmont mine. They have also explored areas of the Penobscot mine.

The merger has provided surplus milling capacity at the Coeur Mill near Osburn, Idaho. The company has planned to change milling from the Contact Mill in Philipsburg to Osburn, Idaho, which is a considerable trucking distance.

### Scratchgravel Placer (Au)

Bud Guthrie continued placer production when sufficient water existed. Mining has been limited.



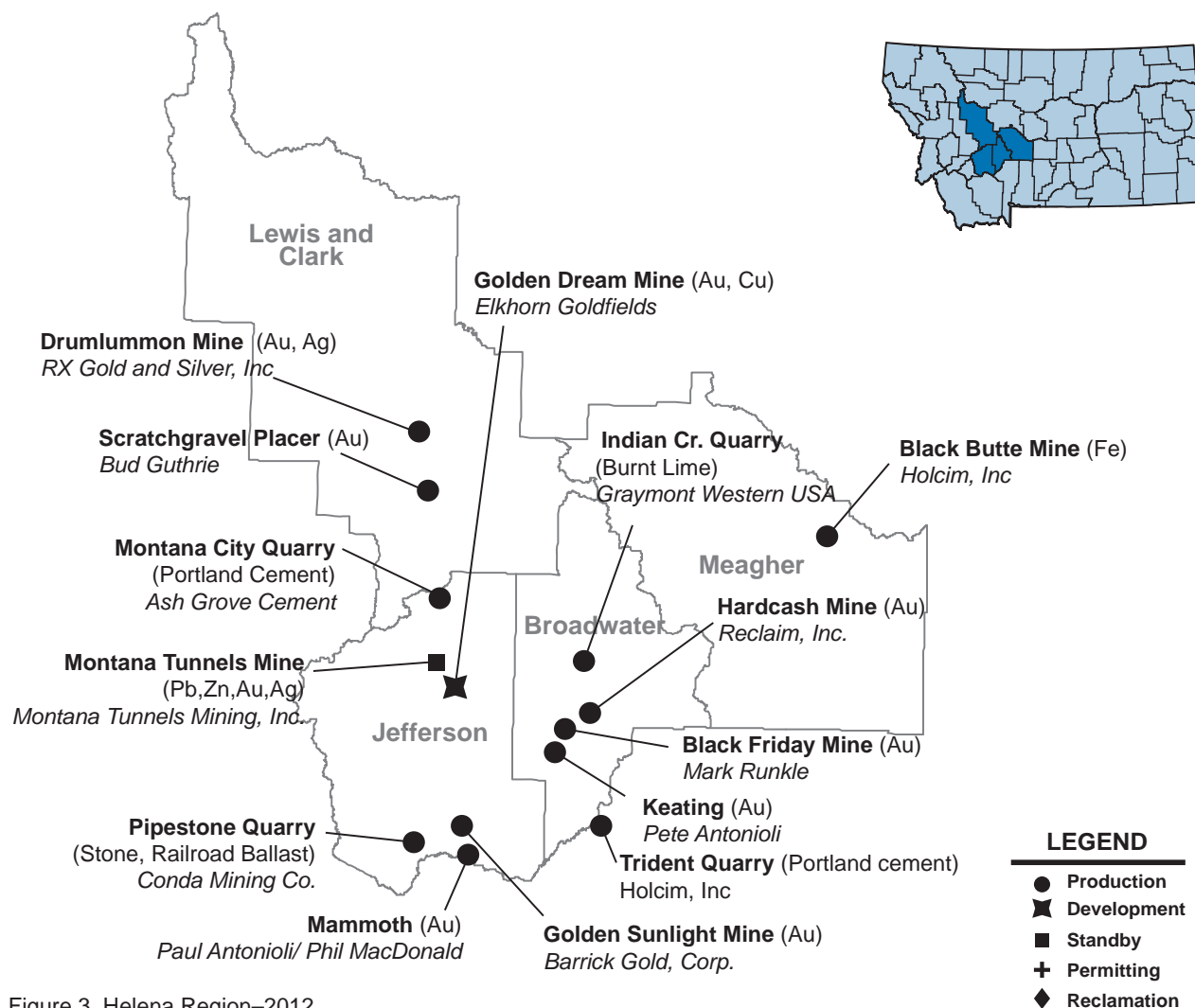


Figure 3. Helena Region–2012

### Montana Tunnels Mine (Au Ag, Pb, Zn)

Operations remained suspended at Montana Tunnels Mining, located west of Jefferson City. The mine is under maintenance until funding is secured.

