CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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Arizona Department of Mines and Mineral Resources Mining Collection

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PRINTED: 03/21/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: MORE SAND

ALTERNATE NAMES:
MOON SAND
SUGARLOAF MTN. AREA PUMICE
CROWN CLAIMS

COCONINO COUNTY MILS NUMBER: 362

LOCATION: TOWNSHIP 23 N RANGE 7 E SECTION 24 QUARTER S2
LATITUDE: N 35DEG 21MIN 56SEC LONGITUDE: W 111DEG 36MIN 15SEC
TOPO MAP NAME: SUNSET CRATER WEST - 7.5 MIN

CURRENT STATUS: PRODUCER

COMMODITY:
PUMICE LT WT AGGREG
ABRASIVE PUMICE

BIBLIOGRAPHY:
ADMMR MORE SAND MOON SAND FILE
SEE: ADMMR BONNER POZZOLAN FILE
PHILLIPS,K.A.,1987, ARIZ. INDUSTRIAL MINERALS
ADMMR MINERAL REPORT MR-4, P. 141

11/14/94

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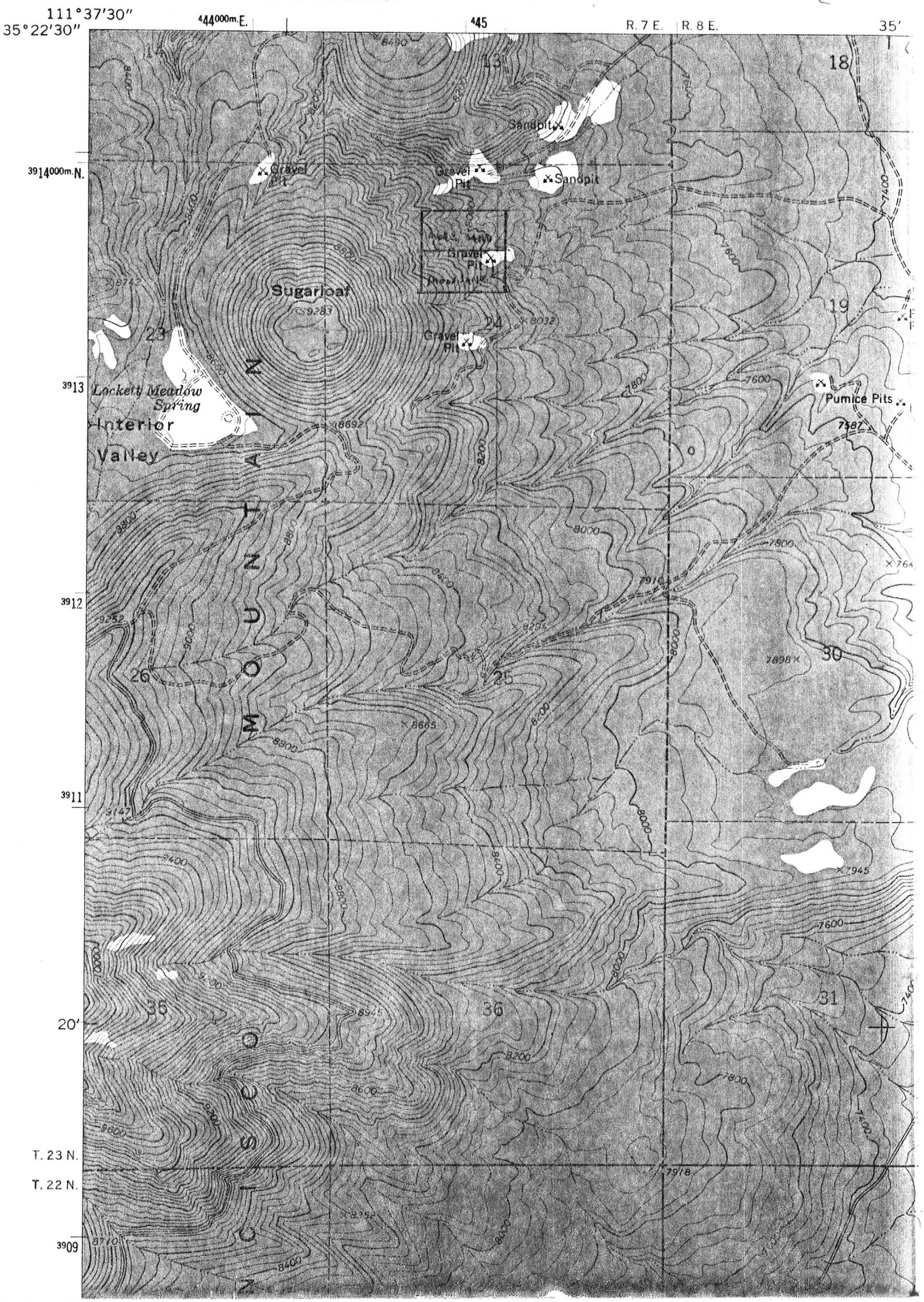
3654 I NW
WHITE HORSE HILLS)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNSET CRATER WEST 7½'



MORE-SAND & MOON-SAND CLAIMS REFERENCE COCONINO COUNTY
White Mesa Mining Dist.
T23N R7E Sec 24 N½

MILS Coconino County Index #361B

See: Sunset Crater Pumice Co. Coconino Co. (file)
Bonner Pozzolan Deposits, Coconino Co. (file)
Arizona Tufflite Inc. (green card)

MORE SAND & MOON SAND COCONINO COUNTY

NJN WR 3/13/87: Wes Morgan, vice president of sales, Arizona Tufflite (c) reported that they are shipping 125 tons of pumacite a day from their More Sand Moon Sand (file) and/or White Vulcan (Sunset Crater Pumice Co - file) Coconino County. The material is being sold at 8 cents per pound to Levy Straus for prewashing blue jeans.

NJN WR 1/8/88: Dave Bellaire of ~~K~~Ch emstone is a major purchaser of the coarse material from Arizona Tufflite's More Sand, Moon Sand (file) Coconino county operation. He is currently unhappy with their unreliable delivery and haphazard moisture content. The material purchased is resold to other clients for the use in stone washed dennim products. Because of the situation, Mr. Bellaire is interested in pursuing other possible sources of pumice.

MORE-SAND & MOON-SAND CLAIMS COCONINO COUNTY

NJN WR 1/14/ 83: Called Tom in the Patent Department at the BLM State Office to inquire about the More Sand and Moon Sand Placer claims, Coconino County, which recently received a patent. A copy of the IBLA Decision was received and a file started on the property.

NJN WR 4/22/84: Wes Morgan with Arizona Pozzalan AKA Tuff Light Co. called seeking the location of a pozzalan deposit near Apache Junction. This could have been J & A Company operation. Mr. Morgan said he would visit our office for additional details as they would like to find a pozzalan deposit close to the Phx. area. Mr. Morgan also reported that his company supplied pozzalan from the Northeast side of the San Francisco Peaks for the construction of Glen Canyon Dam.

NJN WR 11/18/83: Wes Morgan, owner of Arizona Tufflite Inc., AKA Arizona Pozzalan, visited. He reported that his Flagstaff operations produce up to 500 tons per day of Pumice for Pozzalan and light weight aggregate uses. He controls 7,000 acres of claims, including Tognoni's White Vulcan 1 & 2 (Sunset Crater Pumice) and the More-Sand & Moon Sand Claims, Coconino Co. Their operations should be included in the Active Mines Directory next year. AZ Tufflight also sells decorative sand and gravel in the Phoenix area for landscaping.

NJN WR 4/12/85: John Challinor called and reported he has been staking claims for Arizona Tufflite Inc. in the area of the More Sand Moon Sand Mine (f) Coconino County.

NJN WR 8/12/85: John Challinor (c) called and reported that he has been working for Arizona Tufflite Inc. (c) in the area of the More Sand & Moon Sand Claims (f) and the Sunset Crater Pumice Company (f) both in Coconino County. Most of the company's lightweight aggregate production is coming from the Sunset Crater Pumice Company. Material being produced from the More Sand and Moon Sand is being used to backfill gas line trenches and to manufacture blocks. Mr. Challinor has been staking claims and conducting geophysical surveys in the area of both properties. He hopes to conduct some exploration drilling to see what materials underlie areas covered by basalt flows.

More Sand file
Coconino

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1992

ARIZONA TUFFLITE INC.

Crown Claims T23N R7E
More Sand, Moon Sand T23N R7E Sec. 24
White Vulcan T23N R8E Sec. 19
2432 W. Peoria, Suite 1081, Phoenix, AZ 85029 - Phone 931-3682 - Glendale yard located at 6856 W. Orangewood, Glendale - Employees: 18 - Mines located 12 miles north of Flagstaff - Pozzolanic pumice quarries - 6000 yards/month -Used in making lightweight redimix and block - Large size material used in the preparation of "stone washed blue jeans" and in horticultural preparations - Marketed in and out of Arizona.
President C. T. Morgan
Vice President/Mine Manager (Flagstaff) Ed Morgan
Secretary/Treasurer Clay Morgan
Orders and Transportation Marleen Bustamante

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Secretary/Treasurer ..... Clay Morgan
Orders and Transportation ..... Lois Werner

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President ..... C.T. Morgan
Vice President/Mine Manager (Flagstaff) ..... Ed Morgan
Secretary/Treasurer ..... Clay Morgan
Orders and Transportation ..... Shirley Sharkness

ABSTRACTED FROM ADMMR ACTIVE MINES DIRECTORY, 1988

ARIZONA TUFFLITE INC.

