United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name Valley View Leasing and Mining Company Mill

other names/site number Matterhorn Mill; 5SM.6717

2. Location

street & number State Highway 145, 2.8 miles south of Ophir [ ] not for publication

city or town Ophir [x] vicinity

state Colorado code CO county San Miguel code 113 zip code 81426

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this **_x_** nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _x_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ___ statewide _x_ local

Signature of certifying official/Title Date

State or Federal agency/bureau or Tribal Government

In my opinion, the property _x_ meets ___ does not meet the National Register criteria.

Signature of commenting official Date

Deputy
State Historic Preservation Officer

Office of Archaeology and Historic Preservation, Colorado Historical Society

Title State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

Signature of the Keeper Date of Action

Valley View Leasing and Mining Mill Company Mill | San Miguel County, CO
Name of Property | County and State
The Mining Industry in Colorado MPS

5. Classification

Ownership of Property
(Check as many boxes as apply.)

- [ ] private
- [ ] public - Local
- [ ] public - State
- [x] public - Federal

Category of Property
(Check only **one** box.)

- [x] building(s)
- [ ] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
1	0	buildings
0	0	district
0	0	site
0	0	structure
0	0	object
1	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

The Mining Industry in Colorado

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions.)

INDUSTRY/PROCESSING/EXTRACTION
Processing Site: Silver Mining and Processing

Current Functions
(Enter categories from instructions.)

VACANT/NOT IN USE

7. Description

Architectural Classification
(Enter categories from instructions.)

NO STYLE

Materials
(Enter categories from instructions.)

foundation: CONCRETE
walls: WOOD (vertical board siding)
roof: METAL (iron)
other:

Narrative Description

DESCRIPTION

The Valley View Leasing and Mining Company Mill, commonly called the Matterhorn Mill, was constructed in 1920 and rehabilitated in 1961. It was a small (100 ton) flotation mill located 2.8 miles south of Ophir, Colorado, on the west side of State Highway 145 within the historic townsite of Matterhorn, known as San Bernardo before 1908. The mill is located in the valley of the Lake Fork of the San Miguel River at an elevation of 9,431 feet, and at the base of the east slope of 11,845 foot high San Bernardo Mountain in the Trout Lake Mining District just north of Lizard Head Pass. The mill is located approximately 30 degrees from true north, however, the following description refers to nominal directions. Thus, the structure extends roughly 146 feet east to west and 46 feet north to south. At its highest point at the east, the mill is ninety-six feet in height and is visible above the surrounding forest from the highway. To the west, the 146-foot long mill extends down a west slope in five steps to the mill tailings pond located on what was a bench above the Lake Fork of the San Miguel River. The area around the mill is forested, though to the east it is sparse within the 150-foot setback from the highway. Access is by a circular roadway system that connects to the highway north and south of the mill site. The dirt access road leads to the 1960s storage bin of the mill. Beyond is the original grade of the abandoned Rio Grande Southern Railroad spur that extended 200 feet northerly from the Matterhorn Depot across the east elevation of the mill and terminating at the northeast corner according to the 1922 Sanborn Map. The spur passed through a rock cut constructed in 1919 in preparation for the construction of the mill. The Sanborn Map also noted that the mill was electrified, steam heated, and supplied with water from the nearby "creek" that was stored in a 10,000 gallon tank located on the hillside above the mill.

Designated a San Miguel County Landmark December 16, 2005, the Matterhorn Mill was typical of the first generation of flotation mills used to concentrate ores prior to shipment to distant smelters for final processing. The Matterhorn Mill included the four systems of a typical mill, as described in period texts, such as Antoine Marc Gaudin's *Flotation* (New York: McGraw Hill, 1932): 1) an ore delivery system, 2) a crushing and storage section, 3) the concentration section, and 4) filtration and bagging/shipping section. Typical of a flotation mill, the ore from the mine traveled down through fifteen levels to be reduced into concentrates. The levels augmented the economical processing of ore utilizing gravity. Nearly all the equipment remaining in the mill clearly illustrates the flotation process.

INTERIOR MILLING SYSTEM

1) Ore Delivery System: The delivery system at the mill was complex. Because of the dramatic landscape, ore was delivered from the San Bernardo Mine via an aerial tramway directly into the upper level of the mill. The original 1920 aerial tramway system extended 1,700 feet from the San Bernardo Mine's level 2 adit at Portal No. 1, over the river, and then to the bullwheel in the upper level of the mill. At Portal No. 1, mine cars on a surface rail tram delivered ore to an ore bin, where the upper loading platform allowed for the funneling of ore from the bin to awaiting one-ton ore buckets hanging from the tram cable. The buckets were carried downslope on a continuously circulating aerial tramway cable. The tram operated similar to a modern ski lift system.

