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01/10/86

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: APACHE LIMESTONE

ALTERNATE NAMES:

YAVAPAI COUNTY MILS NUMBER: 505

LOCATION: TOWNSHIP 18 N RANGE 2 W SECTION 1 QTR. C  
LATITUDE:N 34DEG 58MIN 30SEC LONGITUDE:W 112DEG 26MIN 00SEC  
TOPO MAP NAME: PAULDEN - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

STONE-(M) LIMESTONE CB -PRIMARY

BIBLIOGRAPHY:

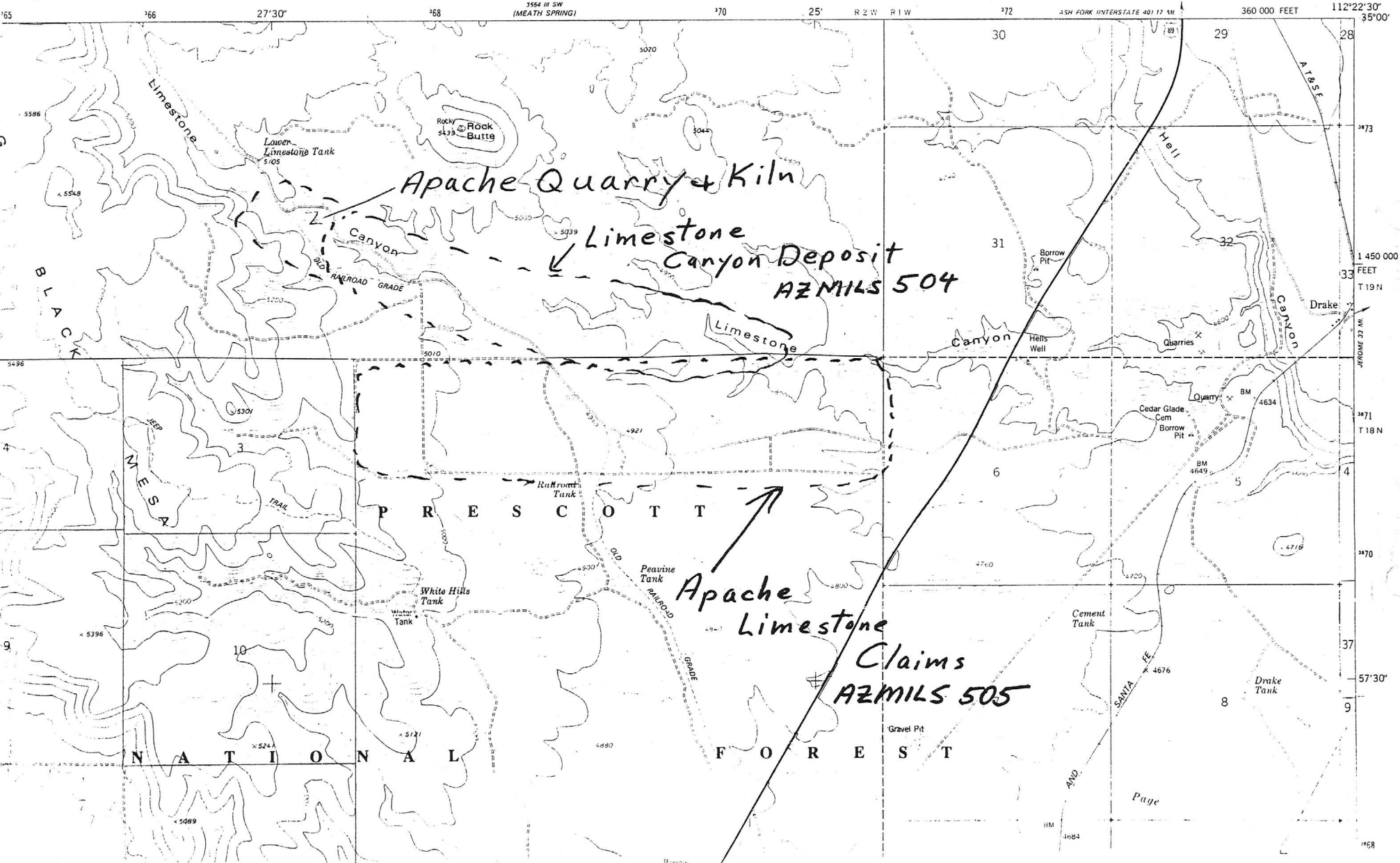
ADMR APACHE LIMESTONE CLAIMS FILE  
BLM AZ MINING CLAIMS LEAD FILE 24649  
CLAIMS COVER ALL OF SEC. 1 & 2





PAULDEN QUADRANGLE  
ARIZONA—YAVAPAI CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)  
NW/4 PAULDEN 15' QUADRANGLE