Crown Claims T23N R7E
More Sand, Moon Sand T23N R7E
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President ..... C.T. Morgan
Vice President/Mine Manager (Flagstaff) ..... Ed Morgan
Secretary/Treasurer ..... Clay Morgan

ABSTRACTED FROM ADMMR 1986
DIRECTORY OF ACTIVE MINES
April 24, 1987

ARIZONA TUFFLITE INC.

Crown Claims
More Sand, Moon Sand
7540 N. 67th Ave., Glendale 85301 - Phone 931-3682 - Located 12 miles north of Flagstaff - Pozzolanic pumice quarries - 6000 yard/month - Used in making lightweight redimix and block - Marketed in and out of Arizona.

President ..... C.T. Morgan
Vice President ..... Ed Morgan
Vice President, Sales ..... Wes Morgan
Secretary/Treasurer ..... Clay Morgan

Coconino

More bond file Coconino Co. JC

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

Trade Name: Tufflite	Chemical Name: Pumice

Section I

Formula: Primarily Silicon Oxide

Manufacturer's Name Arizona Tufflite, Inc.	Emergency Telephone Number 1-800-942-6368
Address *(Number, Street, City, State, and ZIP Code)* 2432 W. Peoria, Suite 1081	Telephone Number for Information 602-931-3681
Phoenix, AZ 85029	Date Prepared September 8, 1987
	Signature of Preparer *(optional)* Environmental Health Assoc. Inc.

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*
Quartz (crystalline silica)				< 1.7%
CAS number: 14808-60-7				
OSHA PEL : 8.1 mg/m^3	(total dust - TWA)			
2.7 mg/m^3	(respirable dust - TWA)			
ACGIH TLV: 0.1 mg/m^3	(respirable quartz - TWA)			
NIOSH : 0.050 mg/m^3	(respirable quartz - TWA)			

Section III — Physical/Chemical Characteristics

Boiling Point: N/A		Specific Gravity (H_2O = 1): 1.14	
Vapor Pressure (mm Hg.): N/A		Melting Point: > 1000°C	
Vapor Density (AIR = 1): N/A		Evaporation Rate (Butyl Acetate = 1): N/A	

Solubility in Water: Insoluble

Appearance and Odor: Off-white powder or fragments/no odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used): N/A	Flammable Limits: N/A	LEL: N/A	UEL: N/A

Extinguishing Media: Will not burn

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

(Reproduce locally)

OSHA 174, Sept. 1985

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	Material is stable.

Incompatibility (*Materials to Avoid*): ClF_3, MnF_3, OF_2

Hazardous Decomposition or Byproducts: None known

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	Polymerization will not occur.

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? yes | Skin? no | Ingestion? not apparent hazard

Health Hazards (*Acute and Chronic*)

Acute - minor irritation to eyes and nose.

Chronic - Repeated exposure to high levels of respirable quartz dust may cause lung damage (silicosis) characterized by scarring and fibrosis of the lungs.

Carcinogenicity: NTP? | IARC Monographs? | OSHA Regulated?

IARC: There is sufficient evidence that silica may cause cancer in animals. There is limited evidence that silica may cause cancer in humans.

Signs and Symptoms of Exposure: Cough, shortness of breath, impaired respiratory function.

Medical Conditions Generally Aggravated by Exposure: Impaired respiratory function.

Emergency and First Aid Procedures: Eyes - immediately wash with large amounts of water.

Inhalation - if large amounts inhaled, move to fresh air at once.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled: Sweep or vacuum and reclaim, dump, or dispose into landfill.

Waste Disposal Method: No specific method is required. Free silica wastes should be dumped into landfills or released to air in accordance with local regulations.

Precautions to Be Taken in Handling and Storing: Avoid dusty conditions. Use with adequate ventilation.

Other Precautions: None

Section VIII — Control Measures

Respiratory Protection (*Specify Type*): Dust mask for employee comfort or for high dust levels is recommended.

Ventilation	Local Exhaust	Recommended	Special	N/A
	Mechanical (*General*)	Recommended	Other	N/A

Protective Gloves	None required	Eye Protection	Safety goggles recommended

Other Protective Clothing or Equipment: None

Work/Hygienic Practices: Avoid inhalation of dust.

☆ USGPO: 1986-491-529/45775

Arizona Tufflite Pumice

Pumice is a porous rock formed by volcanic activity. It is composed primarily of volcanic glass (silicon dioxide) and other inert, nonhazardous natural minerals. Pumice also contains a small amount of crystalline silica (quartz). Arizona Tufflite has been shown to have a low quartz content, less than 1.7%. Arizona Tufflite pumice contains no other hazardous components.

Pumice has many uses in manufacturing and construction industries. Pumice stones and large particles have no known potential for adverse health effects. When pumice is pulverized, crushed, or abraded, dust may be generated. This dust, if present in the air, may potentially be inhaled by workers in the area, and contains a small amount of quartz.

Inhalation of quartz dust has potential adverse effects on the health of workers who inhale it. Studies have shown that workers who have repeated and prolonged exposure to very high levels of quartz dust in the air may develop a type of lung damage known as silicosis. Silicosis is characterized by scarring and fibrosis of the lungs. These studies were done primarily in granite cutters and sand blasters, exposed to levels of quartz many times higher than levels expected in pumice dust. The International Agency of Research on Cancer (IARC) has reviewed the studies concerning the potential of quartz to cause cancer and has determined that there is limited evidence that silica may cause cancer in humans, and sufficient evidence that silica may cause cancer in animals.

In order to prevent silicosis and other potential adverse health effects of quartz, OSHA (Occupational Safety and Health Administration and several other agencies have set recommended limits for dust levels in air. The air levels are considered to be safe for a worker exposed to that level or below for an eight hour day (8 hour time weighted average (TWA)). Dust levels can be measured by one of two methods: the total dust method which measures all sizes of dust particles, or the respirable dust method, which selects only those small size particles which are likely to enter the lungs where they may cause adverse health effects.

The OSHA PEL (Permissible Exposure Limit) is the level which is enforced by the government. The PEL is a value which is calculated based on the percent quartz in the pumice. The OSHA PEL is set for both total dust (quartz plus nonhazardous components in pumice) and respirable total dust (that portion of the dust which passes a filter to eliminate larger particles). Based on a value of 1.7% quartz, the PEL is 8.1 mg/m^3 for total pumice dust. If air samples of respirable dust are measured with a size-selective sampling method, then the PEL is 2.7 mg/m^3 for respirable pumice dust.

The American Conference of Governmental Industrial Hygienists (ACGIH) has recommended a Threshold Limit Value (TLV) for the quartz component of pumice respirable size particles. The TLV is 0.1 mg/m^3 respirable quartz for an 8 hour TWA. The National Institute of Occupational Safety and Health (NIOSH) has recommended a limit of 0.050 mg/m^3 for respirable crystalline silica for a 10 hour TWA.

No adverse health effects are expected to occur among workers exposed to pumice dust below the levels recommended above. The best way to reduce worker exposure to pumice dust, if generated during the use of pumice, is to use exhaust ventilation or to use pumice in a wet process, since water will reduce dust levels in the air. If air levels may exceed those recommended as safe, the worker should be supplied with a dust respirator.

In conclusion, Arizona Tufflite Pumice contains a small amount of quartz. No adverse health effects are expected among workers, when the recommended safety precautions are used.

Arizona Testing Laboratories

817 West Madison Street ◻ Phoenix, Arizona 85007 ◻ 602/254-6181

For: Arizona Tufflite Inc.
7540 North 67th Avenue
Glendale, Arizona 85301

Date: November 23, 1983

Lab No.: 3751

Received: ---

Marked: See Below

Submitted by: Same

REPORT OF QUALITATIVE SPECTROGRAPHIC EXAMINATION

ELEMENT	APPROXIMATE PERCENT		
	New Mexico Powder	Light Weight	Grey Rock
Silicon	Major Constituent----------		
Boron	0.002	0.005	---
Aluminum	8.	9.	10.
Magnesium	0.2	0.04	0.02
Manganese	0.03	0.02	0.02
Iron	1.0	2.0	1.0
Beryllium	0.0005	---	---
Calcium	1.0	0.05	0.02
Vanadium	0.003	0.003	0.003
Copper	0.001	0.003	0.001
Sodium	Over 1 %	Over 1. %	Over 1 %
Titanium	0.04	0.02	0.01
Zirconium	0.01	---	---
Potassium	1.0	1.0	1.0
	12.2865	11.141	

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean, Jr.

Hamm

More Sand - Moon Mtn

85435400

STATE MINE INSPECTOR

NOV 15 1985

Office of State Mine Inspector

705 West Wing, Capitol Building
Phoenix, Arizona 85007
602-255-5971

NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with Arizona Revised Statute Section 27-303*, we are submitting this written notice to the Arizona State Mine Inspector (705 West Wing, Capitol Building, Phoenix, Arizona 85007) of our intent to start/stop (please circle one) a mining operation.

COMPANY NAME Arizona Tufflite, Inc.

CHIEF OFFICER Clarence T. Morgan, President

COMPANY ADDRESS 7540 N. 67th Ave., Glendale, AZ 85303

COMPANY TELEPHONE NUMBER 931-3682

MINE OR PLANT NAME Tufflite Pits - More-Moon Sand & Tufflite Lightweight

MINE OR PLANT LOCATION (including county and nearest town, as well as directions for locating by vehicle)

Twelve miles north of Flagstaff on the N.E. face of Sugarloaf Mountain.