### Golden Dream Mine (Au, Cu)

Development was curtailed early in the year at Great Eastern Resources' mine near Elkhorn (Boulder) when water was intercepted in the decline. The operation is on hold until funding for a water treatment plant can be secured.

### Indian Creek Quarry (burnt lime)

Near Townsend, Graymont Western US mined limestone and produced burnt and hydrated lime products. The company experienced an improving market and increased output by 50%. The mine has experienced a nearly sold-out condition for the first time in a number of years.

To meet the increasing demand, the company put in a master control center on Kiln 1. A new yard loader was purchased and a stockpile for a blending crusher was constructed. The company increased their personnel by 5% while improving their safety record.

They are working on a memorandum of understanding with the Department of Defense in preparation for when the National Guard (Corps of Engineers) takes over the management of the area from the Bureau of Land Management.

### Black Friday Mine (Au)

Near Radersburg, Joe Schmaus and Mark Runkle continued shipping dumps to the Golden Sunlight Mine. Darko Smilovitch was exploring the option of driving a decline to access remaining resources underground.

### Keating Mine (Au)

Also near Radersburg, Pete Antonioli crushed and screened dumps for the Golden Sunlight Mine.

### Hardcash Mine (Au)

Reclaim, LLC mined ore-grade resources from dumps at the Hardcash mine located west of the Keating mine. The company has developed sampling techniques that have yielded ore with very little variance in grade or tonnage from the estimates.

### Golden Sunlight Mine (Au, Ag)

Northeast of Whitehall, Barrick Gold Corporation maintained steady production in the main Golden Sunlight pit. Grades have been consistent with the drill data. The company is permitting expansion to the north and south in satellite ore bodies.

They have also found more ore near the mill. A new pit is planned 1,000 ft to the northeast where 4.2 million tons have been identified. A layback on the south pit wall will expand reserves in the main pit. They continue to have trouble stabilizing the west wall. All additional reserves will extend the mine life to 2017, not counting additional gold ore from external mines.

### Trident Quarry (Portland cement)

Near Three Forks, Holcim, Inc. maintained production of Portland cement. Demand has grown slowly with the recovering economy. Labor has been steady, but only standard maintenance has been followed. In 2013, the company will modify and improve the crushing circuit at the plant. All Portland cement plants will be financially stressed by the new EPA standards as they modify their processes to meet the new criteria.

### Mammoth Mine (Au)

South of Cardwell, Mammoth Mining, LLC continued production from the old tailings pond of the Mammoth mine. Production has been reduced, while the Golden Sunlight mine scheduled delivery of the sticky tailings to match other less sticky ore shipments for a better feed blend. The company hopes to totally remove all of the 1930s and older mine waste.

### Black Butte Mine (Fe)

North of White Sulphur Springs, Holcim continued to campaign mine the iron ore deposit for flux for the Portland cement plant.



## PARK REGION

### East Boulder Mine (Pt Pd, Rh Au, Cu, Ni, Co)

South of Big Timber, Stillwater Mining Company maintained production at the East Boulder mine. Production and the grade are up (0.3 opt pgm); dilution is under 4%. Labor demand is increasing and they are still hiring. Safety has been a primary objective and the company has initiated a self-inspection program that has saved them thousands of dollars in fines from MSHA.

The tunnel boring machine is on schedule to Graham Creek and is expected to be completed in the first quarter of 2013.