From the upper loading platform the aerial tramway crossed over the South Fork of the San Miguel River and then passed diagonally across the sloping Matterhorn Mill lower roof into one of the openings in the west elevation of the mill's upper level. There another bullwheel guided the tram cable and buckets around the top level. The buckets were guided off the tram support cable onto metal rails hung from the ceiling that led the buckets to a point over the ore chute, where they were dumped. Empty ore buckets returned through the opposite doorway and upslope to the loading platform bin at the mine. To anchor the tram cable, a heavy system of anchor cables tied to the oversized structural beams led through the building to footings in the ground.

Although the tramway cable is still in place, the delivery system was replaced in the 1960s. A new road from the relocated entrance of mine to the mill was built at that time. The new road leads to a free-standing 1960s steel ore bin where ore was dumped by truck into the top and sent to the mill by a conveyor belt tube at the bottom. The conveyor

extends from the bottom of the ore bin over the original Rio Grande Southern Railroad spur right-of-way to the upper level of the mill. The conveyor belt, like the earlier tram buckets, dropped the ore into the chute at the top level of the mill.

2) Ore Crushing and Storage Section: The ore dropped from the tram buckets at the top level into a chute lined by "grizzlys," that extended through level fourteen, and fed into the extant Gates Gyratory Crusher, located on levels thirteen and twelve. The grizzly – resembling a sloped highway cattle guard -- was designed to separate the ore by size: ore smaller than a pebble fell between the rails of the grizzly into the ore bin below, while larger pieces fell into the first or primary crusher. Occasionally a large chunk of ore would stick in the chute, requiring a person with sledge or pike to break it free, a dangerous job. The gyratory crusher worked like a druggist's mortar and pestle, crushing the ore to pea size before it dropped out the bottom into the ore bin. The crusher operated by a belt drive. The ore was stored in the large ore bin at level eleven. A wooden bin with a 45-degree sloped bottom extends through levels nine and eight. At level ten, water was also stored in a 7' in diameter by 10'-high tank.

Ore was fed from the storage bin through level seven to the secondary crushers, two ball mills at level six. The 5' x 5' Denver Iron Works ball mill with the cog drive appears to be the original ball mill placed in 1920. The second, an Allis-Chalmers, Chicago, 6' x 5' Ball Mill was added later, possibly during a 1923 renovation. The crushers were rotating iron cylinders with steel balls the size of 10-lbs. cannon shot, that rolled around the interior crushing the ore and creating a fine dust-like ore called "fines." Water was added to the fines to make a sludge-like pulp that passed into the Dorr Classifier between the two ball mills. The classifier separated the fine particles from larger ones that were returned to the ball mills for further crushing. Level five is an intermediate access from concrete foundation number two to foundation number three. A stairway and ramps connect all the concrete foundation levels. The slimy pulp of ore then flowed to the concentration section.

3) Ore Concentration Section: The original Matterhorn Mill, according to the 1922 Sanborn map, included Wilfley concentration (shaker) tables as well as flotation cells. In 1920, when the mill was built, concentration tables were the tried and true method for concentration of ores, while the flotation process was relatively new. In a 1923 remodeling of the mill, the Wilfley tables appear to have been removed from the concentration section of the mill, though one table remained, isolated at the lowest level of the mill. The Wilfley table used the logical process of using the heavier weight of mineral to catch on the table's riffles, while the waste material was washed across the table, as it was bumped and shaken, and then off the table through a trough to the waste pile. By contrast, flotation simply used the adhesion quality of water bubbles to attach to metals and float them to the top of a frothing box or cell to be captured as concentrate. Oil (or some other reagent) added to the water, especially pine oil, agitated by air, aided in the illogical process of floating metals away from the waste material. The end result is not pure metal but a higher percentage of metal in a concentrate than was in the ore.

Two rows of flotation cells were placed parallel with the north and south elevations of the mill. The original flotation cells, made of wood, were replaced in a renovation and the ones now in the mill are two improved, metal Denver Iron Works six-cell flotation units. There the ore pulp went through the flotation process to separate out the various minerals (silver and lead predominately, but gold, copper and zinc as well) based on their different viscosity. From here the metallic particles were sent to the two "thickener tanks." The waste materials captured in the solutions were piped from the flotation cells to the now dry, irregularly-shaped settling pond west of the mill.

