



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

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

PRINTED: 03/05/2003

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: KLANER & DOOLIN

ALTERNATE NAMES:

FRANCONIA

VIVA LUZ (LIGHT OF LIFE)

MOHAVE COUNTY MILS NUMBER: 324A

LOCATION: TOWNSHIP 17 N RANGE 19 W SECTION 36 QUARTER --

LATITUDE: N 34DEG 48MIN 38SEC LONGITUDE: W 114DEG 15MIN 37SEC

TOPO MAP NAME: WARM SPRINGS SE - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

SILICON CRISTOBOLITE

CLAY KAOLIN

SAND & GRAVEL

BIBLIOGRAPHY:

ADMMR KLANER AND DOOLIN FILE

AZ. LAND DEPT. MASTER LEASE FILE LIST

NO. 1154

09/17/85

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: KLANER & DOOLIN

ALTERNATE NAMES:
FRANCONIA

MOHAVE COUNTY MILS NUMBER: 324A

LOCATION: TOWNSHIP 17 N RANGE 19 W SECTION 36 QTR. --
LATITUDE: N 34DEG 48MIN 38SEC LONGITUDE: W 114DEG 15MIN 37SEC
TOPO MAP NAME: WARM SPRINGS SE - 7.5 MIN

CURRENT STATUS: UNKNOWN

COMMODITY:

CLAY

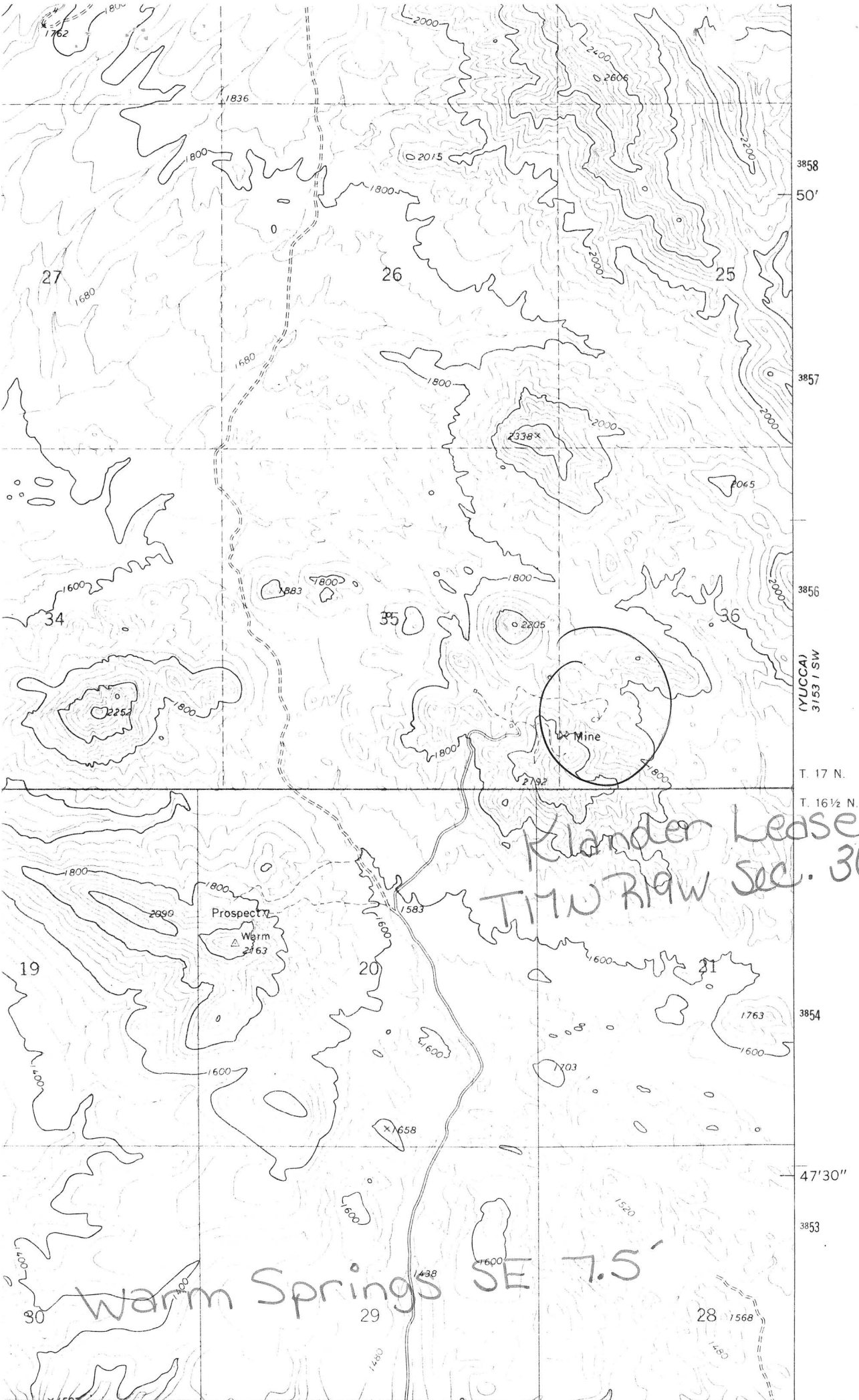
SAND & GRAVEL - COPRODUCT

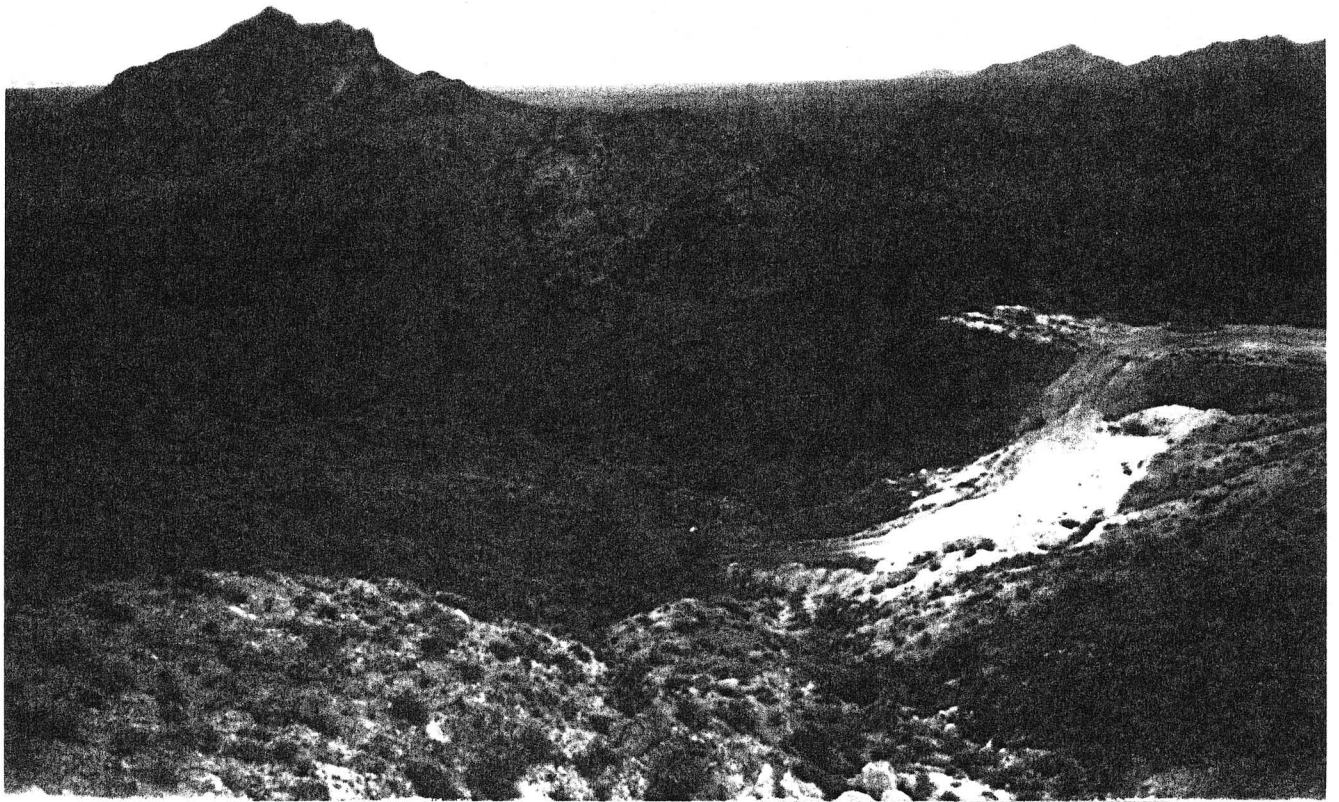
BIBLIOGRAPHY:

AZ. LAND DEPT. MASTER LEASE FILE LIST
NO. 1154

ADMR KLANER AND DOOLIN FILE

ADMR PHOTOS





A-100-16



1959

A-100-15

Name of Mine or Prospec Klaner & Doolin Pits	Township 17N	Range 19W	Section 35	Priority B
Principal Minerals: Kaolinite	1:250,000 Quad Needles	7.5' - 15' Quad Warm Spring SE		
Associated Minerals: Quartz, Cristobalite	District	Principal Product Clay		
Type of Operation: Surface: Open Pits	County Mohave	State AZ	Type of Deposit	
Ownership or Controlling Interest: New Mexico and Arizona Land Company				
Access: From Topock, AZ, proceed east on U.S. 66 for 12.5 miles. Turn left on unimproved road for 6 miles. Mine is shown on topographic quadrangle (unnamed).				
Structural Control or Geological Association: "Past production, white kaolinite, quartz, cristobalite." ¹ "The deposit occurs within a massive northwest-trending hydrothermally altered rhyolite dike. The country rock consists of andesite and latite which overlies a basement of Precambrian gneiss." ³				
Age of Mineralization:				
Production History		Geochemical Analyses		
20,000 or 30,000 tons of ore are exposed in open cuts; Actual production figures are unknown.		Sample # 20-III-80-2 ³ Au=None Ag=0.6 oz/ton (Union Assay Office, Inc.)		
References				
1) Elevatorski (1979) p. 40 2) ADMR file, Phoenix, AZ 3) Field Reconnaissance, Exploration Research Associates Incorporated.				

