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UNITED STATES  
DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
Southwestern Region  
Albuquerque, New Mexico

MINERAL CLASSIFICATION REPORT

LEE CHARTRAND AND HOWARD THOMAS

Lakeside Ranger District  
Sitgreaves National Forest

John Gutierrez  
AZ Zone Mineral Examiner

November 5, 1992  
Date of Report

Robert H. Oldfield  
AZ Zone Mineral Examiner

Beverly E. Morgan  
Geologist

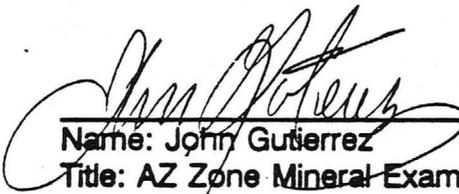
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
Southwestern Region  
Albuquerque, New Mexico

MINERAL REPORT  
(For Administrative Use Only)

2850 Sitgreaves National Forest  
Lee Chartrand and Howard Thomas

June 29-July 1, 1992  
Dates of Examination

November 5, 1992  
Date of Report

  
Name: John Gutierrez  
Title: AZ Zone Mineral Examiner

  
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CATEGORY: Mineral Material Classification

BLM SERIAL NUMBERS: AMC A-286604, 286605, 286606, 390597, 309598, 309599, 309600, 309601, 309602, 309603, 316286 and 316287

CLAIM NAMES: Sierra Stone 1-3 and 14-22 PMCs

BRIEF OF SUMMARY AND CONCLUSIONS: The stone exposed within the mining claims is a material of common variety and should be disposed through a mineral material sale.

TECHNICAL REVIEW:  11/20/92  
Regional Geologist Date

APPROVAL:  11/25/92  
District Ranger Date  
Lakeside RD, Sitgreaves NF

CLASSIFICATION REPORT  
LEE CHARTRAND AND HOWARD THOMAS  
SIERRA STONE PMC 1-22 MINING CLAIMS

LAKESIDE RANGER DISTRICT  
SITGREAVES NATIONAL FOREST

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**APPENDIX A:** Sierra Stone Mining Claim Recordation Notices

**APPENDIX B:** Copy of the Plan of Operations (P.O.O.)

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## I. INTRODUCTION AND SUMMARY

The Lakeside Ranger District of the Apache-Sitgreaves National Forest has requested an opinion on whether the sandstone occurring on certain unpatented mining claims qualifies as a locatable mineral commodity under the General Mining Law of 1872, as amended. The request is in response to a Plan of Operations (POO) submitted to the District Ranger, Lakeside Ranger District by Lee Chartrand and Howard Thomas in compliance with regulations at 36 CFR 228, subpart A regarding surface use management of operations on unpatented mining claims. The proposal is for mining, marketing and processing the sandstone from the claims. Messrs. Chartrand and Thomas believe the stone located and mined is an uncommon variety because of unique coloration, demand of beneficiated products made from the stone and the fact that two of their Independence Picture Rock claims near Heber, AZ were held to be valid in Arizona Contest A-1186 (United States v. Lee Chartrand, et al.), 1969.

The purpose of mineral classification is to examine the mineral material in question and make a determination as to whether the mineral material should be considered locatable or salable. Guidance for the examination is provided at 36 CFR 228 (c), §228.41 (c). No questions of validity are evaluated in this examination. Approval of this report will be by the District Ranger, Lakeside Ranger District, Apache-Sitgreaves National Forest.

For clarity, "picturestone" or "picturerock" will be used as a generic term when referring to the various stones mined and sold as a picturestone or picturerock because of coloration and variegated banding. Trade or given names such as "Sierra Stone" and "Picture Rock" will be used when referring to these specific types of rock mined by Lee Chartrand and Howard Thomas.

A field examination of these claims and the surrounding area was made by the authors on various dates in May, June and July, 1992. We were accompanied by the claimants on June 28, 1992 for the purpose of identifying discoveries and claim corners. We spent several hours at the claimant's store and cutting site in and near Taylor, AZ. The claimants were open and cooperative and provided all information requested.

The subject rock is the Glorieta Sandstone, correlative with the Coconino Sandstone found in much of northern Arizona. In the claim area the Glorieta is a buff colored, fine-grain sandstone with hematite and limonite Liesegang banding. The rock is considered a variation of "picturestone", a generic term for stone with this type of banding. It is mined by drilling and removing boulders ranging in size from 0.5 to 1.5 m<sup>3</sup>.

About one-third of the rock is cut and processed into products such as coasters, clocks, bookends, tables and other curios at Taylor. The remainder is sold and shipped to Desert Sandscapes, Inc. in Tucson, AZ, where similar products are made and marketed. A very small percentage (less than 1 percent) of the boulders are sold to landscape rock companies for resale as landscape boulders or to individuals for personal use.

From our field examinations and research into the uses and markets of this stone and other sandstone building stones, it is our opinion that the Sierra Stone material should be considered a common variety building stone. Proper disposal of this stone, therefore, should be through a mineral material sale under regulations at 36 CFR 228, part C.

## II. LANDS INVOLVED

The claims are located in east-central Arizona about 30 km (18 miles) west of the claimant's stone business in Taylor, AZ (see maps). The mining claims involve approximately 178 ha (440 ac) within T. 12 N., R. 19 E., Section 24 and T. 12 N., R. 20 E., Sections 18 and 20. The existing quarry is located about 2 miles east on Forest Service Road 220 and about 4 miles north of the community of Clay Springs off FS Road 147. The claims are entirely within Navajo County, Sitgreaves National Forest, Arizona as follows:

Sierra Stone 1-3, 14-17 and 22 PMCs: within Section 20, T. 12 N., R. 20 E. G&SRM:

Covering approximately 130 ha (240 ac)

Sierra Stone 18 & 19 PMCs: within Section 18, T. 12 N., R. 20 E. G&SRM:

Covering approximately 32 ha (80 ac)

Sierra Stone 20 & 21 PMCs: within Section 24, T. 12 N., R. 19 E. G&SRM:

Covering approximately 32 ha (80 ac)

Appendix A contains copies of the location notices and maps. Since the claims were staked to cover all known outcrops of the material, their locations do not exactly fit legal subdivision descriptions. Each of the claims are staked and contain proper notice as outlined by Arizona law.

Sierra Stone claims 1, 2 and 3 were the first claims staked. Claims 4-13 were subsequently staked as more material was found. Claims 14-22 amended the location of claims 4-13. Thus, while 22 claims were staked, the claim block contains only 12 placer claims. Refer to Table 1.

The land on which the claims are staked are open to entry and location under the mining laws. The POO proposes to continue mining and removal of rock from Sierra Stone PMC Numbers 1 and 2 only (Appendix B).

Vegetation in the claim block includes Pinyon-Juniper woodland interspersed with sage and high desert grasses. The Forest Plan does not identify any special vegetative, riparian or wildlife management areas in the vicinity of the claims. All of the drainages are ephemeral and northerly draining. Walker Lake, located to the south of the claims, holds water only after snowmelt or heavy rainfall. There are no withdrawals and the area is open for general forest use. All of the area staked is within a grazing allotment owned by Mr. Thomas. His allotment is for 670 animal-unit months (AUM).

### III. RECORD DATA

The following data concerning the subject placer mining claims are on file at the Arizona State Office, Bureau of Land Management:

**TABLE 1**  
**LISTING OF SIERRA STONE PLACER CLAIMS**

NAME OF CLAIM	DATE LOCATED	BLM RECORDATION NBR	STATUS
Sierra Stone No. 1 PMC	6/15/1988	A-286604	Active
Sierra Stone No. 2 PMC	6/15/1988	A-286605	Active
Sierra Stone No. 3 PMC	6/15/1988	A-286606	Active
Sierra Stone No. 4 PMC	ukn	N/A	Over-Staked
Sierra Stone No. 5 PMC	ukn	N/A	do
Sierra Stone No. 6 PMC	ukn	N/A	do
Sierra Stone No. 7 PMC	ukn	N/A	do
Sierra Stone No. 8 PMC	3/25/1989	A-294241	do
Sierra Stone No. 9 PMC	3/25/1989	A-294242	do
Sierra Stone No. 10 PMC	2/9/1989	A-249243	do
Sierra Stone No. 11 PMC	ukn	N/A	do
Sierra Stone No. 12 PMC	ukn	N/A	do
Sierra Stone No. 13 PMC	ukn	N/A	do
Sierra Stone No. 14 PMC	11/01/1990	A-309597	Active
Sierra Stone No. 15 PMC	11/01/1990	A-309598	Active
Sierra Stone No. 16 PMC	11/01/1990	A-309599	Active
Sierra Stone No. 17 PMC	11/01/1990	A-309600	Active
Sierra Stone No. 18 PMC	11/01/1990	A-309601	Active
Sierra Stone No. 19 PMC	11/01/1990	A-309602	Active
Sierra Stone No. 20 PMC	11/01/1990	A-309603	Active
Sierra Stone No. 21 PMC	8/12/1991	A-316286	Active
Sierra Stone No. 22 PMC	8/12/1991	A-316287	Active

**NOTES:**

*All data verified from BLM Mining Claim fiche and the claimants.*

*Mining claims 14 -22 overtake claims 4-13.*

*Mining claims 8, 9 and 10 are still active on BLM records.*

The claims are 40 acre association placer claims. Placer claims were staked because the material is not within a quartz or other mineralized vein. Claims Sierra Stone 1-3 and 14-21 were located by Lee Chartrand and Howard Thomas. Claim 22 was located by Lee Chartrand, Howard Thomas and Barbara Chartrand. Each claim is approximately 402 m (1320 ft) per side, monumented with 10x10 cm x 1.2 m (4x4 in x 4 ft) wooden posts held up by rock. Map 2 shows the approximate overlay of the claims on the Cactus Flat and Clay Springs NE quadrangles. Location notices are contained in glass jars and placed within voids in the rock pile. Positive location was verified with the identification of a section corner for sections 13 and 24 of T. 12 N., R. 19 E. and sections 18 and 19, T. 12 N., R. 20 E., G&SRM. All of the claims have been maintained by annual filings of assessment work affidavits. The claimants believe the rock under claim has "unique properties giving the stone a distinct and special value". Since all of the claims are contiguous, mining on claims 1 and 2 benefit all of the claims. Clearly, at least \$1,200 of work is done annually onsite.

The area has a checkerboard mineral ownership. Sections 13 and 23 of T. 12 N., R. 19 E. and sections 17 and 19 of T. 12 N., R. 20 E., G&SRM have minerals in private ownership. The "Sierra Stone" outcrops on these and other sections but cannot be located under the Mining Law.

#### IV. ACCESS

The claims are approximately equidistant from Show Low and Heber, Arizona near the community of Clay Springs (see maps 1 and 3). The claims can be accessed by taking FS Road 147 (locally known as the Pulp Mill Road) north of SR 260 in Clay Springs or south off of SR 277 to FS Road 220. The workings are approximately 3 km (2 mi) east on that road. FS 220 is an unpaved, single-lane native surface road best navigated with a four-wheel drive or high clearance vehicle.

The claims are within the Clay Springs NE and Cactus Flat, AZ USGS topographic quadrangles.

#### V. BACKGROUND DATA

The Chartrands have been contestees in a contest challenging the validity of some building stone placer claims that were located about 42 km (25 mi) west of this site. The contested claims were Arizona Picture Rock Nos. 1-5 claims and a mineral examination prepared by Mineral Examiner Robert E. Wilson concluded that the stone exposed within the claims was a common variety and not locatable after the Act of July 23, 1955.

A hearing was held in 1969 for United States v. Lee Chartrand, et al., Arizona Contest A-1186. The Department of Interior's Hearing Examiner (now known as an Administrative Law Judge) held that the contestees proved a discovery of a valuable mineral on two adjacent 20-acre parcels of the Arizona Picture Rock Nos. 2 and 5 claims and that the stone exposed in a quarry straddling the claim boundaries:

"...has a unique coloration characteristic which occurs in very limited areas of the widespread Coconino Sandstone deposits. Because of this unique characteristic, the stone commands a distinctively higher price in the market place over stone used for the same purposes, giving it special and distinct value, and qualifying it as an uncommon variety of stone..."

The hearing examiner also found that the stone exposed on the other claims was of a common variety and declared these claims *null and void*. The Interior Board of Land Appeals (IBLA) in a divided opinion affirmed the Hearing Examiner's decision on appeal, U.S. v. Lee Chartrand, et al., 11 IBLA 194 (1973).

The claims declared *null and void* were restaked 9 days after the IBLA decision as Independence Picture Rock Nos. 1-6, PMCs. These claims were the subject of a classification report prepared by Mineral Examiner Hilton Cass on June 25, 1987; however, no action has been taken on the Independence Picture Rock claims at this time. Most of this section has been derived from Cass' report, pages 2 and 3.

## VI. LOCAL AND REGIONAL GEOLOGY

The Sierra Stone 1-22 claims lie in a basin with an east-west axis. The mineral material of interest, the Permian Glorieta Sandstone, grades regionally from eolian to water-lain deposition, and is predominately water deposited in the claim area. The sandstone is interbedded with the San Andreas Limestone, correlative with the Kaibab Limestone west of the claim block area. The formation underlies the Triassic Moenkopi Formation which is exposed along the northern edge of the claim block.

The Glorieta Sandstone in the claim area is a fine grain, thinly laminated, buff to tan color quartz sandstone with iron oxide Liesegang banding. Iron oxide staining is concentrated at the contacts between the (slightly cross-bedded) laminae, forming flowing lines and various "pictures" (see photos) in the cut stone.

The sandstone is capped in many places by Quaternary gravels; where exposed at the surface, the weathered sandstone is friable, though fresh, unweathered surfaces are more competent. The Liesegang banding is distinct and colorful in cleanly cut surfaces of the rock and slightly less distinctive in fresh surfaces on the broken rock. The banding is often indistinct on weathered surfaces of the rock (see photos).

The sandstone is relatively soft. Exposed weathered surfaces of the sandstone can be scratched with a penny, making the sandstone undesirable as an exterior flagstone or veneer rock unless treated or coated.

The outcrop of the formation is shown on Map 4. The Moenkopi was not found on the claims themselves, although as previously mentioned it was found to overlie the sandstone to the north of the claims, off FS Road 147 (see map).

The existing prospects on claims 1 and 2 provide the only locations where the rock can be seen in profile (see photos). The exposure is approximately 2 meters (6.5 ft) thick at this point and appears to thicken to the northwest. An exploration program involving core drilling and trenching would be needed to better define the three-dimensional extent of the material over all of the claims.

As previously mentioned, the sandstone lies in a shallow basin, a setting which may be at least partially responsible for the deposition of iron oxide in the rock, via ground water in the basin. Outcrops of the Glorieta Sandstone and the correlative Coconino Sandstone outside the basin do not exhibit the Liesegang banding.

The "Sierra Stone" is estimated to underlie approximately 60% of the 178.06 ha (480.00 ac) under claim. The claims have a southeast-northwest axis in their orientation. We found several other areas where the rock outcropped or was found as float (discussed in the following paragraph) that were not identified by the claimants. There is also approximately 45 ha (110 ac) of land that has been identified by the claimants as having the "Sierra Stone" but cannot be claimed because the Federal lands have private mineral rights. The minerals reserved include those minerals normally considered locatable and leasable off Federal lands.

Mr. Thomas showed us exposures on each claim. With the exception of claims 1, 2 and 3, these exposures were thin outcrops and float. He also showed us exposures in sections 13 and 24, T. 12 N., R. 19 E. and sections 17 and 19, T. 12 N., R. 20 E., the so-called "Aztec" sections, containing private minerals. We examined his workings, soil stockpile, waste pile and "ore" pile. Their logic for staking so many claims was to "tie up" the rock so they would not have any competitors. They staked claims wherever they found the rock outcropping or as float.

The next day we looked off claim for other areas where the formation may outcrop. We found several locations along FS Road 147, as identified in Maps 2 and 4 and shown on photographs. These locations are in sections 13, 23, 24, 25 and 26 of T. 12 N., R. 19 E. Sections 24 and 26 are public domain minerals and sections 13 and 23 are private minerals. All of the rock found off claim had the buff color and variegated coloration. No depth, thickness or areal extent could be determined, but it is obvious that the material is more widespread than the claimants had believed.

## VII. MINE PRODUCTION

The rock is mined off a face exposed by facing up an area approximately 2.5 m high and 20 m long. The rock is drilled at the top of the face and is separated from the face by a small dozer or front-end loader. Blocks 0.5 to 2.0 m<sup>3</sup> are separated out and the remainder is placed in a waste pile (see photos). The rock is taken to one of the three work areas, depending upon the final disposition of the rock. Production varies with seasons. Rock removed for sale or beneficiation into products averages 90 tons per year. The production records turned into the Lakeside Ranger District show that a total of 267.5 tons of material have been removed since July 1, 1989.

All of the Sierra Stone boulders are either processed into products in Taylor or sold to Desert Sandscapes, Inc. The rock purchased by Desert Sandscapes is also made into products. Only a very small amount of rock is sold to other users from their store.

Table 2 displays a comparison of the Sierra Stone claims with their Picture Rock claims and the Desert Sandscapes claims. Southwestern Stone sells rock off the Sierra Stone and Picture Rock claims to the owner of the Desert Sandscapes claims.

**TABLE 2**  
**COMPARISON OF PICTURESTONE MINING CLAIMS**

NAME OF CLAIMS	OWNER	LOCATION	NUMBER OF CLAIMS	TOTAL AREA
Independence Picture Rock Placer Claims Numbers 1-6	Barbara and Lee Chartrand	T.11N., R.14E., sections 3 & 10  T.12N., R.14E. section 34;  Coconino Co, AZ Sitgreaves NF	6	97.13 ha 240.00 ac
Desert Sandscapes Placer Claims Numbers 1 and 2	Joe Cassetta	St. George BLM District, Utah	2	32.38 ha 80.00 ac
Sierra Stone Placer Claims Numbers 1-3, 14-22	Barbara and Lee Chartrand and Howard Thomas	T.12N., R.19E., section 24 T.12N., R.20E.; sect. 18 and 20 Navajo Co., AZ Sitgreaves NF	12	194.26 ha 480.00 ac

**NOTES:**

1. Does not include all "Picturestone-type" claims.
2. Compares number and area of claims of material referenced in report to the "Sierra Stone" claims.
3. Refer to Table 1 for names of active "Sierra Stone" claims.

There are three work sites in the Taylor area. The downtown site (off SR 77) is their office and workplace where cut blocks and slabs are made into products such as spheres, bookends and tables (see photos). It is also the site where rock is stockpiled for shipment to Desert Sandscapes, Inc. in Tucson, AZ, their only customer for the uncut rock.

They pay \$200 a ton for the Picture Rock mined from the Independence Picture Rock claims, of which \$18 a ton is shipping. This is \$0.116 per pound (\$0.255 per kg) for the Sierra Stone and \$0.091 per pound (\$0.200 per kg) for the Picture Rock, excluding shipping. The owners will sell small quantities of rock to various decorative rock companies for the same price.

Landscape rock companies we contacted stated that they have very little demand for picturestone, mainly due to the expense of the rock. They have to purchase the rock for the same price as a company that buys it for product manufacture and the rock's banding and coloration "as a landscape boulder" is not as striking or even evident in rough form as it is when it is cut (see photos). Most purchasers of landscape boulders look for pleasing color combinations when the rock is incorporated in a landscape plan. Some exotic landscape plans do incorporate cut picturestone in veneers.

We did find that landscape boulders command prices that compare to that of the Picture Rock and Sierra Stone boulder sales to Desert Sandscapes. Landscape boulders of schist, sandstone and volcanic rock are sold at price ranges of \$35 to \$240 a ton in the Phoenix and Tucson markets. Garden Stone Supply, located in Phoenix, sells sandstone boulders mined from a pre-1955 mining claim on the Kaibab NF that is remarkably similar to the "Sierra Stone" as it comes out of the ground (see photos). The variegated banding on this stone, however, is not as distinct as that of the Sierra Stone when cut and the rock is sold at \$120 per ton. The owner of the company admitted that he could charge more for this rock, but is able to sell it for less because he does not have to buy it from anyone and stated that the price charged for the rock depends in part on the current economic conditions. The rock he sells is derived from either the Coconino Sandstone or the Kaibab Formation.

Bedrock Stone Company in Glendale sells a wide variety of rock products by the ton and by the pound. They have 30 rock products they sell by the pound that can be purchased in various sizes. Their prices range from \$0.03 to \$1.00 per pound (\$0.066 to \$2.20 per kg) for products such as granite, quartz, sandstones, river rock, petrified wood and picture rock. As shown in Table 3, their price per pound for picture rock is comparable to that of both the Picture Rock and Sierra Stone sold by the claimants and is within the average range of the rock products that they sell by the pound.

Sandstone flagstones (probably Coconino, Kaibab and Moenkopi Formations) at each of the four rock shops sell for \$140 to \$260 per ton for the beneficiated product. One company sells picturestone veneer for \$340 per ton and another sells a picturestone from near Amarillo, TX for \$0.40 per in<sup>2</sup> (about \$0.065 per cm<sup>2</sup>).

Summarizing prices:

**TABLE 3**  
**ROCK SALES COMPARISON**

COMPANY NAME	ROCK TYPE	PRICE PER TON	PRICE PER KG (LB)
AZ STONE PRODUCTS, INC. Tucson, AZ	Apache Schist	\$120 (L)	\$0.132 (\$0.060)
		\$150 (H)	\$0.165 (\$0.075)
	Moss Rock	\$125 (L)	\$0.1375 (\$0.0625)
		\$145 (H)	\$0.1595 (\$0.0725)
	Malapai (Volcanic)	\$125 (L)	\$0.1375 (\$0.0625)
		\$150 (H)	\$0.165 (\$0.075)
GARDEN STONE SUPPLY, INC. Phoenix, AZ	Granite	\$ 70.	\$0.077 (\$0.035)
	Sandstone	\$ 120.	\$0.132 (\$0.06)
ORIGINAL ROCK REPLICAS, INC. Scottsdale, AZ	Feather Rock (Volcanic)	\$ 440.	\$0.484 (\$0.22)
	Picturerock	\$120 (L)	\$0.132 (\$0.06)
		\$250 (H)	\$0.275 (\$0.125)
Sandstone	\$40.	\$0.044 (\$0.02)	
BEDROCK STONE COMPANY, INC. Glendale, AZ	Picturerock	\$240.	\$0.26 (\$0.12)
	Picturestone (flagstone)	\$300.	\$0.33 (\$0.15)
SOUTHWESTERN STONE, INC. Taylor, AZ	Picturerock	\$200.	\$0.22 (\$0.10)
	Sierra Stone	\$250.	\$0.275 (\$0.125)

**NOTES:**

1. All prices verified through August, 1992.
2. Rock types are boulders, unless otherwise noted.
3. Names of rock types are those given by seller.
4. Each company sells many types of rock.
5. Samples selected are for comparison and contrast purposes.

As can be seen from the above table, prices of some types of landscape boulders are competitive with the Picture Rock and Sierra Stone.

All of the above prices include shipping to the store, so that the FOB price at the mine or quarry could vary significantly.

However, due to competition among rock shops in the Phoenix-Tucson markets, transportation costs are generally averaged over several products. Markups on delivered prices range from 30%-50%, again depending on the product. All will give quantity discounts ranging from 5% to 25% depending on product and quantity. Since the stores keep a smaller inventory of the higher priced rock (malapais and picturestone), quantity discounts are much smaller.

It is clear that the Sierra Stone brings a higher than average price than most landscape rock, but this price as shown from Table 3 is clearly in line with similar rock products sold solely for landscape rock, particularly other types of picturestones. As previously mentioned, picturestone is generally not suited as a flagstone because it is not as strong per unit thickness and generally does not easily cleave. If we totally ignore flagstones, non-picturestone sandstones and all other rock that sells for substantially higher or lower price per unit weight than the Sierra Stone does, Sierra Stone sold as boulders to Desert Sandscapes, Inc. and picturestone sold as landscape rock to the public clearly sell within similar ranges per unit weight. Considering this as an "apples to apples" comparison, the Sierra Stone is not showing a special and distinct advantage in the marketplace. The products manufactured are not unique. Many very similar items such as coasters, clocks, rectangular slabs and spheres are made out of other types of picturestone from the Colorado Plateau or rocks such as travertine, onyx, quartz, sea shells and coal from many different parts of the US, Mexico and other countries. Since prices are set by retailers, no meaningful relationship can be made between the original sales price and retail price; retail prices at souvenir shops depend on competition and marketability of the product. An example of this was seen at two souvenir shops on July 19, 1992. A set of coasters from Desertstone was listed for \$15.00 at a store near Gallup, NM. These same coasters along with those from Desert Sandscapes and those made by Howard Thomas sold for \$25.00 at two stores in the Petrified Forest National Park. A store within the Woodlawn Plaza Motel in Flagstaff, AZ sells the Desert Sandstone and Sierra Stone coasters for \$34.00 a set (price noted on July 14, 1992).

## IX. EVALUATION

The claimants state that the Sierra Stone should be looked at analogous to material such as placer gold or porphyry copper. Their analogy is that as in place material, placer gold and porphyry copper raw material is no different than any other sand and gravel deposit or granitic intrusion. Value is arrived by the discoverer by mining, beneficiating and marketing the metals derived. They state that mining and cutting the Sierra Stone and making "valuable products" are really no different. They also state that these products could also be considered mineral materials if they were not further beneficiated into their metal contents. While this is a convincing analogy, it is flawed as follows:

1. Gold, silver, copper and other base metals are clearly defined as locatable by lode or placer claims in the 1872 Mining Law. Classification is not an issue with these, only marketability.
2. The geologic distribution of placer and lode metals is far more restrictive than that of variegated rock.
3. In the case of lode and placer deposits, it is the metals contained that are valuable, not the host material. Once these metals are removed, the separated rock and sand may or may not have value as a mineral material.
4. In the case of materials such as zeolites, gypsum, limestone and quartz, these materials are locatable due to their chemical properties or ability to influence the manufacture or beneficiate other products.
5. In the case of materials such as travertine and onyx, both can be classified as locatable and both can be used to make clocks, plaques and tabletops. However, there are three important differences:
  - a. Travertine, onyx and similar materials suitable for these and other decorative uses are far less common than variegated sandstones.
  - b. Travertine, onyx and similar materials are not commonly used for landscape rock or even flagstones. Both of these uses are common with variegated sandstones. The Sierra Stone is clearly useful as landscape rock, even if it is unsuitable for flagstone.
  - c. Locatable travertine and onyx bring substantially higher prices in the marketplace as both raw material and as finished products on a per pound (kg) price.

Many rock shops do not even carry travertine or onyx because of their high cost. Two stores visited will only special order products (usually veneer) with payment expected up front.

6. Ample precedent has been established for the sale of the sand and gravel material to placer operators after the gold or other locatable minerals were removed. A miner of porphyry copper would be similarly obligated to a mineral material sale if the rock removed was sold as landscape rock or similar material and not beneficiated into metals. Operators of unpatented mining claims can have material that is both locatable and salable, and pumice operations are good examples. A miner can locate and mine block pumice for its locatable purpose, but can also be obligated to purchase the other pumice that is sold for sand, aggregate and horticultural purposes. In fact, even block pumice can be salable if processed and sold for these purposes.

7. The value given to the Sierra Stone rock is not its contents but the imagination and skill of the cutters and their ability to market their products. The rock itself contains nothing valuable and unique that would make it special and distinct. In fact, the only other economic uses of the material would be as landscape boulders or possibly as an indoor veneer, uses we saw at several rock shops and uses that are clearly common. It is too soft and weathers too easily to be used as flagstone or exterior rock.

Forest Service regulations at 36 CFR 228 (C) define six general categories that classify material as mineral material excepting those that can be shown as having special and distinct values that override classification as a mineral material. The material is clearly mineral material under these regulations for the following reasons:

1. The material is mined as boulders and 75% is sold as boulders.
2. Material mined and sold as boulders that contains similar limonite and hematite variegated banding is readily available in the marketplace at a price in the range that Southwestern Stone sells the Sierra Stone boulders to Desert Landscapes, Inc.
3. The price the end use products bring is dependent upon the imagination and skill of the artisans who make the products and not the material itself (discussed above). Similar and comparable products are made from coal, other sandstones, granites, sea shells, wood and other natural and synthetic products. Some of the materials these products are made from are locatable, such as travertine and onyx. The difference lies in the scarcity of the quality of travertine and onyx suitable to be considered locatable. Clocks, plaques and souvenir knickknacks are really byproducts of the tabletop and veneer production of travertine and onyx. Coal is also valuable as a leasable mineral. But its value lies in being an energy source, not as a source or medium for sculpture. This value is an "opportunity" value provided by the artist. Since sculptured coal can sell at the rate of \$20.00 a pound or more as a finished product (similar to that of finished Sierra Stone products), coal that is suitable for sculpture should be equally as locatable as that for Sierra Stone. The reason it isn't is the same reason why the Sierra Stone (as variegated sandstone) should not be locatable: it is wide spread and easily found in a number of different environments.

Possession of a unique property alone is not enough to qualify a stone as an uncommon variety and locatable mineral. Common variety mineral material and uses for such stone are defined in 36 CFR 228, subpart C, §228.41(c)[(1)-(5)] - (e)[(1)-(2)]. The claimants state that the stone should be considered locatable because it has special and distinct properties that give it value above that of other similar sandstones. They support their claim with the wholesale price of their products and the \$250 a ton they receive from Desert Landscapes in Tucson. The cited regulations do not identify this benefited use. It does state in §228.41 (d)(7), as an exception: "Stone recognized through marketing for its special and distinct properties of strength and durability making it suitable for structural support and used for that purpose". Clearly, Sierra Stone does not meet this test. In §228.41 (e)(2), it states: "A use that qualifies a mineral as an uncommon variety under paragraph (d) overrides classification of that mineral as a common variety under paragraph (c) of this section". There are two uses of the Sierra Stone by the claimants: First, it is benefited by the claimants into products that are wholesaled or sold at their shop and secondly, rock as raw boulders is sold and shipped to Desert Landscapes in Tucson, AZ, where it is benefited into similar products and also wholesaled. The value of the material quarried has been determined in a willing buyer-willing seller agreement of \$250 per ton delivered. Since both buyer and seller are competitors, the sellers (claimants) must feel that the price they receive for the rock does not allow Desert Landscapes to receive a beneficial sales advantage for its products. On the other hand, the purchaser must feel the sales price is such that he can make and wholesale similar products to compete with Southwestern Stone.

The Coconino Formation (and correlative sandstone) as a building stone has been determined by the Courts to be common variety stone that was removed from location under the mining laws by the Act of July 23, 1955, Rawls v. U.S., 566 F. 2d 1373 (1978). This case involved mining of the Coconino Sandstone in the Ash Fork, AZ area. The Ninth Circuit Court of Appeals ruled:

“Determination that the Coconino Sandstone is a common variety of stone, and not a building stone of extraordinary value, based on consideration of stone’s physical characteristics, use and value, was proper thus precluding mineral entry in National Forest absent a valid discovery before July 23, 1955.”

The case, U.S. v. Lee Chartrand, et al., 11 IBLA 194 (1973) discussed in Section V of this report, is an exception to the Rawls ruling, in that the picturesque coloration exhibited on the stone within the Arizona Picture Rock Nos. 2 and 5 claims was considered to be a rare and unique property in the Coconino Sandstone.

The variegated coloration of the Sierra Stone is different than that of the Picture Rock, although it is mined for nearly identical purposes. We have examined the Independence Picture Rock claims and workings and have found the environment somewhat different in that the Picture Rock material has some natural fracture along bedding planes while the Sierra Stone is much more massive. The variegated banding in the Sierra Stone appears to be caused by hematite and limonite minerals, while that of the Picture Rock appears to be of a magnesium oxide origin, a far less common mineral in this area than the iron oxides. In both cases, the rock outcrops beyond claim boundaries.

