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

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Arizona Department of Mines and Mineral Resources Mining Collection

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PRINTED: 11/21/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: ANNABELL GYPSUM

ALTERNATE NAMES:
AZA CLAIMS

GILA COUNTY MILS NUMBER: 574

LOCATION: TOWNSHIP 5 N RANGE 10 E SECTION 1 QUARTER SE
LATITUDE: N 33DEG 48MIN 04SEC LONGITUDE: W 111DEG 16MIN 55SEC
TOPO MAP NAME: TONTO BASIN - 7.5 MIN

CURRENT STATUS: DEVEL DEPOSIT

COMMODITY:
GYPSUM

BIBLIOGRAPHY:
ADMMR ANNABELL GYPSUM FILE
OCCURRENCE INCLUDES MORE THAN THIS QUARTER

12/21/87

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: ANNABELL GYPSUM

ALTERNATE NAMES:

GILA COUNTY MILS NUMBER: 574

LOCATION: TOWNSHIP 5 N RANGE 10 E SECTION 1 QUARTER SE
LATITUDE: N 33DEG 52MIN SEC LONGITUDE: W 111DEG 15MIN SEC
TOPO MAP NAME: TONTO BASIN - 7.5 MIN

CURRENT STATUS: DEVEL DEPOSIT

COMMODITY:
GYPSUM

BIBLIOGRAPHY:
ADMMR ANNABELL GYPSUM FILE
OCCURRENCE INCLUDES MORE THAN THIS QUARTER

COMPLETE AND MAIL TO
STATE MINE INSPECTOR
1624 WEST ADAMS, ROOM 208
PHOENIX, ARIZONA 85007-2606

ANNABELLE GYPSUM (F)
STATE MINE INSPECTOR

AUG 17 1987

FOR OFFICE USE ONLY
START-UP NUMBER 13-9-3514
STATE NUMBER 1014540
MSHA NUMBER

NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with the Arizona Revised Statute Section 27-303, we are submitting this written notice to the Arizona State Mine Inspector of our intent to start X stop ____ move ____ (Please check one) a mining operation.

If this is a move, please show last location: N/A
If you have not operated a mine previously in Arizona, please check here: X If you want the Education and Training Division to assist with your mine safety training, please check here: ____
If this operation will use Cyanide for leaching, please check here: ____

COMPANY NAME: NONE

DIVISION: ____

MINE OR PLANT NAME: ANNA BELLE CLAIMS TELEPHONE: 963-3942

CHIEF OFFICER: W. WAX & H. HOGLE

COMPANY ADDRESS: P.O. BOX 66 TONTO BASIN, AZ

CITY: TONTO BASIN STATE: AZ ZIP CODE: 85553

MINE OR PLANT LOCATION: (Include county and nearest town, as well as directions for locating property by vehicle: (5) MILES SOUTH OF TONTO BASIN P.O AT MILE POST # 257 ON WEST SIDE OF HIGHWAY 188

TYPE OF OPERATION: QUARRY PRINCIPAL PRODUCT: GYPSUM

STARTING DATE: 8/20/87 CLOSING DATE: ____ DURATION: TESTING - UNKNOWN AT THIS TIM

PERSON COMPLETING NOTICE: H. HOGLE TITLE: OPERATIONS

DATE NOTICE MAILED TO STATE MINE INSPECTOR: 8/14/87

FORM 101-106 REV. 08/86


Tonto Basin PO
Cottonwood Creek
Oak Creek
BASIN
25
30
29
BM 2282
2283
2339
2433
2232
2277
36
31
32
TRAIL
Corral
2548
188
2221
Tonto Creek
2199
2202
ANNABELLE GYPSUM
T5N R10E
BM 2190
BM 2363
2278
Creek
TRAIL
6
5
FOREST
JEEP
2600
2400
2200
2451
Ruins
Greenback Ct.
2189
ROAD
Well
8
2160
2456
7
2227
CROSS
TONTO BASIN QUAD
2149
2800
2609
Corral
(GREENBACK CREEK)
24 MI. TO ARIZ. 288
3740
3739
3738

Date Printed: 02/11/97

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION SUMMARY

Information from: **Field Visit w/ Bev Everson & Dale Nation**

Company: Forest Service and N. AZ University

Address:
City, State ZIP:
Phone:

MINE: **Annabell Gypsum**

ADMMR Mine File: Annabell Gypsum
County: **Gila**
AzMILS Number: **574**

SUMMARY

Accompanied Bev Everson, Dale Nations, and a group of Forest Service mineral officials and claim examiners to the Anabell Gypsum Occurrence in Tonto Basin. The claim's owners, Clay Thorne, et. al. have applied to patent the claims covering the occurrence alone Hiway 188. The claim holders are stating that the claims that do not show economic gypsum occurrences are valuable for precious metals including those in the platinum group.The Forest Service mineral examiners are developing a sampling procedure to prove or disprove the claim owners assertions. Copies of maps covering the claims were provided for the file by the Forest Service.

Ken A. Phillips, Chief Engineer Date: January 22, 1997

Annabell Mining Claims
Clay Thorne

PAYSON 29 MI
13 MI. TO ARIZ. 87
3751 IV NE
(KAYLER BUTTE)
17'30"
R 10 E

Creek
Reno
Lambing
Ford
Rancho Del Escondido
Tank
Water Trough
Storage Tank
Corner Spring
BM 2341
Riverside Acres
Corral
Yook Spring
Chalk Spring
Spring
Canyon
Walnut Canyon Spring
Walnut
Gravel Pit
Ford
Water Trough
Creek
Sycamore
Corral

48 49 50 51
47 46 45 44
43 42
41 40
39 38 37
36 35
34 31 33
32
29 30 26 25
28 27
53 54
52

T O N T O

N A T I O N A L F O R E S T

AZA 27208 Annabell
25-54

AZA 27172 Annabell
15-24, 24A-E

Key

- Flood deposits, Alluvium (Holocene)
- Terrace deposits (Pleistocene)
- Pediment terrace deposits (Pleistocene)
- Landslide deposits (Holocene to Pleistocene)
- Basin Fill (Pliocene + Miocene)

(from Anderson and Pierz, 1987)

Punkin Center graben

Tonto Creek

El Oso fault

Contacts; dashed where cont s gradational and approximately located

Samples here described from the mine listed below are are contained in the AzDMMR collection of reference samples.

Date Taken: 08/00/91
Date Logged: 09/30/93
Sample Number: 08/00/91-018

MINE: Annabell Gypsum (file)
COUNTY: Gila AzMILS # 574
LOCATION: From claims along Highway 188
DESCRIPTION: Select samples from seams of selenite from gypsum deposit.
MATERIAL: Gypsum; typical of mode of occurrence of gypsum in deposit.
COMMENTS: Deposit contains beds of zone of gypsum up to 5' feet thick.
Location of deposit is limiting factor.

EXTRA COPY

FVDS.22 **Arizona Department of Mines and Mineral Resources**
MINE AND PROSPECT FIELD VISIT DATA SUMMARY
Sheet 1 of 2

COMMODITIES: **Gypsum**
MILS ID No.: **Gila 574** DATE: **October 10, 1991**
ENGINEER: **Ken A. Phillips & Richard E. Beard**
INFORMATION FROM: **Field visit in the company of Louis Alcocer**

PROPERTY SUMMARY

I. MINE NAME: **Annabell Gypsum** OTHER POSSIBLE NAMES: **Ann**
(INCL. ANY CLAIM NAMES NOTED)

II. LOCATION: T **5N** R **10E** SEC(S): **1** MINE DISTRICT:
5N 11E 6
ELEV. COUNTY: **Gila** TOPO QUAD. **Tonto Basin 7°**
DIRECTIONS: **see maps attached** MAP ATTACHED:

III. OWNERSHIP, NAME: **Clay R. & Bill Thorne** PHONE:

ADDRESS: **Payson**
COMPANY NAME IF ANY:
PERTINENT PEOPLE:

IV. PROPERTY AND HOLDINGS: **Unpatented claims**
V. PAST PRODUCTION-NOTED, KNOWN, PROBABLE, UNKNOWN, NONE: **200 - 2000 tons for agricultural gypsum . Pit reclaimed.**

VI. CURRENT STATUS:

VII. WORKINGS: **Reclaimed surface pits.**
Sheet 2 of 2

VIII. GEOLOGY AND MINERALOGY: DEPOSIT TYPE: **Sedimentary**
LENGTH: **+5000** WIDTH: **+5000** STRIKE: **Beds** DIP:
HOST ROCK:
ECONOMIC MINERALS: **Selenite as satin spar in two beds, each 0.5' to 5' thick separated by 6' to 12' of low grade gypsite (approximately 25% $CaSO_4.2H_2O$). Over burden varies from 0 to 6' above top bed.**

IX. EQUIPMENT ON SIGHT: **None**

X. SAMPLING: NOTE TYPE IF ANY, DRILLING? **Four samples were taken during visit. All were from outcrops. Samples and description are below. ADOT auger drilled numerous points of proposed right of way acquisition for geotechnical highway construction information. The cuttings were not assayed for gypsum.**

EXTRA COPY

Sample #	Description	%	$CaSO_4.2H_2O$
ADMMR 28157	**Sample across selected 1.5' bed of satin spar and gray gypsum from upper bed exposed in south west wall of wash immediately east of past production pit.**	**74 %**	
ADMMR 28158	**Chip sample across 0.7' of satin spar and gray gypsum in lower bed exposed in wash as in sample ADMMR 28157.**	**53 %**	
ADMMR 28159	**Chip Sample across 10' of gypsite material between upper and lower bed exposed in wash as in sample ADMMR 28159.**	**25 %**	
ADMMR 28160	**Selected satin spar from auger drill cuttings in proposed highway right of way acquisition. Representative of selected material from all outcrops of upper and lower bed.**	**92 %**	

FVDS.22

Arizona Department of Mines and Mineral Resources

MINE AND PROSPECT FIELD VISIT DATA SUMMARY

Sheet 1 of 2

COMMODITIES: Gypsum

MILS ID No.: Gila 574 DATE: October 10, 1991

ENGINEER: Ken A. Phillips & Richard E. Beard

INFORMATION FROM: Field visit in the company of Louis Alcocer

PROPERTY SUMMARY

I. MINE NAME: Annabell Gypsum OTHER POSSIBLE NAMES: Ann (INCL. ANY CLAIM NAMES NOTED)

II. LOCATION: T 5N R 10E SEC(S): 1 MINE DISTRICT:
5N 11E 6

ELEV. COUNTY: Gila TOPO QUAD. Tonto Basin 7½

DIRECTIONS: see maps attached

MAP ATTACHED:

III. OWNERSHIP, NAME: Clay R. & Bill Thorne PHONE:

ADDRESS: Payson

COMPANY NAME IF ANY:

PERTINENT PEOPLE:

IV. PROPERTY AND HOLDINGS: Unpatented claims

V. PAST PRODUCTION-NOTED, KNOWN, PROBABLE, UNKNOWN, NONE: 200 - 2000 tons for agricultural gypsum . Pit reclaimed.

VI. CURRENT STATUS:

VII. WORKINGS: Reclaimed surface pits.

VIII. GEOLOGY AND MINERALOGY: DEPOSIT TYPE: Sedimentary

LENGTH: +5000 WIDTH: +5000 STRIKE: Beds DIP:

HOST ROCK:

ECONOMIC MINERALS: Selenite as satin spar in two beds, each 0.5′ to 5′ thick separated by 6′ to 12′ of low grade gypsite (approximately 25% $CaSO_4.2H_2O$). Over burden varies from 0 to 6′ above top bed.

IX. EQUIPMENT ON SIGHT: None

X. SAMPLING: NOTE TYPE IF ANY, DRILLING? Four samples were taken during visit. All were from outcrops. Samples and description are below. ADOT auger drilled numerous points of proposed right of way acquisition for geotechnical highway construction information. The cuttings were not assayed for gypsum.

Sample #	Description	%
		$\underline{CaSO_4.2H_2O}$
ADMMR 28157	Sample across selected 1.5′ bed of satin spar and gray gypsum from upper bed exposed in south west wall of wash immediately east of past production pit.	74 %
ADMMR 28158	Chip sample across 0.7′ of satin spar and gray gypsum in lower bed exposed in wash as in sample ADMMR 28157.	53 %
ADMMR 28159	Chip Sample across 10′ of gypsite material between upper and lower bed exposed in wash as in sample ADMMR 28159.	25 %
ADMMR 28160	Selected satin spar from auger drill cuttings in proposed highway right of way acquisition. Representative of selected material from all outcrops of upper and lower bed.	92 %

DRAFT

Arizona Department of Mines and Mineral Resources

MINE AND PROSPECT FIELD VISIT DATA SUMMARY

COMMODITIES: Gypsum

MILS ID No.: Gila 574 DATE: October 10, 1991

ENGINEER: Ken A. Phillips & Richard E. Beard

INFORMATION FROM: Field visit in the company of Louis Alcocer

PURPOSE OF VISIT: To verify presence of gypsum of commercial grade and assist Arizona Department of Transportation (ADOT) right of group in determining value of the portion of gypsum deposit to be consumed by highway realignment project.

PROPERTY SUMMARY

MINE NAME: Annabell Gypsum also called the Ann Claims

LOCATION: T 5N R 10E SEC(S): 1
5N 11E 6

COUNTY: Gila TOPO QUAD. Tonto Basin 7.5'

DIRECTIONS: see maps attached

OWNERSHIP, NAME: Clay R. & Bill Thorne per ADOT

ADDRESS: Payson, Arizona

PROPERTY AND HOLDINGS: Unpatented claims

PAST PRODUCTION: 200 - 2000 tons for agricultural gypsum. Pit reclaimed.

CURRENT STATUS: Reclaimed open pit gypsum mine

WORKINGS: Reclaimed surface pits.

GEOLOGY AND MINERALOGY:

DEPOSIT TYPE: Sedimentary beds dipping gently east. Numerous small normal faults.

LENGTH: +5000 WIDTH: +5000

HOST ROCK: Pliocene to middle Miocene sedimentary rocks labelled as Tsy on the State Geologic Map.

ECONOMIC MINERALS: Selenite as satin spar in two beds, each 0.5' to 5'thick

separated by 6′ to 12′ of low grade gypsite (approximately 25% $CaSO_4.2H_2O$). The top bed is typically less than 1" foot thick and the bottom bed is typically 2′ feet thick. Over burden varies from 0 to 6′ above top bed.

EQUIPMENT ON SIGHT: None

SAMPLING: Four samples were taken during visit. All were from outcrops. Samples and description are below. ADOT auger drilled numerous points of proposed right of way acquisition for geotechnical highway construction information. The cuttings were not assayed for gypsum.

Sample #	Description	% $CaSO_4.2H_2O$
ADMMR 28157	Sample across selected 1.5′ bed of satin spar and gray gypsum from upper bed exposed in south west wall of wash immediately east of past production pit.	74 %
ADMMR 28158	Chip sample across 0.7′ of satin spar and gray gypsum in lower bed exposed in wash as in sample ADMMR 28157.	53 %
ADMMR 28159	Chip Sample across 10′ of gypsite material between upper and lower bed exposed in wash as in sample ADMMR 28159.	25 %
ADMMR 28160	Selected satin spar from auger drill cuttings in proposed highway right of way acquisition. Representative of selected material from all outcrops of upper and lower bed.	92 %

MARKETS AND ECONOMIC CONSIDERATIONS:

Gypsum mined in Arizona is used as an agricultural mineral applied to crop fields, as a constituent of horticultural mixes, for addition to Portland cement, and for the manufacture of plaster of Paris to make gypsum wallboard. Selected samples from the Annabell deposit may approach the quality required for wallboard manufacture, but the authors believe the material to be best suited for agricultural application to crop fields either by direct application of crushed gypsum or as "ditch rock" dumped into irrigation ditches and disolved by irrigation water as it flows to the fields. In 1990,

64,372 tons of gypsum was applied to crop fields in Arizona. Annual usage over the last five years has varied from a low of 25,874 tons in 1986 to a high of 73,619 tons in 1988. Prices paid by farmers for agricultural gypsum range from $20 to $40 per ton for contract application jobs at the farm. For example, farmers in the Buckeye Valley in western Maricopa County pay $31 per ton delivered and spread for gypsum crushed to -0.125" and assaying at least 90 percent $CaSO_4.2H_2O$ to $40 per ton for small bulk loads picked up at the mine. Farmers closer to the mine area in the Winkleman-Mammoth region of Pinal county pay closer to $20 per ton. The average crude mine value of gypsum mined in Arizona falls between $6.90 and $9.00 per ton.

The nearest market for agricultural gypsum from the Annabell mine is in the Gilbert area or the Florence area about 94 miles from the deposit. Most of the central Arizona market lies between 94 miles in eastern Maricopa County and 155 miles from the deposit in southwestern Maricopa County. Additional market areas lie in the Gila Valley area of central Graham County (124 miles), central Cochise County (196 miles) and along the Colorado River in the southwestern part of the state (200 - 215 miles). The minimum trucking costs using either mine owned trucks or consumer owned trucks is $7.26 per ton to eastern Maricopa County and $11.97 to southwestern Maricopa County.

Using the typical total thickness of gypsum beds (2.75') and thickness of over burden and waste between beds (12') and the assumption that both beds will be mined at the same time, the waste to ore ratio is 4.36:1. Both stripping and ore removal can be done with a rubber tired or tracked front end loader; no blasting is necessary. Mining cost is estimated at $5.50 per ton of gypsum recovered, crushing at $1.50 per ton, loading, weighing and tarping of trucks at $1.00 per ton (total $8.00) and transportation at $9.62 for a total average delivered direct cost of $17.62; (ranging from $15.26 to $19.97 for the Salt River Valley). Sales of fertilizers including gypsum for agriculturaland horticulture is subject to a $0.25 per ton fee paid to the State Chemist's office of the Arizona Department of Agriculture. Any mine production is subject to a 2.5 percent severance tax which would be at least $0.1045 per ton.

The portion of the gypsum deposit to be acquired by ADOT would only be mined if an operation were established on a nearby portion of the claims. Thus fixed costs of market development, bonds, reclaimation, etc. and amortization of investment and equipment prorated to the part of the deposit to be aquired by ADOT would be small and will be ignored for this report.

ADOT proposes to acquire approximately 900,000 square feet of land for highway right of way through the Annabell claims. All of the proposed acquisition appears to be land covering gypsum. Each typical square foot covers 2.75 cubic feet of gypsum, thus 2,475,000 cubic feet of gypsum will be acquired by the highway project. Gypsum weighs .0675 tons per cubic foot (135 lbs./cu.ft.), thus 167,000 tons would be lost to the claim holder by the ADOT acquisition.

Scenario 1

Assume a market based on delivering and spreading agricultural gypsum to farms in Maricopa County at an average price of $31 per ton.

Assume 35% of market	22,400 tons
Life of operation	7.4 years

Assume a 20% discount for being a new penetrator into an established market. $ 24.80 per ton delivered and spread

Assume a lower price for being off grade; ea. 74% $CaSO_4.2H_2O$ as compared to the 85% currently available. Thus discount price by 74/90. $ 20.39

Gross annual sales		$ 456,736
Less		
Cost of spreading at $5.00/ton	112,000	
Cost of trucking at $9.62/ton	215,488	
Cost of mining, crushing, loading, etc. at $8.00/ton	179,200	
AZ Dept. of Revenue severence tax at 2.5% of mine value of $5.77 per ton	$ 3,231	
State Chemists fee @ $0.25/ton	5,600	
TOTAL COSTS	$ 515,519	
TOTAL GROSS PROFIT		(-)$ 58,783

- $ 2.62 per ton

Scenario 2

Assume a market based on delivering agricultural gypsum to nearest farms in eastern Maricopa County and north east Pinal County at $25 per ton.

Assume 20% of market 12,800 tons
Life of operation 13 years

Assume a 20% discount for being a new penetrator into an established market. $ 20.00 per ton delivered and spread

Assume a lower price for being off grade; ea. 74% $CaSO_4.2H_2O$ as compared to the 90% currently available. Thus discount price by 74/90. $ 16.44

Gross annual sales		$ 210,432
Less		
Cost of spreading at $5.00/ton	64,000	
Cost of trucking at $7.26/ton	92,928	
Cost of mining, crushing, loading, etc. at $8.00/ton	102,400	
AZ Dept. of Revenue severence tax at 2.5% at a mine value of $4.18 per ton	$ 1,338	
State Chemists fee @ $0.25/ton	3,200	
TOTAL COSTS	$ 263.866	
TOTAL GROSS PROFIT	(-) $ 53,434	

- $ 4.17 per ton

Note: Portions of the Annabell Gypsum Deposit not within the proposed highway right-of-way have thicker gypsum beds near the surface and will have much lower stripping ratios. Thus a lower mining cost per ton of gypsum recovered, but less recoverable gypsum per square foot of area mined may be available. Similar scenarios to those above for different bed thicknesses at other areas of the claims may show a marginally profitable operation. Also, careful selective mining may allow a higher grade to be maintained and thus avoid the penalty for being less than 90 percent $CaSO_4.2H_2O$.