TYPE OF OPERATION open pit PRINCIPAL PRODUCT Lightweight Aggregate & Industrial Minerals

STARTING DATE Ongoing CLOSING DATE

DURATION OF OPERATION 25 years, plus

PERSON SENDING THIS NOTICE J. Wesley Morgan

TITLE OF PERSON SENDING THIS NOTICE Vice President - Sales

DATE NOTICE SENT TO STATE MINE INSPECTOR 11-8-85

*A.R.S. Section 27-303 NOTIFICATION TO INSPECTOR OF BEGINNING OR SUSPENDING OPERATIONS: When mining operations are commenced in any mine or when operations therein are permanently suspended, the operator shall give written notice to the inspector at his office prior to commencement or suspension of operations.

Revised 7/84

1986

MORE SAND & MOON SAND CLAIMS (File)
Coconino

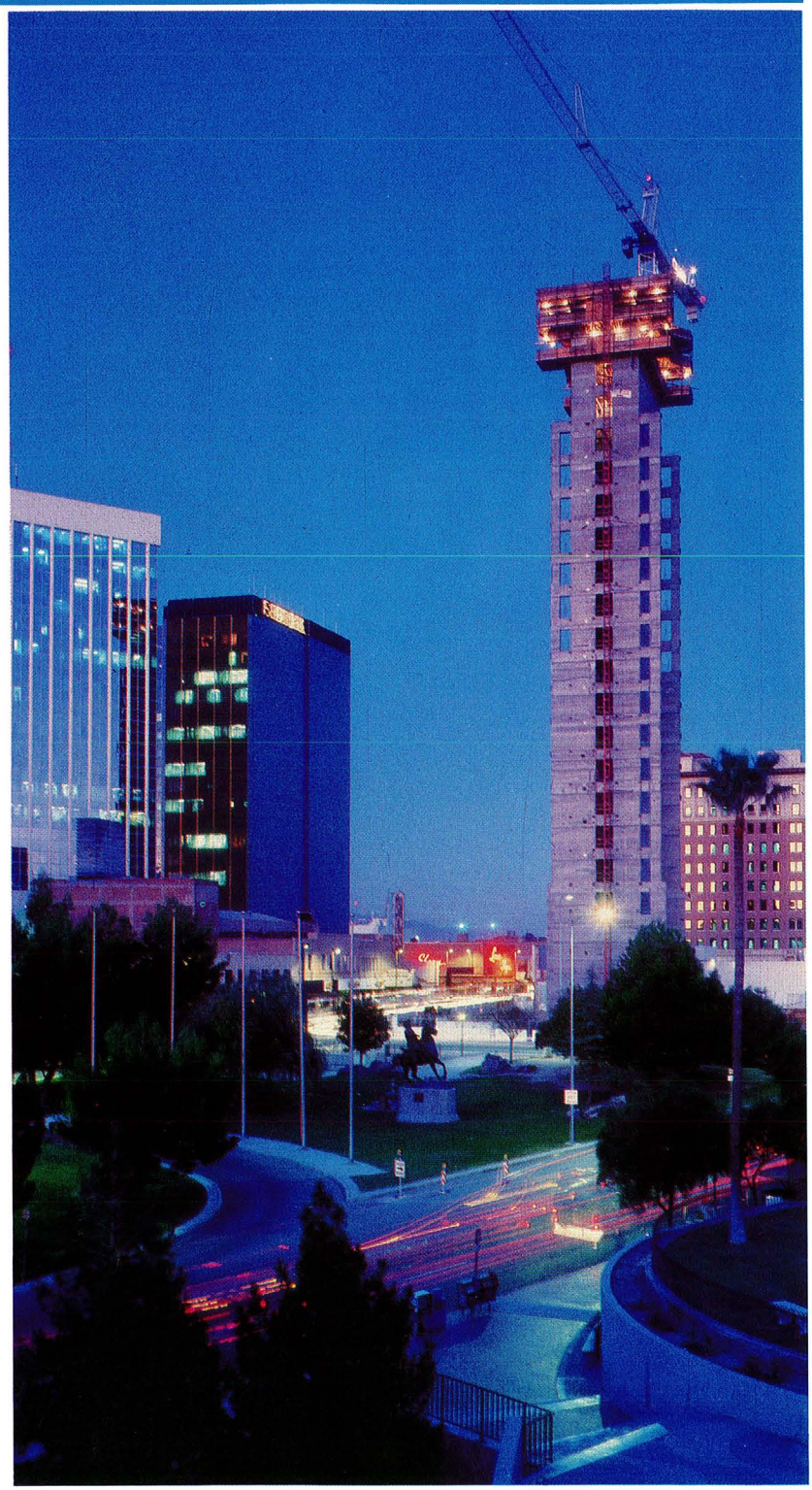
K

ARIZONA TUFFLITE®

Lightweight Aggregate

TECHNICAL DATA:
Lightweight Structural Concrete
Aggregates
Concrete Masonry Units

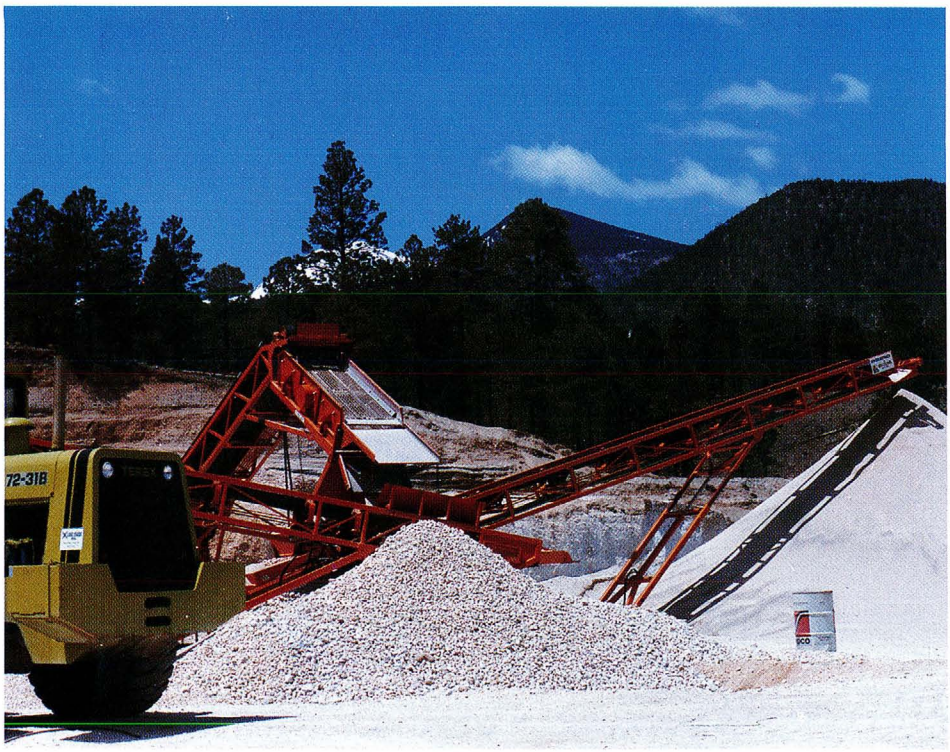
ARIZONA TUFFLITE, INC.
7540 N. 67th Avenue
Glendale, Arizona 85303
(602) 931-3681



United Bank Tower, Tucson Town Center Project. A critical limit of 118 lbs/cu. ft. plastic weight for 3,000 psi strength concrete demanded a mix design with a theoretical dry weight of 108 lbs./cu. ft., obtainable only with **Tufflite Aggregate.** *Photo courtesy: Sundt Corp., general contractor, taken by William Lesch.*

Tufflite: an ideal aggregate for structural lightweight concrete, having an approximate dry loose weight of 25 pounds per cubic foot. Tufflite occurs in nature as a matrix of cemented glass shards and volcanic fragments known as a vitric tuff or pumice.

The physical and chemical properties establish Tufflite as a most suitable material to be specified for a multitude of uses in which weight and insulating qualities of concrete are an important factor. Tufflite meets or exceeds all requirements of ASTM C330 for concrete, ASTM C331 for block, and ASTM C332 for thermal concrete.



The basic reason for Tufflite's high strength is the millions of microscopic non-interconnecting spherical voids that were produced by the extreme heat of volcanic activity. Engineers recognize that these microscopic spheres represent the ultimate in structural values.

Fluidity: Using saturated Tufflite increases fluidity and eliminates the need for pumping aids. Pumping to the 16th floor of the Western Savings Financial Plaza in Mesa, Arizona, with minimal air and no pumping aid, the pumping pressures ranged from 1400 to 1700 psi.

The ease with which it can be pumped, placed and finished has become well established in the industry. Its increasing use foretells its potential in the years ahead. Its application in parking decks, floor slabs and exterior balconies in the past with no apparent wear is a constant reminder of the durability of this material.

PUMICE PITS

Flagstaff, Arizona

Underwriters Laboratories, Inc., File NC 750

Fire Resistance Investigation of Floor-Ceiling Assembly consisting of 2 in. Deep Steel Deck with 3¼ in. thick Lightweight "Tufflite" Pumice Aggregate Concrete topping:

"On September 12, 1985 we conducted . . . in accordance with ASTM E-119 (Standard UL 263), Fire Tests of Building Construction and Materials, a full-scale fire test on the above subject floor-ceiling assembly." The steel deck in the test assembly was unprotected. The steel beam supporting the 14'2" by 17'10" assembly, was coated with spray-applied Monokote.

"The assembly was loaded to provide a uniformly distributed live load equivalent to 269 psf or a combined live and dead load of 311 psf over the 10 ft. long floor span." At 2 hours, the average temperature of the exposed surface of the concrete was 221 °F. At 2½ hours, the temperature at one of 12 thermocouples exceeded the maximum permitted by ASTM E-119 of 325 °F. Thus, the apparent fire endurance was 2 hours, 29 minutes. At that time, the average of all 12 thermocouples on the concrete was 264 °F, that is, 53 °F below the limiting average temperature. The test was terminated by the failure of the steel girder, not failure of the slab.