Variegated rock is not unique; claims for this type of rock have been staked in many places in the Colorado Plateau. The rock also exists in places where claims cannot be staked. Picture rock similar to that quarried by Desert Sandscapes in southern Utah is quarried near Amarillo, TX. In U.S. v. Dunbar Stone Co., 56 IBLA 65 (1981), it was ruled that the beauty of coloration in a building stone is inherently subjective (“Beauty is in the eye of the beholder.”) and not necessarily unique, even if it is unusual.

There are also substantial reserves of the stone within the claims they have staked and on Federal lands with private minerals that they cannot locate mining claims. Excess reserves in itself is not sufficient reason to invalidate a claim; only bad faith in its location [Pacific Coast Molybdenum Co., 81 IBLA 1027 (1983)]. However, in U.S. v. Coleman, 390 US 603-604 (1968), the U.S. Supreme Court stated; “We believe that the Secretary of the Interior was also correct in ruling that: [i]n view of immense quantities of identical stone found outside the claims, the stone must be considered a common variety...”. Clearly, if areal extent is any indicator, substantial reserves lie on lands that cannot be claimed and on lands unclaimed, but identified by the authors. Considering picturestone as a generic term, sandstone with variegated banding is available in several locations within and outside of the Colorado Plateau. Sierra Stone Claim No. 1 contains an estimated 200,000 tons of claimed material. Assuming 50% is waste, the claimants have 500 years of reserves at a mining rate of 182 tonnes (200 tons) per year [which is a mining rate of more than three times their average of 82 tonnes (90 tons) per year over the past 3 years].

The purchaser of the rock is not obligated to make products; he could sell the rock as received for landscape rock; Southwestern Stone can do likewise. However, both companies have invested money into equipment and employees to give added value to the rock by cutting it up and processing it into salable goods. These same goods are made from other natural materials, as discussed previously, so that the stone cannot be considered as having both unique and distinctive properties. Based on the sample of products surveyed, the price of the Sierra Stone (as a raw material or landscape rock) falls within one standard deviation of these prices. It is the price of the Sierra Stone as a raw material that should be considered germane, not the price received from beneficiated products or added value as a result of artistic work.

Sandstone quarried for flagstone and landscape rock has clearly been determined salable in Rawls. However, it is clear that the Sierra Stone (and Picture Rock, for that matter) does not bring a significantly higher price in the marketplace than do other types of rock quarried in a similar manner.

## X. CONCLUSIONS

We conclude the following based on our field examinations, literature review, legal precedents and market data:

1. Based on the above, we do not consider the Sierra Stone material as "unique and distinctive as to command a higher price than that of other similar materials bring to the marketplace". The Sierra Stone material is classified as a mineral material and should be precluded from location under the General Mining Law of 1872 since the Act of July 23, 1955. We agree that the Sierra Stone has distinctive coloration and that the Sierra Stone, when cut and processed, is actively sought. We also note that these products command high prices at both the wholesale and retail level. However, the evidence shows that there are many different types of variegated stones and other natural and synthetic products, such as other sandstones, granites, wood, coal and plastics. that are made into similar products commanding similar prices. The price of the material at the marketplace is an excellent indicator of its value, which is \$250 a ton delivered to Tucson. This delivered price is within the averages of similar rock used primarily for landscape purposes, a use that is clearly within the scope of being a mineral material (36 CFR 228 (c), §228.41(c)(5). According to Messrs. Chartrand and Thomas, 75% of the stone is sold as "raw material" to Desert Landscapes, Inc.

2. Any disposals of this stone should be made by a mineral material contract sale under the authority given by the Materials Act of July 31, 1947. Regulations for the sale of mineral materials are found at 36 CFR 228, subpart C.

Appendices:

Appendix A: Sierra Stone Mining Claim Recordation Notices

Appendix B: Copy of the Plan Of Operation (P.O.O.)

Appendix C: Maps

Appendix D: Photographs

Bibliography

1. Peirce, Wesley H., 1989; *Correlation Problems of Pennsylvanian-Permian Strata of the Colorado Plateau of Arizona*, in Geologic Evolution of Arizona, Arizona Geological Society Digest 17, pp. 349-368, J. P. Jenney and S. J. Reynolds, editors
2. Krumbein and Sloss, 1963; *Stratigraphy and Sedimentation (2<sup>nd</sup> Edition)*, W. H. Freeman & Sons, San Francisco, CA
3. Haskins and Mullin, 1989; *Handbook for Mineral Examiners, H-3890-1*, USDI-BLM Handbook
4. Cass, H. K., 1987; *Chartrand Mineral Material Classification*, Mineral Report, USDA-FS, R-3
5. Maley, T., 1992; *Mining Law (5th Edition)*, Mineral Land Publications, Boise, ID

**APPENDIX A**

**SIERRA STONE  
MINING CLAIM  
RECORDATION NOTICES**

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_



When recorded mail to: \_\_\_\_\_ Witr \_\_\_\_\_  
**SOUTHWESTERN STONE CO.** \_\_\_\_\_  
P. O. BOX 454 \_\_\_\_\_  
TAYLOR, AZ. 85939 \_\_\_\_\_  
536-4912 or 536-4988 \_\_\_\_\_ By \_\_\_\_\_

FEE # 85 07963  
RECORDED AT THE REQUEST OF Howard Thomas  
ON JUN 15 1988 AM -8 40  
IN DOCKET 916 PAGE(S) 181  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER

## MAP OF MINING CLAIM LOCATION

MICROFILMED  
INDEXED

- Location  Amendment *Check only one*
  - Placer  Lode  Millsite  Tunnelsite *Check only one*
  - The name of the claim is SIERRA STONE #1  
The name of the locators ARE; HOWARD THOMAS & Lee CHASTRAND
  - The location of the claim is in Section 20 Township 12 N.  
Range 20 E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The N.E. corner of the claim is 2900 feet in a  
N.N.E. direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF  
Section 20, T12N, R20E.
  - The type of location monument is 4 FOOT POST WITH STONE.  
The type of corner and end monuments are 4 FOOT POST w/ STONE
  - The bearing and distance between the corners of the claim are beginning at the N.E.  
corner of the claim 1320 feet in a Southerly direction to the S.E. corner, then  
1320 feet in a Westerly direction to the S.W. corner, then 1320 feet  
in a NORTHERLY direction and to the N.W. corner then 1320 feet in a Easterly  
direction to the point of beginning.
  - If amending, this claim was previously recorded in Docket \_\_\_\_\_, Page \_\_\_\_\_  
\_\_\_\_\_ Mining District, \_\_\_\_\_ County, Arizona
- Date 6/15/88

Signature Howard Thomas  
DOCKET 916 PAGE 181

RECEIVED  
AZ STATE OFFICE  
JUL - 1  
PR 3:37  
PHENIX, ARIZONA

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_

Fee No.:



FEE # 55 07962  
RECORDED AT THE REQUEST OF

Howard Thomas  
ON JUN 15 1988 AM -8 40  
IN DOCKET 916 PAGE(S) 180  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER

MICROFILMED  
INDEXED

When recorded mail to: V  
SOUTHWESTERN STONE CO  
PO BOX 454  
TAYLOR, AZ 85939 E

### MAP OF MINING CLAIM LOCATION

- Location  Amendment *Check only one*
- Placer  Lode  Millsite  Tunnelsite *Check only one*
- The name of the claim is SIERRA STONE #2  
The name of the locator s ARE: HOWARD THOMAS & LEE CHATRAUD
- The location of the claim is in Section 20 Township 12 N.  
Range 20 E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The N. E. corner of the claim is 4300 feet in a  
N. N. E. direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF  
SECTION 20, T 12 N., R 20 E.
- The type of location monument is 4 FOOT POST WITH STONE.  
The type of corner and end monuments are 4 FOOT POST W/ STONE
- The bearing and distance between the corners of the claim are beginning at the N. E. corner of the claim 1320 feet in a SOUTHERLY direction to the S. E. corner then  
1320 feet in a WESTERLY direction to the S. W. corner, then 1320 feet  
in a NORTHERLY direction and to the N. W. corner then 1320 feet in a WESTERLY  
direction to the point of beginning.
- If amending, this claim was previously recorded in Docket \_\_\_\_\_, Page \_\_\_\_\_  
\_\_\_\_\_ Mining District, \_\_\_\_\_ County, Arizona.

Date 6/15/88

Howard Thomas  
Signature DOCKET 916 PAGE 180

RECEIVED  
BLM. AZ STATE OFFICE  
1988 JUN 15 AM 3:37  
NAVAJO COUNTY ARIZONA

286605

STATE OF ARIZONA,

I hereby certify that the within instrument was filed and

Fee No.:

County of \_\_\_\_\_ ss. recorded \_\_\_\_\_

In Docket No. \_\_\_\_\_

When recorded mail to:

**SOUTHWESTERN STONE CO.**

P. O. BOX 454

TAYLOR, AZ. 85939

536-4912 or 536-4989

FEE # 88 07961

RECORDED AT THE REQUEST OF

Howard Thomas

ON JUN 15 1988 AM - 8 40

IN DOCKET 916 PAGE(S) 179

OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



### MAP OF MINING CLAIM LOCATION

MICROFILMED  
INDEXED

1.  Location  Amendment *Check only one*

2.  Placer  Lode  Millsite  Tunnelsite *Check only one*

3. The name of the claim is SIERRA Stone #3  
The name of the locators ARE: HOWARD THOMAS & Lee CHARTRAND

4. The location of the claim is in Section 20 Township 12 N.  
Range 20 E. G&SRB&M, \_\_\_\_\_ Mining District,  
NAVAJO County, Arizona. The N.E. corner of the claim is 3300 feet in a  
NORTHERLY direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF  
SECTION 20, T12 N., R. 20 E.

5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 Foot post w/ stone

6. The bearing and distance between the corners of the claim are beginning at the N.E.  
corner of the claim 1320 feet in a Southerly direction to the S.E. corner, then  
1320 feet in a westerly direction to the S.W. corner, then 1320 feet  
in a NORTHERLY direction and to the N.W. corner then 1320 feet in a Easterly  
direction to the point of beginning.

7. If amending, this claim was previously recorded in Docket \_\_\_\_\_, Page \_\_\_\_\_  
\_\_\_\_\_ Mining District, \_\_\_\_\_ County, Arizona.

Date 6/15/88

Howard Thomas  
Signature

DOCKET 916 PAGE 179

RECEIVED  
BLM. AZ STATE OFFICE  
JUL - 1 PM 3:37  
ARIZONA

A MC 286606

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
in Docket No. \_\_\_\_\_

FEE # 90 15714  
RECORDED AT THE REQUEST OF

Lee Chartrand  
ON NOV 06 '90-11 10 AM  
IN DOCKET 1013 PAGE(S) 305-306  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



When recorded mail to:  
**SOUTHWESTERN STONE CO.**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

By \_\_\_\_\_  
Deputy Recorder

### NOTICE OF MINING CLAIM LOCATION

- Location     Amendment    *Check only one*
- Placer     Lode     Millsite     Tunnelsite    *Check only one*
- The name of the claim is SIERRA STONE #14  
The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939
- The location of the claim is in Section 20 Township 12N.  
Range 20E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 3620 feet in a  
NNW direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.
- The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone
- The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a easterly direction to the NE corner, then  
1320 feet in a southerly direction to the SE corner, then 1320 feet  
in a westerly direction and to the SW corner then 1320 feet in a northerly  
direction to the point of beginning.

Dec 21 11 06 AM '90

RECORDED  
NAV. REC. OFFICE

Date NOVEMBER 1, 1990

Grove Holladay

Lee Chartrand  
Signature

Notary Public, State of Arizona County of Navajo  
My commission expires 1-11-92

A 11 309597

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_ FEE # 90 15715  
In Docket No. \_\_\_\_\_ RECORDED AT THE REQUEST OF

Lee Chartrand  
ON NOV 06 '90-11 10 AM

When recorded mail to:  
**SOUTHWESTERN STONE CO**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

Wit  
IN DOCKET 1013 PAGE(S) 307-308  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER  
By \_\_\_\_\_ Deputy Recorder



### NOTICE OF MINING CLAIM LOCATION

1.  Location     Amendment    *Check only one*
2.  Placer     Lode     Millsite     Tunnelsite    *Check only one*
3. The name of the claim is SIERRA STONE #15  
The name of the locator.s are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939
4. The location of the claim is in Section 20 Township 12N.  
Range 20E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 2370 feet in a  
NNW direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.
5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone
6. The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a east direction to the NE corner, then  
1320 feet in a south direction to the SE corner, then 1320 feet  
in a west direction and to the SW corner then 1320 feet in a north  
direction to the point of beginning.

Dec 21 11 06 AM '90

A-111-309598

RECEIVED

Date NOVEMBER 1, 1990

*Carol Holladay*

*[Signature]*  
Signature

Notary Public, State of Arizona County of Navajo  
My commission expires 1-11-92

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_ FEE # 90 15716  
In Docket No. \_\_\_\_\_ RECORDED AT THE REQUEST OF

Lee Chartrand

ON NOV 06 '90-11 10 AM

When recorded mail to:

IN DOCKET 1013 PAGE(S) 309-310  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER

**SOUTHWESTERN STONE CO.**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

By \_\_\_\_\_ Deputy Recorder



## NOTICE OF MINING CLAIM LOCATION

1.  Location  Amendment *Check only one*  
2.  Placer  Lode  Millsite  Tunnelsite *Check only one*

3. The name of the claim is SIERRA STONE #16  
The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
whose current address is P.O. Box 454 TAYLOR, AZ 85939

4. The location of the claim is in Section 20 Township 12N  
Range 20E G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 1320 feet in a  
north direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.

5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a east direction to the NE corner, then  
1320 feet in a south direction to the SE corner, then 1320 feet  
in a west direction and to the SW corner then 1320 feet in a north  
direction to the point of beginning.

Date NOVEMBER 1, 1990

Carol Holladay  
Notary Public, State of Arizona County of Navajo  
My Commission expires 1-11-92

J. Turley  
Signature

A 11-309599

DEC 21 11 06 AM '90

RECEIVED  
NAVajo COUNTY OFFICE

STATE OF ARIZONA, I hereby certify that the within instrument was filed and

ss.

County of \_\_\_\_\_ recorded \_\_\_\_\_

FEE # 90 15717

In Docket No. \_\_\_\_\_

RECORDED AT THE REQUEST OF

Lee Chartrand

ON NOV 06 '90-11 10 AM

When recorded mail to:

V

IN DOCKET 1013 PAGE(S) 311-312

SOUTHWESTERN STONE CO.

P. O. BOX 454

TAYLOR, AZ. 85939

536-4912 or 536-4989

OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA

JAY H. TURLEY, RECORDER



Deputy Recorder

# NOTICE OF MINING CLAIM LOCATION

1.  Location  Amendment *Check only one*

2.  Placer  Lode  Millsite  Tunnelsite *Check only one*

3. The name of the claim is SIERRA STONE #17

The name of the locators are LEE CHARTRAND and HOWARD THOMAS

whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939

4. The location of the claim is in Section 20 Township 12N.

Range 20E G&SRB&M,          Mining District,         

NAVAJO County, Arizona. The NW corner of the claim is         

         THE survey monument or permanent natural object described as THE NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.

5. The type of location monument is 4 foot post with stone

The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NW

corner of the claim 1320 feet in a east direction to the NE corner, then

1320 feet in a south direction to the SE corner, then 1320 feet

in a west direction and to the SW corner then 1320 feet in a north

direction to the point of beginning.

Date NOVEMBER 1, 1990

*Carol Holladay*

Notary Public State of Arizona County of Navajo  
My commission expires 1-11-92

*Lee Chartrand*

Signature

11-06-90 06:00

Dec 21 11 06 AM '90

RECEIVED  
NOTARY PUBLIC OFFICE

NOV 06 10 13 AM '90

NOTICE OF MINING CLAIM LOCATION

NOTICE IS HEREBY GIVEN that the Sierra Stone #18 placer mining claim has been located by Howard Thomas, Lee Chartrand and Barbara Chartrand whose current mailing address is P.O. Box 454, Taylor, Arizona 85939.

The general course of this claim is north to south and it is situated in Navajo County, Arizona.

This claim is 1933.8 feet in length and 1320 feet in width. This claim runs from the location monument on which this location notice is posted approximately 1310 feet in a NORTH direction to the NORTH end line and 10 FEET in a SOUTH direction to the SOUTH end line. The claim boundaries are marked by four (4) monuments, one at each corner.

The location monument on which this notice is posted is situated within Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona. This claim encompasses Lot 3, Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

The southwest corner of the claim is located approximately 1320 feet north of the southwest corner of Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

DATED AND POSTED on the ground this 1st day of NOVEMBER, 1990

Howard Thomas  
Lee Chartrand  
Barbara Chartrand

By: [Signature]

RECEIVED  
ARIZONA STATE SERVICE  
DEC 21 11 06 AM '90

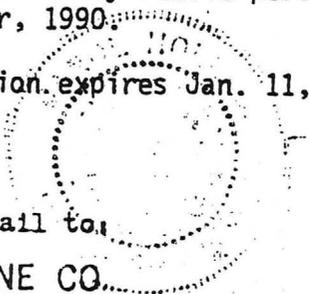
A MC 309601

State of Arizona  
County of Navajo

Before me a Notary Public personally appeared Lee Chartrand this 2nd day of November, 1990.

My commission expires Jan. 11, 1992

[Signature: Carol Holladay]



When recorded mail to:

SIERRA WESTERN STONE CO.

P. O. BOX 454

TAYLOR, AZ. 85939

PHONE 4912 OR 536-4989

NOTICE OF MINING CLAIM LOCATION

NOTICE IS HEREBY GIVEN that the Sierra Stone#19 placer mining claim has been located by Howard Thomas, Lee Chartrand and Barbara Chartrand whose current mailing address is P.O. Box 454, Taylor, Arizona 85939.

The general course of this claim is north to south and it is situated in Navajo County, Arizona.

This claim is 1933.8 feet in length and 1320 feet in width. This claim runs from the location monument on which this location notice is posted approximately 1310 feet in a NORTH direction to the NORTH end line and 10 FEET in a SOUTH direction to the SOUTH end line. The claim boundaries are marked by four (4) monuments, one at each corner.

The location monument on which this notice is posted is situated within Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona. This claim encompasses Lot 4, Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

The southwest corner of the claim is the southwest corner of Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

DATED AND POSTED on the ground this 1st day of NOVEMBER, 1990

Howard Thomas  
Lee Chartrand  
Barbara Chartrand

By: 

State of ARizona  
County of Navajo

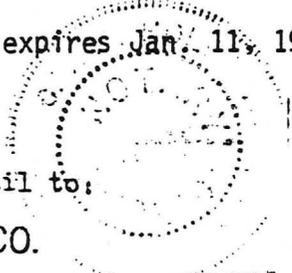
Before me, a Notary Public, personally appeared Lee Chartrand this 2nd day of November, 1990.

My commission expires Jan. 11, 1991



RECEIVED  
ARIZONA COUNTY CLERK  
DEC 21 11 06 AM '90

A 111 309602



When recorded mail to:

SOUTHWESTERN STONE CO.  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

STATE OF ARIZONA,

I hereby certify

ss.

County of \_\_\_\_\_

recorded \_\_\_\_\_

FEE # 90 15720

In Docket No. \_\_\_\_\_

RECORDED AT THE REQUEST OF

Lee Chartrand

ON NOV 06 '90-11 10 AM

When recorded mail to:

IN DOCKET 1013 PAGE(S) 319-320

**SOUTHWESTERN STONE CO.**

P. O. BOX 454

TAYLOR, AZ. 85939

536-4912 or 536-4989

OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA

JAY H. TURLEY, RECORDER

U,

Deputy Recorder



# NOTICE OF MINING CLAIM LOCATION

1.  Location  Amendment *Check only one*

2.  Placer  Lode  Millsite  Tunnelsite *Check only one*

3. The name of the claim is SIERRA STONE #20

The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939

4. The location of the claim is in Section 24 Township 12N.

Range 19E G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_

NAVAJO County, Arizona. The NE corner of the claim is \_\_\_\_\_

\_\_\_\_\_ THE survey monument or permanent natural object described as  
THE NORTHEAST SECTION CORNER OF SECTION 24, T12N. R19E.

5. The type of location monument is 4 foot post with stone

The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NE

corner of the claim 1320 feet in a south direction to the SE corner, then

1320 feet in a west direction to the SW corner, then 1320 feet

in a north direction and to the NW corner then 1320 feet in a east

direction to the point of beginning.

Date NOVEMBER 1, 1990

Carol J. Belladay

Notary Public - State of Arizona County of Navajo  
My commission expires 1-11-92

Lee Chartrand

Signature

DOCKET 1013 PAGE 319

A 11 309603

Dec 21 11:06 AM '90

RECORDED

48

STATE OF ARIZONA, I hereby certify that the within instrument was filed and

County of \_\_\_\_\_ ss. recorded \_\_\_\_\_

In Docket No. \_\_\_\_\_ FEE # 91 11252

RECORDED AT THE REQUEST OF Lee Chartrand

When recorded mail to: \_\_\_\_\_ WI ON AUG 13 '91 - 1 30 PM

IN DOCKET 1043 PAGE(S) 329-330  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
By JAY H. TURLEY, RECORDER



MICROFILMED  
INDEXED

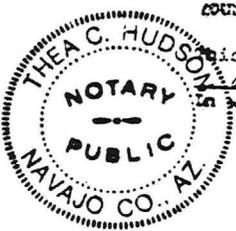
### NOTICE OF MINING CLAIM LOCATION

A 11 316286

- 1.  Location     Amendment    Check only one
- 2.  Placer     Lode     Millsite     Tunnelsite    Check only one
- 3. The name of the claim is SIERRA STONE #21.  
The name of the locator's are LEE CHARTRAND and HOWARD THOMAS  
Whose current mailing address is P.O. Box 454 Taylor, AZ 85939
- 4. The location of the claim is in Section 24 Township 12N.  
Range 19E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NE corner of the claim is 1320 feet in a  
east direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF SECTION 24, T12N., R19E.
- 5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone
- 6. The bearing and distance between the corners of the claim are beginning at the NE  
corner of the claim 1320 feet in a seath direction to the SE corner, then  
1320 feet in a west direction to the SW corner, then 1320 feet  
in a north direction and to the NW corner then 1320 feet in a east  
direction to the point of beginning.

Date Aug 12, 1991

Howard Thomas  
Signature



STATE OF ARIZONA )  
COUNTY OF NAVAJO )  
This instrument was acknowledged before me this 12th day of August, 1991, by Howard Thomas  
in witness whereof I hereunto set my hand and official seal.

Thea C. Hudson  
NOTARY  
My Commission Expires May 9, 1992

Aug 20 10 16 AM '91

# Affidavit of Labor Performed and Improvements Made

STATE OF ARIZONA }  
County of NAVAJO } ss.

LEE CHARTRAND, being duly sworn, according to law, deposes and says:

That he is a citizen of the United States, more than 18 years of age and resides at;

P.O. BOX 454 TAYLOR, Arizona NAVAJO county.

That he is personally acquainted with the following unpatented mining claims which are situated in the HOLBROOK Mining district NAVAJO county, Arizona. The names, books and pages of the recording of the location notices in the office of the recorder of said county and the BLM serial numbers of which are as follows:

Claim Name	Recorded		BLM No.
	Book	Page	
SIERRA STONE #1	916	181	AMC 286604
SIERRA STONE #2	916	180	AMC 286605
SIERRA STONE #3	916	179	AMC 286606

That the notices of location of said claims are posted within the following:

Sections,	Townships,	and Ranges.
20	12N.	20E.

That LEE CHARTRAND, whose address is P.O. BOX 454 TAYLOR, AZ 85939 is the owner of the above-described claims;

That between the 1st day of September 1989, and the 1st day of September 1990, in excess of three hundred Dollars (\$ 300 .00) worth of work and improvements were done and performed upon or for the benefit of this claim group;

That such work and improvements consisted of opening quarry,

removing overburden and rock with hand labor and equipment,

and repair of road.

and were performed by Howard Thomas, Lee Chartrand, Lloyd Chartrand & others, and that the above work and improvements were made by and at the expense of

HOWARD THOMAS AND LEE CHARTRAND the owners of the claims, for the purpose of complying with the laws of the United States pertaining to assessment or annual work.

DATED this 31st day of OCTOBER, 1990.



SUBSCRIBED AND SWORN to before me this 1st day of Nov, 1990 by Lee Chartrand.

  
Notary Public

My Commission Expires:

JAN 11, 1992



RECEIVED  
BLM OFFICE  
11/27 10:45 AM '90

# Affidavit of Labor Performed and Improvements Made

3  
pb

STATE OF ARIZONA }  
County of NAVAJO } ss.

LEE CHARTRAND, being duly sworn, according to law, deposes and says:

That he is a citizen of the United States, more than 18 years of age and resides at: Box 454 Taylor, AZ 84939 Navajo county, Arizona;

That he is personally acquainted with the following unpatented mining claims which are situated in the Holbrook Mining District, Navajo County, Arizona, the names, books, and pages of the recording of the location notices in the office of the recorder of said county and the BLM serial numbers of which are as follows:

Claim Name	Book	Page	BLM No.
SIERRA STONE #1	916	181	AMC 286604
SIERRA STONE #2	916	180	AMC 286605
SIERRA STONE #3	916	179	AMC 286606
SIERRA STONE #14	1013	305	AMC 309597
SIERRA STONE #15	1013	307	AMC 309598
SIERRA STONE #16	1013	909	AMC 309599
SIERRA STONE #17	1013	311	AMC 309600
SIERRA STONE #18	1013	313	AMC 309601
SIERRA STONE #19	1013	316	AMC 309602
SIERRA STONE #20	1013	319	AMC 309603

That the notices of location of said claims are posted within the following:

Sections,	Townships,	and Ranges.
20	12N.	20E.
18	12N.	20E.
24	12N.	19E.

That Lee Chartrand, whose address is Box 454 Taylor, AZ. 84939, is the owner of the above-described claims;

That between the 1st day of September A.D. 1990, and the 1st day of September A.D. 1991, in excess of one thousand Dollars (\$1,000.00) worth of work and improvements were done and performed upon or for the benefit of this claim group;

That such work and improvements consisted of opening quarry, repairing road, removing overburden and rock with hand labor and equipment. and were performed by Howard Thomas, Lee Chartrand, Lloyd Chartrand & others and that the above work and improvements were made by and at the expense of Lee Chartrand ~~and~~ Howard Thomas the owner of the claims, for the purpose of complying with the laws of the United States pertaining to assessment or annual work.

DATED this 29th day of October, 1991.



SUBSCRIBED AND SWORN to before me this 29th day of October, 1991 by Lee Chartrand.

  
Notary Public

My Commission Expires:

Jan 11, 1992

RECEIVED  
BLM AZ STATE  
DEC 10 1 52 PM '91  
PIOPHX:1-1011

**APPENDIX B**

**COPY OF THE  
PLAN OF OPERATION (P.O.O.)**

PLAN OF OPERATIONS  
FOR MINING ACTIVITIES  
ON NATIONAL FOREST LANDS

Submitted by Howard Thomas Operator 6/18/92  
Signature Title Date

Plan Received by \_\_\_\_\_  
Signature Title Date

I. GENERAL INFORMATION

- A. Name of Mine/Project SIERRA STONE
- B. Type of Operation PLACER  
(lode, placer, mill, exploration, development, production, other)
- C. Is this a (new/continuing) operation? (CIRCLE ONE)  
If continuing a previous operation, this plan (replaces/modifies) a previous plan of operation. (CIRCLE ONE)
- D. Proposed start-up date of operation ON DATE OF OPERATION APPROVAL
- E. Proposed duration of operations DECEMBER 31, 1999
- F. Proposed seasonal reclamation close-out date NON-SEASONAL

II. PRINCIPALS

A. Name, address and phone number of operator HOWARD THOMAS  
PO Box 832  
TAYLOR, AZ 85939 - 602-536-4944

B. Name, address, and phone number of authorized field representative (if other than the operator). Attach authorization to act on behalf of operator.  
SAME AS ABOVE

C. List the owners of the claims (if other than the operator)  
Lee CHARTRAND PO Box 454  
TAYLOR, AZ 85939 602-536-4912

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

# Affidavit of Labor Performed and Improvements Made

STATE OF ARIZONA }  
County of NAVAJO }

ss.

HOWARD THOMAS, being duly sworn, according to law, deposes and says:

That he is a citizen of the United States, more than 18 years of age and resides at;

P.O. Box 454 TAYLOR, Arizona 85939 NAVAJO county.

That he is personally acquainted with the following unpatented mining claims which are situated in the HOLBROOK Mining district NAVAJO county, Arizona. The names, books and pages of the recording of the location notices in the office of the recorder of said county and the BLM serial numbers of which are as follows:

Claim Name	Recorded		BLM No.
	Book	Page	
SIERRA STONE #1	916	181	AMC 286604
SIERRA STONE #2	916	180	AMC 286605
SIERRA STONE #3	916	179	AMC 286606

That the notices of location of said claims are posted within the following:

Sections,	Townships,	and Ranges.
20	12 N.	20 E

That HOWARD THOMAS whose address is P.O. Box 454 TAYLOR, AZ 85939 is the owner of the above-described claims;

That between the 1st day of September 1988, and the 1st day of September 1989 in excess of THREE HUNDRED Dollars (\$300.00) worth of work and improvements were done and performed upon or for the benefit of this claim group;

That such work and improvements consisted of REMOVING OVERBURDEN  
AND ROCK IN OPENING NEW QUARRY, QUARRYING  
AND REMOVING AT LEAST 10 TONS OF STONE.

and were performed by HOWARD THOMAS AND LEE CHARTRAND and that the above work and improvements were made by and at the expense of HOWARD THOMAS AND LEE CHARTRAND the owners of the claims, for the purpose of complying with the laws of the United States pertaining to assessment or annual work.

DATED this 15<sup>TH</sup> day of OCTOBER, 1989.

Howard Thomas

SUBSCRIBED AND SWORN to before me this 17<sup>th</sup> day of October  
1989 by HOWARD THOMAS.



Carol K. Kelladery  
Notary Public

WHEN RECORDED  
MAIL TO  
P.O. Box 454  
TAYLOR, AZ 85939  
1-800-912-0368

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorder

Fee No.:

In Docket No. \_\_\_\_\_

FEE # 91 11253

RECORDED AT THE REQUEST OF

Lee Chutrand

ON AUG 13 '91-7 30 PM

IN DOCKET 1043 PAGE(S) 331-332

OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



MICROFILMED  
INDEXED

When recorded mail to:

### NOTICE OF MINING CLAIM LOCATION

- 1.  Location     Amendment    *Check only one*
- 2.  Placer     Lode     Millsite     Tunnelsite    *Check only one*

3. The name of the claim is SIERRA STONE #22

The name of the locator is Mr HOWARD THOMAS, LEE CHARTRAND and BARBARA CHARTRAND  
whose current mailing address is P.O. Box 454 Taylor, Az. 85939

4. The location of the claim is in Section 20 Township 12N

Range 20E G&SRB&M, Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 1320 feet in a  
west direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N., R20E.

5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a east direction to the NE corner, then  
1980 feet in a south direction to the SE corner, then 1320 feet  
in a west direction and to the SW corner then 1980 feet in a north  
direction to the point of beginning.

Date Aug 12, 1991

Howard Thomas  
Signature



STATE OF ARIZONA ) ss  
COUNTY OF NAVAJO )

This instrument was acknowledged before me this 12th day of  
August, 1991, by Howard Thomas  
in witness whereof I hereunto set my hand and official seal.