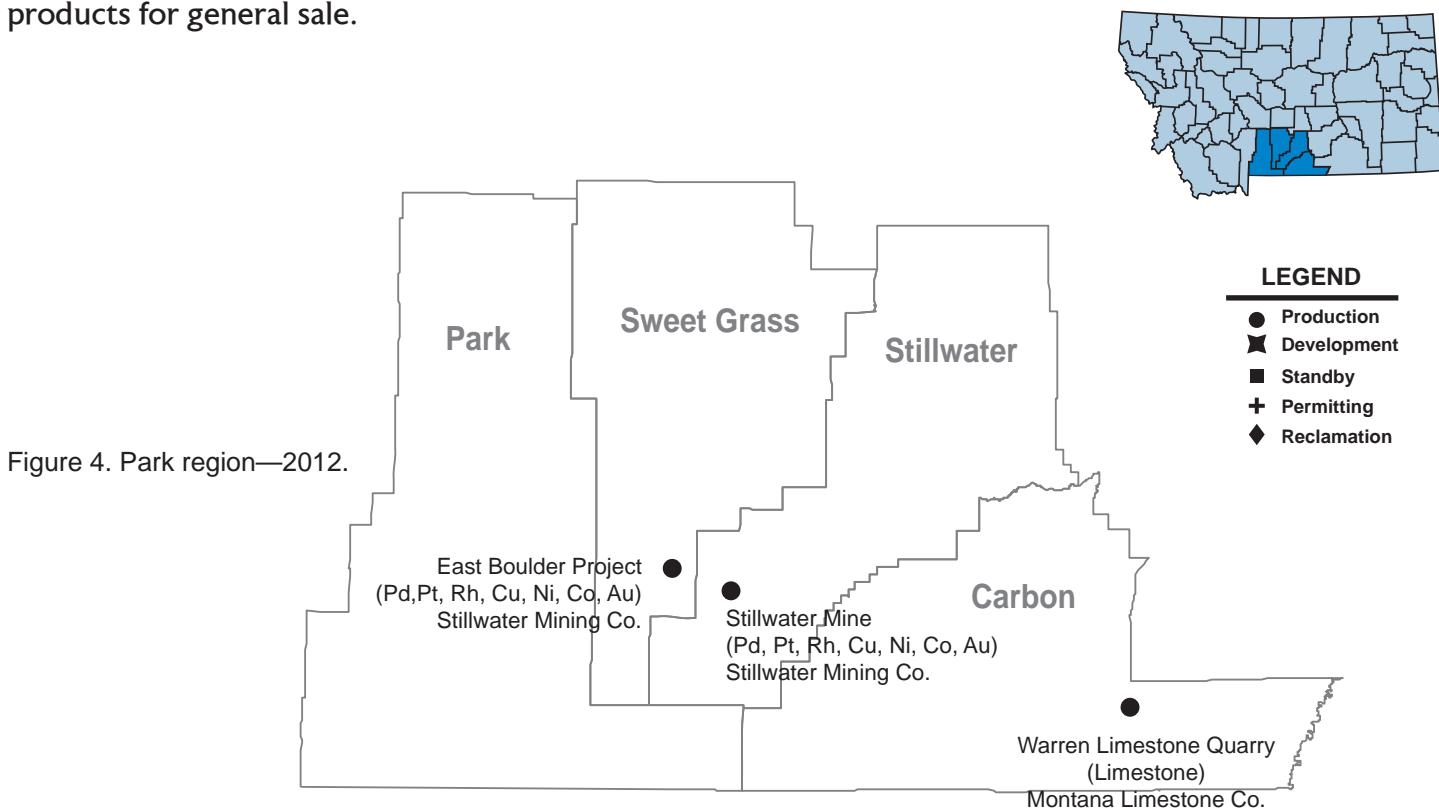
### Stillwater Mine (Pt, Pd, Rh, Au, Cu, Ni, Co)

Southwest of Columbus, the Stillwater Mine has reached a production target of 2,500 tpd. Union contracts have been ratified, and Stillwater Mining Company is focusing on core safety programs and miner training for local hires. Building a workforce from the local area has been shown to reduce turnover. The Kiruna electric truck (30 tons) program is meeting its production objectives while limiting pollution. The company has also started to use stick powder to reduce nitrates.

The Blitz project is up and running as of the third quarter 2012. The company is planning a decline on the east end for ventilation and secondary escape-way. In Columbus, the company is working on modification to the smelter to improve production and efficiencies.

### Warren Limestone Quarry (limestone)

South of Billings, the Montana Limestone Company (a subsidiary of Dakota Coal Company) maintained production of limestone from the Mission Canyon Formation. The company continues to produce limestone for the Western Sugar Cooperative in Billings and Sidney Sugar, Inc., in Sidney, as well as the Wyoming Lime Producers plant in Frannie, Wyoming. In addition, they produce a variety of stone products for general sale.



## EXPLORATION

Metal and industrial mineral exploration increased slightly for placer deposits, while metal lode mine exploration lagged severely behind comparable states of similar mineral wealth.

### JF Property (Au, Cu)

Near the Troy mine, Genesis, Inc. drilled to further define reserves on the JF property.

### Eureka Gulch Placer (Au, sapphires)

West of Philipsburg, Potentate Mining Company completed gravel testing in Eureka gulch. Results are very good, and the company is planning to commence mining on their property in spring 2013.