MINING

A CLAY R. & BILL THORNE

- (A) = UNPATENTED LODE M. C. ANNABELL
- (B) = UNPATENTED LODE M. C. ANNABELL NO. 3
- (C) = UNPATENTED LODE M. C. ANNABELL NO. 4
- (D) = UNPATENTED LODE M. C. ANNABELL NO. 5

BA(?) by now CLAY R THORNE

- (3) = UNPATENTED LODE M. C. ANN NO. 3
- (4) = UNPATENTED LODE M. C. ANN NO. 4
- (6) = UNPATENTED LODE M. C. ANN NO. 6
- (7) = UNPATENTED LODE M. C. ANN NO. 7
- (8) = UNPATENTED LODE M. C. ANN NO. 8
- (9) = UNPATENTED LODE M. C. ANN NO. 9

N

GILA COUNTY
SCALE 1" = 200'

EXIST R/W
S 76° 19' 10" E
EXIST R/W
970
125'
125'
MATCH LINE
TS 968+19.99
SC 971+19.99
P.O.C. 973+00
100'
100'
CS 975+94.38
ST 978+94.38
STA. 188
P.O.T. 980+00
P.O.T. 982+00
980
BEG. CONSTR. PROJ.
F-038-1(4)
M.P. 258.44
END R/W PROJECT
S-456-708
ASSUMED RANGE LINE
APPROX LOT LINE
Approx Mid Sec Line
SW⁴ NE⁴
SUR. & CONST. ℄
P.I. 973+73.69
SE⁴ NE⁴
NE⁴ NE⁴
PROTRACTED
TONTO
NOT FND.
36 | 31
1 | 6
NATIONAL
4-372
SUR. & CONST. ℄
P.I. 1007+61.09
LOT 5
FOREST
CENTER SECTION
NOT FND.
ASSUMED MID SEC. LINE
4-372 M-2
4-372 M-1
4-372

SPIRAL
a= 1 2/3
Δ= 7°30'00"
L= 300.00
o= 3.27
t= 149.92

TOTAL
Δ = 38°43'10" RT
R+o= 1149.19
T = 553.70
L = 1074.39

MAIN CURVE
Δ= 23°43'10"
D= 5°00'00"
R= 1145.92
E= 25.00

SPIRAL
a= 1 2/3
Δ= 7°30'00"
L= 300.00
o= 3.27
t= 149.92

NEW R/W
S 57°36'00" E
ST 987+63.78
SC 990+63.78
990
EXIST R/W
Approx 1/16 Line
145.65' (CALC)
CS 997+53.11
1000
ST 1000+53.11
40x250
S 87°04'00" E
99.59'
SURVEY & CONST. ℄

SPIRAL
a= 1 2/3
Δ= 7°30'00"
L= 300.00
o= 3.27
t= 149.91

TOTAL
Δ = 43°30'00"RT
R+o= 1149.19
T = 608.39
L = 1170.00

MAIN CURVE
Δ= 28°30'00"
D= 5°00'00"
R= 1145.92
L= 570.00
EXT= 36.38

SPIRAL
a= 1 2/3
Δ= 7°30'00"
L= 300.00
o= 3.27
t= 149.91

950x130
150x950 = 447,676
1010
CS 1010+22.70
ST 1013+22.70
NE⁴ SW⁴
110x550
2
1020
ST 1022+00
EXIST R/W
STA 188
12A
11A
100'
100'
125'
150'
APPROX LOT LINE
P.O.T. 1020+50
TS 1021+12.76
TRACH LINE
SE⁴ SW⁴
14A

387,986
31,416
447,676
30,250
897,328

26,000
to
160,000

Value range
80 To 80,000

FND.¼COR.
3" B.C.
USDI BLM 1985
S 0°19'38" W
2460.44' (CALC)
POC 997+15.05 (CALC)
L.T.B. N 77°39'49" W
TS 1001+52.70
SC 1004+52.70
LOT 6
LOT 7
T.C.E.
175'x 710'
T.5N. R.10E.
T.5N. R.11E.
FND. SECTION COR.
3" B.C.
USDI BLM 1985
1 | 6
12 | 7

Approximate Area of previous gypsum production.

SUR. & CONST. ℄
P.I. 994+43.07

SPIRAL
a= 1 2/3
Δ= 7°30'00"
L= 300.00
o= 3.27
t= 149.91

TOTAL
Δ = 49°28'00"LT
R+o= 1149.19
T = 679.29
L = 1289.33

MAIN CURVE
Δ= 34°28'00"
D= 5°00'00"
R= 1145.92
L= 689.33
EXT= 53.86

SPIRAL
a= 1 2/3
Δ= 7°30'00"
L= 300.00
o= 3.27
t= 149.91

Spiral Note: All Spirals on Right of way
Lines are CHORDED as per ADOT Standards

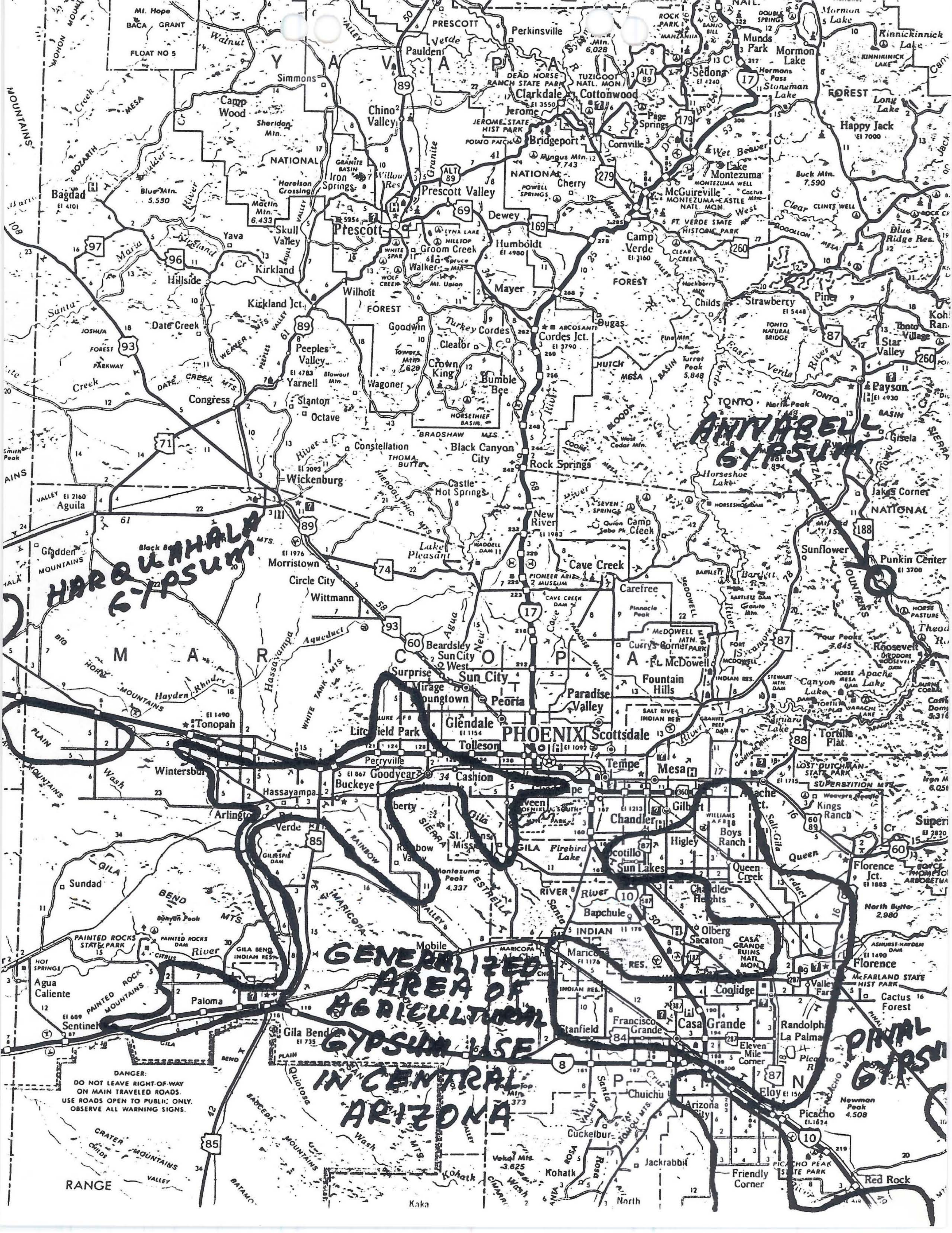
REVISIONS					DRAWING NO.	D-4-17-393	ARIZONA DEPARTMENT OF TRANSPORTATION
C.O. NO.	DATE	BY	DESCRIPTION		HARD COPY	3017 MI	HIGHWAYS DIVISION
8364	6-27-91	LD	ADDED T.C.E. PT. STA. 1012+, DEL. T.C.E. PT. STA. 1022+.		DRAWN/DATE	MA 8/90	RIGHT OF WAY PLANS SERVICES
8395	9-23-91	JCH	ADDED EXIST R/W		CHECKED/DATE	MA 8/90	ROOSEVELT-PAYSON
					RITOCH-POWELL		PROJECT NO. F-038-1-708
					SR 188		ROOSEVELT DAM-JCT SR 87

TRACS NO. 188 M 241 -2849 D3R

SHEET 14 OF 15

___ OF ___

N:\SPECIFICATION***** VIEW NAME:
CTIME:*****



HARQUAHALA GYPSUM
ANNABELL GYPSUM
GENERALIZED AREA OF AGRICULTURAL GYPSUM USE IN CENTRAL ARIZONA
PINAL GYPSUM
DANGER:
DO NOT LEAVE RIGHT-OF-WAY
ON MAIN TRAVELED ROADS.
USE ROADS OPEN TO PUBLIC ONLY.
OBSERVE ALL WARNING SIGNS.
PHOENIX
Prescott
Wickenburg
Scottsdale
Tempe
Mesa
Chandler
Glendale
Casa Grande
Coolidge
Florence
Gila Bend
Buckeye
Payson

Arizona Testing Laboratories

810 East Hammond Lane ☐ Phoenix, Arizona 85034 ☐ 602/254-6181

For: Arizona Dept. of Transportation
Attn: Louis M. Alcocer
205 S. 17th Avenue, 612E
Phoenix, Arizona 85007-3212

Date: October 28, 1991

Lab. No.: 7330401 thru 04

Sample: Gypsum

Marked: See Below

Received: 10/21/91

Submitted by: Same

REPORT OF LABORATORY TESTS

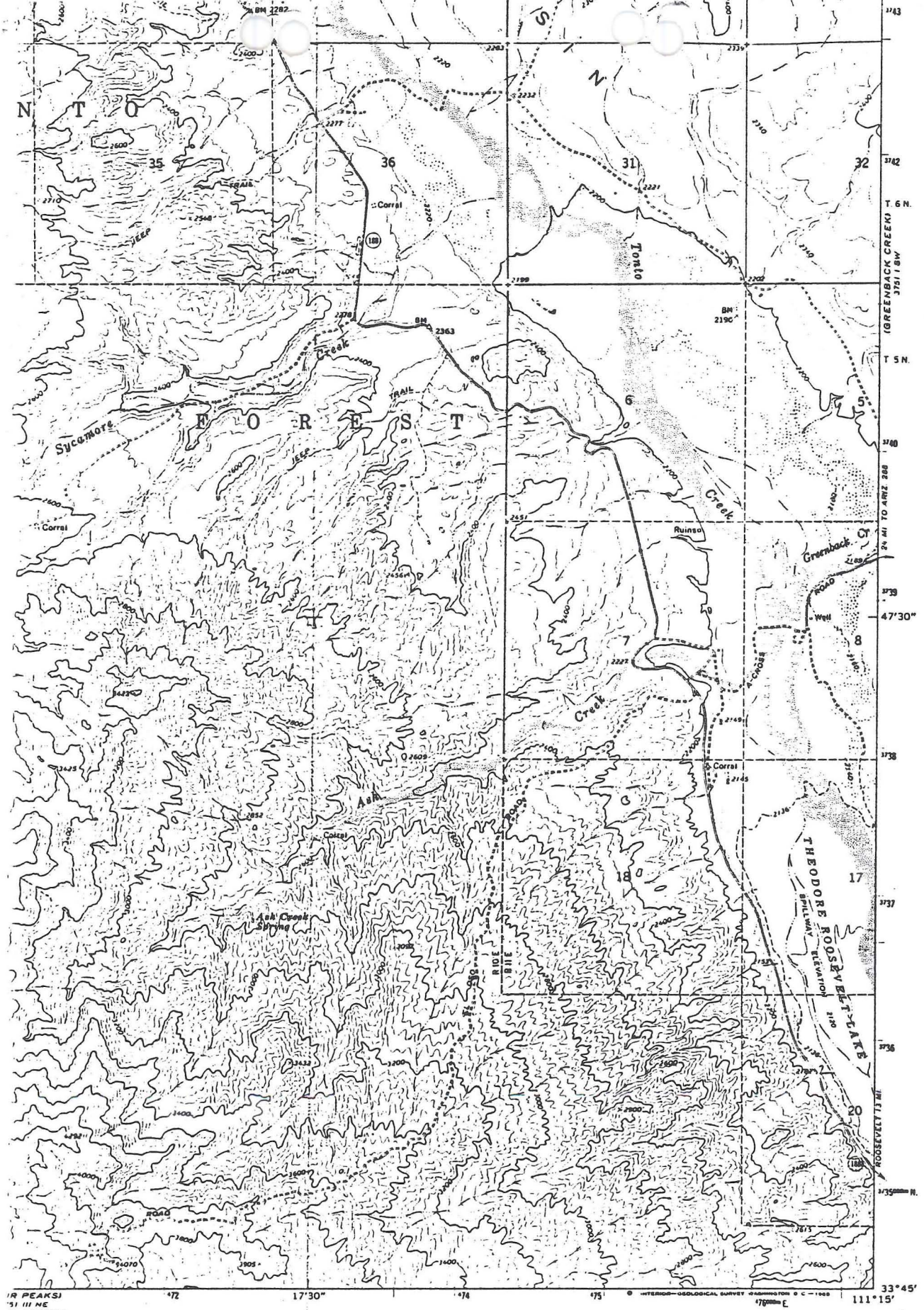
	28157	28158	28159	28160	
Calcium Oxide CaO	29.7	21.6	16.6	32.1	%
Sulfur Trioxide SO3	34.5	24.5	11.6	42.9	
Gypsum calculated from above	74.	53.	25.	92.	

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E McLean

Claude E. McLean, Jr.


T 6 N.
T 5 N.
17'30"
47'30"
111°15'
33°45'
Corral
Ruins
Well
Trail
Jeep
Road
Creek
Sycamore
Greenback
Ash
Tonto
Ash Creek Spring
Theodore Roosevelt Lake
Spillway Elevation
Roosevelt 13 mi
2 mi to Ariz 288
(Greenback Creek)
3751 I SW
3751 II NW
(Theodore Roosevelt Dam)
F O R E S T
N T O
1 MILE
1 KILOMETER
INTERVAL 40 FEET
PRESENT 20-FOOT CONTOURS
MEAN SEA LEVEL
ROAD CLASSIFICATION
Light-duty
Unimproved dirt
State Route
ARIZONA
QUADRANGLE LOCATION
TONTO BASIN, ARIZ.
7-C

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY (SHORT FORM)
May be Reproduced
May Be Inserted Into Mine File Or Added To "Rumor Page"

1. Information from: Vasio Gianulias, U.S. Navy Contract Office

   Address: Washington, D.C.

2. Phone:

3. Mine: ANNABELL GYPSUM CLAIMS

4. ADMMR Mine File: Annabell Gypsum (file)

5. County: Gila

6. MILS Number: 574

7. Operational Status:

8. Summary of information received, comments, etc.:

Ms. Gianulias called asking about the Anabel Gypsum Claims. She explained she received documents from a bidder on a military contract that proposes to pledge the claims to the government in lien of a performance bond guaranteeing successful completion of the contract. She explained that the company's past performance has made them unbondable. The company claims the deposit is 30 miles south of Payson and is valued at $60 million. The BLM microfische indicates the claims are owned by Clay Thorne et al. The documents Ms. Gianulias was provided includes assays by Don Jordon and an engineers' report by Dr. William Dusenberry.

Date: Sept. 22, 1988

Ken A. Phillips
(Signature) AzDMMR

ANNABELL GYPSUM GILA COUNTY

NJN WR 10/9/87: Jack Quay (card), reported that mineral surveyor, O. T. Smith reported someone has been mining gypsum and leaching it for gold, he believes, near Payson, and was seeking further details on the occurrence. I contacted Hilton cass who reported that there is indeed a gypsum deposit about 3 miles south of Pumpkin Center, west of the highway, where gypsum is being mined by Clay Thorne. This will be a new MILS occurrence called Annabell Gypsum, T5N R10E Sec 1 SE, Gila County. The property is being operated by Harold Hoggle. He is selling the 78% gypsum product as an agricultural product in the east valley. The gypsum occurs over a large aerial extent as lakebeds of interbedded silt and gypsum. Mr. Hoggle produces the gypsum as a crushed and screened product. A stockpile of oversize material is what Mr. Quay was referring to as the material being leached for gold, however unlikely that seems. Mr. Cass reports the samples he has taken run

Calcium oxide (aO) 28.2%
Sulfate trioxide (SO3) 36.6%

from which a calculated gypsum content would be 78.5%.

RRB WR 5/13/88: The Annabell Gypsum Claims (file) Gila County about 30 miles south of Payson being promoted by DBS out of Henderson, NV. They claim that they not only have high grade gypsum but that the inclusions are high grade gold, silver and platinum stringers. Assay are done by Don Jordon in conjunction with Dr. Dusenbury and Lawrence D. Royce. Also involved are Midas Corp (possibly Midas Management Inc. and Punkin Center Gypsum. According to the BLM microfiche Clay Thorne holds the Annabell Claims in Sec 1 & 2, T5N R10E and Sec 6, T5N R11E. It does not appear in "Industrial Mienrals."