To Franconia - still idle. FTJ WR 5-10-71

Went to Franconia but couldn't get to the tuff grinding and sizing plant due to an approach road being built from the freeway, but looked it over with binoculars. No sign of recent activity. GW WR 4/6/72

I drove to the Franconia Clay plant where I collected three samples for analysis. VBD WR 1/8/75

Went on to Franconia and got a sample of the kaoline from the bin. The gate was locked and it was reported that the watchman was confined in a Vet's hospital. GW WR 4/4/74

Went to the Horseshoe Dam vicinity and got some grab samples of the so called clay. It appears to be weathered tuff in which the alteration has not extended to the clay stage. The deposit crops out for close to 2 miles and in a generally E-W direction and dips 10° - 50° to the south, the dip increases to the west as the deposit approaches the mountains. In places there are hard layers from a few inches to a few feet in thickness. Near the east end of the outcrop the lower portion becomes quite massive forming a cliff 15 to 20 feet high. In only a very few places noted were there clay-like material and it is only 4"-6" thick. Took 4 samples of clayey material to Walt Statler for analysis for Al_2O_3 and SiO_2 . The samples were all grabs from the Charbonneau, Cibola, Horseshoe and Franconia deposits. GW WR 1/23/75

GM/WR 3/6/79 - Mr. Ralph Starr (Barney) is mining "rhyolite" at the Franconia Mine north of Franconia. I think his mine is in a wilderness "roadless" area. 4/30/79 a.p.

NJN WR 1/15/88: Bob Nakaoka visited and reported that na Illinois company produces intermittently from the clay at the Klaner Doolin (file) Mohave County. The material is used to produce a fire retardent paint.

Visited Franconia - idle. FTJ WR 11-5-65

Visited the Franconia mill - no activity. FTJ WR 3-4-66

Visited Franconia property which has been operating about 2 weeks. U.S. Marble is doing the mining and milling. FTJ WR 5-6-66

Del Peterson visited re Franconia Mining Co. Owners are Glover, Hefner & Kennedy Oil Co., 1010 Kermac Bldg., Oklahoma City, Oklahoma. Material bagged at Franconia used principally for pressed brick refractories. FTJ WR 5-7-66

Franconia tuff operation is operating as usual. FTJ WR 9-9-66

Visited Franconia plant - which is idle. FTJ WR 11-5-66

Visited Franconia plant - which is still idle. FTJ WR 1-7-67

Franconia Mill and Mine were idle at the end of the quarter. FTJ QR 2nd 1966-67

The Franconia tuff operation remained idle during the quarter. FTJ QR 4-5-67

Visited the Franconia mill - idle. FTJ WR 9-8-67

Visited Franconia - idle. FTJ WR 7-12-68

Visited Franconia where operations are occasional to fill far between orders. FTJ WR 3-8-68

Visited the Franconia - they were idle. FTJ WR 11-8-68

Visited Franconia - no activity. FTJ WR 7-11-69

Visited Franconia - plant idel. Watchman said several people have been looking at the property but no definite plans made. FTJ WR 11-7-69

Visited Franconia - idle. FTJ WR 3-6-70

Visited the Franconia - idle - no plans as far as the watchman knew. FTJ WR 7-11-70

Visited Franconia plant - idle. FTJ WR 11-6-70

See 9. 16 N 1944
 Visited the Klaner & Doolin mine with crushing and sacking plant in operation at Franconia siding (approximately 10 miles east of Topock) and the quarry some 5 miles north of the plant. 11 men employed with Tris Norton as supt. The present product is roof granules. A building block plant is under construction. TPL WR 10-21-61

Visited the Klaner & Doolin tuff (?) property at Franconia. A block plant is under construction and occasional shipments of rock granules are going out from the crushing plant. The crew averages about 10 men. TPL WR 12-22-61

This is a tuff property. William Doolin, 325 W. 4th St., Scottsdale, Arizona - 10 men
 3-1-62

Visited Klaner & Doolin "Ark-o-lite" block plant at Franconia. Completion of plant is waiting delivery of supplies and some additional equipment. 3 men are employed with Tris Norton, supt. TPL WR 5-19-62

Paul Wilbert, 204 National Bank Bldg., Pittsburgh, attorney for the estate of Mrs. Mattie Klaner, visited to obtain information re the affairs of the tuff deposit and block plant project of Klaner & Doolin at Franconia. TPL WR 6-29-62

Plant visit with "Red" Williams

The operation is conducted by Klaner and Doolin of Phoenix

At present the quarry, 4 miles northwest of the plant, was idle, as a large stock pile of the kaolinized rhyolite tuff was built up at the plant. The haul by road to the quarry is 6½ miles. The plant was also idle while a key part to the crusher was being replaced. The tuff was being ground to 1½ inch, 3/8 inch, and 65 mesh sizes. It is sacked in 70 pound bags for 3/8 inch mesh material. The plant is on the Santa Fe Railroad. The 3/8 inch material is used mostly for airplane runways. The 1½ inch material is used for aggregates, roof covers, etc. A block and panel board plant is being erected. The shipment rate is now around 2 trucks per day of finished material.

The plant consists of a 12 x 20 inch Denver Equipment Co. crusher and multiple shaking screens, bins, conveyors, and an automatic weighing and sacking machine.

4 men are employed at the plant, when in operation, and 3 at the mine.

LAS Memo 9-6-62

Visited Klaner & Doolin Ark-o-lite plant at Franconia. Interviewed Tris Norton, supt. Block plant still not completed. Plant is idle, but expected to start soon. EGW WR 11-9-62

Active Mine List Oct. 1963 - 3 men

Visited Klaner-Doolin plant at Franconia. No activity. EGW WR 11-18-63

Date Printed: 10/14/92

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

Information from: Bob Needsman

Company: Heat Shield Technologies
Address: 8400 University Drive, Suite 316
City, State ZIP: Tamarac, FL 33321
Phone: 305-726-2774

MINE: Klaner-Doolin

ADMMR Mine File Klaner-Doolin
County: Mohave
AzMILS Number: 324A

SUMMARY

Bob Needsman of Heat Shield Technologies called with some specific information on the progress at the Klaner-Doolin property. They mined and shipped an 80 ton sample to Australia for evaluation for thermal shielding. Bob has backed off from trying to sell the material for the excessively high value uses and is working on producing a good non calcium carbonate paint filler at 18 microns particle size and maybe a silane coated 6 microns filler for plastics.

They still are having railroad problems with Santa Fe at the Franconia Siding and must arrange for a flagman from the railroad 48 hours in advance of their using the crossing at Franconia. They have to pay the railroad for the flagman.

Ken A. Phillips, Chief Engineer Date: October 14, 1992

*Klanner & Poolin file
Mohave County*

HEATSHIELD
TECHNOLOGIES, INC.

March 24, 1992

Mr. Ken Phillips, Chief Engineer
Arizona Department of Mines and Mineral Resources
1502 W. Washington
Phoenix, Arizona 85007

Dear Ken:

Again, we would like to thank you for your help at the Fort Mohave Indian Tribe meeting. Everything went smoothly and your presence was a positive factor in our project's acceptance.

Paul and I went back to the Viva Luz mine to make a Brunton and tape survey of the deposit. We did this because the existing map didn't seem right in scale and orientation. The resulting map is enclosed.

There appears to be three types of Klannerite: a high grade zone next to the chalcedony; a zone characterized by breccia and manganese-stained augen; and a greenish, less pure Klannerite located to the north of the chalcedony.

We have decided to concentrate our efforts on the high grade K1 zone, with only a few holes in the lower grade K2 and K3 zones.

We'll keep you informed of our progress and please feel free to visit the property when you have a chance.

Kind regards,

Bob Needham

Robert E. Needham

REN/jy

Enc.

ARIZONA NATURAL POZZOLAN PROJECT

Klanner & Doolin
Mine (F)
Mohave County

EXECUTIVE SUMMARY

Project Description

The project plan is to construct a 45,000 tpa plant to produce Arizona Natural Pozzolan (ANP), a white pozzolan produced from a silica-clay ore in northern Arizona.

Pozzolans are additives or admixtures to Portland cement. Pozzolans in themselves will not set up to a hard mass, but they do react with Portland cement to produce cementitious products. Pozzolans improve the quality of concrete, and include a wide variety of materials priced from \$35 to \$300 per ton delivered in bulk. ANP, due to its performance properties compared to competing materials, is expected to sell for \$80 to \$112 per ton, delivered in bulk in Phoenix.

Location, Access, Ownership

The ore deposit is accessed by a 6.5 mile gravel road from an interchange on Interstate I-40. The deposit is on an 80 acre parcel of land. Due to the steep topography and lack of utilities, it is envisioned that the ore used to manufacture ANP will be mined at the site and processed at a more convenient location near the Interstate.

The 80 acre parcel is privately owned, and United Minerals Corporation (UMC) has a perpetual mining lease subject to a royalty payment. United Minerals Corporation is a wholly owned subsidiary of the AIM Group, OTC BB symbol "AIGU"; website "aimgroup.com".