### Lower Gold Creek Placer (Au)

Near the old dredge tailings of Gold Creek (west of Garrison), Gordon Jones contracted Knife River to test remaining gravels. Initial tests appeared positive, but no future plans have been announced.

### Smart Creek (Cu)

Near Philipsburg, Frank Antonioli continued exploration in Smart Creek. Results have not been announced.

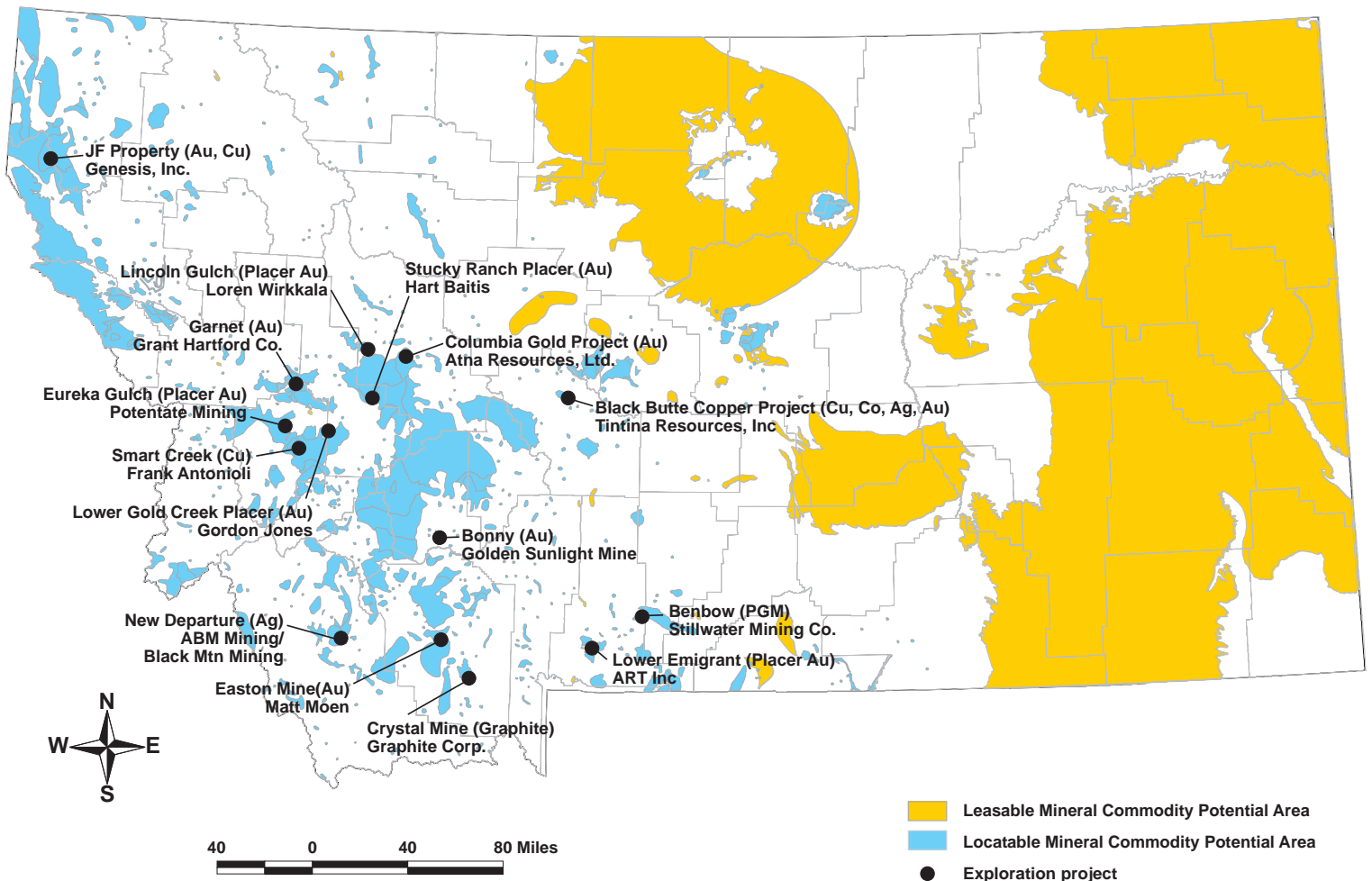


Figure 5. Exploration in Montana—2012.