Form 3060-1
July 1984

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number
AZA-27172
AZA-27208

MINERAL REPORT

Patent Application AZA-27172
Patent Application AZA-27208

Lands Involved

The applications involve 45 placer claims that lie in T. 6 N., R.10 E., and T. 5 N., R.11 E. Gila County, Arizona – Gila and Salt River Meridian

Claim - Annabell	Application Number	AMC Number	Claim - Annabell	Application Number	AMC Number	Claim - Annabell	Application Number	AMC Number	Claim - Annabell	Application Number	AMC Number
15	AZA 27172	32289	24C	AZA 27172	322618	34	AZA 27208	323007	46	AZA 27208	323019
16	AZA 27172	322290	24D	AZA 27172	322619	35	AZA 27208	323008	47	AZA 27208	323020
17	AZA 27172	322291	24E	AZA 27172	322635	36	AZA 27208	323009	48	AZA 27208	323021
18	AZA 27172	322292	25	AZA 27208	3222998	37	AZA 27208	323010	49	AZA 27208	323022
19	AZA 27172	322293	26	AZA 27208	3222999	38	AZA 27208	323011	50	AZA 27208	323023
20	AZA 27172	322294	27	AZA 27208	323000	39	AZA 27208	323012	51	AZA 27208	324197
21	AZA 27172	322295	28	AZA 27208	323001	40	AZA 27208	323013	52	AZA 27208	323025
22	AZA 27172	322296	29	AZA 27208	323002	41	AZA 27208	323014	53	AZA 27208	323026
23	AZA 27172	322297	30	AZA 27208	323003	42	AZA 27208	323015	54	AZA 27208	323027
24	AZA 27172	322298	31	AZA 27208	323004	43	AZA 27208	323016			
24A	AZA 27172	3222616	32	AZA 27208	323005	44	AZA 27208	323017			
24B	AZA 27172	3222617	33	AZA 27208	323006	45	AZA 27208	323018			

Containing 3,422.95 acres

Prepared by:

Ralph Costa
Mining Engineer, Arizona S.O. BLM

Technical Approval:

Byard L. Kershaw
Geologist, Arizona S.O. BLM

Management Acknowledgment:

Al Burch
Group Administrator, Geologist - Minerals and Renewable Resources Group,
Arizona S.O. BLM

Forest Service Review:

Michael A. Linden
Geologist, FS Region 9

Form 3060-1
July 1984

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number
AZA-27172
AZA-27208

MINERAL REPORT

Patent Application AZA-27172
Patent Application AZA-27208

Lands Involved

The applications involve 45 placer claims that lie in T. 6 N., R.10 E., and T. 5 N., R.11 E.
Gila County, Arizona – Gila and Salt River Meridian

Claim - Annabell	Application Number	AMC Number	Claim - Annabell	Application Number	AMC Number	Claim - Annabell	Application Number	AMC Number	Claim - Annabell	Application Number	AMC Number
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20	AZA 27172	322294	27	AZA 27208	323000	39	AZA 27208	323012	51	AZA 27208	324197
21	AZA 27172	322295	28	AZA 27208	323001	40	AZA 27208	323013	52	AZA 27208	323025
22	AZA 27172	322296	29	AZA 27208	323002	41	AZA 27208	323014	53	AZA 27208	323026
23	AZA 27172	322297	30	AZA 27208	323003	42	AZA 27208	323015	54	AZA 27208	323027
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24B	AZA 27172	3222617	33	AZA 27208	323006	45	AZA 27208	323018			

Containing 3,422.95 acres

Prepared by:

BUREAU OF LAND MANAGEMENT CERTIFIED Ralph Costa 0098 U.S. DEPARTMENT OF THE INTERIOR MINERAL EXAMINER

Ralph Costa
Mining Engineer, Arizona S.O. BLM

November 7, 2002
(Date)

Technical Approval:

BUREAU OF LAND MANAGEMENT CERTIFIED Byron L. Kershaw 029 U.S. DEPARTMENT OF THE INTERIOR MINERAL EXAMINER

Byron L. Kershaw
Geologist, Arizona S.O. BLM

November 7, 2002
(Date)

Management Acknowledgment:

Al Burch
Group Administrator, Geologist - Minerals
and Renewable Resources Group,
Arizona S.O. BLM

November 7, 2002
(Date)

Forest Service Review:

MICHAEL A. LINDEN No. 024 CERTIFIED MINERAL EXAMINER U.S. FOREST SERVICE

Michael A. Linden

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SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary & Purpose

The purpose of this report is to record and document the results of field examinations of the Annabell claim block and to evaluate technical information submitted in support of the applications for patent (Serial Numbers AZA-27208 and AZA-27172) for the 45 placer claims contained within the claim block. The report also serves to determine if the Applicants (Clay, Ann, Bill and Sharlene Thorne, hereafter referred to as the Applicants) have complied with the requirements of the mining law for patent to the claims.

Conclusions

On the basis of an evaluation of the information submitted by the Applicants, review of the published literature and mining law, and field examination of the subject mining claims, the following conclusions are drawn:

Placer and Gypsum Deposits

1. The Applicant failed to make the necessary $500 worth of improvements to the claims in the patent applications as required by law. The work done as listed in Exhibit V in application AZA-27172 and Exhibit J in AZA-27208 constitutes a geological survey and does not qualify as an improvement that meets the requirement for patent. See 43 CFR 3851.2(a)(4) and 3861.2-3 (b). The work done by the mining claimant on the claims, at best, may be an aid to further prospecting and does not, in and of itself, aid in the extraction and removal of "ore".

2. It is clear from field investigations that if the requirements to monument and post location notices as prescribed by Federal and State law were ever met, these monuments and location notices were not maintained over time.

3. The location of discovery points have not been maintained over time and the Applicants, represented by Clay Thorne (hereafter referred to as Thorne), could not remember their location. Although specifically asked where the discovery points were on the claims Thorne could not identify these points and claimed to be unaware of the responsibility to maintain the discovery. He declined the opportunity to visit all of the claims in the group and select sample sites. He also declined the opportunity to bring additional equipment and personnel on the site to open his discovery points. Instead, he pointed to a few locations he felt had very high values of gold and silver. These points were then sampled but subsequent assays showed only trace amounts of metals to be present.

   Thorne did not indicate any sites to be sampled for gypsum content. The lone point selected by Thorne in a sediment horizon containing gypsum was designated by him to be assayed for gold, silver, platinum and palladium he said were associated with the gypsum. The sample taken at this location showed in a subsequent assay to contain only trace amounts of these metals.

Placer Deposits

1. Stream sediment samples and even those samples specifically designated by Thorne as being representative of areas of high concentrations of precious metals (several ounces per ton) contain only trace amounts of these metals.

2. The sampling program used by the Applicants suffers from many serious deficiencies such as small sample size and improper drilling techniques.

3. Reputable assay labs, acting as disinterested third parties, were not used by the Applicants to verify their assay results. Because there was no independent verification of the assay results by reputable labs and other relevant factors, the reliability of the Applicant supplied assay results is suspect.

4. The mining history of the region supports the results of the sampling program as prospectors over the last century have not found any promising precious metal deposits in the Tonto Basin area and there is no historical precious metals production from the region. There are no active mines in the region and despite claims to extraordinarily high values of precious metals none of the claims in the application were actively mined.

Gypsum Deposits

1. As there is a relative abundance of gypsum in Arizona, markets drive the development of gypsum deposits. Without a readily identifiable and developed market, there is little incentive to develop this gypsum resource with further exploration. The Applicants do state they would produce gypsum for agricultural purposes but other producers in this market have excess capacity and have been unable to sell their presently stockpiled product or their mines are idle. Additionally, most of the producers for the agricultural markets produce agricultural grade gypsum as a by-product of either wallboard grade product or cement grade product. Some producers are using scrap wallboard from construction in Phoenix to produce agricultural gypsum and synthetic gypsum continues to claim an increasing market share of many traditional gypsum markets (Mining Engineering, October 2001, p 14).

2. The gypsiferous zones on the Annabell claims cannot produce a grade of gypsum (averaged over the horizons studied) that is of sufficient quality and quantity to be used in the production of either wallboard or cement products. The only use for the Thorne gypsum is in the agricultural gypsum market. Currently, producers with a distinct cost advantage when compared to the gypsiferous zones on the Annabell claims dominate this market. These producers provide agricultural gypsum as a by-product of either their wallboard or cement grade products and enjoy the benefits of spreading mining and beneficiation costs over two distinct product lines.

3. Over most of the exposures, the gypsiferous zones on the Annabell claims require stripping of overburden and interburden for mining to occur. The other mines studied do not require stripping to any large extent and any interburden encountered is either mined and processed or easily stripped as a single lift. The Gypsiferous zones on the Annabell claims suffers a distinct cost disadvantage over other producers.

4. The other mines visited had large, massive occurrences of gypsum ranging in thickness from 20 to 70 feet. The Thorne gypsum runs 5 to 7 feet in thickness with several interbedded clay layers.

5. The poor overall percentage of gypsum in the depositional zones (Horizons A, B and C) at the Thorne site results in very low recoveries. Even the Applicants recognize this fact when they state in their application " Applicant's and Arizona Department of Transportation show a typical total thickness of gypsum beds of 6 inches and a thickness of non-gypsum material of 30 inches between beds, giving a non-gypsum material to gypsum ratio of 5:1." This amounts to a recovery of 20%. The mines used for comparison have recoveries in excess of 70 or 80%. All else being equal, mining costs are inversely proportional to the recovery.

6. There are no precious metals contained in either the gypsum or associated clay layers that could augment revenues or offset mining costs.

7. The Applicants do not define a reserve of gypsum minerals amenable to mining. The applications contain a description of the gypsum deposit as being 1,760 acres of material with 6 inches of gypsum in 30 inches of non-gypsum material. They do not provide maps showing where this area is or drill hole data that would verify the existence of this material. Additionally, the gypsiferous horizons are discontinuous along the length of the exposed outcrop and are probably discontinuous along their dip as well. Only further exploration could outline a gypsum resource within the claim group.

Recommendations

On the basis of the information developed in this report, the following recommendations are offered:

1. It is recommended that the patent applications be rejected. Grounds for rejection include:

   A. **Failure to Make Necessary Expenditures and Improvements**: The requisite $500 worth of expenditures and improvements was not done as required by 43 CFR 3863.1-2. The work done by the Applicants consists of several small drill holes and one small trench dug on each claim. Collectively the work done by the Applicants does not define "ore blocks" or assist in the development of the property but rather consists of a poorly conceived and executed mode of prospecting that constitutes a primitive "geologic survey" as defined by 43 CFR

3851.2 (b)(1). Statements made by the Applicant, Clay Thorne, verify this conclusion. Pursuant to 43 CFR 3851.2(a)(4), a geologic survey cannot apply toward the statutory provision requiring the expenditure of $500 for each claim for mineral patent. The quantity of work performed in this case is immaterial; the type of work performed does not qualify as an improvement under 43 CFR 3863.1-2.

Despite claims of high precious metals values in material at or near the surface, readily amenable for excavation, the area encompassed by the two mineral patent applications is barren of all signs of prospecting, mining or milling related activities. There are no drill holes, excavations, tunnels, shafts, adits, stockpiles, equipment, buildings or other forms of mining related infrastructure on any of the claims.

2. Should recommendation 1 be taken, contest of the mining claims within the two patent applications would not be necessary. If however, contest should become necessary, or if contest is a preferred management alternative, it is then recommended that all of the Annabell claims encompassed in AZA-27172 and AZA-27208 be contested with specific charges as follows:

A. **Failure to Make Necessary Expenditures and Improvements**: As stated in recommendation 1.

B. **Lack of Discovery**. Minerals have not been found within the limits of the Annabell claims in patent applications AZA-27172 and AZA-27208 in sufficient quantities and/or qualities to constitute a valid discovery of a valuable mineral deposit. **See Castle v. Womble, 19 L.D. 455 (1894); Jefferson-Montana Copper Mines Co., 41 L.D. 320 (1912).**

C. **Nonmineral Tracts in Placer Claims**. The entirety of the lands encompassed in patent applications AZA-27172 and AZA-27208 is nonmineral in character and therefore, should be excluded from patent.

Taken specifically by claim:

1. The Annabell 25-54 claims in applications AZA-27208 and the Annabell 15-24, 24A, 24B, 24C, 24D, and 24E claims in Application AZA-27172 should be contested for lack of discovery of a valuable placer deposit of gold, silver, platinum or palladium in sufficient quality and quantity to warrant the further expenditure of time and effort in developing a paying mine.

2. The Annabell 15, 16, 17 1, 19, 20, 24A, 24B, 24C, 24D, 24E, 27, 28, 29, 30, 32, 34, 36, 39, 40, 41, 43, 46, 47, 48, 49, 50 and 51 claims do not have an exposure of gypsum and as such were not shown by the claimant to have mineral in place of sufficient quality and quantity to

warrant the further expenditure of time and effort in developing a paying mine.

3. The Annabell 21, 22, 23, 25, 26, 31, 33, 35, 37, 38, 42, 44, 45, 52, 53 and 54 claims contain physical exposures of gypsiferous horizons, but the claimant failed to provide sufficient information to show that the exposures were of sufficient quality and quantity to warrant the further expenditure of time and effort in developing a paying mine. Additionally, the further analysis of these exposures in this report indicates that the physical characteristics of these horizons are of sufficiently poor quality that a person of ordinary prudence would not be justified in the further expenditure of time and effort in developing a paying mine based on their occurrence.

D. Failure to Prosecute Application with Diligence: The Applicants have not maintained a tangible presence on the ground and have failed to prosecute the application with diligence as required by 43 CFR 3862.6. Specifically:

1. None of the pits or drill holes made by the Applicants could be located and no "point of discovery" could be found on the claims. When asked to expose the point of discovery, the Applicant, Clay Thorne, refused saying it was the government's responsibility to provide the equipment for such sampling. Thorne also refused to visit all of the claims citing health reasons. Thorne also declined the opportunity to have his agents meet with the mineral examiner and guide him to discovery points or locate sample points on the claims, instead pointing to a few areas he alleged to have high mineral concentration that ultimately proved to be barren of valuable mineralization.

2. If it ever existed, proper claim monumentation as required by Arizona law has not been maintained over time. Claim monuments by law are to be conspicuous monuments of stone not less than 3 feet in height or an upright post securely fixed to the ground and projecting at least 4 feet above the ground. Each placer claim must have 6 such monuments, one at each corner and one at each end-line. For the 45 claims in the two patent applications, a minimum of 270 such monuments should have been in evidence on the ground, but none were found. Additionally, a location notice must also be placed on each claim. No location notices were found.

EXECUTIVE SUMMARY

On September 22, 1992, Clay, Ann, Bill and Sharlene Thorne filed two applications with the Arizona State Office of the Bureau of Land Management (BLM) for patent to 45 placer mining claims. On May 13, 1993, the purchase price was paid for Mineral Application AZA-27208 and AZA-27172. On December 1, 1994, the First Half–Final Certificate was issued for AZA 27208 and AZA-27172.

The mineral examination of the property began in the spring of 1997, and extensive sampling was done on the claims during the week of November 2, 1997. Further field examinations and sampling were done in June of 1998 with final site evaluations and sampling done in February through May of 2002.

The claim groups, known as the Annabell 15 through 24E and Annabell 25 through 54, are situated in the Tonto Basin of central Arizona, approximately 30 miles south of the town of Payson. The claims are all within the Tonto National Forest (Figures 1 & 2).

The Annabell #15 through 24 claims were located on June 18, 1992, and their locations were amended on August 13, 1992. The Annabell 24A claim was located on June 24, 1992 and amended on August 13, 1992. Annabell claims #24B through 24E were located on June 24, 1992. Exploration activity on the claims has included sampling by shallow augering. In addition, shallow pits were excavated in some areas. The Applicants, using their own assay laboratory, assayed the pit and auger samples for gold, platinum and silver.

The patent applications indicate that mineral deposits on the claims include gold, silver and platinum group metals in clay and gypsum that occur in stream and alluvial gravels and other sediments. The applications also indicate that a valuable deposit of gypsum, suitable for use as cement retarder and agricultural applications, exists on the claims.

The area under the applications has little history of mining. Mining for copper, uranium, and minor amounts of manganese, iron and tungsten has occurred in older rock in the Sierra Ancha Mountains to the northeast of Tonto Basin. One mine in the Mazatzal Mountains to the southwest of the project area reportedly produced a small amount (100 oz. or less) of gold. No previous mining activity or exploration is known to have occurred in the area of the Annabell Claims.

The claimants state that mining would be done by surface excavation, at a rate of 300,000 tons per year, with approximately 1,250 tons of ore milled per day (including 1,000 tons per day of placer material and 250 tons per day of gypsum laden material). The estimated amount of reserves reported by the claimants is 17,900,00 tons, which at a mining rate of 300,000 tons per year, indicates a mine life of about 60 years. Neither the full cost, nor the time needed to bring the proposed mine into production, was given in the patent applications.

INTRODUCTION

On August 11, 1992, Clay Thorne, of 501 S. Rimview Circle, Payson, Arizona, 85547, along with Ann, Bill and Sharlene Thorne (the Applicants), filed an application (AZA 27172) with the Arizona State Office of the Bureau of Land Management, U.S. Department of the Interior, for patent to 15 association placer mining claims on the Tonto National Forest in the Tonto Basin, Gila County, Arizona. Refer to Figures 1 and 2 for the location of Tonto Basin.

On September 22, 1992, the Applicants filed a second patent application (AZA 27208)

with the Arizona State Office of the Bureau of Land Management (BLM), for 30 association placer mining claims on the Tonto National Forest in the Tonto Basin, Gila County, Arizona. The First Half of Mineral Entry Final Certificates for mineral patent applications AZA 27172 (Annabell 15 through 24E) and AZA 27208 (Annabell 25 through 54) were issued on December 1, 1994. The Annabell claims 15 through 24E and 25 through 54 are referred to in this report collectively as the "subject claims" or the "subject claim group".

Once First Half of Mineral Entry Final Certificate was issued for the two applications, a mineral report was requested. Originally, the responsibility for preparing this mineral report was assigned to Elizabeth Mathews, Mineral Examiner for the Arizona Zone of the Southwest Region of the Forest Service (FS), U.S Department of Agriculture. A project team was then assembled, primarily of Ms. Mathews and Prescott National Forest Geologist Beverley Everson acting as an assistant for Ms. Mathews. On February 21, 1998, Ms. Mathews disappeared and has not been heard from since.

Due to the disappearance of Ms. Mathews, the report was assigned to Ms. Becky Hammond of the BLM Arizona Strip Field Office. Due largely to her promotion to Acting Monument Manager of the BLM Grand Canyon-Parashant National Monument, the responsibility for writing the report was then given to Ralph Costa, BLM Mining Law Program Lead for Arizona for completion. Because of the disappearance of Mathews and errors found in the assay data provided to the FS for the samples taken by her, all of the fieldwork was repeated.

LANDS INVOLVED AND LAND STATUS

The Annabell Claims are located in Gila County Arizona and lie immediately south of the small town of Punkin Center and are adjacent to and extend south of the small town of Tonto Basin. Primary access to the claims is by State Highway 188, which runs north-south through the Tonto Basin (Figures 2 & 3). East and west access into the claims is by the A+ road at the south end of the south claim block and a few scattered jeep trails and FS roads further north leading to the west. Some of the claims can not be accessed by road or trail and were accessed by walking or ATV. The northern block of claims lies primarily to the west of the highway; the southern block lies east of the highway.

Physiographic Data

The claims lie approximately 90 miles north of downtown Phoenix or about 2 hrs and 30 minutes driving time. The closest community of any size is Payson, Arizona, which lies to the north of the claims about 30 miles. Driving time from the claims to Payson is about 30 minutes (Figure 2).

Land Use and Ongoing Activities

Exact statistics for the populations of Punkin Center and Tonto Basin could not be found, but the populations of the two communities combined is estimated to be less than 5,000. Between them, the communities have 2 hotels, 3 restaurants and a convenience store/gas station. The hotels and gas station cater largely to fishermen who fish on lake Roosevelt,

which lies to the south of Tonto Basin about 10 miles. Hunters also frequent the area and considerable evidence of hunting, such as spent shells, was observed on the claims.

Although the towns are small, the area has all necessary utilities that a mining operation would require. Utility feed lines would have to be run to any mining activity but main electric power and telephone lines are readily available in the area. The area also offers cell-phone service.

The area appears to be going through a moderate growth cycle and several new homes are being built in the area. Some homes are immediately adjacent to the claims, separated only by a fence.

Local residents report an increase in land and home prices. The building cycle seems to be spurred by a land exchange by the Tonto National Forest that placed some of the lands in Tonto Basin along the highway into private ownership. These lands are being developed primarily for single-family residences, cottages, cabins and other types of recreational housing. Gila County (www.gila.lib.az.us/index3.html) states that the Forest Service manages 56% of the land in the county, 2% of the lands are managed by BLM and 2% are managed by the state. The remaining lands are in private ownership.

The primary industries in the area are recreation and ranching. A few cultivated fields could be seen in the Tonto Creek flood plain but overall they represented a very small percentage of the overall land area. Evidence of grazing could be seen everywhere on the claim block.

Topography and Climate

On average, the Tonto Basin area, lying just south of the Colorado plateau, in the southwest desert has about 230 days of sunshine each year (www.arizonan.com/weather). Average rainfall in the area is between 2 to 5 inches. Daily high temperatures occur in September at 102 degrees and daily low temperatures occur in January at 31 degrees.

There are no climatic conditions that would limit mining, but only a trace amount of surface water was observed (See Photos 1 and 2). Tonto Creek is the only drainage in the area that carries any surface flow. The flow in Tonto Creek is sporadic and flows from north to south through the claim group and water for a mining operation would have to be provided by a well.

Land Status

A review of Bureau of Land Management (BLM) automated Internet records (http://blm.gov/lr2000//) and master title plats provided the status and restrictions on mineral entry in the subject claims. The master title records indicate that the area encompassing T. 6 N. R 10 E. was incorporated into the Tonto National Forest on October 3, 1905, while the area encompassing T. 5 N. R 11 E. was incorporated into the Tonto National Forest on January 13, 1908 under part of Presidential Proclamation 795. According to BLM records, the areas encompassed by the claims were open to mineral entry under the 1872 Mining Law when the claims were located in 1992. Review of

BLM records also indicate that no mineral leases or prospecting permits are in effect for the area under patent application (Appendix 1).

Mining Claim Recordation

The 45 claims in the two applications are in two distinct blocks; one to the north and one to the south. The northern block encompasses 2,350 acres and includes the Annabell 25-54 claims. This block is located in portions of sections 15, 22, 26, 27, 35 and 36, T6N., R10E. (Application AZA-27208). The southern block of claims covers approximately 1,073 acres, and includes Annabell 15-24, 24A, 24B, 24C, 24D, and 24E claims (Application AZA-27172). These claims are located in portions of sections 6, 7 and 8, T.5N., R.11E. All of the claims are located in Gila County, Arizona, within the Tonto National Forest, Gila and Salt River Base and Meridian.