Geology and Ore Reserves

The ore is a hydrothermally altered tuff; alteration has produced a very pure, white rock consisting of cristobalite, kaolinite, tridymite, and quartz. This rock has been named Klannerite. The ultrafine grain size plus metastable nature of the mineralogy creates, after thermal activation, a reactive pozzolan. Geologic mapping has identified 3 types of Klannerite: K-1, very pure and white; K-2, slightly off color breccia of the same mineralogy; K-3, a rock with more clay. Both K-1 and K-2 yield excellent pozzolan; K-3 does not work as well, but little exploration and testing has been done on this material. The ore deposit has been stripped of overburden and test drilled. Thirteen reverse circulation six inch holes completely penetrate the deposit. The holes were sampled on 5 foot intervals, and analyzed by Lakefield Research, Canada. Cross sections were constructed in ACAD. Ore reserves in short tons are:

	K-1	K-2	Total
Proved	262,311		262,311
Probable	78,259	478,500	556,759
Geologic reserve	340,560	478,500	819,070
Mineable reserve (90%)	306,504	430,650	737,154

Market

Market constraints for ANP include price, introducing a new and different product, and cost of shipping constraints. A model of these constraints predicts sales starting at 25,000 tons and growing to 45,000 tons (plant capacity) over 3 years. This is smaller than the potential local market share which is expected to grow to 91,000 tons over 15 years. However, a larger plant, due to its capital cost, results in a lower project return and the ore reserve also limits the project size. Major market areas include Phoenix and Las Vegas.

ANP is a special pozzolan because it is white in color and can be used therefore with white Portland cement in such products as stuccos, tile grouts, and swimming pool plasters. The principal white pozzolan in this market sector is metakaolin from Georgia, costing more than \$200 per ton. For these applications ANP is expected to sell for \$112 per ton.

The larger market in terms of tonnage is pozzolan used with common grey Portland cement for general construction, roads, and bridge decks. In this market, ANP will compete against fly ash selling for \$35 per ton and silica fume selling for \$250 per ton. For these applications, ANP is expected to sell for \$80 per ton. ANP has already been submitted to the Arizona Department of Transportation (ADOT) and passed their performance tests.

Financial Results

The fixed capital investment, including land and utilities and both new and used equipment is \$4.8 million.

Cash direct operating costs including local supervision and office are \$31/ton. State mineral tax, royalties, selling expense, and central office costs (legal, accounting, executive management) are \$9/ton. On an unleveraged basis, the internal rate of return is 25%; the payback is 4 years, and the net present value at 12% is \$4.3 million.

Once financing is committed, the project can be built in about 1 year, 3 weeks.

United Minerals Corporation

UNITED MINERALS CORPORATION - NATURAL ARIZONA POZZOLAN

Preliminary Specifications - Class N Pozzolan

- Deposit description - The deposit is located in Mohave County, northwest Arizona and has drill-proved reserves. The rock, a clay-silica material, after proper heat treatment and grinding, is an excellent white Class N Pozzolan.
- White Cement Applications - The Arizona Pozzolan material is pure white, allowing its use in white cements, grouts, thin sets, and mortars, and architectural applications where color is important. The use of Arizona Pozzolan will lower the cost of the mix, while maintaining strength and preventing Alkali-silica reaction.
- Alkali-Silica Reaction (ASR) - The microcrystalline, high surface area natural silica contained in UMC's Arizona Pozzolan is especially indicated to control undesirable ASR typically caused by reactive South West aggregates.
- Specifications - The pozzolan has been tested by a major cement producer and an independent ASTM approved cement laboratory. Arizona Pozzolan meets or exceeds all specifications of ASTM C-618, "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete":

Klaner-
Doolin
Mind(f)
Mohave Co.

Test	Unit	ASTM spec	AZ Pozzolan
$\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$	%	≥ 70	92
SO_3	%	≤ 4.0	0.0
Moisture content	%	≤ 3.0	0.1
Loss on Ignition	%	≤ 10.0	3.0
Available alkalies, Na_2O equiv.	%	≤ 1.5	0.3
Fineness, retained on 325 mesh	%	≤ 34	8
Water requirement vs control	%	≤ 115	103
Strength activity, 7 days	%	≥ 75	93 to 98
Strength activity, 28 days	%	≥ 75	109 to 110

12 JUNE 98

DEAR KEN:

HERE IS SOME INFORMATION
ON THE KLANNERITE AND
POZZOLAN, WHICH WE WANT
TO CALL "ARIZONA POZZOLAN".

I'LL BE IN PHOENIX 23RD PM,
AND 24TH, THEN TO MINE ON 25TH
THEN PHOENIX ON 26TH PM.

I WANT TO MEET WITH YOU, BUT
SCHEDULE IS TIGHT. DINNER
TUES. NIGHT?

Bob Needham

12 JUNE 98

DEAR KEN:

HERE IS SOME INFORMATION
ON THE KLANNERITE AND
POZZOLAN, WHICH WE WANT
TO CALL "ARIZONA POZZOLAN".

I'LL BE IN PHOENIX 23RD PM,
AND 24TH, THEN TO MINE ON 25TH
THEN PHOENIX ON 26TH PM.

I WANT TO MEET WITH YOU, BUT
SCHEDULE IS TIGHT. DINNER
TUES. NIGHT?

Bob Needham

United Minerals Corporation

- Potential Alkali Reactivity of Aggregates - ASTM C 1260 - Arizona Pozzolan has been tested against a control mortar bar of type I cement, where 25% of the cement was replaced. The aggregate was a highly reactive New Mexico rock. The addition of 25% Arizona Pozzolan successfully controlled detrimental expansion:

	Control	25% AZ Pozzolan
7 day expansion, %	0.451	0.003
10 day	off scale	0.012
14 day	off scale	0.016
16 day	off scale	0.026

- Early Strength Formula - Typical pozzolans have the undesirable property of lowering the early strength (1 and 3 day). United Minerals Corporation has a special formulation under development with excellent early strength. Preliminary tests with this formulation give the following results, using ASTM C 109 method, "Compressive Strength of Hydraulic Cement Mortars" at constant flow:

Test	Unit	ASTM spec	25% AZ Special Pozzolan
Water requirement vs control	%	≤ 115	104
Strength activity, 1 day	%	N/A	97
Strength activity, 3 days	%	N/A	94
Strength activity, 7 days	%	≥ 75	104
Strength activity, 28 days	%	≥ 75	117
Strength activity, 56 days	%	N/A	121
Strength activity, 91 days	%	N/A	122

- Development Plans - Pending preliminary market approval, UMC plans the construction of a 70,000 tpa grinding, calcining, and storage facility to serve the Southwestern United States for construction pozzolans and the United States and foreign countries for white pozzolans.

For further information, please contact Bob Needham at United Minerals Corporation, Florida office, at 888-222-2197.

Klannerite Technical Information

What is Klannerite? - Klannerite is the name given to an unusual rock, from a mineral deposit in northern Arizona, USA, studied by the geologist John Klanner. The rock has been mined in the past for use as roofing granules, and the property is known locally as the "Viva Luz" mine.

Geology - The Klannerite deposit is a hydrothermally altered volcanic tuff of Miocene age. The deposit is cut by a NE-SW trending fault. Hydrothermal fluids moving along the fault have altered the Klannerite rock in 3 ways:

1. The rock has been partially silicified.
2. The rock has been purified, with most Fe, Ca, K, and Na removed by the hydrothermal fluids and redeposited in the enclosing wall rocks.
3. Feldspathic minerals have been altered to clay minerals.

The resulting Klannerite rock is white, pure, uniform, porous, and easily excavated. Three rock units have been mapped: a pure white rock denominated K1; an off color, brecciated rock denominated K2, and a still lower grade pale green rock denominated K3. The average composition of unprocessed K1 and K2 are compared to typical unaltered local volcanic tuff of rhyolitic composition:

	K1	K2	tuff
SiO ₂	81.30	76.88	73.66
Al ₂ O ₃	10.70	12.41	13.45
Fe ₂ O ₃	0.19	0.34	2.00
TiO ₂	0.35	0.18	0.22
MnO	<0.01	<0.01	0.03
MgO	0.35	0.77	0.32
BaO	0.04	0.04	<0.01
CaO	0.12	0.54	1.13
Na ₂ O	0.11	0.38	2.99
K ₂ O	0.08	0.21	5.35
Cr ₂ O ₃	<0.01	<0.01	<0.01
P ₂ O ₅	0.03	0.04	0.07
S	0.02	0.04	<0.01
H ₂ O	6.80	8.35	0.78
Total, %	100.09	100.20	100.00

Very little work has been done on the K3 unit; it is often brecciated and heavily stained. Similar hydrothermally altered tuffs are found in the region, but geologic reconnaissance has shown the other deposits to be much smaller and often less pure. Other rock units include tuff country rock and a chalcedony zone.

Mineralogy - Typical mineral composition of the K1 and K2 units is:

cristobalite	42
kaolinite, montmorillonite	30
tridymite	17
quartz	10
opal, volcanic glass, biotite, zeolites, other	1
Total, %	100

Cristobalite is a high temperature polymorph of quartz. This less common form of silica is less dense than quartz (2.32 vs 2.65), slightly softer (Mohs hardness 6.5 vs 7), has a lower index of refraction (1.49 vs 1.55), and belongs to a different crystal system (isometric vs trigonal). Tridymite is another polymorph of quartz which is also less dense (2.26) and with a lower index of refraction (1.47). Kaolinite and montmorillonite are 2 common clay minerals.

Thin section and SEM examination shows the rock to be microcrystalline, with anhedral mineral grains sized 1 to 3 micrometers. A 5 hour water boil shows 7.7% porosity. A mercury porosimeter was used to measure pore size. Pore size ranges from 0.007 to 0.04 micrometers.

