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GEOLOGY OF THE ENGINEER PASS TO CINNAMON PASS LOOP, WEST OF LAKE CITY, SAN JUAN MOUNTAINS, COLORADO

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[1]Denver, Colorado

If you had visited this area between 30 and 35 million years ago, you would have been here when dozens of volcanoes, similar to Mt. St. Helens in southwestern Washington, were erupting lavas and relatively small amounts of ash. About 30 million years ago, the source and style of volcanism changed to voluminous eruptions of hot, gas-charged ash from large circular depressions many kilometers wide called calderas or cauldrons. The ash formed a thick blanket over the previous landscape and formed the volcanic rocks that are so prevalent in this area. The earliest of these caldrons to form in the Lake City-Silverton area were the San Juan and Uncompahgre calderas, which erupted simultaneously about 29 million years ago. Later caldera eruptions formed within the sites of these earlier calderas and include the 27 million year-old Silverton caldera and the 23 million year-old Lake City caldera. About 10,000 years ago, at the end of the last ice age, water from rivers and melting glaciers cut down through these rocks, forming the landscape and rugged peaks you see today. The route from Lake City to Engineer and Cinnamon Passes begins in the Uncompahgre caldera, then traverses the rim that separates the Uncompahgre and Lake City calderas from the San Juan and Silverton calderas, and returns along the south flank of the Lake City caldera.

Gold was probably first discovered in the Lake City area in 1842 (or ‘48) although no one seems to know exactly where. At that time, all the land in the San Juan Mountains belonged to the Ute tribe. In 1874, a treaty ceded a strip of land 60 miles by 75 miles to the U.S. Government opening the way for mineral development and settlement of the region.

Lake City to Henson

Along Henson Creek, from Lake City to Henson and beyond, the canyon and cliff walls are made up of 27 million year-old volcanic rocks of the Uncompahgre caldera. If you look closely at them, you may see layers that indicate separate eruptions, fragments of other types of rocks that indicate the violent nature of some eruptions, and many other features. You may also notice different colors, such as rusty-looking iron stains, in the rocks. Most of these are due to mineral-rich waters circulating in the rocks causing a breakdown of the original minerals into alteration products.

In a few areas, you will also see slopes of loose rocks, or talus. These rocks have broken off from their original locations and slid down slope due to gravity after the last ice age.

Some of the old mines along this part of Henson Creek include (from east to west) the Mount Morris, Cleveland, Fanny Fern, Joker, Pelican, Grand LaPlata, Risorgimento, Ute-Hidden Treasure, and California.

Henson

(Note that this is private property. Please respect all “no trespassing” signs.)

The Ute and Ulay veins were discovered in 1871, but it wasn’t until after the treaty was signed in 1874, that the claims could be developed. Together, these veins comprise the Ute-Ulay mine which produced mostly silver and lead ore from veins within the 27 million year-old rocks. The main vein can be traced on the surface for 2700 ft. It is about 4 feet wide, on average, but can vary from nearly nothing to 20 ft. Together, the mines near Henson produced about $13 million (at the time of mining) in ore. For most of the mines’ productive lives, gold was valued at $20.67 per ounce. In addition to other metals, about 630,000 oz of gold was produced.

Henson townsite was platted in 1880. The mill site was located in the valley to the east of the dam. The dam provided electric power for the mill and townsite. Ore was hauled to the mill by tram. You may see remnants of old trams and their cables and towers on your journey today.

Henson to Capitol City

Approaching Capitol City, if you look ahead or slightly right, you may notice a rusty stain on the lower slope of Sunshine Mountain. This is mineral alteration and is often an indicator that hot water circulating through the rocks may have deposited metals. And, indeed, there were productive mines at Capitol City including the Capitol City, Yellow Medicine, Excelsior, and less productive mines, such as the Czar, Gallic-Vulcan, Silver Chord, Chord Extension, and Woodstock. Most of these mines contained lead and silver ore. Other minerals such as native silver and native copper, were reported locally. The Gallic-Vulcan mine also has rare telluride minerals. These mines produced between $18,000 and $41,000 before 1909 (Irving and Bancroft, 1911; value at the time of mining).