354 1/4 SE  
MATTERDRI



Lower Limestone Tank  
5105

Rocky But  
5439

5044

Canyon

Old RAILROAD GRADE

Limestone

5010

4921

Railroad Tank

P R E S C O T T

*Apache Limestone Claims*  
*T18N R2W Sec. 1+2*

White Hills Tank

Water Tank

Pearline Tank

I O N A L F O R E S T

Gravel Pit

Borrow Pit

Abra 4706

Cinder Pit

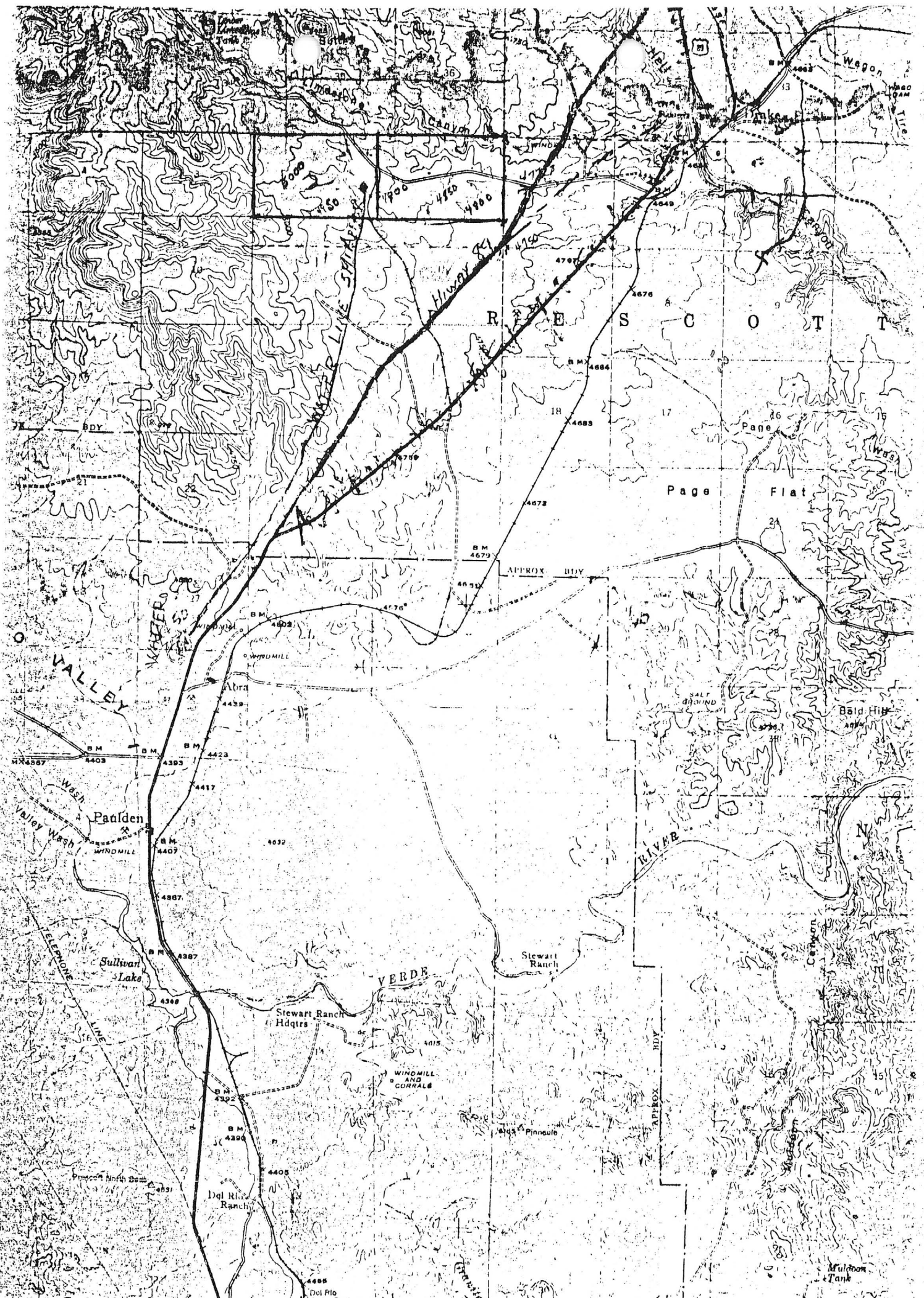
4767

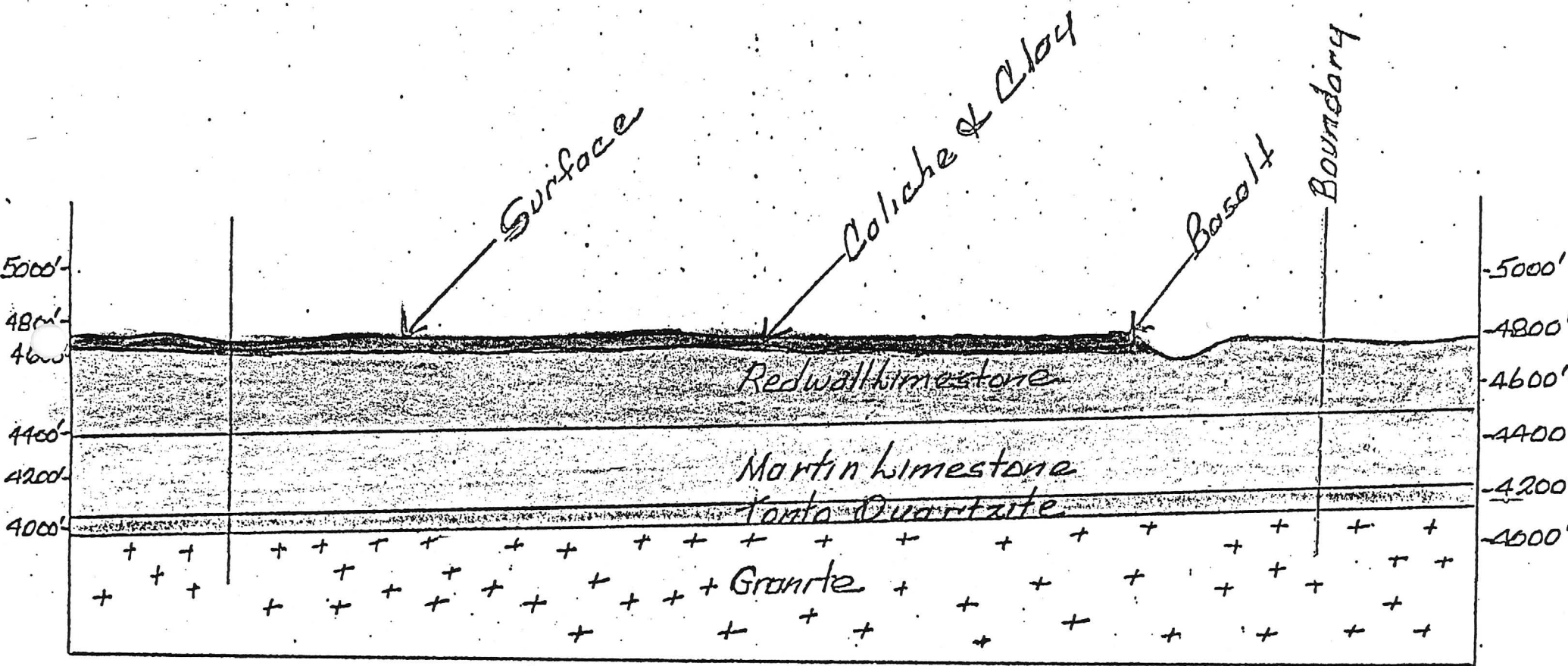
*Paalden 7.5'*

4986

4800

Borrow

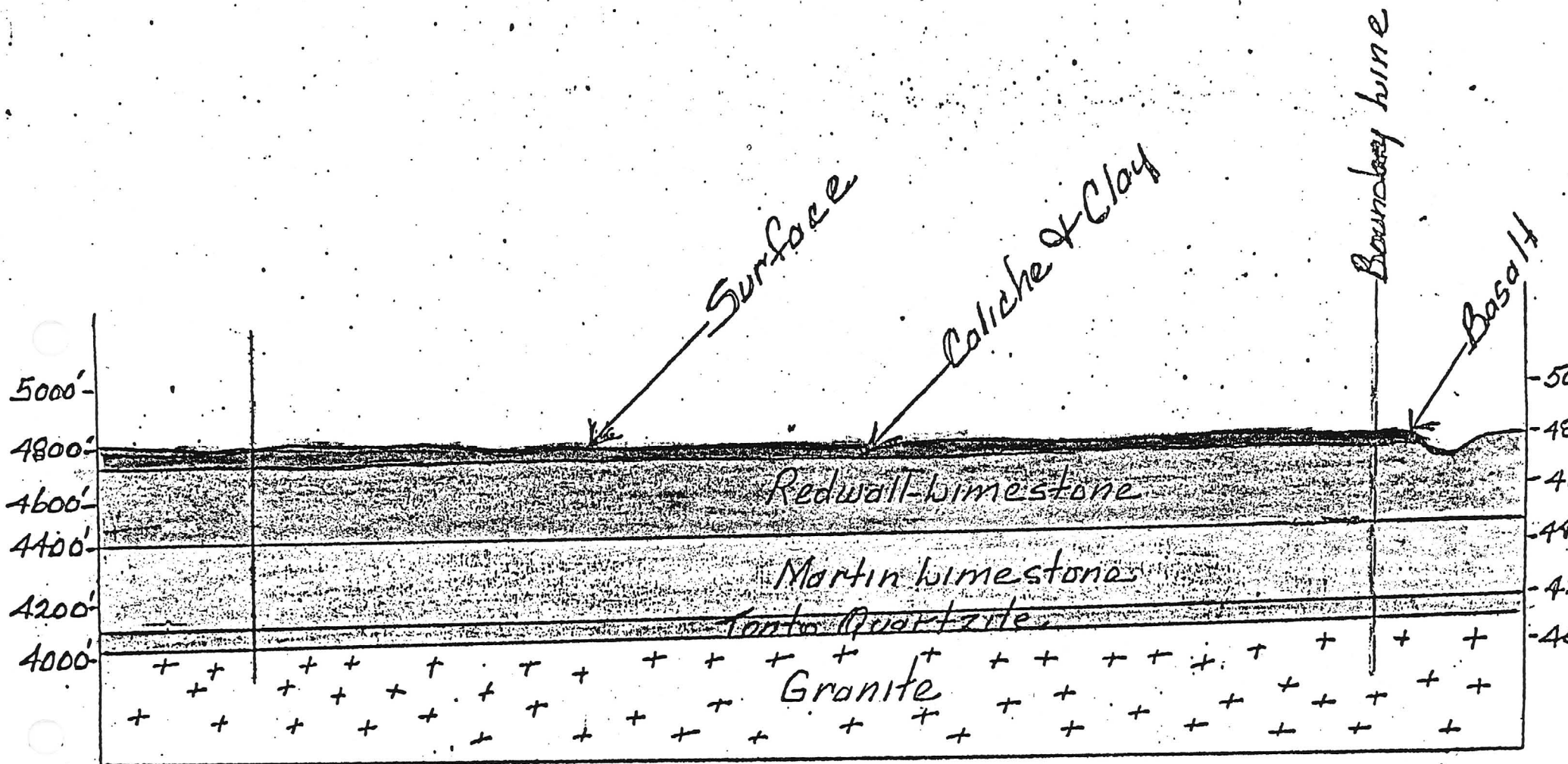




PROFILE A-A' LOOKING WEST  
 Scale Vertical and Horizontal 1" = 60'  
 - Sealed Down -

APACHE LIMESTONE CLAIMS





PROFILE B-B' LOOKING WEST  
 Scale Vertical and Horizontal 1" = 60'  
 - Scaled Down -