4) Filtration and Bagging/Shipment Section: At Matterhorn Mill, like all others, the resultant metallic oil solution was piped or sent via a trough to the thickener tanks where the flotation pulp was dewatered. The two 12-foot diameter by 7-foot high "thickeners" were located at level two on concrete foundation two. The tanks' slowly rotating settling arms allowed for the settlement of the concentrate in the tank, while removing the water-oil solution. Between level two and one, at level three, is a rotary vacuum separator that was the final dewatering step for the flotation concentrates. The dried ore concentrate was deposited into a concentrate storage bin at level one. Unfortunately, from the aspect of economy, because the railroad line was above the mill, the concentrate had to be returned upslope to the concentrate storage bins attached to the southeast corner of the mill where the concentrate could be loaded onto railroad cars for shipment. The original system for moving the ore was replaced by the 1960s conveyor belt system. The system runs parallel with the west elevation (beneath the concentrate bin) where it met the interior conveyor that paralleled the south elevation and extended the length of the mill up to the shed at the railroad right-of-way.

Oddly, the mill includes a single Wilfley table at the bottom of the entire process, located in a shed addition to the first level of the mill. Probably used for special testing of some ores or for limited production of concentrate, its use at this date is speculative.

The 1961-2 coal fired boiler, used to heat the mill, is also located on level one and concrete foundation five. A coal chute extended diagonally through the north wall from the adjacent exterior shed roofed coal shed.

The mill's interior structural system is fully exposed and includes "cribs" constructed of 8"-square timber posts and beams with diagonal bracing and trusses. The cribs form a grid system, generally three deep and of varying lengths depending on the needs of each process area. A roof truss system supports the gabled roof of the head house and twelve-inch square timbers support the main ore bin on a diagonally-braced trestle system below it forming the first foundation level. Joists are 2" x 12" and the rafters are 2" x 6" components. Flooring is wooden with some 1962 concrete floors under new equipment and at the lowest level. Walls are composed of the exterior siding applied directly to the post and beam framework. The interior stepped downslope in four additional foundation steps, while the mill equipment is located through fifteen levels, each engineered to house a specific function of the milling process.

EXTERIOR

The wooden-framed Matterhorn Mill has an approximately 1:2-pitch gabled roof, four-story east end that extends a full story above the 1:2-pitch shed-roofed section extending downslope over the levels and the foundation steps. The gabled roof ridge of the east end or upper level of the mill is parallel with its east elevation. All the roofs are clad in corrugated iron and have wooden fascias at the verges and at the eaves masking the rafter tails. The frame structure is clad in tiers of generally 1"x10" vertical boarding roughly installed with continuous butt joints at the floor levels. At the lowest level of the north elevation the walling is corrugated metal protecting the structure at the tall metal flue venting the boiler in the northwest corner. The flue is supported on iron legs that splay out at an angle. Throughout the mill structure a concrete foundation was inserted in 1961-2 replacing the 1920 stone masonry and timber foundation.

At the east structure of the mill, each floor level of the east façade is defined with window openings and an entry doorway with double unequal leaves, also constructed of vertical boards. Several panels of corrugated iron siding remain over the walling at the first level where it opens directly to the railroad spur right-of-way. The above three levels each have two window openings. At the second and third levels they are spaced above each other near the center and towards the north corner; a third window near the south corner of the third level has been closed with vertical boards. At the fourth level the two windows are located towards the north and south corners, while a third center opening has been closed with vertical boarding. To the north is located an opening for the 23-inch diameter conveyor belt tube to deliver ore from the 1960s steel ore bin. Typical of the mill structure, all the window openings have plain board trim and a wooden sill set with double-hung, six-over-six-light sash. The opposite west elevation of the head house, above the shed roof over the stepped foundation structure, has three window openings symmetrically placed and spaced with two double-door openings that provided for the delivery of ore from the upslope aerial tramway system that entered one doorway and returned through the other. The north gable-end elevation of the head house has two window openings with one opening on the south gable-end elevation where there is a doorway slightly angled into the east corner that was once part of an early system for hoisting machinery and bulky items out and into the top level head house. Along the south and north elevations the window openings are randomly placed with two stepped tiers generally in the upper levels and a single stepped tier at the lower levels. A single doorway with a board door is located on the north elevation near the center that opened to a coal storage area which had a steel chute to deliver coal to the boiler area.

At the south elevation, a 1920s shed-roofed addition clad in corrugated iron enclosed a conveyor system on rails to move the ore concentrate up to the storage bins in the one-story addition paralleling the railroad right-of-way. A doorway is located in the shed near the top. At the west end of the shed-roofed addition are structural timbers attached to the walling that are the remains of the tramway from the lowest level of the mill to the entrance to the conveyor belt shed. According to former Silver Hat Mining Co. employee Scott Smith of Telluride, Colorado, in correspondence dated November 3, 2009: "The 1920s version of the concentrate 'tram'…consisted of small ½" gallon sized metal scoops (buckets) and traveled the length of the mill." This conveyor system was designed to solve the logistics of transporting the ore concentrate back

upslope for storage and shipment via the railroad. (The moving of ore concentrate logistics upslope was always exacerbated by the fact that the mill is reversed in relationship to the railroad right-of-way east of the mill.) Much of the lowest south elevation and the west elevation of the stepped foundation mill structure is clad in corrugated iron. At the west elevation, a single window opening set into the walling near the north corner. The main shed roof projects over two-thirds of the elevation towards the south and beyond the original walling to enclose a room at the southwest corner of the lowest level. There the addition is mostly clad in tar paper and has a doorway and vertical board door on the south elevation that provided access to the exterior. The west shed extension has collapsed.