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

Information Summary

Information From: **Bob Needan**

Company: Heat Shield Technologies

Address: 8400 University Drive Suite 316
City, State Zip Tamarac, FL 33321
Phone: 305-726-2774

Mine: **Klaner-Doolin**

ADMMR Mine File: **Klaner-Doolin**
County: **Mohave**
AZMILS Number **324A**

SUMMARY

Bob Needhan of Heat Shield technologies called with some specific information on the progress at the Klaner-Doolin property. They mined and shipped an 80 ton sample to Australia for evaluation for thermal shielding. Bob has backed off from trying to sell the material for the excessively high value uses and is working on producing a good non calcium carbonate paint filler at 18 microns particle size and maybe a silane coated 6 microns filler for plastics.

They still are having railroad problems with Santa Fe at the Franconia Siding and must arrange for a flagman from the railroad 48 hours in advance of their using the crossing at Franconia. They have to pay the railroad for the flagman.

Signed: Ken A., Phillips, Chief Engineer
Date: October 14, 1992

Date Printed: 10/14/92

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

Information from: Bob Needsman

Company: Heat Shield Technologies
Address: 8400 University Drive, Suite 316
City, State ZIP: Tamarac, FL 33321
Phone: 305-726-2774

MINE: Klaner-Doolin

ADMMR Mine File Klaner-Doolin
County: Mohave
AzMILS Number: 324A

SUMMARY

Bob Needsman of Heat Shield Technologies called with some specific information on the progress at the Klaner-Doolin property. They mined and shipped an 80 ton sample to Australia for evaluation for thermal shielding. Bob has backed off from trying to sell the material for the excessively high value uses and is working on producing a good non calcium carbonate paint filler at 18 microns particle size and maybe a silane coated 6 microns filler for plastics.

They still are having railroad problems with Santa Fe at the Franconia Siding and must arrange for a flagman from the railroad 48 hours in advance of their using the crossing at Franconia. They have to pay the railroad for the flagman.

Ken A. Phillips, Chief Engineer Date: October 14, 1992

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Information from: Bob E. Needham
Company: Heatshield Technologies
Address:
2. Phone: (305) 726- 2774
3. Mine: Klaner & Doolin
4. ADMMR Mine File: Klaner & Doolin
5. County: Mohave MILS Number: 324A
6. Summary of information received, comments, etc.:

The company has completed a geologic map of the deposit and will begin drilling on March 22, 1992. Twelve holes are planned. Ten are to be located within the outcropping deposit to quantify quality and quantity. Two are to be used to prospect for extensions of the deposit.

They are also going to produce about 300 tons of crude material so as to supply a trial order of 250 tons of ground product.

Heatshield Technologies uses the trademarked name *Klanerite* for the silica-kaolin rock.

Date: March 23, 1992 Engineer: Ken A. Phillips

K

MARCIA WEEKS
CHAIRMAN

RENZ D. JENNINGS
COMMISSIONER

DALE H. MORGAN
COMMISSIONER



JAMES MATTHEWS
EXECUTIVE SECRETARY

ARIZONA CORPORATION COMMISSION

SECURITIES DIVISION
(602) 542-4242

November 26, 1990

*KLANNER - DOOLIN
file
MOHAVE Co.*

Ken Phillips
Arizona Department of Mines & Mineral Resources
Mineral Building
Fairgrounds
Phoenix, Arizona 85007

RE: DOLPHIN INC./KLANNERITE

Dear Ken:

I am forwarding you copies of the correspondence we received from the investor, Mr. Allio. I am also forwarding a copy of the letter I sent him. I referred Allio to you for any technical questions he might have regarding Klannerite.

Thank you for your help. If you want to speak with me further, my direct line is 542-0629.

Sincerely,

ALAN BASKIN
Securities Specialist

AB:bb

Enclosure

VIS9.19

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Information from: Joe D. Sphar
2. Address: New Mexico -Arizona Land Co.
6100 Indian School Road, N.E., Albuquerque, NM 87110
3. Phone: 505-6644
4. Mine or property name: Klaner and Doolin
5. ADMMR Mine file: Klaner and Doolin
6. County: Mohave
7. MILS number: 324A
8. Operational Status:
9. Summary of information received, comments, etc.:

Talked to Mr. Sphar regarding the current status of their ownership of the private land portion of this deposit.

They have leased it to a company whose current name is PDC Industrial Coatings. Dolphin Chemical, Eterna-Tec, and Gold Coin Mining are other names that have been used by lessors. Through all the name changes, Ken Sain (of a Chicago Law Firm), 55 East Monroe, Chicago, IL 60603, Phone (312) 236-9637, has been the consistent contact. The lease has continued for 5 or 6 years with an annual rental of \$5,000. There has been no commercial production. A bulk sample of about 100 tons was removed during the past years. Lee Camel, Phone (219) 465-1808 in Valpariso, Indiana is the other principal.

In a related inquiry, an investor in Gold Coin Mining inquired of the of the Arizona Corporation Commission regarding a merger of Gold Coin with PDC Industrial Coating. The investor requested information on the mineral Klanerite. Klanerite is the pseudo trade name given to the siliceous kaolin from the Klaner-Doolin deposit.

PDC has made many claims for the kaolin as the basis for an energy reflective coating and/or a fire proof coating. A copy of their promotional material was provided by New Mexico-Arizona Land Co. Review of their material might lead one to believe they are not aware of the existence of other kaolin deposits in the world.

Date: Nov. 20, 1990

Ken A. Phillips

MR. ANGELO F. ALLIO
8525 DESOTO #60
CANDORA PARK, CA 91304
818-341-5629

Dec. 24, 1990

Corporation Commission
Phoenix, Az.

Gentlemen:

I have enclosed two news releases, one from Gold Coin Mining Corp. in which I hold shares and one from Dolphin Inc.

I would like to know if either of these two companies are registered with you, and if you, or an affiliated agency are able to verify the legitimacy of this operation. I have never heard of Klammite and do not find it listed in my Minerals Handbooks.

Please advise.

Sincerely,
Angelo F. Allio

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Information from: Ken A. Phillips
Company:
Address:
2. Phone:
3. Mine: Klaner and Doolin
4. ADMMR Mine File: Klaner and Doolin
5. County: Mohave MILS Number: 324A
6. Summary of information received, comments, etc.:

In the company of Sharon Bolling of Florida Tile and Rom Reyes of the Arizona Department of Commerce the Klaner and Doolin clay deposit was visited to obtain samples for evaluation in the manufacture of white body ceramic tile. Approximately 50 pounds were collected. Some was kept in storage at the ADMMR while half was sent to Florida Tile in Lakeland, Florida for analysis and testing.

Date: December 1989 Engineer: Ken A. Phillips 

Department of Mines and Mineral Resources
MINE AND PROSPECT FIELD VISIT DATA SUMMARY

Sheet 1 of 2

COMMODITIES: Clay "Kaolin"

MILS ID No.: Mohave 323 and 324A DATE: 4-5-89

ENGINEER: Nyal Niemuth and Ken Phillips

INFORMATION FROM: Field visit

PROPERTY SUMMARY

I. MINE NAME: Klaner-Doolin OTHER POSSIBLE NAMES Franconia Clay
INCL. ANY CLAIM NAMES NOTED:

II. LOCATION: T 17N R 19W SEC(S) 35&36 MINE DISTRICT

ELEV.: COUNTY TOPO QUAD.

DIRECTIONS: North from Franconia

MAP ATTACHED

III. OWNERSHIP: NAME Pfizer (circa 1984) PHONE:
currently Don Valin?

ADDRESS:

COMPANY NAME IF ANY:

PERTINENT PEOPLE:

IV. PROPERTY AND HOLDINGS: Unpatented K Claims by Don Valin

V. PAST PRODUCTION-NOTED, KNOWN, PROBABLE, UNKNOWN, NONE: + 500 tons.
Last production likely within past five years.

VI. CURRENT STATUS: Idle (Past Producer)

VII. WORKINGS: Open pit. Two benches, lower 150x50x30' high, upper
50 x 20 x 29' high. Both upper and lower benches developed. Additional
material to east is prospected.

SHEET 2 of 2

**VIII GEOLOGY AND MINERALOGY: DEPOSIT TYPE: Hydrothermal alteration of
rhyolite tuffs**

LENGTH: +1000' WIDTH +300 VEIN STRIKE E-W DIP +300 Depth

HOST ROCK: Altered rhyolite tuffs, tertiary volcanics

ECONOMIC MINERALS: Clay "Kaolin"?

**COMMENTS: Silicification and argillation of rhyolite tuffs resulting
"kaolin" i.e. white massive clay deposit. Additional resources likely one
mile west at Clay Deposit (Mohave MILS #323A).**

IX. EQUIPMENT ON SIGHT: None

**X. SAMPLING: NOTE TYPE IF ANY, DRILLING? ADMMR 28046 and 7. 046 clay with
fines from lower pit floor, 047 select lumps of clay.**

XI. REFERENCES AND REMARKS:



Dolphin Inc.

5609 MURVILL ROAD - VALPARAISO, INDIANA 46383 - (219) 485-1808 - TELEX 725491 - FAX NO. (219) 464-1508

September 23, 1990

Dear Shareholders and Investors:

I am very pleased to welcome you to the new merged corporation which is the result of the acquisition of Dolphin, Inc. (a process chemical corporation) of Valparaiso, Indiana and Gold Coin Mining of Spokane, Washington.

The joining of the Corporations took place because of the needs of both corporations. Dolphin had reached the size and maturity where access to the public market was needed to sustain it's future growth and accelerate it's overseas expansion. Gold Coin Mining's shareholders desired to begin the formation of a broader based corporation rather than be totally dependent on the price of Gold. This joining accomplishes both goals.

Dolphin, Inc. brings a financial history of 19 years of growth and profit. It's current sales are 4 Million dollars per year, with a realistic expansion to the 8 to 10 Million dollar range by the year 1994. This is based upon new technologies and an ever increasing market share.

