

BONANZA OPAL MINES, INC.

FEE DIG HOST MANUAL

2010

What is a “Fee dig host”, anyway?

The Bonanza, like a few other mines, opens part of its operation to the public, and charges a fee for the privilege of digging. Customers, because they pay a fee to dig, are called fee diggers. An individual who oversees the fee dig operation is a Fee Dig Host, in much the same way as a campground host oversees the monetary and usage aspects of a campground.

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Provided for Hosts-

By far, the most unique and valuable privilege bestowed upon Fee Dig Hosts at Bonanza is the ability to mine for opals on the same basis as the shareholder/owners.

Fee Dig Hosts are a team of two, or a couple, which means that one of the two can mine for opals most of each day. Bonanza Opal Mines, Inc. shareholders mine on a share basis; **half of the opals found belong to the mine.** The same “split” is required of Fee Dig Hosts for any opals found. The mine’s half provides the funds to operate heavy equipment and pay other mine expenses.

The Bonanza is located in Virgin Valley in Humboldt County, northwestern Nevada. Access is from NV State Hwy 140, about 30 miles west of Denio, NV. Prominent highway signs mark the gravel road turning south into the valley.

You will bring your RV to the Bonanza mill site, which is 2 miles on the good, graded gravel road from paved State Hwy. 140 and ¼ mile south of the BLM campground, on the left fork after the road turns south. (The left fork is marked for “Rainbow Ridge”) A site for your RV will await you at the mill site. Included is 30 amp electricity, so if you use a 50 amp cord, you’ll need to bring an adapter. Water is available to fill your tank, or to connect by hose to the mill site system. A dump station is provided, but there is no sewer hookup. Your stay at the mill site is free.

Wifi is available at the mill site. There is also one land line telephone to be shared, and all calls are long distance. Bring a phone card. Cell phones do not function in the valley.

You are expected to host fee dig activities at the mine five (5) days per week. The mine will be closed to the public each Monday. Your other free day must be either Sunday or Tuesday. This is your choice, but must stay the same through out your time as host. If you wish, you may also use your free days to mine for opals.

What you will need—

Motorhomes and trailers cannot be taken to the mine itself, which is 5 miles from the mill site. You should have another vehicle for commuting to the mine and back each day. (any passenger car or pickup, etc. will suffice)

Limited foodstuffs and fuel is available at Denio, approximately 30 miles distant. Serious shopping is at Lakeview, OR (95 miles) or Winnemucca, NV. (120 miles) This means you should bring all food, beverages, medications, and other necessities including propane and motor fuel, for the length of your stay.

Weather in the Virgin Valley can vary greatly, as is common in all Great Basin areas. Generally, the extremes are on the warm side. Nonetheless, you should have jackets and warm clothing for early mornings, or days when it is windy. Rain showers are usually brief and if heavy or prolonged, everyone vacates the mine. Sun protection is a must –

besides sunscreen lotion, broad hats, and even long-sleeve, light-colored shirts may be helpful. UV is intense at the 5,200' elevation of the mine, and sunglasses may be helpful. In July and August, the hottest months, temperatures from time to time can reach 100 degrees. In early June and late September, for a short period at daybreak, temperatures can drop below freezing, or even into the 20's.

Because the ground at the mine is loose and uneven, sturdy footwear is a must. If you intend to dig in any clay bank, ankle-high boots are required for safety.

You probably have TV in your rig. The only reception in Virgin Valley is via satellite. While a revolving lending library is maintained at the mill site, you may wish to bring adequate reading material of your choice.

Duties –

1. **Safety.** The first and primary duty of everyone at Bonanza Opal Mines, Inc., is safety. For you as the host of the fee dig operation, safety begins on a personal basis. The Virgin Valley boasts the sagebrush of the Great Plains, complete with its fauna which includes, rarely, scorpions and rattlesnakes. There are no outdoor lights at the campground, and you will be expected to use common sense.

Driving to and from the mine each day on the gravel road should be done responsibly. Sheldon National Wildlife refuge, in which Virgin Valley is located, imposes a 35 mph speed limit to reduce washboarding and because there are corners where sight distance is limited. The last mile of road to the mine itself is rough, and a speed of 10-15 mph will allow passage without damaging vehicles, or the roadway.

Once hosting at the fee dig area of the mine, your responsibility is to see that fee dig customers remain within the marked digging area. You should also observe the progress and general health appearance of fee diggers, who may not understand the effects of heat and bright sun.

EMERGENCIES- Contact the mine manager, or have someone else immediately contact the mine manager, or the nearest shareholder.

There is an automated Defibrillator at the mine site, and another at the mill site.

