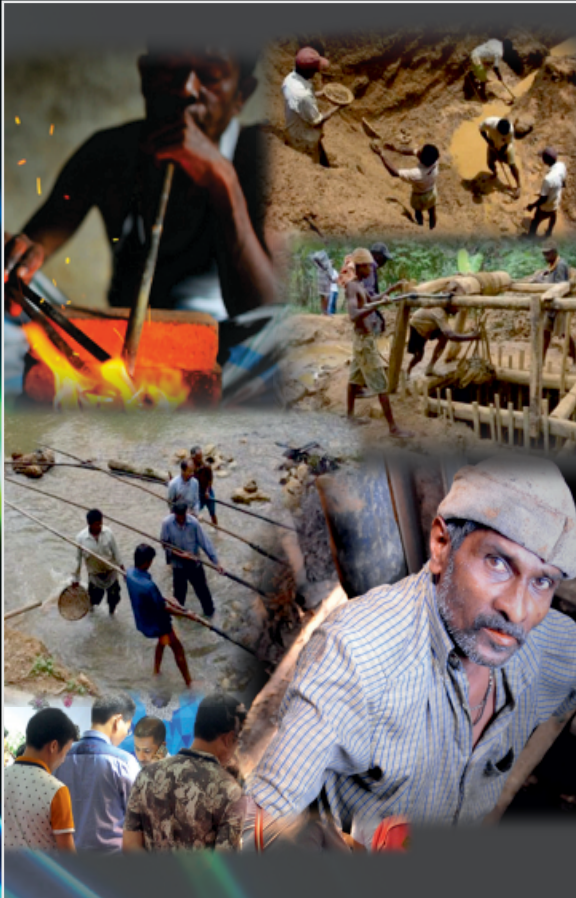


# TNJ COLORS



## Exotic *Sri Lanka* set to Host ICA Congress

44

THE GEM AND JEWELRY INSTITUTE  
OF THAILAND HOSTS EXQUISITE  
GEM CONNECTIVITY GIT 2014

18



A PASSION FOR TRAPICHE GEMS,  
OR A HEXAGONAL OBSESSION?

34





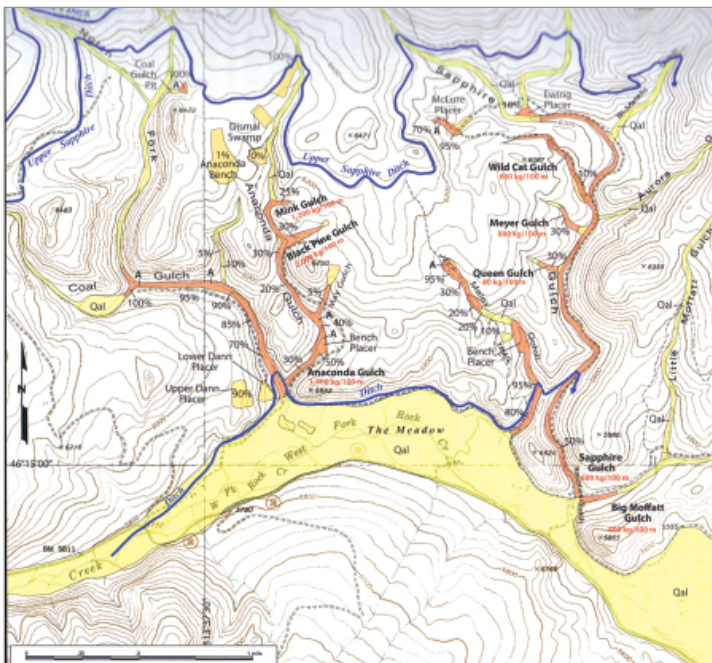
Photo by Warren F. Boyd

An overview of the processing operation at Rock Creek at Eureka Gulch showing excavator, bulldozer, mining dump truck, and the ore processing circuit.

# MINING SAPPHIRES IN MONTANA

By Barbara Wheat Lipatapanlop

Photo Credit: Montana Bureau of Mines & Geology

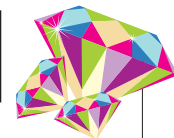


The state of Montana in the western United States has several nicknames due to a wealth of underground natural resources. It is most widely known as the Treasure State in honor of its rich mineral reserves. The western portion of the state rises up as tall, rugged Rocky

Mountain terrain, while towards the east vast plains stretch out for miles. It is the more mountainous areas of Montana that have yielded a fortune in gold and silver since the first substantial deposits were discovered in the early 1860's. Copper was discovered soon after in the hills

of Butte producing 210,000,000 pounds of it in 1896 from a mere five square mile patch of earth. The Rock Creek sapphire district is situated southwest of Philipsburg on the eastern flank of the Sapphire Range in southwestern Montana (Berg, 2014), which is northwest of Butte. Historic information related to production and ownership of the mines is available, with records dating back to the late 1890s. Gold prospectors first found sapphires clogging their sluice boxes in the 1890's but were unsure as to what they were. George F. Kunz, the USGS special agent for precious stones described a brooch on display at the 1900 Paris Exposition made by Tiffany & Co. It contained over 200 Rock Creek sapphires, each of a different shade. Weights ranged from 1.5 to 3 carats. The corundum first mined at Rock Creek supplied Gubelin AG in