Dolphin, Inc. has recently signed agreements with Koma Engineering and Choongwae Industrial Group of Seoul, Korea. These agreements are for the manufacture, marketing, and sales of Dolphin products in Korea. For this licensing agreement, Dolphin, Inc. receives a minimum of 5% of the equivalent of gross sales. Total sales are expected to reach 10 Million dollars by 1994 from this venture alone.

The new Gold Coin/Dolphin has entered into an agreement to acquire PDC Industrial Coatings (a publicly traded Vancouver Stock Exchange Company). This merger will take place on a 1:1 basis and will be completed in the shortest possible time.

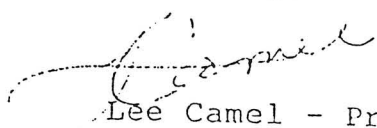
PDC brings to the new company substantial assets - but more importantly, technology which has been demonstrated to produce energy savings in the range of 12% to 24% depending upon the application. The source of the mineral which makes this possible is located in Northwest Arizona and has a minimum deposit size of 400,000 tons with projections as high as 5,000,000 tons. The exact size will be determined in the near future.

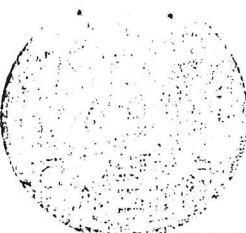
What has been referenced is only one known application and market. The coating made from this exclusive mineral deposit sells for \$70./gallon. Based on the energy savings derived on testing for one particular application the coating has a payback time of four (4) days in use and a life of 3-6 months. Because of the unique crystalline structure, we believe there are many applications in the paint pigment market, ceramics and paper industry.

When you look at the final corporation you have the following:
Gold Coin Mining, Inc. - NASDAQ listed with proven assets;
Dolphin, Inc. - Sales, cash flow, profits, proven management;
P.D.C. Industrial Coatings, Inc. - large potential upside.

We at Dolphin/Gold Coin are very excited about the future. Your expectations for your company should include greater communication with the Dolphin/Gold Coin team. In the future I will write frequently and in greater detail to keep you current with the progress of your company. I would like to ask all of you as you become more familiar with the products and new services of your company to actively seek and search economic opportunities which can further growth and profitability of the Corporation you own.

Sincerely,


Lee Camel - President
Dolphin/Gold Coin



Gold Coin Mining, Inc.
P.O. Box 1342 T.A. Spokane, WA 99220

FOR IMMEDIATE RELEASE

GOLD COIN MINING, INC., ANNOUNCES
ACQUISITION AND MERGER

Spokane, Washington
July 24, 1990

Gold Coin Mining, Inc., announced today that it has signed an agreement to acquire Dolphin, Inc., a privately owned chemical manufacturing company headquartered in Valparaiso, Indiana.

The agreement provides for the shareholders of Dolphin Inc., to exchange their shares in Dolphin Inc., for 3,650,000 shares in Gold Coin Mining, Inc.; 2,990,000 shares will be issued at closing and the balance issued as soon as possible after the Articles of Incorporation of Gold Coin have been amended to increase the number of authorized shares.

Upon completion of the Dolphin acquisition, Gold Coin agreed to a merger with P.D.C. Industrial Coatings, Inc., a publicly traded company listed on the Vancouver Stock Exchange. The merger provides for the P.D.C. shareholders to receive one (1) share of Gold Coin stock in exchange for one (1) share of P.D.C. stock. Presently, P.D.C. has 5,058,416 shares issued and outstanding, 2,000,000 earn-out shares allocated to be issued, and 2,105,000 warrants and options.

The agreement with Dolphin, P.D.C. and Gold Coin calls for the further issuance of not less than 1,300,000 shares to various finders, subject to the increase of the authorized capital of Gold Coin.

P.D.C. Industrial Coatings, Inc., has a mineral deposit with unique properties not known to occur elsewhere. This mineral has been used in a new ceramic coating which can save the U.S. Steel Industry upwards of \$94,000,000 a year on its energy bills. The company's new ceramic paint, or "Photon Diffusive Coating", as it is called, has the ability to reflect photons in the range of .5 through 7.5 microns, with an efficiency of 85%. This covers the UV through Infrared spectrum. It is possible that with modification it may be effective into the micro-wave areas, such as Radar, allowing for a wide variety of potential applications. According to P.D.C. President and CEO Lee Camel, "Because P.D.C. reflects the energy produced by common source, such as sunlight, natural gas, and other radiant sources, the product is effective as protective shielding, a fireproof coating, or alternatively as a means of reducing energy consumption".

Management has initially targeted two (2) major potential users of P.D.C. and its major component "Klannerite". They cover both ends of the spectrum. The first is the Steel Industry, due to its high consumption of energy in the production of steel. P.D.C. has been proven to be effective in reducing by as much as 18 to 24% the energy needed to reheat steel in "soaking pits", and

"Reheat Furnaces". When applied to the inside walls of "boiling pots", the coating appears to reflect the heat away from the walls and back into the furnaces", thus reducing the amount of energy necessary to achieve desired results. The Coating in this particular case is operating in the range of 2450 degrees F. Tests conducted at the Gary Works of the giant U.S.X. Corporation, in conjunction with a doctoral candidate at M.I.T., indicate an average fuel savings of 18% using P.D.C. Looked at another way, each gallon of P.D.C., projected to sell at \$70.00 U.S., resulted in an energy savings of \$520.00.

The other major area of commercial interest is in the Paint and Paper Industry. Klannerite, the mineral has commercial potential usages as a replacement for (TiO₂) Titanium Dioxide, a pigment widely used to insure "Whiteness" in paints and paper. It currently sells in the \$0.60/lb range at the low end, and as high as \$1.05 at the top end. P.D.C. has been approached by a British firm which has expressed an interest in acquiring the rights to mine, process and sell the klanerite mineral, and return a profit of about \$0.05/lb to P.D.C. Currently, the minimum estimate for reserve of the deposit is in the range of 500,000 tons, or 1,000,000,000 lbs. The high range is in the 4-6 million ton range. Accurate sampling will provide this data in the near future.

In addition P.D.C. may have significant commercial value in other industries, such as, ceramics, aluminum, chemicals, and construction; as well as, in certain military applications. The Company has even developed a consumer version of P.D.C. as a fireproof alternative to ordinary decorative house paint.

Dolphin Inc., manufactures and markets chemicals for the processing of steel prior to coating with various materials, such as tin, or zinc. It also manufactures and researches into other related areas for processing of finished metal products.

Dolphin Inc., was founded in 1971 and has progressed to a market penetration of almost \$4,000,000 in 1989.

"The merged company will have its headquarters in Valparaiso, Indiana, where Dolphin has operated from for almost 20 years", says Lee Camel Jr., President and CEO of Dolphin. Following completion of the transaction, Gold Coin will have greater assets and be in a better position to develop and expand both the specialty chemical and coating business, and the many valuable new products evolving from P.D.C. unique mineral deposit.

Dolphin has recently signed contracts with Koma Engineering of Seoul, Republic of Korea for the manufacture and marketing of its Steel Mill Process Chemicals. This relationship should increase sales in the range of \$1,500,000 per year. Dolphin is also very close to signing an agreement with Choongwae Industrial Products of Seoul for the manufacture and sales of its maintenance and consumer/light industrial products. The Chairman of Choongwae has projected future sales of Dolphin products at \$10,000,000 by the third year.

Dolphin Inc., currently is in negotiations with a major Korean company for the marketing of P.D.C. coating into the Steel Industry in Korea, Mainland China, Thailand, and Indonesia. It has also entered into negotiations with a major subsidiary of a U.S. Steel producer for the marketing support for P.D.C., worldwide.

The current Board of Directors of Gold Coin will be replaced by a new board yet to be named with Mr. Leroy Camel Jr., as President and CEO.

ETERNA-TEC CORPORATION

CONFIDENTIAL MEMORANDUM

PHOTON DIFFUSIVE COATING (PDC)

The information contained herein is highly proprietary and strictly confidential to the Eterna-Tec Corporation. PDC, a new and unique product developed and produced by Eterna-Tec, is a specific micro-crystalline shield for the prevention of photon absorption. It has the ability to diffuse or scatter wave energy for the purpose of protective shielding and fireproofing. PDC effectively shields or scatters electromagnetic radiation in the range of 0.5 to 5 microns. PDC is an effective protective shielding, fireproof coating and an energy savings material.

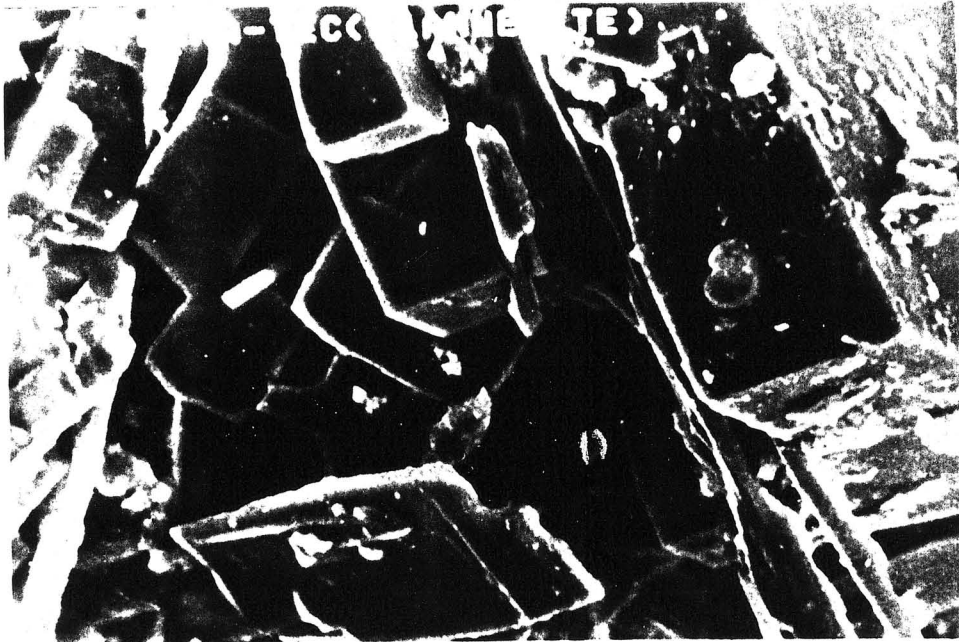
JANUARY, 1987

This memorandum contains the most current detailed product and proprietary information available and supersedes all prior memoranda on the subject matter.