Appendix 1 contains summaries of the original location dates for each claim in the applications as well as the dates of any amendments. All of the claims in Application AZA-27208 were located or amended prior to September 8, 1992. The claims in Application AZA-27172 were located or amended prior to August 13, 1992. Mining claim recordation files with the BLM were examined to insure that all of the claims under consideration are compliant with section 314 of the Federal Land Policy and Management Act of 1976 and with regulations outlined in 43 CFR Part 3833. Final mineral entry on all of the claims under application was allowed on December 1, 1994.

Maintenance of Claim Monuments and Discovery Points

During the period of field study for this report, none of the claim corner monuments were found. While there was no directed effort by BLM during the latest round of site visits to find each and every claim corner, several were searched for and were found to be absent. The discovery points, if they were ever established, have not been maintained and an exact point of discovery could not be located on any of the subject claims. None of the pits or drill holes listed by the claimants in the patent applications were found. In addition, no location notices were found.

In 1997, Liz Mathews searched the claims for monuments and location notices. Her field notes are presented in Appendix 2. Mathews also could not find all of the claim corners and reported that the claims lacked location notices.

State law in Arizona for the location of an unpatented mining claim requires placing at one corner of the claim and within the boundaries of the claim, a location monument. This monument must be a conspicuous construction of stones not less than 3 feet in height or an upright post securely fixed and projecting at least 4 feet above the ground. The law requires that a location notice be posted and signed by the name of the locator and placed on the location monument or post. (Clark, p. 25) It is clear from field investigations that if the requirements to monument and post locations notices were ever met, they were not maintained over time. Photo 3 shows a properly staked mining claim corner near Salome, Arizona.

Actions Affecting Land and Mineral Status

Administrative Site Withdrawal

On March 30, 1966, PLO 3965 (Appendix 1) removed the area of the Tonto Basin Administrative site from mineral entry. The 70 acres in this removal consist of:

T. 6N., R. 10E.,
Sec 10: W2SE4SE4, E2W4SE4
Sec 15: NE4NE4

This withdrawal does not involve any of the subject claims and is mentioned because of its boundary with the north edge of the claims in Application AZA-27208.

Community Pit Right of Way

On February 9, 1998, the Forest Service established a community pit for deposits of sand and/or gravel, or other common variety mineral materials suitable for, but not limited to such uses as road armor, road mix aggregate, and concrete aggregate. This appropriation, AZA-23207 (Appendix 1), establishes the community pit as a superior right against any subsequent mining claim or entry upon the land. However the appropriation does not close the lands to proper mineral entry under the 1872 Mining Law, as amended. The effect of the appropriation is to make any such claims subject to the use of common variety minerals by the U.S. Government. Any mining claims filed after February 9, 1998 on the following parcels would be subject to the prior right of the appropriation:

T. 5N., R. 11 E.,
Sec. 6: NW4, SW4NE4, SE4
Sec. 7: E2
Sec. 8: W2NW4, W2SW4, SE4SE4, SW4SE4, SE4SE4, SE4SE4, NE4SE4, SE4SE4, E2NE4

Mining on the claims in the two patent applications, if shown to be valid, would not be subject to the community pit as all of the claims involved in the applications were filed or amended several years before the establishment of the community pit.

Highway Easements

There are two separate highway easements for the routing of Highway 188. The first is dated July 6, 1992 and the second is dated December 20, 2001. Both easements postdate the location dates of the claims in the applications although some of the claims were amended after the date of the July 6, 1992 easement. The July 6, 1992 easement specifically requires the State of Arizona to obtain such permission as may be necessary for the use of outstanding valid claims. It is clear that the claims under consideration for patent were filed before the issuance of the easements and, if shown to be valid, would maintain pre-existing rights. Any allowance for a right-of-way would be negotiated between the Applicants and ADOT as specified by the July 6, easement.

Roosevelt Lake Expansion

On December 3, 1999 Public Land Order (PLO) 7420 (Appendix 1) removed the Roosevelt Lake Expansion Area from mineral entry (but not mineral leasing) under U.S.

mining laws until December 2, 2019. Portions of the area included in PLO 7420 encompass parts of the southern block of the Annabell Claims in application AZA-27172. These specific areas consist of:

T. 5N., R. 11E.,
Sec 6: Lots 3, 4, 5 SW4NE4, SE4NW4, NE4SW4, SE4
Sec 7: NE4, N2SE4
Sec 8: W2NW4

The claims under consideration for patent were filed or amended before the passage of PLO 7420 and, if shown to be valid, would maintain pre-existing rights to any minerals.

Special Use Permit – Salt River Project

On November 9, 1995, the Forest Service issued a special use permit for the placement of power lines across:

T. 5N., R. 11E.,
Sec 5, Sec 7, Sec 8 for a distance of 2,323.2 feet with a width of 20 feet.

The claims under consideration for patent were filed or amended before the issuance of this permit and, if shown to be valid, would maintain a pre-existing right. However, patent should reflect an allowance for the power line right-of-way.

Forest Roads

There are two clearly marked Forest roads that traverse the claim group. The roads are FS 245 and FS 1720. The Forest Service was asked to provide land status information concerning these roads and produced a map showing several roads that traverse the subject claims but were not marked. In this instance, should patent issue, allowance should be made for a right-of-way for these roads.

GEOLOGY AND MINERALIZATION OF THE CLAIMS

The Tonto Basin is in the Central Mountain Province, or Transition Zone, of Arizona. This geographic and geomorphic province is characterized by rugged mountain ranges composed of Precambrian igneous and metamorphic rocks, erosional remnants of Paleozoic sedimentary rocks, and Tertiary volcanic and sedimentary rocks.

Regional Geology

The Tonto Basin formed in response to Basin and Range Tectonism during the mid to late Tertiary. Tonto Basin is a Mid-Tertiary, west-tilted half-graben located in the Transition Zone tectonic province of central Arizona. (Ferguson, p. 1) More specifically, the Tonto Basin is an asymmetric, north-south to northwest-southeast trending graben, about 56 kilometers long and 6 to 16 kilometers wide. Major high angle, normal faults are present on both sides of the basin, with the greatest displacement on the west side. The Armer Mountain Fault bounds the northeast margin of the basin, and the Two Bar Fault bounds the southwest margin (Anderson, p. 12).

The mountain ranges surrounding the Tonto Basin, the Mazatzal Mountains to the west, the Sierra Ancha range to the east, and Two Bar Ridge to the south, are composed of a thick section of Precambrian and Paleozoic Rocks. The oldest rock in the area is the 1700 Ma Mazatzal Quartzite (Anderson, p. 6).

Middle Paleozoic rocks discomformably overlie the Precambrian deposits. The Paleozoic rocks include the Martin and Redwall limestones of Devonian and Mississippian age, respectively. No Mesozoic rocks are preserved in the Tonto Basin area. (Anderson, p. 6).

Volcanic rocks, primarily basalt and dacite, are the oldest known Tertiary deposits in the area of study. These volcanic rocks are probably part of the Superstition-Superior volcanic field, which was active about 21 to 18 Ma during a mid-Tertiary orogenic event. (Anderson, p. 6).

A thick sequence of upper Tertiary basin-fill deposits is present in the Tonto Basin. These deposits are believed to be primarily of Miocene age. They are generally divided into two general units; a gray to reddish-brown conglomerate and a reddish-brown mudstone (Anderson, p. 7).

Terrace, pediment and alluvial gravels overlie the older basin fill. Deposition of these gravels began with breaching of the basin by the ancestral Salt River and the establishment of through-flowing drainage. The gravels are thought to range in age from late Pliocene to about 15 thousand years old (Anderson and others, p. 10). In addition to these older gravels, recent gravels occur in landslides and in the channels of Tonto Creek and its tributaries.

The Applicants indicate the Tertiary sediments and the various Quaternary units host precious metals and mineable gypsum. These units, the Tertiary sediments and the Quaternary sediments, are the only units to be investigated further in this report as they are the only units physically exposed on the subject claim group.

Site Geology

The site geology of the claim group itself consists of two basic geologic units, Tertiary sediments and Quaternary alluvium. Over the area of interest, the Quaternary alluvium is divided into four units, Younger alluvium (Qa), Terraced alluvium (Qt), Piedmont deposits (Qp) and Older alluvium (Qao). Over this same area, the Tertiary sediments are divided into two units, Red Mudstone (Tm) and Younger conglomerate (Tcy). Figure 4 is a geologic map of the subject claims based on the Arizona Geological Survey Geologic Map of the Tonto Basin 7.5' Quandrangle.

Tertiary Sediments

The principle Tertiary unit in the area is a red mudstone and siltstone (Tm) with conspicuous beds, ranging in thickness from a few centimeters to over 40 meters, of thin-bedded to laminated gypsum and green mudstone. The gypsum beds are thickest in the

south where they comprise up to 10% of the unit, and they pinch out altogether just north of the area encompassed by the 7.5 minute Tonto Basin Quadrangle. (Ferguson, p. 2)

Tertiary sediments appear to underlie the basin throughout the extent of the claim group, and these sediments form the lowest, oldest geologic unit that outcrops in the claim area. From northwest to southeast, the valley cut by Tonto Creek exposes older sediments (lowest elevation) with the youngest Tertiary sediment in the northwest corner of the claim group.

Also in evidence from north to south is the relative quantity of black sands visible in the drainages. In the north, visible signs of black sands are infrequent and the amount of black sand that is visible is sparse. In the south, the quantity of black sand greatly increases with large amounts readily visible in stream channels and cut-banks. This is due in part to the thickness of Quaternary gravels in the north and south but also to a change in the lithology of the Tertiary sediments.

In the south, the Tertiary sediments tend to have a coarser constituent of fine gravels that is lacking further north. In these coarser layers, black sand lenses can be seen in cut banks and must certainly contribute to the black sands visible in stream channels. In statements made by Thorne to the Forest Service, the precious metal values are associated with the black sands so the presence of black sands is important to the design of a sampling program (Appendix 8).

Of primary concern in the Tertiary sediments is the presence of localized occurrences of gypsum. These occurrences are typically small layers of gypsum often a few millimeters thick interspersed with gray or green clays. These "gypsiferous zones" can be up to 10 to 15 feet thick and occur intermittently up in elevation through the claim group. Photo 4 shows a typical gypsiferous zone.

Along Highway 188 there are numerous regular occurrences of these gypsiferous zones outcropping in the bluffs along the west side of the highway (Photo 5). These bluffs are pediments from the nearby mountains that have apparently been protected from weathering by pediment gravels and the overall resistant nature of the gypsiferous zones themselves. Often, the highest pediment plains are now capped by gypsum bearing formations (Photo 6).

Generally, these gypsiferous zones appear from the highway to be much higher in gypsum content than they are. As the gypsum occurs in thin lenses, erosion typically liberates these lenses allowing them to fall out of the formation down slope. From the highway these liberated particles of gypsum "float" lead to the false impression that the light colored zone is very high in gypsum. In truth, the zone overall has high quality gypsum in a much lower percentage than the down slope talus material would suggest (Photo 7).

It is relatively easy to correlate these zones moving from south to north along the highway. In general, beds at the highest elevations along the road at the south end of the

claim group can be seen lower in the bluffs further north until they are lost, sinking below the lowest eroded features while bluffs progressing north expose higher (in elevation) gypsiferous zones progressively. The extent of these outcrops is mapped in Figure 7.

A few of the unnamed drainages between pediments are underlain with these gypsiferous zones at various depths. A simple profile was drawn through each sample point taken in the gypsiferous zones to determine the elevation of each sample point. Using the elevation information, an attempt was made to correlate the various zones and estimate their likely depth to determine possible stripping ratios and to explore those claims where physical exposures of the gypsiferous zones might exist. In general, the gypsum zones outcrop along a bluff parallel to the highway and are generally under deep cover (20 feet or more).

In general, these gypsiferous zones do not constitute "beds" of gypsum or even gypsite, but are rather semi-continuous zones of a common depositional environment. The zones tend to change radically from one outcrop to the next. Often an exposure in one area that is highly resistant to weathering and thus considered to have higher gypsum content is, in the next exposure extensively weathered and thus considered to have higher clay content. The conclusion is that the gypsum content is highly variable and although these common depositional zones may correlate from one bluff to the next for short distances along Highway 188, the gypsum content that they contain does not necessary correlate.

During sampling an attempt was made to select those areas believed to contain the highest amounts of gypsum to establish if the best zones were of sufficient grade to warrant further prospecting. The results of this sampling seem to indicate relatively uniform grades along the strike of the gypsiferous zones. Generally this is not the case but rather a consequence of the sampling method used. For production mining operations, samples would be taken at much closer intervals to determine the true nature of the gypsiferous zones. In any event, sampling on closer intervals would probably serve to reduce the average gypsum content of these gypsiferous zones as in this report those areas believed to have the highest gypsum concentrations were the areas sampled. However further sampling would be necessary to prove this conclusively.

Using the cross section to determine the elevation for each sample, sample logs for thickness and assay data for gypsum and clay content, the following table was constructed which shows the most likely configuration, based on the available information, of the gypsiferous zones:

Sample Number	Claim	Elevation (feet)	Measured Thickness (feet)	Horizon	Unit	Average Thickness (feet)	Strike (a)	Dip	% Gypsum(c)
5	33	2470	11.5	A	a1	12	(b)		0.5%
				Interburden	i	10			
3	45	2460	5.7		a2	6	(b)		53.8%
1	44	2460	6.7						
				Interburden	i	20			
4	45	2440	7.3		a3	6.7	N 33° W	<1 °	50.9%

Sample Number	Claim	Elevation (feet)	Measured Thickness (feet)	Horizon	Unit	Average Thickness (feet)	Strike (a)	Dip	% Gypsum(c)
1	23	2440	6						
3	35	2430	6.8	A					
				Interburden	i	20			
1	42	2410	2.4		a4	2.5	N 30° W	1° SW	57.9%
4	33	2405	6						
2	37	2395	4.7						
				Interburden	i	20			
2	52	2375	4.8	B	b1	4.5	N 58°W	<1°	61.1%
3	33	2365	4						
1	37	2360	4						
				Interburden	i	15			
1	52	2345	8.8		b2	6	N 43° W	1° SW	47.2%
3	22	2335	2.4						
5	22	2330	6						
				Interburden	i	5			
2	33	2325	4.7		b3	4.5	N 33° W	5° SW	46.7%
4	54	2310	4.5						
4	22	2310	4						
				Interburden	i	10			
3	54	2300	3.3	C	c1	3.5	N 44° W	<1°	40.6%
5	54	2295	1.2						
5	21	2295	5.5						
				Interburden	i	10			
1	54	2285	3		c2	2.8	(b)		9.6%
6	54	2275	2.72		c2	2.8			
				Interburden		20			
3	21	2255	5		c3	4.5	Due West	6° S	38.3%
1	22	2245	4						
4	21	2240	4						

(a) The measured strike and dip of the individual units was calculated using the Three Point method and Figures 5a, 5b, and 5c. The results are in general agreement with Anderson who reports sedimentary rocks in the vicinity of Roosevelt Dam strike N 40 W (Anderson, p 13).

(b) Less than three exposures were sampled, as a result the Three Point method could not be used.

(c) Based on recoverable gypsum.

The layers seem to distribute themselves into three horizons which for this report are labeled A, B and C. Within each horizon are one or more units of gypsiferous layers separated by layers of interburden. For each horizon, the contour intervals for the uppermost and lowermost elevations (horizon boundaries) were selectively plotted on a map of the claims. Refer to Figure 6. Note that if the horizons are continuous, gypsiferous layers should outcrop all along the west edge of Highway 188. These layers, if they are continuous and of relatively similar geology, should outcrop along the

highway as the topography (and presumably geomorphology) along the road is relatively constant, consisting of small bluffs and drainages. However, these horizons outcrop only locally. Additionally, the strike of the three horizons is between N 35° W and N 43° W with a very slight dip to the SW. The strike of the beds in general parallels Highway 188 which has a general bearing of N 38° W, except at the north end of the claim group where the highway veers in a more northerly direction

On May 30 and 31st, 2002, the site was again visited and Figure 6 was compared to the actual distribution of outcrops along Highway 188. Figure 7 shows the actual distribution of outcrops along the highway. Note that the actual length of outcrops is significantly less then the expected length of outcrops if the beds were continuous. This indicates clearly that the horizons are not continuous along the highway and thus along their strike.

During earlier field inspections, the hills and ravines were examined closely to find sample points for gypsum samples. Few outcrops of gypsum were found in the drainages on those claims not immediately adjacent to the highway. Only two drainages, one at the north end of the northern claim group (Photo 8) and one at the north end of the south claim group (Photo 9) contained outcrops of gypsum in drainages not visible from Highway 188 and both exposures were sampled. A lens of clay and gypsum can be seen along Tonto Creek in a single location but this lens was not sampled as it is of very poor quality (Photo 10) and contains only three small 1-inch lenses of gypsum.

Because the gypsiferous horizons do not outcrop continuously along the highway (highway bearing is N 38° W), up the drainages or along Tonto Creek, these zones most likely are not continuous along either their strike or dip. Instead, the available evidence suggests that the gypsum minerals probably occur only locally in small lenses with little continuity between them. While the horizons do tend to occur at common elevations, the depositional conditions for the formation of gypsum within these horizons were apparently highly localized and variable. The gypsum minerals appear to occur in a relatively narrow band for intermittent distances along the highway and have little lateral extent to the west of the highway as evidenced by the lack of outcrops in the drainages or to the east as evidenced by the lack of outcrops along Tonto Creek. Visually then, the zones are discontinuous along this dip but only development drilling or trenching could show this conclusively.

It is relatively simple to see that the zones with the highest gypsum content do not extend to any great distance but rather "pinch out" as they tend from a shade of white (highest gypsum content) to shades of brown, green or red until they are lost in the clay formations above and below the gypsiferous horizons (Photo 11). Again this provides visual proof that the gypsiferous beds are not continuous but exist as lenses or pods.

Of the entire claim group, only the following claims contained exposures of gypsum, Annabell 21, 22, 23, 25, 26, 31, 33, 35, 37, 38, 42, 44, 45, 52, 53 and 54. The remaining 29 claims in the applications do not have any physical exposures of gypsum.

A second unit of Tertiary sediments, Younger Conglomerate (Tcy) also covers some of the subject claims. The younger conglomerate is defined by interbedded green mudstone and pebbly, granular sandstone. At one locality (in the gulch about a mile south of Walnut Canyon Spring), the contact is marked by a 2 meter-thick, massive, white, fine-grained sandstone that may represent a shoreface deposit (Ferguson, p.3). This unit does not contain any visible occurrences of gypsum.

Quaternary Alluvium

Four sets of Quaternary map units were recognized in the map area; younger alluvium (Qa), terraced alluvium (Qt), piedmont deposits (Qp) and older alluvium (Qao). Younger alluvium was found along the active channels and braids of Tonto Creek and its principal tributaries. Many of these deposits are heavily vegetated and slightly elevated in relation to the active channel. (Ferguson, p. 3)

A complex set of alluvial terraces, composed of well-rounded, clast-supported gravels and poorly indurated conglomerate are preserved at various levels up to 100 meters above and within about a kilometer of Tonto Creek. A set of piedmont terraces (Qp) slope down from the mountain fronts on both sides of the creek. The piedmont terraces on the west side of Tonto Creek consist of relatively irregular surfaces covered with angular to sub-angular boulders and cobbles of locally derived granitoid lithologies. (Ferguson, p. 3)

Quaternary piedmont gravels (Qp) in the northwest and terrace gravels in the south cover the highest elevations. These units can be distinguished by several characteristics, but most relevant is the thickness of the units with the Terrace gravels (Qt) in the south being the thicker of the two units.

The gravels on the upper pediments appear to be only a few feet thick in the claim area with a large amount of red Tertiary clays still visible at the highest elevations. In the south, the terrace gravels tend to be tens of feet thick with little Tertiary sediments visible at elevation. In these areas the only visible Tertiary sediments are found in the eroded banks of drainages with the uplands covered by terrace gravels and the valley floors covered by alluviual material.

Only one major alluvial terrace was differentiated as older alluvium (Qao); an extensive mud-rich alluvial bench that occurs at an elevation of between 3 and 10 meters above Tonto Creek along its west bank. Most of the commercial and residential development in the communities of Punkin Center and Tonto Basin occur on this alluvial bench. (Ferguson, p. 4)

After a careful study of the area and its geology, it seemed reasonable to assume that taking samples in drainages within the claim boundaries would show the presence of precious metals in either the Tertiary sediments or the upper Quaternary gravel deposits since material from both of these units will erode to the drainages. Areas where samples show the presence of gold will be re-sampled to determine which unit or units carry the gold values. Of course, a few spot samples will be taken directly from the Tertiary sediments and Quaternary alluvium in areas where they show good exposures.