Thea C. Hudson  
NOTARY

My Commission Expires May 9, 1992

AUG 20 10 16 AM '91

- D. List name and address of any other lessees, assigns, agents, etc. and briefly describe their involvement with the operation, if applicable:

173112

### III. PROPERTY OR AREA

Name of claim and the legal land description where the operation will be conducted:

MC #	Name	Section	Township	Range
286604	SIERRA Stone #1	20	12N	20E
286605	SIERRA Stone #2	20	12N	20E

### IV. DESCRIPTION OF THE OPERATION

- A. Access. Show on a map (USGS quadrangle map or a National Forest map, for example) the claim boundaries and describe and show on the map all access needs, on and off the claim. Specify what Forest Service existing roads will be used, where maintenance or reconstruction is proposed and where any new construction is necessary. For new construction, include construction specifications such as widths, grades, etc. Show location and size of culverts. Describe maintenance plans. Describe the type and sizes of vehicles and equipment that will be traveling the access routes.

ENTRY WILL BE FROM SR #277 ONTO PAVED FOREST RT #147 FOR APPROX. 3 1/2 MILES SOUTH, THEN TURNING EAST ONTO FOREST ROUTE #220 APPROX. 1 3/4 MILES TO SITE OF PLANNED OPERATION.

- B. Attach map, sketch or drawing showing location and layout of the area of operation. Include names and locations of any streams, creeks, and springs. Describe and explain on the map the type of operation, method or techniques you propose (examples: drilling, open pit mining, dredging, milling, etc.; include locations, capacity, size, amount, etc.). Show on the map and describe below the size and kind of all surface disturbance, such as trenches, pits, settling ponds, stream channels and run-off diversions, waste dumps, drill pads, timber disposal or clearance, etc. Include sizes, capacities, acreage, amounts, locations, materials involved, etc.

SURFACE ACTIVITIES WILL CONSIST OF DRILLING AND WEDGING LARGE BOULDERS FROM NATURALLY EXPOSED ROCK LEDGE OR WHERE OVERBURDEN IS AT A MINIMUM.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

C. Project Description. Describe all aspects of the operation: how clearing will be accomplished, topsoil stockpiled, waste rock placed, tailing disposed of, etc. Calculate production rates and total volumes of waste rock and ore. Include justification and calculations for settling pond capacities and sizing of runoff diversion channels.

1. For first 12 months:

SURFACE DISTURBANCE OF SOIL AND PLANT LIFE WILL BE VERY MINIMAL SINCE FORMATION IS ON OR NEAR THE SURFACE. WASTE ROCK SHALL BE USED TO FILL ANY AREAS SUCH AS BACK FILLING QUARRY OR HOLES NEEDED FILLED TO BENEFIT APPEARANCE OF AREA AND BY DIRECTION OF RANGER IN CHARGE. ANY SOIL DISTURBED SHALL BE STOCKPILED AND USED TO SPREAD OVER THAT AREA WHEN OPERATIONS CEASE.

2. For total life of project:

SAME AS ABOVE

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

D. Describe the Equipment and Vehicles you propose to use in your operation (Examples: drill, dozer, wash plant, mill, etc.). Include: sizes, capacity, frequency of use, etc.

EQUIPMENT USED IN OPERATION WILL CONSIST  
OF COMPRESSOR AND ROCK DRILL.  
580 D CASE BACKHOE, 920 CAT WHEEL  
LOADER, AND 1845 CASE UNLOADER

E. Structures. Describe and include justification for the structures or facilities planned for the operation. Include such things as storage sheds, mill buildings, thickener tanks, fuel storage, powder magazines, pipe lines, water diversions, trailers, sanitation facilities, etc. Include justification and calculations for sizing of tanks, pipelines and water diversions. The fuel storage facilities should include containment structures that will hold the volume of the largest storage tank in case of a tank failure or leak. Show the locations on the sketch map.

NONE

#### V. ENVIRONMENTAL PROTECTION MEASURES (SEE 36 CFR 228.8)

A. Air Quality. Describe measures to be taken to minimize impacts on air quality such as obtaining a burning permit for slash disposal or dust abatement on roads.

NO SLASH DISPOSAL PROBLEM SHOULD  
EXIST SINCE AREA OF OPERATION HAS  
VERY SPARSE VEGETATION.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

B. **Water Quality.** State how applicable state and federal water quality standards will be met. Describe what measures or management practices will be used to minimize water quality impacts and meet applicable standards.

1. If water is to be used in the operation (processing ore, washing ore, solution make-up, etc.) state how the water will be stored, treated and disposed of. If ponds of any type are proposed, such as for storage or settling, state how they will be designed and built. Provide storage capacities and water balance calculations. State how ponds will be maintained on an annual basis.
2. Describe methods to control runoff and erosion to prevent entry into surface water for all disturbed areas, including waste and tailings dumps.
3. Describe proposed surface water and groundwater quality monitoring, if required, to demonstrate compliance with federal or state water quality standards.
4. Describe what measures will be used to minimize potential water quality impacts during winter closure, if applicable.
5. If land application is proposed for wastewater disposal, the location and operation of the land application system should be described.

NO WATER WILL BE USED IN THE QUARRYING OPERATION, ALSO THE SITE OF OPERATIONS ARE LOCATED ON THE HIGHER GROUND AND WELL AWAY FROM THE NATURAL DRAINAGES. NO WATER DRAINAGE PROBLEM WILL OCCUR OTHER THAN NATURAL EROSION.

C. **Solid Wastes.** State how any tailing, dumpage, or other waste produced by operations will be disposed of or treated so as to minimize adverse impacts. Include a statement that all unburnable garbage and refuse will be hauled off-Forest to a sanitary landfill.

THERE WILL BE NO WASTE MATERIAL (REFUSE) CAUSED BY THE QUARRYING OPERATION. GARBAGE AND OTHER TYPES OF WASTE, IF ANY, WILL BE HAULED TO THE LANDFILL AND DISPOSED OF PROPERLY.

D. **Scenic Values.** State how scenic values will be protected. Examples are screening, slash disposal, timely reclamation, etc.

NO PROBLEM SHOULD EXIST SINCE MOST OF THE QUARRIED MATERIAL WILL BE HAULED TO THE PROCESSING PLANT IN TAYLOR, OR DIRECTLY TO THE MARKET.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

E. Fish and Wildlife. All practicable measures to maintain and protect fisheries and wildlife habitat affected by the operations must be taken, and should be defined. Most of those measures involve avoidance of critical habitat such as along streams and bogs when planning roads, dumps, etc. Opportunities during reclamation to prevent erosion or plant browse or forage species should be described.

NO FISH OR WILDLIFE DISTURBANCE  
WILL OCCUR.

F. Cultural Resources. Describe procedures for protection of historic and archeological values. The Forest Service is responsible for insuring that the area to be covered by the operating plan is inventoried prior to plan approval to determine the presence of significant cultural resources and will specify protective and/or mitigation measures to be taken by the operator. If previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, the operator shall not proceed until he is notified by the District Ranger that he has complied with provisions for mitigating unforeseen impacts as required by 36 CFR 228.4(e) and 36 CFR 800.

NO HISTORIC OR PREHISTORIC CULTURAL  
RESOURCES EXIST ON OR NEAR THE SITE  
OF OPERATION.

G. List all hazardous substances (by name and quantity required) which you intend to use or generate during the proposed operation. Operations USING or GENERATING HAZARDOUS SUBSTANCES must attach copies of other Federal and State agency permits, including all stipulations and conditions pertaining to the permit.

NO HAZARDOUS SUBSTANCES WILL BE USED.

H. With regard to hazardous substances, discuss handling, storage, security (fencing), identification (signing), or other special operations requirements necessary to conduct the proposed operation.

NONE USED

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

- I. Close-out Reclamation. This section should describe the removal of structures and facilities, and the reclamation of the access road. It should specify that roads no longer needed: (1) be closed, (2) bridges and culverts be removed, (3) cross drains, dips, or water bars be constructed, and (4) the road surface be shaped to as near a natural contour as practicable and be stabilized. Show the expected date for completion of all reclamation.

EXISTING ROADS ARE SUFFICIENT FOR THE OPERATION. WHERE TOP SOIL MAY BE DISTURBED, SOIL WILL BE PILED DURING QUARRY OPERATION AND SPREAD OVER THAT AREA WHEN OPERATIONS CEASE.

VI. FOREST SERVICE EVALUATION OF PLAN OF OPERATIONS

- A. Recommended Changes/Modifications for Plan of Operations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- B. Bond - As a further guarantee of faithful performance with the reclamation requirements agreed upon in the plan of operations, the operator delivers herewith and agrees to maintain a surety bond, cash, bond, irrevocable letters of credit in the sum of \_\_\_\_\_ (\$ \_\_\_\_\_).

ACKNOWLEDGMENTS

- A. It is understood that should the nature of the operation change a modified or supplemental plan of operations may be required.
- B. It is understood that approval of this plan of operations does not constitute: (1) Certification of ownership to any person named herein; and (2) Recognition of the validity of any mining claim named herein.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

- C. It is understood that a bond equivalent to the actual cost of performing the agreed upon mitigation and reclamation measures may be required before this plan can be approved.
- D. It is understood that approval of this plan does not relieve me of my responsibility to comply with any other applicable State or Federal laws, rules or regulations.
- E. It is understood that any information provided with this plan that is marked confidential will be treated by the agency in accordance with that agency's laws, rules and regulations.

I/We have reviewed and agree to comply with all conditions in this plan of operations, including the recommended changes and reclamation requirements. I/We understand that the bond will not be released until the Forest Officer in charge gives written approval of the reclamation work.

Hand Thomas  
Operator (or Authorized Official)

6/18/92  
(Date)

**OPERATING PLAN APPROVAL:**

(Name)	(Title)
(Authorized Officer)	(Date)

Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB #0596-0022), Washington, D.C. 20503.

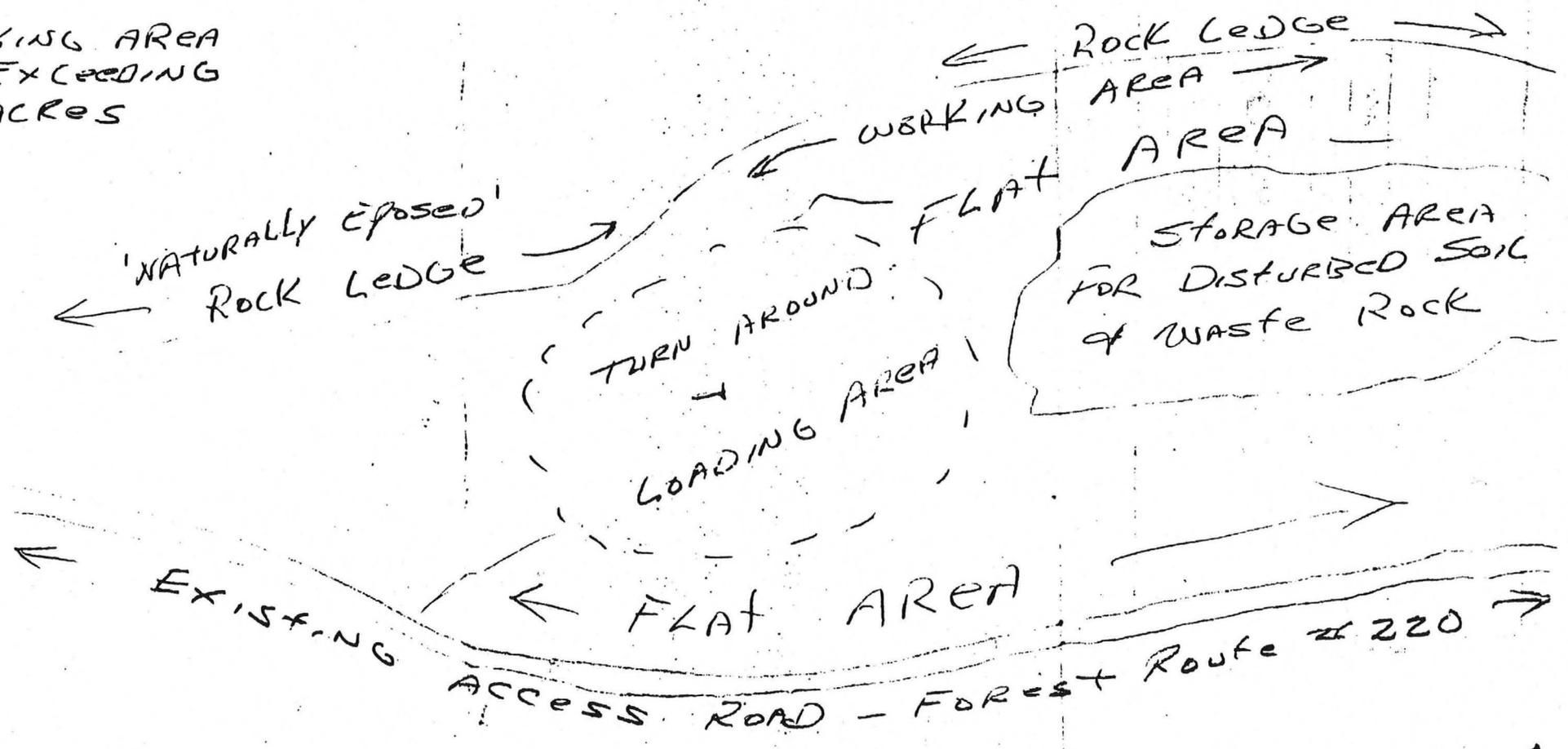
NORTH  
↑

SCALE APPROX  
" = 30'

# THE SIERRA STONE PLACER MINING CLAIMS OPERATING PLAN SUBMITTED 6-20-92

## SURFACE DISTURBANCE MAP

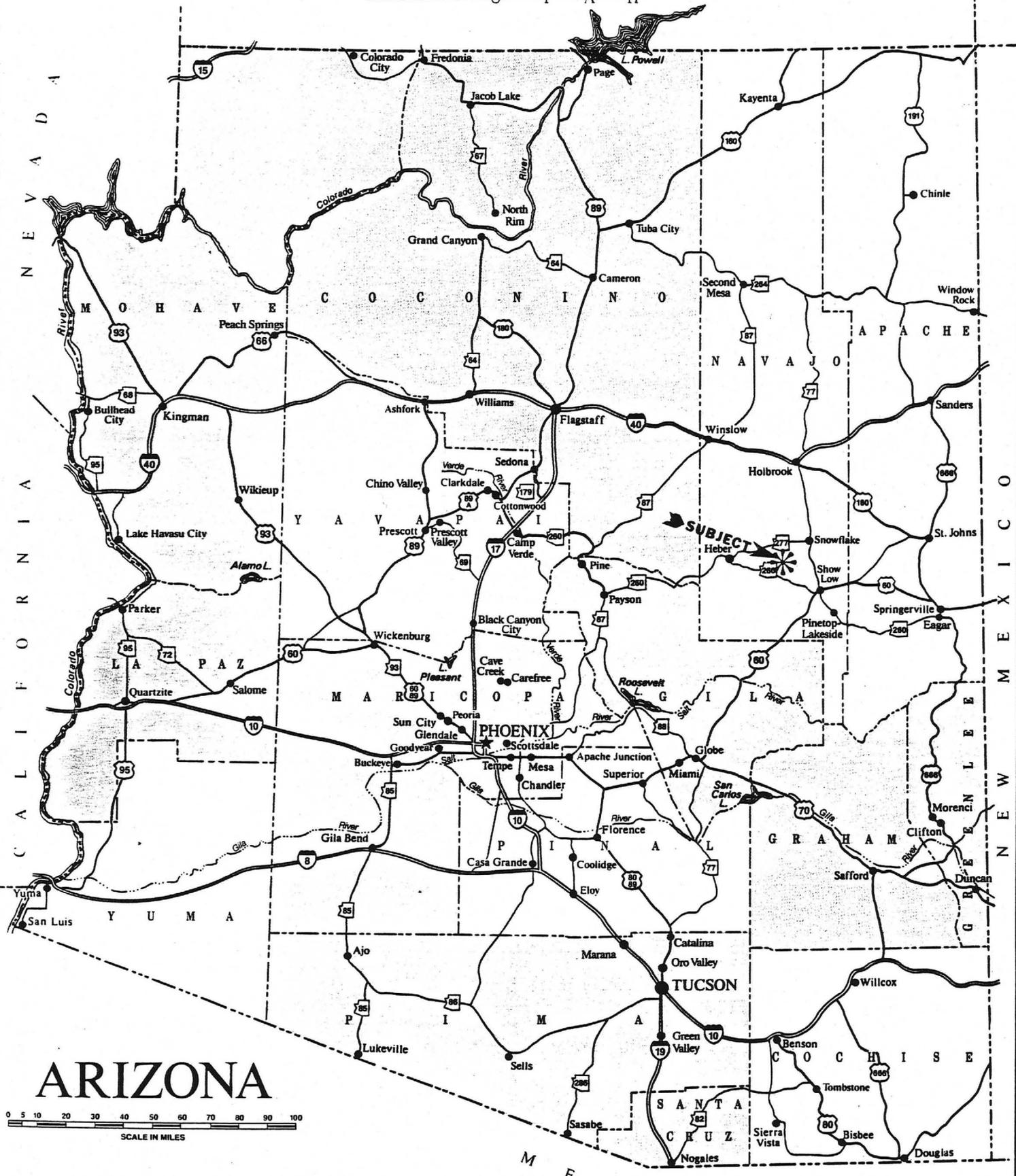
WORKING AREA  
NOT EXCEEDING  
2 ACRES



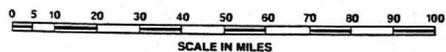
**APPENDIX C**

**MAPS**

# Location Map



## ARIZONA

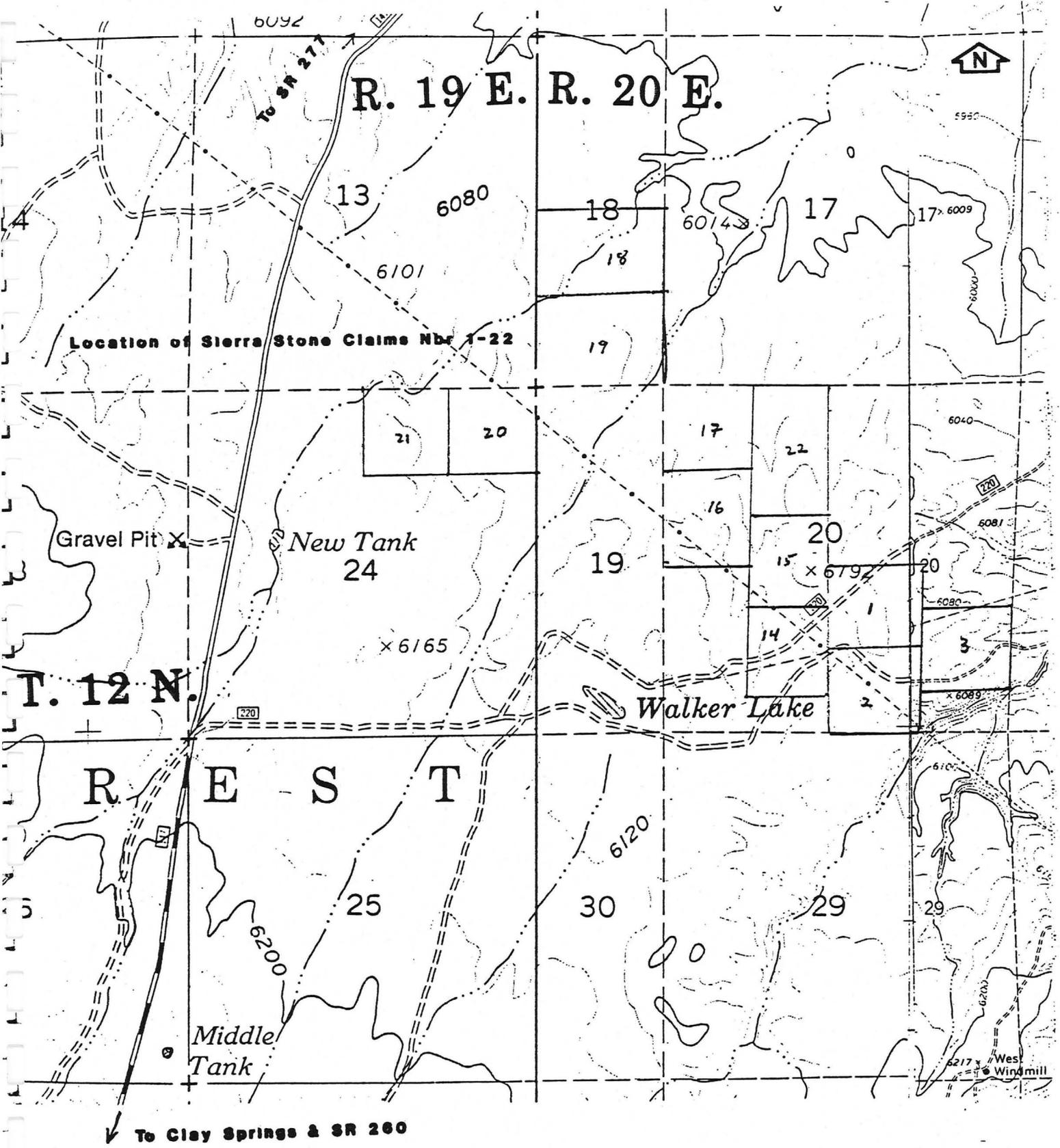


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All rights reserved. It is illegal to copy or reproduce this map by any method, in whole or in part, regardless of purpose, without the authorization of Wide World of Maps, Inc.

Item No. 90812

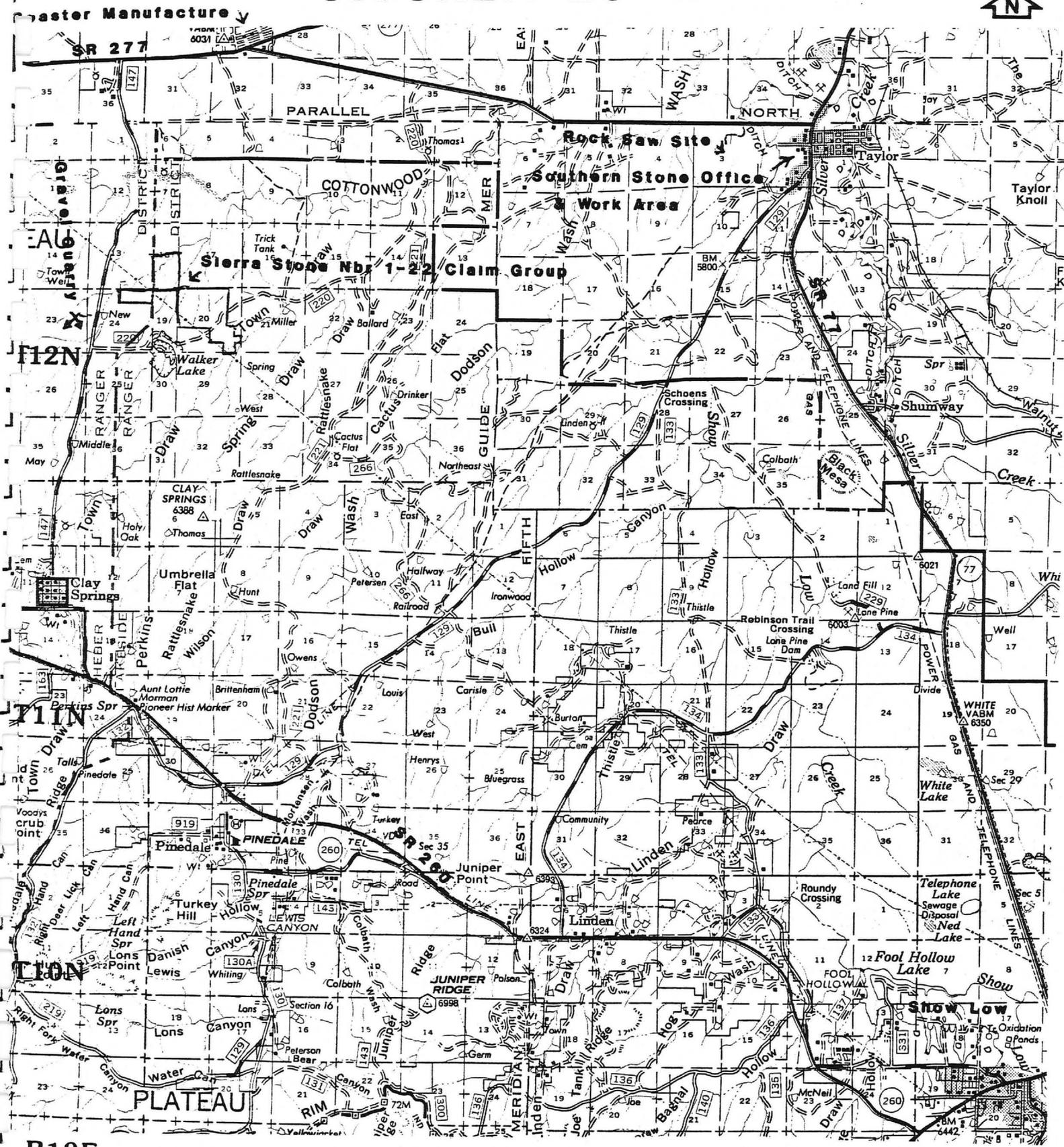
# MAP 1

# SITGREAVES NF



**Scale:** 1 Inch = 2000 Feet  
1 Cm = 787.4 Meters

# SITGREAVES NF



R19E

R20E

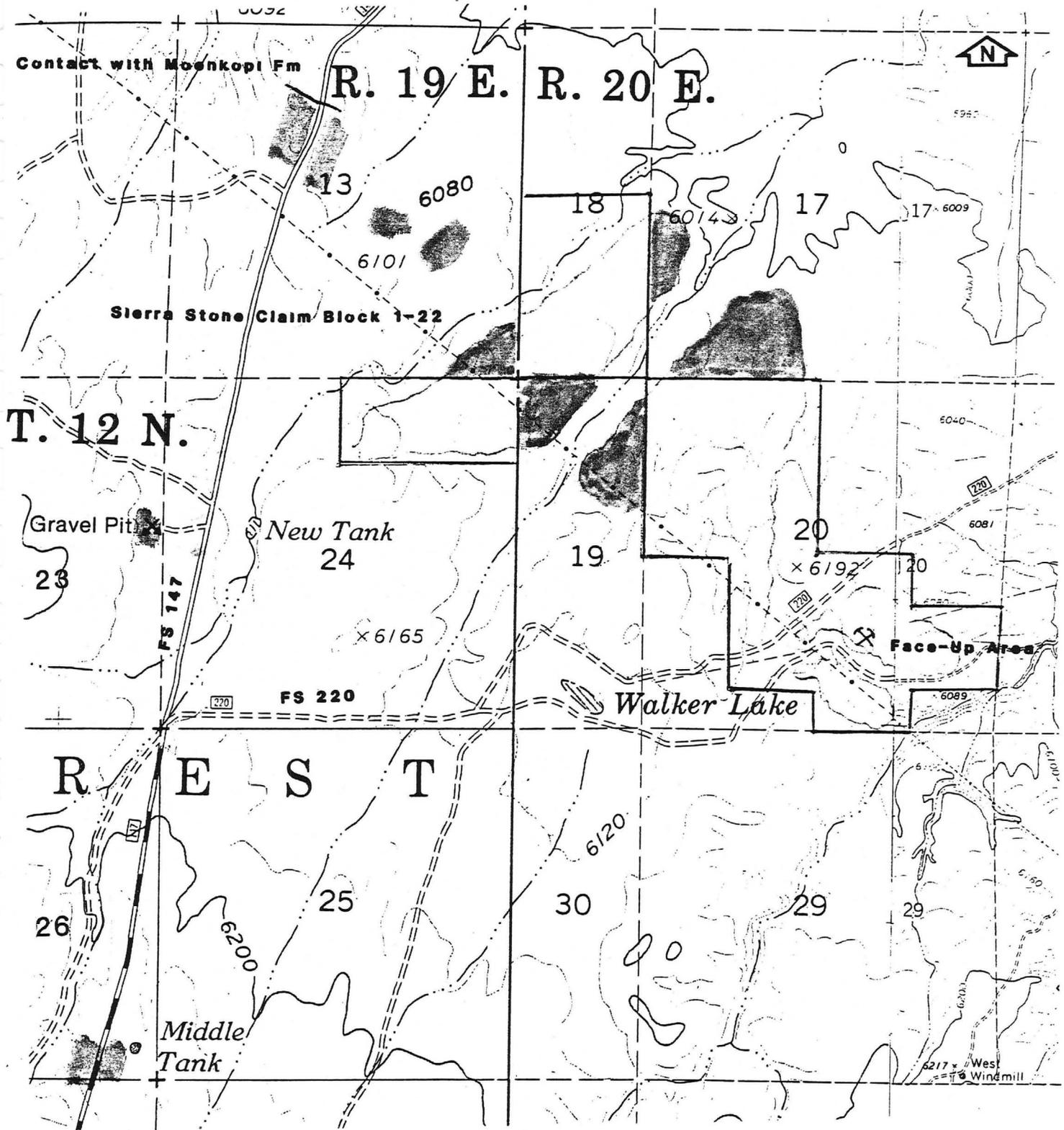
R21E

R22E

Scale: 1 Inch = 2 Miles  
1 Cm = 1.28 Km

# MAP 3

# SITGREAVES NF



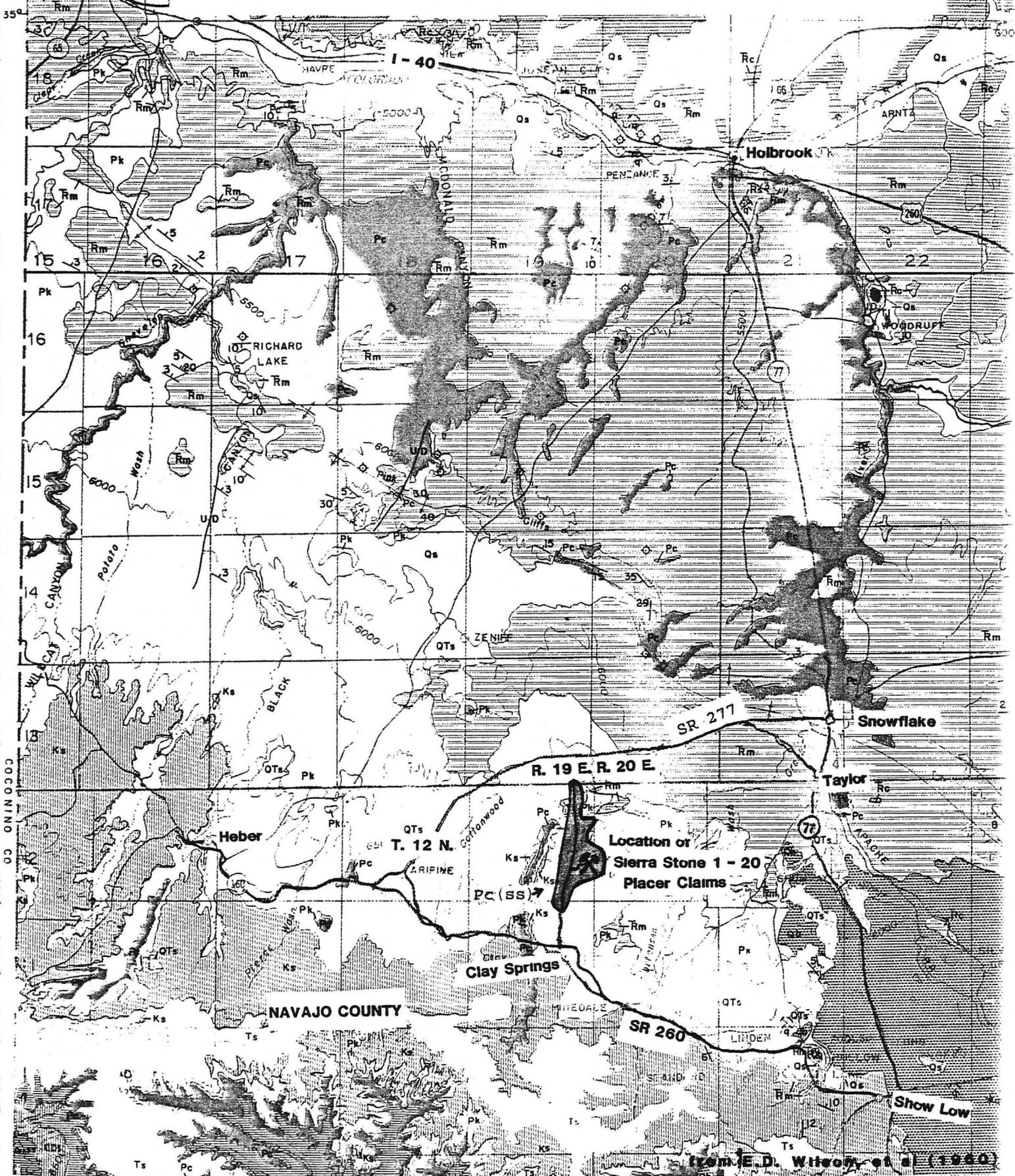
## COLOR LEGEND

- YELLOW: "Sierra Stone" under claim
- PINK: "Sierra Stone" outcropping on lands having private minerals ("AZTEC" sections)
- GREEN: "Sierra Stone" found on FS lands with Public Domain minerals

NOTE: "Patch" Pink and Green along FS 147 are "Sierra Stone" rock found by the authors.