Township 18 North

Range 2 West

Claim 6

Road

Section 2

APACHE LIMESTONE CLAIMS

Road

Claim 7

Profile Section

Claim 8

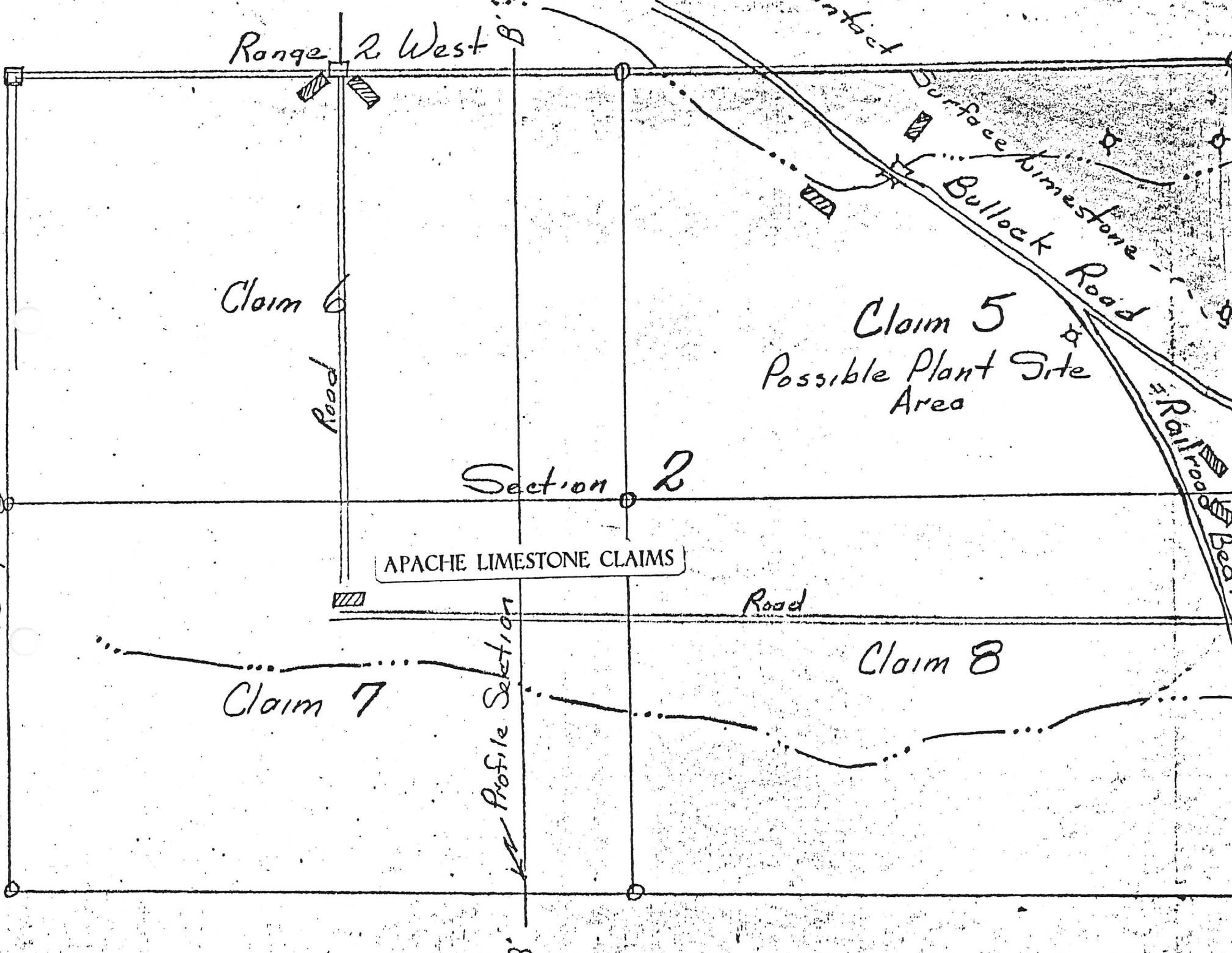
Claim 5  
Possible Plant Site Area

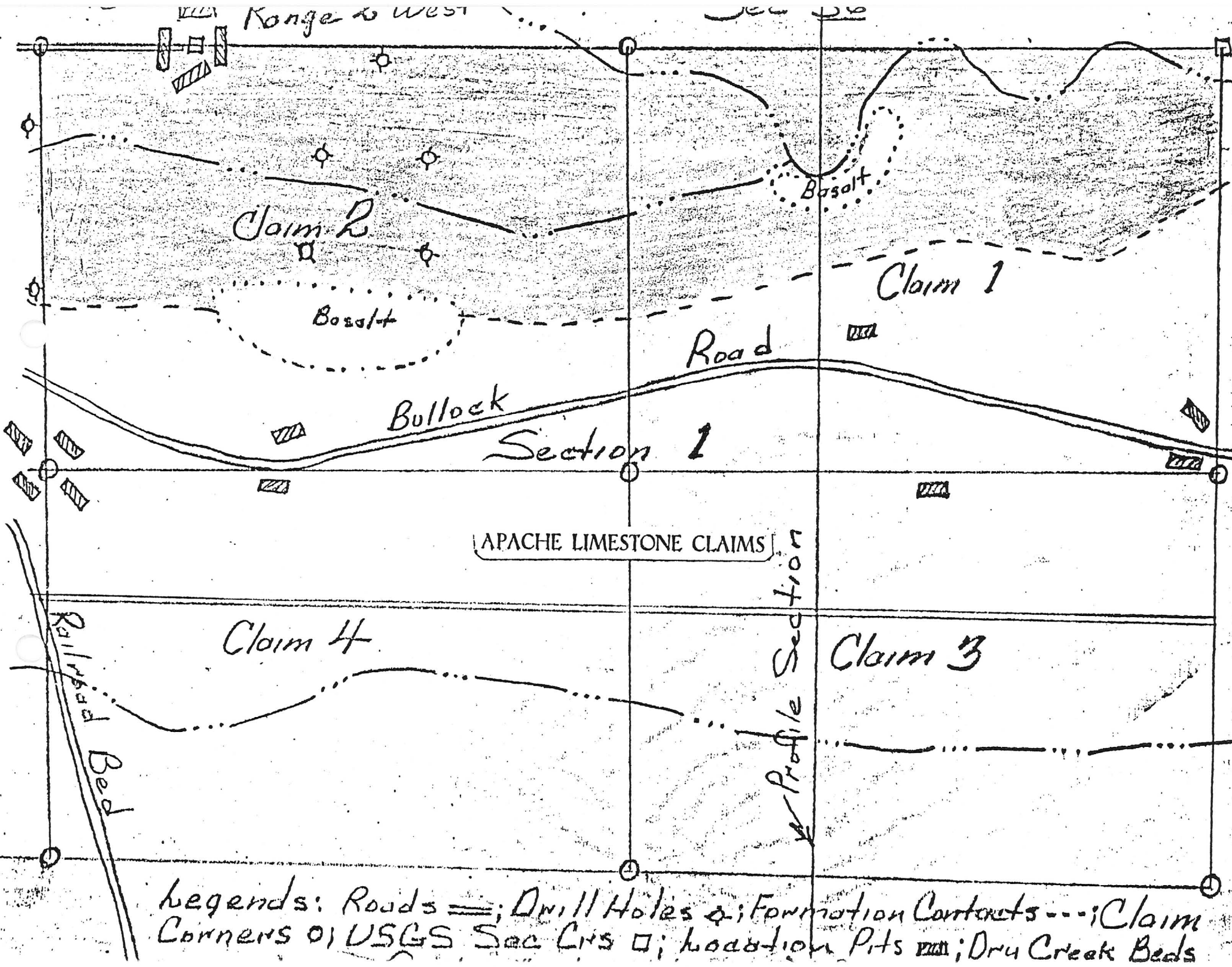
Bullock Road

Railroad Bed

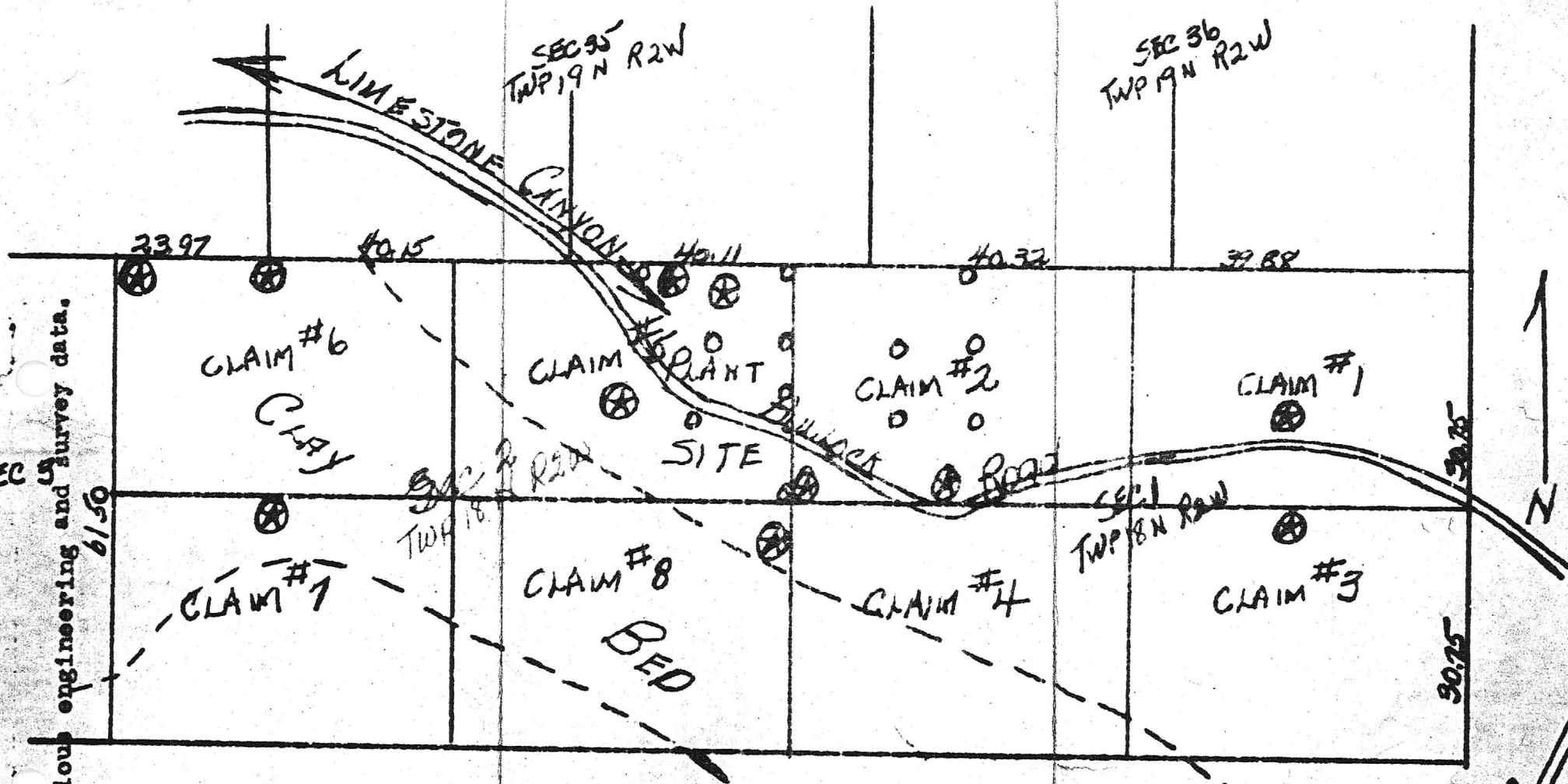
Contact

Surface limestone



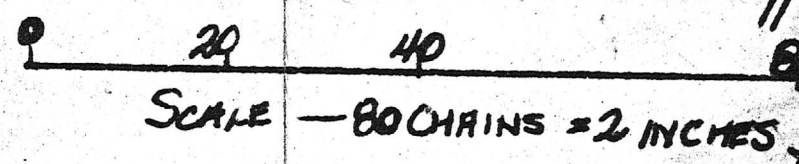


Excerpts from various engineering and survey data.



### APACHE LIMESTONE CLAIMS - NEAR DRAKE, ARIZONA

- ⊗ LOCATIONS & OPEN PITS
- CORE HOLES



HIGHWAY #89  
 RR  
 S.W. LINE  
 S.W. QUARTER



## DESCRIPTION OF PROPERTY OFFERED

Eight (8) Fractional Quarter Section Placer Mining Claims (113 1/4 acres), known as "Apache Limestone Claims," consisting of all of Fractional Sections 1 and 2, Township 18 North, Range 2 West, situated near Drake, in Yavapai County, Arizona, on U. S. Highway #89, about 125 miles from Phoenix.

## LIMESTONE AND CLAY DEPOSITS

The limestone and clay deposits have been core-drilled and blocked out by Kaiser Engineers, and are sufficient in reserve to support a large operation. The limestone is suitable for the manufacture of Portland Cement and for Concrete Aggregates. It tests 96.88 plus CaCO<sub>3</sub>, with average hardness of 3.5 and specific gravity of 2.59. The clay meets Portland Cement requirements. The property was formerly qualified by an Agency of the Federal Government, for a cement mill, to support a bid to furnish the cement for the Glen Canyon Dam Project.

## INDUSTRIAL UTILITIES AVAILABLE

Power and gas are located within one (1) mile of the property. Water is available within five miles of the property at the rate of 10,000 gallons per minute. The AT&SF Railroad is located within one mile of the property. There is a cement mill site on the property, and U. S. Highway #89 is one of the main transportation arteries in Arizona.

## INDUSTRIAL POTENTIAL

The State of Arizona and Federal Government plans include a multi-billion dollar water program. The Central Arizona Project includes, "A system of 400 miles of aqueducts and pumping facilities." This system will divert 391 billion gallons of water each year into the Phoenix and Tucson areas. Two large dams, with power facilities at Bridge Canyon and at Marble Canyon were formerly planned. However, instead, two large steam plants and a huge coal slurry pipe line are to be built. A steam plant is to be built at Marble Canyon Dam site, and one near Lake Mohave at Davis Dam. Southern California Edison Company is to build the Mohave Steam Plant. The pipe line is to transport water and coal slurry from the Colorado River and the Coal Fields in Northeastern Arizona across the State to the Mohave Steam Plant. Presently there is only one cement mill in the area - at Clarkdale. It is reported to be operating at capacity with a major water problem. The above described property is better situated - on U. S. Highway #89 - with no problems. It is situated in the very heart of the projects planned.

## OFFERING PRICE

The above described claims are hereby offered on open listing with any qualified real estate firm at \$5 million. Lease-back money is available in Arizona, for qualified operators, for the plant facilities, and the price of the claims can be included in the lease-back arrangements.

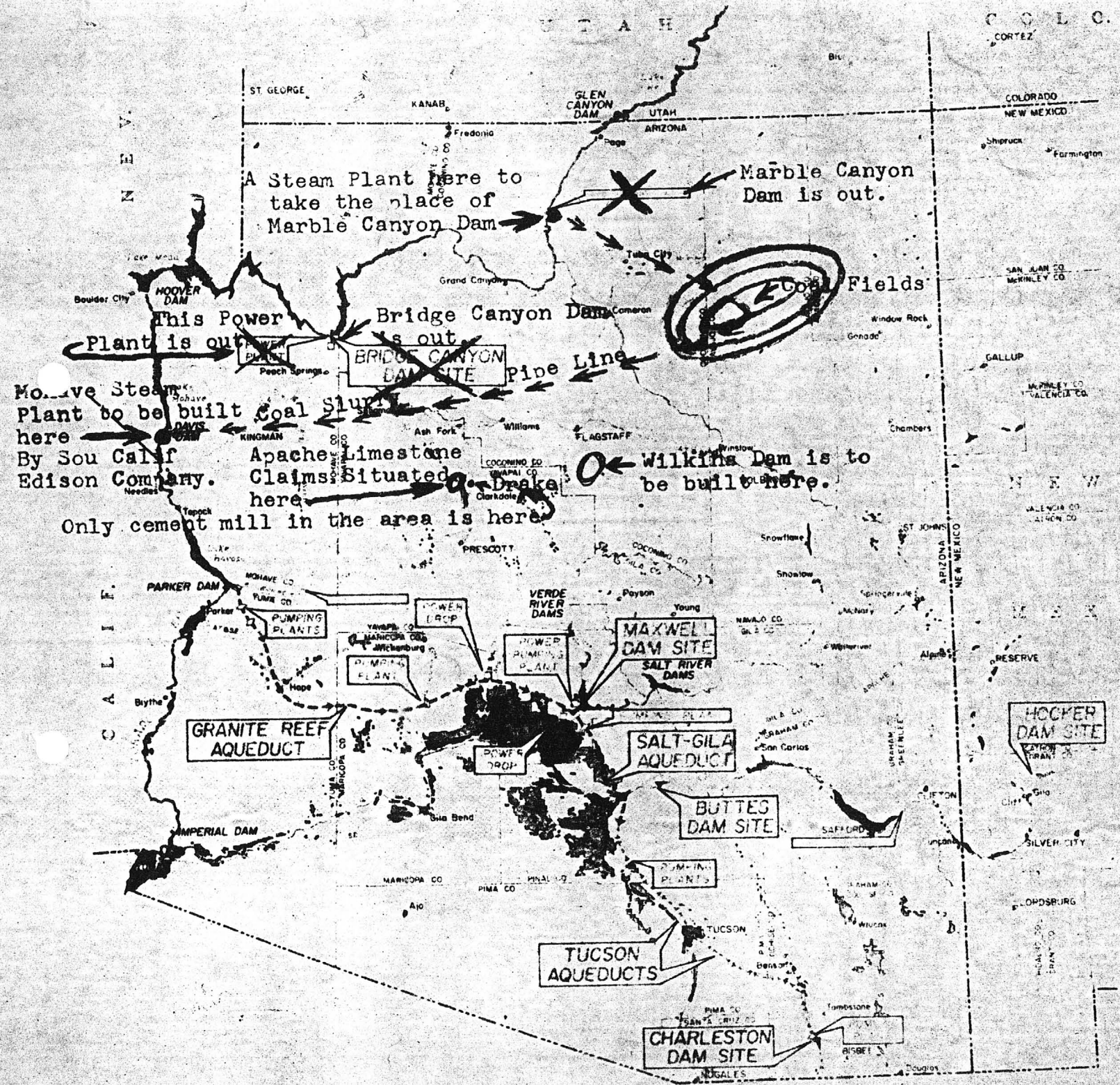
## PRESENT OWNERS OF THE APACHE LIMESTONE CLAIMS