Phones- The nearest phone is at the "blue house", which is just off the main gravel road, ¼ mile west of the short road up to the mine. If you haven't located the blue house, ask someone to point it out to you. Time from the mine to blue house, 5-8 minutes.

Next nearest phone is at the Bonanza millsite. Time – 15-20 minutes.

A 911 call will likely result in medical help being dispatched from Winnemucca, 2 ½ to 3 hours away. In some instances, a paramedic may be present closer, or in Denio.

Preventative- You may want to observe any unsafe usage of digging tools, and suggest proper usage in any instances. Generally, this is not a problem. **Most important is to remind customers to drink lots of water, and avoid getting overheated or dehydrated.**

2. Open the mine at 8:00 am each day. After opening the gate at the edge of our patented mine, proceed to the “canopy” and set out the opals, hats, t-shirts and other items for sale. You will have a cash box complete with funds for making change, which will be counted out to you beforehand, and which will remain your responsibility. You will also have a clipboard with Liability Release forms, which must be signed by **each** fee digger. You will receive fee dig monies, make out a receipt in the receipt book, and deliver a copy to the digger. Forms for this process, including sourcing inquiries, are constantly being improved, and the current system will be explained to you. It is not complicated. The greatest challenge can be when several fee diggers arrive simultaneously. Even then, good nature and courtesy always win out.

You will also have a sign-in sheet for shareholders. There is also a list for verifying shareholders, if you are in doubt.

You will be advised as to prices for the various items for sale.

One of your duties is to make sure that the 5-gallon water containers at the canopy are adequately supplied with water and ice. This usually means that one of the containers must be returned to the mill site each night, and the ice and water within replenished. There are other small components of duties which vary, and will be explained to you.

There are a number of plastic chairs at a long table under the canopy. This is the only shade.

Many fee dig customers have no experience. It is to the benefit of the Bonanza, and the customer, if the digging experience is both productive and enjoyable. So, some basic instruction should be given to customers. Many have no idea what the opal they are likely to find looks like. Many also have no idea of how to be most effective in looking for the opal. You will be carefully instructed by the mine manager in these areas, in order that you can be both knowledgeable and helpful. (If you’ve had no experience, this will help *you* find opal also) Remember, a happy customer is a repeat customer. All contacts should be positive, and delivered in a good-natured manner.

It is proven that the miner who visually inspects, in a careful and methodical manner, the most surface area will find the most opals. Digging holes may not expose the most

surface area. Careful raking in an arc, beginning at the base of a pile, does expose the most area.

You will be asked many questions by the fee dig customers. These will range broadly in scope, and there is no way to prepare for everything. Asking a shareholder may be helpful. However, the later parts of this manual will provide basic background on Bonanza Opal Mines, Inc., Virgin Valley, and the opal that is found there.

Closing the mine at 4:00 is your responsibility. At that time, all fee diggers, and all shareholders, must leave the mine. Shareholders must sign out on the same sheet used for signing in. There is no sign-out sheet for fee diggers. You will develop a 6th sense for when the fee customers depart. (you'll see their vehicles leave) You then put away the retail sales items, proceed down the hill, **lock the gate**, and return to the mill site.

The day's cash receipts are then reconciled at the mill site, and delivered either to the mine manager or to the mill site manager. You will be instructed on these procedures; they are not complicated or involved.

After that, you have no other duties until opening at 8:00 am next morning. Traditionally, an optional pot luck dinner "happens" every Friday evening for those staying at the Bonanza mill site.

BONANZA OPAL MINES, INC.

A short history

The first opals found in the Virgin Valley at the turn of the 20th century were likely seen from horseback, as some cowboy looked down from his saddle at a sparkling, fire-filled stone on the surface of the desert. The first claim in Virgin Valley was filed in 1905, on the Opal Queen, the mine just downslope from the Bonanza. One year later the Bonanza, originally known as the Virgin Mine, was filed upon. Many claims were filed in the next few years, but by 1913, opal had fallen out of favor in the markets and this, along with several accidents in un-timbered mine tunnels (There aren't many trees in or around Virgin Valley) caused a lull in mining activity.

Around 1915 an unlikely miner appeared, a reporter from a major newspaper, sent to Virgin Valley to do a story. Her name was Flora Loughead, but somewhere along the way it underwent a spelling change, to Lockheed. Her two sons, Allan and Malcolm, were better known than she; one became prominent in aviation and the other in hydraulic brakes. Flora caught the opal bug, gave up reporting, and began mining in earnest, buying claims along the way. The Virgin Mine was among them. Soon she was hiring miners, and working alongside them.

The opal market was still uncertain, and as labor costs mounted, Flora began paying some of her miners with claims. She still swung a mean pick, however, and continued working in the valley for many years. Eventually she divested of the Virgin Mine, and others.