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Switzerland with gem bearings for pocket watches and approximately 60 tons were shipped from Montana by the original American Gem Mining Syndicate from 1901 to 1935. Historic records found in the Montana Historical Society Archives show that production of sapphires from Rock Creek exceeds that of all other Montana sapphire districts combined (Berg, 2014). Sites include both alluvial and colluvial deposits, although the distinction between the two types of deposits can be somewhat arbitrary. It can be said that most of the production

between 1903 and 1930 was found in alluvium and was mined by using high pressure water jets, or "hydrauliking." The resulting slurry of rocks and mud containing sapphire was run into wooden sluice boxes. The concentration of corundum was so high that the boxes were cleaned out with coal shovels. Natural gem quality sapphires from Rock Creek represent 8 to 12 percent of the yield and come in a full spectrum of colors including blue, bubble-gum pink, lavender, intense yellow, orange, white, and the highly desirable - though rare - padparadscha. Some natural ruby has been found. Tennis bracelets of natural Rock Creek sapphires showing the full spectrum of colors are particularly popular in the jewelry trade.

The majority of the material found in Rock Creek requires heat treatment before it can be used in the gemstone market. Rock Creek sapphire responds particularly well to heat treatment, transforming blue-

green sapphires to a deeper blue color saturation. In addition to enhancing color, the heat treatment enhances clarity by eliminating tiny exsolved rutile crystals or "silk." Star sapphires are particularly rare at this locality. Potentate Mining LLC, a Montana-based private company, has been mining gold and sapphires at Eureka Gulch for three seasons now. In February, the company acquired close to 3,000 acres of the Gem Mountain historic sapphire area to the south and was engaged in testing and bulk sampling in summer 2014. Career geologist Dr. Keith Barron, who first visited Gem Mountain in 1993, heads up Potentate. Barron says he was always intrigued by the geology of the area and by the fact that productive areas away from the creek beds and described by local miners as "bench placers" were nothing of the kind. Bench placers are gravel bars that are found to the side and above active streams and are parts of



Photo by Jeffery Scovil

Blue Sapphire Rough & Polished: A selection of blue and blue-green Rock Creek sapphires. Polished sapphire from 1.50 carat to 5.70 carat. Rough sapphire from 0.50 carat to 17.00 carats in size.



▲ *Orange and Fancy Sapphire Colours: A selection of orange, golden, and fancy colored Rock Creek sapphires. Polished sapphires from 0.65 carat to 1.60 carat.*

the stream abandoned as it cuts vertically downward through the streambed. At Gem Mountain the bedrock between the drainages is capped with up to 10 or 12 feet of colluvium, which is an unsorted mixture of angular rock, clay and sand known to geologists as a "debris flow," or more commonly to those in the northwest and California, as a mudslide. Over the millennia, through a process called "mass wasting," perhaps 1,000 feet or more of the top of Gem

Mountain has been worn away through gradual landsliding. The sources of the sapphires still have not been found and no one has found sapphires "in situ" within a rock, though Barron says he expects to locate them this coming summer. The unique geology means that most of Gem Mountain is covered by a mantle of sapphire-bearing colluvium from which the gems are easily extracted. This is the target of future mining operations. Potentate does not have plans to

heat treat and polish sapphires as some other Montana vertically-integrated operators have done. The focus will be getting the gems out of the ground to provide the trade with a reliable source of stones. With already two years of mine reserves identified, it seems likely that this area will produce stones for many years to come.

For more information on **Montana Sapphires** please write to **Potentate Mining:**

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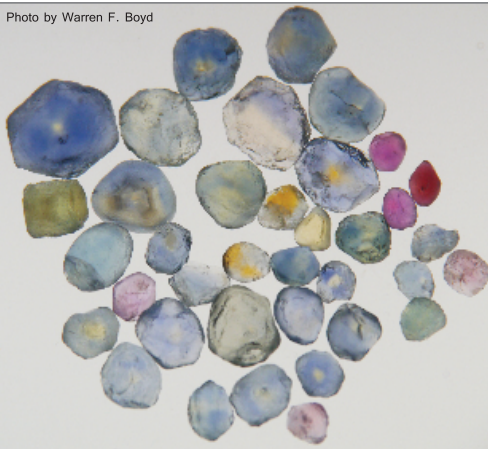
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**Reference:** *Berg, Richard B. Sapphires in the Southwestern Part of Rock Creek Sapphire District, Granite County, Montana. Montana Bureau of Mines and Geology, Bulletin 135, 2014.*

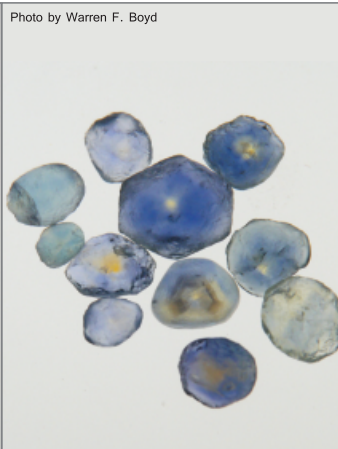
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Photo by Warren F. Boyd



▲ A selection of rough Rock Creek sapphire ranging in size from 0.60 carats to 14 carats in transmitted light under immersion. Sapphires not heat treated.

Photo by Warren F. Boyd



▲ A selection of rough Rock Creek sapphire ranging in size from 1.70 carats to 14 carats in transmitted light under immersion. Sapphires not heat treated.