EXPLORATION AND DEVELOPMENT WORK

Although there is no on-the-ground evidence that any of the claims in the patent application were developed for mining, were actively mined, or were used for milling related purposes, the Applicants do provide information in their applications concerning the exploration of the claims. This information consists of drill logs, sample logs, and assays for placer drilling and placer – pit sampling. General exploration information concerning the gypsum present on some of the claims is also given but it is of significantly less quantity and detail than the exploration information provided for the placer material.

Placer Exploration

Placer Drilling

The claimant reported that all of the claims had been drilled. The claimant provided some of the information from the drilling program in the patent application. The drilling consisted of one or more holes per claim drilled with a 2-inch auger drill. The drill used is pictured in a photo provided by the Applicants (Photo 12). According to Clay Thorne, during his site visit on April 4, 2002, all of the drill holes were uncased and the crews took samples by removing the cuttings and bagging them as they came to the top of the hole. No evidence of the claimants drilling or sampling program was found.

The drill holes ranged from 1 to 6 feet deep and while the position of the holes is provided on the drill logs, only vague information was provided concerning the geologic unit being sampled. It is not possible to tell from the information provided why all of the holes were not drilled to a common depth or why subsequent reserve calculations made by the claimants used a depth of 3 feet (AZA-27208) and 6 feet (AZA-27172) as the depth for reserve calculations. The claimant did not identify a "pay-streak" or mining horizon in the applications other than the reference to the entire top 3 or 6-foot interval.

The type of drill program used by the claimants is inappropriate for determining the quantity and quality of placer ore reserves as stated in the patent applications. The SME Mining Engineering Handbook (1973) lists erroneous procedures in placer sampling on page 5-49. The Handbook states "Many of the serious errors made in placer evaluations result from using hard-rock exploration procedures. Two recurring mistakes are the use of uncased or small-diameter holes, and fire assay of samples."

Fire assaying recovers and reports the total gold content of the sample, including gold combined with other substances or in ore particles not recoverable by placer mining methods. (SME 73, 5-46) Fire assay was chosen for the processing of samples for this application as the Applicants allude to using milling procedures not usually employed by placer operations. For the purpose of this report, total gold content is an important statistic and if of sufficient quality, warrants further sampling with traditional placer recovery techniques.

Drilling of placer deposits is usually resorted to in deep or wet ground where sampling by means of pits, trenches or shafts is not practical. (Wells, 45) In all the available

references, drilling when used, always requires a cased hole for recovery of the placer core material. (SME 73, 5-46, Wells, 44, Lewis and Clark, 336).

Without a cased hole, yielding a known amount of material, it is impossible to tell the exact quantity of placer material represented by the drill hole. Often, in uncased holes, fine material may be left behind by the drill when casings aren't used or fine material from the walls of the holes may slough into the hole increasing the yield. Since gold and other precious metals tend to associate with the finer materials, a loss or increase in the amount of fines recovered by the drill can greatly influence the calculated value of the placer ground. Figure 5-11 in the SME Mining Engineering Handbook (1973) indicates that a single 1 milligram gold particle recovered in a 3 inch hole as opposed to an 18 inch hole can change the calculated value of the in place material by almost 3,600%.

In addition to the problems associated with drilling a placer deposit, there are significant problems with the records maintained by the Applicants for the drilling program. As an example, on the Annabell 25 claim, the drill log for sample 25-6-W-1 lists 2 holes drilled to a depth of 3 feet in the comments section of the log. The log table however, shows the hole to a depth of 6 feet with the sample apparently being taken in the sixth foot interval. For sample 25-3-S-8, the drill log states in the comments section that 3 holes were drilled 3 feet deep in the same location and the maximum depth recorded on the log table is 3 feet with the sample being taken in the third foot. It is impossible to tell from the information provided why in the first instance the log would be recorded to 6 feet when only three foot holes were drilled and in the second case why only one sample would be taken for three holes with the log showing only one three foot interval. There are numerous examples of these types of inconsistencies in the documents provided in the application.

Pit-Placer Samples

The preferred method for sampling a placer deposit is through pits or trenches. Pits or trenches, when they can be used, permit first-hand inspection of the ground to be mined. This makes it possible to visually determine the character and size of gravels to be dealt with and additionally, pay or barren sections can be determined. (Wells, 44) The claimants dug one pit sample on each of the claims in the application. No evidence of these pits was found during our examination.

The pit samples are all described on "Development Sample Logs" and the claimant provided these logs in the application. For the claim group under application AZA-27172 (Annabell 15 – 24E), these pits ranged in size from 3 feet deep by 3 feet long by 4 feet wide to 6 feet deep by 6 feet long by 5 feet wide. For the claim group under application AZA – 27208 (Annabell 25 – 54) each pit was uniform in size at 1 foot deep by 6 feet long by 1 foot wide.

None of the sample logs identify the exact geologic units being sampled and offer only minimal descriptions of the material such as "Red-Clay-Granite". The logs do not explain why the depth of the pit was chosen or if any pay-streaks were identified. Generally, in areas of diverse geologic units such as the Tonto basin, samples are grouped

by geologic unit so that gold values, if found, can be compared across the area of each unit. From the data provided by the claimant, no attempt was made to segregate samples by common geology.

The patent applications encompass a combined surface area of approximately 3,400 acres and contain 45 claims. At one pit sample per claim, pit samples occur at a rate of one sample every 76 acres. Placer deposits are generally prospected by holes placed on 50-ft., 200-ft., 300-ft., or even 10-acre squares. (Lewis and Clark, 336) At a rate of one pit sample every 76 acres it is evident that while sampling with pits can yield better results than drilling, the amount of pit sampling done by the claimant is insufficient by industry standards to determine the value of the placer ground for these claims and must be augmented by the drilling program. The conclusion then, is that the pit-sampling program is insufficient by itself to delineate an ore body and as such suffers from the same limitations as the drilling program as it is dependant on that program.

Placer Assays

Both applications contain assay data. Application AZA-27208 contains only summary sheets of assays reported on September 1, 11, and 17, 1992 labeled "Amalgamation Tests". No other assay data is provided with this application. Application AZA 27172 contains summaries of assays and some assay reports from Thorneco West, Inc. The summaries provided with AZA 27172 are again labeled "Amalgamation Tests" and are dated August 17, 1992 and September 19, 1992.

There is insufficient data provided in the application to determine if the claimant used all of the assay data to determine the quality and quantity of mineralization that may be present on the claims or if only the amalgamation data was used. Only the amalgamation data was identified as an exhibit in the applications. The other assay data provided appears to be independent of the amalgamation test as these assays were done on different dates than the amalgamation tests.

There are serious problems associated with the assays presented. There are many instances where drill logs were provided in the application, but assay data was either not provided or never obtained from the sample. Taking Annabell 25 data as an example, assay data was not provided for either sample 25-6-W-1 or 25-3-S-8. Appendix 3 gives a list of those samples for which assay data was not provided.

In a letter dated January 9, 2002 (Appendix 3), BLM asked Thorne to explain why some samples were taken but not subsequently sent for assay. In his February 6, 2002 (Appendix 4) response, Thorne states:

> "In order to comply with the 10 acre rule, I instructed field personnel to take several samples from each 10-acre section. However, if I get positive results on one or two samples, I often did not assay remaining samples for the same ten-acre section, especially when a large number of samples were collected. However, I kept all samples labeled and stored for future assays, if needed. I tried finding my notebooks and the samples in storage.

> Unfortunately, several years after the patent applications were filed, the premises where my records were stored was burglarized and vandalized. I am certain that I had positive assays for each 10-acre section and every claim."

BLM received approximately 340 drill logs in the applications, many of which are for drill holes located on the same 10-acre parcel. The total number of drill logs, pit logs and accompanying assays received is well short of 1 for every 10-acre parcel.

Later in his letter Thorne states:

> "Also, as explained below, in many cases when samples were obtained from the same drill hole at different depths, the samples were combined before assaying. Also, when I had a large number of samples from the same general location or from the same claim, I often combined samples for assaying. For these reasons, you will not find a separate assay for each sample."

Thorne's response is very problematic in that he violates many tenants of sample processing and reserve calculations. Getting "positive results from one or two samples" and extrapolating that to an entire 10-acre section is contrary to established practice. In practice, established placer operations often give limited credence to any one sample. (SME 73, 5-45) However, there are no simple rules governing the number of samples to be taken and each project should be planned on the basis of the reconnaissance findings. (SME 5-46) Additionally, the evaluation of placer ground, and mines in general, is predicated on standard averaging techniques. It violates standard engineering practice to combine different samples for assaying, especially when those samples are from different depths and different geologic conditions.

The assay data obtained from different samples at various depths, in standard practice is used to determine barren or pay zones and establish such parameters as depth of cover and stripping ratio. In this case, the deposit has been defined by the claimant in the application as the entire surface area of the claim group to a depth of 3 or 6 feet depending on the application (although he later disputes this to a degree in his letter of February 6, 2002, Appendix 4). The surface area of the claims varies greatly with some areas covered with boulder-strewn pediments and others covered predominantly with fine red clay sediments. There is absolutely no reason to combine samples over an area as large as even a single claim because of the varying geology.

Generally, the smaller and more uniform the size of the gravel, and the more evenly distributed the mineralization, the fewer are the samples needed for evaluation. (SME 73, 5-47) In this case, because of the varying nature of the geology across the surface of the claims (Figure 4), every sample taken should have been analyzed and augmented by a development pit-sampling program before calculating a reserve base for any potential deposit and delineate its extent. In this case, samples were not even segregated into groups of similar geology.

Another problem with the assay data concerns the definition of "head ore". In general practice, a sample is taken of fairly large size (25 pounds and up). Generally, assay labs do not have crushers, pulverizers or other equipment of sufficient size to handle a large sample. To accommodate the labs, either splits or concentrates are taken from the sample to reduce the amount of material to a point where laboratory scale equipment can be used for processing. In fact, it appears that the claimants followed this procedure for their samples. For example, on the Assay Report dated July 23, 1992 (Appendix 5) a value of 0.1 oz of gold per ton is given for Annabell 24 raw ore – 200-mesh. It is difficult to tell what is meant, but it appears that from the total quantity of 6.67 cubic yards of material shown as removed on the development pit sample log for the Annabell 24 claim (Appendix 5) a concentrate of 0.5 cubic yds was taken and from that, a portion was screened to 200-mesh. The minus 200-mesh fraction was then assayed yielding a value 0.1 oz per ton. The problem is that the assay is assigned the label "raw ore". In essence the grade of a 200-mesh concentrate is reported as the grade of un-concentrated in-place material.

Terms like raw ore, head ore or feed material denote material in its state as it is removed from the ground. If one would assume that the –200 mesh material screened from the sample weighed say, 10% of the total sample, the contribution to value by this size fraction to the total in-place value would be no more than 0.01 oz per ton. This is significantly less the than value of gold present in the sample reported by the claimants as "raw ore".

This effect of reducing the grade of a concentrate to the grade of in-place material is due to the concentration ratio. As a further example, consider the assay for HC1-24B (Appendix 5) at 0.7 oz/ton. Referring to the Development Sample Log for the Annabell 24B claim (Appendix 5), HC1-24B is a concentrate produced by the Blue Goose trommel and sluice and the concentrate weighed 120 lbs. This concentrate is (apparently) from a 1 cu yd split taken from a total sample of 6.67 yards. Using a density of 3,300 lbs per cu yd (supplied by the claimant) the total weight of the split from which HC1-24B was concentrated was 3,300 lbs. Of this entire split only 120lbs had an average grade of 0.7 oz/ton. This is equivalent to a concentration ratio of 27.5 to 1 (3,300/120).

Assuming 100% recovery of the gold in the 1 cu yd split, and assuming all of that gold being concentrated in HC1-24B, the total split contained 0.042 (0.7*120/2,000) ounces of gold (assuming the assay is correct). This amount of gold is present then in 3,300 lbs or 1.65 tons of mine run or in-place material. The final estimate of gold per in-place-ton (assuming the split is representative of the entire 6.67 yd sample) would then be 0.0255 oz/ton (0.042/1.65). This is in contrast to the figures reported for pit sample Annabell 24B Head ore at 0.2 oz/ton reported on the Amalgamation Test Results of August 17, 1992 (Appendix 5). The reduction in grade derived from the concentrate assay from the amalgamation of "head ore" is 87.25%.

This discussion leads directly to another problem with the assays. Many of the samples have multiple and usually conflicting assays. Appendix 3 lists those samples that have

more than one assay. Thorne was asked to explain why some samples had more than one assay and how he wished to reconcile these inconsistent assays. Again, in his February 6, 2002, response (Appendix 4), Thorne states

> " Generally, at least 1-kg or more of material was collected from one location. The sample was thoroughly mixed and sampled for assay. However, even with thorough mixing, it was difficult to make the sample completely homogeneous. My normal procedure would be to take a portion of the material for a first assay. Often, a second assay would be done. There is absolutely no reason why the first and second assay should be the same since different samples of material were used for the two assays. Also, if the sample contains free gold grains, even a small grain of gold would cause a high result. Therefore, your contention that the assay results are inconsistent is not correct. Different results are obtained because the material is not 100% homogeneous."

It is understood that statistical variations in sample selection, laboratory errors in the assay process and other errors can give rise to different assays for the same sample. However, when filing for patent it is the claimant's responsibility to reconcile these differences, correct any errors in the assay process, and make a cogent determination of the value of any minerals that might be present. Even in cases where patent is not at issue, sound business practice demands that anyone serious about operating a profitable mining venture make such a determination.

In this case the information provided falls short of this basic requirement. As an example, Sample 46-W5-D taken from the Annabell 46 claim has two assay values, 0.10 oz Au/ton, 0.05 oz Au/ ton. Both of these values were obtained from amalgamation tests dated September 1, 1992. Note that in the BLM letter of January 9, 2002 (Appendix 3), Thorne was asked how he wished to reconcile these differences. His response merely acknowledges that differences exist and he does not discuss any method for reconciliation of values. In fact, without further evidence of exploration and analytic work, these differences cannot be reconciled

Given the problems identified with the placer exploration data provided by the Applicants it is evident that it falls short of being of a quality that would indicate the property is nearing the development stage of mining and the work done, if of any value at all, is more valuable a geologic survey to guide further prospecting.

Gypsum Exploration

The claimants did not present any data in the applications indicating that they did any of their own assays for gypsum. In application AZA-27172, the Applicants state:

> "The Annabell Claims containing the gypsum/sedimentary bed deposits total about 760 acres. Drilling by the Applicant and the Arizona Department of Transportation, and visual observation of the sedimentary beds exposed by erosion show that the gypsum layers are present in the

Claims at depths of at least fifty feet. Applicant's and Arizona Department of Transportation show a typical total thickness of gypsum beds of 6 inches and a thickness of non-gypsum containing material of 30 inches between beds, giving a non-gypsum material to gypsum ratio of 5:1. Therefore, each typical square feet (sic) contains 0.5 cubic feet of gypsum per 3 feet of depth, and each square yard contains 4.5 cubic feet per 3 feet of depth, each square yard contains 4.5 cubic feet per 3 feet of depth, and each acre contains 21,780 cubic feet (807 yards) per 3 feet of depth. Gypsum weighs 135 lbs per cubic feet (sic) or 3645 lbs per cubic yard, or about 1.8 tons per cubic yard. Therefore, each 3-foot depth contains about 1,453 tons of gypsum (1.8 tons x 807 yards/acre). Applicant's drill logs have verified gypsum to an average depth of 6 feet. The known gypsum reserves in the 760 acres of gypsum deposits can be calculated as follows:

760 acres x 1,453 tons/acre x 2 = about 2.2 million tons"

Application AZA-27208 contains a similar statement with the total area of gypsum stated as 1,000 acres.

The quoted excerpt contains several statements that directly conflict with standard engineering practice and accepted principles for exploration. In addition, these statements are not supported by the drill data provided with the application as the Applicants suggest.

The information provided by the Applicants from the drilling program for gypsum consists of drill logs. These drill logs are not accompanied by assay data that would determine the quality of the gypsum present and there is no information concerning the lithology of the gypsum or surrounding beds. The drill logs generally refer to gypsum only in passing. For example, the drill log 35-3-W1A contains only the phrase "Jepsum (sic), Sand and Rock". This is typical for all of the drill logs. The following table contains a list of those logs that contain a reference to gypsum:

Claim (a)	Gysum Outcrop	Sample	Reference
Annabell 21	Yes	None provided	
Annabell 22	Yes	None provided	
Annabell 23	Yes	None provided	
Annabell 25		25-6-W1 25-6-E2 25-6-N3 25-6-S4 25-2-E6 25-3-E7	Light sand & gypsum " " Sandy gray gypsum Gypsum sand Lt. Brown gyp. " "
Annabell 26		26-2-N1 26-6-N2	Grey clay & gypsum " "

Claim (a)	Gysum Outcrop	Sample	Reference
		26-6W-3	Sandy gray gypsum
		26-6-E4	Gray sandy gyp some gravel
		#26-S6	DG sandy gypsum
		26-S7	Sandy gypsum
		26-W8	Sand & gypsum
		26-3-E1	Gypsum sand
Annabell 27	No	27-2-W4	Granite gyp
		27-2-E5	Gypsum granite
Annabell 30	No	30-2-N1	Gray gyp. Sm. gravel
Annabell 31	Yes	31-3-W3	Dark sandy gypsum
		31-3-E4	Gypsum – red clay
Annabell32	Yes	None provided	
Annabell 33	Yes	33-3-E4	Gray gypsum
		33-3-N3	" "
		33-3-W2	Gypsum clay-sand
Annabell 35	Yes	35-W1A	Jepsum sand+rock
		35-3W1B	Gypsum + sand+ rock
		35-2-W2A	" "
		35-W2B	" "
		35-2-E4A	Gray gypsum rock sand
		35-E4B	" "
Annabell 36	No	36-3-W3A	Gray clay & gypsum
Annabell 37	Yes	37-3-E1B	Gypsum
		37-4-E1C	" "
		37-4-E1D	" "
Annabell 38	Yes	None provided	
Annabell 40	No	40A	Very nice hill of pure gypsum
Annabell 42	Yes	42-3-5-1A	Gray gypsum – some gravel
		42-3-S1B	" "
		42-3-S1C	" "
		42-2-S1D	" "
		42-3-E3A	Gray gypsum with white pieces
		42-3-E3B	" "
		42-3-E3C	" "
		42-2-E3D	" "
		42-3-N-5A	Gray gypsum
		42-3-N5B	" "
		42-3-N5C	Gray gypsum
		42-2-N5D	Gray gypsum
Annabell 44		44-3-W4A	Gray gypsum
		44-3-W4B	Gyp powder & mixed minerals
		44-3-W4C	" "
		44-1-W4D	" "
		44-3-E5A	" "

Claim (a)	Gysum Outcrop	Sample	Reference
		44-3-E5B 44-3-E5C 44-1-E5D	 " " " "
Annabell 45	Yes	None provided	
Annabell 52	Yes	52-6-N1 52-6-S2 E-6 A/E S-7 A/E	Light gray gypsum " " Gypsum & red clay " "
Annabell 53	Yes	53-6-W5	Gypsum & sand
Annabell 54	Yes	54-6-W1 54-6-S2 54-6-N3 54-6-E4 54-W6 54-3-E7	Gypsum & sand Gypsum " " " " Sand & gypsum Sandy gypsum

(a) Claims that do not have a gypsum outcrop and do have drill logs are not listed.

The information provided by these drill logs is for all practical purposes useless. It is impossible to tell which of the samples may have produced higher percentages of gypsum, how that gypsum occurs in the stratigraphic sequence and what grade it might run. In fact, looking at the Annabell 40 claim, the drill log mentions a "very nice hill of pure gypsum" when in fact there is no outcrop of gypsiferous layers on this claim. It seems clear that the drillers weren't even aware of where they were on the ground at all times. Also notice that several claims (Annabell 21,22,23,32,38,and 45) have distinct outcrops of gypsum but sample information or drill logs were not provided for these gypsum occurrences. Photos 13 and 14, supplied by the Applicants, indicate that samples were obtained from some of these claims (Annabell 22) but the Applicants did not provide drill log information for these samples.

