



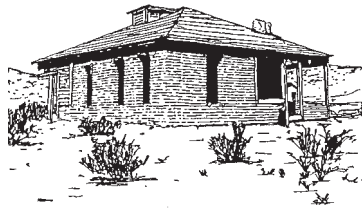
## Mariscal Mine



The Mariscal Mine once bustled as the center of the Big Bend quicksilver mining economy. From 1900 to 1943, Mariscal Mine produced 1,400 seventy-six pound flasks of mercury - nearly one quarter of the total produced in the United States! Now deserted, the mine and its surroundings once provided the people who lived here an income, a community, and a home.

A visit to Mariscal Mine conjures up images of hard-working men, women, and machines. With a little imagination, you can get a feeling for the work of these early pioneers and their contributions to Big Bend's rich human history. The remains of the mine stand today as a symbol of a time when "quicksilver was king" and as a vivid reminder of the cycle of human activities and nature's reclamation.

### The Owners



Farmer Martin Solis discovered the bright red mercury-bearing ore called cinnabar near his farm in 1900, and set the history of Mariscal Mine in motion. Shortly thereafter, local U.S. Customs agent and Boquillas, Texas, store owner Ed Lindsay filed the first mining claim on Mariscal Mountain. The Lindsay Mine produced some ore between 1900 and 1905, but Lindsay encountered numerous difficulties. Transporting the cinnabar ore 30 miles by mule was costly and a lawsuit challenged his ownership of the property. Subsequently, Lindsay sold his interests to Isaac Sanger of Dallas in November 1905. Only four years later, Sanger's Texas Almaden Mining Company closed due to a worldwide economic depression.

World War I created demand for mercury because it was required in the manufacture of blasting caps and bomb detonators. Subsequently, W.K. Ellis, a Midwestern inventor, purchased the mine in 1917. He built a four compartment ore bin that fed into three stationary retorts, or glazed tubes. The Ellis Mine produced 894 flasks of mercury, but when prices plummeted at the end of the war, Ellis wisely sold the mine to William "Billy" Burcham. Structures from this early phase of cinnabar ore processing are visible at the lowest level of the Mariscal Mine complex.

### Life at the Mine



Between 1919 and 1923, Mariscal Mine employed 20 to 40 people. The miners were Mexican citizens who had walked into Texas to escape the Mexican Revolution. Only the manager, foreman, and brick-kiln specialist were American.

Newly-arrived miners usually lived in brush shelters at the foot of Mariscal Mountain. As time permitted, they gathered rocks and built houses. Their wives planted and cared for small vegetable gardens near Fresno Creek. Most of the ruins you can see today were one to three room houses, built between 1919 and 1923. During 1942-43, the Vivianna Mining Company built ten concrete and stucco homes for the miners. Ironically, they were probably never occupied as the mine never realized its potential.

Water for the community was obtained from shallow, hand-dug wells along Fresno Creek, about a mile north of the mine. Mexican freighters also hauled large quantities of water to the mine from Glenn Spring, ten miles north of Mariscal Mine.

In the summer of 1919, Burcham and several New York financiers formed the Mariscal Mining Company. Naming the company after the mountain it rests upon, Burcham opened the mine and invested in modern equipment and refining methods to increase efficiency and production. The large Scott Furnace and elaborate concrete condenser system that stands above it are the remains of the Mariscal Mining Company. Unfortunately, the system proved to be not so modern or as efficient as hoped. The declining mercury market doomed the mine to failure, and it closed in 1923.

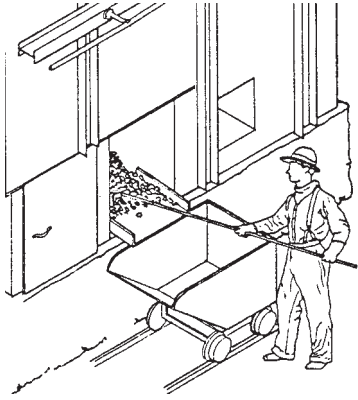
At the beginning of World War II, Burcham reopened Mariscal Mine under the name of the Vivianna Mining Company. He installed a 30-ton Gould rotary furnace. The high prices he anticipated for mercury did not materialize, and the mine closed for the final time in 1943, just a year before the establishment of Big Bend National Park. All items of value were sold at auction. Ironically, some of the mercury-soaked bricks from the Scott Furnace were processed, yielding a considerable quantity of mercury.