The south elevation's shed roofed conveyor tram terminates at the southeast corner at the ore concentrate storage shed that angles from the east façade of the head house. The storage shed is built on timber pilings and is essentially of studs-out construction with vertical sheathing on the interior. The north end, probably modified in the 1960s, is sheathed in vertical boarding and the shed roof is covered with corrugated iron. The east eave has a fascia; the west eave has exposed rafter tips. The east elevation had high awning-type loading doors and a pedestrian doorway with a board and diagonal batten door. The modified north third of the east elevation is clad with vertical boards and has two pairs of doors. The south doorway has vertical board doors and a four-light sash above it; the north door is constructed of diagonal boards. This section was designed to receive the ore concentrate from the south conveyor shed and off load the concentrate to be transported by the railroad to be smelted. An early photograph of the Matterhorn Mill shows that the ore concentrate storage shed was originally two stories high with a gabled roof. It appears to have been reduced to one story, probably in 1923 as part of alterations to update the mill to make it more efficient.

ALTERATIONS

After completion in 1920 the mill was closed for upgrading in 1922-3 and then continued to be operated until 1929. It was closed during the 1930s, opening again in 1940 and again shut down during World War II. The first major alteration seems to have been alterations of the southeast ore concentrate storage wing that was reduced to one story probably during the 1922-3 upgrading. The mill was revived between1961-3 and at that time the structure was stabilized with a new concrete foundation replacing the original stone and timber foundation. Other alterations included equipment replacement and repair to expedite the reuse of the froth-flotation process and the replacement of the electrical and heating systems. Other alterations included the construction of a southwestern addition at the west end of the mill and installation of the south conveyor system to deliver the ore concentrate to the southeast concentrate storage shed.

Reopening the mine utilizing the Garabaldi Tunnel adit after 1961 necessitated change in how ore was delivered to the mill. Trucks delivered raw ore to the steel ore storage bin east of the Matterhorn Mill. From there the ore was transported directly to the head house by a 23" conveyor tube and belt that extended to the east façade. The mill shut down in 1968 leaving most equipment in place and was not reopened.

United States Forest Service archeologist, Leigh-Ann Hunt reported on November 2, 2009 that the southwest shed, added in the 1960s to house the shaker table, has collapsed and will be stabilized and reroofed. The south foundation of the mill is also structurally unsound. The 1920s conveyor tram structure running much of the length of the south elevation has damaged the foundation, causing it to become unstable. The conveyor shed will be removed to repair the foundation and then replaced in-kind. All work will be done in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Meanwhile, the property retains all seven aspects of integrity: feeling; setting; association; materials; workmanship; design; and location.

THE MINE SITE

Besides the tramway bin and loading platform, several other structural ruins are located north and south of the level two adit on private property and thus not part of this nomination. At the mine adit, waste rock was carried by mine cars over trackage that forked to the north to a dump point over the mountain side. Probably dating from 1890, at surface level 6 above the 1920s adit are remains of an ore load-out location that delivered ore to the original San Bernardo Mill site located southwest of the Matterhorn Mill and somewhat southeast of the San Bernardo Mine adit. The earlier San Bernardo Mill was nearly destroyed by a flood in 1909, partially rebuilt, and removed by 1920. In the 1960s a surface level one adit was constructed above the original mill site at what was known as the Garibaldi Tunnel. There a portal shed partially encloses ore cart trackage that extends east on a leveled talus slope area to a shed above the load-out

structure and bin that allowed ore to be dumped directly into trucks and then driven to the steel ore storage bin located east of the head house of Matterhorn Mill. To the south, on the surface level one area, there are compressor and machine sheds. At the end of a northeast trackage spur is a waste rock dump over the talus slope.