Capitol City was a 200-acre townsite named Galena City in 1877. Soon thereafter, it was renamed either because its inhabitants optimistically expected it to surpass Denver in size and importance or for a local peak that resembled the dome on a captiol building[2].

Capitol City to Engineer Pass

Beaver ponds, some with well-maintained lodges, are prevalent along Henson Creek. The dams create wetlands and wildlife habitat.

Avalanche chutes are conspicuous on the south side of Henson Creek. Snow avalanches can roar downslope at 40 to 80 miles per hour and clear anything in their path. Notice several chutes cross the creek and start up the opposite side of the valley. At the base of some of the chutes are triangular clearings called fans.

A large red headframe of the Empire Chief mill stands by mine workings on the right (north) side of the road. In 1929 a large avalanche from the mountain south of the road killed 4 people and demolished the circa 1904 mill[2]. The current mill was reconstructed later that year. Abundant pyrite (iron sulfide, also called fool’s gold) can be found in the waste piles. Under certain conditions, pyrite can contribute to acid mine drainage.

A turnoff to the site of the Rose Cabin is on the left. Built by Croydon Rose as a tavern and dormitory, it was one of the first structures in the area[2]. At one time it was famous for its bar and entertainment. If you chose to see the old site, it is recommended that you retrace your tracks back to the main road after your visit as the continuation of the road is very rough.

At the junction of Henson Creek and Palmetto Gulch, is a new log home with a suspension bridge on the north of the Creek. Here, the road leaves Henson Creek to follow Palmetto Gulch for the final ascent to Engineer Pass. Only about 1/4 mi farther, on the south side of Palmetto Gulch, a tiny old prospector’s cabin is preserved.

Within a mile, on the south side of the road at the first switchback, is the old Palmetto silver mine. The mine produced silver ore prior to 1891. Most of the richest silver ore was near the surface. Ore from the 400-500 ft shaft was lower grade. Negligent visitors have misused this site for human waste and trash. Please be considerate and respectful of the environment. At this elevation, waste does not break down for many years.

About 1/2 mi farther west, and only a few hundred feet east of Engineer Pass, on the north side of the road is the Frank Hough mine. It consisted of a shaft with

[2]J. Coleman-Fike, BLM, written commun., 3/21/01.

tunnels (drifts) on four levels, one connecting to an adit or surface entrance. All the workings have been caved for many years. The mine shipped copper and silver ore from 1908-1920. Its total output was valued at $600,000 in 1946. Altogether, it produced 350,000 oz of silver. Presumably, the mine connects with the Frank Hough Tunnel on the west side of the pass providing a haulage way to get the ore to railroad transportation on the west side of the San Juan Mountains.

Engineer Pass

Engineer Pass is also known as North Engineer Pass. Engineer Mountain, the small mountain to the south, is made up of rocks that are about 23 million years old. The ridge north of Engineer Pass was prospected for molybdenum in the 1980's. The rocks are what is left of the neck of a volcano that erupted lava less than 12 million years ago. Glassy rocks indicate the lava cooled very quickly at or near the ground's surface.

Enjoy the view to the east back down Henson Creek into the Lake City caldera, then continue south on the west side of the ridge to a nearly east-west spur. This unmarked side road offers terrific views. To the west, in the distance, the flat-topped mountain is Potosi Peak (el. 13,786 ft.), the pointed summit to the north is Mt. Sneffles (el. 14,150 ft.). Below you on the hillside is the Mineral Point mining district. The hummocky land forms and perched lakes are all indicators of glaciers that sculpted the landscape as we know it about 10,000 years ago. Turn around and look southeast along the ridge to another Engineer Pass, also known as South Engineer Pass. South Engineer Pass was the original route through the mountains until the 1980's. The ridge is cut by veins of silver ore.