# MAP 4

# GENERALIZED GEOLOGIC MAP OF REGION



## Chartrand - Thomas Sierra Stone Classification

Scale (RF): 1:375,000

**APPENDIX D**  
**PHOTOGRAPHS**

**SIERRA STONE ROCK**

**GLORIETA FORMATION**

from

Lee Chartrand  
and  
Howard Thomas Claims  
Southwestern Stone, Inc.

Apache-Sitgreaves NF  
Lakeside RD

Navajo County, AZ

**SIERRA STONE  
MINING CLAIMS**

**PICTURE ROCK ROCK**

**COCONINO SANDSTONE**

from

Lee Chartrand Claims  
Southwestern Stone, Inc.

Apache-Sitgreaves NF  
Heber RD

Coconino County, AZ

**INDEPENDENCE PICTURE ROCK  
MINING CLAIMS**

**DESERT SANDSCAPE ROCK**

**SHINARUP FORMATION**

from

Joe Cassetta Claims  
Desert Sandscapes, Inc.

BLM Lands

Kane County, UT

**DESERT STONE  
MINING CLAIMS**

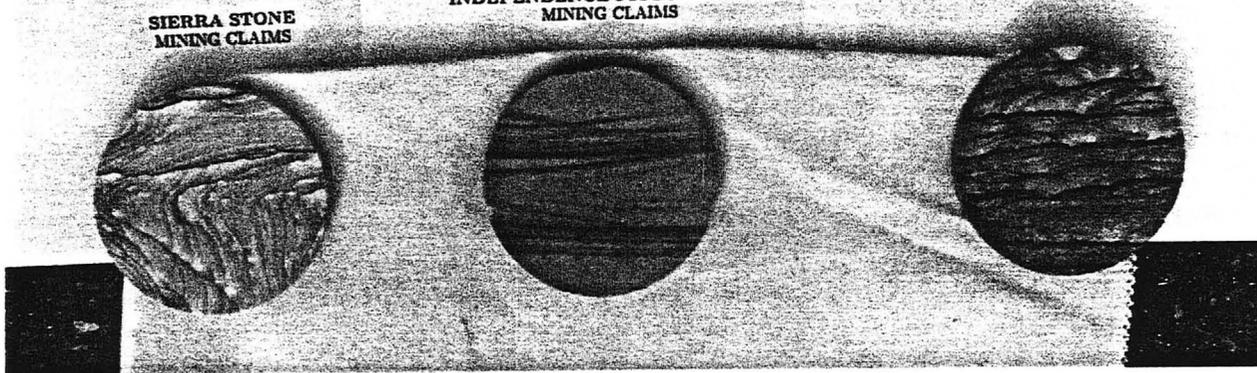


PHOTO 1.  
COMPARISON OF THE SIERRA STONE ROCK  
WITH THE PICTURE ROCK STONE AND THE  
DESERT SANDSCAPE ROCK  
(SAMPLES AS CUT FOR COASTERS)  
Taken October 30, 1992 (Oldfield)



PHOTO 2  
MINESITE FACEUP  
Taken June 29, 1992 (Oldfield)



PHOTO 3  
ROCK BOULDERS STOCKPILED AT MINE  
Taken June 29, 1992 (Morgan)



PHOTO 4  
SECTION CORNER AND CLAIM CORNER  
SECTIONS 13 & 24, T. 12 N., R. 19 E.  
SECTIONS 17 & 20, T. 12 N., R. 20 E.  
SIERRA STONE PMC 19 (SECT. 17) AND 20 (SECT 24)  
Taken June 29, 1992 (Oldfield)



PHOTO 5  
ROCK EXPOSED ON CLAIM AT SURFACE  
Taken June 29, 1992 (Oldfield)

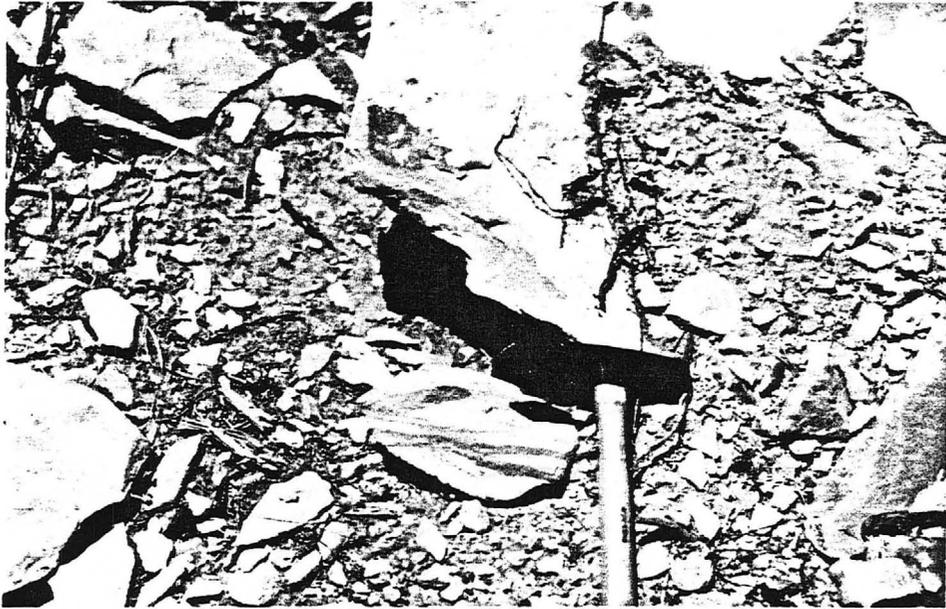


PHOTO 6  
ROCK EXPOSED OFF CLAIM IN SECTION 13  
OFF FS-147  
Taken June 29, 1992 (Morgan)



PHOTO 7  
VIEW SOUTH ALONG FS-147 AT MOENKOPI-GLORIETA CONTACT  
Taken June 29, 1992 (Morgan)



PHOTO 8  
SOUTHWESTERN STONE SHOP IN TAYLOR, AZ  
Taken June 28, 1992 (Oldfield)

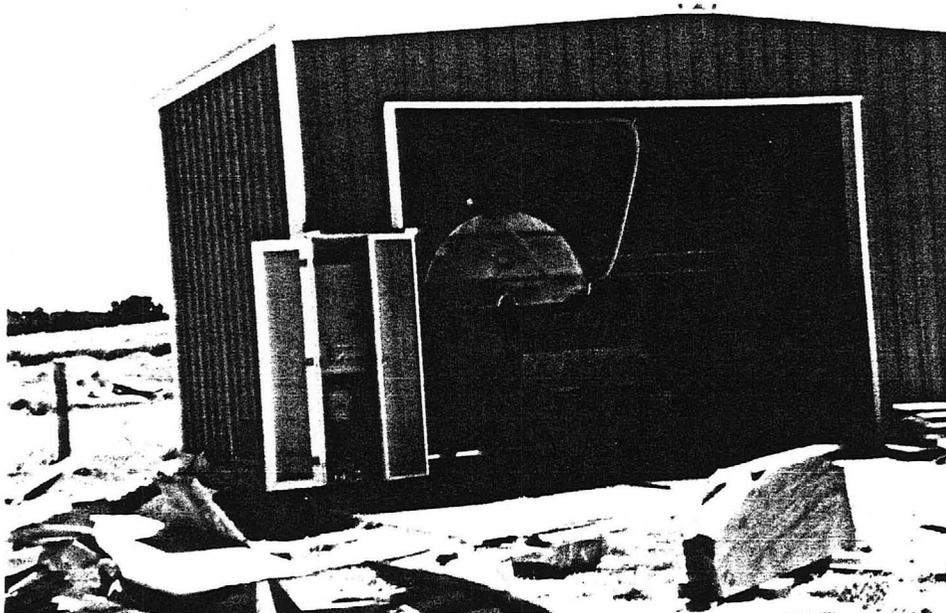


PHOTO 9  
ROCK SAW ON SITE WEST OF TAYLOR, AZ  
Taken June 28, 1992 (Oldfield)

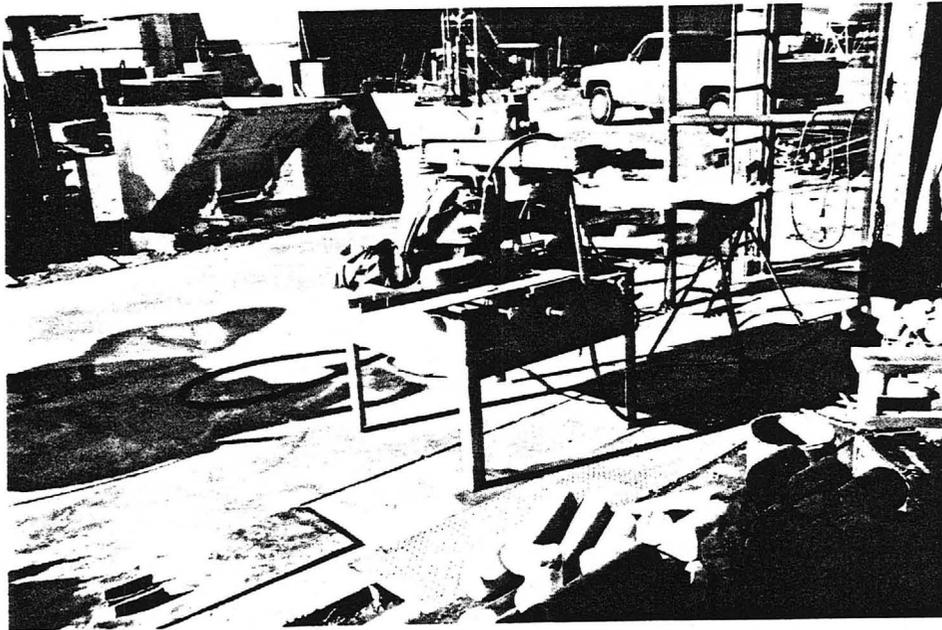


PHOTO 10  
COASTER PRODUCING SHOP AT PULPMILL  
ABOUT 13 KM W OF TAYLOR, AZ (SR 277)  
Taken June 30, 1992 (Oldfield)

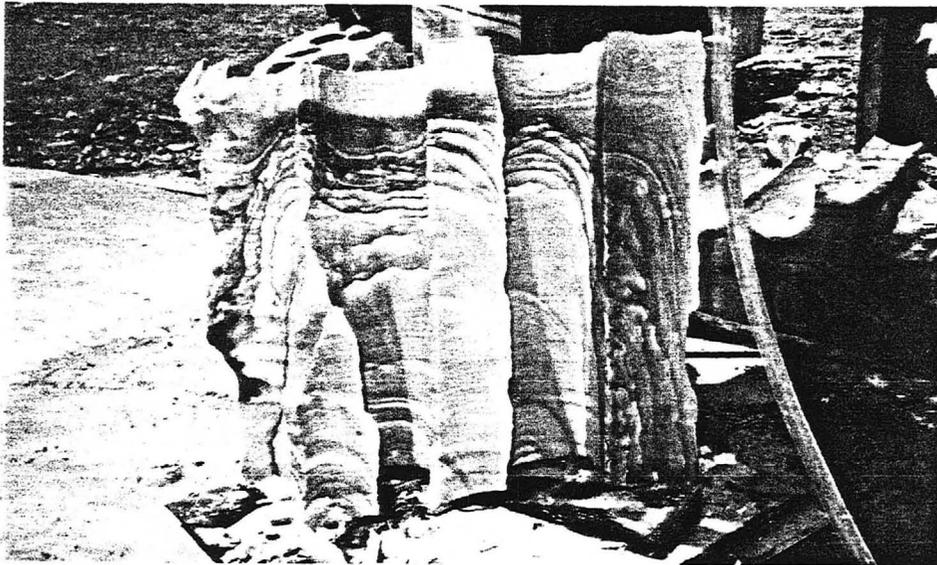


PHOTO 11  
CORED SIERRA STONE (FOR COASTERS) SHOWING BANDED AND  
UNBANDED ZONES IN GLORIETA SANDSTONE  
Taken June 29, 1992 (Morgan)

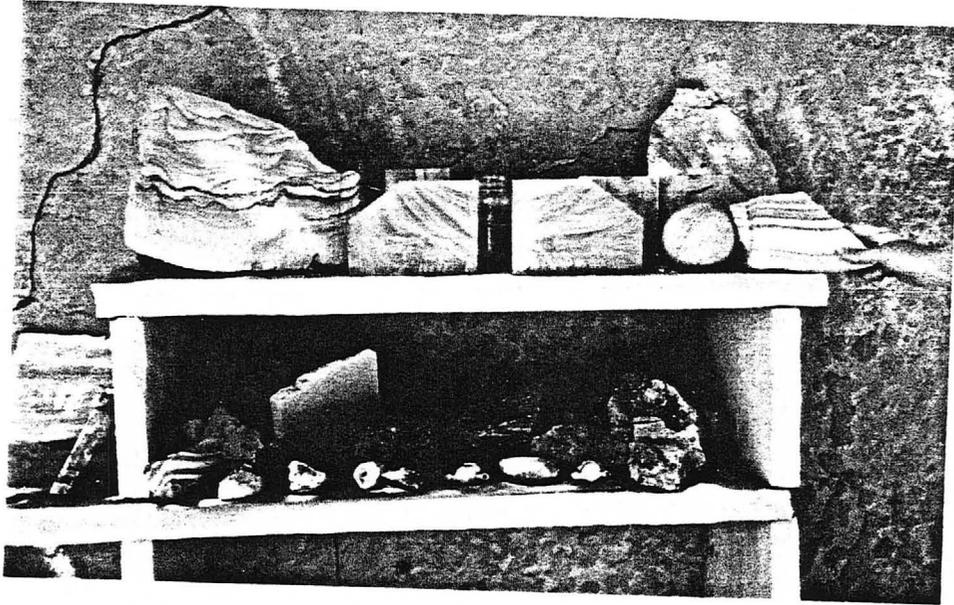


PHOTO 12  
PRODUCTS MADE BY LEE CHARTRAND  
Taken June 28, 1992 (Oldfield)

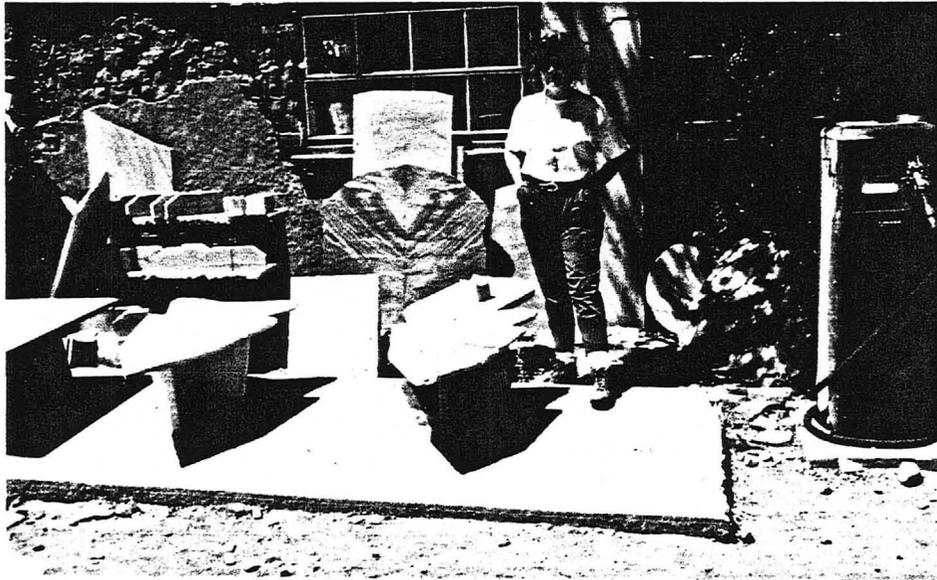


PHOTO 13  
PRODUCTS MADE BY CHARTRAND AND THOMAS  
Taken June 28, 1992 (Oldfield)

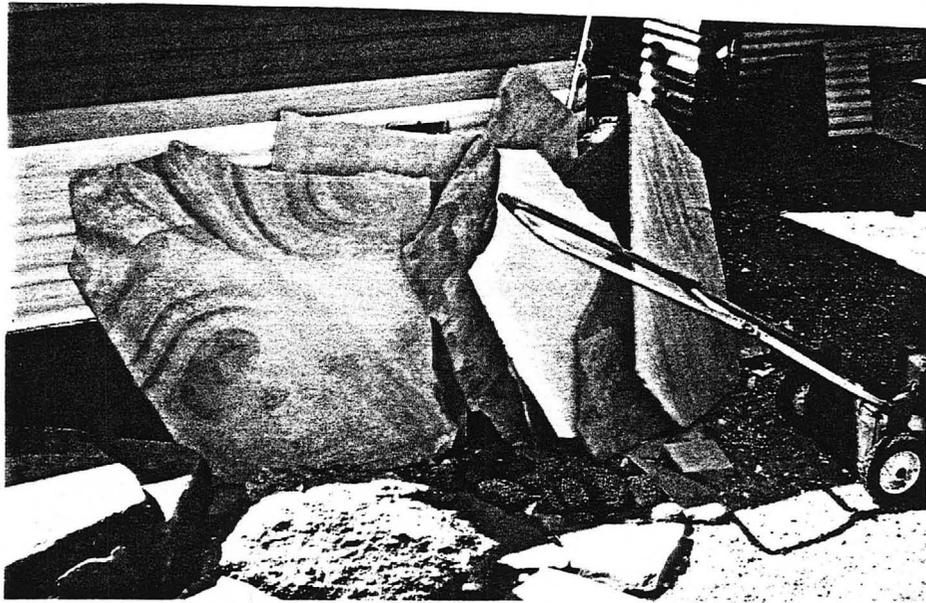


PHOTO 14  
PICTUREROCK AT ARIZONA STONE, INC.  
Taken July 8, 1992 (Oldfield)



PHOTO 15  
PICTUREROCK AT GARDEN STONE SUPPLY, INC.  
Taken July 9, 1992 (Oldfield)

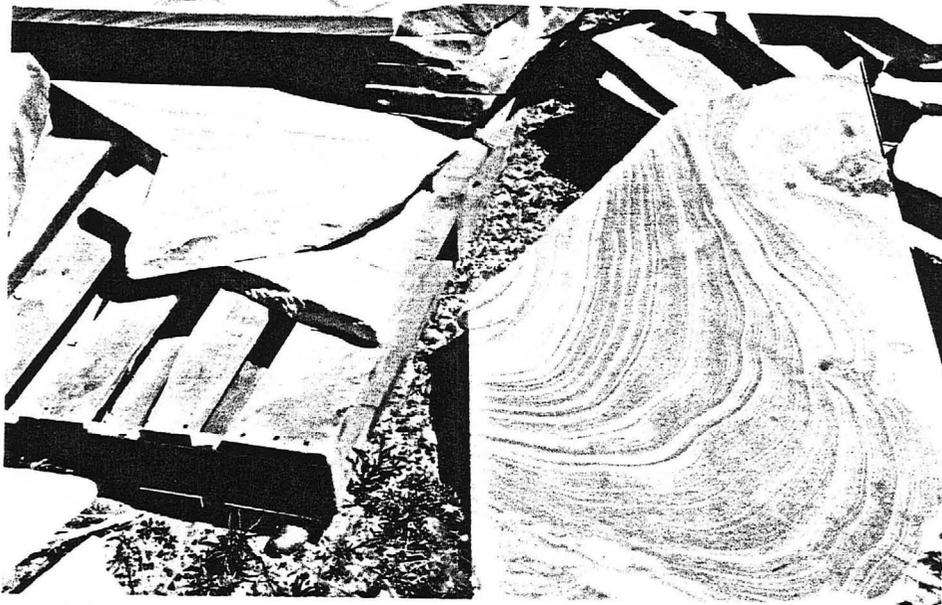


PHOTO 16  
COMPARING SIERRA STONE (L) AND PICTURE ROCK (R) AFTER FRESH CUT  
Taken June 28, 1992 (Morgan)

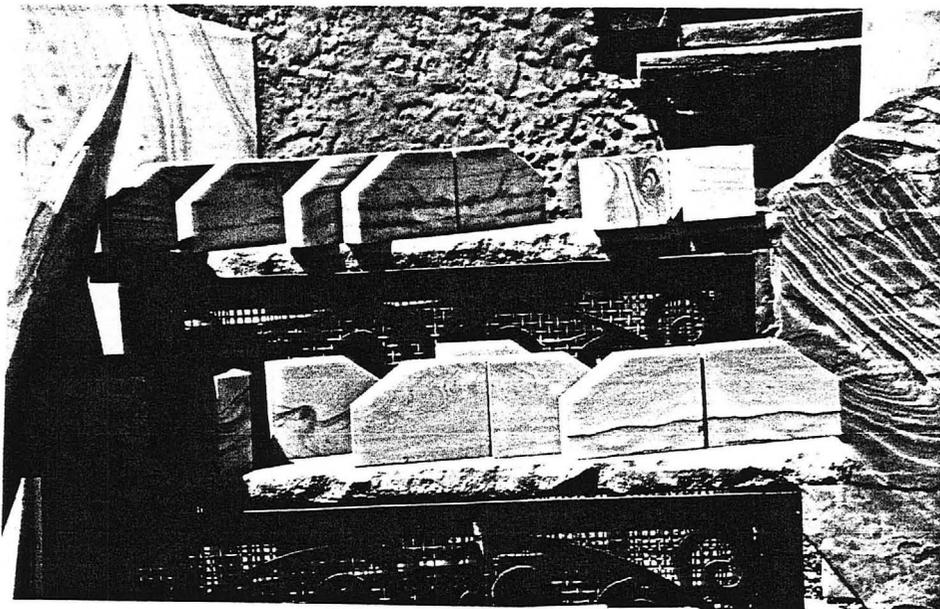


PHOTO 17  
ROCK AND PRODUCTS AT SOUTHWESTERN STONE, INC  
Taken June 28, 1992 (Morgan)



PHOTO 18  
COASTERS PRODUCED BY DESERT SANDSCAPES, INC.  
NOTE THREE ROCK TYPES AS SHOWN IN PHOTO 1  
Taken July 8, 1992 (Oldfield)

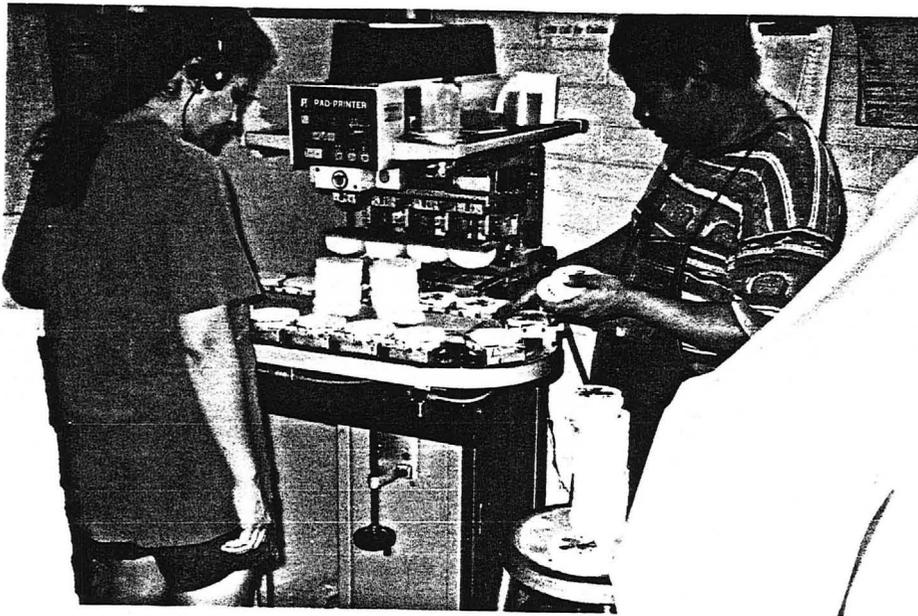


PHOTO 19  
COASTERS BEING PAINTED AT DESERT SANDSCAPES, INC.  
Taken July 8, 1992 (Oldfield)

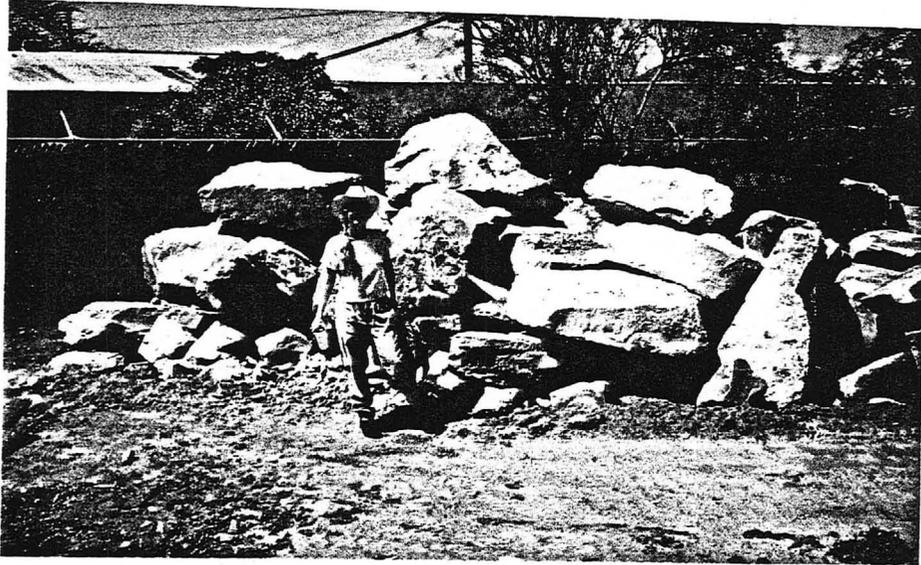


PHOTO 20  
STOCKPILED SIERRA STONE BOULDERS AT DESERT SANDSCAPES, INC.  
Taken July 8, 1992 (Oldfield)

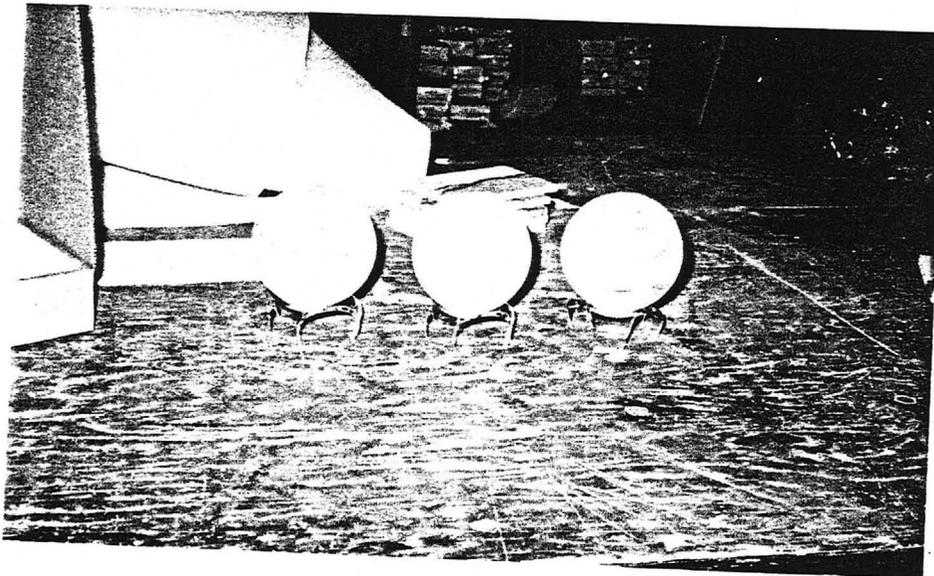


PHOTO 21  
ROCK PRODUCTS PRODUCED BY DESERT SANDSCAPES, INC.  
Taken July 8, 1992 (Oldfield)

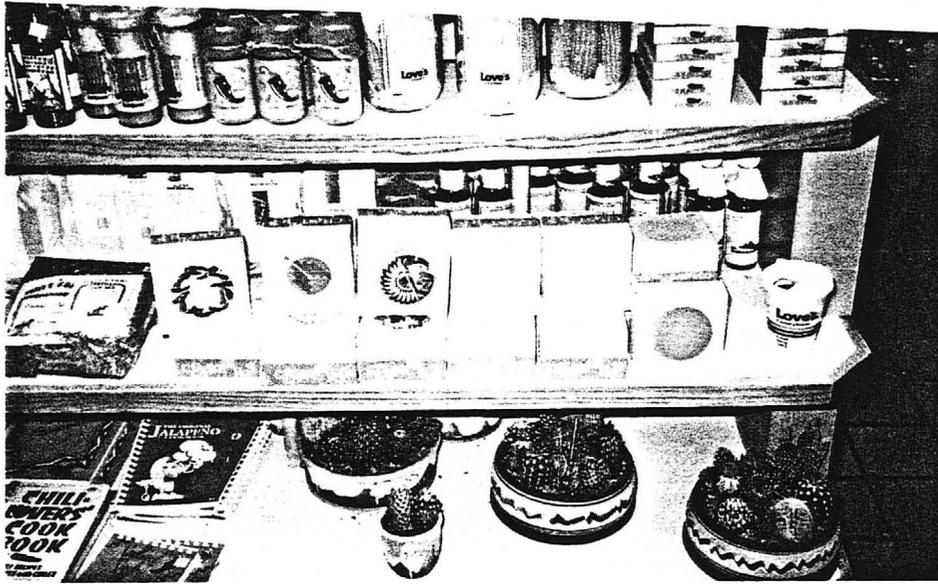


PHOTO 22  
COASTERS PRODUCED BY DESERTSTONE  
FOR SALE AT LOVE'S, NEAR GALLUP NM  
Taken July 19, 1992 (Oldfield)