Working six days per week, experienced miners were paid up to \$1.50 per 10-hour shift while less-skilled laborers earned \$1-\$1.25. Most of the miners' earnings returned to the mine owners via the company store, which provided supplies. Each employee also contributed \$1 per paycheck to support the resident doctor in return for medical care.

Mariscal Mine and its community depended on the Mexican freighters for all their supplies, including firewood for the Scott Furnace. The freighters hauled extracted mercury from the Mine to the railhead at Marfa for \$1 per flask.

The work of digging cinnabar ore by pick and shovel from the depths of Mariscal Mine and then heating it to render mercury was both difficult and unhealthy. Many miners succumbed to mercury poisoning from handling the ore. Those who worked around the Scott Furnace often became "salivated," meaning they produced abnormal amounts of saliva. Most veteran furnace men had no teeth and developed chronic respiratory problems from mercury fumes.

## Mercury Processing



Cinnabar, the ore containing mercury, must be heated to release elemental mercury from the compound mercury sulfide. To do this, the Mariscal Mining Company built the large Scott Furnace, the remains of which you can see below three large condensers on the hillside. Built of bricks made from local Pen clay, the furnace originally stood 20 feet square and 40 feet tall. Almost a year of steady burning was required before the porous bricks were adequately saturated with liquid mercury to allow commercial production to begin.

During the Mariscal Mining Company period, the ore burned in the 360°F furnace, where the mercury vaporized. Workers tended the furnace from a scaffold where they periodically inspected its interior by looking through peepholes covered by removable iron plugs. Each hour of the day and night, a furnace man at the bottom withdrew a quantity of burned ore, or slag, while a second man at the top quickly replaced it with a like quantity of unprocessed ore.

A system of several condensers was used to recover the mercury. Mercury rich exhaust from the Scott Furnace was carefully routed through each condenser by way of iron pipes. These chambers trapped the mercury fumes until the temperature dropped sufficiently for the mercury to condense into liquid.

Little mercury was recovered in the first two condensers due to the high temperature of the vapor. But by the time the gas reached the third and fourth chambers, it had cooled adequately for the mercury to condense. Less recovery took place in the remaining structures and only a trace of mercury was lost out the 30-foot tall smoke stack beyond the final condenser. The liquid mercury settled into the wells of the slanted condenser floors, dripped out of a pipe into a three-quart iron flask, and was ready for market.

## Reaching the Mine

Mariscal Mine, a National Register Historic District, is located on the northern end of Mariscal Mountain, deep in the interior of Big Bend National Park. Easiest access to the area is via the River Road east, which begins just five miles west of Rio Grande Village.

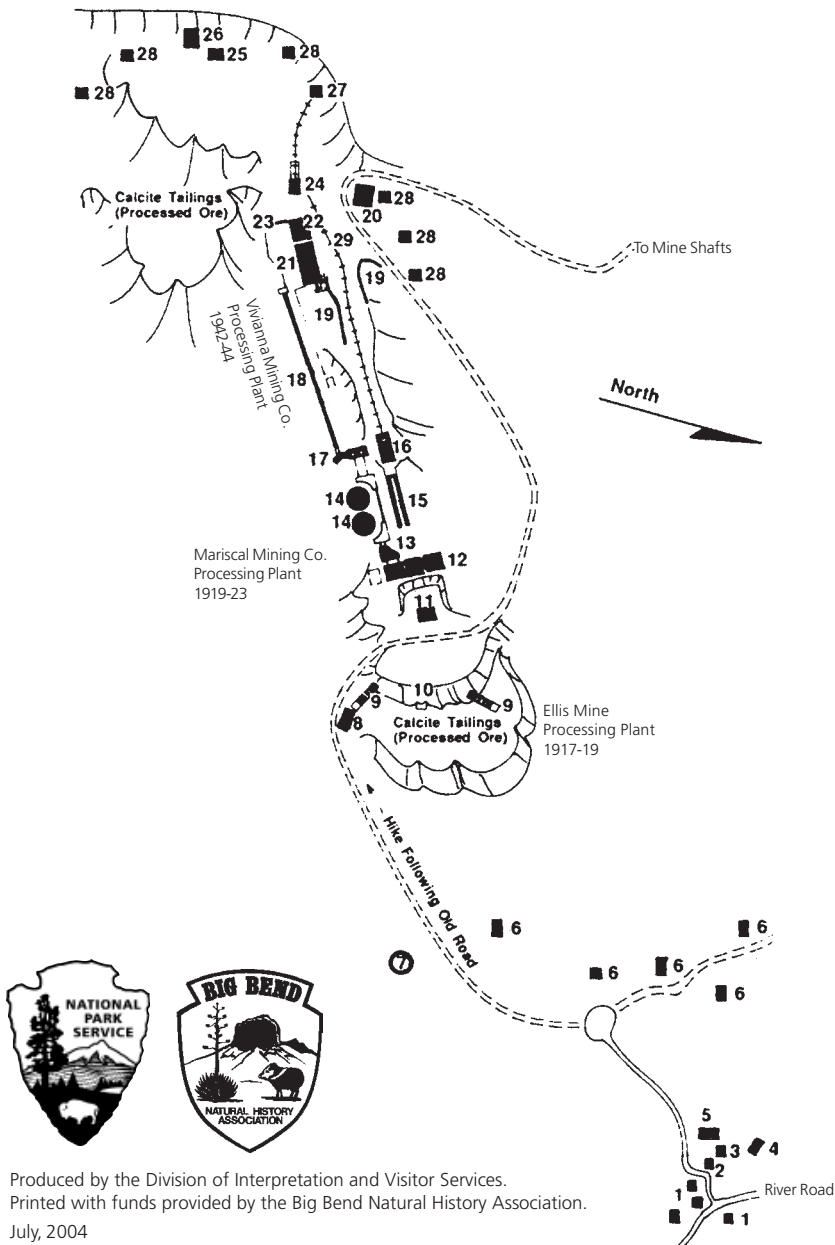
High clearance or four-wheel drive vehicles are recommended for traveling this dirt road; check with a park ranger for current road conditions before setting out. Allow at least one-half day for the excursion.