Return to the main road and continue to the junction of the roads to Cinnamon Pass and Animas Forks. To return to Lake City, keep to the left to Cinnamon Pass. To the right, a trip to the ghost town of Animas Forks and the ruins of the Gold Prince Mill, which was abandoned in 1917, makes an interesting detour.

Animas Forks to Cinnamon Pass

Glaciers carved a naturally rounded amphitheater, or cirque, on the north side of Cinnamon Mountain. The mountain got its name for its color. From Cinnamon Pass (el. 12,598 ft.), you may notice distinct color and texture changes in the rocks; these are blocks of different types of rocks separated by faults.

Cinnamon Pass to Sherman

Down the valley, in the core of the Lake City caldera, are Sunshine Peak (el. 14,001 ft.) in the foreground and Redcloud Peak (el. 14,034 ft.) in the background. Whitecross Mountain (el. 13,543 ft.) is to the south, outside the Lake City caldera. If you stop at the switchbacks, American Basin is to the south, on the west flank of Handies Peak (el. 14,048 ft.). Near the turnoff to American Basin you will cross a fault and continue in Precambrian granite that is about 1,450 million years old.

Notice the mineral alteration at the head of the valley to the east of Handies Peak. Conspicuous from here to Burrows Park are avalanche chutes off of Whitecross Mountain and beaver ponds and lodges in the Lake Fork.

At Burrows Park you cross a ring fault that outlines the Lake City caldera and pass from 1,450 million year-old granite into about 23 million year-old rocks made up of ash that erupted from the Lake City caldera. To the northwest, you may notice a steep valley with alteration that marks the edge of the ring fault.

Several prospects, including the Napoleon Lode, are in Burrows Park. Some of these were prospected as recently as the 1980's.

Beaver ponds fill the valley on the south of the road. Near the east end of the shelf road, you may notice three narrow avalanche chutes.

Sherman to Lake San Cristobal

Above the old site of Sherman, you will again cross the ring fault of the Lake City caldera and return to Precambrian rocks. If you look carefully, you may notice dark rocks cutting the granite; these are diabase dikes similar to those at Black Canyon of the Gunnison. Reports that Sherman was settled as a placer gold operation may be exaggerated. There is no recorded placer production in Hinsdale County. Placer mining is quite different from lode mining. In a lode, the mineral occurs within surrounding rock which then must be milled and chemically treated to release the mineral. In a placer, the mineral, usually gold, is mixed in with unconsolidated sediments and gravels, and can be separated using water methods.

The trail up Wager Gulch leads to the ghost town of Carson. In its day, Carson Camp produced a small amount of silver and lesser amounts of gold and copper.

Shortly past Wager Gulch, the valley opens up and you will leave the Precambrian rocks. At the bridge over Lake Fork, a granitic rock called monzonite can be seen. This rock cooled nearly 23 million years ago and has been exposed by erosion. Then you will pass into rocks that

were deposited after the collapse of the Uncompahgre caldera but before the collapse of the Silverton or Lake City calderas. If you look closely at the cliffs on either side of the road, you will see the differences between each layer of volcanic rock. Some of these rocks appear contorted or folded. This distortion formed as the highly viscous lava flowed, cooled, and solidified.

Lake San Cristobal to Lake City

Near the north end of Lake San Cristobal, ruins of buildings at the Golden Fleece mine are on the right. The Golden Fleece was one of the better-known mines in the region, in part, because of the unusual minerals found in it. It was discovered in 1874. By 1904 it had produced $1,400,000 in silver and gold ore. The mine operated intermittently until 1919. There was renewed interest in the property in the mid 1960's, but other than a couple of small test shipments, there is no recorded production.

At the bridge across the northern tip of the lake, is the toe of the Slumgullion earthflow. About 700 years ago, the earth came loose and began a slow creep downslope. A much better view of the earthflow can be seen from the highway south of Lake City.

Return to Lake City in the same volcanic rocks that you saw earlier today on the journey up Henson Creek.

For More Information

For additional information you may wish to refer to some of the following. This is by no means an exhaustive list. Most public libraries will have to request these through interlibrary loan.

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