Sound engineering and exploration practice involves logging the drill hole to a degree that the depth to the target zone or bed is recorded, the nature of the bed is recorded and the thickness of the bed or zone is recorded. None of this data was provided in the application and without it, it is impossible to verify the Applicants assertion that the gypsum consists of one or more layers totaling 6 inches in thickness and that it is intermingled with up to 30 inches of non-gypsiferous material. In fact, physical exposures of the gypsiferous zones do not support the contention that there are 1,700 acres with gypsum totaling 6 inches in a 36-inch zone within the subject claims.

My field observations indicate that the gypsiferous zones are **not** in a single layer of 36 inches containing approximately 6 inches of gypsum and the zones that do outcrop, do so over a relatively small portion of the claims and most of the gypsiferous zones, if they are continuous, are under relatively deep cover. Please refer to the Geology section of this report for a thorough description of the gypsiferous zones.

Note that the application does not contain information on stripping ratios, the exact nature of the gypsum (in one layer of 6 inches of 60 layers of .1 inch) and the accompanying 30 inches of interburden and the quality of the gypsum present. All of these factors are essential to properly describe a mineral deposit in sufficient detail to conduct strip mining or to sign a long-term contract in good faith that the contract conditions could be met. What the applicants present is information from three sources indicating that others, acting on the behalf of the claimants or acting independently have done sampling work in the area of the subject claims.

Of the claims in the two applications, only the following claims have exposures of gypsum, Annabell 21, 22 and 23 in application AZA-27172 and Annabell 25, 26, 31, 33, 35, 37, 38, 42, 44, 45, 52, 53 and 54 in AZA-27208. Application AZA-27172 contains reports concerning gypsum from the Arizona Department of Transportation (ADOT), the Arizona Department of Mines and Mineral Resources (ADMMR) and a report prepared by William Duesenberry.

In addition, this application contains two published documents, a 1992 report prepared by the Bureau of Mines on gypsum and a sales brochure from Domtar Gypsum explaining the use of gypsum in agricultural applications. These documents do not mention the subject properties in any way and appear to be provided only as general information. The application AZA-27208 did not contain these documents but did include a report prepared by Iseman Consulting that is discussed later in this report.

Arizona Department of Transportation

As part of the realignment of Arizona Highway 188, ADOT conducted some sampling of gypsum outcrops in the vicinity of the claim group. There is insufficient detail provided in the ADOT information to determine if this drilling was done on any of the subject claims and if the attached assays are for the samples taken. The assay submitted by the applicant shows assays marked "ADOT Sample" and gives them designations 4389, 4388, 4431, 4391, 4410, 4386 and 4387 (See the July 23, 92 assay report of Thorneco West, Inc.). The sample logs provided by the Applicants, and prepared by ADOT, do not reference these numbers. In short there is no way to determine if the assays and sample logs related to each other and if the samples were taken from the subject claims. As is, this information cannot be used to determine the quantity and quality of gypsum on the subject claims.

Iseman Consulting

The application also contains a series of flotation tests and assays prepared by Iseman Consulting, Inc. These tests, numbered sequentially from 9208060 through 9208067, lack sample numbers and as such cannot be related to the subject properties. Thorne states in his October 15, 1997 letter to Mathews (Appendix 6), "After reviewing our records, we have not been able to identify the sample numbers for the material tested by Iseman. However, to the best of my recollection, I believe the samples were taken from the mining site that we were proposing to start operations and had submitted a plan of operation to the US Forest Service for approval. Although the samples cannot be

identified accurately, the flotation report is still useful for identifying the types of modifiers and promoters that could be used with our gypsum/sedimentary ore deposits."

Since the information provided cannot be tied to any of the subject claims, it does not represent exploration or prospecting data representing the subject claims. As explained in the Geology section of this report, the geology of the gypsiferous zones changes over distance and this data may or may not be representative of the gypsiferous zones found on the claims. Additionally, the area mined for gypsum is outside the area encompassed by the two patent applications.

Arizona Department of Mines and Mineral Resources

The application also contains a report prepared by Ken A. Phillips and Richard Beard of ADMMR concerning the quality of gypsum present, in the area of the subject claims. The report provided references to a reclaimed pit where past mining production occurred at an estimated rate of 200 to 2,000 tons. Thorne asserts this material was used for agricultural purposes. Since the report refers to a "reclaimed mining" operation, the area sampled cannot be within the boundary of the subject claims as no mining activity took place within the claim group. The area that Thorne pointed out as the area he mined gypsum is just off of the subject claims and is shown on Figure 9.

The report is based on four samples, ADMMR 28157 through 28160. Gypsum values range from a low of 25% to a high of 92%. Without a further description of the location of these samples, it is impossible to use these results to establish the quantity and quality of gypsum deposits on the subject claims. Again, this data suffers from the same deficiencies as the ADOT data and the Iseman data.

Duesenberry Report

The application also contains a report from Dr. William Deusenberry concerning the gypsum in the area. The report begins by specifying the claims are in T.5 N., R. 10 E. The subject claims are not located in this township. Again, the report refers to claims that are being mined. The subject claims were not mined. Only claims outside the application were mined for a brief period. In fact, according to Thorne, in his letter of October 15, 1997, he states:

> "The Duesenberry report was done before the current claims were staked. The samples were taken by Dr. Duesenberry during a tour of the property lead by me. I showed Dr. Duesenberry locations where I had made discoveries of gold. However, at this time, I do not know the exact locations, except that they are now the Annabell claims."

Again, the Duesenberry report suffers from the same deficiencies as the ADOT, Iseman and ADMMR report. To conclude, the applicant does not provide a single assay or sample log that relates directly to any claim in the subject claim group.

The Duesenberry report appears to be the basis for the belief that the clay layers in the gypsiferous zones contain precious metals. This reports states,

"THE GEOLOGIC DETERMINATIONS CAN BE EASILY TRANSPOSED INTO A LAYMEN'S LANGUAGE AS THE COMPLEXITIES OF THE GEOLOGIC DESCRIPTIONS ARE RELATIVELY ELEMENTARY IN THE AREA.

ON THE GEOLOGIC CALENDAR, THE AREA WAS FORMED IN THE SILURIAN PERIOD IN THE LATTER PART OF THE PALEOZOIC ERA WHICH WAS 450 MILLION YEARS AGO. THIS AREA IS TEN TIMES EARLIER THAN THE PRE-CAMBRIAN PERIOD WHICH IS QUITE PREVALANT IN ARIZONA.

THE GYPSUM DEPOSITS WERE LAID DOWN IN A SALT SEA, AND UPON THE SUBSEQUENT EVAPORATION PROCESSES IN MANY SERIES, THE GYPSUM VEINS WERE LAYERED UPON ONE ANOTHER. IN ADDITION, GROUND UPHEAVALS FORCED HYDROTHERMAL DEPOSITS ABOVE AND BELOW THE GYPSUM VEINS, CARRYING THE VALUABEL MINERALS."

Several statements made by Duesenberry are incorrect. First, after weeks of studying the area, no evidence was found to support the idea of "upheavals" or hydrothermal deposits or alteration. A review of the available literature on the geology of the Tonto Basin does not mention any "upheavals" or volcanic or hydrothermal activity associated with the area after the deposition of the evaporite (gypsum) layers and all authors agree that the area is a sediment filled graben.

Additionally the gypsum formed in lenses through the action of sedimentary forces, but is mischaracterized by Duesenberry as "vein" type material indicating an igneous origin. The gypsum is of sedimentary origin as Duesenberry states, but properly should be referred to as "layers", "seams" or "beds" befitting the sedimentary origin of the gypsiferous zones.

The available literature on the area sets the age of these sediments in the late Miocene to Pliocene to Pleistocene epochs (Nations, 1987, p. 8). The Pliocene and Miocene epochs are in the Tertiary period and the Pleistocene epoch is in the Quaternary period. All of the exposed rocks on the subject claims are, according to all available published sources of either Quaternary or Tertiary age (Cenozoic Era). There is no mention at all of Silurian age rocks and the Silurian period is more recent (395 to 435 million years before present) than the Precambrian Era (600 million years before present), (Glover, p. 256).

Development Work

The Mining Law of 1872 requires that $500 worth of improvements be made on a mining claim prior to filing for patent. To this end Thorne provides Exhibit V in application AZA-27172 and Exhibit J in AZA-27208. These exhibits list for each claim in the applications the number of drill holes and trenches on that claim. In each case a

monetary value is placed on this activity and in each case the value exceeds the requisite $500.

Development and/or production drilling or sampling is done to delineate an economically viable mineral deposit. As said earlier, the sampling done by the claimant falls short of this goal. With development level sampling, ore reserves are calculated and an average grade is calculated. Generally the minimum or "cut-off" grade of the deposit is also calculated. Both applications contain statements concerning cut-off grade and average grade and reserve tonnage. Both applications list the average grade at 0.1 oz per ton and the cutoff-grade at 0.02 oz per ton.

The assay data provided, that deals with samples labeled "raw ore" (concentrate values were not considered due to the effect of the concentration ratio), shows that not a single assay showed a gold content of less than 0.03 oz per ton (sample 4389 labeled ADOT sample and assayed on July 23, 1992 by Thornco West, Inc.) with most samples showing 0.05 oz per ton. Not a single sample came back without a showing of precious metals. This is highly unusual for placer ground with the type of variable geology found on the subject claims. However, the result is in keeping with the reserve calculations presented by the claimant in the applications.

The Applicants state in the section titled "Ore Reserves" (in AZA-27208):

> "The known precious metal ore reserves per acre to a depth of three feet is calculated as follows:
>
> 43,560 sq ft/acre X 3 feet/ 27 cu ft/yd X 1.5 tons/yd = 7260 tons per acre
>
> At Applicants' cut off ore grade, the ounces of precious metals per acre is calculated as follows:
>
> 7,260 tons X 0.02 ounces/ton = 145 ounces per acre
>
> The tons of known ore and metal reserves and for the Claims (2350 acres) are calculated as follows:
>
> 2350 acres X 7,260 tons/acre = about 17.1 million tons"

A similar calculation can be found in application AZA-27172 using a depth of 6 feet.

The calculations show that the claimant is stating that the Annabell claims have, over their entire surface area of 2,350 acres (for AZA-27208), a precious metals (gold or presumably platinum) content of at least 0.02 oz/ton to a depth of 3 feet or 6 feet. Thorne was asked in the January 9, 2002, letter (Appendix 3) what evidence they had to support the assumption that every square inch of each claim in the claim group has a precious metals content of at least 0.02 oz/ton.

Their sample logs indicate that sampling was done with a 2" drill to depths ranging from 1 to 6 feet with the average depth being from 2 to 4 feet. The claimant was asked how 3 feet was decided on for the reserve estimate. They were asked if any sampling was done to bedrock. The pit sample logs provided show that samples were only taken to a depth of 1 foot (on the northern claim block). The claimant was asked, why wasn't this sampling done to a depth of 3 feet?

To these questions, the claimant responded (February 6, 2002 letter, Appendix 4):

> "We have no evidence that every square inch has 0.02 oz/ton, which is only a cut-off number. These calculations were done to show that with a placer operation, mining would be economically feasible with gold values equal to or greater than 0.02 oz/ton. We would start mining at areas with at least 0.1 oz/ton. Only 20% of the claim needs to have at least 0.1 oz/ton before the entire claim would average 0.02 oz/ton (20% of 0.1 oz/ton)."

This answer violates many of the accepted engineering principles for valuing a mineral deposit. First, when developing reserve estimates, samples are given "areas of influence". Typically rules such as half the distance to the nearest neighbor are used to construct polygons or triangles to which the assay value of the sample is applied (SME Handbook 1973, 5-46, SME Handbook 1992, 352, Lewis and Clark, 334, Wells, 56, Peters, 481). To assume that a single drill hole with an assay of 0.1 oz per ton over 20% of the claim would make the entire area of the claim average 0.02 oz/ton is to miss the entire point of development sampling and drilling.

In a development and sampling plan, properly executed, the area assigned to a sample with an assay of 0.1 oz per ton would be calculated and tested in the field, usually with additional sampling if the original sampling was widely spaced. Using the claimants example of a sample registering 0.1 oz per ton, on say a 20 acre mining claim, that, say through standard engineering procedures was determined to have an area of influence of 4 acres (20%), standard procedure would then identify the remaining 16 acres as "unknown". The 4 acres could be designated for mining (assuming a cut-off grade of 0.02 oz/ton) and the remaining 16 would be designated for further exploration if the prevailing geology on those acres were considered amenable to possible mineralization or simply considered to have no value if the prevailing geology was inappropriate for mineralization.

Aspects of the deposit other than cut-off grade, average grade and total reserves are also necessary to determine before mining can be successfully initiated. These factors include, but are not limited to, the character of the bedrock, smooth, irregular, hard or soft, the amount and size of boulders present, the character of the ground, loose, cemented, or containing clay, and the nature of the gold. (Lewis and Clark, 338).

In the application AZA-27172, the claimants state:

> "...precious metals are present in the gypsum/sedimentary deposits to a depth of at least 50 feet. In the alluvial deposits, ground water and large boulders or bedrock is not encountered until 10 to 15 foot depths. Applicant's drill logs for the gypsum/sedimentary beds and alluvial deposits verify precious metal mineralization at or above the cut off grade of 0.2 ounces per ton to average depth of at least 6 feet."

An identical statement is made in application AZA-27208 with two exceptions, first the assumed typographic error of 0.2 oz per ton is corrected to read 0.02 oz per ton and the average depth is amended to read 3 feet.

The average thickness of the mineralized zone reported by the claimant does not conform to standard engineering practice for calculating the average thickness of a deposit. In general, the average thickness of a deposit, using accepted engineering practice, is calculated using a weighted average. For example, consider a 20-acre mining claim with 10 drill holes and each hole having a mineralized zone ranging from 1 foot up to 10 feet, increasing progressively in thickness in 1-foot increments. If each drill hole has an area of influence of 2 acres (evenly spaced holes) the average thickness of the deposit would be 5.5 feet (55/10 = 5.5 feet).

In application AZA-27208 drill holes were drilled to a depth of 3 feet but the pit-samples were dug to only a depth of 1 foot. Since the bulk of the assay data was for the pit-samples, the average depth for assayed material should be closer to 1 foot not 3 or 6 feet as the Applicant suggests. Additionally, the statement that precious metals are present to a depth of 50 feet cannot be supported by any sample data presented in the application, as the deepest samples on any of the claims were pit-samples dug to a depth of 6 feet. The 50-foot depth must be a matter of speculation.

Other aspects of the "deposit" cannot be borne out by inspection. For instance, the assertion that boulders are not encountered until 10 to 15 foot depths is simply not true over most of the regions of the claim groups. This statement may be true for parts of the Tonto and Ash Creek channels but over most of the area of the Tonto Creek floodplain and most of the upper reaches of the claims (covered with pediment gravels), it is not true. These areas are covered with boulders and large rocks clearly visible on the surface (See Photos 15 & 16). The presence of this oversize material greatly hampers mining as this oversize material must be removed and generally is not associated with any gold. Essentially the removal of the boulders adds to the mining cost, but does not produce offsetting revenue.

The depth of water reported by the claimant at 10 to 15 feet does seem to fit with information provided by local residents. One woman reported that the water table in areas was only 9 feet deep. The presence of Roosevelt Lake raises the water table in the area considerably.

The statement that bedrock is not encountered until 10 feet conflicts with observations made at the site. One local resident stated that a local drilling company, drilling in Tonto

Creek, did not hit "bedrock" at a depth of 200 feet. In this area, the term bedrock is somewhat misleading as a thick layer of Tertiary sediments, predominantly red-clay, underlies the area and these sediments essentially function as "bedrock". However, the claimant alleges that these very red clay sediments, together with the clay layers in the gypsiferous zones host the gold and platinum.

The Applicants also address the characteristics of the gold. In both applications the claimant describes the economic minerals as layered beds of gypsum, layers and beds of sand, clay and gravel containing disseminated gold and platinum group metals and alluvial deposits of free micron gold and platinum group metals. This is somewhat in contrast to statements that Thorne made during his field trip on April 2, 2002 (Appendix 7) when he said "The gold occurs as "be-bes" of a size similar to #1 shot-gun shot to fines." He added that the gold be-bes are perfectly round and added that he knew it was difficult to believe. It is very difficult to believe that gold be-bes as described by the claimant are naturally occurring as placer gold never occurs in this form since there is no natural process that can produce perfectly round gold particles.

Over the course of several weeks of field reconnaissance, a large number of shotgun shell casing were found on the ground. The hunters and sportsmen frequently use the area for quail and other forms of bird hunting. The gold be-bes observed by the claimant may in fact be shotgun shot as panning and the action of sluice boxes routinely recover shotgun shot.

Analysis of Development Work

The stage of the drilling program and sampling program presented by the claimant in both patent applications, based on earlier discussions, suffers from many shortcomings and errors. Based on the data presented there is no reason to believe that an "ore body" or mineralized zone suitable for mining has been or could be identified by the claimant. True development level drilling and sampling would provide such data.

Based on the information provided, and the area encompassed by the patent applications, if the Applicants assay data is taken at face value, the area under patent application is little more than a prospect. In this case the work done more resembles initial prospecting and is more closely related to a geologic survey. On April 2, 2002, Thorne was asked specifically if the work that he did constitutes development drilling. To this he answered "No" we are still prospecting. He was then asked if he felt his exploration work constitutes a geologic survey of the area and he answered, "Yes" (Appendix 7).

From the foregoing discussion it is clear that the work done as listed in Exhibit V in application AZA-27172 and Exhibit J in AZA-27208 constitutes initial prospecting or the initial phases of a geological survey and does not qualify as an improvement that meets the requirement for patent. See 43 CFR 3851.2(a)(4) and 3861.2-3 (b). The work done by the mining claimant on the claims does not, in and of itself, directly aid in the extraction and removal of "ore".

Even the discovery points on the claims were not marked and there was no evidence of discovery pits, trenches or shafts. When asked in our meeting on April 2, 2002 (Appendix 7) if he had identified a "pay streak" Thorne answered, "It's a zone about 5 or 6 feet down." He was then told that this was the first mention of any such pay streak and that his applications used the top 3 to 6 feet of material as the mineralized horizon for reserve calculations. He was then asked how he wished to have us sample this new pay streak. He answered by saying that "Mathews (FS Mineral Examiner) had a backhoe." He was told that maintaining the discovery points on his claims by keeping them open for inspection and sampling was his responsibility as a claimant and that if he wanted to get a backhoe and open this pay streak for sampling we would allow him an opportunity to get some equipment and meet at a time when his equipment was on-site. He said "This is the first I've heard about this requirement to keep my discovery points open and I don't have the financial resources to get the equipment out here. It's unfair of the government to expect me to keep these points open after all of these years." He was then asked to point out places on the any of the claims where he though his best gold was and he pointed out several surface exposures. These points are discussed in "U.S. Government Sampling Procedures and Assay Results" section of this report.

The work done by the claimant does not show, to any acceptable level of certainty, that there is "ore" on any of the subject claims. There are no excavations on the claims that meet the requirements under 43 CFR 3861.2-2. The only mining that took place in the vicinity of the claims was a small placer operation conducted by the claimant in Tonto Creek that was just off of the claim group and the gypsum operation conducted by a third party was in T. 5 N., R. 10 E. and is not in the area encompassed by the two applications. See Figure 9 for the location of these operations.

Applicants Description of the Deposit

The applicants state in the patent application "The United States Patent being applied for is placer ground containing valuable layered beds of gypsum and disseminated gold and platinum group metals in the clay and sand." However, the patent applications do not contain a robust or substantial description of the deposits. The applications do state the following under the heading "General Geology":

> "a. Sedimentary Beds and Basin Fill. These beds have small normal faults. Host rocks are Pliocene to middle Miocene sedimentary rocks labeled as Tsy on the Arizona State Geologic Map. The economic minerals in these deposits are layered beds of gypsum, and layers and beds of sand, clay and gravel containing disseminated gold and platinum group metals.
>
> "b. Alluvial. The claims near Tonto Creek are alluvial deposits of free micron gold and platinum group metals."
>
> Under the heading Economic Evaluation the applications state:
>
> "(2) The beneficiation process will comprise the steps of surface mining the gypsum ore, screening the gypsum ore to separate the gypsum and the sand

and clay by-product containing precious metals, and crushing the gypsum to market specifications, generally 1/8 inch to 200 mesh. The by-product sand and clay is used to recover precious metals." See heading "b. Gypsum Mining".

As stated earlier in this report, the Applicant reports gold in a layer from the surface to a depth of either 3 (AZA-27208) or 6 (AZA-27172) feet. After her review of the material presented in the application, Mathews wrote a December 19, 1996 (Appendix 6), letter to Thorne asking him specific questions about the deposit and Thorne answered in his unsigned correspondence on October 15, 1997 (Appendix 6). Excerpts from Thorne's response are presented as follows:

> "Gold and platinum are present in at least the range of 0.02 to 0.1 in all of the claims. Gold and platinum also occur in the gypsum layers. Silver is present in almost all claims, and the patents can be based on the discovery of silver. The silver values are sometimes high enough to cover the cost of operations."