Harry and Marie Beckelman, one-half interest; L. W. Armour, one-eighth interest; Elsie Nokes, one-eighth interest; Leland Lindley and his mother Della Lindley, one-fourth interest.

Telephone: 349-3234 (7ll)

Harry Beckelman  
Star Route, Box 82-B  
Mountain Center, California 92261





The deletions and additions on this map were made by the Bureau of Reclamation, on another Map No. 344-314-114, of the same size and scale as this one, and were taken therefrom.

**EXPLANATION**

- PROPOSED DAM AND RESERVOIR
- PROPOSED OPEN AQUEDUCT
- PROPOSED CLOSED AQUEDUCT
- PROPOSED PUMPING PLANT
- PROPOSED POWER PLANT
- URBAN AREA
- LAND IRRIGATED PREDOMINANTLY WITH GROUND-WATER
- LAND IRRIGATED WITH BOTH SURFACE AND GROUND WATER

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION

**CENTRAL ARIZONA PROJECT  
ARIZONA-NEW MEXICO**

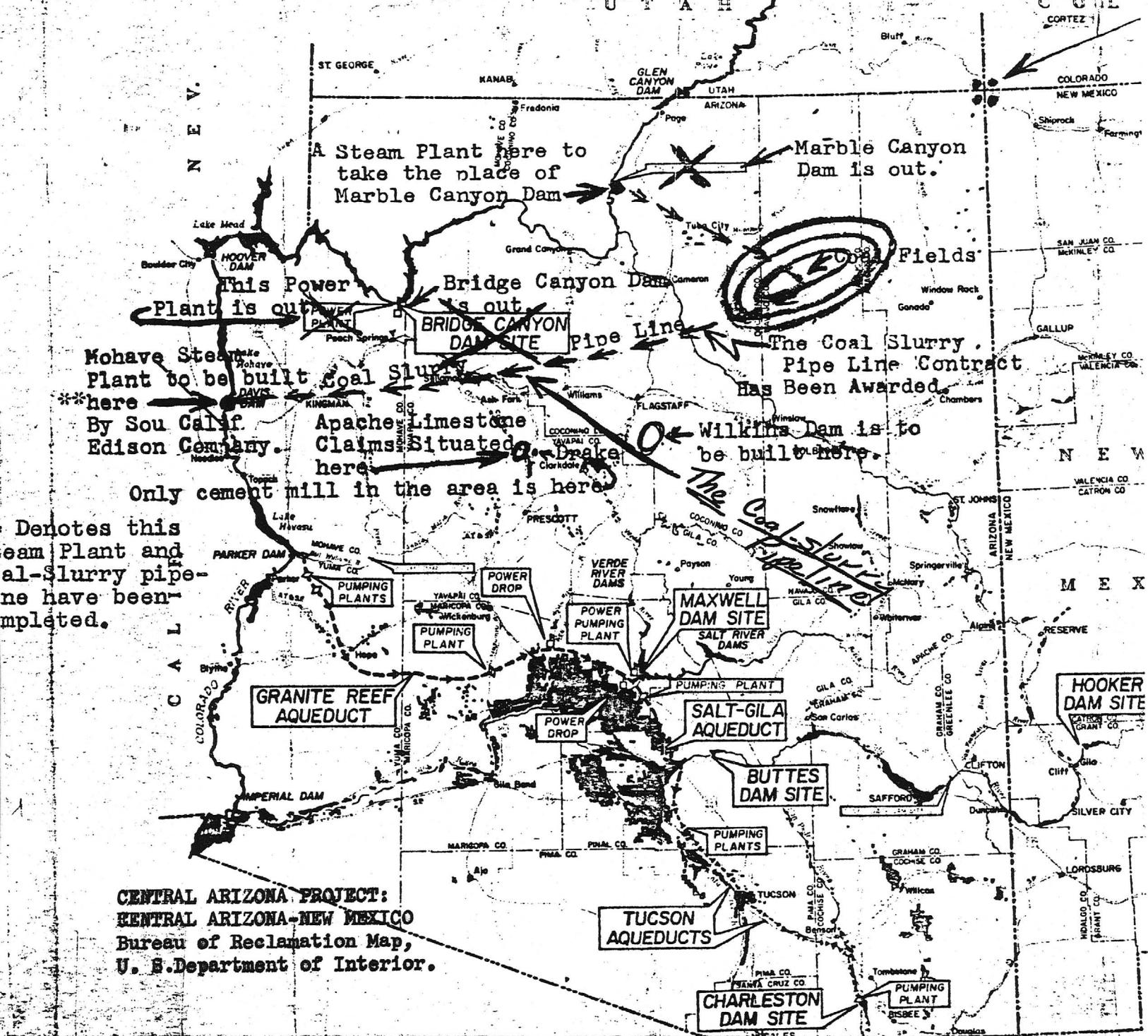
MAP No. 344-314-114

SCALE 1" = 10 MILES

AUGUST 1963



MAJOR PROJECTS FOR ARIZONA NOW UNDER CONTRACT AND PENDING



According to documented information contained in a California Department of Natural Resources, Mines and Geology Publication: "In 1940, California with about 1/20 of the country's population, produced over 1/10 of the Portland cement made in the United States. In 1945, eleven cement mills in California shipped a total of 15,864,134 barrels of cement. In 1946, the total California production was 21,200,000 barrels of Portland cement. The total capacity of California cement plants was 27,740,000 barrels as of January 1, 1946." The total capacity of California cement plants was almost double the 1946 capacity, by 1974.

At the present time there are only two cement plants in Arizona, with a total capacity of about 5-million barrels of Portland cement a year. Before the present business slump, the estimated total annual consumption in Arizona, was about 11-million barrels. By most conservative estimates, in the light of the present and projected economic profile for Arizona, is that about 27-million barrels of Portland cement a year will be consumed in that State, by the year-2000.

Based on published information, an expenditure of \$6-Billion is to be made in Arizona, over the next quarter-century - \$3-Billion by the Federal and State governments, on water distribution and on hydro-electric development projects, the Central Arizona Project in particular and on the other Lower Colorado River Basin Projects, in general, and \$3-Billion by industry in services that will stem from the initial water distribution and hydro-electric projects in addition to the many other developments, in Arizona, including the air pollution control projects, mentioned above, which are expected to use, "whole mountains of limestone."

APACHE LIMESTONE CLAIMS 1-8

YAVAPAI COUNTY

WR KP 10-28-77 - The Apache Limestone Claims 1-8 in Secs. 1&2, T.18N, R.2W, were discussed with Tom Gwinn, Peter Kiewit & Sons, 1000 Kiewit Plaza, Omaha, Nebraska 68131. He reported the properties had been submitted to the company for the evaluation and potential use. The property is owned by a Mr. Robinson and is located about 36 miles north of Prescott near Paulden within sight of U.S. Highway 89. The property shows signs of "early day" production based on the presence of remains of a lime kiln and abandoned rail siding. The deposit is reported to contain a blocked out 300,000 tons of 96-98%  $\text{CaCO}_3$ . Average analysis was reported as 54.79%  $\text{CaO}$ , 0.08%  $\text{MgO}$ , 0.114%  $\text{Fe}_2\text{O}_3$ , 1.68%  $\text{SiO}_2$ , loss on ignition 43.07%, 97.86%  $\text{CaCO}_3$ . The deposit had been evaluated for use in the Glen Canyon Dam construction project, but sources closer to the construction site were subsequently located. 11-9-77 bh

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Apache Limestone Claims Date September 20, 1967  
District Mineral Point - Yavapai County Engineer F. T. Johnson  
Subject: Visit to property

Eight fractional quarter section placer claims (1134 acres). Sec. 1 & 2, T18N, R2W.

Information concerning these claims could not be enlarged over the description etc. of Harry Beckelman, Star Route, Box 82-B., Mountain Center, California 92361.

Mr. Larry Walker, Plant Mgr. of Phoenix Cement, Clarkdale verified the drilling by Kaiser Co. who also bid on the Glen Canyon Dam and were going to use cement made from the above limestone.

The Phoenix cement plant is not operating to capacity (1 kiln shut down) due to slack demand. Also Phoenix cement does not suffer from water shortage of any kind.

NOT PERT.  
TO APAC  
LIMESTONE  
CLAIMS  
KAP  
11/90

R. C. Wilton, P.O. Box 534, Yucca Valley, California 92284 says he holds lease option on this property. LP 2-24-70

Apache Limestone, a California company, is engaged in a limestone exploration program west of Highway 89 near Drake on their claims in T19N, R1&2W. KAP WR 10/3/75

STATE OF ARIZONA  
DEPARTMENT OF MINERAL RESOURCES  
MINERAL BUILDING, FAIRGROUNDS  
PHOENIX, ARIZONA 85007



February 28, 1968

Mr. Harry Beckelman  
Star Route  
Mountain Center, California 92361

Dear Mr. Beckelman:

Your "Geologic Report on Apache Limestone" situated in Juniper Mts., Yavapai County has been forwarded to this office for open filing.

We are always pleased to receive such reports as we have many inquiries concerning all types of mineral and stone deposits.

I am not aware of the availability of lease-back money in Arizona, but suspect that there is such money for a feasible operation.