EXECUTIVE SUMMARY

Eterna-Tec Corporation has created a Photon Diffusive/Fireproof Coating. This product is new and totally unique for the following reasons:

(1) A new form of a unique mineral deposit has been discovered and its only source is available through Eterna-Tec.



The Prismatic and Refractory Characteristics of the Mineral

(2) The newly discovered high purity crystalline structure has been modified and engineered by a proprietary chemical process to produce the Photon Diffusive/Fireproofing Coating.

This product which is now available from the Eterna-Tec Corporation is an easily applied coating consisting of a specific

micro-crystalline shield or barrier for the prevention of photon absorption. It has the ability to diffuse or scatter wave energy forms for the purpose of shielding and fireproofing.

Eterna-Tec's Photon Diffusive/Fireproof Coating is not a "High Emissivity Coating". "High Emissivity" materials absorb and then reradiate the energy and when closely monitored in most cases actually increase energy use.

PDC reflects/refracts energy photons in the range from visible to infrared. The coating is not an insulating material, it adds nothing to wall thickness beyond a few thousands of an inch.

APPLICATION:	Commercial airless sprayer or brush. (We are using Graco Airless 3000 psi sprayers with a variable orifice nozzle.)
COVERAGE:	Depending on substrate/50-150 S.F. per gallon.
SURFACE PREPARATION:	Minimal -- remove any loose materials, oils and greases.
CURRENT EVALUATORS:	J.P.L. Boeing USX (United States Steel Corporation) AVSCOM U.S. Testing Company U.S. Navy, Office of Ship Safety and Survivability

Gulf States Steel Corporation
LTV Steel Corporation
FMC

USES:

Protective Shielding/Fireproofing

Ship's superstructures
Aircraft interiors, exteriors and wheelwells
Transportational vehicles and train exteriors
and interiors
Buildings, interior walls and fire safe
corridors
Remote utility stations/non-minimal
facilities, exterior and interior walls

Energy Savings

Furnace and boiler interiors
Off gas hoods
Hot air ducts
Refrigerated tanks and trucks
Storage tanks
Cryogenice tank
Liquified gas storage tanks

Other Uses

Pigment enhancement
Optional enhancement
Diffusion of ultraviolet, infrared and radar
imaging
Reduction of thermal swing

ETERNA-TEC CORPORATION

PHOTON DIFFUSIVE COATING (PDC)

PDC is a specific micro-crystalline shield for the prevention of photon absorption. It has the ability to diffuse or scatter wave energy forms either on the inside of thermal operating units or on the outside surfaces of installations for the purpose of protective shielding. PDC effectively shields or scatters visible through infrared energy (0.5 to 5 microns). PDC is both an effective protective shielding and an energy saving material. Extensive testing has been performed on PDC.

JANUARY, 1987

This bulletin contains the most current detailed product information available and supersedes all prior product information bulletins on the subject matter.

PHOTON DIFFUSIVE COATING

PDC is a specific micro-crystalline shield for the prevention of photon absorption and the diffusion or scattering of energy photons either on the inside of thermal operating units or as exterior protection from various external energy photons. PDC can be used on the interior of heat-treat furnaces, soaking pits, annealing furnaces, etc., any where an energy saving material is desired and needed. Current industrial production tests have shown results ranging between 12-24% fuel savings with increased combustion air temperatures (via recuperators) of 200-300 F. Three and one-half months of testing was conducted at a facility which uses approximately 500 MM BTU's of energy per hour.

DESCRIPTION:

The micro-crystalline shield consists of a multiplicity of sub-micron orthorhombic crystals. The effect of this is to dramatically reduce infrared absorption and redirect over 85% of the infrared energy. Though the coating gives the appearance of stark whiteness, it is translucent; what is being seen is reflected/refracted photons of natural light.

By combining the natural properties of this mineral with a proprietary manufacturing process, which both restricts the maximum crystal lattice axis and assures maximum parallel alignment, the photon diffusive character of this mineral can be engineered in the visible and infrared region.

CHARACTERISTICS:

PDC is inert to most atmospheres found in the production of metals and glass. It has the co-property of masking refractories and metal substrates from the deleterious gases which destroy refractories and metal substrates. It has excellent adhesion to both metal and metal oxides. PDC retains all of its functional characteristics when sprayed on surfaces having an elevated temperature up to 3500F. Dramatic thermal cycling does not deteriorate the coating. PDC is engineered for maximum energy scattering to insure total thermal uniformity and the prevention of hot spots. Application is by conventional airless sprayer.

USES:

PDC can be used for the wetted surface of any heat entity to save energy and/or reduce maintenance. Typical examples are:

ENERGY SAVINGS

Soaking Pits
Reheat Furnaces
Melting Furnaces
Annealing Furnace
Heat Treat Furnaces
Permanent Mold Coating
Off Gas Hoods
Hot Air Ducts
Refrigerated Tank Cars and Trucks
Storage Tanks
Cryogenic Tanks
Liquified Gas Storage Tanks
Roofs

PROTECTIVE SHIELDING/FIRE PROOFING

Aircraft interiors, exteriors and wheel wells.
Ship's superstructures
Transportational vehicles and train
exteriors and interiors.
Commercial, residential (Public & Private) and
business buildings, interior walls and fire safe
corridors.
Remote utility stations and non-manned
facilities, exterior and interior walls.

OTHER USES

Pigment enhancement
Optical enhancement
Diffusion of ultraviolet and infrared.
Reduction of thermal swing.

Wm. F. Frank
5/12/87

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

BOX 14 — PHONE 632-7410

HUMBOLDT, ARIZONA 86329

ASSAY
MADE
FOR

Dept. of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Ariz. 85007

[illegible]

CHARGES 45.00

ASSAYER 220

Kloneer + Doolin
Clay Data

BLACK MOUNTAINS PLANNING UNIT 02-02

MINERALS

STEPS 3 and 4

from BLM- Kingman
office

Several minerals occur in minor amounts in the gold-quartz veins in the Black Mountains. Silver and lead production from these veins have been, and probably always will be, dependent on gold production. Vismuth, vanadium, beryllium, and fluorite also occur in the veins in small amounts. It is unlikely that these minerals will ever be produced in commercial quantities in the planning unit.

Brucite

Brucite-1 was designated on the basis of several blocks of mining claims located for brucite. Within this IMA is ~~an~~ MRA-1 that is based on the occurrence of the brucite deposits. According to several sources, (Step 3), these deposits consist of partially inventoried reserves. Although they are low-grade deposits, they should be considered a potential mineral resource. Increased demand for magnesium metal (Step 3) could result in development of these deposits in the foreseeable future. Likely mining methods could either be underground or open pit, since the deposits are sometimes nearly flat lying and other times steeply dipping.

Clay

The boundary of Clay-1 encloses an area in which several clay deposits occur. The boundary is rather arbitrary and is intended to indicate an area where clay is likely to be found; as more becomes known about clay occurrences in this area the boundary may change. MRA-³~~7~~ encloses the area in E $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 35, T. 17 N., R. 19 W., where clay was mined in the past. Published information indicates that there may be substantial reserves of good quality refractory clay at this deposit. At first glance, it appears that

an attempt to mine the clay failed; however, sustained production may not have been planned from the start since the clay was used in the construction of an airport. Further production will depend on similar needs or demand for refractory material. It is believed that the clay deposits in Clay-1 have potential for further production. Any future mining will continue to be by open pit.

Perlite

The boundary of Perlite-1 was designated on the basis of the geologic occurrence of a large perlite deposit. ^{MRA-4, which is located} ~~The MRA~~ within Perlite-1, designates an area estimated to consist of 250,000 tons of perlite. This material has been tested and was found to expand from a raw density of 96 lbs/cu. ft. to a "popped" density of $1\frac{1}{2}$ to 10 lbs/cu. ft. This represents an average increase in volume of about 2000%, which indicates the perlite is suitable for commercial use. The question that remains is - could these deposits compete with other deposits? The deposits at Superior have dominated Arizona perlite production for some time and this situation is expected to continue. However, the expansion of western perlite markets and rising costs of transportation may require development of more strategically located deposits (5, p. 1136). The perlite deposits near Yucca are favorably situated to the Southern California and Las Vegas markets and future growth along the Colorado River could create a local market for the deposits; however, when these deposits might offer serious competition to the Superior deposits is not known.

The boundary of Perlite-2 was established on the basis of the reported occurrence of perlite beds in T. 22 & 23 N., R. 19 & 20 W. (4, p. 406).

Brucite 1

Brucite is a magnesium hydroxide mineral used in ceramics, refractories, textiles, rubber, and also as a source of magnesium metal. Little is known of future trends in the market for brucite, although the demand for magnesium metal is expected to increase because of increased use of light weight metals by the auto industry. It is also being anticipated that magnesium may replace aluminum in structural materials¹.