Reasonable extrapolation indicates the test on the 2 hour assembly would have gone approximately 3 hours. "Accordingly, the above subject assembly is eligible for a 2 hour Restrained Assembly Rating in accordance with the Conditions of Acceptance in the Test Standard UL 263 (ASTM E-119)."

Armand H. Gustaferro of the Consulting Engineers Group, supervised our UL Test. The following list is only a small part of Mr. Gustaferro's activities in the Concrete Industry.

Structural Engineer, Illinois; Professional Engineer, California and Ohio.

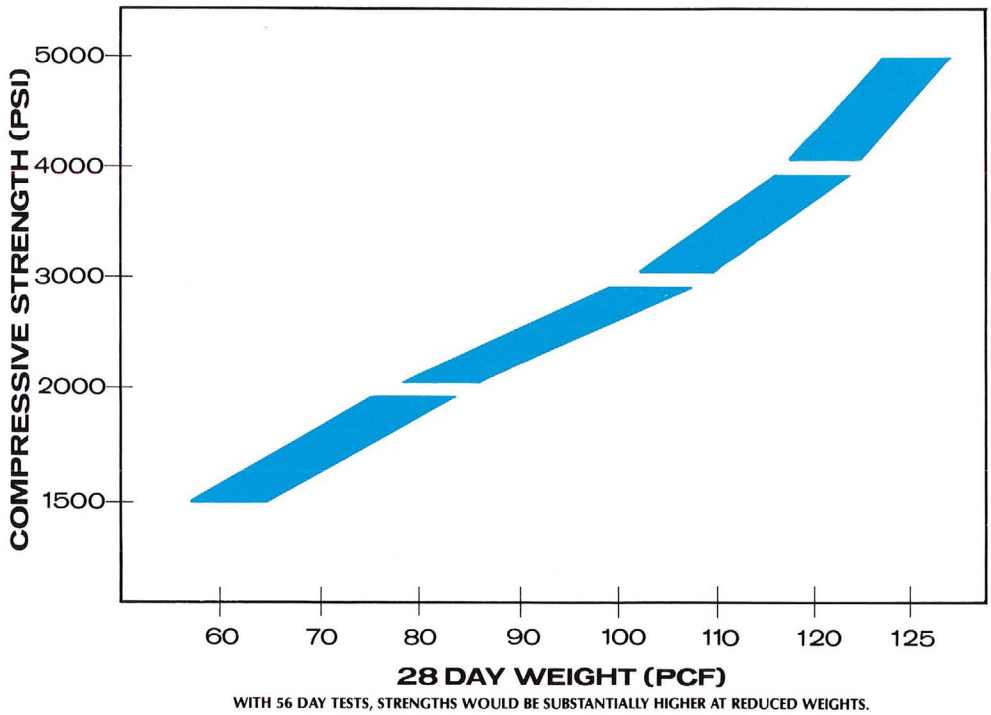
American Society for Testing Materials, Committees E-5 and E-39.

American Concrete Institute, Committee on Fire Resistance and Fire Protection of Structures.

Prestressed Concrete Institute, Board of Directors, Chairman Fire Committee, Chairman Building Code Committee.

More than 50 authored papers dealing with concrete technology and fire resistance of structures.

CHARACTERISTICS OF CONCRETE CONTAINING TUFFLITE



WITH 56 DAY TESTS, STRENGTHS WOULD BE SUBSTANTIALLY HIGHER AT REDUCED WEIGHTS.

Compressive strengths for lightweight concrete are comparable to regular concrete with 3000 to 4000 psi being most commonly specified. The industry trend to 56 day tests for lightweight concrete will widen the difference for weight versus strength between lightweight concrete and normal concrete.

Flexural Strength, P.S.I.
(ASTM C78-75)
365

Splitting Tensile
(ASTM C496-71)
Splitting tensile is high giving results of:
350-460

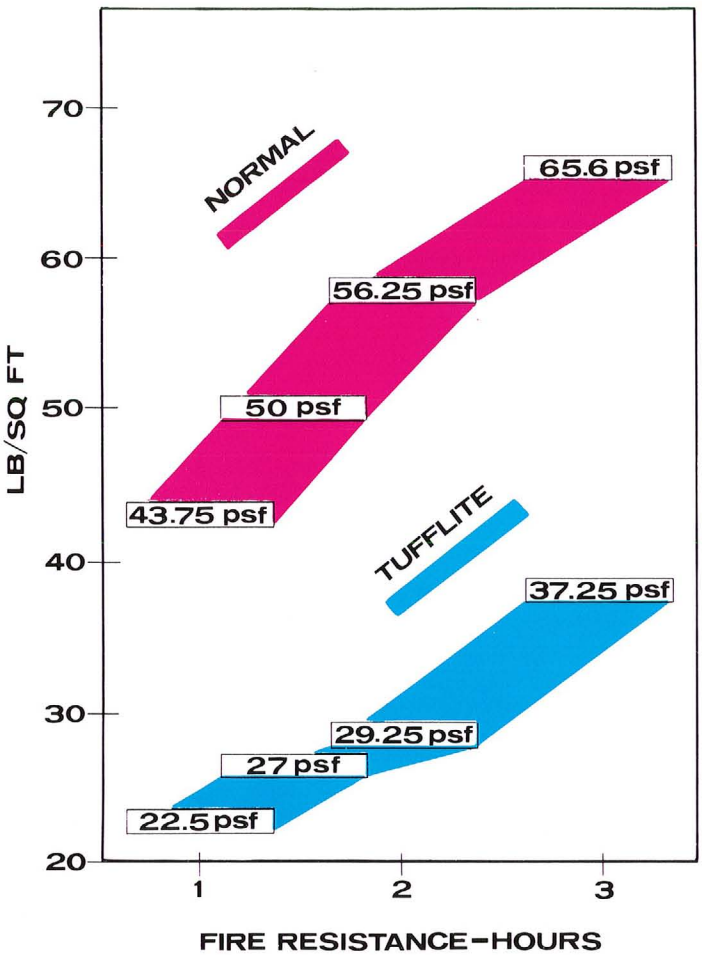
Modulus of Elasticity
(ASTM C469-65)

EC = $2.35X10^6$ p.s.i.

Popout Materials (ASTM C-151)	
Days	**Popouts/Surface Discoloration**
1	None
7	None
28	None

Potential Reactivity of Cement-Aggregate Combinations:
(ASTM C227) (Mortar Bar Method)

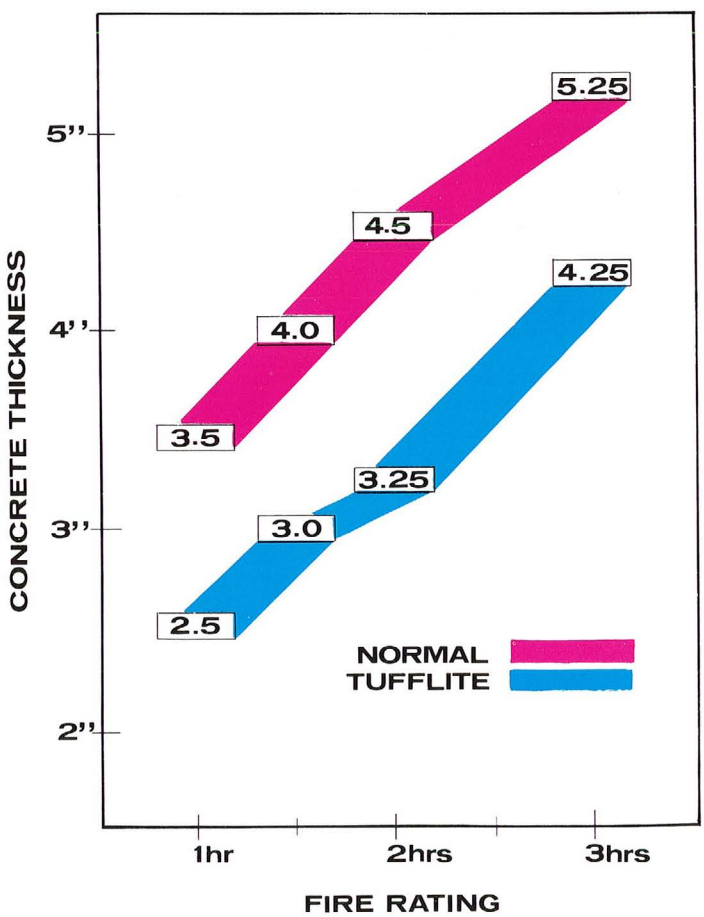
Ingredient	Cement-Aggregate Combinations	Source / Type	Average Length Change %
Cement:	Alkali Content - 0.53%	Arizona Portland Cement Type 1 & 2	14 days 1 month 0.01 3 months 0.02 3 months 0.03 4 months 0.03 5 months 0.04 6 months 0.04
Pozzolan:	% of cement replaced - 0	None	
Aggregate:	Grading as per Table 1 of ASTM C-227	Arizona Tufflite	
Water:	Percent by weight of cement	29.6	



Fire Resistance versus lbs / sq. ft. deadload is a real indication of the potential savings to be achieved in the structural design of any multi-story building. An average 47% reduction is achieved, reducing footing sizes and all structural members.

Drying Shrinkage
(ASTM C157)

Date	Days Drying	Age (Total)	Length Change (%)
4/30	7 (Moist)	7	0.000
5/07	7 (Dry)	14	-0.005
5/24	14 (Dry)	21	-0.011
5/21	21 (Dry)	28	-0.017
5/28	28 (Dry)	35	-0.022



Less concrete is required by an average of over one inch to achieve a given fire rating.