Lincoln Gulch Placer (Au)

Loren Wirkkala returned to sample gravels in Lincoln gulch. Results were spotty, indicating that the main pay zones are narrow and not easily identified by wide-spaced sampling. Further work is planned in the coming year.

Columbia Gold Project (Au)

Atna Resources, Ltd. drilled seven reverse circulation holes (3, 468 ft) on the old 7-Up Pete deposit located east of Lincoln. The company was after metallurgical samples while confirming down-dip mineralization.

The company is carrying a resource of 741,000 oz of gold. The reserves are 16.7 million tons at 0.45 opt Au (indicated) and 10.7 million tons at 0.045 opt Au (inferred).

Atna Resources has started gathering baseline data to initiate permitting.

Stucky Ranch Placer (Au)

Hart Baitis has developed a testing program on the Stucky Ranch that may include placer deposits near Washington creek and Jefferson creek. The focus of the program is lag gravels on the ridges.

Bonny Deposit (Au, Ag)

Golden Sunlight drilled the Bonny deposit near the microwave tower, north of the Golden Sunlight mine.

New Departure (Ag)

South of Argenta, Black Mountain Resources, Ltd. drilled one diamond drill hole and one reverse circulation hole. The portal of the Laczay tunnel was stabilized, but the main development work planned was not completed. The property has a history of silver production.

Crystal Graphite Mine (graphite)

Graphite Corporation processed a dump at the Crystal Graphite mine located south of Dillon. Results are unknown at this time; the deposit contains crystalline graphite.

Lower Emigrant Placer (Au)

Jeff Frank with ART, Inc. initiated an extensive geophysical exploration program to define and examine gold placer resources on the Pittsburg mining property. Late season trenching identified remaining gold placer resources along Emigrant creek near Chico Hot Springs.

Black Butte Copper Project (Cu, Co, Ag, Au)

Tintina Resources, Inc. continued defining copper resources north of White Sulphur Springs. The company defined the Lowry deposit at 5.1 million tonnes at 2.6% Cu, 0.12% Co, 14.6% g/tonne Ag through infill drilling. Cumulative to date, Tintina has inferred resources of 623 million pounds of copper at an average grade of 3.2%. They have an indicated resource of 533 million pounds of copper at 2.96% Cu. Their measured reserves are at 266 million tonnes at 2.99% Cu.

Permitting for a decline, which will facilitate a metallurgical sample, is planned to commence in 2013. An application for mining is planned in 2014. Many unexplored deposits exist and wait to be drilled.

Benbow deposit (Pt, Pd, Rh, Au, Cu, Ni, Co)

Stillwater Mining Company is working on a number of diamond drill holes located near the Benbow chromite mine. These holes will examine grade and rock conditions that are expected to be encountered by the Blitz project in their drive toward the east from the Stillwater mine.

COAL

Coal production was down by 13% to 36,661,187 tons. Most of the companies blamed the reduction on mild weather that reduced demand as well as increased competition from wind energy. Coal exports to the Pacific Rim have been the first opportunity for market expansion for Montana in years.

Decker Coal Mine

Production from the Decker Coal Co. was up at both mines. East Decker was up 18% to 2,247,873 tons and the west Decker mine was up 64% to 484,570 tons. The mines are operated by Kiewit Mining Group for Cloud Peak Energy and Level 3 Communication. The property is managed by Ambre Energy.

Savage Strip Mine

Westmoreland Savage Corp. decreased production at the Savage Strip mine (lignite) by 16% to 296,454