There are few commercial size deposits of brucite known in the United States. Included with these are the deposits near Oatman in Sections 7, 8, 17 and 18, T. 19 N., R. 20 W.; the only known deposits of brucite in Arizona.

Estimates of reserves range from 40,000 tons² to 500,000 tons³. One deposit was drilled a few years ago (probably middle or late 1960's) resulting in an estimate of 200,000 tons of reserves. There was limited production from the deposits around 1953, but the low grade of the ore ended further production. The deposits consist of some high grade material, but not enough to justify mining at present.

Several groups of unpatented claims cover the deposits. These include the Mag group, Whitehouse group, Midnight group, Pioneer group, and Moss Wash group. Other unpatented claims occur nearby partly because the area is within the Oatman Mining District.

-
1. Engineering and Mining Journal, vol. 174, no. 3, March 1973, p. 120.
 2. Mineral and Water Resources of Arizona; Arizona Bureau of Mines Bulletin 180, 1969, p. 324.
 3. Compendium on Nonmetallic Minerals of Arizona; prepared by the Southwest Research Institute, San Antonio, Texas, 1964, p. 58.

Clay-1

Clays are a group of minerals with a wide variety of uses. Properties such as purity, resistance to high temperatures, bonding strength, and swelling capacity determine what the clay can be used for. Most clay mined in Arizona has been used for refractory and ceramic purposes. About 600,000 tons were mined in Arizona from 1962 to 1965.

Several clay deposits occur at the southern end of the Black Mountains, but little is known of their extent and quality. One deposit occurs on Federal land where the mineral estate is privately owned (E $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 35, T. 17 N., R. 19 W.). Reserves are reported to be large (2, p. 83), and tests have shown the material has desirable properties as refractory material (2, p. 83).

Sometime during the 1960's, the deposit was mined and the clay shipped by rail from the nearby Franconia siding. It is not known how much of the material was mined or how much still remains. According to Gerald Weathers, Consulting Geologist in Phoenix, the clay was used in the construction of an airport. There has been no mining activity at the deposit in the past several years and all improvements are in an advanced state of disrepair.

ARKLA was active in Clay-1 during the 1960's. They conducted geophysical exploration, drilling for gold veins and disseminated copper deposit, and they located a number of claims (Don claims).

References:

1. Compendium of Nonmetallic Metals of Arizona; prepared by the Southwest Research Institute, San Antonio, Texas 1964.
2. Mineral and Water Resources of Arizona; Arizona Bureau of Mines Bull. 180, 1969.

TABLE 1

District or area	Name of Mine	Periods of Production	Minerals Produced	Amount Produced	Source of Information
Oatman	Tom Reed	1909-1931	Gold & Silver	984,000 tons ore at \$13,000,000	7
	United Eastern	1915-1926	Gold & Silver	697,000 tons ore at \$15,000,000	7
	Gold Road	1897-1924	Gold & Silver	738,000 tons ore at \$7,000,000	7
	Moss	1860's & early 1900's	Gold	\$250,000	7
	Telluride	1922-1925	Gold	\$200,000	7
	Unknown	1953	Brucite	A few tons	2,4
	Vivian	1938&1949	Lead	A few tons lead	7
Katherine - Union Pass	Katherine	1900-1930	Gold & Silver	\$1,000,000	7
	Roadside	1915-1934	Gold & Silver	890 oz. gold 1734 oz. silver	7
	Arabian	1917-1933	Gold & Silver	593 oz. gold 1156 oz. silver	7
Northern Black Mountains	Gold Bug	1893-1932	Gold & Silver	\$55,000	7
	Mocking Bird	before 1908	Gold & Silver	\$20,000	7
	Pilgrim	1903-1934	Gold	unknown	7
Southern Black Mountains	Unknown	1950's or 1960's	Clay	estimated at few hundred tons	2
	Unknown	1942	Perlite	Two carloads	2,4

Note: Where possible the amount of commodity produced was listed. Dollar values for gold production are based on a price of \$20/oz.

To Franconia - still idle. FTJ WR 5-10-71

Went to Franconia but couldn't get to the tuff grinding and sizing plant due to an approach road being built from the freeway, but looked it over with binoculars. No sign of recent activity. GW WR 4/6/72

I drove to the Franconia Clay plant where I collected three samples for analysis. VBD WR 1/8/75

Went on to Franconia and got a sample of the kaoline from the bin. The gate was locked and it was reported that the watchman was confined in a Vet's hospital. GW WR 4/4/74

Went to the Horseshoe Dam vicinity and got some grab samples of the so called clay. It appears to be weathered tuff in which the alteration has not extended to the clay stage. The deposit crops out for close to 2 miles and in a generally E-W direction and dips 10°-50° to the south, the dip increases to the west as the deposit approaches the mountains. In places there are hard layers from a few inches to a few feet in thickness. Near the east end of the outcrop the lower portion becomes quite massive forming a cliff 15 to 20 feet high. In only a very few places noted were there clay-like material and it is only 4"-6" thick. Took 4 samples of clayey material to Walt Statler for analysis for Al_2O_3 and SiO_2 . The samples were all grabs from the Charbonneau, Cibola, Horseshoe and Franconia deposits. GW WR 1/23/75

GM/WR 3/6/79 - Mr. Ralph Starr (Barney) is mining "rhyolite" at the Franconia Mine north of Franconia. I think his mine is in a wilderness "roadless" area. 4/30/79 a.p.

NJN WR 1/15/88: Bob Nakaoka visited and reported that na Illinois company produces intermittently from the clay at the Klaner Doolin (file) Mohave County. The material is used to produce a fire retardent paint.

Visited Franconia - idle. FTJ WR 11-5-65

Visited the Franconia mill - no activity. FTJ WR 3-4-66

Visited Franconia property which has been operating about 2 weeks. U.S. Marble is doing the mining and milling. FTJ WR 5-6-66

Del Peterson visited re Franconia Mining Co. Owners are Glover, Hefner & Kennedy Oil Co., 1010 Kermac Bldg., Oklahoma City, Oklahoma. Material bagged at Franconia used principally for pressed brick refractories. FTJ WR 5-7-66

Franconia tuff operation is operating as usual. FTJ WR 9-9-66

Visited Franconia plant - which is idle. FTJ WR 11-5-66

Visited Franconia plant - which is still idle. FTJ WR 1-7-67

Franconia Mill and Mine were idle at the end of the quarter. FTJ QR 2nd 1966-67

The Franconia tuff operation remained idle during the quarter. FTJ QR 4-5-67

Visited the Franconia mill - idle. FTJ WR 9-8-67

Visited Franconia - idle. FTJ WR 7-12-68

Visited Franconia where operations are occasional to fill far between orders. FTJ WR 3-8-68

Visited the Franconia - they were idle. FTJ WR 11-8-68

Visited Franconia - no activity. FTJ WR 7-11-69

Visited Franconia - plant idel. Watchman said several people have been looking at the property but no definite plans made. FTJ WR 11-7-69

Visited Franconia - idle. FTJ WR 3-6-70

Visited the Franconia - idle - no plans as far as the watchman knew. FTJ WR 7-11-70

Visited Franconia plant - idle. FTJ WR 11-6-70

see 9. 16 N 19 W
 Visited the Klaner & Doolin mine with crushing and sacking plant in operation at Franconia siding (approximately 10 miles east of Topock) and the quarry some 5 miles north of the plant. 11 men employed with Tris Norton as supt. The present product is roof granules. A building block plant is under construction. TPL WR 10-21-61

Visited the Klaner & Doolin tuff (?) property at Franconia. A block plant is under construction and occasional shipments of rock granules are going out from the crushing plant. The crew averages about 10 men. TPL WR 12-22-61

This is a tuff property. William Doolin, 325 W. 4th St., Scottsdale, Arizona - 10 men
 3-1-62

Visited Klaner & Doolin "Ark-o-lite" block plant at Franconia. Completion of plant is waiting delivery of supplies and some additional equipment. 3 men are employed with Tris Norton, supt. TPL WR 5-19-62

Paul Wilbert, 204 National Bank Bldg., Pittsburgh, attorney for the estate of Mrs. Mattie Klaner, visited to obtain information re the affairs of the tuff deposit and block plant project of Klaner & Doolin at Franconia. TPL WR 6-29-62

Plant visit with "Red" Williams

The operation is conducted by Klaner and Doolin of Phoenix

At present the quarry, 4 miles northwest of the plant, was idle, as a large stock pile of the kaolinized rhyolite tuff was built up at the plant. The haul by road to the quarry is 6½ miles. The plant was also idle while a key part to the crusher was being replaced. The tuff was being ground to 1½ inch, 3/8 inch, and 65 mesh sizes. It is sacked in 70 pound bags for 3/8 inch mesh material. The plant is on the Santa Fe Railroad. The 3/8 inch material is used mostly for airplane runways. The 1½ inch material is used for aggregates, roof covers, etc. A block and panel board plant is being erected. The shipment rate is now around 2 trucks per day of finished material.

The plant consists of a 12 x 20 inch Denver Equipment Co. crusher and multiple shaking screens, bins, conveyors, and an automatic weighing and sacking machine.

4 men are employed at the plant, when in operation, and 3 at the mine.