TECHNICAL INFORMATION ON TUFFLITE AGGREGATES

SIEVE ANALYSIS

Tufflite is produced to standard Sieve Analyses and to sizes required by industries for uses from stone worn blue jeans to lightweight structural concretes, insulating concretes, concrete masonry units, cool decking, stuccos and finishes.

For concrete and concrete masonry units, our aggregates conform to ASTM C-330-80, for structural concrete; C-331-81, for concrete masonry units; C-332-80 for insulating thermal concrete. The sieve analysis portion of the specification shall be the grading requirements for ¾" and 1½" size designations.

SPECIFIC GRAVITY

The specific gravity of Tufflite is 1.14.

VODAVI TECHNOLOGIES
Scottsdale, Arizona
103 precast lightweight wall panels assembled on site
Lufkin, Inc.

Chemical Analysis	Aggregate	Sand
Silicon dioxide (SiO_2), plus aluminum oxide (Al_2O_3), plus iron oxide (Fe_2O_3)	94.46	87.90
Magnesium oxide (MgO)	0.41	0.26
Sulfur trioxide (SO_3)	Trace	0.00
Loss of ignition	4.00	1.39
Moisture content	0.46	0.07
Available alkalies	1.82	1.02

Loss on Ignition:

(ASTM C114, Section 36)

Loss on ignition of the 204.367 tons used at Glen Canyon Dam ran at 1.4 to 1.5% on the average. The loss was substantially less than the specified amount of 5%.

Staining Materials:

(ASTM C641)

The stain index of 20, very light stain, was well below the specification amount of 100.

Color:

Tufflite occurs in a very soft off-white with high color uniformity.

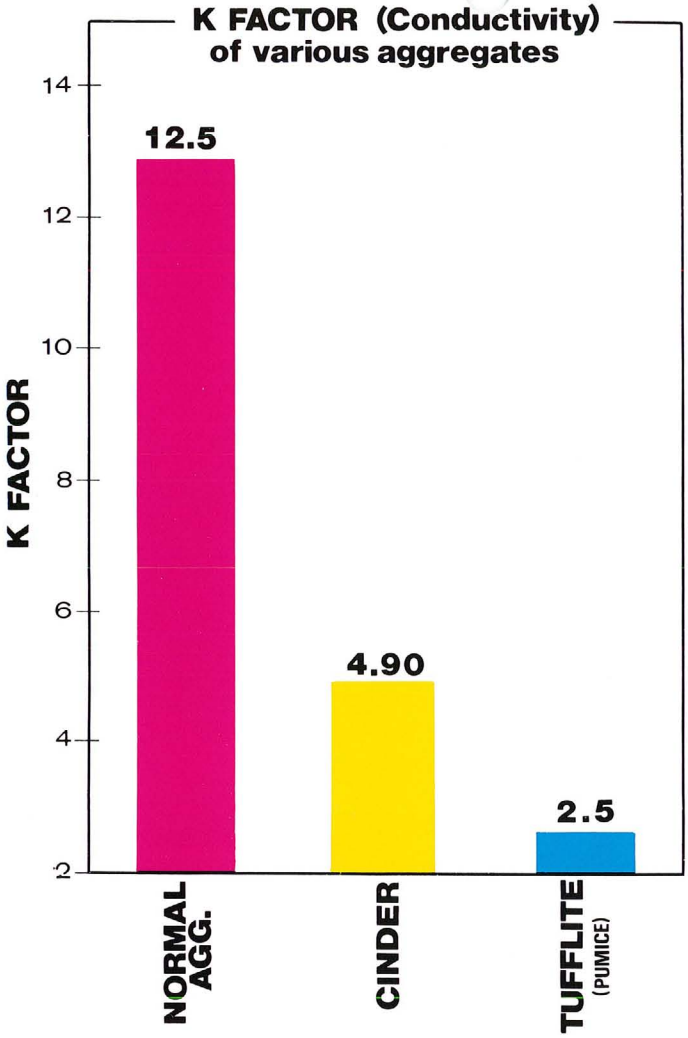
Clay Lumps:

(ASTM C142)

No clay lumps occur in this material.

Petrographic Examination

Tufflite is a naturally occurring matrix of amorphous silica with a reflective index of 1.515. Abundant microscopic pores occur.



Pre-Wetting Pumice Aggregate for Lightweight Concrete

To insure maximum strengths and workability, pumice aggregate needs to be saturated to a weight of 47-50 lbs/cu. ft. for ¾" and 43-46 lbs/cu. ft. for ½". Screened material delivered to the ready-mix plant will vary in weight with the moisture content from 30 lbs/cu. ft. to over 40 lbs/cu. ft.

For maximum saturation, the material should be sprinkled in the bin or pile for at least 48 hours and the pile should be turned at least twice a day.

The basis for the fire resistance is in the reduced thermal conductivity of the lightweight aggregate. Its ability to make good concrete due to its absorption and adhesion of the matrix is a contributing factor to maintaining strength while limiting heat transfer.

CONCRETE MASONRY UNITS

(ASTM C331-80)

Concrete masonry units using both lightweight sand and aggregate are in regular production. Weights as low as 23 lbs. for an 8" x 8" x 16" block are being achieved in units conforming to every industry standard.

Various other pre-cast masonry products such as slabs to cover roof membranes, stepping stones and other retail products in which weight becomes a premium, are being made.

Our aggregate is also used in stone wearing blue jeans, potting soil and kitty litter and as a filler for chemicals, stucco finishes and plaster.

Current Projects with TUFFLITE Aggregate in Lightweight Concrete

High and Mid Rise Buildings

Western Savings Financial Plaza
Mesa, 16 stories, Sundtcorp

Talley Building
Phoenix, 11 stories, McCarthy-Western

Bob Hope Theatre
Palm Springs, CA

Scottsdale Memorial Hospital
Scottsdale, six stories, Kitchell Contractors

East Valley Lutheran Hospial
Tempe, five stories, Kitchell Contractors

Metro Center Office Building
Phoenix, four stories, Roth Construction

Family Health Center
Phoenix, four stories, DEFCO.

GTE Lab Building
Phoenix, two stories, Olsen Construction Co.

Mervyn's Department Store
Tucson, two stories, Tierra Grande Const.

Yuma County Sherrif's Office
and Detention Facility
Yuma, Tanner Companies Construction

Purgatory Ski Resort
Durango, Colorado, Burnett Construction

United Bank Tower
Tucson, 23 stories, Sundtcorp

Eisenhower Memorial Hospital Addition
Palm Springs, CA, Peter Kiewit

Robinson's Department Store
Indian Wells, CA

Desert Samaritan Hospital
Mesa, Joe E. Woods

ASU, Business Administration Building
Tempe, five stories, Joe E. Woods

Salt River Project Office Building
Phoenix, three stories, Mardian Company

Valley Commerce Center
Phoenix, three stories, Case Construction Co.

Memorial Hospital
Phoenix, five stories, Kitchell Contractors

Target Store
Paradise Valley, two stories

Hilton Hotel
Tucson, Decker Construction

Garrett-Air Research,
Manufacturing facility
Tucson, KRI Constructors

Pre-Cast or Tilt-Up Buildings

Vodavi Technologies
Scottsdale, two stories, Lufkin, Inc.

A.E. Peterman Warehouse
Phoenix,, Lufkin, Inc.

John F. Lawhon Furniture
Mesa, Lufkin, Inc.

Williams Air Force Base, Pump House
Chandler, Lufkin, Inc.

Smith Pipe and Steel Warehouse
Phoenix, Lufkin, Inc.

Ray Long, Office-Warehouse
Phoenix, Lufkin, Inc.

Dr. Forest Holber, Horse Arena
Scottsdale, Lufkin, Inc.

Contractors Office Park
Glendale, Aragon Development Corporation

Lightweight Concrete over Plywood

Center Court Condos
Scottsdale

Motel Six
Flagstaff

Office Building (two stories)
Sedona, Blavert Construction

Charter Oaks Medical Building
Sun City, two stories

Western Savings Financial Plaza, developed by the Wolfswinkle Group,
Sundt Corp., General Contractor

School of Business Administration, Arizona State University, Tempe, Arizona.
Joe E. Woods, Contractor

1986

STATE OF ARIZONA
DEPARTMENT OF MINES AND MINERAL RESOURCES
Mineral Building, Fairgrounds, Phoenix, Arizona 85007 • (602) 255-3791

MINE VISIT

8/13/85

More Sand & Moon Sand

Richard R. Beard
Mining Engineer

A visit was made to the More Sand & Moon Sand pit of Arizona Tufflite Inc. Mr. Ed Morgan, Vice President of Arizona Tufflite, reports that the bulk of the production is now going to Phoenix for aggregate in lightweight concrete in the construction of high rise buildngs. Current operation consists of screening bank run material to approximately minus 3/4 inch plus 1/8 inch. Some of the undersize is being sold as pozzolan. A front end loader is used to feed the all hydraulic operated double deck screening plant. (see photo)

Future plans include bringing a crusher up from Phoenix to crush the oversize fraction and the purchase of a pulverizer to produce pozzolan from the undersize fraction.