Sincerely yours,

F. T. JOHNSON,  
Field Engineer.

FTJ:p

C  
O  
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Y



**STATE OF ARIZONA  
DEVELOPMENT BOARD**

WESTERN FINANCIAL CENTER • 3443 NORTH CENTRAL AVENUE • SUITE 310  
PHOENIX, ARIZONA 85012 TELEPHONE (602) 271-4431

Refer File No.:

February 26, 1968

Mr. Harry Beckelman  
Star Route, Box 82-B  
Mountain Center, California 92361

Dear Mr. Beckelman:

Thank you for your letter of February 21, addressed to the  
Natural Resources Department.

Your letter, along with your report on Apache Limestone,  
has been sent to the Arizona Department of Mineral Resources  
for their information.

Sincerely,

(Mrs.) Joan Georgens  
Executive Secretary

cc: Mineral Resources Dept. ✓

**CHARLES R. WARD CORPORATION***Mining Development & Mineral Recovery*

4728 N. 21ST AVENUE

PHOENIX, ARIZONA 85015

26 December 1976

## TO WHOM IT MAY CONCERN:

The C. R. Ward Corporation, at the request of Mr. Harry Beckelman, is producing a comprehensive feasibility study of a Coal-Lime Gasification facility. This plant will provide a partial solution to the major shortage of natural gas in Arizona, and produce the much needed lime products such as aggregate and burnt-lime.

In mid December, 1976, a delegation met with Mr. Tom Lynch, Chief of Energy Programs for the State of Arizona in the Office of Economic Planning and Development. Mr. Lynch had received Mr. Beckelman's letter to the Governor of Arizona, Mr. Raul Castro, and requested additional information.

The total plan was presented and received with great favor. It was explained the first phase of construction will involve a portable aggregate plant of sufficient size to begin producing limestone products, generating an immediate cash flow situation.

The second phase will entail final engineering and construction of the Coal-Lime Gasification facility. Research is being compiled from the Smithsonian Institute, General Electric Corporation and others who are capable and experienced in this and related fields.

The raw products such as coal have been contracted and commitments received. The by-product market indicates an extreme shortage of burnt-lime for the Central Arizona Project (now under construction), concrete pipe and cement for construction purposes.

The Venell Corporation of San Francisco has indicated a desire to construct the cement facility, to mine and process the aggregate. Other by-product manufacturing facilities will be constructed under phase three to produce items as; pipe, conduit, block, etc.

In summary, this project will:

- a) offer a new supply of natural gas
- b) assist in correcting the shortage of cement
- c) open many new job opportunities
- d) assist in correcting the shortage of cement products
- e) establish a new townsite and community
- f) bring additional revenue into Arizona

The C. R. Ward Corporation wholly supports this project as to what seems at this time a very feasible endeavor for the multitudes concerned.

Very Truly Yours,

C. R. Ward, President



# THE APACHE LIMESTONE & CLAY DEPOSIT

**PROPERTY:** Eight fractional quarter-section placer mining claims, known as Apache Limestone Numbers One, Two, Three, Four, Five, Six, Seven and Eight, consisting of all of fractional Sections 1 and 2, Township 18 North, Range 2 West, (1,13<sup>4</sup> acres more or less), near Drake, in Yavapai County, Arizona.

**MINERALS:** Limestone, argillaceous limestone, and clay.

**GEOLOGY:** The massive limestone beds that underlie the argillaceous limestone and clay are mainly in the north part of the claimed area. About 200 feet of the bedded limestone is exposed in the canyon. It is a tan crystalline limestone of the Redwall and Martin formations. Argillaceous limestone (caliche) overlies the major part of the claims with a sizable red clay deposit in the western part. Overall or average red clay thickness is probably 30 feet thick.

**QUANTITY:** The limestone beds here total 2,000 feet thick in places. Using a minable 100 foot thickness, 300,000,000 tons are available here. The caliche beds probably contain upwards of 10,000,000 tons and the red clay beds in the western part around 3,000,000 tons of usable material.

**QUALITY:** Chemical analysis on the limestone show that it runs from 96.88% CaCO<sub>3</sub> to 99% plus CaCO<sub>3</sub>. It is low in alkali, iron, magnesium and silica. See copies of analysis of limestone. The argillaceous limestone contains principally calcium, aluminum, and silica. With the addition of argillaceous clay, and small amounts of the high-calcium limestone, it is suitable for the manufacture of Portland Cement. The clay is a red plastic material and contains enough aluminum silica and iron to be cement making additive material.

**MILLSITE:** A millsite on which to build a large Portland Cement Mill, has been prepared on the property.

**ACCESS:** The property is situated within a quarter of a mile from U. S. Highway #89. An access road from the highway intersects the property.

**RAILROAD:** The property is within one mile of the Atcheson, Topeka and Santa Fe Railroad. The area was once traversed with a railroad, but rails are removed, grade remains.

**POWER:** Electric power is within one mile of the property.

**WATER:** The Abra Water Company, a Public Utility, has made 10,000 gallons of water per minute, available to the said Claims. The Abra Water Company is situated within five miles of the said property.

## APACHE LIMESTONE GEOLOGIC REPORT

This large limestone deposit is located in the south end of the Juniper Mountains in Yavapai County, Arizona. Thirty-six miles north of Prescott, Arizona and close to State Highway #89. The property consists of eight fractional quarter section placer mining claims, known as Apache Limestone, numbers one through eight, consisting of all fractional Sections 1 and 2 in Township 18 North-Range 2 West (1,134 acres more or less) near Drake, Arizona.

The claims lie within sight of Highway #89 and to the west of the highway. The topography is one of gentle long slopes, mostly conforming to the bedding of the underlying limestones except where canyons have been eroded through these beds. The limestone beds have a very slight dip to the southeast and are relatively unfaulted.

Vegetation consists of scrub pine, pinion and juniper trees and low brush with sparse grass. The rainfall is around three to five inches per year with occasional heavy winter snows.

Good access to Highway 89 is provided by the County maintained Bullock Road which traverses considerable of the area.

### HISTORY:

This area was formerly the site of an early day limestone kiln as evidenced by the still standing structure (see two photographs) and one important enough to rate a railroad to its operation. Production here in about 1890, amounted to about 50,000 tons total of lime products. The rails are now gone, but the rail bed is in evidence on claims 5 and 8.

About 1960 the Henry Kaiser Company, through one of its subsidiaries, the Republic Cement Corporation was organized to bid for the cement to be used on the Glen Canyon Dam project (which contract was eventually awarded to the Riverside Cement Company of Riverside, California.

The Republic Cement Corporation drilled a number of drill holes in the area, mostly on claims 2 and 5. These holes were diamond drill holes in the surface exposed limestone areas. The clay and caliche were probably drilled with a bucket type drill rig. No drill sites of this type are in evidence today.

The geologic survey of this deposit was made near the end of August, 1967. The purpose was to prepare a detailed geologic map of the area and to delineate structure and extent of this very large economic carbonate body in the Southern Juniper Mountains of Arizona.

The claims are now properly claimed and recorded and are owned by Harry and Marie Beckelman, one-half interest; L. W. Armour, one-eighth interest; Elsie Nokes, one-eighth interest; Leland Lindley and his mother, Della Lindley, one-fourth interest, a California group.

### REGIONAL GEOLOGY:

The topography here is the range and basin type with volcanic

lava remnants capping beds to the north. Water in streams flowing from the northwest has cut steep walled canyons on the northern boundary of the claims. These canyons are generally not over 100 feet deep. Bare mountain slopes are mostly limestone exposures and the alluvium covered slopes and valleys are covered with red and brown clays and tan white caliche beds of varying thicknesses.

To the northeast the Mogollon Rim Country rises steeply ten miles away with heavy timber country stretching away from its rim to the north and northeasterly direction.

#### LOCAL GEOLOGY:

##### Stratigraphy (Lithology) -

1. The recent alluvium here is a river flood plain type of clay deposit. It is a red-brown heavy clay with inclusions of caliche, silicious (cherty) concretions and basalt fragments.
2. Next in the column is a bed of tan-white, fluffy, loose, uncompacted, light weight caliche with limestone pebbles, silicious concretions, basalt fragments and other sedimentary deposited impurities.
3. The surface outcrop of limestone is a gray-tan hard crystallized rock of the Redwall and Martin group, under which lies the Tonto quartzite group.
4. The Tonto formation is not exposed in the area of the claims but is exposed several miles to the southwest.

The Redwall formation, the top of which is exposed in a canyon about 100 feet deep that skirts along the north boundary of the claims. The surface contact with overburden alluvium is plotted on plan map. This exposed area has 12 drill holes drilled in the exposed bedrock portions. The drill holes were put down only in claims 2 and 5. The drill holes were put down as 1½ inch diamond drill holes. A few of these cores are available for inspection. Several holes of 2 inch size were also drilled.

The red-brown clay was deposited as stream flood plain deposits and covers most of claims 5, 6, 7 and 8. In some places it is 50 feet deep (drillers verbal data?). The tan white caliche probably underlies the red clay everywhere except where the limestone is exposed near the canyon area of claims 1 and 2.

#### Geological Structural Features

There are no structural features prominent here, except the Limestone Creek on the north side of claims and its clearly exposed limestone cliffs. No major faults are exposed or mapped within this report area, but faults do occur to the northeast, toward the "Rim Country".

See profile or cross-section map included with report. Plan map shows claim location or discovery pits and surface geology.

Redwall Limestone -

This massive bedded gray limestone bed appears to be a coarsely crystalline metamorphic rock of Mississippian age with few impurities. Chemical analysis is as follows - 96.88% CaCO<sub>3</sub> to 99% plus CaCO<sub>3</sub>. It is low in iron, magnesium, silica and alkali salts.

The Redwall bed is very consistant as to color and grain size but in places it tends to become a dense fine grained limestone. Grain or crystal size is around 1/8 inch, the rock has an average hardness of 3.5 and a specific gravity of 2.59.

GEOLOGIC COLUMN OF THE AREA

	<u>Thickness</u>	<u>Age</u>
Alluvium (Red Clay White tan Caliche)	50' 30'	Quaternary to recent
Basalt	100 - 200'	Miocene
Clay (limey)	50 - 70'	Miocene
Redwall Limestone - w/agglomerate lenses	200'?	Mississippian
Martin Limestone - w/agglomerate lenses	200'?	Devonian
Quartzite	100 - 200'	Pre-Cambrian
Granite Basement		

General Discussion of Cement Limestones:

A plant chemist usually determines what type of materials to blend for a certain type of cement. A region like the Apache claims area usually has within a few miles all of the necessary materials. Iron ore, high grade hematite ore exists about 25 miles to the northwest, near Seligman, Arizona. High alumina clays can be found usually associated with hydrothermally altered areas and these are not too far distant. The pipestone high alumina clay deposits are in the area. Silica is abundant in the area of the Mogollon Rim in the large sandstone deposits (flagstone rock) about 10 miles in a north-east direction.

Blended Portland Cement mixtures ready to be put into kilns usually have the following chemical limits (dry basis).

Lime (CaO) - - - - -	42-45%
Silica - - - - -	13-16%
Alumina - - - - -	4-6%
Iron Oxide - - - - -	-2-3%
Carbon Dioxide (CO <sub>2</sub> ) - - - - -	33-35%
Remainder* - - - - -	1-3%

\*(Includes magnesia (MgO) and alkalis, such as K<sub>2</sub>O and Na<sub>2</sub>O)

The degree of variance within these ranges depends upon the type of cement being produced and whether these raw materials are available in the area.