Valley View Leasing and Mining Mill Company Mill
Name of Property

San Miguel County, CO
County and State

The Mining Industry in Colorado MPS

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [x] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [x] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

- [ ] A Owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)

INDUSTRY
ENGINEERING

Period of Significance

1920-1929

Significant Dates

1920-1929

Significant Person
(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation

N/A

Architect/Builder

REED, WALTER L., mining engineer
BESELACK, OTTO, builder

SIGNIFICANCE

The 1920 Valley View Leasing and Mining Company Mill, commonly known as the Matterhorn Mill, is eligible for the National Register of Historic Places under Criterion A in the area of industry at the local level of significance for its contribution to the 20th-century silver mining in Colorado's San Juan Mountains where it related directly to mining within San Bernardo Mountain. During its most active period through the 1920s, the Matterhorn Mill processed San Bernardo mine ore and shipped the ore concentrate to smelters, such as those in Durango and Pueblo, via the Rio Grande Southern Railroad. When constructed the Matterhorn Mill was a state-of-the-art flotation mill that utilized new technology to produce a higher grade concentrate than could be accomplished by the old-style stamp mill with concentration (shaker) tables. Flotation technology replaced stamp mill technology such as that of the earlier San Bernardo Mill originally constructed nearby in the 1890s and largely destroyed in 1909. Flotation technology is detailed in the1998 National Park Service Intermountain Region study, "*Frothers, Bubbles and Flotation, A Survey of Flotation Milling in the Twentieth-Century Metals Industry*," by Dawn Bunyak. Matterhorn Mill remains as nearly complete an example of a concentration mill using the first generation of the flotation system extant in the American West

The mill building meets the National Register requirements identified in the National Register of Historic Places Multiple Property Documentation Form "*The Mining Industry in Colorado: Mining Technology, Methods, and Equipment in Colorado: 1858-2005*" and represents the "Ore-Concentration Facility—Concentration Mill" property type. As such, it is an excellent example of the flotation system of ore concentration.

Matterhorn Mill is also eligible under Criterion C in the area of engineering at the local level of significance. It is a nearly intact example of a very accessible smaller flotation mill that was typically stepped downslope and equipped on fifteen levels to accommodate the newest technological advances in concentrating ore using the flotation system.

Historical Background and Criterion A, Industry

The San Juan Mountains of Southwest Colorado has been one of the most productive mineral regions of the United States. Primarily known for its silver and gold production, the first years of major production occurred between the late 1890s and 1929, the peak years of production at the Matterhorn Mill. Prospectors had first staked claims in the San Juans in the 1860s, but not until the 1873 Brunot agreement reduced the 1868 Ute Indian reservation by four million acres, including the entire San Juan Mountains of Southwestern Colorado, did a mining rush into the area begin. The first mining claim in the Telluride area was filed in 1875 by Linnard Remine and others. All had been prospecting the area since 1873.

According to Steven G. Baker in his study, "The 2007 Historical Archaeological Assessment of the San Bernardo Mine (5SM.2608), San Miguel County, Colorado," prospectors searching out from Telluride discovered and then patented the original San Bernardo Mine claim in 1877. Adjacent claims were added later under the San Bernardo name. Claimants were Gus Giamboni, James Tankisley, and John Eder, who secured a strip beginning 1,500 feet up the east flank of San Bernardo Mountain. In 1881 Gus Giamboni patented the Garabaldi Mine north of San Bernardo Mine within what was named the Iron Springs District and later became the Trout Lakes District. These two claims formed the basis of the present San Bernardo Mine, though the Honduras Mine was patented on the north side of the Garabaldi and abutted the lower east end of the San Bernardo. The Honduras, though, appears to have been over the same vein. Ore was packed by mule train south to Rico, Colorado to be milled separating copper, galena, and high grade silver ores suitable for smelting.

Because of the high cost of shipping the ore for smelting, the original San Bernardo Mine claimants sold out in 1888 to the San Bernardo Mining and Milling Co., Ltd., of London, England. Ultimately, the company acquired the nearby Garabaldi and consolidated the mines. Following the pattern of a well-capitalized company, the new owners constructed a mill on the west bank of the Lake Fork of the San Miguel River in 1890 and connected the mill to the mine adit at the10,400-foot level by a tramway. Processed ore concentrate was transported out via a wagon road until the Rio Grande Southern Railroad was extended through the valley in 1891. The mine continued to be worked and the ore milled steadily until the

silver crash of 1893, brought on by repeal of the Sherman Silver Purchase Act, which forced the closure of the silver mines of the San Juan Mountains. It was marginally reopened from 1895 to 1899 by Frank Fox under a lease with the London consortium. In 1900 the San Bernardo Mining and Milling Co., Ltd. appointed Major A. B. Litchfield, a mining engineer

from Telluride, as its American representative. Subsequently, a local partnership was formed in 1900 as the San Bernardo Mining and Milling Company to lease the mine and mill from the London consortium for five years, though by 1901 the company was sold to others. The lease was terminated in 1902 because of financial insolvency largely brought on by labor strife that began in 1901. Frank Fox became the lessee again at that time through 1909 when the Trout Lake dam failed, sending flood waters down the Lake Fork of the San Miguel River and partially destroying the San Bernardo Mill.