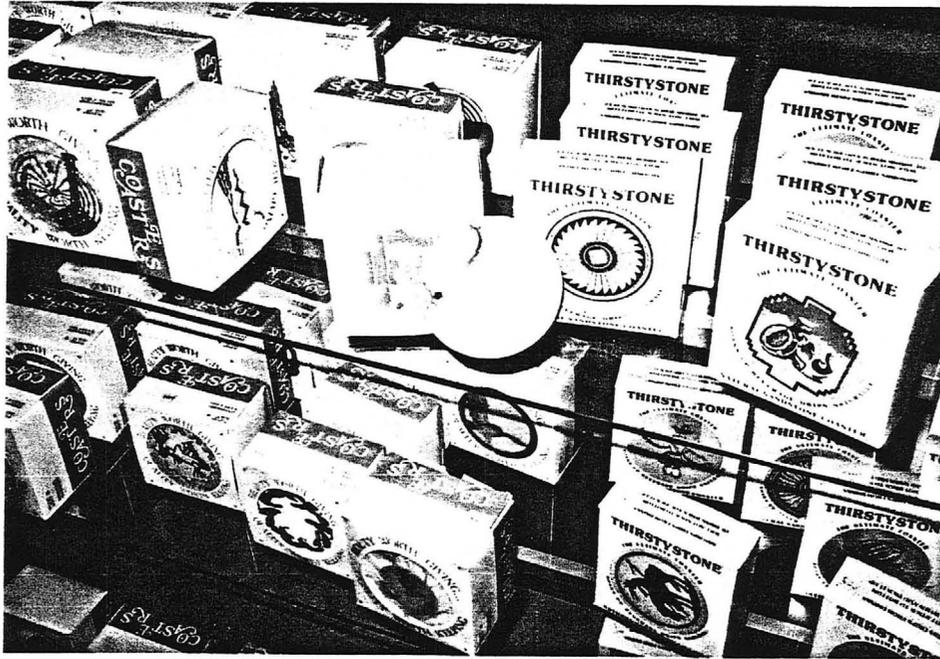


PHOTO 23  
COASTERS PRODUCED BY DESERTSTONE, DESERT SANDSCAPES (BOTH PAINTED)  
AND AN UNPAINTED SIERRA STONE COASTER FOR SALE AT  
GIFT SHOP NEAR HOLBROOK, AZ  
Taken July 19, 1992 (Oldfield)



PHOTO 24  
VARIOUS ROCK PRODUCT SOUVENIRS (INCLUDING THOSE OF SOUTHWESTERN STONE)  
FOR SALE AT PAINTED DESERT NP GIFT SHOP NEAR HOLBROOK, AZ  
Taken July 19, 1992 (Oldfield)

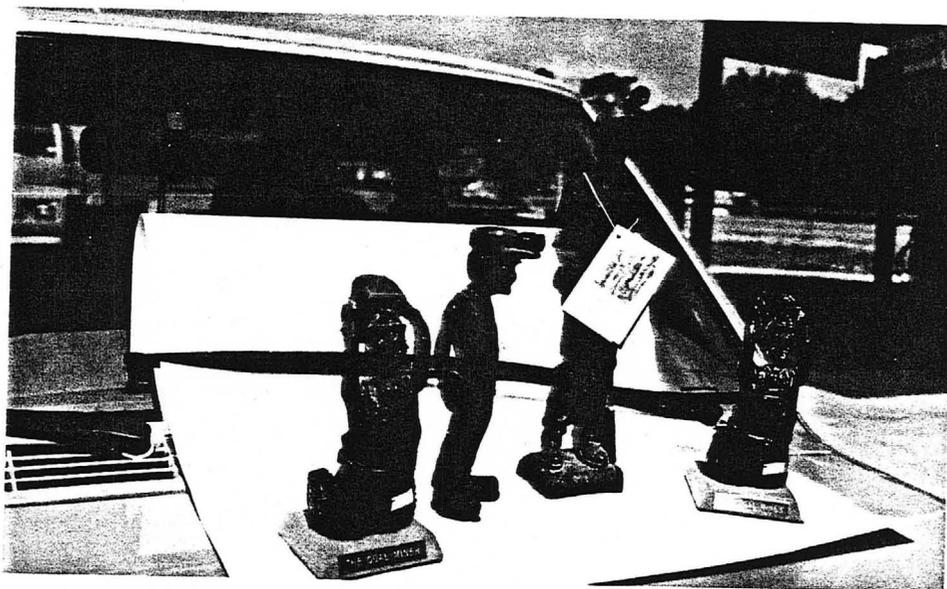


PHOTO 25  
EXAMPLES OF COAL SCULPTURES  
FOR SALE NEAR SOMERSET, KY  
Taken August 19, 1992 (Ed Swan, Somerset RD, DBNF)

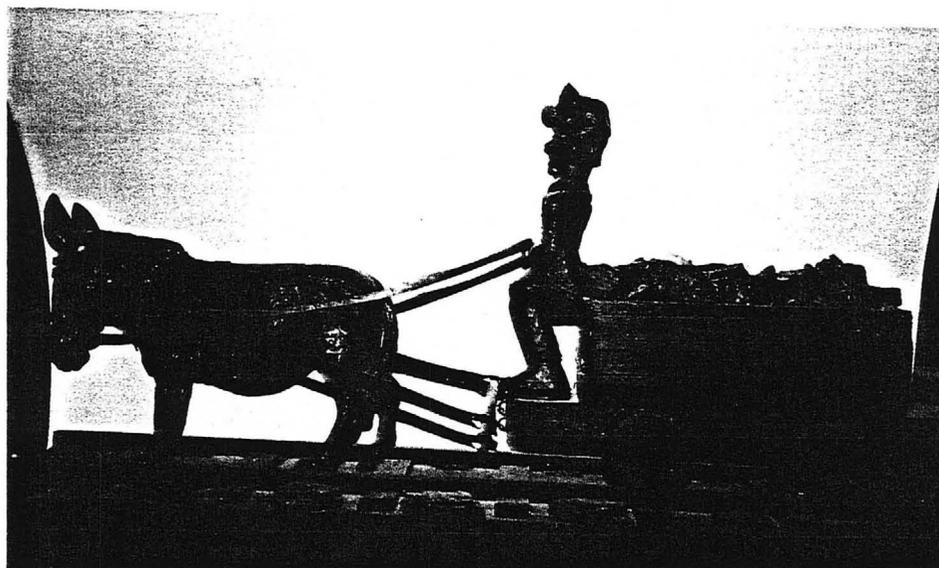
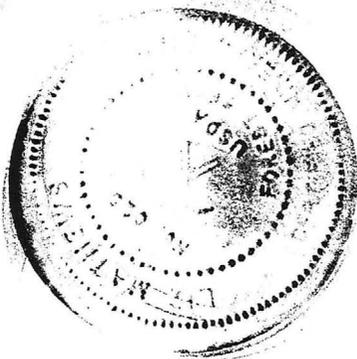


PHOTO 26  
COAL SCULPTURE  
Taken August 19, 1992 (Swan)



UNITED STATES  
DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
Southwestern Region  
Albuquerque, New Mexico

MINERAL REPORT  
(For Administrative Use Only)

ADMMR  
1920629  
Sierra Stone  
File  
Navajo County

2850 Mineral Material Classification  
Sitgreaves National Forest  
Lee Chartrand and Howard Thomas

June 29-July 1, 1992  
Dates of Examination

Elizabeth M. Mathews  
Name: ELIZABETH M. MATHEWS  
Title: Certified Examiner  
Date: 6/23/93

/s/ Beverly E. Morgan  
Name: BEVERLY E. MORGAN  
Title: Geologist  
Date: 6/24/93

CATEGORY: Mineral Material Classification

BLM STATE OFFICE AND SERIAL NUMBER: AMC A-286604, 286605, 286606, 390597, 309598, 309599, 309600, 309601, 309602, 309603, 316286 and 316287

CLAIM NAMES: Sierra Stone 1-3 and 14-22 PMCs

BRIEF OF SUMMARY AND CONCLUSIONS: Disposal of the subject material should be authorized under 36 CFR 228, Subpart A regulations for minerals locatable under the general mining laws.

TECHNICAL APPROVAL:

Roger D. Marion  
Regional Geologist

6/23/93  
Date





UNITED STATES  
DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
Southwestern Region  
Albuquerque, New Mexico

MINERAL REPORT  
(For Administrative Use Only)

2850 Mineral Material Classification  
Sitgreaves National Forest  
Lee Chartrand and Howard Thomas

June 29-July 1, 1992  
Dates of Examination

*Elizabeth M. Mathews*  
Name: ELIZABETH M. MATHEWS  
Title: Certified Examiner  
Date: 6/23/93

*Beverly E. Morgan*  
Name: BEVERLY E. MORGAN  
Title: Geologist  
Date: 6/24/93

CATEGORY: Mineral Material Classification

BLM STATE OFFICE AND SERIAL NUMBER: AMC A-286604, 286605, 286606, 390597, 309598, 309599, 309600, 309601, 309602, 309603, 316286 and 316287

CLAIM NAMES: Sierra Stone 1-3 and 14-22 PMCs

BRIEF OF SUMMARY AND CONCLUSIONS: Disposal of the subject material should be authorized under 36 CFR 228, Subpart A regulations for minerals locatable under the general mining laws.

TECHNICAL APPROVAL:

*Raymond D. Morgan* 6/23/93  
Regional Geologist Date



RECEIVED USFS

JUN 28 1993

REGION 3  
LANDS & MINERALS

Classification Report  
Lee Chartrand and Howard Thomas  
Sierra Stone PMC 1-22 Mining Claims

Lakeside Ranger District  
Sitgreaves National Forest

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X. Conclusions	9
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APPENDICES

- Appendix A: Sierra Stone Mining Claim Recordation Notices
- Appendix B: Copy of the Plan of Operations (POO)
- Appendix C: Maps
- Appendix D: Photographs
- Appendix E: B. Hauser letter of 4/22/93 with attachments

## I. INTRODUCTION AND SUMMARY

In summer, 1992, the Lakeside Ranger District of the Apache-Sitgreaves National Forests requested an opinion on whether or not a sandstone occurring on certain unpatented mining claims qualifies as a locatable mineral commodity under the Mining Law of 1872, as amended. The request was in response to an operating plan proposal submitted by Lee Chartrand and Howard Thomas, in compliance with regulations at 36 CFR 228, Subpart A, dealing with surface use management of mining operations involving locatable minerals. The mineral material Chartrand and Thomas proposed to mine is a variegated sandstone which they call **Sierra Stone**; they believe that due to its distinctive coloration, and the demand for beneficiated products made from the the stone (coasters, slabs and other products), that **Sierra Stone** is locatable. They have started removing this stone under a mineral material permit, which recently expired. Because of their belief that **Sierra Stone** is locatable, they do not wish to renew the mineral material permit and have instead requested that they be allowed to mine **Sierra Stone** under a Plan of Operations.

A mineral classification report on **Sierra Stone** was written on November 5, 1992, by John Gutierrez, Barney Oldfield and Beverly Morgan, in response to the District's request. The field examination and other research done for the report resulted in a common variety classification of **Sierra Stone**. Based on this original report, District Ranger Ed Collins made a decision to not approve the Plan of Operations submitted by Chartrand and Thomas, but to continue allowing them to purchase the stone under permit from the Forest Service. The decision was appealed by the operators. After reviewing the appeal record, Apache-Sitgreaves Forest Supervisor John Bedell remanded the appeal and directed Ranger Collins to seek peer review of the original report, in order to clarify several points in that report. We prepared this new report as a result of that peer review. It replaces the original classification and clarifies issues that generated questions from the Forest Supervisor.

We (the authors) conducted field examinations and interviews with Chartrand and Thomas in February and March, 1993. We visited the **Sierra Stone** quarry, cutting site and coaster plant, and discussed mining and marketing of the stone with the operators. After repeated requests, the operators provided information on their most recent sales of **Sierra Stone**. We incorporated this new information into our report along with the sales information obtained for the previous classification report.

We also obtained information on marketing of sandstone and other rock (comparable to **Sierra Stone**) from various stone suppliers and dealers, and reexamined values for these materials given in the original report.

In our review of Forest Service regulations, we were reminded that classification of decorative stone such as **Sierra Stone** is a complex issue, and one that is not specifically addressed by the regulations. For this reason, it was necessary to use criteria established through case law in making our classification determination. Case law has determined that the uniqueness of a given stone, and the price it commands in the market, are the primary factors which determine its classification as locatable or common variety.

In our review of the uses and markets of **Sierra Stone** and comparable stone, we found that **Sierra Stone** has a distinctively higher value. Hence, **It is our opinion that the subject deposit of sandstone should be considered locatable under the general mining laws.** It should be noted that this determination does not address or draw any conclusions regarding validity of the mining claims involved.

## II. LANDS INVOLVED AND ACCESS

The **Sierra Stone** claims are located on the Apache-Sitgreaves National Forests and are open to mineral entry under the General Mining Law of 1872, as amended. They are located in Navajo County, in T. 12 N., R. 19 E., section 24, and in T. 12 N., R. 20 E., sections 18 and 20, G&SRB&M, approximately 3 miles (5 km) northwest of Show Low, Arizona (see Appendix B). The location of the claims is as follows:

Sierra Stone 1-3, 14-17 and 22 PMCs - T. 12 N., R. 20 E., section 20.

Sierra Stone 18 & 19 PMCs - T. 12 N., R. 20 E., section 18

Sierra Stone 20 and 21 PMCs - T. 12 N., R. 19 E., section 24

The **Sierra Stone** quarry is in section 20, T. 12 N., R. 20 E. It is accessed by following State Route 260 west out of Show Low for approximately 4 miles (6.7 km) to Forest Road 147, then following Forest Road 147 north to Forest Road 220. The quarry is on Forest Road 220, approximately 2 miles (3.3 km) east of Forest Road 147.

### III. RECORD DATA

The following data on the **Sierra Stone** Claims are recorded at the Arizona State Office of the Bureau of Land Management:

TABLE 1

<i>Name of Claim</i>	<i>Date Located</i>	<i>BLM Recordation No.</i>	<i>Acres</i>
Sierra Stone No. 1 PMC	6/15/88	A-286604	40
Sierra Stone No. 2 PMC	6/15/88	A-286605	40
Sierra Stone No. 3 PMC	6/15/88	A-286606	40
Sierra Stone No. 8 PMC	3/25/89	A-294241	(abandoned)
Sierra Stone No. 9 PMC	3/25/89	A-294242	(abandoned)
Sierra Stone No. 10 PMC	2/09/89	A-294243	(abandoned)
Sierra Stone No. 14 PMC	11/01/90	A-309597	40
Sierra Stone No. 15 PMC	11/01/90	A-309598	40
Sierra Stone No. 16 PMC	11/01/90	A-309599	40
Sierra Stone No. 17 PMC	11/01/90	A-309600	40
Sierra Stone No. 18 PMC	11/01/90	A-309601	60
Sierra Stone No. 19 PMC	11/01/90	A-309602	60
Sierra Stone No. 20 PMC	11/01/90	A-309603	40
Sierra Stone No. 21 PMC	8/12/91	A-316286	40
Sierra Stone No. 22 PMC	8/12/91	A-316287	60

The **Sierra Stone** Claims are 40 and 60 acre association placer claims. **Sierra Stone** Claims 1-3, 14-17, 20 and 21 were located by Lee Chartrand and Howard Thomas; **Sierra Stone** Claims 18, 19 and 22 were located by Lee and Barbara Chartrand, and Howard Thomas (Appendix C). The claims are monumented with wooden posts, with location notices contained in glass jars (photo 1, Appendix D). All of the claims have been maintained with annual filings of assessment work affidavits.

### IV. BACKGROUND DATA

Lee Chartrand and Howard Thomas first contacted the Lakeside Ranger District concerning their **Sierra Stone** operation in the summer of 1988. The Notice of Intent that they submitted then was reviewed by Mineral Examiner Robin Strathy, who advised the Lakeside District Ranger to allow limited removal of **Sierra Stone** under a mineral material permit. Ms. Strathy further advised that a mineral classification could be done on **Sierra Stone** after the claimants had removed some of the stone and had had an opportunity to market it (letter to the Lakeside District Ranger from Robin Strathy, November 29, 1988).

The claimants submitted a Plan of Operations for **Sierra Stone** removal on May 18, 1989. Instead of approving the submitted plan, the Lakeside District issued Chartrand and Thomas a one year mineral material permit, on June 2, 1989. The permit was extended several times before finally expiring on March 31, 1992.

A second Plan of Operations, submitted by Chartrand and Thomas on June 18, 1992, prompted District Ranger Ed Collins to request a mineral classification of **Sierra Stone**. The November 5, 1992, classification report by Gutierrez, Oldfield and Morgan was completed in response to Ranger Collin's request.

As per our introduction (p. 1), this report is being written to clarify issues raised with the original classification report, and to incorporate new marketing information into the classification analysis.

## V. AREA GEOLOGY

In their November 5, 1992, **Sierra Stone** Classification report, Gutierrez, Oldfield and Morgan stated that **Sierra Stone** occurs in the Permian Glorieta Sandstone (correlative with the Permian Coconino Sandstone). In reviewing that original report, we conferred extensively with U.S. Geological Survey geologist Brenda Hauser (who visited the **Sierra Stone** quarry and surrounding area on March 24 and 25, 1993), and with other geologists, particularly stratigraphers, who had studied the subject area in detail. Through our research into the geology of the claim area we came to the conclusion that, due to the absence of productid brachiopods in the underlying limestone, the subject sandstone could not be part of the Glorieta Sandstone formation (personal communication with Wesley Peirce, May 24, 1993). Although the complexity of the stratigraphy of late Paleozoic sedimentary rocks in the subject area makes it difficult to positively identify the formation that **Sierra Stone** is found in, the most likely formations are either the Permian Kaibab Formation or the lowermost Triassic Moenkopi Formation (as per a letter to Roger Marion from Brenda Hauser, April 22, 1993, and a letter from H. Wesley Peirce, retired Arizona Geological Survey geologist, to Howard Thomas, December 1, 1992: these letters are included in Appendix E). Appendix A includes a geologic map of the subject area.

The Permian Kaibab Formation is the caprock of the Grand Canyon and extends eastward and southward from the canyon to blanket much of the northern half of the state. The formation has a thickness of about 300' to 500' (91-152m) in the Grand Canyon area, but thins eastward from the canyon, finally pinching out altogether in northeastern Arizona. In the subject area, the Kaibab Formation is about 100' (30m) thick (Peirce, 1989). The formation is composed predominantly of limestone and dolomite, with relatively minor sandstone, mudstone, gypsum, conglomerate and chert (Beus and Morales, 1990). In general, the Kaibab Formation contains more sandstone in eastern Arizona than in the western part of the state.

The Moenkopi Formation outcrops in north-central and northeastern Arizona on the Colorado Plateau. It is 500' to 1000' (152-304m) thick north of the Grand Canyon, thinning progressively to the east, and pinching out altogether in the Four Corners area of northeastern Arizona. The formation as a whole is composed predominantly of fine-grained red beds, with minor coarse-grained clastics, carbonates and gypsum. The occurrence of carbonates in the formation increases to the west, so that some parts of the formation in its westernmost extent are 50% carbonate. (Blakey, 1989). The lowermost part of the formation contains, in some localities, a thin section of buff-colored quartz sandstone (personal communication with Wesley Peirce, May 24, 1993).

The sandstone in the quarry area is approximately 12' (3m) thick, and is a fine-grained, buff colored quartz sandstone with iron oxide Liesegang banding. Iron oxide staining is concentrated at the contacts between slightly cross-bedded laminae, forming flowing lines and various "pictures" in the rock. The sandstone is underlain by buff-colored limestone, and overlain in part by Quaternary gravels.

Although Liesegang banding is seen in similar sandstone outside of the quarry area, the variegation is not widespread. It should also be noted the variegated sandstone outside of the quarry area is often softer and more friable than **Sierra Stone** currently being mined by Chartrand and Thomas. The quality of this sandstone may improve with depth, where the stone has not been exposed to surface weathering.

## VI. MINING AND PRODUCTION

The rock is mined from the quarry face, a cut approximately 8 ft (2.5 m) high and 65 ft (20 m) long, using a small bulldozer or front end loader. The stone breaks relatively easily along natural fractures. Blocks of various sizes are separated out (see photos 2-4, Appendix D) and taken to one of three work areas, depending on the planned disposition of the rock. The volume of rock removed from the quarry varies with season and weather conditions, with the annual average being about 90 tons. Production records submitted to the Lakeside Ranger District show a total of 267.5 tons removed between July 1, 1989 and July 1, 1992.

**Sierra Stone** blocks are either beneficiated into products by Chartrand and Thomas or sold to various companies that beneficiate and market the stone. Chartrand and Thomas also sell "raw" (unpacked, and without cork backing) coasters to companies that package and market them.

The claimants operate the quarry and also have three work sites in the Taylor area. The office in downtown Taylor serves as a work place for cutting blocks and slabs to make spheres, bookends, tables and wall hangings (see photos 5, 6 and 7, Appendix D).

The claimants operate a saw at a second site, located about 2 miles (3.2 km) west of Taylor, off Paper Mill Road (photos 8 and 9, Appendix D). The saw is 6 ft (1.8 m) in diameter and is computer controlled. Most of the rock cut at this site is mined from the **Sierra Stone** quarry and other quarries owned by Chartrand and Thomas, though they also do some custom cutting.

A third work area is located near a pulp mill about 10 miles (16 km) west of Taylor, near the junction of SR 277 and Paper Mill Road. Howard Thomas operates a shop and equipment at this location, and produces coasters from **Sierra Stone** there. The coasters are made by first coring the rock into cylinders, and then slicing the cylinders into coasters (see photos 10 and 11, Appendix D).

**Sierra Stone** coasters have also been made at Desert Sandscapes, Inc. in Tucson, Arizona. The owners of Desert Sandscapes purchased raw blocks of **Sierra Stone** from Chartrand and Thomas and also made coasters from variegated sandstone they mine from their quarry on claims they own on BLM lands in Utah.

## VII. MARKET ANALYSIS

In our market analysis, we compared the value of **Sierra Stone** with other sandstones, with schist, and with other variegated stone such as travertine. We compared the F.O.B. quarry value of raw (unbeneficiated) **Sierra Stone** with that of other raw mineral material. When we contacted stone yards, we asked for wholesale prices (the price paid by the stone yard to the producer) or if the retailer was also the producer, we asked for an estimated wholesale value. If delivery was included in this price, we subtracted the estimated transportation costs of the material from the quarry to the stone yard in order to arrive at the estimated F.O.B. quarry value. We also compared the retail price of **Sierra Stone** coasters and table tops with the retail price of the same products made from other types of stone. Since the beneficiation process for a given product (ie. coasters) is a fairly constant factor, any difference in retail prices for this type of product made from different kinds of stone should reflect differences in the intrinsic values of the stone. The prices of the various mineral materials and products are shown in Table 2, Parts A and B respectively.

In researching the value of mineral material F.O.B. quarry, we talked to several quarry owners and operators in the Paulden and Ashfork, Arizona area. We also talked to one stone dealer operating a quarry in the Kingman, Arizona area. The owners and operators in that area are all mining Coconino Sandstone, a (usually) monochromatic sandstone with distinctive cross bedding and a strong tendency to cleave along the bedding planes. Because of its clean cleavage, Coconino Sandstone is commonly used as flagstone in landscaping and construction.

We found a wide range in the price of Coconino Sandstone. We were told by quarry owners and retail stone suppliers that the value of the flagstone varies according to the thickness of the slabs, the uniformity of thickness, and the length and width of the slabs. Price can also vary with the color of the sandstone. For example, the 1" minus (ie., 1" or less in thickness) "chocolate" Coconino Sand-

stone mined in the Kingman area by Dunbar Stone is valued F.O.B. quarry at a minimum of \$40 per ton higher than the same thickness of the more common pale pink Coconino Sandstone. The chocolate sandstone is managed by the Kingman District BLM as a locatable stone, due to its unusual color and higher market value. Monochromatic pale pink Coconino Sandstone on federal lands is generally considered common variety and is sold under a mineral material permit.

In addition to its use as flagstone, Coconino Sandstone cleaved slabs are sometimes used as table tops. It is also occasionally sawed and used as floor tiling and as ashlar in fireplace and building construction. In Part B of Table 2, we compared the retail price of cleaved Coconino Sandstone slabs sold as table tops with sawed Sierra Stone table tops.

Although Coconino Sandstone (like most sandstones) is usually monochromatic, it occasionally displays reddish, yellowish and purple Liesegang banding that forms irregular streaks of color across the pink sandstone. An example of this type of Coconino Sandstone is currently being mined by claimant Lee Chartrand, at a quarry about 47 miles (78 km) southwest of Taylor. This deposit, which Mr. Chartrand calls **Picture Rock** (photo 12, Appendix D), is managed by the Heber Ranger District of the Apache-Sitgreaves National Forest under a Plan of Operations. **Picture Rock** sells for a minimum of \$37 per ton higher than most monochromatic Coconino Sandstone.

Maximum economic value of variegated stone such as **Picture Rock** and **Sierra Stone** is obtained through beneficiation of the raw mineral material. The color variation and patterning of variegated stone, though relatively indistinct on weathered surfaces, is noticeably enhanced by cutting or by splitting along bedding planes. Due to the relatively high cost of **Sierra Stone**, and the fact that the variegation in the rock is not distinctive on uncut surfaces, **Sierra Stone** is not sold as landscape boulders or other landscaping material.

The banding in **Sierra Stone** and similar stone (such as the **Desert Sandscapes** sandstone, photo 13, Appendix D) is especially unique in that it often displays a desert "landscape" pattern not commonly replicated in other natural products. Banding in the two sandstones often forms "pictures" of mountains with a setting sun and other desert scenery.

Purchasers of unbeneficiated **Sierra Stone** blocks have included Desert Sandscapes, Inc. and an Albuquerque, New Mexico stone dealer. **Sierra Stone** was sold to Desert Sandscapes for \$232 per ton plus shipping of \$18.00 per ton (the total cost to Desert Sandscapes being \$250 per ton). Desert Sandscapes beneficiates the raw stone such as their own **Desert Sandscapes** sandstone, Lee Chartrand's banded Coconino Sandstone and (previously) **Sierra Stone** into coasters and other products (see photos 13, 14 and 15, Appendix D). Some of the coasters have flowers, lizards and other designs painted on them before packaging; others are left unpainted (photo 15, Appendix D).

We spoke with Joe and Julie Cassetta, the owners of Desert Sandscapes, Inc., and were told that they no longer purchase **Sierra Stone**. They stated that they are not satisfied with the quality of the stone because it is softer than their **Desert Sandscapes** sandstone and tends to have occasional pitting.

We decided to use the sale of **Sierra Stone** to Desert Sandscapes in our market analysis despite the fact that the company is no longer buying the stone, because **Sierra Stone** coasters still draw a comparable price on the retail market with other Desert Sandscapes, Inc. coasters. Desert Sandscapes coasters sell for \$15 to \$28 (retail, per box of four) in souvenir and other specialty shops in Arizona and various locations out of state. **Sierra Stone** coasters cut by Chartrand and Thomas and marketed and packaged by an Indiana company, sell at Dillard's department stores in the Phoenix, Arizona area for \$24 per box of four. Assuming that the production, shipping and marketing costs for **Sierra Stone** coasters is similar to that of the Desert Sandscapes coasters, any alleged deficiency in the quality of **Sierra Stone** is not reflected in its market price.

In order to further document the relative value of **Sierra Stone**, we compared the retail price of beneficiated Coconino Sandstone with a similar product made from **Sierra Stone** (see Table 2, Part B). An Albuquerque stone dealer that purchases **Sierra Stone** blocks beneficiates the raw stone into  $\frac{3}{4}$ " thick slabs that he sells for table tops; he also purchases monochromatic Coconino Sandstone that he sells for table tops. The monochromatic slabs sell for \$9.50 per ft<sup>2</sup> and the **Sierra Stone** slabs for \$30 per ft<sup>2</sup>. The dealer estimates that **Sierra Stone** slabs cost about \$5.00/ft<sup>2</sup> more to make than

the nonvariegated sandstone because it has to be cut into slabs, while the plain sandstone cleaves naturally.

TABLE 2  
ROCK SALES COMPARISON

Part A - "raw" (unbeneficiated) mineral material:

<b>COMPANY NAME</b>	<b>ROCK TYPE</b>	<b>USE OF ROCK</b>	<b>PRICE/TON F.O.B. QUARRY</b>
APACHE STONE PRODUCTS, INC. Phoenix, AZ.	Apache Schist	flagstone	\$50 - \$100
	Travertine	ashlar, landscaping	\$75 - \$80
	Coconino Sandstone, various thicknesses	flagstone	\$50 - \$120
LAVIN STONE & ROCK Ashfork, AZ	Coconino Sandstone, various thicknesses	flagstone	\$50 - \$100
DUNBAR STONE Paulden, AZ	Coconino Sandstone, various thicknesses	flagstone	\$65 - \$100
	Coconino Sandstone, hand sorted 1" minus slabs	flagstone	\$145.00
	Coconino Sandstone, hand sorted "chocolate" 1" minus slabs	flagstone	\$185.00
SOUTHWESTERN STONE, INC. Taylor, AZ	Sierra Stone Picture Rock	coasters	\$232
		coasters	\$182
WESTERN STATES STONE CO. Ashfork, AZ	Coconino Sandstone various thicknesses	flagstone	\$70 - \$92

Part B. - beneficiated stone products:

<i>COMPANY NAME</i>	<i>ROCK TYPE</i>	<i>USE OF ROCK</i>	<i>PRICE PER FT<sup>2</sup> RETAIL</i>
UNNAMED Albuquerque, NM STONE DEALER	Coconino Sandstone, split slabs	table tops	\$9.50
	<b>Sierra Stone</b> sawed slabs	table tops	\$25

VIII. *LEGAL PRECEDENTS AND REGULATORY AUTHORITIES*

A. *Legal Precedents and Regulatory Authorities*

The general Mining Law of 1872 gave citizens the right to locate and patent mining claims on federal lands. Initially, all mineral commodities were encompassed under this authority. However, over the years, Congress has passed various other laws (such as the Mineral Leasing Act of 1920) which removed certain mineral and energy resources from location under the mining laws.

In 1955, Congress passed Public Law 167 which removed common varieties of sand, stone, gravel, pumice, pumicite, cinders and clay from location under the mining laws. An exception was made, however, for:

"materials which are valuable because the deposit has some property giving it distinct and special value..."

Materials falling into this category became known as "uncommon varieties", that remain locatable under the mining laws.

B. *Federal Regulations*

Department of Agriculture regulations (36 CFR 228, Subpart C) define common variety minerals as:

"...mineral materials which consist of petrified wood and common varieties of sand, gravel, stone, pumice, pumicite, cinders, clay and other similar materials. Such mineral materials include deposits which, although they have economic value, are used for agriculture, animal husbandry, building, abrasion, construction, landscaping, and similar uses."

Uncommon varieties of mineral materials, to be administered as locatable minerals under 36 CFR 228, subpart A, are defined as follows:

"...any mineral used in manufacturing, industrial processing, or chemical operations for which no other mineral and be substituted due to unique properties giving the particular mineral a distinct and special value"

The regulations go on to describe and discuss specific categories of common and uncommon varieties of mineral materials, but do not specifically address decorative stone such as **Sierra Stone**.

Decorative stone was addressed in the draft version of the regulations. However, according to supplementary information accompanying publication of the final rule in the Federal Register (December 17, 1990):

"...because of the analytical difficulties encountered in deriving a suitable distinction between common and uncommon varieties, the category of "Decorative and Ornamental Arts Materials" has not been retained in the final rule."

For this reason, it was necessary to use the criteria established through case law, and not the regulations, in making our classification determination.

### C. Case Law

Ever since Public Law 167 was signed into law, the question of what constitutes an uncommon variety mineral material has been the subject of numerous interpretations by various Administrative Law Judges, the Interior Board of Land Appeals, the Federal Courts, and the Secretaries of Interior and Agriculture.