Notes:

A high alumina clay that is suitable for blending with other materials, usually ranges from 22 to 25% Al<sub>2</sub>O<sub>3</sub> and is free of alkali salts. (Usually 3% is maximum allowed here).

Magnesium oxide content of Portland Cement klinker must be kept below 5 percent, most cement plants will not use a limestone which, in raw ore form, averages more than 3 percent MgO. Alluvial and residual clays, clay shale, and quartz-mica schist are common forms of sources of alumina and silica. Quartzite, high alumina laterite, partly altered volcanic rock, and quartz diorite can be used if they chemically supply the need.

Gypsum, an essential additive in all types of Portland Cement, (used to control the setting time) is used from 2 to 5 percent. There are fine gypsum deposits about 30 miles east of the Apache claims in the area of Camp Verde, Arizona.

LABORATORY RESULTS:

<u>Red Clay</u>	<u>Approx. %</u>	<u>Caliche</u>	<u>%</u>
CaO - - - - -	9%	CaO - - - - -	46%
K <sub>2</sub> O - - - - -	1.5%	K <sub>2</sub> O - - - - -	1.3%
MgO - - - - -	2.5%	MgO - - - - -	3%
Na <sub>2</sub> O - - - - -	4%	Na <sub>2</sub> O - - - - -	6%
Al <sub>2</sub> O <sub>3</sub> - - - - -	19%	Al <sub>2</sub> O <sub>3</sub> - - - - -	4 - 5%
SiO <sub>2</sub> - - - - -	40%	SiO <sub>2</sub> - - - - -	34%
Fe <sub>2</sub> O <sub>3</sub> - - - - -	5%	Fe <sub>2</sub> O <sub>3</sub> - - - - -	1.5%

<u>Altered Sedimentary Clay</u>	<u>Approx. %</u>
CaO - - - - -	32%
K <sub>2</sub> O - - - - -	9%
MgO - - - - -	1%
Na <sub>2</sub> O - - - - -	.4%
Al <sub>2</sub> O <sub>3</sub> - - - - -	12%
SiO <sub>2</sub> - - - - -	34%
Fe <sub>2</sub> O <sub>3</sub> - - - - -	2.0%

### Sampling Procedure:

Three samples of raw materials were taken on the claims. These were all channel wall cuts in bulldozer cut trenches on the claims.

These samples were (1) The red clay horizon, a composite of four samples from four pits. (2) A composite sample from three caliche exposures in pits, and (3) A remnant limey red pink yellow semi-altered clay, located in the northeast corner of claim #1. This clay occurs in large deposits about  $1\frac{1}{2}$  miles to the north of the claims.

Each sample was about 30 pounds in weight. The composite sample of each was quartered down to small size by putting through a Jones riffle sampling device. Assays were done by Mecco Assayers of Los Angeles, California. (See analysis sheet.)

### Cement Plant Utilities:

(1) The area around claim 5 where railroad could terminate affords an excellent site for a cement plant or other mill site. The land is fairly level and has clay and caliche as surface soil.

(2) Railroad: The mill site area is about 2 miles from the main line of the Atcheson, Topeka and Santa Fe Railroad tracks to the east. The mill site area was once traversed with a railroad track but the rails were removed.

(3) At present electric power lines are within two miles of the mill site. Large power lines can easily be brought in from the Chino Valley area by the Arizona Power Company.

(4) Water for the mill can be obtained from the Abra Water Company, a Public Utility, has made 10,000 gallons of water per minute, available to the said claims. The Abra Water Company is situated five miles south of the mill site.

(5) The mill site area and the claims are located within a quarter of a mile of U. S. Highway #89. An access road, the Bullock Road, crosses over the property going west.

(6) A natural gas pipe line carrying enough gas for a large cement plant is available in a large 36" high pressure line located east and just alongside Highway #89. This would put it within  $1\frac{1}{4}$  miles of the proposed mill site.

### Conclusions:

(1) Using an open pit depth of 100' (or a mineable depth of), there is 300,000,000 tons of high grade limestone available here for cement manufacture. The material reported on is very consistant in color, grain size and other properties and one which should merit serious consideration by any leading cement manufacturer.

(2) It is a known cement limestone, as it was formerly qualified by an agency of the Federal Government, for a cement mill, to support a bid to furnish the cement for the Glen Canyon Dam Project.

(3) It has a fine "Industrial Potential" as the State of Arizona and the U. S. Government plan a series of new dams and electric power plants in the area around the Colorado River which will require large amounts of high test Portland Cement. Only one other cement plant can economically compete here for these projects and it is located at Clarksdale, Arizona.

(4) The eight fractional claims comprise 1,134.61 acres and are short about 145 acres of eight regular placer mining claims. If more claims are necessary, the sections to the north, 35 and 36, should be available.

(5) These Placer claims are for sale or lease and this one should merit careful consideration and examination by interested cement manufacturing companies.



APACHE LIMESTONE  
REPORT  
By  
NORMAN M NICHOLS  
MINING GEOLOGIST





Star Route, Box 8-B  
Mountain Center, Calif 92361  
February 21, 1968

The Director  
Natural Resources Dept  
ARIZONA DEVELOPMENT BOARD  
1521 W. Jefferson Street  
Phoenix, Arizona

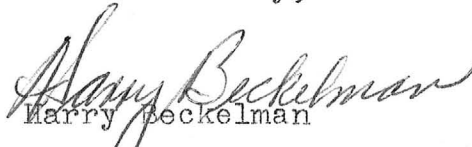
Dear Sir:

Here for your information and records is a copy of the most recent Geology, and Geological Appraisal on our Apache Limestone Claims in Yavapai County, Arizona.

Please feel free to make the information contained in this Report available to any prospective operators. And, I might add that we have been informed by a reliable firm in Phoenix, that lease-back money is available in Arizona for qualified operators.

Also, please acknowledge receipt of this Report and thank you for the courtsey.

Most sincerely,

  
Harry Beckelman

HB/mk.  
Encl 1.

## APACHE LIMESTONE GEOLOGIC REPORT

This large limestone deposit is located in the south end of the Juniper Mountains in Yavapai County, Arizona. Thirty-six miles north of Prescott, Arizona and close to State Highway #89. The property consists of eight fractional quarter section placer mining claims, known as Apache Limestone, numbers one through eight, consisting of all fractional Sections 1 and 2 in Township 18 North-Range 2 West (1,134 acres more or less) near Drake, Arizona.

The claims lie within sight of Highway #89 and to the west of the highway. The topography is one of gentle long slopes, mostly conforming to the bedding of the underlying limestones except where canyons have been eroded through these beds. The limestone beds have a very slight dip to the southeast and are relatively unfaulted.

Vegetation consists of scrub pine, piñon and juniper trees and low brush with sparse grass. The rainfall is around three to five inches per year with occasional heavy winter snows.

Good access to Highway 89 is provided by the County maintained Bullock Road which traverses considerable of the area.

### HISTORY:

This area was formerly the site of an early day limestone kiln as evidenced by the still standing structure (see two photographs) and one important enough to rate a railroad to its operation. Production here in about 1890, amounted to about 50,000 tons total of lime products. The rails are now gone, but the rail bed is in evidence on claims 5 and 8.

About 1960 the Henry Kaiser Company, through one of its subsidiaries, the Republic Cement Corporation, located part of this area and part in Section 35 and Section 36 of Township 18N-Range 2 West. The Republic Cement Corporation was organized to bid for the cement to be used on the Glen Canyon Dam project (which contract was eventually awarded to the Riverside Cement Company of Riverside, California).

The Republic Cement Corporation drilled a number of drill holes in the area, mostly on claims 2 and 5. These holes were diamond drill holes in the surface exposed limestone areas. The clay and caliche were probably drilled with a bucket type drill rig. No drill sites of this type are in evidence today.

The geologic survey of this deposit was made near the end of August, 1967. The purpose was to prepare a detailed geologic map of the area and to delineate structure and extent of this very large economic carbonate body in the Southern Juniper Mountains of Arizona.

The claims are now properly claimed and recorded and are owned by Harry and Marie Beckelman, one-half interest; L.W. Armour, one-eighth interest; Elsie Nokes, one-eighth interest; Leland Lindley and his mother, Della Lindley, one-fourth interest, a California group.

### REGIONAL GEOLOGY:

The topography here is the range and basin type with volcanic

lava remnants capping beds to the north. Water in streams flowing from the northwest has cut steep walled canyons on the northern boundary of the claims. These canyons are generally not over 100 feet deep. Bare mountain slopes are mostly limestone exposures and the alluvium covered slopes and valleys are covered with red and brown clays and tan white caliche beds of varying thicknesses.

To the northeast the Mogollon Rim Country rises steeply ten miles away with heavy timber country stretching away from its rim to the north and northeasterly direction.

#### LOCAL GEOLOGY:

##### Stratigraphy (Lithology) -

1. The recent alluvium here is a river flood plain type of clay deposit. It is a red-brown heavy clay with inclusions of caliche, silicious (cherty) concretions and basalt fragments.
2. Next in the column is a bed of tan-white, fluffy, loose, uncompactd, light weight caliche with limestone pebbles, silicious concretions, basalt fragments and other sedimentary deposited impurities.
3. The surface outcrop of limestone is a gray-tan hard crystallized rock of the Redwall and Martin group, under which lies the Tonto quartzite group.
4. The Tonto formation is not exposed in the area of the claims but is exposed several miles to the southwest.

The Redwall formation, the top of which is exposed in a canyon about 100 feet deep that skirts along the north boundary of the claims. The surface contact with overburden alluvium is plotted on plan map. This exposed area has 12 drill holes drilled in the exposed bedrock portions. The drill holes were put down only in claims 2 and 5. The drill holes were put down as  $1\frac{1}{2}$  inch diamond drill holes. A few of these cores are available for inspection. Several holes of 2 inch size were also drilled.

The red-brown clay was deposited as stream flood plain deposits and covers most of claims 5, 6, 7 and 8. In some places it is 50 feet deep (drillers verbal data?). The tan white caliche probably underlies the red clay everywhere except where the limestone is exposed near the canyon area of claims 1 and 2.

#### Geological Structural Features

There are no structural features prominent here, except the Limestone Creek on the north side of claims and its clearly exposed limestone cliffs. No major faults are exposed or mapped within this report area, but faults do occur to the northeast, toward the "Rim Country".

See profile or cross-section map included with report. Plan map shows claim location or discovery pits and surface geology.

Redwall Limestone -

This massive bedded gray limestone bed appears to be a coarsely crystalline metamorphic rock of Mississippian age with few impurities. Chemical analysis is as follows - 96.88% CaCO<sub>3</sub> to 99% plus CaCO<sub>3</sub>. It is low in iron, magnesium, silica and alkali salts.

The Redwall bed is very consistant as to color and grain size but in places it tends to become a dense fine grained limestone. Grain or crystal size is around 1/8 inch, the rock has an average hardness of 3.5 and a specific gravity of 2.59.