A June 1, 1908, newspaper article in the *Daily Journal* of Telluride noted, in conjunction with the shipment of a new drill to the San Bernardo Mine, that the company in charge of the operation was the Matterhorn Mining and Milling Co., which operated from 1898 to 1917 in the area. As a side note, the article stated that, "The company also has plans in process of drawing for a stamp mill to be erected on the railroad near Matterhorn station (formerly San Bernardo.)" The mill was never built before the company closed, but the firm had caused the mining camp of Bernardo to be called Matterhorn. The Rio Grande Southern depot acquired the Matterhorn name as well.

Meanwhile, the London consortium sold the mine property to the Denver based San Bernardo Mines Company, incorporated in 1910. They operated the mine until it was sold in a sheriff's sale in 1913 to pay off debts. There is little evidence that the San Bernardo Mine was open during the years leading up to World War I. In 1917, Otto Beselack and others organized the Valley View Leasing and Mining Company to take over operations and advantage of the high mineral market prices during the war. On November 11, 1919, the *Pueblo Chieftain* reported that the company had made "arrangements for the construction of a 100-ton reduction mill." The paper added:

> Walter L. Reed, oil flotation expert, has designed and will construct and equip the mill. The air compressor has been successfully transported up the hill. The power line will be completed quickly…the grading of the spur to the mill is progressing rapidly. The company has fixed up a good boarding house and sleeping quarters for the men down on the flat out of danger of the snow slides.

The forty year-old German, Beselack, was manager for the construction of the new mill adjacent to the townsite of Matterhorn. The Valley View Leasing and Mining Company Mill, commonly known as the Matterhorn Mill, was connected to the San Bernardo Mine by a new aerial tramway. However, the operation was hurt by the post-war economic crash of 1921, and was threatened with a suit when it reduced miners' wages. The operation was also encumbered by outdated equipment and the mill was closed in 1923. Beselack organized a new company – the Otto Mining Company -- and updated the mill at a reported cost of $100,000. With reopening, the mine and mill experienced a boom through 1926, the peak year of production, when the company reported $193,056 in silver, lead, and zinc ores. The Matterhorn Mill, like others in the San Juans, shut down following the stock market crash of 1929. By then production of the San Bernardo mine had reached a total of over $600,000 worth of silver, lead, copper, gold, and zinc – a respectable amount, but not a bonanza. It appears to have been inactive during the 1930s, but was revived in the early 1940s, closing again during World War II.

The operations of the San Bernardo Mine and Matterhorn Mill remained closed until the early 1960s. In 1961 the Silver Hat Mining Company of Las Vegas, Nevada, began improvements to the mine and mill that lasted into 1963. In addition to stabilizing Matterhorn Mill and improving its operation, the company held seven patented mining claims in and around the San Bernardo Mine. The company redeveloped the mine portals including Garabaldi Tunnel that became their primary adit at the lowest level of the mine complex where a new road was constructed to transport the ore by truck to the holding storage bin at the mill. Within the townsite of Matterhorn, the company constructed company residences, warehouses and storage facilities along with a water system. All of these buildings and structures have been destroyed or altered. Silver Hill Mining Company kept the mine and mill in operation until 1968, when it let the claim to the mill site lapse and the property reverted to the ownership of the United States Forest Service as part of the surrounding San Juan National Forest. The mine patents are still held in private ownership.

Criterion C, Engineering

Designed by Walter L. Reed and built by Otto Beselack for the flotation of ores from the San Bernardo Mine, the Matterhorn Mill reflects typical mill construction techniques that provided for a downslope gravity-fed system to produce ore concentrates for shipment to a smelter. The mill, dating from 1920, included an upper level that received the ore by

way of an aerial tramway from the mine adit. The ore was crushed within the gyratory crusher and ball mills and then passed downward through the various functions designed to concentrate the ore – primarily flotation cells, but also Wilfley (shaker) tables – all under the long shed roof characteristic of ore mills. To accommodate these functions, the building foundation steps down the slope and has fifteen levels reflecting each process that was ultimately designed to be a flotation process system that included settling tanks and filters in the final step before shipment to a smelter.