More Sand Moon Sand - 8/13/85
AZ. Tufflite

Arizona Department of Mines and Mineral Resources

VERBAL INFORMATION SUMMARY

May be Reproduced

1. Information from: C. T. Morgan President Arizona Tufflite
   Address: 7540 N. 67th Ave., Glendale, AZ 85031 phone 931-3682
2. Mine: More Sand, Moon Sand (f) 3. ADMMR Mine File More Sand, Moon Sand
4. County: Coconino 5. District
6. Township 23N Range 7E Sec(s) 24 N½
7. Location:
8. No. of Claims - Patented 2 Unpatented
9. Owner (if different from above)
10. Address:
11. Operating Company: Arizona Tufflite
12. Pertinent People and/or Firm: C. T. Morgan
13. Commodities: Pozzolanic pumice
14. Operational Status: active
15. Summary of information received, comments, etc.: C. T. Morgan reported that Arizona Tufflite operation at the More Sand, Moon Sand Mine (f) Coconino Co. currently employs about 10 people, including Phoenix office and Flagstaff Mine personnel. At the mine site they have a crushing and screening plant. Current production rate is about 2,000 tons a month of pozzolanic pumice. The material is trucked to Phoenix where it is used in two ways: one is making light weight cement for use in highrise construction and two, in producing lightweight blocks. The resulting products have superior acoustic (sound deadening) and thermal (fire retardent) properties than material made with ordinary aggregate.

The pozzolan currently sells for $23/yd in Phoenix. Arizona Tufflite has recently received an underwriters laboratory number (UL#) for concrete made with the pozzolan based on its fire retardent qualities. The material is presently marketed in and out of Arizona, Though most material is now sold in Phoenix or Tucson.

Date: 10/25/84 (Signature) M. R. S. ADMMR

NEW BOOKS.....

CANADIAN MINES HANDBOOK 1982-83 - An annual handbook listing exports, production, and dividends for Canada's minerals industry. Chapters are also included on Canadian mining companies, mineral production by province, mining maps, mining stock prices, smelting plants and refineries, and federal and provincial mines departments. Published by Northern Miner Press Ltd., 7 Labatt Ave., Toronto, Canada M5A 3Ps, 432 pp., paper bound, $19 (Canadian).

1981 NON-FERROUS METAL DATA YEARBOOK - Provides worldwide statistical data on copper, lead, zinc, aluminum, silver, gold, antimony, cadmium, magnesium, molybdenum, cobalt, nickel, platinum, selenium, tellurium, titanium, tin, uranium, and other nonferrous metals. Data for five comparative years are included, and more than 180 statistical tables for mine, smelter, and refined production, consumption, inventories, imports, exports, published prices, and other metal statistics. The yearbook also contains an extensive listing of names, and in some cases, addresses of producers, smelters, and refiners of most reported metals. Published by American Bureau of Metal Statistics Inc., 420 Lexington Ave., New York, NY 10170, 150 pp., hardcover, $35.

PRINCIPLES OF ROCK DRILLING AND BIT WEAR, PART 2, by George B. Clark. Order the Colorado School of Mines Quarterly, Vol. 77, No. 2, Colorado School of Mines Press, Golden, CO 80401. $12.

GEOLOGY OF THE ELMERS ROCK GREENSTONE BELT, LARAMIE RANGE, WYOMING, by P. G. Graff et al. Available for purchase as Report of Investigations No. 14 from Geological Survey of Wyoming, Box 3008, University Station, Laramie, WY 82071. $5. plus $1 postage.

ELSEVIER'S MINERAL AND ROCK TABLE, compiled by P. Lof. The at-a-glance format shows 74 rock-forming minerals, 53 ore minerals, comprehensive diagrams, full indexing and Michel-Levy Chart. Order from Elsevier Scientific Publishing Co., P.O. Box 211, 1000 AE Amsterdam, The Netherlands. $17.03 (includes postage-prepaid).

A new report about the chemical nature of mine drainages and methods of treatment for the effluents from mining operations called A WATER HANDBOOK FOR METAL MINE OPERATIONS, is now available from the Colorado Water Resources Research Institute at Colorado State University in Fort Collins, CO 80523. The 84-page handbook was written by Thomas R. Wildeman and sells for $5.00, prepaid.

+ + + + + + + + +

Western State College Foundation is selling a 24 x 30 inch bedrock geologic map of the Central Okanogan Range, Washington, for $5. The map, without gravity lines, is available for $4. The map was prepared by Dr. Fred J. Menzer, Jr., in conjunction with a report being published in the Geological Society of America Journal. For further information, contact - Thomas E. Blagg, Western State College Foundation, 120 N. Blvd., Gunnison, CO 81230.

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The Bureau of Land Management has advised that Floyd R. Bleak has received patent on placer mining claims known as the More-Sand and Moon-Sand in the White Mesa Mining District, Coconino County, AZ. The lands included in the patent are in the N½ of Section 24, Township 23 North, Range 7 East.

+ + + + + + + + +

More dirt comes out of a hole than you can get back into it.

Commodity code: Pozzolan

IN REPLY REFER TO:

United States Department of the Interior

OFFICE OF HEARINGS AND APPEALS
Hearings Division
6432 Federal Building
Salt Lake City, Utah 84138

June 12, 1978

UNITED STATES OF AMERICA,	:	ARIZONA 4602
	:	
Contestant	:	Involving the More-Sand (Amended) and
	:	Moon-Sand (Amended)
v.	:	Placer Mining Claims,
	:	situated in Sec. 24,
ROBERTA FOREHAND and FLOYD R. BLEAK,	:	T. 23 N., R. 7 E.,
	:	GSR Meridian, Coconino
Contestees	:	County, Arizona.

DECISION

Appearances: Richard L. Fowler and Demetrie L. Augustinos, Office of the General Counsel, U. S. Department of Agriculture, Albuquerque, New Mexico, for Contestant;
Thomas L. Palmer, Wade Robson Palmer & Bathea, Ltd., Attorneys at Law, Mesa, Arizona, for Contestees.

Before: Administrative Law Judge Rampton

Pursuant to 43 CFR Part 4, the Arizona Land Office Manager of the Bureau of Land Management, United States Department of the Interior, issued a complaint (amended) on behalf of the United States Forest Service challenging the validity of the subject mining claims for which patent application has been made. The complaint charged that the mining claims are invalid because:

a. That a valid discovery as required by the mining laws of the United States

does not exist within the limits of the More-Sand and Moon-Sand placer mining claims.

b. That the mineral material found within the limits of said claims is not a valuable mineral deposit under 30 U.S.C. § 611.

c. That the land embraced within the limits of the claims is nonmineral in character within the meaning of the mining laws.

d. That the Purchase Agreement of March 1, 1970, between Roberta Forehand and Floyd R. Bleak does not constitute a valid transfer of an interest in said claims to Floyd R. Bleak.

e. That the Contestees failed to perform assessment work as required by 30 U.S.C. § 28.

No answer to the complaint was filed by Mrs. Forehand. However, a timely answer denying the allegations of the complaint was filed by Floyd R. Bleak. He stated that he was the owner of the mining claims and attached a copy of his purchase agreement dated March 1, 1970.

At the hearing, the contestant moved that a default judgment be entered declaring the claims in issue to be null and void because no answer had been filed by the proper party in interest.

The motion was taken under advisement and evidence received as to all of the issues raised in the complaint. Prior to filing briefs on the remaining issues, the parties were allowed to file briefs on the motion. By order dated November 7, 1972, the motion for default judgment was denied. An appeal was filed to the Interior Board of Land Appeals from this order. Subsequently, the contestant filed a motion before the Board requesting an extension of time for the filing of a statement of reasons for the appeal until such time as a decision has been issued on the other issues in this contest, and requesting that the case file be returned to this office for completion of the record and a ruling on the other issues. The purpose of the motion was to defer ruling on the propriety of the order denying the motion to dismiss and to permit further testimony to be taken by deposition with respect to a market survey submitted after the hearing. The oral deposition was

taken and received and the record was closed. The parties have each filed briefs on the issues raised in the complaint and not considered in my previous ruling on charge No. "d."

Findings and Conclusions

Failure to Perform Assessment Work

Mr. Donald J. Alexander, a mining engineer employed by the U. S. Forest Service, testified that he had searched the documents recorded in the county records of Coconino County and that he found recorded affidavits of assessment work on the claims in issue beginning in 1954 through 1958. In 1959 through 1962 nothing was recorded. In 1963 through 1970 affidavits of assessment were filed. On this basis, the contestant challenged the validity of the claims on the basis for failure to perform assessment work 1959 through 1962. (Ex. C, Tr. 15-17)

In rebuttal, the contestant offered the testimony of Roberta Forehand McInelly, one of the contestees, who testified that assessment work had been done on the claims from 1952 until 1970 when she sold her interests to Mr. Bleak. Even after the claims were sold, she made sure the assessment work was done by going out there to verify the work each year, and she took no one's word for it. (Tr. 142)

Her explanation as to why no affidavits were filed during the year 1959 through 1962 was that a Mr. Melvin McCormick was supposed to be doing the filing and, although the work was done, Mr. McCormick failed to file the affidavits because, in his opinion, it was not necessary to file each year, but only necessary to do the assessment work and then file two or three affidavits at a time. (Tr. 143)

The mining laws of the United States require a mining claimant to perform $100 worth of assessment each year for the benefit of his claim or run the risk of losing it. 30 U.S.C. § 28. The regulations 43 CFR 3851.3(a), which have been in effect since 1972 states:

> Failure of a mining claimant to comply substantially with the requirement of an annual expenditure of $100 in labor or improvements on a claim imposed by Section 2324 of the Revised Statutes (30 U.S.C. 28) will render the claim subject to cancellation.

The statute and regulations do not provide for cancellation for failure to file affidavits of assessment work. Cancellation may result only from noncompliance with the requirement of annual expenditures. The failure to file assessment affidavits creates at most a rebuttable presumption that the assessment work was not done. The uncontradicted testimony of Mrs. McInelly was that the assessment has always been completed. Any presumption created by the lack of filing has been effectively refuted by a clear preponderance of the evidence. Charge "e" of the complaint is, therefore, dismissed.