GEOLOGIC COLUMN OF THE AREA

	<u>Thickness</u>	<u>Age</u>
Alluvium (Red Clay (White tan Caliche)	50' 30'	Quaternary to recent
Basalt	100 - 200'	Miocene
Clay (limey)	50 - 70'	Miocene
Redwall Limestone - w/agglomerate lenses	200'?	Mississippian
Martin Limestone - w/agglomerate lenses	200'?	Devonian
Quartzite	100 200'	Pre-Cambrian
Granite Basement		

General Discussion of Cement Limestones:

A plant chemist usually determines what type of materials to blend for a certain type of cement. A region like the Apache claims area usually has within a few miles all of the necessary materials. Iron ore, high grade hematite ore exists about 25 miles to the northwest, near Seligman, Arizona. High alumina clays can be found usually associated with hydrothermally altered areas and these are not too far distant. The pipestone high alumina clay deposits are in the area. Silica is abundant in the area of the Mogollon Rim in the large sandstone deposits (flagstone rock) about 10 miles in a north-east direction.

Blended Portland Cement mixtures ready to be put into kilns usually have the following chemical limits (dry basis).

Lime (CaO)	-- -- -- -- --	-42-45%
Silica	- - - - -	-13-16%
Alumina	- - - - -	-4-6%
Iron Oxide	- - - - -	-2-3%
Carbon Dioxide (CO <sub>2</sub> )	- - - - -	-33-35%
Remainder*	- - - - -	-1-3%

\*(includes magnesia (MgO) and alkalies, such as K<sub>2</sub>O and Na<sub>2</sub>O)

The degree of variance within these ranges depends upon the type of cement being produced and whether these raw materials are available in the area.

Notes:

A high alumina clay that is suitable for blending with other materials, usually ranges from 22 to 25% Al<sub>2</sub>O<sub>3</sub> and is free of alkali salts. (Usually 3% is maximum allowed here).

Magnesium oxide content of Portland Cement klinker must be kept below 5 percent, most cement plants will not use a limestone which, in raw ore form, averages more than 3 percent MgO. Alluvial and residual clays, clay shale, and quartz-mica schist are common forms of sources of alumina and silica. Quartzite, high alumina laterite, partly altered volcanic rock, and quartz diorite can be used if they chemically supply the need.

Gypsum, an essential additive in all types of Portland Cement, (used to control the setting time) is used from 2 to 5 percent. There are fine gypsum deposits about 30 miles east of the Apache claims in the area of Camp Verde, Arizona.

LABORATORY RESULTS:

<u>Red Clay</u>	<u>Approx. %</u>	<u>Caliche</u>	<u>%</u>
CaO	- - - - - 9%	CaO	- - - - - 46%
K <sub>2</sub> O	- - - - - 15%	K <sub>2</sub> O	- - - - - 1.3%
MgO	- - - - - 2.5%	MgO	- - - - - 3%
Na <sub>2</sub> O	- - - - - 4%	Na <sub>2</sub> O	- - - - - 6%
Al <sub>2</sub> O <sub>3</sub>	- - - - - 19%	Al <sub>2</sub> O <sub>3</sub>	- - - - - 4. - 5%
SiO <sub>2</sub>	- - - - - 40%	SiO <sub>2</sub>	- - - - - 34%
Fe <sub>2</sub> O <sub>3</sub>	- - - - - 5%	Fe <sub>2</sub> O <sub>3</sub>	- - - - - 1.5%

<u>Altered Sedimentary Clay</u>	<u>Approx. %</u>
CaO	- - - - - 32%
K <sub>2</sub> O	- - - - - 9%
MgO	- - - - - 1%
Na <sub>2</sub> O	- - - - - .4%
Al <sub>2</sub> O <sub>3</sub>	- - - - - 12%
SiO <sub>2</sub>	- - - - - 34%
Fe <sub>2</sub> O <sub>3</sub>	- - - - - 2.0%



### Sampling Procedure:

Three samples of raw materials were taken on the claims. These were all channel wall cuts in bulldozer cut trenches on the claims.

These samples were (1) The red clay horizon, a composite of four samples from four pits. (2) A composite sample from three caliche exposures in pits, and (3) A remnant limey red pink yellow semi-altered clay, located in the northeast corner of claim #1. This clay occurs in large deposits about  $1\frac{1}{2}$  miles to the north of the claims.

Each sample was about 30 pounds in weight. The composite sample of each was quartered down to small size by putting through a Jones riffle sampling device. Assays were done by Mecco Assayers of Los Angeles, California. (See analysis sheet.)

### Cement Plant Utilities:

(1) The area around claim 5 where railroad could terminate affords an excellent site for a cement plant or other mill site. The land is fairly level and has clay and caliche as surface soil.

(2) Railroad: The mill site area is about 2 miles from the main line of the Atcheson, Topeka and Santa Fe Railroad tracks to the east. The mill site area was once traversed with a railroad track but the rails were removed.

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*N. M. Nichols*

N. M. Nichols  
Mining Geologist

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### REGIONAL GEOLOGY:

The topography here is the range and basin type with volcanic



ED. EISENHAUER, JR.  
G. EISENHAUER RAYMOND

The EISENHAUER LABORATORIES  
316-322 South San Pedro Street  
Phone MADison 2-9328 . . . LOS ANGELES 13, CALIF.

Established 1916  
ASSAYERS  
METALLURGISTS  
CHEMISTS  
ORE TESTING

Sept. 18/62

Palm Canyon Rock Products, Inc.  
Palm Springs  
California

Subject: Assay of Limestone.

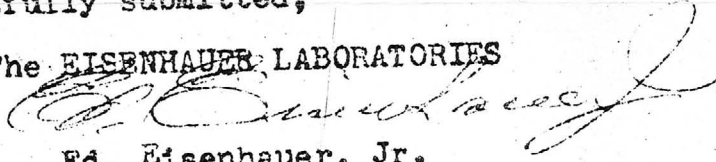
Marked: Limestone core.

Calcium carbonate (CaCO<sub>3</sub>)

96.88%

Respectfully submitted,

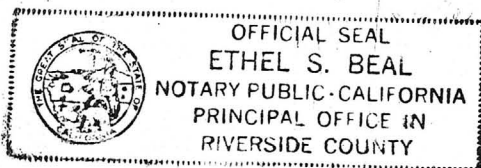
The EISENHAUER LABORATORIES


  
Ed. Eisenhauer, Jr.

I, HARRY BECKELMAN, certify that the above analysis<sup>15</sup> of Limestone samples ~~were~~ cut from the Apache Limestone claims on sections 1 and 2 Township 18 north, Range 2 west, Yavapai County Arizona.

  
HARRY BECKELMAN

Subscribed and sworn to before me on this 22nd day of December, 1962



  
Notary Public in and for  
said State.

ETHEL S. BEAL  
My Commission Expires Feb. 6, 1970

GEOLOGICAL APPRAISAL

Date: November 7, 1967

For: Harry Beckelman  
Star Route, Box 82-B  
Mountain Center, Calif. 92361

-----

PROPERTY: Eight fractional quarter-section placer mining claims, known as Apache Limestone Numbers One, Two, Three, Four, Five, Six, Seven and Eight, consisting of all of fractional sections 1 and 2, Township 18 North, Range 2 West, (1134 acres more or less), near Drake, in Yavapai County, Arizona.

MINERALS: Limestone, Argillaceous Limestone, and Clay.

GEOLOGY: The massive limestone beds that underlie the argillaceous limestone and clay are mainly in the north part of the claimed area. About 200 feet of the bedded limestone is exposed in the canyon. It is a tan crystalline limestone of the Redwall and Martin formations. Argillaceous limestone (caliche) overlies the major part of the claims with a sizable red clay deposit in the western part. Overall or average red clay thickness is probably 30 feet thick.

QUANTITY: The limestone beds here total 600-90 feet thick in places. Using a minable 100 foot thickness, 300,000,000 tons are available here. The caliche beds probably contain upwards of 10,000,000 tons and the red clay beds in the western part around 3,000,000 tons of usable material.

QUALITY: Chemical analysis on the limestone show that it runs from 96.88%  $\text{CaCO}_3$  to 99% plus  $\text{CaCO}_3$ . It is low in alkali, iron, manganese and silica. See copies of analysis of limestone. The argillaceous limestone contains principally calcium, aluminum, and silica. With the addition of argillaceous clay, and small amounts of the high-calcium limestone, it is suitable for the manufacture of Portland Cement. The clay is a red plastic material and contains enough aluminum silica and iron to be cement making additive material.

MILLSITE: A millsite on which to build a large Portland Cement mill has been prepared on the property.

ACCESS: The property is situated within a quarter of a mile from U.S. Highway #89. An access road from the highway intersects the property.

RAILROAD: The property is within one mile of the Atlanta, Topeka and Santa Fe Railroad. The area was once traversed with a railroad, but rails are removed, grade remains.

POWER: Electric power is within one mile of the property.

WATER: The Abra Water Company, a Public Utility, has made 10,000 gallons of water per minute available to the said Claims. The Abra Water Company is situated within five miles of the said property.

USES: Portland Cement, concrete aggregates, lime, limestone products.

MARKET: Central Arizona specifically, the Southwest generally.

VALUE: \$3 to \$5 million or more.

-----

Subscribed and sworn to before me this

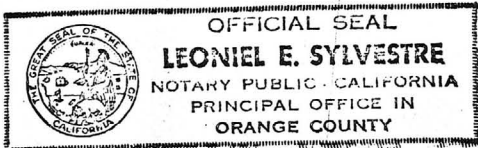
16 day of Dec 1967

*Leonel E. Sylvestre* Notary Public.  
State of California - Principal Office, Orange County

LEONIEL E. SYLVESTRE  
My Commission Expires Feb. 14, 1971

*Norman M. Nichols*

Norman M. Nichols  
Mining Geologist



ED. EISENHAUER, JR.  
G. EISENHAUER RAYMOND

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Established 1916  
ASSAYERS  
METALLURGISTS  
CHEMISTS  
ORE TESTING

Sept. 3/65

Leland Lindley  
Thousand Oaks  
California

Subject: Analysis of Limestone

Marked: #6-Limestone

Calcium oxide (CaO)	54.79%
Magnesium oxide (MgO)	0.08%
Ferric oxide (Fe <sub>2</sub> O <sub>3</sub> )	0.14%
Aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )	0.26%
Silica (SiO <sub>2</sub> )	1.68%
Loss on ignition	43.07%

Respectfully submitted,

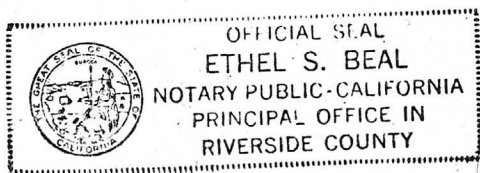
The EISENHAUER LABORATORIES

*Ed. Eisenhauer, Jr.*  
Ed. Eisenhauer, Jr.

I, HARRY BECKELMAN, certify that the above analysis<sup>is</sup> of Limestone samples ~~were~~ cut from the Apache Limestone claims on sections 1 and 2 Township 18 north, Range 2 west, Yavapai County Arizona.