One case in particular, *McClarty v. Secretary of the Interior*, 408 F2d 907 (9th Cir 1969), introduced the most commonly accepted test to determine whether or not a material is an uncommon variety. According to this test, an uncommon variety must meet the following criteria:

- (1) there must be a comparison of the mineral deposit in question with other deposits of such minerals generally;
- (2) the mineral deposit in question must have a unique property;
- (3) the unique property must give the deposit a distinct and special value;
- (4) if the special value is for uses to which ordinary varieties of the mineral are put, the deposit must have a distinct and special value for such use, and;
- (5) the distinct and special value must be reflected by the higher price which the material commands in the market place.

Other case law was reviewed which clarifies and reaffirms the McClarty standards. In *U. S. v. Vaughn*, 56 IBLA 247 (1981), it was decided that in determining whether or not a material has a distinct and special value it should be compared with deposits of common variety mineral material:

"It is a prerequisite for an adequate comparison that the stone in question be compared with deposits of common varieties in order to determine if it has a distinct and special value. The mere fact that the materials are used for the same purposes is not sufficient. The test must be applied to the stone in question verses known common varieties.

The importance of market analysis in determining whether or not a mineral material has a "unique property" is addressed in *U. S. v. Multiple Use, Inc.*, 12 IBLA 63, 78, 79, and 102 (1991), as follows:

"...the willingness of a user to buy a mineral material at a higher price is a clear indication that the mineral material has an intrinsic property that renders it an uncommon variety."

"...Once a common variety sales price is established, evidence of an arm's length purchaser's willingness to pay much more than the "common variety price" for a particular mineral material strongly supports a finding that the deposit of that material is intrinsically unique."

## IX. EVALUATION

Our evaluation of **Sierra Stone** involved a step by step analysis using the McClarty standards, as follows:

We compared **Sierra Stone** with other deposits of such minerals generally, including variegated stone such as travertine, banded rhyolite and marble, and also other sandstones. We found that there are many types of variegated or banded rock, but relatively few types that display the distinctive "pictures" seen in **Sierra Stone**.

Much of the mineral material we compared **Sierra Stone** with comes from federal lands and is being managed by either the BLM or the USFS as common variety mineral material. However, the chocolate Coconino 1" minus flagstone, the Chartrand **Picture Rock**, and the **Desert Sandstone** sandstone are managed as locatable minerals.

We determined that although sandstone is very widespread, comprising approximately 15% of all rock exposed on the Earth's surface (Lutgens and Tarbuck, 1982), there are relatively few deposits of "picture stone". We are aware of only three areas in the Southwest where similar deposits occur; the Kanab, Utah area (the source of **Desert Sandstone** sandstone); portions of the Zuni Sandstone of northern New Mexico, and the **Sierra Stone** deposit. In spite of the abundance of sandstone outcrops in the Southwest, the occurrence of "picture stone" is relatively rare. We thus concluded that the designs formed with Liesegang banding in the **Sierra Stone** give the deposit a *unique property*.

We determined through market analysis that *the unique patterning in Sierra Stone gives it a distinct and special value* when compared with ordinary varieties of stone and with other types of variegated stone such as travertine. **Sierra Stone** in raw form sells for \$82 to \$182 higher than local flagstone schist, \$152 - \$157 higher than local travertine, \$50 higher than the Chartrands' **Picture Rock**, and \$87 to \$182 higher than most monochromatic sandstone (see Table 2, Part A). The difference in price between **Sierra Stone** and 1" minus chocolate Coconino Sandstone is \$47. But, as stated previously, it is being managed by the BLM as a locatable mineral.

The value of **Sierra Stone** is demonstrated especially well by the sale of slabs for table tops. Monochromatic sandstone table tops sell in Albuquerque for \$9.50/ft<sup>2</sup> while **Sierra Stone** table tops sell for \$25/ft<sup>2</sup> (see Table 3, part B). Presumably the only difference in the mining and manufacture of the two types of table tops is that the **Sierra Stone** has to be cut into slabs while the plain sandstone cleaves naturally along the bedding planes. Even if the cost of cutting the stone (\$5/ft<sup>2</sup>) is subtracted from the sale price of **Sierra Stone**, it would still be more than twice the price of monochromatic sandstone. Thus although **Sierra Stone** is used in making a product (ie. table tops) that is also made from common variety sandstone, *its distinct and special value is reflected by the higher price it commands in the market place*.

## X. CONCLUSIONS

From our field examinations of **Sierra Stone** exposed on the subject mining claims, and review of the uses and market for **Sierra Stone**, we conclude the following:

1. The patterning, color and intensity seen in **Sierra Stone** is not typical of other variegated stone or other sandstones, in general, and thus is a property unique to **Sierra Stone** and a very few other similar deposits of stone.
2. The unique patterning in **Sierra Stone** allows it to bring a distinctively higher price than other variegated stone and other sandstones on the market.
3. **Sierra Stone** is a locatable mineral deposit and should be managed under the regulations at 36 CFR 228, Subpart A. Disposal should be authorized under a Plan of Operations.

XI. REFERENCES

Blakey, Ronald C., 1989, Triassic and Jurassic Geology of the Colorado Plateau, Arizona Geological Society Digest 17, p. 369-396.

Gutierrez, John; Oldfield, Robert and Morgan, Beverly, 1992, Lee Chartrand and Howard Thomas Mineral Classification Report.

Bues, Stanley S. and Michael Morales, 1990, Grand Canyon Geology.

Lutgens, F. K. and E. J. Tarbuck, 1982, Essentials of Geology.

Peirce, H. Wesley, 1989, Correlation Problems of Pennsylvanian-Permian Strata of the Colorado Plateau of Arizona, in Geologic Evolution of Arizona, Arizona Geological Society Digest 17, pp. 349-368, J. P. Jenney and S. J. Reynolds, editors.

**APPENDIX A**

**SIERRA STONE  
MINING CLAIM  
RECORDATION NOTICES**

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_



FEE # 55 07963  
RECORDED AT THE REQUEST OF Howard Thomas  
ON JUN 15 1988 AM -8 40  
IN DOCKET 916 PAGE(S) 181  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER

When recorded mail to: Witr \_\_\_\_\_  
**SOUTHWESTERN STONE CO.**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4988 By \_\_\_\_\_

## MAP OF MINING CLAIM LOCATION

MICROFILMED  
INDEXED

- Location     Amendment    Check only one
- Placer     Lode     Millsite     Tunnelsite    Check only one
- The name of the claim is SIERRA STONE #1  
The name of the locators ARE; HOWARD THOMAS & Lee CHATRAND
- The location of the claim is in Section 20 Township 12 N.  
Range 20 E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The N.E. corner of the claim is 2900 feet in a  
N.N.E. direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF  
Section 20, T12N., R20E.
- The type of location monument is 4 FOOT POST WITH STONE  
The type of corner and end monuments are 4 FOOT POST w/ stone
- The bearing and distance between the corners of the claim are beginning at the N.E.  
corner of the claim 1320 feet in a Southealy direction to the S.E. corner, then  
1320 feet in a westealy direction to the S.W. corner, then 1320 feet  
in a NortHealy direction and to the N.W. corner then 1320 feet in a East  
direction to the point of beginning.

7. If amending, this claim was previously recorded in Docket \_\_\_\_\_, Page \_\_\_\_\_  
\_\_\_\_\_ Mining District, \_\_\_\_\_ County, Arizona

Date 6/15/88

Signature Howard Thomas  
DOCKET **916** PAGE **181**

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AZ STATE OFFICE  
JUL - 1  
PH 3:37  
DENIX, ARIZONA

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_

Fee No.:



FEE # 88 07962  
RECORDED AT THE REQUEST OF  
Howard Thomas  
ON JUN 15 1988 AM -8 40  
IN DOCKET 916 PAGE(S) 180  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER

When recorded mail to: \_\_\_\_\_ V

SOUTHWESTERN STONE CO  
PO BOX 454  
TAYLOR, AZ 85939 E

MICROFILMED  
INDEXED

### MAP OF MINING CLAIM LOCATION

- Location     Amendment    Check only one
- Placer     Lode     Millsite     Tunnelsite    Check only one
- The name of the claim is SIERRA STONE #2  
The name of the locator s AAE; HOWARD THOMAS & LEE CHARTRAND
- The location of the claim is in Section 20 Township 12 N.  
Range 20 E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The N. E. corner of the claim is 4300 feet in a  
N. N. E. direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF  
SECTION 20, T12 N., R 20 E.
- The type of location monument is 4 FOOT POST WITH STONE.  
The type of corner and end monuments are 4 FOOT POST W/ STONE
- The bearing and distance between the corners of the claim are beginning at the \_\_\_\_\_  
corner of the claim 1320 feet in a SOUTHERLY direction to the S.E. corner, then  
1320 feet in a WESTERLY direction to the S.W. corner, then 1320 feet  
in a NORTHERLY direction and to the N.W. corner then 1320 feet in a WESTERLY  
direction to the point of beginning.
- If amending, this claim was previously recorded in Docket \_\_\_\_\_, Page \_\_\_\_\_  
\_\_\_\_\_ Mining District, \_\_\_\_\_ County, Arizona.

Date 6/15/88

Howard Thomas  
Signature DOCKET 916 PAGE 180

RECEIVED  
B.L.H. AZ STATE OFFICE  
JUN 15 1988  
M 3:37  
ARIZONA

A MC 286605

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_

Fee No.:



When recorded mail to:  
**SOUTHWESTERN STONE CO.**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

FEE # 88 07961  
RECORDED AT THE REQUEST OF  
Howard Thomas  
ON JUN 15 1988 AM - 8 40  
IN DOCKET 916 PAGE(S) 179  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER

## MAP OF MINING CLAIM LOCATION

MICROFILMED  
INDEXED

- Location     Amendment    Check only one
  - Placer     Lode     Millsite     Tunnelsite    Check only one
  - The name of the claim is SIERRA Stone #3  
The name of the locators ARE; HOWARD THOMAS & Lee CHARTRAND
  - The location of the claim is in Section 20 Township 12 N.  
Range 20 E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The N.E. corner of the claim is 3300 feet in a  
NORTHERLY direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF  
SECTION 20, T12 N., R. 20 E.
  - The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post w/ stone
  - The bearing and distance between the corners of the claim are beginning at the N.E.  
corner of the claim 1320 feet in a southerly direction to the S.E. corner, then  
1320 feet in a westerly direction to the S.W. corner, then 1320 feet  
in a NORTHERLY direction and to the N.W. corner then 1320 feet in a Easterly  
direction to the point of beginning.
  - If amending, this claim was previously recorded in Docket \_\_\_\_\_, Page \_\_\_\_\_  
\_\_\_\_\_ Mining District, \_\_\_\_\_ County, Arizona.
- Date 6/15/88

Howard Thomas  
Signature DOCKET 916 PAGE 179

RECEIVED  
B.L.M. AZ STATE OFFICE  
JUL - 1 PM 3:37  
ERIK, ARIZONA

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_

FEE # 90 15714  
RECORDED AT THE REQUEST OF

Lee Chartrand  
ON NOV 06 '90-11 10 AM

IN DOCKET 1013 PAGE(S) 305-306  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



When recorded mail to: \_\_\_\_\_ Wi \_\_\_\_\_  
By \_\_\_\_\_  
SOUTHWESTERN STONE CO.  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

Deputy recorder

## NOTICE OF MINING CLAIM LOCATION

1.  Location     Amendment    *Check only one*
2.  Placer     Lode     Millsite     Tunnelsite    *Check only one*

3. The name of the claim is SIERRA STONE #14  
The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939

4. The location of the claim is in Section 20 Township 12N.  
Range 20E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 3620 feet in a  
NNW direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.

5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a easterly direction to the NE corner, then  
1320 feet in a southerly direction to the SE corner, then 1320 feet  
in a westerly direction and to the SW corner then 1320 feet in a northerly  
direction to the point of beginning.

DEC 21 11 05 AM '90

ARIZONA COUNTY CLERK'S OFFICE

Date NOVEMBER 1, 1990

Greta Holladay

Lee Chartrand  
Signature

Notary Public, State of Arizona County of Navajo  
My commission expires 1-11-92

A 111 309597

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_ FEE # **90 15715**  
In Docket No. \_\_\_\_\_ RECORDED AT THE REQUEST OF

Lee Chartrand  
ON NOV 06 '90-11 10 AM  
IN DOCKET 1013 PAGE(S) 307-308  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



When recorded mail to: \_\_\_\_\_ Wit \_\_\_\_\_  
**SOUTHWESTERN STONE CO**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

By \_\_\_\_\_ Deputy Recorder

### NOTICE OF MINING CLAIM LOCATION

1.  Location     Amendment    *Check only one*
2.  Placer     Lode     Millsite     Tunnelsite    *Check only one*
3. The name of the claim is SIERRA STONE #15  
The name of the locator.s are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939
4. The location of the claim is in Section 20 Township 12N.  
Range 20E. G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 2370 feet in a  
NNW direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N, R20E.
5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone
6. The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a east direction to the NE corner, then  
1320 feet in a south direction to the SE corner, then 1320 feet  
in a west direction and to the SW corner then 1320 feet in a north  
direction to the point of beginning.

Dec 21 11 06 AM '90

Date NOVEMBER 1, 1990

Carol Holladay

Lee Chartrand  
Signature

Notary Public, State of Arizona County of Navajo  
My commission expires 1-11-92

A 111-309598

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded \_\_\_\_\_ FEE # 90 15716  
In Docket No. \_\_\_\_\_ RECORDED AT THE REQUEST OF

Lee Chartrand  
ON NOV 06 '90-11 10 AM

When recorded mail to:

**SOUTHWESTERN STONE CO.**  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

IN DOCKET 1013 PAGE(S) 309-310  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



Deputy Recorder

## NOTICE OF MINING CLAIM LOCATION

1.  Location  Amendment *Check only one*

2.  Placer  Lode  Millsite  Tunnelsite *Check only one*

3. The name of the claim is SIERRA STONE #16

The name of the locator<sup>s</sup> are LEE CHARTRAND and HOWARD THOMAS  
whose current address is P.O. Box 454 TAYLOR, AZ 85939

4. The location of the claim is in Section 20 Township 12N  
Range 20E G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 1320 feet in a  
north direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.

5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NW  
corner of the claim 1320 feet in a east direction to the NE corner, then  
1320 feet in a south direction to the SE corner, then 1320 feet  
in a west direction and to the SW corner then 1320 feet in a north  
direction to the point of beginning.

Date NOVEMBER 1, 1990

Gail Holladay  
Notary Public, State of Arizona County of Navajo  
My Commission expires 1-11-92

[Signature]  
Signature

Dec 21 11 06 AM '90

RECEIVED  
NAVajo COUNTY RECORDER

A 110 309599

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
 County of \_\_\_\_\_ ss. recorded \_\_\_\_\_ FEE # 90 15717  
 In Docket No. \_\_\_\_\_ RECORDED AT THE REQUEST OF  
 \_\_\_\_\_ Lee Chartrand  
 ON NOV 06 '90-11 10AM  
 When recorded mail to: V IN DOCKET 1013 PAGE(S) 311-312  
 SOUTHWESTERN STONE CO. OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
 P. O. BOX 454 JAY H. TURLEY, RECORDER  
 TAYLOR, AZ. 85939  
 536-4912 or 536-4989 E. Deputy Recorder



## NOTICE OF MINING CLAIM LOCATION

1.  Location     Amendment    *Check only one*
2.  Placer     Lode     Millsite     Tunnelsite    *Check only one*
3. The name of the claim is SIERRA STONE #17  
 The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
 whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939
4. The location of the claim is in Section 20 Township 12N.  
 Range 20E G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is \_\_\_\_\_  
 \_\_\_\_\_ THE survey monument or permanent natural object described as  
THE NORTHWEST SECTION CORNER OF SECTION 20, T12N. R20E.
5. The type of location monument is 4 foot post with stone  
 The type of corner and end monuments are 4 foot post with stone
6. The bearing and distance between the corners of the claim are beginning at the NW  
 corner of the claim 1320 feet in a east direction to the NE corner, then  
1320 feet in a south direction to the SE corner, then 1320 feet  
 in a west direction and to the SW corner then 1320 feet in a north  
 direction to the point of beginning.

Date NOVEMBER 1, 1990

*Carol Holladay*  
 Notary Public State of Arizona County of Navajo  
 My commission expires 1-11-92

*Lee Chartrand*  
 Signature

DEC 21 11 05 AM '90  
 RECEIVED  
 OFFICE

3096011

NOTICE OF MINING CLAIM LOCATION

NOTICE IS HEREBY GIVEN that the Sierra Stone #18 placer mining claim has been located by Howard Thomas, Lee Chartrand and Barbara Chartrand whose current mailing address is P.O. Box 454, Taylor, Arizona 85939.

The general course of this claim is north to south and it is situated in Navajo County, Arizona.

This claim is 1933.8 feet in length and 1320 feet in width. This claim runs from the location monument on which this location notice is posted approximately 1310 feet in a NORTH direction to the NORTH end line and 10 FEET in a SOUTH direction to the SOUTH end line. The claim boundaries are marked by four (4) monuments, one at each corner.

The location monument on which this notice is posted is situated within Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona. This claim encompasses Lot 3, Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

The southwest corner of the claim is located approximately 1320 feet north of the southwest corner of Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

DATED AND POSTED on the ground this 1st day of NOVEMBER, 1990

Howard Thomas  
Lee Chartrand  
Barbara Chartrand

By: [Signature]

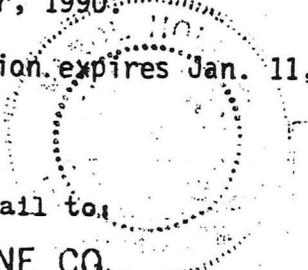
RECEIVED  
APR 21 11 05 AM '90

State of Arizona  
County of Navajo

Before me a Notary Public personally appeared Lee Chartrand this 2nd day of November, 1990.

My commission expires Jan. 11, 1992

[Signature: Carol Holladay]



When recorded mail to:

SOUTHWESTERN STONE CO.  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536 4912 or 536-4989

NOTICE OF MINING CLAIM LOCATION

NOTICE IS HEREBY GIVEN that the Sierra Stone#19 placer mining claim has been located by Howard Thomas, Lee Chartrand and Barbara Chartrand whose current mailing address is P.O. Box 454, Taylor, Arizona 85939.

The general course of this claim is north to south and it is situated in Navajo County, Arizona.

This claim is 1933.8 feet in length and 1320 feet in width. This claim runs from the location monument on which this location notice is posted approximately 1310 feet in a NORTH direction to the NORTH end line and 10 FEET in a SOUTH direction to the SOUTH end line. The claim boundaries are marked by four (4) monuments, one at each corner.

The location monument on which this notice is posted is situated within Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona. This claim encompasses Lot 4, Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

The southwest corner of the claim is the southwest corner of Section 18, Township 12 North, Range 20 East, G.&S.R.B.&M., State of Arizona.

DATED AND POSTED on the ground this 1st day of NOVEMBER, 1990

Howard Thomas  
Lee Chartrand  
Barbara Chartrand

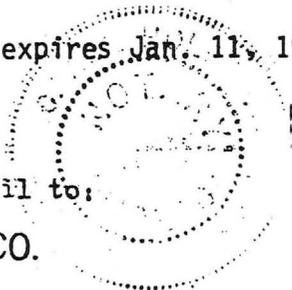
By: 

State of ARizona  
County of Navajo

Before me, a Notary Public, personally appeared Lee Chartrand this 2nd day of November, 1990.

My commission expires Jan. 11, 1991





When recorded mail to:

SOUTHWESTERN STONE CO.  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

Dec 21 11 06 AM '90

RECEIVED,  
BLISS  
ARIZONA DEPARTMENT OF  
MINE

H H L 309602

STATE OF ARIZONA, I hereby certify that the foregoing is a true and correct copy of the original as recorded in the public records of this office.  
County of \_\_\_\_\_ recorded \_\_\_\_\_  
In Docket No. \_\_\_\_\_

FEE # 90 15720  
RECORDED AT THE REQUEST OF

Lee Chartrand  
ON NOV 06 '90-11 10 AM



When recorded mail to:  
SOUTHWESTERN STONE CO.  
P. O. BOX 454  
TAYLOR, AZ. 85939  
536-4912 or 536-4989

IN DOCKET 1013 PAGE(S) 319-320  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER  
Deputy Recorder

### NOTICE OF MINING CLAIM LOCATION

- Location     Amendment    *Check only one*
- Placer     Lode     Millsite     Tunnel site    *Check only one*
- The name of the claim is SIERRA STONE #20  
The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 TAYLOR, AZ 85939
- The location of the claim is in Section 24 Township 12N.  
Range 19E G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NE corner of the claim is \_\_\_\_\_  
\_\_\_\_\_ THE survey monument or permanent natural object described as  
THE NORTHEAST SECTION CORNER OF SECTION 24, T12N. R19E.
- The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone
- The bearing and distance between the corners of the claim are beginning at the NE  
corner of the claim 1320 feet in a south direction to the SE corner, then  
1320 feet in a west direction to the SW corner, then 1320 feet  
in a north direction and to the NW corner then 1320 feet in a east  
direction to the point of beginning.

Dec 21 11:06 AM '90

A 11 309603

Date NOVEMBER 1, 1990

Howard J. Holladay

Lee Chartrand  
Signature

Notary Public - State of Arizona County of Navajo  
My commission expires 1-11-92

DOCKET 1013 PAGE 319

STATE OF ARIZONA, I hereby certify that the within instrument was filed and

County of \_\_\_\_\_ ss. recorded \_\_\_\_\_

In Docket No. \_\_\_\_\_ FEE # 91 11252

RECORDED AT THE REQUEST OF

By Lee Chartrand  
ON AUG 13 91-1 30 PM

When recorded mail to:

IN DOCKET 1043 PAGE(S) 329-330  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
By JAY H. TURLEY, RECORDER



MICROFILMED  
INDEXED

### NOTICE OF MINING CLAIM LOCATION

- 1.  Location     Amendment    Check only one
- 2.  Placer     Lode     Millsite     Tunnelsite    Check only one

3. The name of the claim is SIERRA STONE #21

The name of the locators are LEE CHARTRAND and HOWARD THOMAS  
whose current mailing address is P.O. Box 454 Taylor, AZ 85939

4. The location of the claim is in Section 24 Township 12N.  
Range 19E. G&SRB&M, \_\_\_\_\_ Mining District,  
NAVAJO County, Arizona. The NE corner of the claim is 1320 feet in a  
east direction to a survey monument or permanent natural object described as  
NORTHEAST SECTION CORNER OF SECTION 24, T12N., R19E.

5. The type of location monument is 4 foot post with stone  
The type of corner and end monuments are 4 foot post with stone

6. The bearing and distance between the corners of the claim are beginning at the NE  
corner of the claim 1320 feet in a south direction to the SE corner, then  
1320 feet in a west direction to the SW corner, then 1320 feet  
in a north direction and to the NW corner then 1320 feet in a east  
direction to the point of beginning.

Date Aug 12, 1991

Howard Thomas  
Signature

A 11 216286



STATE OF ARIZONA }  
COUNTY OF NAVAJO } ss

This instrument was acknowledged before me this 12th day of  
August, 1991, by Howard Thomas  
in witness whereof I hereunto set my hand and official seal.

Thea C. Hudson  
NOTARY

My Commission Expires May 8, 1992

Aug 20 10 16 AM '91

1111

20

STATE OF ARIZONA, I hereby certify that the within instrument was filed and  
County of \_\_\_\_\_ ss. recorded  
In Docket No. \_\_\_\_\_

Fee No.:

FEE # 91 11253  
RECORDED AT THE REQUEST OF  
Lee Churtrand  
ON AUG 13 '91 - 7 30 PM  
IN DOCKET 1043 PAGE(S) 331-332  
OFFICIAL RECORDS OF NAVAJO COUNTY, ARIZONA  
JAY H. TURLEY, RECORDER



MICROFILMED  
INDEXED

When recorded mail to:

### NOTICE OF MINING CLAIM LOCATION

- 1.  Location     Amendment    Check only one
- 2.  Placer     Lode     Millsite     Tunnelsite    Check only one

3. The name of the claim is SIERRA STONE #22  
 The name of the locator # Mr HOWARD THOMAS, LEE CHURTRAND and BARBARA CHURTRAND  
 Whose current mailing address is P.O. Box 454 Taylor, Az. 85939  
 4. The location of the claim is in Section 20 Township 12N  
 Range 20E G&SRB&M, \_\_\_\_\_ Mining District, \_\_\_\_\_  
NAVAJO County, Arizona. The NW corner of the claim is 1320 feet in a  
west direction to a survey monument or permanent natural object described as  
NORTHWEST SECTION CORNER OF SECTION 20, T12N., R20E.

5. The type of location monument is 4 foot post with stone  
 The type of corner and end monuments are 4 foot post with stone

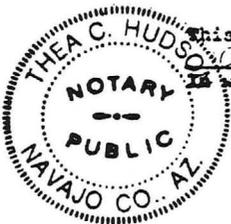
6. The bearing and distance between the corners of the claim are beginning at the NW  
 corner of the claim 1320 feet in a east direction to the NE corner, then  
1980 feet in a south direction to the SE corner, then 1320 feet  
 in a west direction and to the SW corner then 1980 feet in a north  
 direction to the point of beginning.

Date Aug 12, 1991

Howard Thomas  
Signature

STATE OF ARIZONA )  
COUNTY OF NAVAJO ) ss

This instrument was acknowledged before me this 11th day of  
August, 1991, by Howard Thomas  
as witness whereof I hereunto set my hand and official seal.



Thea C. Hudson  
NOTARY

My Commission Expires May 9, 1992

AUG 20 10 16 AM '91

# Affidavit of Labor Performed and Improvements Made

CASH  
REC  
4 11 89

WHEN RECORDED CONTACT SHERIFF'S OFFICE  
P.O. Box 401  
TUCSON, AZ 85720  
PHONE 520-622-4449

STATE OF ARIZONA }  
County of NAVAJO } ss.

HOWARD THOMAS, being duly sworn, according to law, deposes and says:

That he is a citizen of the United States, more than 18 years of age and resides at;

P.O. Box 454 TAYLOR, Arizona 85939 NAVAJO county.

That he is personally acquainted with the following unpatented mining claims which are situated in the HOLBROOK Mining district NAVAJO county, Arizona. The names, books and pages of the recording of the location notices in the office of the recorder of said county and the BLM serial numbers of which are as follows:

Claim Name	Book	Page	Recorded	BLM No.
SIERRA STONE #1	916	181		AMC 286604
SIERRA STONE #2	916	180		AMC 286605
SIERRA STONE #3	916	179		AMC 286606

That the notices of location of said claims are posted within the following:

Sections,      Townships,      and Ranges.  
20                      12 N.                      20 E

That HOWARD THOMAS whose address is P.O. Box 454 TAYLOR, AZ 85939 is the owner of the above-described claims;

That between the 1st day of September 1988, and the 1st day of September 1989 in excess of THREE HUNDRED Dollars (\$300.00) worth of work and improvements were done and performed upon or for the benefit of this claim group;

That such work and improvements consisted of REMOVING OVERBURDEN  
AND ROCK IN OPENING NEW QUARRY, QUARRYING  
AND REMOVING AT LEAST 10 TONS OF STONE.

and were performed by HOWARD THOMAS AND LEE CHARTRAND and that the above work and improvements were made by and at the expense of HOWARD THOMAS AND LEE CHARTRAND the owners of the claims, for the purpose of complying with the laws of the United States pertaining to assessment or annual work.

DATED this 15<sup>TH</sup> day of OCTOBER, 1989.

Howard Thomas

SUBSCRIBED AND SWORN to before me this 17<sup>th</sup> day of October, 1989 by HOWARD THOMAS.

Carol Hilladay  
Notary Public

My Commission Expires:  
July 11, 1992

# Affidavit of Labor Performed and Improvements Made

STATE OF ARIZONA }  
County of NAVAJO } ss.

LEE CHARTRAND, being duly sworn, according to law, deposes and says:

That he is a citizen of the United States, more than 18 years of age and resides at;

P.O. BOX 454 TAYLOR, Arizona NAVAJO county.

That he is personally acquainted with the following unpatented mining claims which are situated in the HOLBROOK Mining district NAVAJO county, Arizona. The names, books and pages of the recording of the location notices in the office of the recorder of said county and the BLM serial numbers of which are as follows:

Claim Name	Recorded		BLM No.
	Book	Page	
SIERRA STONE #1	916	181	AMC 286604
SIERRA STONE #2	916	180	AMC 286605
SIERRA STONE #3	916	179	AMC 286606

That the notices of location of said claims are posted within the following:

Sections,            Townships,    and Ranges.  
20                            12N.                            20E.

That LEE CHARTRAND, whose address is P.O. BOX 454 TAYLOR, AZ 85939, is the owner of the above-described claims;

That between the 1st day of September 1989, and the 1st day of September 1990, in excess of three hundred Dollars (\$ 300 .00) worth of work and improvements were done and performed upon or for the benefit of this claim group;

That such work and improvements consisted of opening quarry,

removing overburden and rock with hand labor and equipment,

and repair of road.

and were performed by Howard Thomas, Lee Chartrand, Lloyd Chartrand & others, and that the above work and improvements were made by and at the expense of

HOWARD THOMAS AND LEE CHARTRAND the owners of the claims, for the purpose of complying with the laws of the United States pertaining to assessment or annual work.

DATED this 31st day of OCTOBER, 1990.

  
\_\_\_\_\_

SUBSCRIBED AND SWORN to before me this 1st day of Nov,  
1990 by Lee Chartrand.

  
Notary Public

My Commission Expires:

JAN 11, 1992



RECEIVED  
BLM FIELD OFFICE  
DEC 21 10 45 AM '90  
FBI/DOJ

# Affidavit of Labor Performed and Improvements Made

3  
66

STATE OF ARIZONA }  
County of NAVAJO } ss.

LEE CHARTRAND, being duly sworn, according to law, deposes and says:

That he is a citizen of the United States, more than 18 years of age and resides at; Box 454 Taylor, AZ 85939 Navajo county, Arizona;

That he is personally acquainted with the following unpatented mining claims which are situated in the Holbrook Mining District, Navajo County, Arizona, the names, books, and pages of the recording of the location notices in the office of the recorder of said county and the BLM serial numbers of which are as follows:

Claim Name	Book	Page	BLM No.
SIERRA STONE #1	916	181	AMC 286604
SIERRA STONE #2	916	180	AMC 286605
SIERRA STONE #3	916	179	AMC 286606
SIERRA STONE #14	1013	305	AMC 309597
SIERRA STONE #15	1013	307	AMC 309598
SIERRA STONE #16	1013	909	AMC 309599
SIERRA STONE #17	1013	311	AMC 309600
SIERRA STONE #18	1013	313	AMC 309601
SIERRA STONE #19	1013	316	AMC 309602
SIERRA STONE #20	1013	319	AMC 309603

That the notices of location of said claims are posted within the following:

Sections,	Townships,	and Ranges.
20	12N.	20E.
18	12N.	20E.
24	12N.	19E.

That Lee Chartrand, whose address is Box 454 Taylor, Az. 85939, is the owner of the above-described claims;

That between the 1st day of September A.D. 1990, and the 1st day of September A.D. 1991, in excess of one thousand Dollars (\$1,000.00) worth of work and improvements were done and performed upon or for the benefit of this claim group;

That such work and improvements consisted of opening quarry, repairing road, removing overburden and rock with hand labor and equipment. and were performed by Howard Thomas, Lee Chartrand, Lloyd Chartrand & others and that the above work and improvements were made by and at the expense of Lee Chartrand, Howard Thomas the owners of the claims, for the purpose of complying with the laws of the United States pertaining to assessment or annual work.

DATED this 29th day of October, 1991.

*[Signature]*

SUBSCRIBED AND SWORN to before me this 29th day of October, 1991 by Lee Chartrand.