Whether a Valid Discovery Was Made Prior to July 23, 1955

Mr. Donald J. Alexander first examined the claims in issue on July 16 and 29, October 16, December 22, 1969, and on July 6 and 26, 1972. He searched the county records and found that the Moon-Sand was located by Melvin McCormick and N. B. Forehand on October 29, 1953. The More-Sand was located by N. B. Forehand on October 29, 1953.

In his 1969 examination, he found on the More-Sand claim a pit approximately 75 feet wide and roughly 10 feet deep with a 30 foot face. He found trees growing at the base of the face and no evidence at that time of work going on at the pit site. (Tr. 31) On the Moon-Sand claim he found a pit approximately 90 feet wide, 60 feet in depth with a 117 foot face. From the appearance, he stated it looked as if it had been several years since activity had been carried on at the pit. (Tr. 33)

He described the claims as being located 11-1/2 air miles northeast of Flagstaff with a good road extending into each of the claims. Geologically the claims are located in a volcanic field and the material found on the claim he described as a rhyolite or rhyolitic ash plus regular detritus or soils. He found the material to be mostly fines with some larger grains of material which were stratified. The material is thoroughly unconsolidated and easily dug with a shovel.

He testified that the material on the claims is suitable for use in asphaltic concrete and in most uses where sand would be used. (Tr. 38) He knew of no other actual use for the material. (Tr. 41)

In his opinion, the material did not have any special property or other use for which material such as sand and gravels can

be used and that there is a lot of the same type of material spread over a good deal of territory. (Tr. 41)

This testimony of Mr. Alexander completed the Government's case in chief, both as to the question of whether a discovery had been made prior to 1955 and whether the material found on the claims is a common variety as alleged in allegation "b" that the mineral material found within the limits of the claim is not a valuable mineral deposit under 30 U.S.C. § 611.

The Act of July 23, 1955, 69 Stat. 368, 30 U.S.C. § 611, provides:

> No deposit of common varieties of sand, stone, gravel, pumice, pumicite, or cinders and no deposit of petrified wood shall be deemed a valuable mineral deposit within the meaning of the mining laws of the United States so as to give effective validity to any mining claim hereafter located under such mining laws . . . ."

Thus, prior to the passage of this Act, it is well recognized that the deposits described above were locatable under the mining laws. Common varieties of sand can be valid if it can be shown that the requirements for a valid discovery of the deposit existed as of July 23, 1955. United States v. Barrows, 404 F.2d 749 (9th Cir. 1968), cert. denied, 394 U.S. 974 (1969); United States v. Stewart, 5 IBLA 39, 50 (1972). It is the contestees' position that, although the mineral on these claims is not a common variety, there was a valid discovery of a valuable mineral deposit prior to the passage of the Act of July 23, 1955, supra.

A primary issue, then, is whether from the date of location until passage of the "common variety" Act, 69 Stat. 368, supra, materials from the claims were mined and marketed at a profit.

Mr. Alexander never addressed himself specifically to the issue of discovery prior to the date in question. His testimony consists solely of observations as to the pit sizes, the evidence of recent work done, and of the type of material found upon the claims. He made no investigation as to possible sales or activity on the claims, either prior to or subsequent to July 25, 1955. At best, his examination could be considered as an inspection of the material existing in the pits, the size of the pits, and an expert opinion that the material is a common variety.

It is doubtful whether this type of examination could be considered as a prima facie case in support of the contestant's allegation that there was no market for the material in 1953 and 1954. But even assuming, arguendo, that a prima facie case was made, the contestees' evidence appears to be sufficient to establish that from the inception of the location of these claims, the materials were removed and marketed at a profit.

Mrs. Roberta Forehand McInelly testified that she and her former husband mined, extracted, and disposed of the materials from the claims since 1953. A record of the disposition and production and sale of this material was kept. (Tr. 137) She identified Exhibit 17 as excerpts taken from the book where she had always put her accounts receivable. She went through the accounts receivable book, page by page, and extracted entries where the sand had been sold and the dates and the prices. She testified that there was more sand sold on the claims but that she could not document the sales because she has a cash book, and in her cash book she did not delineate between sand and cinders from another claim owned by her and her husband. (Tr. 138) The period covered by the exhibit is from 1952 through 1963. Mrs. McInelly stated that at all times they were producing from these claims they produced at a profit. (Tr. 141, 146-147)

The fact that the claims were operated at a profit is evidenced by her testimony that they were able to acquire more equipment, and as they purchased more equipment and did more work on the claims, they made more money. (Tr. 149-150)

The law governing discovery of valuable mineral deposits has been stated by the United States Supreme Court in United States v. Coleman, 390 U.S. 599, S. Ct. 1327, 20 L. Ed. 2d 170 (1968), wherein the Court applied two tests which complement one to the other. These tests are the "prudent-man test" and the "marketability test."

With respect to the prudent-man test, the Court stated:

> Under this "prudent-man test" in order to qualify as "valuable mineral deposits", the discovered deposits must be of such a character that "a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success, in developing a valuable mine . . ." (390 U.S. 599, at 602)

The marketability test was described as follows:

> . . . to qualify as "valuable mineral deposits" under 30 U.S.C. §22 it must be shown that the mineral can be "extracted, removed, and marketed at a profit" . . . . (390 U.S. 599, at 600)

In the recent case of United States v. Verrue, 457 F.2d 1202 (9th Cir. 1972), the Court of Appeals further defined these tests by quoting with approval from Foster v. Seaton, 271 F.2d 836 (D.C. Cir. 1959), and Barrows v. Hickel, 447 F.2d 80 (9th Cir. 1971). The Court in Verrue at p. 1203, quoting from the Barrows case in regard to the "prudent-man test" recognized that:

> Actual successful exploitation of a mining claim is not required to satisfy the "prudent-man test." (447 F.2d at 82)

With regard to the "marketability test," the Court of Appeals in Verrue at p. 1203, quoted with approval from Barrows as follows:

> The "marketability test" requires claimed materials to possess value as of the time of their discovery. Locations based on speculation that there may at some future date be a market for the discovered material cannot be sustained. What is required is that there be, at the time of discovery a market for the discovered material that is sufficiently profitable to attract the efforts of a person of ordinary prudence. (447 F.2d at 83)

The criteria for marketability recognized by the Court of Appeals in Verrue, supra, are (1) accessibility of the deposit, (2) bona fides in development, (3) proximity to market, and (4) existence of a present demand.

(1) Accessibility of the deposit. The Government introduced no evidence whatsoever to indicate that the deposit was other than accessible, and in fact, their only witness testified that there was a road extending into each of the claims at the time he examined them. (Tr. 24)

(2) Bona fides in development. The record bears out that these claims were actively mined and developed from their inception in 1953.

The testimony of Mr. Hale Tognoni, a mining engineer who made a market analysis of the material from the claims, when questioned regarding the actual mining, removal, and disposition of the material from the claims in issue was as follows:

> Q In your opinion, based upon the experience in the things to which you have testified today, can the deposit of material, or material on the Moon-Sand/More-Sand claims be mined, removed and disposed of at a profit?
>
> A Yes, at a greater profit than they are realizing today.
>
> Q Would it have been prior to 1955?
>
> A Yes.
>
> Q And, in fact, was it?
>
> A It was.
> (Tr. 286-287)

No evidence was presented to refute the testimony by Mrs. McInelly and Mr. Tognoni that materials from the claims had been mined, removed, and sold at a profit prior to 1955. That testimony stands uncontradicted.

I conclude, therefore, that irrespective of whether these claims constitute a "common variety" that the evidence is sufficient to show that the claims in issue were valid prior to 1955. Allegation "b" is, therefore, dismissed.

Common Variety

In view of my holding that the claims were valid prior to 1955, it would ordinarily not be necessary to comment on the issue of whether the material upon the claims is an uncommon variety of material presently locatable under the mining laws of the United States. However, the bulk of the testimony was addressed to this question, and there still remains the question of a continuing market. I will, therefore, make findings and conclusions on whether a discovery exists after July 25, 1955.

Mr. Donald J. Alexander stated that the material on the claims does not have any special property, and that there is "a lot

of this stuff . . . spread over a good deal of territory here." (Tr. 41)

Although Mr. Alexander is a qualified mining engineer and has examined many mining claims involving sand and gravel for a validity determination, he admitted that this was the first case in which he had occasion to examine the so-called rhyolite ash deposits and that most of his experience prior to the time he came with the Federal Government was in the area of metalic or nonmetalic minerals. (Tr. 48)

He was asked for the basis of his opinion when questioned on direct examination by contestant's counsel as follows:

> Q Do you have any knowledge about actual uses of this material?
>
> A Actual uses? No, I don't, of this particular material.
> (Tr. 40-41)

In determining whether a material is a common variety, the Department of the Interior has stated:

> To determine whether the material is an uncommon variety within the meaning of the 1955 Act, the mining claimant must establish (1) that the deposit has unique property and (2) that the unique property gives it a distinct and special value. United States v. Penrose, 10 IBLA 332, 340 (1973).

The same criteria were recognized in the recent decision of the Department of the Interior in United States v. Chartrand et al., 11 IBLA 194, 201 (1973), where the Board recognized these criteria and then stated:

> . . . In order to determine whether a deposit of stone has a unique property which gives it a distinct and special value, there must be a comparison of the material under consideration with other deposits of similar materials. Therefore, it must be shown that the material under consideration has some property which gives it value for purposes for which other materials are not suited, or, if the material is to be used for

> the same purposes as other materials of common occurrence, that it possess some property which gives it a special value for such uses, which value is generally reflected by the fact that it commands a higher price in the market place. . . .