> "The Annabell claims contain free gold that ranges from 1 mesh and larger to 400 mesh and smaller. Most of the larger mesh size gold can be recovered by conventional placer methods. To achieve a substantial recovery of the 400 mesh and smaller gold, the ore may be milled to 400 mesh. However, the ore has sufficient gold in the large mesh sizes, for example 100-300 mesh, so that it is not necessary in a commercial operation to mill to 400 mesh."

As a final note, based on conversations with Thorne on April 2, 2002 and as verified in a conversation log prepared by Diane Nowlin-Tafoya, (Appendix 8) Thorne claims that the precious metals are contained in and associated with black sands. This is typical of placer deposits.

To summarize, the applicants have stated the following points as they relate to their claims:

Placer Deposits

1. Gold, silver and/or platinum can be found on all of the subject claims in quantities of at least 0.02 troy ounces per ton.
2. Gold, silver an/or platinum can be found on all claims to at least a depth of 3 feet.
3. Gold, silver and/or platinum are associated with concentrations of black sands.
4. Gold particle sizes are in the range 1 mesh and larger to 400 mesh and smaller with alluvial material having micron size free gold.

Gypsum Deposits

As expressed earlier in this report, the Applicants provide very little information concerning the gypsum deposit other than it covers approximately 1,700 acres and the gypsum occurs in one or more layers totaling 6 inches in a zone about 36 inches wide at a depth of between 0 to 3 or 6 feet. As a result, all exposures of gypsiferous materials were considered as potential sources of mineable gypsum and were sampled.

MINING, MILLING AND RELATED OPERATIONS

Mining History of the Tonto Basin

King Woolsey, a pioneer rancher named Tonto Creek in 1864. In 1867 Camp Reno was established in the basin a mile west of Tonto Creek. Gold prospectors tried their luck in the basin but didn't find enough gold to make wages. Soldiers from Camp Reno did some panning in their spare time and found a little gold in Reno Creek. Tonto Basin made its name in the cattle business rather than gold mining. (Trimble, p.211,212)

Reno Creek lies just off the northeast corner of the claim group and runs between the claim group and the town of Punkin Center. It is similar in character to the many named and unnamed drainages that flow from the west, through the claim group to Tonto Creek.

Gold placers that have been of economic importance occur in all but three Arizona Counties, Apache, Coconino, and Navajo. The placer districts in Arizona that have been notably worked are in the southwestern mountainous and desert half of the state. Many placers occur in gulches that issue from numerous mineralized areas throughout the region.

The gold placers of Arizona, with the exception of a few that occur within mountain ranges are related to pediments. The gold-bearing gravels occur not only in gulches and old channels which traverse or issue from pediments, but also, in many cases, as mantle upon the pediment itself. (Arizona Bureau of Mines, p. 12)

The pediments described are identical in configuration to the many pediments that extend west to east on the subject claim group. The gulches described fit the description of Reno Creek, however, despite these similarities, and the fact that the area has been the subject of prospectors since 1867, it is not a known mining district and has no history of gold production.

Gila County is however known for placer gold production. Placer gold in Gila County has been mined in the Banner (Dripping Spring, Barbarossa), Globe-Miami, Green Valley (Payson), Mazatzal, and Spring Creek Districts. The Banner District is located 24 miles west of Globe, the Globe-Miami Placers are located along Pinal Creek north of Globe, the Green Valley District is near Payson on a tributary of the East Verde River and the Spring Creek district is on the Gila River near Spring Creek and Bonita Creek about 14 miles to 20 miles north of Safford Arizona. Absent is any mention of placer mining along Tonto Creek or its tributaries in Tonto Basin. The nearest mining district is

the Punkin Center Mining District, which is north and east of the subject claims. No production information is available for this district.

In the Notice of Publication for the Mineral Patent Applications the applicants state the claims are situated in the Spring Creek Mining District. This is not the case. The Spring Creek Mining District is located northeast of the subject claims along Spring Creek.

Based on the historical information, any discovery of gold along Tonto Creek or in the Tonto Basin would be a new discovery. Generally much can be learned from mines operating in the vicinity of a new prospect. Such things as possible grade, host geology, and gold particle size greatly aid prospecting efforts. Gold particle size and host geology are very important in estimating the type and size of sample to be taken during the prospecting phase. Large gold particles would tend to indicate a large sample size. Known pay streaks (host geology) would dictate the depth at which samples should be taken. Operating in a completely unknown area, standard practice is to take a phased approach to exploration. Exploration at this stage is for the purpose of initial valuation as opposed to sampling to block out a finite parcel of mining ground (Wells, p.34).

Mining Operations

The applicants are not presently mining any of the claims and there is no mining related equipment on any of the claims. In the past, the Applicants did have a small operation in Tonto Creek just east of the Annabell 24B claim, but this mining occurred off the claim (Figure 9) and Thorne reported that all of the equipment and processing facilities had been washed away in a flood. On April 2, 2002, all that remained of the work was a small excavation, barely recognizable, and three cement pads. One pad was exposed and two were covered with a thin layer of alluvial material. No other placer related excavations were observed on the claim group.

The applicants also ran a small-scale gypsum mining operation. The operation was leased to an individual for a royalty. The operation was not conducted on the subject claims (Figure 9). As it was not on the claims, its only potential relevance to this report is in examining possible markets for the gypsum found on the claims. This aspect will be covered in the Economic Evaluation section of this report.

Because there are no active or idle mining operations on the subject claims, it is difficult to take anything other than a surface sample in natural exposures. Thorne was unaware of his responsibility to establish and maintain discovery sites. When he was given the opportunity to bring equipment to the site and establish or reestablish his discovery points, he declined stating that he did not have the financial resources to bring equipment on site. He then said he felt that surface samples would produce adequate results.

There is one active mining operation in the area. Just south of the claims in the channel of Ash Creek, the Forest Service maintains a "community pit" for the sale of sand and gravel. Trucks were observed leaving the site with loads of sand from Ash Creek. The area mined was examined and found to be in sandy material that exhibited many layers of black sand. This material is not being mined for its precious metal content rather it is

being used as a sand product. Although not on the claims, this excavation does offer an exposure of subsurface sediments.

Milling Operations

There are presently no milling operations or milling related equipment on any of the subject claims. A third patent application is presently under review for millsites associated with and dependant upon the claims in this application.

U.S. GOVERNMENT SAMPLING PROCEDURES AND ASSAY RESULTS

Based on the Applicants description of the discovery on the claims, sampling on the site was done to determine the presence of gold and platinum group metals and to establish the quantity and grade of the gypsum that is present. Both the FS and BLM conducted sampling programs of the subject claims.

The first round of sampling of the claims was done by a team of mineral examiners and geologists under the direction of Ms. Elizabeth Mathews beginning on Sunday November 2, 1997, and ending on Thursday, November 6, 1997. The team consisted of John Guttirrez, Certified Review Mineral Examiner (CRME) FS Washington Office, Barney Oldfield, Certified Mineral Examiner (CME) FS Region 3, Tina Garcia, Land Law Examiner, Walt Keyes, geologist, Coronado NF, Karyn Harbour, geologist, Tonto NF, Roger Marion, CRME, FS Region 3 and Beverly Everson, geologist Prescott NF. Two additional samples were taken in October, 1998 by Becky Hammond, CME BLM Arizona Strip Field Office and Everson. The final round of samples was taken by Ralph Costa, CME, BLM Arizona State Office. The conclusions of this report are based on the results of this final round of sampling.

Summaries of these efforts are presented as follows:

Forest Service Sampling

On May 14, 1997, Mathews prepared a sampling plan detailing the locations and procedures to be used for the sampling of the subject claims. This plan is included as Appendix 9.

The sampling plan prepared by Mathews allowed for those sampling to vary the actual number of samples to be taken. In some cases, more samples than planned were taken. In all cases at least one sample per claim was taken. These additional samples were labeled following the conventions stated in the plan. In addition, the plan was amended to provide for 7 additional samples requested by the claimant. Also, two samples were moved to accommodate requests made by Thorne and one was moved to prevent archeological conflicts. The samples planned, taken (as noted in the field sample logs) and the samples sent for assay are listed in Appendix 9. Shortly after the sampling was complete, the samples were sent for assay. The assay results and associated correspondence are presented in Appendix 10. The Forest Service assays results appear

to be supportive of the conclusions of this report, but due to the reasons stated below, these assay results cannot be relied upon to base this examination.

The FS sampling has serious impediments for use in the evaluation of the subject properties. They are as follows:

1. Mathews is not available to discuss her methodology for sampling the claims.
2. There are glaring inaccuracies in the assays obtained from the samples. All of the samples were sent to Mountain States Research and Development (MSRD) for assay.
3. Once returned from MSRD, the samples were improperly stored and as a result could not be sent for a second assay. Photos 17&18 show the present state of the samples. Note that the sample bags are deteriorated and the contents are leaking. Under the dock they may have been contaminated and the chain of custody can no longer be assured.

From the information left by Mathews, it is unclear why some placer samples were large bulk samples when others did not involve samples of this size. It is also unclear why some claims were sampled for gypsum and not placer material when all of the claims clearly have sediments that could be conducive to a placer deposit. Without Mathews to answer some of these questions it is unknown if she planned additional sampling pending the results of the assays from the first round. If so, it is uncertain how this sampling was to proceed and what specific assay results would trigger additional work. At the time of her disappearance, the sampling of the subject claims was certainly still a "work in progress" and cannot be considered complete to a degree that conclusions concerning the subject property could be drawn.

In addition, there are significant problems with the assay results returned by MSRD. In her letter of February 13, 1998, (Appendix 10) Mathews questions MSRD on the results of the gypsum analysis. Essentially the total percentage of constituents in the sample, gypsum plus insoluables totaled over 100%. This is clearly in error.

In response to Mathews, MSRD in their letter of February 24, 1998, (Appendix 10) admits that the results of the assays on Certificates of Analysis Nos. 97-055-L, 97-056-L, and 97-057-L dated 12/12/97 (all in Appendix 10) for the gypsum determination are incorrect. MSRD explains the error as a combination of reporting errors and typographic errors. MSRD provided amended Certificates of Analysis for the samples.

Unfortunately, other analyses done by MSRD were also flawed. As the Applicants provided information on the flotation of precious metals, Mathews asked MSRD to do flotation tests for select samples. The result of this work is provided in Appendix 10. Referring to the flotation test of 12/1/97 for sample A21-3 the following results were reported:

Rougher Con	1.17 Ag G/MT
Rougher Tail	0.34 Ag G/MT
Head Assay	0.00 Ag G/MT

This result is in error as the mass balance is incorrect. In any metallurgical process, mass must balance. In this case the head assay should have a value for silver in excess of zero as there is a clear indication that both the concentrate (Rougher Con) and tails (Rougher Tail) have silver as a constituent. Since the head or feed is comprised of both the tail and the concentrate, the head must have an assay value between the head grade and the tail grade since the total gold and silver in the tail and con must be derived from the head or feed material. From the results it is uncertain if the assays for the head material or the concentrate or tails is inaccurate. At best, all that can be said is that the flotation tests contain inaccuracies.

Additionally, the amalgamation tests run by MSRD also appear in error. Looking at Certificate 97-020-L, December 9, 1997, all of the results are reported in "G/T". The Certificate does not provide a statement concerning the abbreviation G/T. If G/T represents grams per metric ton then it is equivalent to parts-per-million (ppm). Parts-per-million is a common unit for reporting the results of an assay for silver, but parts-per-billion (ppb) are generally used for gold. However, if that is the case then the units are inappropriate for reporting the results of amalgamation. Amalgamation results are usually reported in milligrams. Additionally some of the documents provided by MSRD use a more specific abbreviation "g/mt" for grams per metric ton so the documentation provided is internally inconsistent.

Further examination of the documentation makes the reported data even more suspect. Looking at the Certificate of Analysis 97-020-L and comparing that to the results stated in "Amalgamation Testing of Black Sand Concentrates" and in "Results of Screen and Fire Assay Analysis Selected Samples Screened at + and –1/2" (Appendix 10) shows discrepancies in the reporting of assay results between the two documents. As an example, the results for the fire assay analysis shows the two documents use two different sample names for the same analysis. On the Certificate, the samples labeled A-24B-1a plus and minus, A-24B-1b plus and minus and A-50-3 plus and minus have as their reported assay values the values for sample A24B1A which is repeated three times on the "Results of Screen and Fire Assay Analysis Selected Samples Screened at + and –1/2" document. The following table compares the two documents:

Results of Screen and Fire Assay Analysis			Certificate 97-020-L		
Sample Name	Au g/mt	Ag g/mt	Sample Name	Au g/mt	Ag g/mt
A24B1A +1/2	n.d.	3.29	A-24B-1a+1/2	n.d.	3.29
A24B1A-1/2	n.d.	1.17	A-24B-1a-1/2	n.d.	1.17
A24B1A +1/2	n.d.	1.89	A-24B-1b+1/2	n.d.	1.89
A24B1A-1/2	n.d.	1.34	A-24B-1b-1/2	n.d.	1.34
A24B1A +1/2	n.d.	1.23	A-50-3+1/2	n.d.	1.23
A24B1A-1/2	n.d.	0.48	A-50-3-1/2	n.d.	0.48

Without further information from the lab, it appears that assay results were incorrectly reported for the samples presented in the table. Many of these errors might have been explained had there been prompt follow up with the lab. However, due to the

disappearance of Mathews some of these inconsistencies were not found until this year (2002), over 4 years later.

Because of the many inconsistencies found with the assay data provided by MSRD, a certified assay laboratory in Arizona, the information cannot be used to form an opinion as to the presence or absence of minerals on the subject property. Without reliable assay data, or the option to send the samples for further analysis, the whole of the sampling conducted by the FS is useless for the purpose of this report with one notable exception, field inspections of the concentrates produced by the bulk placer sampling directed by Mathews and done by Michael Linden.

Linden processed bulk samples using a sluice in combination with a Denver Goldsaver. This equipment was provided by the National Training Center (NTC) and is frequently used for placer examinations. During the processing of the samples, Linden and others observed that there was no visible gold in the black sand concentrates produced from the samples. This is very important as the samples were taken from the area where Thorne stated the golden be-be's were to be found. While the subsequent processing of the samples by the lab voids the assay results, the fact that no visible gold could be found refutes the claimant's statements concerning gold in visible size fractions. A statement prepared by Linden is contained in Appendix 8.

BLM – Forest Service Sampling

After the disappearance of Ms. Mathews, the responsibility for writing the report was given to Becky Hammond of BLM and Beverly Everson of the FS. As part of their effort to do the field examination necessary to write the report, they collected two samples on November 17, 1998. These two samples were A21-4 and A22-3. In addition, Hammond specified that 12 samples from the first round of sampling be re-assayed for their gypsum content. The samples were A-21-1a, A-21-1b, A-22-1a, A-22-1c, A-22-1e, A-24c-1, A-31-1c, A-37-1, A-44-1c+, A-52-1c, A-53-1 and A-54-1. Two additional samples from the first round of sampling, A-38-1 and A-42-2a, were to be re-assayed for their gold content. Of these, the FS geologist assigned to retrieving these samples from the ware yard could not find A-21-1b and sent A-31-1 in place of A-31-1c. Documents on file do not explain why these samples were chosen either for re-sampling or re-assay. The assay certificates for these assays and the accompanying field notes are in Appendix 11.

The assay techniques used to determine the percentage of gypsum were based on the water of hydration of the gypsum molecule. Basically, by weight, gypsum is 20.9% water of hydration. Knowing the percentage of this water in the sample gives, indirectly, the total contained gypsum. The results of this analysis are presented below:

Sample Number	H_2O (225° C) %	Multiplier 172.182/36.032	$CaSO_4.2(H_2O)$ %
A21-4	12.69	4.778	60.64
A22-3	12.68	4.778	60.59
A21-1A	11.03	4.778	52.71
A21-1B	(a)	4.778	

Sample Number	H_2O (225° C) %	Multiplier 172.182/36.032	$CaSO_4.2(H_2O)$ %
A22-1A	6.58	4.778	31.44
A22-1C	12.39	4.778	59.21
A22-1E	15.17	4.778	72.49
A24C-1	5.17	4.778	24.71
A31-1C	(a)	4.778	
A37-1	16.67	4.778	79.66
A44-1C	6.41	4.778	30.63
A52-1C	16.26	4.778	77.70
A53-1	15.99	4.778	76.49
A54-1	5.63	4.778	26.90
A31-1	.26	4.778	1.24

(a) Sample was not received.

This analysis must be discounted for two reasons. First, all but two of the samples came from the first round of sampling. The samples were stored under the freight dock since early 1998 when they were returned from the lab following the first round of assays. The samples had not been maintained in safe conditions, no chain of custody had been maintained and the samples had been left exposed to the elements for about 19 months. Because of this the results obtained from the samples must be considered suspect as they may have cross-contaminated each other. Additionally it appears that some of the samples had been lost.

The results of the analysis are also misleading as the lab technique used does not account for beneficiation. In the final round of sampling by BLM, analysis showed that the percentage of gypsum in a final product could be increased simply by screening the in place material over a ½ inch mesh screen. Since screening is such a simple beneficiation technique easily integrated into any mining scenario, the beneficiated product grade and the resulting recovery are more important parameters than the simple in-place percentage of gypsum in the deposit.

As was said earlier, two additional samples were re-analyzed for their gold and silver content. The results of that assay for gold and silver are presented below and in Appendix 11:

Sample Name	Mg (Au) Per Assay ton	Ounces per ton	PPM	PPB
A-42-2A	.001	.001	.034	34.3
A-38-1	.002	.002	.069	68.6

Sample Name (FS Samples)	Mg (Ag) Per Assay ton	Ounces per ton	PPM
A-42-2A	.05	< .05	< 1.71
A-38-1	.05	.05	1.71

The results of the analysis show only trace amounts of gold and silver but do appear to be elevated above the results obtained by the BLM sampling. Because of the poor conditions under which the samples were stored, cross-contamination between samples from the freight dock or materials stored on the dock could possibly account for these slightly elevated levels. Additionally, differences in sample size and laboratory methodology could also account for these slightly divergent values. However, the value of 0.002 oz/ton for gold is significantly less than the stated cut off grade of 0.02 ounces per ton.

BLM Sampling

After review of the data collected from the Forest Service sampling effort, given the many errors in the assays and the fact that the samples could not be sent for a second round of assays, it was decided to conduct an new sampling program, independent of all previous efforts. The first step of the new program began by developing a sampling strategy based on the Applicants description of the deposit, their drilling program and the related sampling done by the Applicants.

Placer Sampling

Given the many problems associated with the Applicants sampling procedures and assay results and the conclusion that the exploration work done by the Applicant is essentially a geologic survey, it was decided that the subject claims would be sampled using standard prospecting procedures as opposed to procedures suited more for the development of reserves.

Essentially, it was decided to first verify if in fact gold or other precious metals were present and then, after this was completed, go to those area where samples reported high values and do further sampling. Samples that show a value of gold or platinum (or both) of .01 oz per ton or less would not be re-sampled. In those cases, the Applicants assertions of mineralization would be refuted.

A value of 0.01 oz per ton was chosen as a cut-off as the Applicant states in the letter of October 15, 1997 (Appendix 6):

> "If the gypsum at the deposit being mined has a only a low content of gold, for example, less than 0.01 ounces per ton, it will be screened and sold directly as a gypsum product, for example, for agricultural uses, without any wet processing in the gold recovery circuit."

If, the samples taken showed gold consistently in the ranges stated by the Applicant, across the entire area of the claims, no further sampling would be necessary, as the Applicants results would be verified.

A sampling plan for the subject claims must be based on sound engineering practice. Wells suggests four basic steps in placer exploration: (1) reconnaissance, (2) sampling,

(3) sample processing and (4) evaluation of results. (SME 73, 5-44) These steps are adopted as the basis for the sampling program and are summarized as follows:

Reconnaissance

Reconnaissance consisted of several trips to the site over an approximate 3-week period. The site was first visited by Costa on January 28, 2002, accompanied by Everson. That trip lasted 3 days until the January 30, 2002, when the fieldwork was stopped due to a snowstorm. On February 4, Costa again visited the site and was then later joined by Everson on February 5 –7, returning to Phoenix on February 8, 2002. Reconnaissance was completed on February 11, 12 and 13, 2002 by Costa.