*Harry Beckelman*  
HARRY BECKELMAN

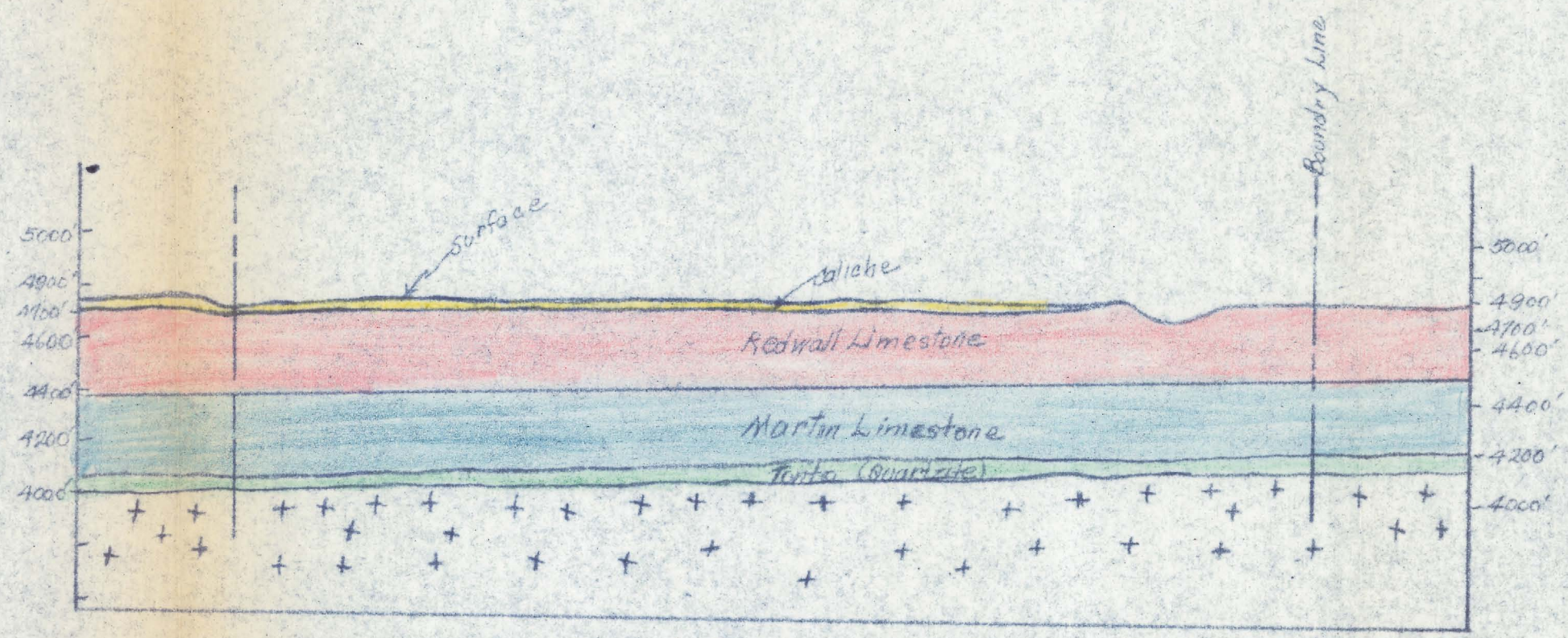
Subscribed and sworn to before me on this 22nd day of December, 1967.



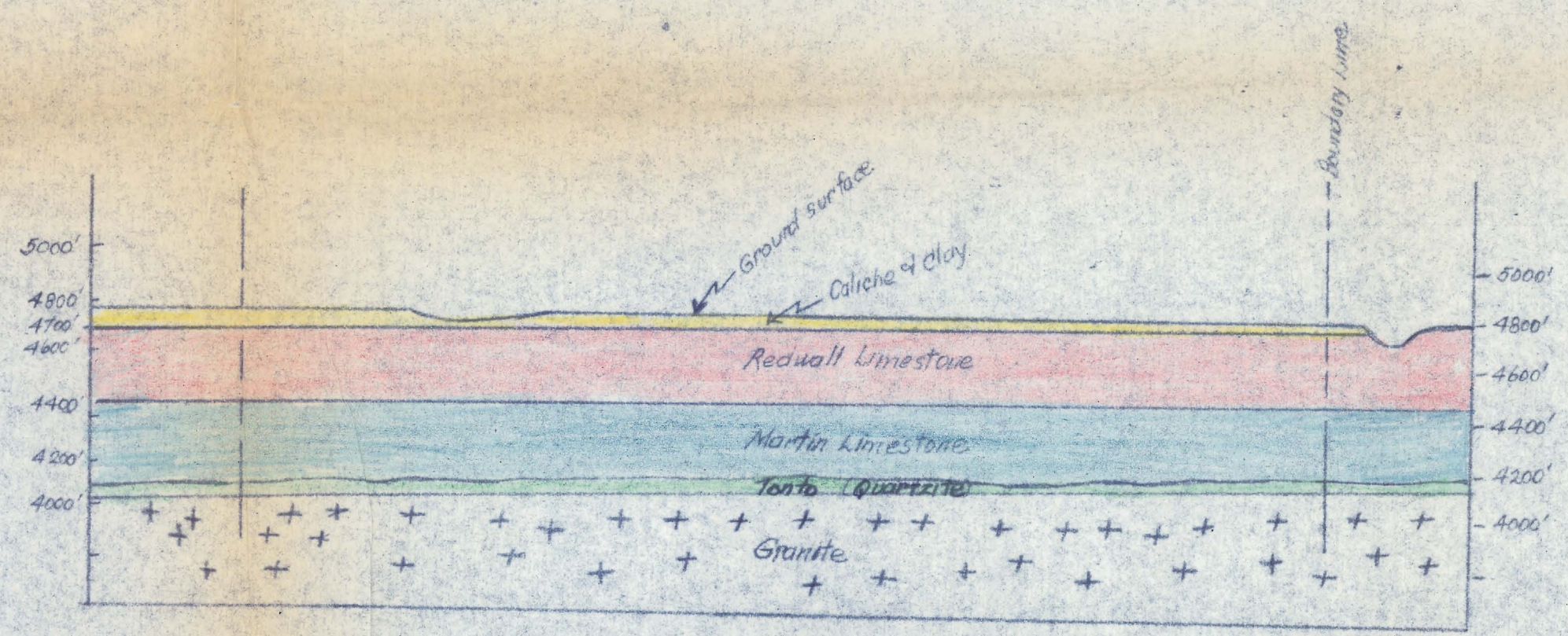
*Ethel S. Beal*  
Notary Public in and for  
said State.

ETHEL S. BEAL  
My Commission Expires Feb. 6, 1970





PROFILE A-A' LOOKING WEST  
Scale, Vertical and Horizontal 1"=60'



PROFILE B-B' LOOKING WEST  
Scale, Vertical and Horizontal 1"=60'

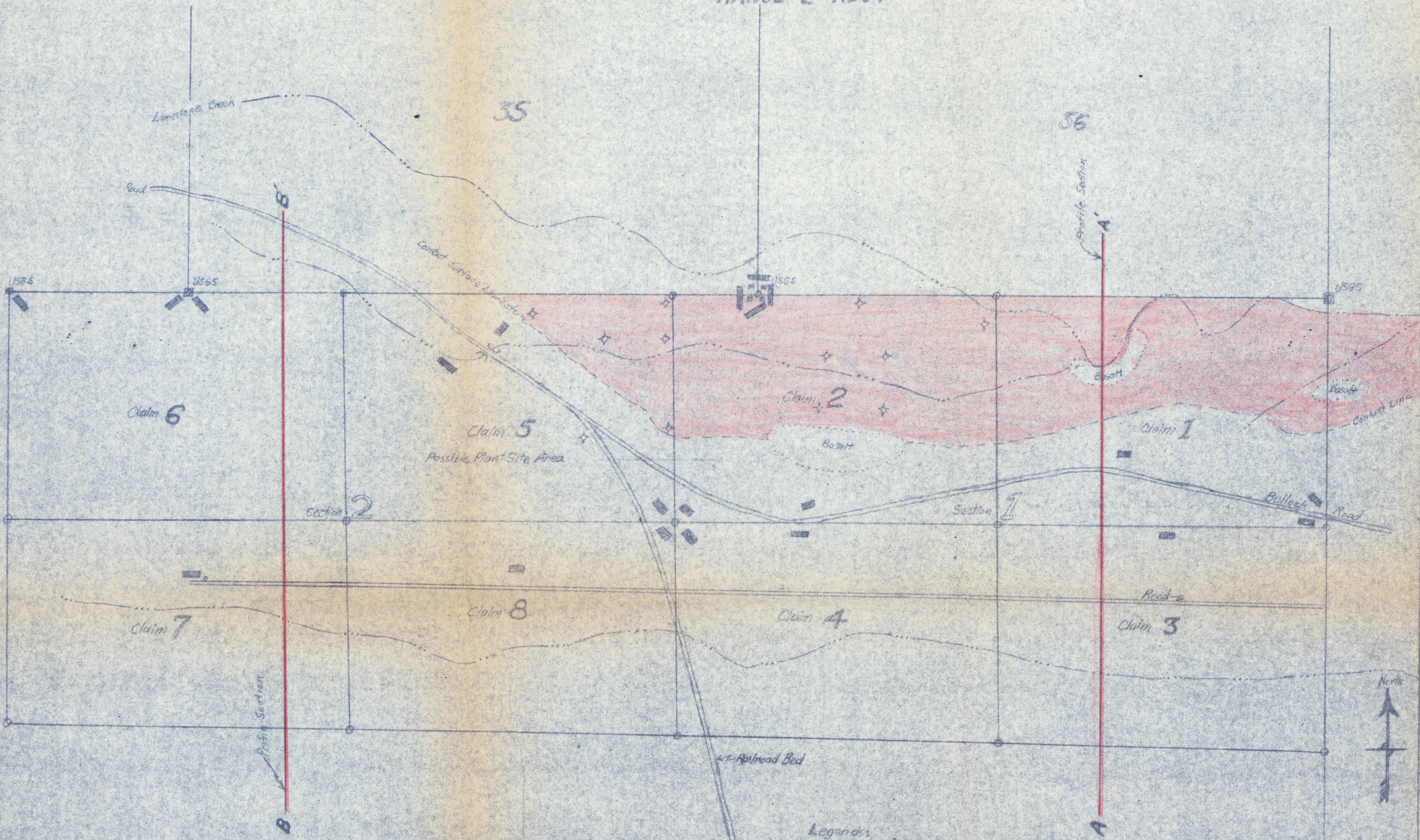
APACHE LIMESTONE  
CROSS-SECTION MAP

By HMMN  
Scale 1"=60' H+V. Date 9-7-67



RANGE 2 WEST

TOWNSHIP 18 NORTH



- Legends:
- Roads
  - Drill Holes
  - Formation Contacts
  - Claim Corners
  - USGS Section Corners
  - Location Claim Pits
  - Dry Creek Beds

**APACHE LIMESTONE CLAIMS**  
 Sections 1 and 2 T18N-R2W  
 YAVAPAI COUNTY, ARIZONA

Scale 1" = 60'  
 Date 9-7-67  
 By NMN