It would appear that Otto Beselack may have originally utilized floatation cells using paddle agitation in the original configuration but modified the mill in 1922-3 to update the process (after the original inventor's U. S. patent for the flotation process had lapsed) incorporating the newest technology, air agitation or "froth" flotation. The near universal term was flotation since the paddle method of agitation had been replaced by the air or "froth" agitation. Dr. Robert Spude has pointed out that a wooden-framed mill is unusual in 1920 when comparable mills were iron-framed structures. According to Steven G. Baker, by the time the mill was upgraded, ore production alone in 1922 had reached $118,489 with silver being 75% of that amount. Twenty men were working the operation when it was considered to be at the first peak of its production history. However, by 1922 mechanical problems began to affect the operation and mill production slowed until it was closed. The 1922 Sanborn Map notes that the mill was closed. Beselack's new company raised $100,000 for the upgrade that may have included air or "froth" agitation in the flotation cell improvements therein. Though the mill remained closed through 1924, the success of the project was evident with the increase in production of 1926 that reached an all time high netting $193,056 in ore production. This boom ended in 1929 with the onset of the Great Depression following the stock market crash.

Otto Beselack, according to the chapter on Matterhorn Mill in *The R.G.S Story*, *Vol. III—Over the Bridges…Vance Junction to Ophir*, was a mining promoter, who lived in the townsite of Matterhorn. He formed several mining companies to work several local mines including the Valley View Leasing & Mining Company to operate the San Bernardo Mine. Following the 1922-3 closure of the mill, Beselack organized the Otto Mining Company to rebuild the mill. During the time of closure, the ore was shipped directly by the Rio Grande Southern Railroad to the Durango, Colorado American Smelting and Refining Company. Mining engineer Walter L. Reed was a Denver-based mill designer who worked closely with the Denver Iron Works, which supplied much of the machinery for the mill. He was a graduate of the Colorado School of Mines, though died quite young while in Chile working on a project there.

The siting and construction of the Matterhorn Mill in 1920 related directly to a spur of the narrow gauge Rio Grande Southern Railroad extending from the Matterhorn Depot to the south. The railroad reached the San Bernardo area in 1891 from the junction with the Denver & Grande Western to the north at Ridgway and progressed south serving Telluride, Ophir, Rico, Dolores, Mancos, and Durango. There it reconnected with the Denver & Rio Grande Western. Though records are scarce for production at the first mill for the 1890s, the fact that only thirteen carloads of ore were shipped in 1897 and valued at only $8,700 suggests poor production. The following year shipments were valued at $34,800. After the original San Bernardo Mill was ruined in the 1909 flood, the ore was shipped directly south to Rico and Durango until the mill was partially repaired and the tramway was rebuilt in 1912. Otto Beselack bypassed the dangerous site of the original mill and built his older mode wooden mill much closer to the right-of-way of the railroad that provided a spur directly to the Matterhorn Mill paralleling the east end of the mill and connecting south to the Matterhorn Depot. He constructed the mill with the projecting southeast ore concentrate storage building that was probably modified in 1923-1924 with the removal of the second story and reconstruction of its façade.

According to the 1974 Silver Hat Mining, Inc. report there was some activity in the late 1940s. Mining Engineer Charles N. Bell recommended the use of the Garibaldi Tunnel as the adit and in 1948 "…more equipment was added to increase the efficiency of the mill, but the mine was only operated spasmodically." The mine and Matterhorn Mill were closed completely until the operation was revived by Silver Hat Mining, Inc. starting in 1961 and ending in 1968.

The mill, as built in 1920 by Reed and Beselack and remodeled by the latter in 1923-1924, was stabilized and repaired in the early 1960s by Silver Hat Mining, Inc., led by Hugh Thomas of Cincinnati, Ohio, where he ran successful funeral homes. According to *The R.G.S Story, Vol. III*, he visited Colorado and the San Bernardo Mine in 1960. Reconstruction and renovation of the Matterhorn Mill began in 1962 and the San Bernardo Mine was accessed through the Garabaldi Tunnel as the upper portal three-hundred feet above was blocked by cave-ins. Without the need to reconstruct the aerial tramway, the lower adit easily facilitated the use of trucks to transport ore to the mill.

At this time it was noted that Silver Hat Mining poured a new concrete foundation, repaired the mill, added a new electrical system, and repaired or replaced the ore processing equipment. Demonstrating the continuum of reuse of the original flotation Matterhorn Mill, *The R.G.S Story*, *Vol. III*, reports that:

> The crusher and two ball mills were put back in working order. Two six-cell steel-flotation units were purchased to replace the old wooden units. Two 8 x 12-foot-diameter thickener tanks, complete with bases and motor drives, were purchased and installed. A boiler and heating system for the mill was also installed. Heavy concrete floor were poured to replace the old wooden flooring for all the new equipment. A 150-foot belt conveyor was installed along the [interior] south wall of the mill to transport concentrates from the bins at the lowest level of the mill to the upper front end of the mill. On the outside of the mill, a new 140-foot belt conveyor was erected to carry ore from a new 25-ton steel ore bin to the crusher at the top of the mill (pp. 478-9).