An interesting story developed about how Flora, in her elder years, after being placed in a comfortable home in Southern California, decided she wanted to go mining. No longer able to drive, Flora hired a taxi to take her back "home" to the Virgin Valley. It was there that her sons found her and sent a limo to bring her back. Flora went to that great opal field in the sky in 1943.

Mining activity picked up after WWII, and by the mid-70's, Keith Hodson owned the mine now named the Bonanza. In 1976, Keith was operating a bulldozer, cutting into a clay bank, when he looked back and thought he had run over several coke bottles. In fact, it was a 23, 587 carat opal, later named the Bonanza Opal. A portion of that opal is in the Smithsonian Gem & Mineral Museum.

After being patented in 1980, the Bonanza was purchased by Lloyd Olds and Dick Leger in 1988, who incorporated and formed a mine owned by shareholders. There are 100 shares. The business of the mine is carried on in the same manner as in any other small

corporation. Revenue is derived from the fee dig operation, and from sales of the mines' half of opals found. Some opal sales take place at the mine or at the mill site, but the major effort is an annual winter trip to Quartzite, AZ, where the Bonanza operates a sales booth at the 90-day rockhound event. The major expenditure for Bonanza is the operation of heavy equipment to prospect for, and uncover, opal-bearing strata.

Aside from a short tunnel to exploit a rich, opal-bearing pocket of clay on a steep hillside during the early years, operation at the Bonanza is of the open-pit variety. Located in sloping terrain, clay areas to be mined extend, nearly level, back into the hill, which means that an ever-increasing amount of useless material lying above, called overburden, must be removed in order to expose the bank for mining.

It is just such a level strata, or "bank", some 7' thick, that once covered the flat area from the canopy westward to the vertical cliff. This bank was rich in opal, and was dug away by busy shareholders over a dozen or so years. There was so much opal in the clay, that the mining became sloppy; it was "hurry and pick some more," and many of the smaller opals were missed or ignored. Much of the clay was left in large chunks, and not broken into smaller chunks for the opal they contained.

Tailings is the name given to the chunks and chips of clay resulting and left behind as a shareholders picked their way through the solid clay bank. These tailings were hauled a short distance and piled up, where drying took place over the ensuing years. And they were rich tailings, left by miners who were hurrying to find large opals. As the lumps of clay dry, they also break down naturally into finer and finer grains, and any opals contained inside, are freed. It is this opal that is so sought after by fee diggers. Such opal is dry, that is it has been acclimated to near the ambient humidity and temperature, and is therefore more stable.

The Bonanza tailings offered for fee digging are those described above. They have not been screened. A loader picks up the tailings from the main pile, and takes them to the level fee dig area. There, they await fee diggers to find the treasures they contain.

VIRGIN VALLEY

A thumbnail sketch

That portion of the history of Virgin Valley we will be concerned with here began approximately 15 million years ago, when a number of nearby volcanoes erupted explosively. The ash ejected in many eruptions over a period of thousands if not millions of years, built up across the region in layers born by wind, water, and in some cases, by lahars, violent flows of hot ejecta moving at high speeds down slopes in destructive

avalanches of hot ash that can shred forests. And yes, there were forests present, although the plants and trees may not have looked like those we see today.

The layers of ash built up over time to a thickness up to 1,000 feet. Then the explosive volcanoes became dormant, and largely eroded away. Time, aided by water, turned many of the ash layers into various clays. Imbedded in some of the clay layers was wood debris from local forests. At various times, water was present in the form of lakes, further aiding the ash-to-clay transition.

Later, fault fissures opened in the area, and layers of lava poured basalt across the surface of the landscape. This basalt at first protected the softer clays beneath from the forces of erosion, until that erosion finally broke through, and the basalt layer began to crumble and fall as it was undermined. An example of this process is visible at the top of the hill immediately north of the fee dig area, and along the rimrock at the far north horizon from the mine. This rimrock is the edge of the lava cap rock, and covers what is called the Gooch Plateau, a flat tableland several square miles in extent.

Look south, across the valley, and you may see other clay layers similar to those at the Bonanza. Indeed they are similar, if not continuations of those at the Bonanza. Now imagine the ash layers extending from the mine site, level, all the way across the valley. Where did all that material go?

Virgin Valley is in the Basin and Range Province, a geological designation that describes portions of the land surface that are alternatively sinking, while adjoining areas are rising. Rising areas eventually become mountains, while the sinking areas become valleys. It is likely that Virgin Valley was once much deeper than it is today, having been filled to some extent with eroding clays.