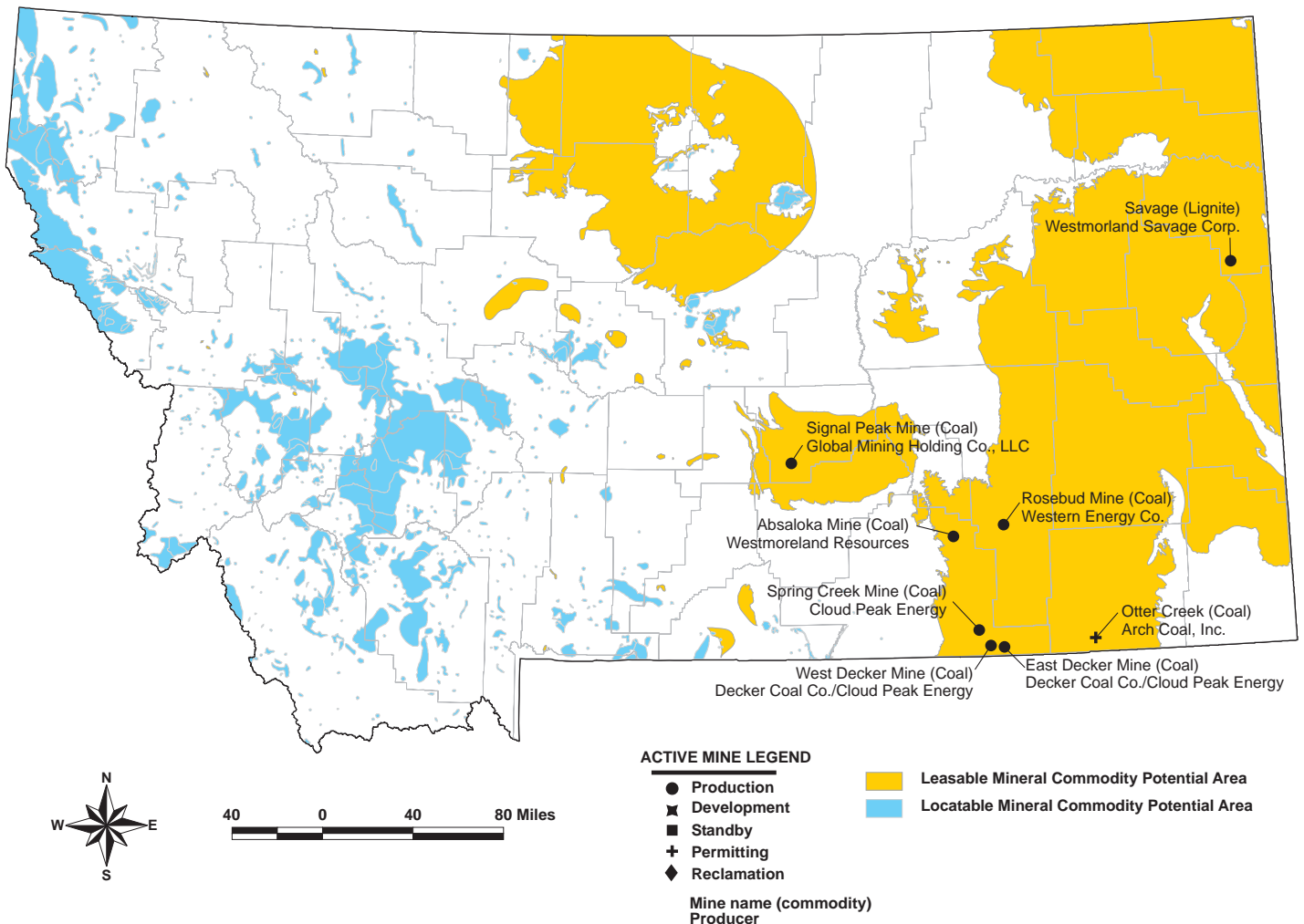


Figure 5. Coal mines in Montana—2012.

tons. Purchasers of lignite range from the sugar plant to the Dakota Utilities mine-mouth generation facilities. Additional causes for reductions of coal demand and resulting production decrease include diminished sugar beet production and mild winter weather.

### Rosebud Mine

Western Energy produced 10% less coal at the Rosebud mine; however, the CELP (waste coal) production was up by 22% to 248,691 tons. The Rosebud production was 7,761,804 tons.

### Absaloka Mine

The largest decline in production was at the Absaloka mine run by Westmoreland Resources. Production there declined by 51% to 2,714,063 tons. Production was reduced matching diminished demand. Other factors resulting in decreased production include a large unplanned maintenance program at the mine and a fire at a customer's facilities.

Westmoreland Resources also announced completion of a lease with the Crow Tribe of 145 million tons.

### Spring Creek Mine

Cloud Peak Energy continued to be the largest coal producer in Montana with a 10% decrease at the Spring Creek mine to 17,200,109 tons.

### Signal Peak Mine

The Signal Peak Energy mine was up by 11% to 5,707,623 tons. They have obtained a lease from the Bureau of Land Management for 35.5 million tons of additional coal.

### Otter Creek Mine

Arch Coal Co. continued to work through a combination of permitting and lawsuits on the Otter Creek coal lease.

## ACKNOWLEDGMENTS

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