*[Signature]*  
Notary Public

My Commission Expires:

Jan 11, 1992

RECEIVED  
BLM AZ STATE OFFICE  
DEC 10 1 52 PM '91  
PIERRE

**APPENDIX B**

**COPY OF THE  
PLAN OF OPERATION (P.O.O.)**

PLAN OF OPERATIONS  
FOR MINING ACTIVITIES  
ON NATIONAL FOREST LANDS

Submitted by Howard Thomas Operator 6/18/92  
Signature Title Date

Plan Received by \_\_\_\_\_  
Signature Title Date

I. GENERAL INFORMATION

- A. Name of Mine/Project SIERRA STONE
- B. Type of Operation PLACER  
(lode, placer, mill, exploration, development, production, other)
- C. Is this a (new/continuing) operation? (CIRCLE ONE)  
If continuing a previous operation, this plan (replaces/modifies) a previous plan of operation. (CIRCLE ONE)
- D. Proposed start-up date of operation ON DATE OF OPERATION APPROVAL
- E. Proposed duration of operations DECEMBER 31, 1999
- F. Proposed seasonal reclamation close-out date NON-SEASONAL

II. PRINCIPALS

A. Name, address and phone number of operator HOWARD THOMAS  
PO Box 832  
TAYLOR, AZ 85939 - 602-536-4944

B. Name, address, and phone number of authorized field representative (if other than the operator). Attach authorization to act on behalf of operator.  
SAME AS ABOVE

C. List the owners of the claims (if other than the operator)  
LEE CHARTRAND PO Box 454  
TAYLOR, AZ 85939 602-536-4912

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

- D. List name and address of any other lessees, assigns, agents, etc. and briefly describe their involvement with the operation, if applicable:

None

### III. PROPERTY OR AREA

Name of claim and the legal land description where the operation will be conducted.

MC #	Name	Section	Township	Range
286604	SIERRA Stone #1	20	12N	20E
286605	SIERRA Stone #2	20	12N	20E

### IV. DESCRIPTION OF THE OPERATION

- A. Access. Show on a map (USGS quadrangle map or a National Forest map, for example) the claim boundaries and describe and show on the map all access needs, on and off the claim. Specify what Forest Service existing roads will be used, where maintenance or reconstruction is proposed and where any new construction is necessary. For new construction, include construction specifications such as widths, grades, etc. Show location and size of culverts. Describe maintenance plans. Describe the type and sizes of vehicles and equipment that will be traveling the access routes.

Entry will be from SR #277 onto paved Forest Rt #147 for approx. 3 1/2 miles south, then turning east onto Forest Route #220 approx. 1 3/4 miles to site of planned operation.

- B. Attach map, sketch or drawing showing location and layout of the area of operation. Include names and locations of any streams, creeks, and springs. Describe and explain on the map the type of operation, method or techniques you propose (examples: drilling, open pit mining, dredging, milling, etc.; include locations, capacity, size, amount, etc.). Show on the map and describe below the size and kind of all surface disturbance, such as trenches, pits, settling ponds, stream channels and run-off diversions, waste dumps, drill pads, timber disposal or clearance, etc. Include sizes, capacities, acreage, amounts, locations, materials involved, etc.

Surface activities will consist of drilling and wedging large boulders from naturally exposed rock ledge or where overburden is at a minimum.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

C. Project Description. Describe all aspects of the operation: how clearing will be accomplished, topsoil stockpiled, waste rock placed, tailing disposed of, etc. Calculate production rates and total volumes of waste rock and ore. Include justification and calculations for settling pond capacities and sizing of runoff diversion channels.

1. For first 12 months:

SURFACE DISTURBANCE OF SOIL AND PLANT LIFE WILL BE VERY MINIMAL SINCE FORMATION IS ON OR NEAR THE SURFACE. WASTE ROCK SHALL BE USED TO FILL ANY AREAS SUCH AS BACK FILLING QUARRY OR HOLES NEEDED FILLED TO BENEFIT APPEARANCE OF AREA AND BY DIRECTION OF RANGER IN CHARGE. ANY SOIL DISTURBED SHALL BE STOCKPILED AND USED TO SPREAD OVER THAT AREA WHEN OPERATIONS CEASE.

2. For total life of project:

SAME AS ABOVE

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

D. Describe the Equipment and Vehicles you propose to use in your operation (Examples: drill, dozer, wash plant, mill, etc.). Include: sizes, capacity, frequency of use, etc.

EQUIPMENT USED IN OPERATION WILL CONSIST OF COMPRESSOR AND ROCK DRILL. 580 D CASE BACKHOE, 920 CAT WHEEL LOADER, AND 1845 CASE UNLOADER

E. Structures. Describe and include justification for the structures or facilities planned for the operation. Include such things as storage sheds, mill buildings, thickener tanks, fuel storage, powder magazines, pipe lines, water diversions, trailers, sanitation facilities, etc. Include justification and calculations for sizing of tanks, pipelines and water diversions. The fuel storage facilities should include containment structures that will hold the volume of the largest storage tank in case of a tank failure or leak. Show the locations on the sketch map.

NONE

#### V. ENVIRONMENTAL PROTECTION MEASURES (SEE 36 CFR 228.8)

A. Air Quality. Describe measures to be taken to minimize impacts on air quality such as obtaining a burning permit for slash disposal or dust abatement on roads.

NO SLASH DISPOSAL PROBLEM SHOULD EXIST SINCE AREA OF OPERATION HAS VERY SPARSE VEGETATION.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

B. **Water Quality.** State how applicable state and federal water quality standards will be met. Describe what measures or management practices will be used to minimize water quality impacts and meet applicable standards.

1. If water is to be used in the operation (processing ore, washing ore, solution make-up, etc.) state how the water will be stored, treated and disposed of. If ponds of any type are proposed, such as for storage or settling, state how they will be designed and built. Provide storage capacities and water balance calculations. State how ponds will be maintained on an annual basis.
2. Describe methods to control runoff and erosion to prevent entry into surface water for all disturbed areas, including waste and tailings dumps.
3. Describe proposed surface water and groundwater quality monitoring, if required, to demonstrate compliance with federal or state water quality standards.
4. Describe what measures will be used to minimize potential water quality impacts during winter closure, if applicable.
5. If land application is proposed for wastewater disposal, the location and operation of the land application system should be described.

NO WATER WILL BE USED IN THE QUARRYING OPERATION. ALSO THE SITE OF OPERATIONS ARE LOCATED ON THE HIGHER GROUND AND WELL AWAY FROM THE NATURAL DRAINAGES. NO WATER DRAINAGE PROBLEM WILL OCCUR OTHER THAN NATURAL EROSION.

C. **Solid Wastes.** State how any tailing, dumptage, or other waste produced by operations will be disposed of or treated so as to minimize adverse impacts. Include a statement that all unburnable garbage and refuse will be hauled off-Forest to a sanitary landfill.

THERE WILL BE NO WASTE MATERIAL (REFUSE) CAUSED BY THE QUARRYING OPERATION. GARBAGE AND OTHER TYPES OF WASTE, IF ANY, WILL BE HAULED TO THE LANDFILL AND DISPOSED OF PROPERLY.

D. **Scenic Values.** State how scenic values will be protected. Examples are screening, slash disposal, timely reclamation, etc.

NO PROBLEM SHOULD EXIST SINCE MOST OF THE QUARRIED MATERIAL WILL BE HAULED TO THE PROCESSING PLANT IN TAYLOR, OR DIRECTLY TO THE MARKET.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

- E. **Fish and Wildlife.** All practicable measures to maintain and protect fisheries and wildlife habitat affected by the operations must be taken, and should be defined. Most of those measures involve avoidance of critical habitat such as along streams and bogs when planning roads, dumps, etc. Opportunities during reclamation to prevent erosion or plant browse or forage species should be described.

NO FISH OR WILDLIFE DISTURBANCE  
WILL OCCUR.

- F. **Cultural Resources.** Describe procedures for protection of historic and archeological values. The Forest Service is responsible for insuring that the area to be covered by the operating plan is inventoried prior to plan approval to determine the presence of significant cultural resources and will specify protective and/or mitigation measures to be taken by the operator. If previously undiscovered cultural resources (historic or prehistoric objects, artifacts, or sites) are exposed as a result of operations, the operator shall not proceed until he is notified by the District Ranger that he has complied with provisions for mitigating unforeseen impacts as required by 36 CFR 228.4(e) and 36 CFR 800.

NO HISTORIC OR PREHISTORIC CULTURAL  
RESOURCES EXIST ON OR NEAR THE SITE  
OF OPERATION.

- G. List all hazardous substances (by name and quantity required) which you intend to use or generate during the proposed operation. Operations USING or GENERATING HAZARDOUS SUBSTANCES must attach copies of other Federal and State agency permits, including all stipulations and conditions pertaining to the permit.

NO HAZARDOUS SUBSTANCES WILL BE USED.

- H. With regard to hazardous substances, discuss handling, storage, security (fencing), identification (signing), or other special operations requirements necessary to conduct the proposed operation.

NONE USED

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

- I. Close-out Reclamation. This section should describe the removal of structures and facilities, and the reclamation of the access road. It should specify that roads no longer needed: (1) be closed, (2) bridges and culverts be removed, (3) cross drains, dips, or water bars be constructed, and (4) the road surface be shaped to as near a natural contour as practicable and be stabilized. Show the expected date for completion of all reclamation.

EXISTING ROADS ARE SUFFICIENT FOR THE OPERATIONS. WHERE TOPSOIL MAY BE DISTURBED, SOIL WILL BE PILED DURING QUARRY OPERATION AND SPREAD OVER THAT AREA WHEN OPERATIONS CEASE.

VI. FOREST SERVICE EVALUATION OF PLAN OF OPERATIONS

- A. Recommended Changes/Modifications for Plan of Operations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- B. Bond - As a further guarantee of faithful performance with the reclamation requirements agreed upon in the plan of operations, the operator delivers herewith and agrees to maintain a surety bond, cash, bond, irrevocable letters of credit in the sum of \_\_\_\_\_ (\$ \_\_\_\_\_).

ACKNOWLEDGMENTS

- A. It is understood that should the nature of the operation change a modified or supplemental plan of operations may be required.
- B. It is understood that approval of this plan of operations does not constitute: (1) Certification of ownership to any person named herein; and (2) Recognition of the validity of any mining claim named herein.

(If more space is needed to fill out a block of information, use additional sheets and attach to form.)

- C. It is understood that a bond equivalent to the actual cost of performing the agreed upon mitigation and reclamation measures may be required before this plan can be approved.
- D. It is understood that approval of this plan does not relieve me of my responsibility to comply with any other applicable State or Federal laws, rules or regulations.
- E. It is understood that any information provided with this plan that is marked confidential will be treated by the agency in accordance with that agency's laws, rules and regulations.

I/We have reviewed and agree to comply with all conditions in this plan of operations, including the recommended changes and reclamation requirements. I/We understand that the bond will not be released until the Forest Officer in charge gives written approval of the reclamation work.

Hand Thomas  
Operator (or Authorized Official)

6/18/92  
(Date)

**OPERATING PLAN APPROVAL:**

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Authorized Officer)

\_\_\_\_\_  
(Date)

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NORTH



SCALE APPROX

" = 30'

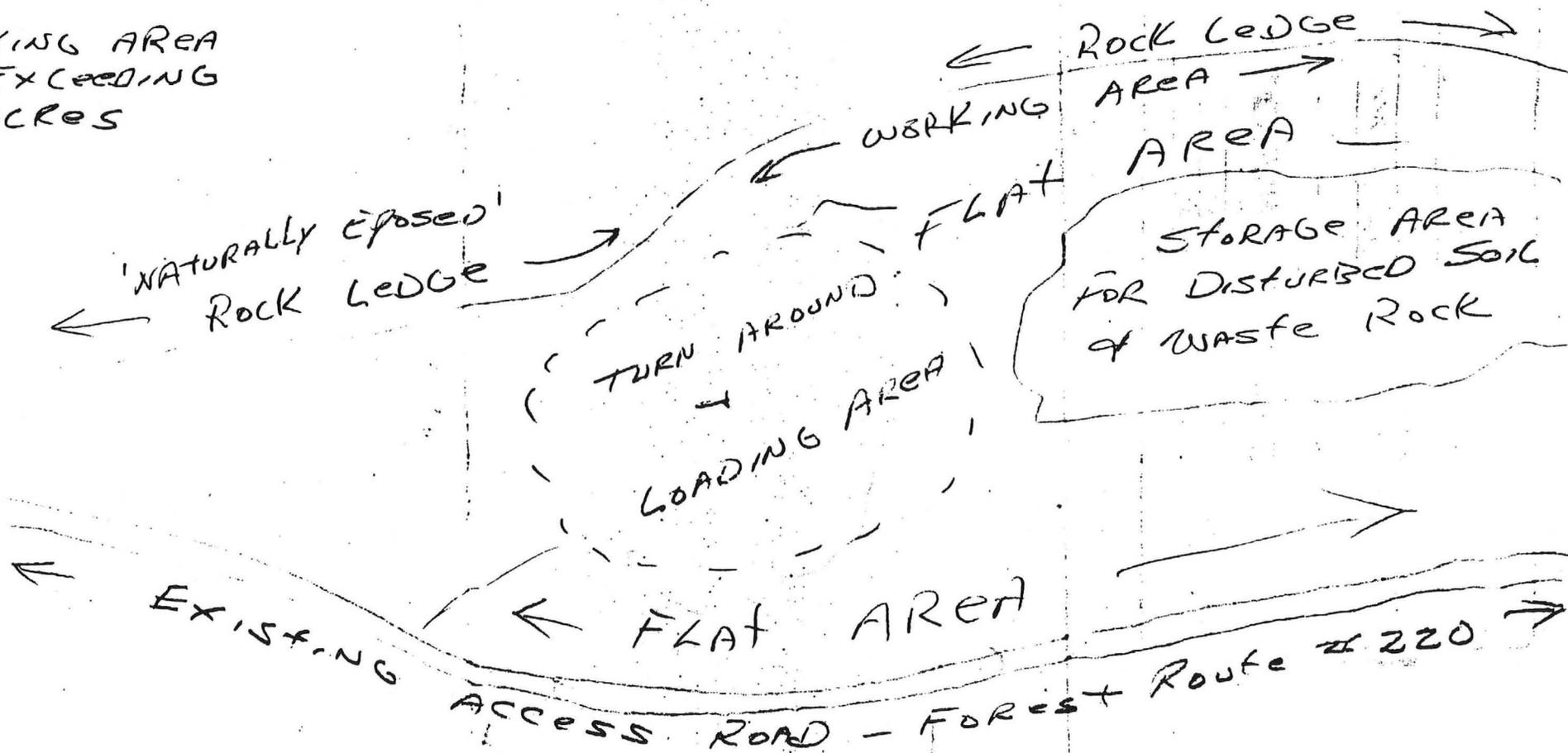
# THE SIERRA Stone

## PLACER MINING CLAIMS

### OPERATING PLAN SUBMITTED 6-20-92

## SURFACE DISTURBANCE MAP

WORKING AREA  
NOT EXCEEDING  
2 ACRES



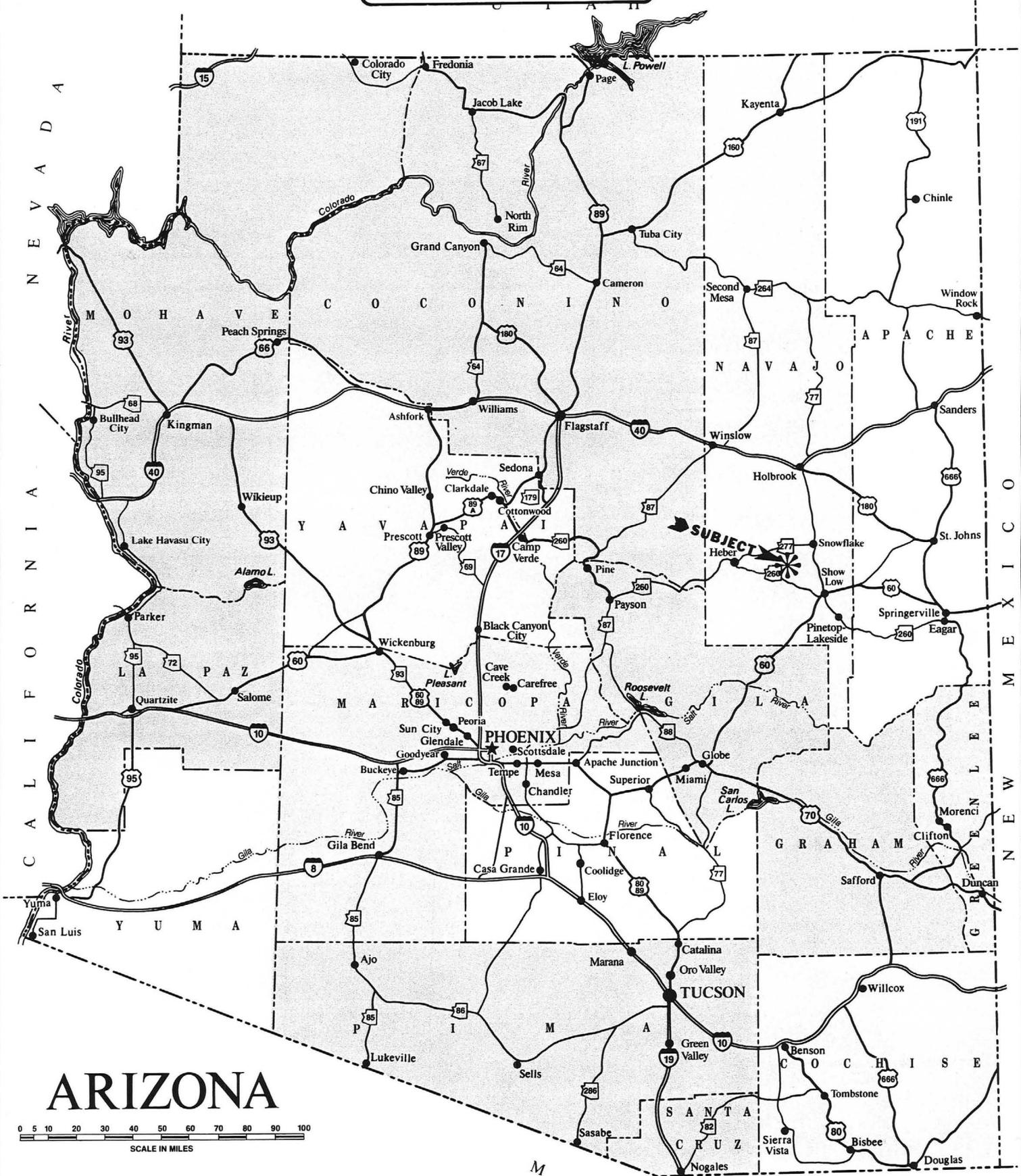
APPENDIX C

MAPS

**APPENDIX C**

**MAPS**

# Location Map



## ARIZONA

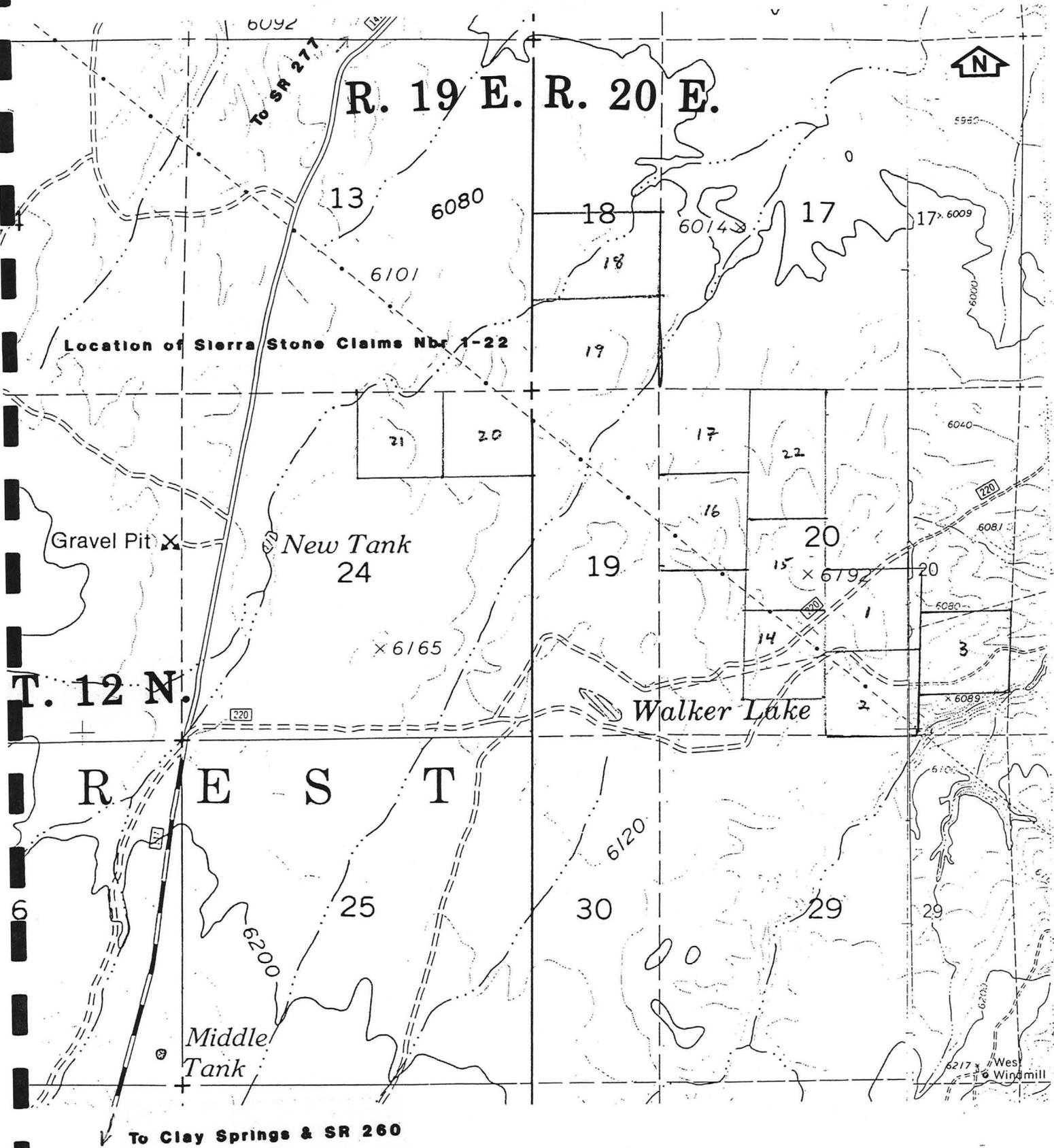


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Item No. 90812

# MAP 1

# SITGREAVES NF

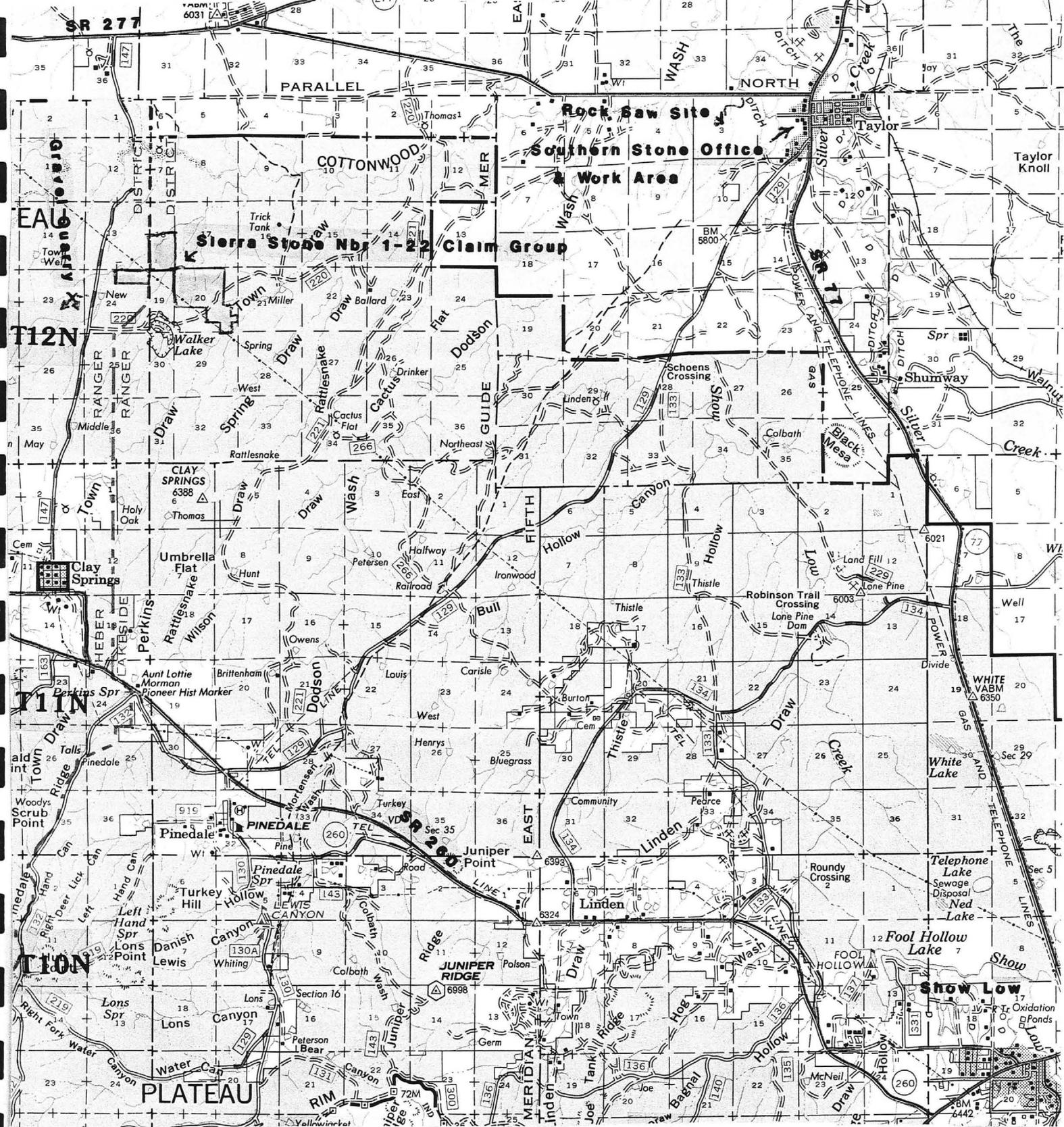


**Scale:** 1 Inch = 2000 Feet  
1 Cm = 787.4 Meters

# SITGREAVES NF



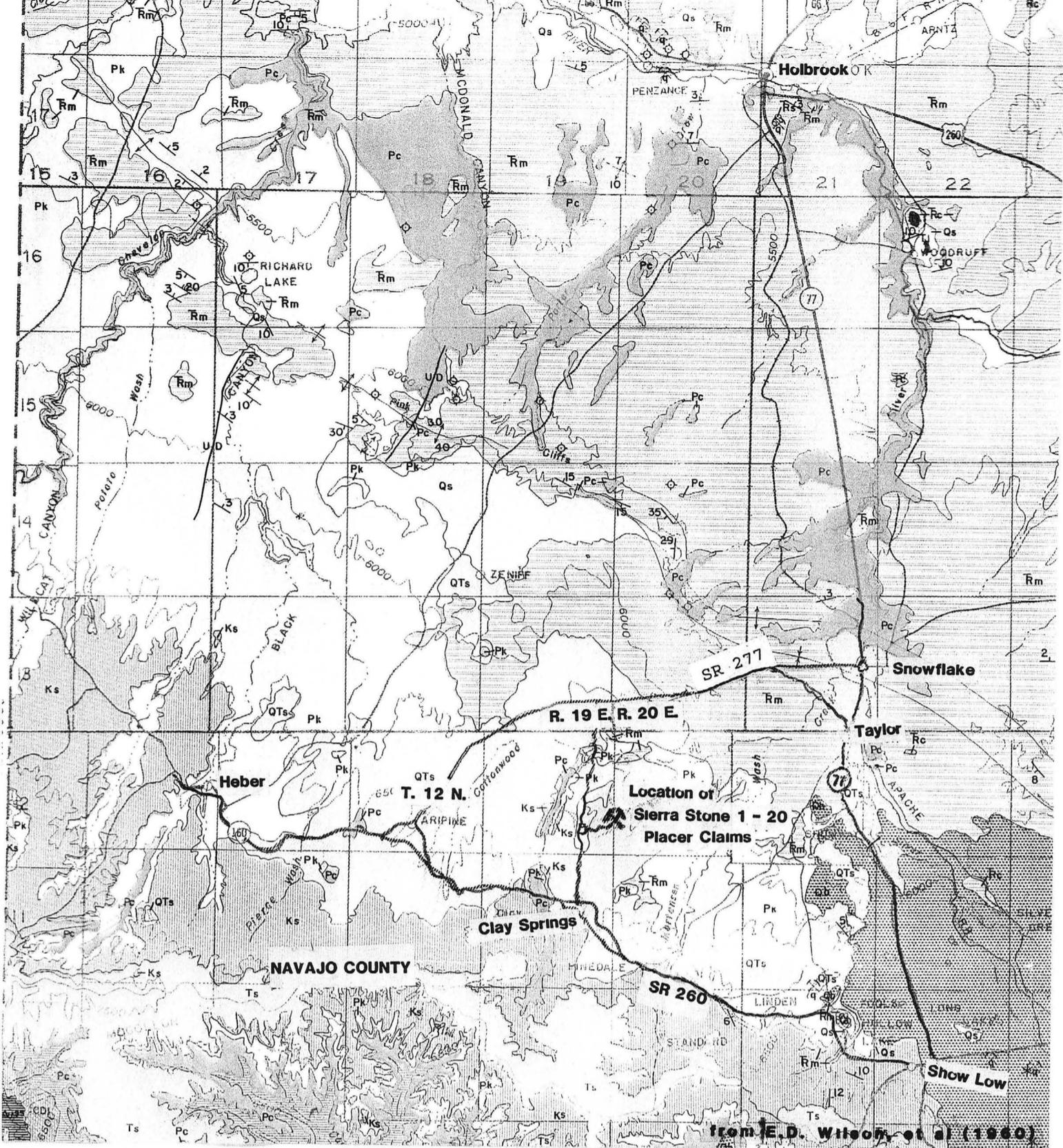
Coaster Manufacture



R19E                      R20E                      R21E                      R22E

Scale: 1 Inch = 2 Miles  
1 Cm = 1.28 Km

# MAP 3



## Chartrand – Thomas Sierra Stone Classification

Scale (RF): 1:375,000

### MAP KEY (for units of interest in this report)

- QTs - Quaternary sand, silt, gravel and conglomerate
- Trm - Triassic Moenkopi Formation
- Ks - Cretaceous undivided limestone, shale and sandstone
- Pk - Permian Kaibab Limestone or San Andres Limestone
- Pc - Permian Coconino Sandstone or Glorieta Sandstone

**APPENDIX D**  
**PHOTOGRAPHS**



**PHOTO 1**  
**Section Corner and Claim Corner**  
T. 12 N., R. 19 E., Sections 13 & 24  
T. 12 N. R. 20 E., Sections 17 & 20  
**SIERRA STONE PMC 19 (SEC. 17) AND 20 (SEC. 24)**  
Taken June 29, 1992 (Oldfield)



**PHOTO 2**  
**Sierra Stone Quarry**  
Taken March 25, 1993 (Marion)



PHOTO 3  
Minesite Faceup  
Taken June 29, 1992 (Oldfield)