Water had considerable effect in forming Virgin Valley as it exists today. At various times, inland lakes covered the area. Water from these lakes seeped downward into the ash and clays, bringing about changes as the formations, high in silica content, continued to change into various clays over the immense periods of time. Don't forget that there were pieces of wood, organic material, entrapped originally in the ash that became clay. More about that in the following section dealing with opal.

Gradually, the land surface in some areas rose even more, while adjoining areas sank. Eventually, a stream course, begun as a slight erosion gully, became established, and Virgin Creek was born. As Virgin Creek was forming the broad expanses of Virgin Valley, a ridge of rhyolite was gradually rising, in the area just east of the BLM campground. It is unknown whether this ridge formed a dam, which caused Virgin Creek to create additional lakes, but it is generally believed that the rising rhyolite was cut or eroded by the silt-bearing creek about as fast as it was rising. At any rate, the result is the narrow, deep canyon you can observe today just ½ mile from the campground.

OPAL

A short treatise

Opal is, chemically, silicon dioxide with varying amounts of water entrapped. The formula is $\text{SiO}_2 \cdot n \text{H}_2\text{O}$. This makes opal, and ordinary window glass which is also silicon dioxide but without the water, close cousins. Neither have a crystalline structure. Common quartz is also silicon dioxide, but it does form a crystalline structure. But here the similarity ends, and opal moves towards that realm occupied by the precious gems we have all loved and admired.

Because this is introductory in scope, we'll touch on the high points of the types of opal found at Bonanza and in the Virgin Valley. Most of the opal found here is **wood replacement** opal. This means the form that is now opal, was once the form of wood. The wood has been replaced by opal (silica) in the same way that wood in the petrified forest in Arizona was replaced by agates and jaspers. In this process, ions of silica, in solution in water, exchange with ions of the organic wood, replicating the organic form with silica dioxide. In another opal-forming process, silica-rich fluid fills gaps, or vugs, in the clay or stone, and gradually over time, the gap fills with opal. This form is called **seam or amygdule** opal. Additional research is needed, because it is often observable that both processes have occurred in the same piece of opal. It is also not known how much time is required for opal-forming to occur. It may have occurred relatively rapidly once the ingredients were present, or it may have been in the process of forming over millions of years.

Opal itself, regardless of the originating process, is of two characteristics which are immensely important. Common opal does not contain play of color, often called "fire". Precious opal does contain play of color. Often a single opal will be composed of an area that is common opal, usually of a white or grayish color, and another area of precious opal that sparkles with red, green, blue and yellow play of color.

Common opal is called potch. This term, wouldn't you know, originated in Australia, but we use it here also. Common opal, usually white or clear, may have other "base colors" of green, blue, tan, black or other hues. This is a color that is imparted by mineral impurities as the opal was formed, and is much different than play of color.

The electron scanning microscope made it possible to determine some of the properties of opal. It was found that in all opal, the silica present was in the form of tiny spheres, around one-millionth of an inch in size. In common opal, the spheres vary in size and are arranged in a haphazard manner.

In **precious opal**, the spheres are identical in size, and are arranged in an orderly pattern in flat planes. These flat planes form a refraction grid, which sends back flashes of a single color to the observer, the **play of color** that is so coveted. As the angle of view is altered, so is the direction of the light falling upon the opal, and a different color may be refracted from a different grid. Opal has no light of its own. It merely refracts the light that falls upon it, back to you. The brighter and more dense the play of color, the more valuable the opal becomes.

It is normal for opals in the Virgin Valley to faithfully replicate the wood shapes from which they formed. So, limb casts are common. Small seed-like opal have been found which are obviously replacements of their organic ancestors. Small “pine cones” of opal are not uncommon. Even acorn-like shapes occur. Anything is possible, but no significant fauna replacement finds have been made.

Paleobotanists have identified some of the wood species found in the clay deposits of Virgin Valley. “Sequoia” is one label. This doesn’t mean that the sequoia present was the same as our redwoods of today. What it does mean, is that the species exhibits sequoia-like characteristics. The large, silicified log beside the canopy displays a “sequoia-like” appearance. The other species is “cedar”. Again, think cedar-like. And you can use red cedar in your imagination, or you can conjure up a historic tree on your own that might have been an ancestor of the widespread juniper.

Lastly, a word about the opal clay, the material in which our opal is found. Technically, this is montmorillonite, a clay very rich in silica and closely associated with bentonite, another clay. Both are formed as a product of degrading volcanic ash. About all we need to know about it, for one thing, is that the dust can be highly irritating, because of the silica content. The other characteristic you will immediately observe if it begins to rain. The clay swells, is as sticky as anything you can imagine, and even more slippery. If the surface becomes completely wet, vehicles have difficulty moving. That’s why we evacuate the mine immediately when faced by prolonged showers.