

# Queen Chrome/Red Mountain Mine

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Ground Truth Trekking

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# Mining



**MINE SHAFT** — This HDR image is similar to how it looks after your eyes adjust to the dim light. Snow at the entrance reflects light straight down the shaft, providing some light all the way to the back of this straight shaft, where the mine spreads out along the main seam that was mined. — Get Photo (/photos/mine-shaft/)

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The Queen Chrome Mine (often called “Red Mountain Mine”) operated on Red Mountain near the town of Seldovia from 1942-1944 and again from 1952-1957. The rich chromite deposits on Red Mountain are part of a large arc that runs from the end of the Kenai Peninsula to Sutton. Chromite, an oxide of chromium and iron was refined to produce chromium. In addition to the Queen Chrome Mine, small-scale surface mining of chrome was conducted nearby, and a small shaft was dug at the tip of the Kenai Peninsula at Chrome Bay. Commercial-scale mining didn’t begin until demand for steel alloys shot up during WWII, though the Red Mountain area had been explored and prospected since the start of the 20th century. The post-war fashion for chrome on automobiles drove the second opening of the mine.

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**CHROME BAY MINE** — The geology of Red Mt. crops up in a string of deposits that includes Chrome Bay, where this small shaft gradually collapses. — Get Photo (/photos/chrome-bay-mine/)

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Some of the more recent interest in the deposit has been focused not only on the chrome, but the possibility of manufacturing sand-blasting grit. There are no active leases on the mine and the last geophysical surveys of the area were performed in the 1980's. There is also widespread interest in similar deposits because olivine, the dominant mineral in the deposit, can be ground up and reacted with CO2 to bind it and remove it from the atmosphere.

## Geology

Red Mountain is thought to be a giant blob of cooled magma (pluton) from deep below an island-arc volcano like the volcanoes in the Aleutians. It would have been very deep down - well below the magma that actually erupts to the surface. It's something of a mystery how it ended up stuck in the middle of the Kenai Mountains, but likely it was sitting on top of ocean crust that got pulled under Alaska, and because it stuck up it got scraped off and mashed together with the ocean floor sediment and pillow basalts that surround it.

Though the mountain is named for it's distinctive tan hue, this color is only skin-deep. Much of the mountain is made of the mineral olivine (https://en.wikipedia.org/wiki/Olivine), which is green, but readily reacts with oxygen and CO2 producing the tan color you see. Olivine and minerals commonly associated with it are very rich in magnesium and iron, which is why they're called "ultramafic (https://en.wikipedia.org/wiki/Ultramafic_rock)" - the "ma" is for magnesium, and the "fic" is related to ferric, or iron-bearing. When they weather, the

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resulting soil is not very good for plants (serpentine soil (https://en.wikipedia.org/wiki/Serpentine_soil)). The high magnesium is particularly problematic. As a result, there's fewer plants, and those plants that do survive might be otherwise unknown in the area (like the maidenhair fern (https://en.wikipedia.org/wiki/Adiantum_aleuticum) that's widespread at Red Mt. but you won't find anywhere else in our area.)

Red Mountain was mined because it is unusually rich in chromite (chromium oxide) (https://en.wikipedia.org/wiki/Chromite), which occurs as jet-black layers that commonly stripe the olivine. These layers formed in the original magma chamber as cooling, chemical changes, and flowing magma caused the chromite crystals to precipitate and fall to the floor of the magma chamger (sort of like a snow-storm forming a layer of snow.)

As the red mountain rock was squashed between the sedimentary and igneous rocks that surround it, the olivine and other minerals reacted with water to form serpentine (https://en.wikipedia.org/wiki/Serpentine_subgroup), especially in a band along the edge. Unlike olivine, serpentine doesn't readily weather to red. It can be yellow, green, or black, commonly with a smeared look. Often the largest seams break apart into sharp-edged lenticular fragments, bounded on every surface by minor faults. Serpentine is a close relative of jade, and can have a similar deep translucent green color. In rare cases, small seams of asbestos (also a form of serpentine) can be found.

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One particularly odd bit of geology at Red Mountain is a small protrusion of garnet clinopyroxenite along the northern edge. This rare rock is usually found as isolated fragments floating in basaltic magma or lava - presumably carried in the flowing lava from deep down. Its minerology suggests it forms not in the earth's crust, but below it, in the mantle. No one knows how a rock with such a deep source ended up in Red Mt.

## Further Reading

> "A little Kachemak Bay chrome", Homer Bay Tribune. July 2nd 2009 (http://homertribune.com/2009/07/a-little-kachemak-bay-chrome/)

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