LAS Memo 9-6-62

Visited Klaner & Doolin Ark-o-lite plant at Franconia. Interviewed Tris Norton, supt. Block plant still not completed. Plant is idle, but expected to start soon. EGW WR 11-9-62

Active Mine List Oct. 1963 - 3 men

Visited Klaner-Doolin plant at Franconia. No activity. EGW WR 11-18-63

IRON KING ASSAY OFFICE

ASSAY CERTIFICATE

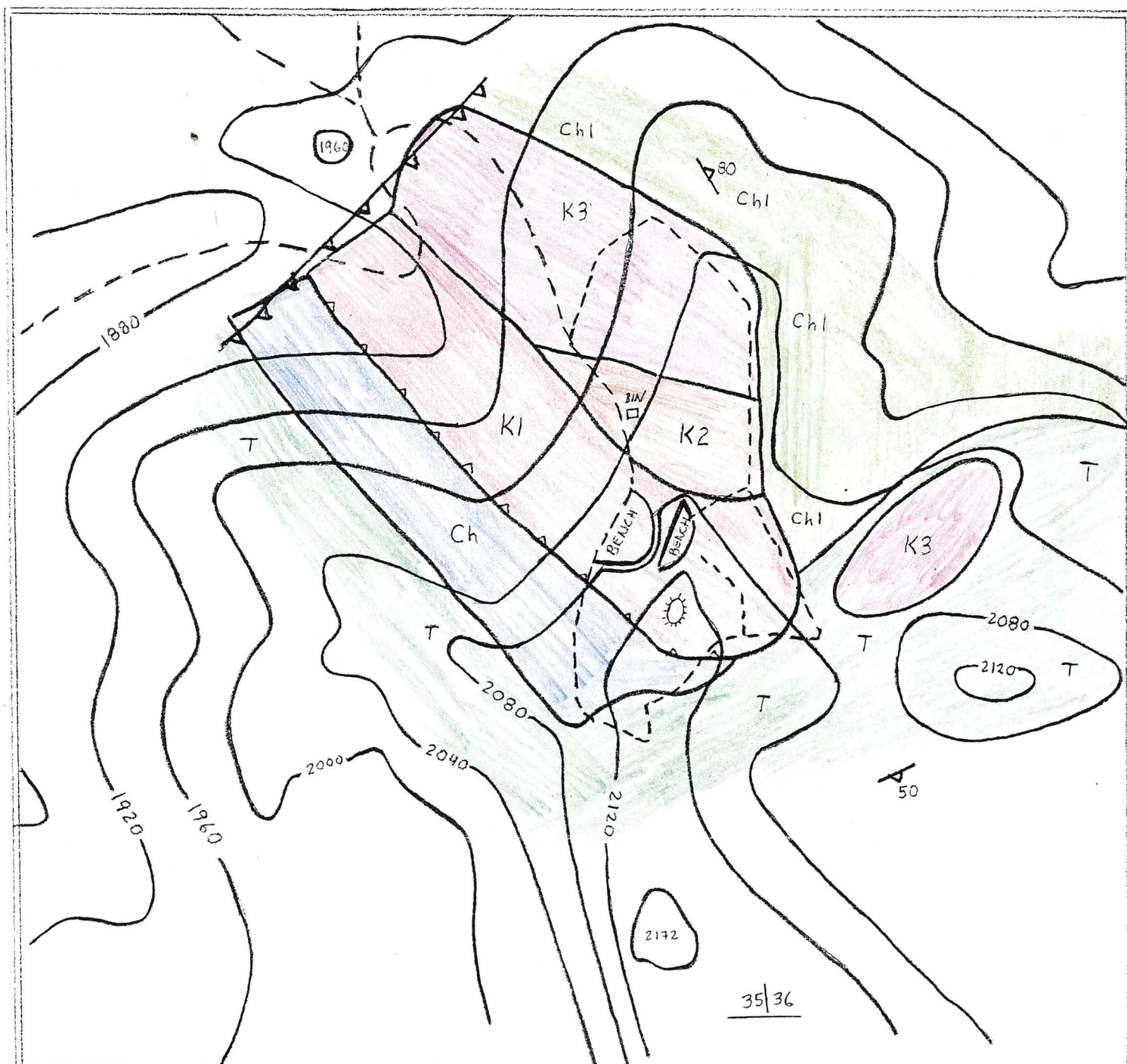
BOX 14 — PHONE 632-7410

HUMBOLDT, ARIZONA 86329

ASSAY
MADE
FOR

Dept. of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Ariz. 85007

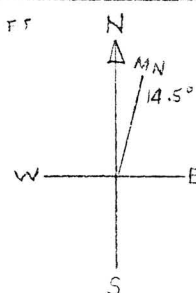
[illegible]



- K1 KLANHERITE, WHITE, HIGH QUALITY
- K2 KLANHERITE, BRECCIA ZONE WITH PURPLE STAINING
- K3 KLANHERITE, GREEN PARTIALLY ALTERED
- Ch CHALCEDONY
- Chl ALTERED TUFF, GREEN
- T TUFF, BROWN

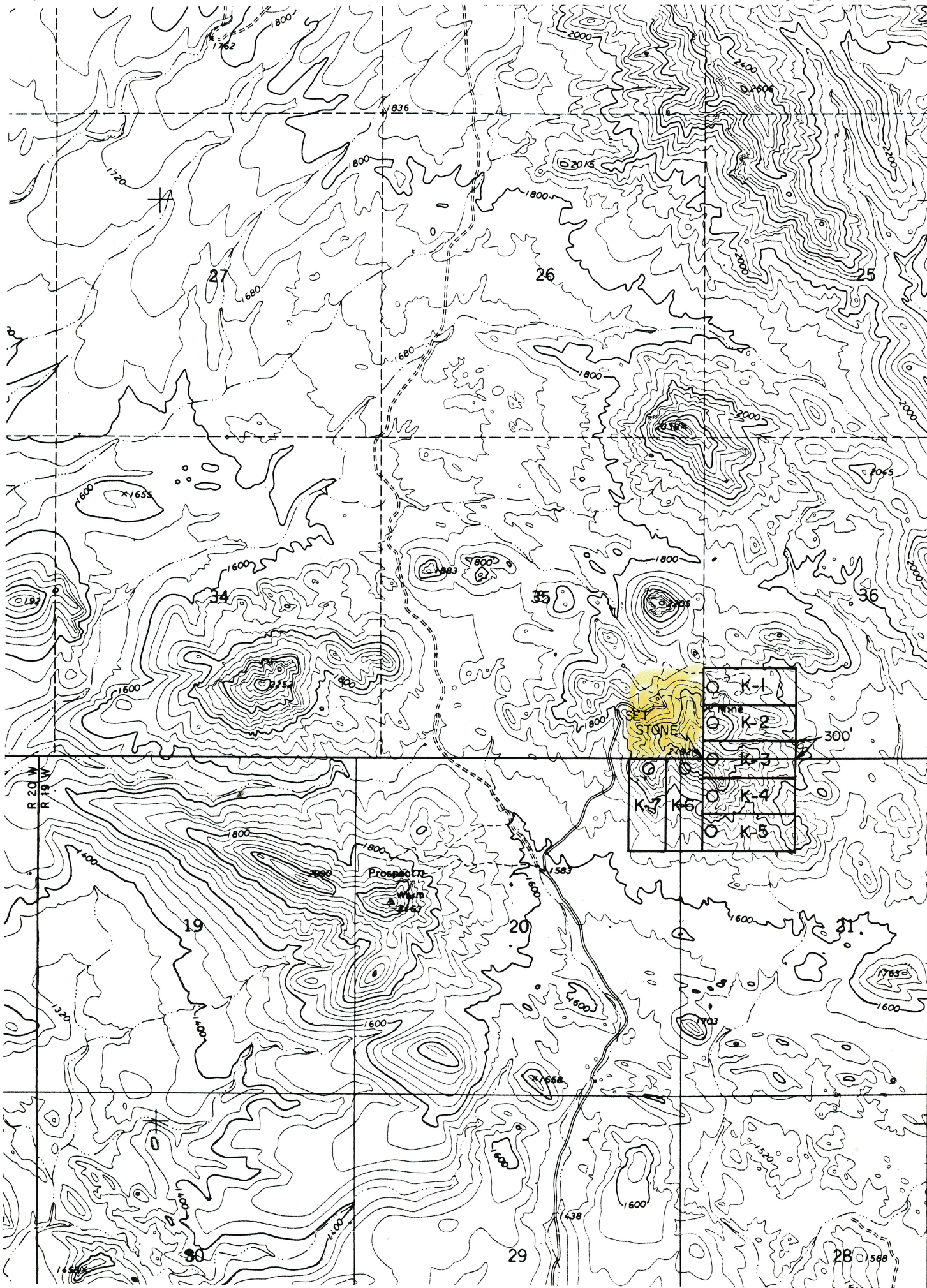
0 100 200 FT

--- ROAD
 --- CONTACT
 ▲▲▲▲▲ FAULT



R. 19 W.

KLANER-DOOLIN file
MOHAVE Co.



○ = LOCATION MONUMENT

ALL CLAIMS ARE 600'x1500' UNLESS OTHERWISE NOTED.

ALL LOCATION MONUMENTS ARE OFFSET 50' FROM END CENTERS UNLESS OTHERWISE NOTED.

ALL LOCATION MONUMENTS, END CENTERS AND CORNERS ARE MONUMENTED WITH 2"x2"x4 1/2' WOOD POSTS.

MAP

OF
LODE MINING CLAIMS

WITHIN

TOWNSHIPS 16 1/2 & 17 NORTH, RANGE 19 WEST

GILA and SALT RIVER MERIDIAN
MOHAVE COUNTY, ARIZONA

FOR

NEW MEXICO and ARIZONA LAND COMPANY

6100 INDIAN SCHOOL NE., SUITE 120

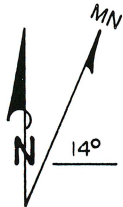
ALBUQUERQUE, NEW MEXICO 87110

K CLAIMS 1-7

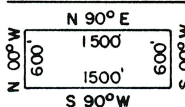
LOCATED- MAY 9, 1987

USGS QUADRANGLE

WARM SPRINGS SE, ARIZ. 7.5' 1970



TYPICAL CLAIM



1" = 2000'



NZ Fee mineral ownership

Dan G. Gaudin
5/12/87