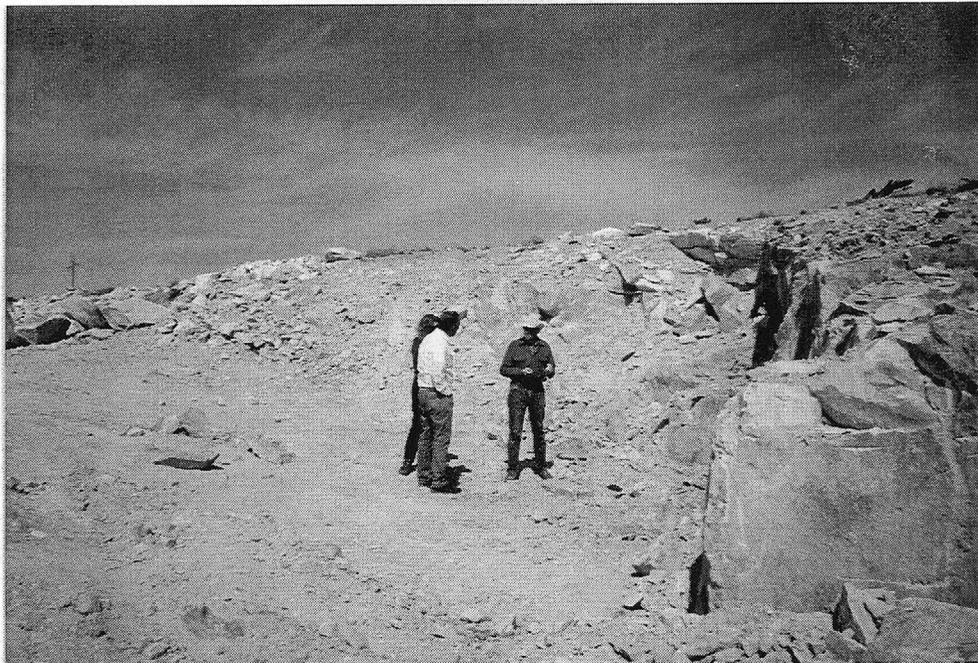


PHOTO 4  
Quarry Site  
Taken March 25, 1993 (Marion)

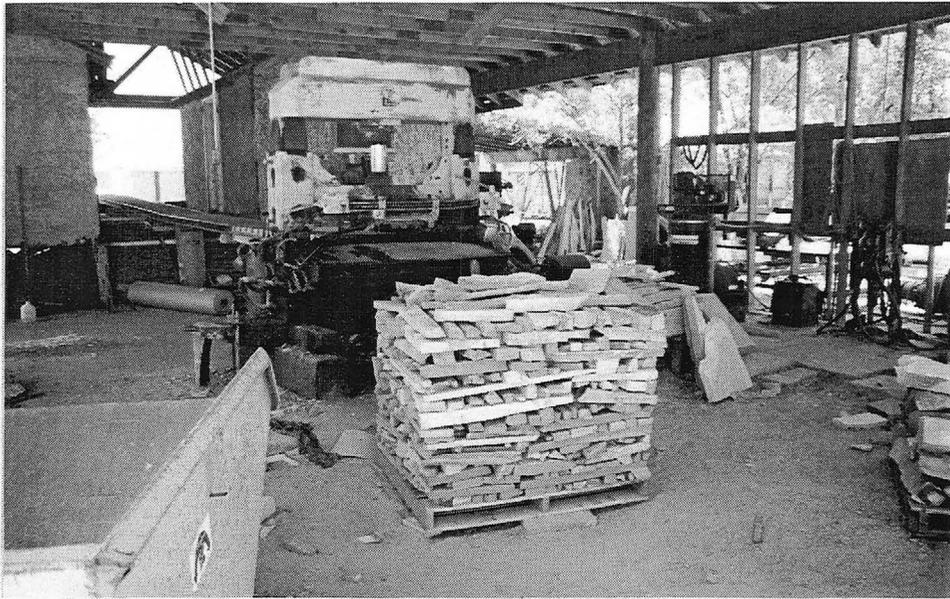


PHOTO 5  
Southwestern Stone Shop in Taylor, AZ  
Taken June 28, 1992 (Oldfield)



PHOTO 6  
Products made by Lee Chartrand and Howard Thomas  
Taken June 28, 1992 (Oldfield)

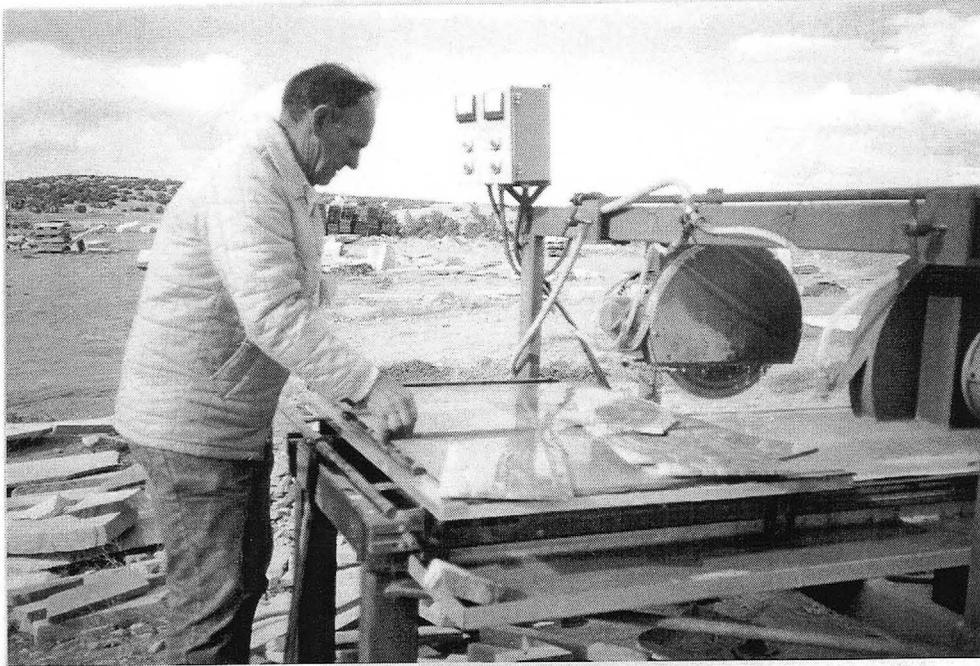


PHOTO 7

Lee Chartrand cutting decorative Sierra Stone slabs  
Taken March 25, 1993 (Marion)

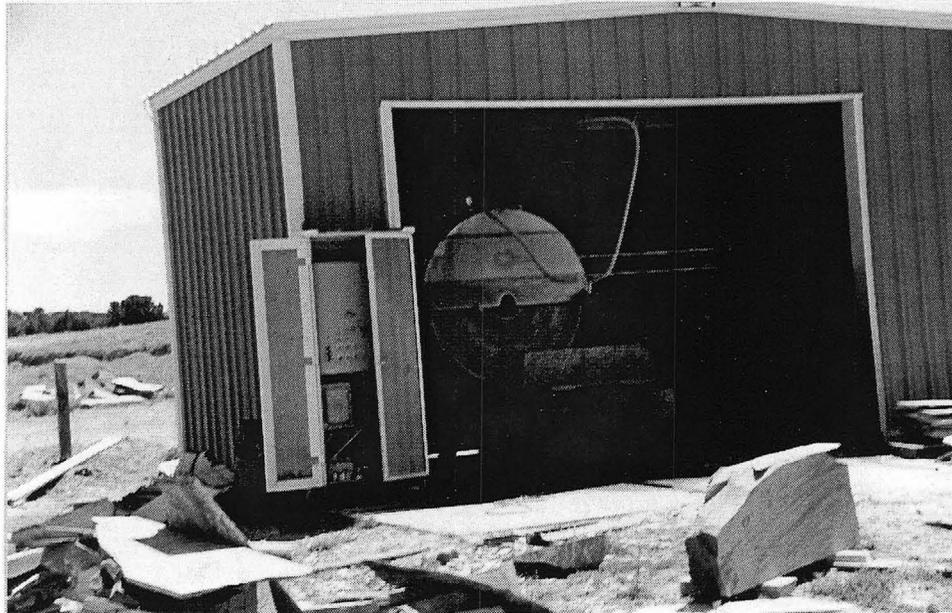
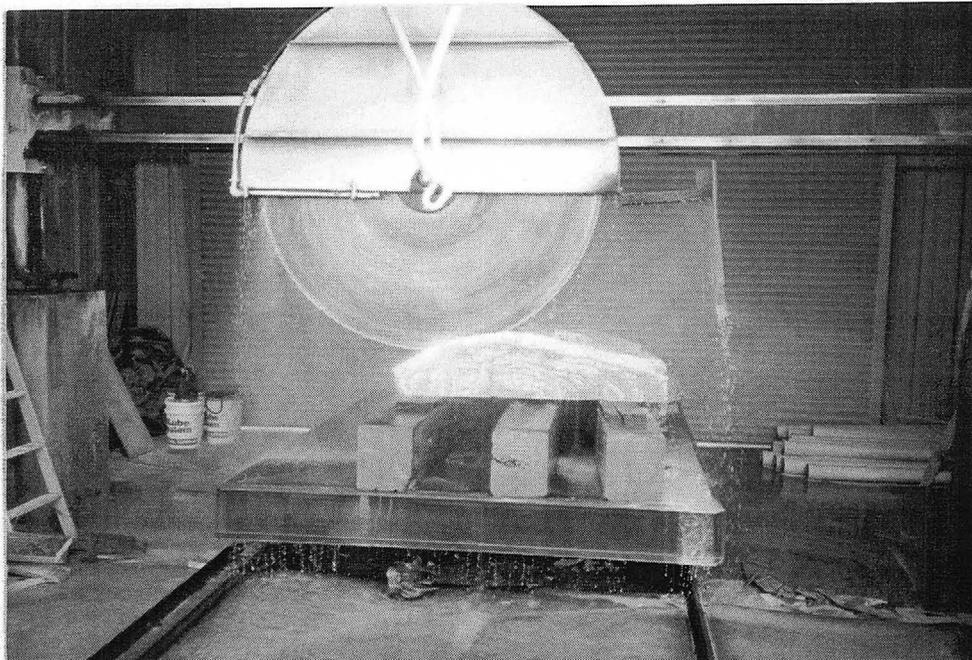


PHOTO 8

Rock saw on site west of Taylor, AZ  
Taken June 28, 1992 (Oldfield)



**PHOTO 9**  
Rock saw on site west of Taylor, AZ  
Taken March 25, 1993 (Marion)



**PHOTO 10**  
Sierra Stone cylinders to be sliced into coasters.  
Taken March 25, 1993 (Marion)

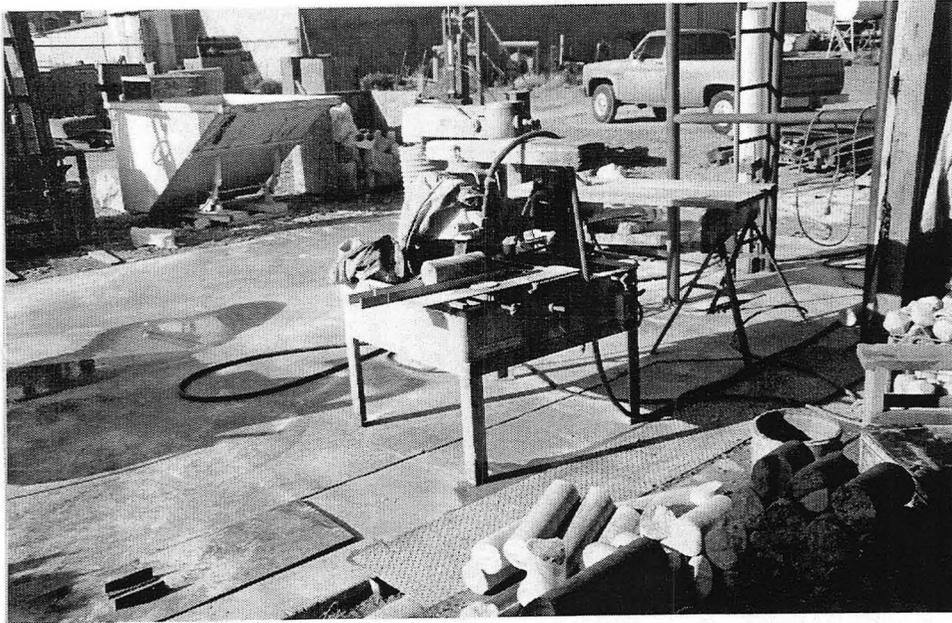
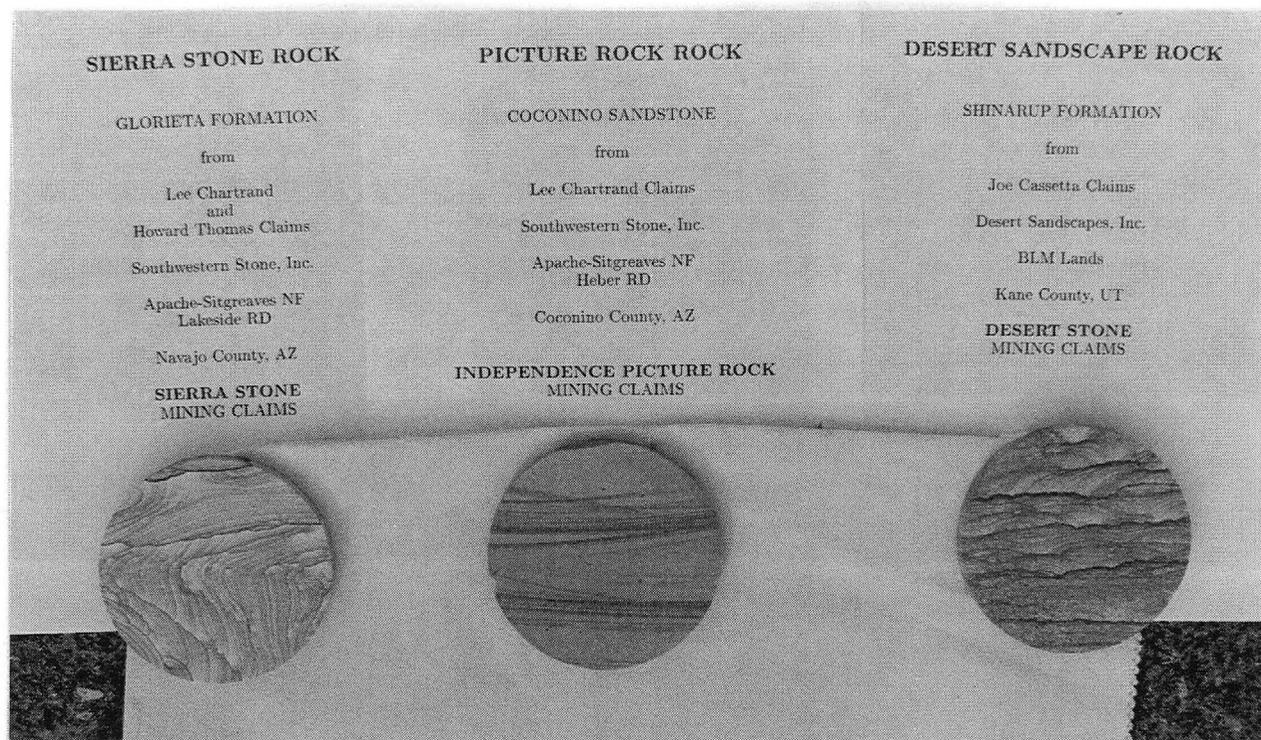


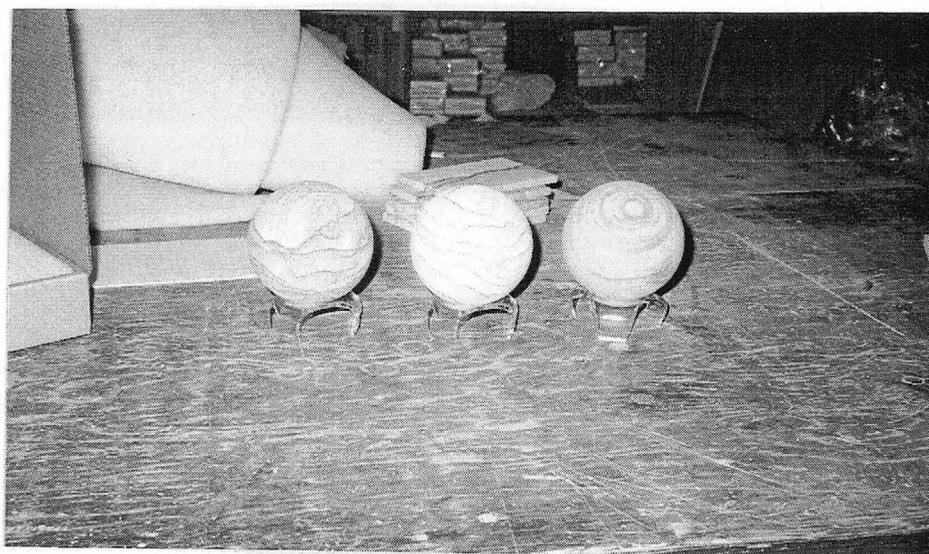
PHOTO 11  
Coaster producing shop at pulpmill  
about 8 miles west of Taylor, AZ (SR 277)  
Taken June 30, 1992 (Oldfield)



PHOTO 12  
Lee Chartrand's Coconino Sandstone "Picture Rock"  
Taken March 25, 1993 (Marion)



**PHOTO 13**  
**Comparison of the Sierra Stone Rock**  
**with the "Picture Rock" Stone and the**  
**Desert Sandscape Rock**  
**(Samples as cut for coasters)**  
**Taken October 30, 1992 (Oldfield)**



**PHOTO 14**  
**Rock products produced by Desert Sandscapes, Inc.**  
**Taken July 8, 1992 (Oldfield)**



PHOTO 15  
Coasters produced by Desert Sandscapes (painted)  
and an unpainted Sierra Stone coaster for sale at a gift shop  
near Holbrook, AZ  
Taken July 19, 1992 (Oldfield)

**Appendix E**



# United States Department of the Interior



## GEOLOGICAL SURVEY

WMR Tucson Field Office  
University of Arizona  
Gould-Simpson Building, 4th Floor  
Tucson, Arizona 85721

April 22, 1993

### MEMORANDUM

To: Roger Marion, Regional Geologist, U. S. Forest Service

Through: *Wendy E. Deeth for F. S. Fisher.*  
F. S. Fisher, Assistant Branch Chief, Tucson Field Office  
R. G. Worl, Chief, Branch of Western Mineral Resources  
*R. G. Worl*

From: Brenda B. Houser, Geologist, Branch of Western Mineral Resources  
*Brenda Houser*

Subject: Geologic investigation of Sierra Stone occurrence

On April 14 and 15, 1993, as the U. S. Geological Survey member of a U. S. Forest Service peer review group, I carried out a reconnaissance field investigation of the geology and areal extent of a sandstone unit, commercially termed Sierra Stone, being quarried on placers claims in the Sitgreaves National Forest by Lee Chartrand and Howard Thomas. John C. Bedell (Forest Supervisor, Apache-Sitgreaves National Forest) requested this peer review of the Mineral Classification Report (MCR) of the Chartrand and Thomas Sierra Stone PMC 1-22 mining claims, Feb. 2, 1993.

### SIERRA STONE

The rock being worked at the Sierra Stone quarry (Sec. 20, T. 12 N., R. 20 E.) is a quartzose sandstone distinctively marked by gold to dark brown liesegang banding. The unbanded sandstone is white to yellowish-gray to very pale orange. The rock is well bedded, but because there are no mineralogic partings along bedding planes, it breaks along variably spaced high-, moderate-, and low-angle fractures into blocks as large as 2 m in long dimension. The liesegang banding is three-dimensionally concentric within each fracture-bounded block, but is generally absent in the outer few centimeters of the surface of the blocks. This suggests that the fractures are the conduits along which ground water carries the iron-oxide minerals responsible for the banding.

U.S. MINERALS & GEOLOGY

SEARCHED  INDEXED  FILE *Chartrand Thomas*

SERIALIZED  LIBRARY *Sierra*

PHOTO  PERSON  CO: *Leteside* *RO Stone*

LINDEN  AZ ZONE  OTHER *Sm 5/14/93*  
*fax*

## STRATIGRAPHY - PREVIOUS STUDIES

A chief question addressed in this investigation is the potential areal extent of the massive, distinctively banded Sierra Stone. The area around the quarry is shown on the Arizona geologic map (Wilson and others, 1969) as the Permian Kaibab Formation, which consists of limestone, dolomite, dolomitic mudstone, and carbonate cemented sandstone. Although the Kaibab contains a significant component of sandstone, R. H. Oldfield and B. E. Morgan (coauthors of the MCR under review) assigned the sandstone exposed at the Sierra Stone quarry to a tongue of the Permian Glorieta Sandstone within the San Andres Formation. The San Andres and Glorieta are eastern facies equivalents of the Kaibab and underlying Coconino Sandstone, respectively. B. E. Morgan outlined the reasons for this stratigraphic assignment in a letter to Elizabeth Mathews dated March 20, 1993 (see attachment 1).

In assigning the sandstone at the Sierra Stone quarry to the Glorieta (Coconino) Sandstone, Oldfield and Morgan imply that not only is Sierra Stone not unique, but its potential for widespread occurrence is high. These sandstone formations are exposed over large areas of northern Arizona and New Mexico and, thus, although unusual local conditions may be required to form the distinctive appearance of Sierra Stone, the large outcrop area of the Glorieta (Coconino) would have the affect of providing more opportunities for the unusual local conditions to have been met.

H. Wesley Peirce (Principal Geologist Emeritus, Arizona Geological Survey) made a site visit to the Sierra Stone quarry and nearby exposures of similar rock. He transmitted his observations and opinions to Howard Thomas in a letter dated December 1, 1992. Peirce thought that the Sierra Stone sandstone is definitely not part of the Coconino (Glorieta) Sandstone, but is instead either near the top of the Kaibab Formation or near the base of the overlying Triassic Moenkopi Formation (see attachment 2).

## STRATIGRAPHY - PRESENT STUDY

My reconnaissance investigation leads me to agree with Peirce that the Sierra Stone sandstone should be placed either in the Kaibab or Moenkopi Formation, most probably at the top of the Kaibab. The Sierra Stone sandstone is a very clean quartz sandstone as are sandstone beds in the Kaibab Formation. Sandstone beds in the Moenkopi in the area, however, contain lithic grains and detrital biotite in addition to quartz sand. Thus, Sierra Stone is more similar lithologically to the Kaibab.

I think the Sierra Stone sandstone is a regressive shoreline deposit that represents a variety of low-energy depositional environments ranging from muddy sand flat or sabkha, to beach, to low dunes. I interpret all three of these environments to be present in the vicinity of the quarry. Beneath the Sierra Stone sandstone and above the Kaibab carbonate units, there is a poorly exposed, poorly sorted silty sandstone unit about 1 m thick with thin discontinuous wavy bedding that may be a low-energy tidal flat or sabkha deposit. The Sierra Stone sandstone itself is about 4 m thick at the quarry and is probably a barrier complex composed of beach and low-energy starved dune deposits. Although bedding is very hard to see in the Sierra Stone sandstone, a beach environment is indicated by thin, continuous horizontal bedding and an eolian environment is indicated by common low-angle planar crossbed sets 15 to 30 cm thick.

Although exposures are poor, the Sierra Stone sandstone seems to show significant local variability, as would be expected in a regressive shoreline deposit that was subjected to several million years of erosion following deposition. About half a day of reconnaissance within several kilometers of the quarry showed the sandstone to be absent in some places, topographically lower in others as though it had been deposited in channels, and commonly thinner-bedded or more friable than the sandstone at the quarry. A few kilometers north of the quarry, where Paper Mill Road crosses Cottonwood Wash, there is an exposure of sandstone along the wash west of the road that is similar to the Sierra Stone sandstone. It is a crossbedded clean quartz sandstone about 3 to 4 m thick between the Kaibab and Moenkopi Formations, but the sandstone is not liesegang banded. Along the wash on the east side of the road, there is no interval of clean quartz sand separating the Kaibab and Moenkopi Formations.

#### CONCLUSIONS

My conclusion regarding the areal distribution of Sierra Stone sandstone, based on reconnaissance in the area between Cottonwood Wash and Show Low, is that the occurrence at the Sierra Stone quarry is probably very unusual. The sandstone very likely had a patchy depositional pattern to begin with and was variously eroded following deposition. Liesegang banding is a function of local groundwater conditions and porosity and permeability of the rock, and can be removed as easily as it was formed.

Attachments

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APR 28 1993

REGION 3  
LANDS & MINERALS

United States  
Department of  
Agriculture

Forest  
Service

Bradshaw RD

2230 E. Highway 69  
Prescott, AZ 86301

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Reply to: 2810/2850

Date: March 20, 1993

Subject: Chartrand Classification Report

To: Liz Mathews

This letter is in response to your request for additional information on the geology of the Sierra Stone deposit.

In the classification report I coauthored with Barney Oldfield the source of the Sierra Stone was stated to be the Glorieta Formation, a sandstone which correlates with the Coconino Sandstone exposed in the Grand Canyon, on the Mogollon Rim, and in other localities in northern Arizona.

The Coconino and Glorieta sandstones are similar in age, lithology and stratigraphic position. The two formations were named separately, in the two states in which they were first recognized, the Coconino Sandstone in Arizona and the Glorieta Sandstone in New Mexico. The point at which the two formations converge varies among the different geologists that studied them; for example, the "contact" has been placed at the New Mexico/Arizona state line (Colpitts, 1989) and, conversely, in eastern Arizona (Peirce, 1989). The stratigraphy of the sandstone and overlying formations (traditionally, the Kaibab Formation over the Coconino Sandstone and the San Andres Formation over the Glorieta Sandstone) is also described differently by different geologists; Colpitts describes the Glorieta/San Andres relationship as an intertonguing of the Glorieta Sandstone into the San Andres Formation, rather than the limestone overlying the sandstone; paleontologist and stratigrapher Spencer Lucas of the New Mexico Museum of Natural History and stratigrapher J. Dale Nations of Northern Arizona University concur with the "intertonguing" stratigraphic relationship of the two formations (personal communication, February, 1993 and September 1993, respectively).

The disagreement I've just described is due to two factors: limited exposure and complex facies changes in the Pennsylvanian and Permian formations of east central Arizona. Needless to say, the complexity of the stratigraphy and the disagreement surrounding it made it difficult for Barney and I to assign a formation name to the Sierra Stone. Our final decision was based primarily on the character of the Sierra Stone sandstone. The Kaibab Formation and San Andres Formation consist of limestone and various other types of rock, including some non-carbonate sandstone; the Coconino and Glorieta Formations are predominantly mature quartz sandstone with a siliceous cement. The lithology of the Sierra Stone in our opinion was more like the Coconino/Glorieta Sandstones than the Kaibab Formation and San Andres Formation.

Our decision to assign the Sierra Stone to the Glorieta Sandstone rather than the Coconino Sandstone was based primarily on the relationship of the sandstone to the local limestone; the limestone both overlies and underlies the Sierra Stone. The stratigraphic relationship described by Colpitts for the Glorieta

Sandstone and San Andres Formation is very similar to the relationship between the two lithologic units that we observed in the field.

*Bev Morgan*

Bev Morgan  
Bradshaw District Geologist

Colpitts, Robert M., 1989, Permian Reference Section for the Southeastern Zuni Mountains, Cibola County, New Mexico, in New Mexico Geological Society Handbook 40th Field Conference, Southeastern Colorado Plateau.

Peirce, Wesley H., 1989; Correlation Problems of Pennsylvanian-Permian Strata of the Colorado Plateau of Arizona, in Geologic Evolution of Arizona, Arizona Geological Society Digest, pp. 349-368, J. P. Jenney and S. J. Reynolds, editors.

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APR 28 1993

REGION 3  
LANDS & MINERALS



Fife Symington  
Governor

State of Arizona  
**Arizona Geological Survey**

845 North Park Avenue, #100  
Tucson, Arizona 85719  
(602) 882-4795

Larry D. Fellows  
Director and State Geologist

December 1, 1992

Mr. Howard Thomas, President  
T+C Enterprises  
PO Box 832  
Taylor, AZ 85939

Dear Mr. Thomas:

This is a summary geological review of my recent visit to the region of occurrence of what you refer to popularly as "Sierra Stone". It is my observation that development is in the beginning stages and much remains to be learned about the stone's distribution, character, handling, uses, etc. Although both raw stone and manufactured products are being marketed, enhanced development of obvious potential requires a step by step learning process. I was impressed by your intense interest and the deliberateness of your approach to initiating a new, geologically related, business enterprise in Arizona. Your dedication to the possibilities involved augurs well for a successful future.

#### SIERRA STONE

"Sierra Stone" is a popular name that you have assigned to the specific geologic rock unit of commercial interest. Your attraction is to a light-colored sedimentary rock, of limited thickness and lateral extent, that displays a three-dimensional, well known geologic phenomenon known as liesegang, or diffusion, banding. It is a geochemical feature involving the movement (migration) and precipitation of iron compounds that usually form in spherical or curving arcs and bands. This is one example of nature's artistry and, like all art, comes in great variety and styles.

In "Sierra Stone", the banding pays no attention to the primary flat-bedding structures inherent in this fine-grained, slightly calcareous, water deposited clastic sedimentary rock. Rather, control is associated with near vertical fractures, variably spaced, that most likely served as the major plumbing system for fluid migration.

One of the special assets of this rock layer (approximately 12.0 feet thick in the quarry), is its massiveness. This makes it

possible to remove the stone in relatively large chunks for either direct shipping or for coring of lengthy cylinders, or, slabbing for other decorative, but functional, purposes. Too, the fine-grained, partially cemented character of the stone renders it tough and durable, an essential quality in the making of stable products.

There seems to be differing opinions as to which formal geologic stratigraphic unit "Sierra Stone" belongs. It is a certainty that it is not a part of the Coconino Sandstone that underlies the region generally. The Coconino Sandstone is, in turn, overlain by the Kaibab Formation (no longer Kaibab Limestone), which contains both carbonate and siliceous (sand) strata. "Sierra Stone", is, in fact, either high in the Kaibab Formation or low in the next overlying unit, the Moenkopi Formation. Determining this association requires additional investigation within the region where exposures might permit this discrimination. My own prejudice favors the Kaibab Formation. If correct, the exotic iron-diffusion patterns could be associated with the major erosional unconformity (time gap involving several million years) that separates the Permian Kaibab Formation from the overlying Triassic Moenkopi Formation.

There is a question of lateral extent and continuity of "Sierra Stone". Thickness variations, fracture density, strength-durability factors, pattern consistency, etc. are variables that must be determined in order to establish known reserves of "Sierra Stone" of commercial interest.

#### GENERAL COMMENTS

Although rocks containing diffusion banding are not rare, no two are alike in the details that determine character and value. I am confident that "Sierra Stone", when well understood and properly characterized, will be found to be unique not only in Arizona but in the world as well (a thing of its own). Too, I suspect that you would have no difficulty in establishing that "Sierra Stone" is sufficiently attractive and novel to stimulate serious demand for a variety of products made therefrom-seeing is believing!

In geologizing Arizona for over 40 years I have not seen a rock capable of matching the assets manifested in this occurrence of diffusion banding. Too, its exploitative setting is excellent. No, I do not think that "Sierra Stone", considering all relevant attributes, is a common occurrence of what it represents geologically.

I congratulate you for your persistence and imagination and wish you every success in sharing this Arizona geologic "thing of beauty" with the waiting multitudes.

Sincerely,

*H. Wesley Peirce*

H. Wesley Peirce, PhD  
Principal Geologist Emeritus

cc: Larry Fellows, Director/State Geologist  
Thomas McGarvin, Geologist

P.S. I became involved in your affairs after you contacted the Arizona Geological Survey for information. Although retired, I remain available for assistance on matters most familiar to me. Having a long standing interest in the geology of the southern plateau region, I was contacted by my former colleagues. This led to my contacting you and volunteering my services so that we might learn more about Arizona while serving some of your geologic concerns. Thanks to your interest and guidance we now know more than we did about Arizona.