## Safety Precautions and Regulations

Use this guide and the map below to guide you as you explore the ruins of Mariscal Mine. While exploring the area, remember to leave all objects in place in the park; **collecting is prohibited**. Because they are old, fragile, and unsafe, please stay off the structures.

**Avoid handling the bricks of the Scott Furnace and condensers or handling mine tailings as they may contain poisonous concentrations of mercury.** Finally, be careful around the mine shafts; although most are fenced, they are vertical and deep, and other unfenced shafts may exist in the area.

## Map of Mariscal Mine National Register Historic District (not to scale)



1. Houses (Vivianna Mine Period)
2. Mine Superintendent's House (Mariscal Mine Period)
3. Adobe warehouse (Mariscal Mine Period)
4. Unfinished Commissary (Vivianna Mine Period)
5. Company Store (Vivianna Mine Period)
6. Miner's homes (Mariscal Mine Period)
7. Brick kiln (Period Unknown)
8. Mariscal Mining Company commissary & paymaster's office.
9. Ellis Mine Condensers
10. Other Ellis Mine retort  
Condensers are buried under tailings.
11. Scott Furnace, 1919 (Mariscal Mine Period)
12. Three Main Condensers (Mariscal Mine Period)
13. Secondary condenser (Mariscal Mine Period)
14. Foundations for two redwood tanks. Vapors were routed through tanks to condense mercury vapors. Wood was considered superior to rock or concrete for mercury recovery. (Mariscal Mine Period)
15. Lower Ore Bin. Ore was delivered across the open space via rails and fed into the Scott Furnace. Railway, timbers, ore bins, and equipment were removed during the 1950s. (Mariscal Mine Period)
16. Large platform, part of ore delivery system. (Mariscal Mine Period)
17. Final condenser and exhaust stack. (Mariscal Mine Period)
18. Cement conduit was covered with ceramic tiles and served as a final condenser. (Mariscal Mine Period)
19. Rock walls built to stabilize the slope. (Mariscal Mine Period)
20. Blacksmith shop (Mariscal Mine Period)
21. Offices. Note the reuse of ceramic tiles and bricks from earlier mining periods. (Mariscal Mine Period)
22. Ore bin (Vivianna Mine Period)
23. Gould rotary furnace & condensers platform. (Vivianna Mine Period)
24. Platform for hoists. (Vivianna Mine Period)
25. Compressor foundation (Vivianna Mine Period)
26. Possibly a generator foundation (Vivianna Mine Period)
27. Main Shaft
28. Mine entrance or inclined shaft. Used as secondary access tunnels or ventilation shafts.
29. Railway to carry ore. (removed in the 1950s)