Mr. Alexander not only admitted that he had no knowledge about actual uses of the material from the claims, but merely testified as to what uses he did know about and did not testify that in his opinion this material could not be used for purposes other than purposes for which common varieties of sand can be used. He made no comparison between the properties of the mineral on this claim with the properties of mineral from deposits of common varieties of sand. His experience in analyzing deposits of volcanic ash was admittedly limited to mining claims in the Flagstaff area and, further, most of his experience has been in the area of metalics and not in the area of nonmetalics.

Even assuming that Mr. Alexander's limited and general statement constitutes a prima facie case, the evidence submitted by the contestee appears to be sufficient to sustain any burden of proof required or placed upon a mining claimant to establish that the material on the claim meets the criteria as set forth in the Interior decisions to establish that the material on the claim is not a common variety.

Testifying for the contestee was Dr. Michael F. Sheridan, Associate Professor of Geology, Arizona State University, one of the world's leading experts in the area of analyzing rhyolitic deposits similar to those found on the More-Sand and Moon-Sand claims.

Dr. Sheridan identified Exhibit 12 as an abstract of a paper presented by Mr. Updike and himself at the Geological Society of America meeting in Riverside, California in 1971. The paper is a description of the Sugarloaf Tephra deposit, a rhyolitic deposit of base-surge origin in northern Arizona and which includes the area in which the claims are located. He collected some 75 samples from the Tephra deposit over a period of two or three years and performed mechanical size analyses. (Tr. 84)

He has examined the two claims in issue and is familiar with the deposits and has run tests on the samples taken. (Tr. 91)

Dr. Sheridan said that the deposit is unique and that such deposits are rare. The uniqueness is found in the textural characteristics and the deposit has a particular type of bedding or structure. It has unique grain size and textural property that makes it different from other ashes. It is extremely high in silica content, and he stated that the deposits would have a special value. (Tr. 99)

He characterized the deposits as possessing pozzolan and stated that in other areas of the country, deposits of this general type are useful in making lightweight aggregate blocks. The blocks have unusually good thermal and acoustic properties that make the block especially desirable because they are lightweight and yet strong. (Tr. 100) In California deposits of this type have been used for producing pumice and the values obtained from the pumice was accorded 15 times the value as opposed to sand and gravel in the same areas. (Tr. 100)

Mr. Arthur M. Bleak, who owns the Bleak Brothers Sand and Rock and Concrete Materials Company in Flagstaff, testified that subsequent to 1966 he has produced or used the pozzolan sand from another pit called the Fisher pit and from both claims in issue to the present time. He used the material for making concrete and asphalt. (Tr. 156) He has also used the sand for making slurry for highways and found that it is better for this purpose than other aggregates taken from the Salt River, Camp Verde, or Paulden aggregates. (Tr. 156-157)

He stated that the material provides higher strength in the concrete product, giving it an advantage over common varieties of sand which he formerly used in this concrete.

The material from the claims is much lighter from the deposits of common variety sands from other sources and is clean and there is no waste in the deposit which would contribute to a cost savings in terms of material to be needed to work for a sale. (Tr. 160)

In comparing the material from the claims with common varieties of sands, he was of the opinion that the high pozzolanic quality or content of the material gives special qualities to the concrete made from the materials. It gives concrete earlier strength than common varieties of sand and the concrete continues to gain in strength. In use for mortar sand, these strength qualities make the mortar sand more attractive to contractors and they receive a price of $10 a yard for mortar sand from the claims. The closest pits of common variety sand at Camp Verde sells for $6 or $7 per yard delivered in Flagstaff. (Tr. 161)

Bruce E. Rigby, General Manager, Concrete Materials Corporation, identifed Exhibit 20 as a report on cylinder tests taken at Culp Construction. On a normal cylinder the break strength is supposed to be achieved in 28 days. Sand from the claims in issue used in making the cylinder met the break strength test in 7 days. (Tr. 178) He verified the testimony previously given by contestees' witnesses that the material from the claims is a much lighter material than from common variety sand deposits and, as a result, less material by weight can be used in their concrete mix, more sand can be hauled by the yard, and in the end, the contractors prefer the lighter weight material because it can be poured and laid quicker and, therefore, more economically. (Tr. 183-184) He testified that the unique properties of the material are reflected in the higher price on the market than for the material from the common variety sands.

Mr. Donald F. Reed, a mining engineer formerly employed by the Bureau of Land Management as a mineral examiner, testified that he had examined the deposits and that he had never seen any deposit anywhere similar to these deposits. He testified that the sands from the claims were the only ones he had seen which were capable of being used for concrete aggregates without any crushing or little screening; that it was readily accessible to mining and that it had unique properties in that the sands were homogeneous, the particles were not rounded as they would be in a stream deposited bed, and were relatively light in weight. (Tr. 328-329)

Mr. Hale C. Tognoni, a mining engineer who has had special experience with the different types of sand and gravel and aggregates used in the construction of roads and airfields with the Corps of Engineers during World War II, conducted a market survey and geological study of the material on the claims. He found the material to possess unique properties not present in common sands in that the material is lighter in weight, has favorable particle shape and surface texture, greater strength, limited waste material in the deposits, added durability, natural air entrainment, homogeneity, corrosive resistance, cementatious quality, heat insulation, and nonconductor of electricity. (Tr. 271-286)

Mr. Tognoni stated that, in his opinion, the unique qualities described in his testimony lend a distinct and special value to the deposits on the claims in issue which would be reflected economically in the price received for the material.

The contestant challenged the marketability report submitted by Mr. Hale Tognoni through the testimony of Mr. Stanley

Randall, an agricultural economist. According to Mr. Randall, the elements of a good marketability report are:

1. Good information on the supply of the material to be sold.

2. The quality of the product and whether the source of supply is uniform.

3. A good set of cost figures.

4. Information on the competition, including those producing the same product and those producing a substitute product, the number of competitors, their location, the quality and quantity of their product, and their cost figures.

5. Knowledge about the demand for the product, the kind of customers, their location, the product they want, whether quality would affect price, and the value of the product to the customer and the producer.

6. Concern about the ratio of supply to demand.

7. Definition of a market area with emphasis on transportation costs.

8. Depletion of the source material.

9. An amortization period for equipment and other major investment items.

10. Potential uses for the product.

11. Whether a higher price can be obtained by "salesmanship."

In its brief, the contestant criticizes the Tognoni market survey as being built on a framework of suppositions, estimates, hearsay and irrelevant factors, and states that no prudent man would commence a sustained mining operation on the basis of the details in the report.

In reviewing the report, I must conclude that some of the criticisms have validity. For example, Mr. Tognoni sets forth an estimate of the reserves of the material on the claims as being apparently between 400,000 and 1,600,000

cubic yards. This estimate was not based upon core drillings and must be regarded as an opinion based solely on geologic inference.

Further, Mr. Tognoni's conclusion that the operators from the claims could capture 50% of a presumed market is a general statement unsupported by specific figures on the quantity of concrete aggregate used in the Flagstaff area and information as to the ability of the present suppliers to fulfill the demands.

It is true that some of the assumptions and conclusions drawn in the Tognoni report, in and of themselves without additional supporting data and facts as supplied at the hearing, would not be sufficient for an operator to commence a sustained mining operation on the basis of the details in the report alone. However, the Tognoni report does have validity. It does contain justifiable assumptions and conclusions by an expert in the field of concrete aggregates. Moreover, it is not the sole basis for the evidence presented by the contestees that there is an existing market for the materials from these claims. The deposits have been worked and materials removed have been sold in the open market for a period of years. The claims have, in fact, been developed into a valuable mine. Sales of materials from the deposits have been made at a profit since 1953 up until the present time. This fact in itself is sufficient to show irrespective of the market analysis that there does exist a continuing and expanding market for the material from these claims.

I find from the testimony presented that the material on the claim is not a common variety within the meaning of 30 U.S.C. § 611. The deposit has unique properties giving it a distinct and special value for purposes and uses for which other materials, such as common variety sands, are not suited. In addition, when this material is used for the same purpose as materials of common occurrence, the properties which it possesses give it a special value in that it commands a higher price in the market place and the cost of preparing the material for market transportation and use are less, resulting in increased profit for the operator.

Summary and Conclusions

At best, the contestant presented a bare bones prima facie case with respect to the allegations of the complaint.

However, if indeed, a sufficient prima facie case was made by the contestant that evidence was refuted by the evidence presented by the contestees. Further, the contestees have met the burden of proof in establishing that the mineral deposit found on the claims in issue is not a common variety; that the minerals have been mined, removed and marketed at a profit prior to July 23, 1955, and continuing to the present and that, therefore, there was and continues to be a valid discovery of a valuable mineral deposit within the limits of the More-Sand and Moon-Sand claims.

The complaint is dismissed and patent should issue to the More-Sand and Moon-Sand placer mining claims.

John R. Rampton, Jr.
Administrative Law Judge

APPEAL INFORMATION

Contestant, as the party adversely affected by this decision, has the right of appeal to the Interior Board of Land Appeals. The appeal must be in strict compliance with the regulations in Title 43 CFR Part 4. (See enclosed information pertaining to appeals procedures.)

If an appeal is taken, the adverse party, contestees, can be served by service upon Mr. Thomas L. Palmer, Attorney at Law, at the address listed on page 16.

Enclosure: Information Pertaining to Appeals Procedures

ROBERTA FOREHAND and
FLOYD R. BLEAK
ARIZONA 4602

Distribution
By Certified Mail

Mr. Thomas L. Palmer
Wade Robson Palmer & Bethea, Ltd.
Attorneys at Law
318 Valley National Bank Building
Mesa, Arizona 85201

Office of the General Counsel
U. S. Department of Agriculture
Room 4017, Federal Building
517 Gold Avenue, S.W.
Albuquerque, New Mexico 87101