The 1974 report of Silver Hat Mining, Inc., provided a list of equipment at the mine and mill site. For the mill it is listed that, in addition to the 1962-3 exterior steel ore bin (7' x 11' x 10') and the 170’ x 23" belt conveyor from the storage bin to the mill, the following “major” items included:

One Allis-Chalmers Ball Mill, 6' x 5'
One Denver Iron Works Ball Mill, 5' x 5'
Classifier, Dorr Duplex Double Rake
One Denver 6 cell floatation unit, No A-24
One new (never used) floatation unit similar to the above
Belt type feeder conveyor inside the mill.
Two ‘Thickener Tanks’, 8' deep by 12' diameter.
One ‘American’ continuous vacuum filter for concentrate. Double 4' disc
One concentrate conveyor, 150' x 16" belt [paralleling the interior of the south elevation]
One Concentrate Conveyor, 32' x 12" belt [paralleling the interior of the west elevation]
“Pacific steam boiler, capacity 1,000,000 BTU with Winkler Stoker and all necessary controls

The first shipment of ore concentrates was shipped to El Paso, Texas, in June of 1964. However, reopening of the mine and mill only produced a total of $37,009 before closing in 1968 with a financial loss of $340,000. A 1974 report of Silver Hat Mining, Inc., reported that the company had spent a total of $850,000 in the development of the mine and mill.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form.)

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Barbour, Elizabeth, and the Telluride Historical Museum. *Images of America, Telluride.* Charleston, Chicago, Portsmouth, and San Francisco: Arcadia Publishing, 2006.

Bunyak, Dawn. "Frothers, Bubbles and Flotation, A Survey of Flotation Milling in the Twentieth-Century Metals Industry." Denver: National Park Service, Intermountain Region, 1998.

Buys, Christian J. *A Brief History of Telluride*. Montrose, CO: Western Reflections Publishing Company, 2003.

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Telluride Historical Museum. San Bernardo Mine and Matterhorn Mill file storage box that includes assorted materials including newspaper articles; USGS maps; Silver Hat Mining, Inc., documents; and, other items.

Zaske, Sarah, and Felicia Harmon. "National Register of Historic Places Registration Form, Lewis Mill." Telluride, CO: Colorado Historical Society, Office of Archaeology and Historic Preservation, 2008.

Valley View Leasing and Mining Mill Company Mill
Name of Property

San Miguel County, CO
County and State

The Mining Industry in Colorado MPS

Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67 has been requested)
____ previously listed in the National Register
____ previously determined eligible by the National Register
____ designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #_____
____ recorded by Historic American Engineering Record # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

__x__ State Historic Preservation Office
____ Other State agency
____ Federal agency
__x__ Local government
____ University
____ Other

Name of repository: **Colorado Historical Society; San Miguel County Historical Society**

Historic Resources Survey Number (if assigned):
5SM.6717

10. Geographical Data

Acreage of Property Less than one
(Do not include previously listed resource acreage.) (NAD 27)

The UTMS were derived by OAHP from heads up digitization on Digital Raster Graphic (DRG) maps provided to OAHP by the U.S. Bureau of Land Management

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing		Zone	Easting	Northing
1	13	246263	4192773	3			
2				4			

Verbal Boundary Description (Describe the boundaries of the property.)

The boundary extends around the mill building starting at the west side of State Highway 145 to include the circular road system between the mill and highway. From the road right-of-way it extends diagonally to a point near the northwest corner, parallels the east end of the mill incorporating the eastern end of the tailings pond, and extends diagonally back to State Highway 145. Measurements are provided in the site plan. The legal locational information corresponds to: PM Twnshp Range NM 41N 9W.

Boundary Justification (Explain why the boundaries were selected.)

The nominated area contains that which was historically associated with the milling operation: the building, landscape features visible from the highway, and part of the tailings pond.

11. Form Prepared By

name/title Rodd L. Wheaton, Architectural Historian (for property owner)
organization The Collaborative, Inc. date November 2009
street & number 2080 Pearl telephone 303 442-3601

Valley View Leasing and Mining Mill Company Mill — San Miguel County, CO
Name of Property — County and State
The Mining Industry in Colorado MPS

city or town Boulder state CO zip code 80302

e-mail tsarrodd@aol.com

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Property Owner:

(Complete this item at the request of the SHPO or FPO.)

name United States Forest Service, Forest Supervisor, Grand Mesa-Uncompahgre-Gunnison National Forests (contact: Leigh-Ann Hunt)

street & number 2250 Highway 50 telephone 970 874-6691

city or town Delta state CO zip code 81416