During the reconnaissance phase, all of the claims were walked. The general pattern was to begin at Highway 188 and walk up one stream or drainage to the furthest extent of the claims then over the uplands to the next drainage and walk back. The reconnaissance started in the south end of the claim block and proceeded north with east and west traverses run in the drainages. A traverse was also run along Tonto Creek. The reconnaissance focused on two principle targets of interest, resistant ledges formed by sedimentary beds, thought to be high in gypsum, and accumulations of black sand in the drainages thought to be indicators of possible concentrations of precious metals.

No previous mine workings or sample points could be found except for some of the sample points located by Mathews. In some cases BLM samples were taken very near the exact locations used by Mathews. Since no previous working could be found, sampling was limited to existing exposures such as creek beds and creek or dry-wash cut banks.

The placer samples ranged in size but in general were over 30 lbs. By themselves, the samples obtained from existing exposures can seldom be expected to indicate the actual value of placer ground. They may, however, prove or disprove the presence of gold. And if correctly interpreted, they can indicate the range of values to be expected. (Wells, 35) For this reason, more intensive sampling would augment the first round samples when first round samples indicate the presence of gold above 0.01 oz per ton.

As each claim was explored, sample points were set using an iPAQ pocket computer, running Arcpad 5.1 software with location data supplied by a Teletype Global Positioning System (GPS) unit (20 meter accuracy). Usually the coordinates were verified using a Garmin III GPS unit. As a sample site was located the coordinates were recorded (UTM Zone 12, North American Datum, Continental U.S. 1927) and a reference photo was taken. The point was entered into a map of the claim group (Figures 5a, 5b, and 5c) and was recorded for future sampling. No marks were left on the ground to prevent any tampering and the exact locations of the sample points were kept confidential until sampling actually began.

Sampling

From previous discussions relating to the quality of sampling done by the Applicants and the description of the mineralized zone (essentially everywhere to a depth of at least three feet) the following sampling instructions were given to crews in the field:

1. Use the iPAQ to locate the approximate location of the proposed sample site. There is no stake or marker on the ground to locate the site. This was done to prevent any tampering of the site. The iPAQ will get you to the location where the sample was proposed. Instead of looking for the exact coordinate location, get as close as you can, then look for black sands if present or fines if black sands are not present.

a. The purpose of the sampling is to do a "survey" of mineral values that may be present. Any samples that return high values for gold, silver, or platinum will be re-sampled with a larger sample size.

b. For our purposes, we are trying to find mineral values. To this end, selectively try to "high grade" the sample by taking as much material that might possibly contain mineral values as possible.

2. Take the sample by placing a plastic sample bag into a canvas sample bag and then place both bags into a 5 gallon bucket. Cover the bucket with the screen supplied. Shovel the sample through the screen and remove the oversize material. Place this material into the second 5 gallon bucket.

3. Weigh both the sample and oversize material. **DO NOT** subtract the weight of the bucket from the total weight of the sample of oversize material. All buckets weigh 1 pound and the subtraction for the weight of the bucket will be done when the report is written.

4. After weighing the oversize material, sort through it and attempt to identify any minerals that may be of value. After examining the oversize, discard it.

5. Record the data concerning the sample on the sheets provided include the date, sample crew, time started and time ended. Photograph the site before beginning, during sampling and after the sample has been obtained. Photos are numbered sequentially by roll number. For example, photo 6 on the 11th roll used would be 6 – roll 11

The information recorded on the sample logs is presented in Appendix 12. Sampling of the claim began on February 19, 2002 and continued on February 20, 21, 22, 25, 26, 27, 28, March 6, 7, and April 2, 3, 2002. The sampling was divided at times between as many as three crews. Present were Ralph Costa, CME, BLM Arizona State Office, Byard Kershaw CRME, Arizona State Office, Jeff Garrett, CME, BLM Phoenix Field Office, Steve Fechner, CME, BLM National Training Center, Paul Buff, geologist, BLM, Arizona State Office, Dave Eddy, geologist, BLM, Phoenix Field Office, Dave Fanning, BLM, geologist, Phoenix Field Office, Gary Rowell, BLM, surface protection specialist,

Yuma Field Office, Dave Wilson, geographic information specialist, BLM, Arizona State Office and Beverly (Bev) Everson, geologist, FS, Coronado National Forest.

Each crew was run with between 2 to 4 people and all crews, at all times, were headed by a CME or a CRME. All of the samples were maintained in the custody of a CME or CRME at all times and were maintained in locked vehicles while in the field. When the samples were returned to the office, they were placed in a locked storage shed in the secure ware yard at the Phoenix Field Office. Only Costa and Garrett had keys to the shed. Shortly after this the samples were moved to locked cabinets in a locked storage facility at the BLM National Training Center by Costa and Eddy. Only Costa and Matt Shumaker, CRME, BLM National Training Center (NTC) had access to the samples at this location.

On May 3, 2002, Costa and Kershaw removed the samples from the locked storage at the NTC and boxed the samples for shipment. The samples were divided into two batches, a gypsum batch and a placer batch. Each batch was palletized and secured with shrink-wrap. Once palletized, the samples were locked in the warehouse at NTC for shipment.

On May 6, 2002, Eddie Chavez of the SO trucked the samples to the Chemex laboratory in Elko, Nevada. The samples were padlocked in an enclosed truck and the boxes and pallets remained undisturbed until they reached Chemex. On May 8, 2002, Sharon Collins of Chemex signed for the two batches of samples.

Sample Processing

All of the samples were sent to Chemex for analysis. The following is a list of the assay instructions given to Chemex for the analysis of non-gypsum placer samples:

ALS Chemex Code	Description
Sample Preparation	
BAT-01	Processing fee for each batch of samples submitted.
LOG-22	Log sample into tracking system.
SCR-41	Dry, weigh, and dry sieve to –80 mesh (-180 micron), retaining plus fraction.
PUL-32	Pulverize a 1,000-gram split to better than 95% passing 150 mesh (106 micron).
	Weigh and record weight of sieved fractions
Assay Procedures	
PGM-MS23	30-gram Fire Assay/ICP-MS finish for Au, Pt, and Pd. Range: Au (1 – 2,000 ppb), Pt (0.5 – 2,000 ppb), and Pd (1- 2,000 ppb)
NA03 (Bondar Clegg)	Au + 33 Exploration Option 1 – 10 gram vial Ag, As, Au, Ba, Br, Cd, Ce, Co, Cr, Cs, Eu, Fe, Hf, Ir, La, Lu, Mo, Na, Ni, Rb, Sb, Sc, Se, Wm, Sn, Ta, Tb, Te, Th, U, W, Yb, Zn, and Zr by Instrumental Neutron Activation Analysis (INAA) of 10 grams of sample.

ALS Chemex Code	Description
ME-ICP61	27 elements by HF-HNO3-HClO4 acid digestion, HCl leach and ICP-AES without Hg.

A copy of the assay instructions together with the laboratory price quote is in Appendix 13.

Gypsum Sampling

Gypsum sampling ran concurrently with the placer sampling, the same methods, personnel and dates of field work apply to both the placer sampling and gypsum sampling. The following sections explain the differences between the two sampling programs.

Reconnaissance

In the patent applications, the applicants state that the gypsum occurs over 1,760 acres and in these areas is from 0 to 6 feet deep in a zone about 36 inches thick. Samples were taken at every outcrop. Since there are no artificial exposures of the gypsum faces on any of the subject claims, sampling was limited to natural exposures of the gypsiferous zones. Sample sites for gypsum samples were chosen based on the field observation that the zones highest in gypsum mineral were distinctly more resistant to weathering and erosion than other beds. In general, the gypsiferous zones, where they did outcrop, were very distinctive and easily recognizable. However, some of the exposed zones graded quickly to areas of lesser gypsum as the overall color of the zones or beds shifted from a distinct shade of white to softer shades of brown, red or green until they were lost in the host sediments.

Sampling

From previous discussions relating to the quality of sampling done by the applicant and the description of the mineralized zone the following sampling instructions were given to crews in the field:

1. Use the iPAQ to locate the approximate location of the proposed sample site. There is no stake or marker on the ground to locate the site. This was done to prevent any tampering of the site. The iPAQ will get you to the location where the sample was proposed. Instead of looking for the exact coordinate location, chose an area on the exposed bed where the entire sequence can be sampled.

2. The most resistant bed will be sampled. These beds seem to indicate the highest percentage of gypsum.

3. Clean away the face of the gypsiferous zone to expose the entire stratigraphic sequence. Record the stratigraphic sequence.

4. For multiple seams separated by a large distance > 1 foot each bed is given a separate sample number such as 3-48, 4-48 etc.

5. When seams are separated by sedimentary layers from 1 inch to one foot, separate these sections into different samples and label them in decimal form such as 3-48 for gypsum, then 3.1-48 for clay then 3.2-48 for gypsum etc.

6. When seams are separated from each other by less than 1 inch, take a single channel sample along the entire stratigraphic section.

7. Weigh each sample. DO NOT subtract the weight of the bucket.

8. Record the data concerning the sample on the sheets provided, include the date, sample crew, time started, time ended. Photograph the site before beginning, during sampling and after the sample has been obtained. Photos are numbered sequentially by roll number. For example, photo 6 on the 11th roll used would be 6 – roll 11

It must be noted at this point that the instructions in step 5 were impractical to implement once sampling began. Because of the high percentage of clay layers present in many of the sample locations, chip samples were generally taken across gypsum and clay zones alike and combined into a single sample to mimic the extraction procedures that would be used in an actual mining operation. When clay layers reached upwards of 1 foot, the channel was stopped as a mining operation could reasonably be expected to handle this much material as a separate lift. If gypsum occurred above the point where the sample was stopped a new sample would be taken and given a different numerical designation. There was only one instance where the decimal notation was used.

Sample Processing

The applications concerning the processing of gypsum state the following:

"(2) The beneficiation process will comprise the steps of surface mining the gypsum ore, screening the gypsum to separate the gypsum and the sand and clay by-product containing precious metals, and crushing to 1/8 inch to 200 mesh. The by-product sand and clay is used to recover precious metals."

Following this procedure, assay instructions were developed to first screen (1/2 inch) the sample to remove the clay material and then assay the +1/2 inch fraction for gypsum and both the –1/2 and +1/2 fractions for precious metals. When the samples were taken, it was obvious that the gypsum minerals tended to break off in rather large pieces and the +1/2 inch would contain most of the gypsum content. In addition to these tests, the –1/2 inch fraction would undergo a "whole rock" analysis to determine the composition of this material. This was done to determine what effect the –1/2 fraction would have on the overall quality of the final gypsum product as there is always some contamination when screening.

All of the samples were sent to Chemex for analysis. The following is a list of the assay instructions given to Chemex for the analysis of gypsum samples:

ALS Chemex Code	Description
Sample preparation	
BAT-01	Processing fee for each batch of samples submitted.
LOG-22	Log sample into tracking system.
SCR-45a	Dry, weigh, and dry sieve to – ½ inch, retaining plus fraction.
CRU-31	Fine crushing of rock chips or coarse sediments to better than 70% passing 2mm (10 mesh). **–1/2 Fraction**
CRU-31	Fine crushing of rock chips or coarse sediments to better than 70% passing 2mm (10 mesh). **+1/2 Fraction**
PUL-32	Pulverize a 1,000-gram split to better than 95% passing 150 mesh (106 micron). **–1/2 Fraction**
PUL-32	Pulverize a 1,000-gram split to better than 95% passing 150 mesh (106 micron). **+1/2 fraction**
PUL-31	Pulverize a 250-gram split to better than 95% passing 150 mesh (106 micron). **–1/2 Fraction**
PUL-31	Pulverize a 250-gram split to better than 95% passing 150 mesh (106 micron). **+1/2 Fraction**
	Weigh and record weight of screened fractions

Analytic Procedures	
PGM-MS23	30-gram Fire Assay/ICP-MS finish for Au, Pt, and Pd. Range: Au (1 – 2,000 ppb), Pt (0.5 – 2,000 ppb), and Pd (1- 2,000 ppb) **Both Fractions**
ME-ICP61	27 elements by HF-HNO3-HClO4 acid digestion, HCl leach and ICP-AES without Hg. **Both Fractions**
ME-XRF06	Whole rock analysis by lithium metaborate fusion/XRF analysis, reporting 13 major element oxides, Loss on Ignition, and Calculated Totals. **–1/2 Fraction only**
ME-ICP05	Analysis of gypsum samples for: $CaSO_4*2H_2O$, $CaCO_3$, $MgCO_3$, NaCl, and KCl. **+1/2 fraction only**

A copy of the assay instructions together with the laboratory price quote is in Appendix 13.

Presentation and Evaluation of Results

Placer Deposit

The assay results obtained from the sampling were used to calculate the in-place value of the material from which they were taken. To do this the assay would be converted to ounces per ton. This figure would be the gold in ounces per ton of –80 mesh material. For purposes of this report, the +80 mesh fraction would also be assumed to have an identical gold content. That is, the assay for both size fractions would be considered to have a constant grade. The total weight of the sample, in place, would also contain the weight of the +1/4 size fraction. The gold value for this fraction in all cases is taken to be

zero. The total weight of the sample would be calculated by adding the weight of the ¼ + fraction to the weight of the sample received by the lab. The in-place value per ton would then be calculated. The area from which any sample having an in-place gold or platinum content of more than 340 ppb (slightly less than 0.01 troy ounces per ton) would be targeted for additional field work, re-sampling and if necessary bulk sampling.

To insure the quality of the laboratory analysis the BLM included several standards and blanks in the run of samples. The lab was totally unaware that these standards and blanks had been included with the samples. The standard and blank samples are presented in the following table together with their known values and the values reported by Chemex:

Sample Name	Known Value	Reported Gold Value
1-14	7.81 ppm Au	8.6 ppm Au (a)
1-24F	Below detection	4 ppb
1-55	12.1 ppm Pt	11.65 ppm Pt (b)

(a) The sample submitted was not entirely homogeneous and as a result a second analysis showed gold values over 10 ppm.

(b) The value reported by Chemex for the platinum in the standard was initially reported as 1,165 ppb, an order of magnitude lower than the accepted value. Chemex confirmed in a letter (Appendix 13) that the error was due to calibration caused by the high value of the sample. Essentially, the decimal point was set incorrectly.

The summarized results for the assays are given in the following table and compared to the average crustal abundance of these elements:

	Au ppb	Pt ppb	Pd ppb	Ag ppb
Average Grade	5.93	0.97	1.8	939.19
Crustal Average (a)	4	6	6	70
Soil Averages	2	6	6	70

(a) Values from Glover p. 246

Cut off grade 0.02 oz/ton Au, Pt is equivalent to 685 ppb Au, Pt.
Total Au, Pt, Pd present equals 8.7 ppb
Average total value of Au, Pt, Pd present as a percentage of cut-off grade is 1.27%

The highest reported values were for sample 1-18 at 400 ppb Au, 2T-24B at 374 ppb Au and 1-38 at 66 ppb (Au). Each of these sample was reanalyzed to insure that the results were repeatable and not simply a false reading. Sample 1-18 recorded <5 ppb, 2T-24B recorded <5, 15, and <5 ppb and sample 1-38 recorded 5, <5 and <5 ppb. None of the samples showed any repeatability in the higher values and as such warrant no further study.

For a complete list of all assay data for each sample refer to Appendices 12 and 13. From the information obtained from Chemex, the samples average values are similar to what is expected for the occurrence of gold, platinum and palladium in the crust of the earth or in stream sediments (Glover, p. 246). Silver appears to be elevated above crustal averages

but the average value of 940 ppb is equal to 0.0275 oz/ton. At a price of $5.00 per ounce this amounts to an in place value of $0.14/ton which is negligible. None of the samples obtained from the subject group of mining claims indicates that gold, silver, platinum or palladium occur in sufficient quantities to warrant further investigation.

It must be emphasized that this sampling plan was organized around an approach that would allow the property to develop, that is, if the early sampling produced promising results in one or more areas, these areas would then be targeted for further exploration and a more significant expenditure of time and effort. Should the sampling results show that there would be little or no incentive to prospect or explore further, then the claim from which the sample came would not be considered to have mineral of sufficient quality and quantity to justify the further expenditure of time and effort in the development of a paying mine.

Gold Nugget Effect

A notation on Chemex assay number A02159 that states, "Some samples in this set exhibit a gold nugget effect" must be addressed before conclusions concerning the applications can be made. Although it seemed clear that the notation concerned only a few samples in the run, the notation appeared to concern all of the samples assayed. A series of e-mails were sent (Appendix 12) to Chemex for more information. This effort resulted in the Chemex letter of July 15, 2002 (Appendix 12).

In the Chemex letter, Patrick Highsmith, Chief Geochemist, states:

> "There is no scientific evidence to indicate a failed fire assay, contamination, or a faulty calibration at the instrument that might explain these few anomalous determinations. If you examine the sixteen results on A0217759, you can see that none of these anomalous values re-occurred in our attempts to repeat them. Therefore, a preponderance of the evidence suggests that the samples in question (1-18, 1-24A, 1-24B, 2T-24B, 1-30, and 1-38) probably do not contain appreciable amounts of gold.
>
> This does not eliminate the possibility of a very rare grain of gold appearing in any given sub-sample causing an anomalous assay, but there is no reason to believe that the bulk composition of these samples is anomalous in gold. The confusion over these few isolated anomalous readings may be the result of operator error in the laboratory. Again, we have not uncovered evidence to support this assertion but it is possible that the isolated anomalous readings were the result of calibration errors on the ICP-MS instrument. In addition to the repeat analyses provided in A0217759, which were determined by atomic absorption spectrometry (AAS) – a completely different analytical technology, we have instituted a re-run of all 77 samples by fire assay/AAS. This is an additional measure of caution to reinforce our confidence in the gold results. These should be

completed by the end of this week or beginning of next. There will be no charge for this final round of checks."

The results of this re-run (Appendix 13) indicate that gold, silver and platinum occur in the same relative quantities as in the initial assays and no anomalous readings of gold, silver or platinum were detected.

Gypsum Deposit

There are two aspects to the gypsum or gypsiferous occurrences in the subject claims, the quality and recoverability of the gypsum present and the assertion that the clays within the gypsum and the staining on the gypsum contain gold, silver, platinum and palladium.

Precious Metals Occurrence in the Gypsiferous Horizons

To examine the claim that gold and platinum occur in mineable quantities and to mimic the beneficiation process, the gypsum samples were screened over a ½ inch screen. The minus ½ inch fraction, containing the bulk of the clays was then sent for analysis for precious metals. To insure that the presence of any precious metals would be verified, portions of the +1/2 fraction were also assayed for precious metal content. The following table analyzes those results:

	Total	-1/2 fraction						+1/2 fraction				
SAMPLE	KG	KG	Au	Pt	Pd	Ag	SAMPLE	KG	Au	Pt	Pd	Ag
DESCRIPTION	kg	kg	ppb	ppb	ppb	ppm	DESCRIPTION	kg	ppb	ppb	ppb	ppm
3-21 -1/2 MESH	6.4	3.7	1	<0.5	<1	0.5	3-21 +1/2 MESH	2.68	1	<0.5	<1	<0.5
4-21 -1/2 MESH	7.68	4.96	2	<0.5	1	0.5	4-21 +1/2 MESH	2.68	<1	<0.5	<1	<0.5
5-21 -1/2 MESH	3.82	2.16	2	1	<1	0.5	5-21 +1/2 MESH	1.66	<1	<0.5	<1	<0.5
1-22 -1/2 MESH	5.92	4.16	2	1	1	1.5	1-22 +1/2 MESH	1.74	1	0.5	<1	2
3-22 -1/2 MESH	4.92	3.12	2	0.5	<1	0.5	3-22 +1/2 MESH	1.78	<1	<0.5	<1	<0.5
4-22 -1/2 MESH	8.52	5.74	1	<0.5	<1	0.5	4-22 +1/2 MESH	2.76	<1	<0.5	<1	<0.5
5-22 -1/2 MESH	5.82	4.08	2	<0.5	<1	0.5	5-22 +1/2 MESH	1.72	<1	<0.5	<1	<0.5
1.1-23 -1/2 MESH	11.8	7.48	2	0.5	<1	0.5	1.1-23 +1/2 MESH	4.28	<1	<0.5	<1	<0.5
1.2-23 -1/2 MESH	5.08	2.38	1	<0.5	<1	0.5	1.2-23 +1/2 MESH	2.68	<1	<0.5	<1	<0.5
2-23 -1/2 MESH	3.16	1.52	1	0.5	<1	0.5	2-33 +1/2 MESH	1.64	<1	<0.5	<1	<0.5
3-33 -1/2 MESH	10.9	4.66	1	0.5	<1	1	3-33 +1/2 MESH	6.22	<1	<0.5	<1	<0.5
4-33 -1/2 MESH	9.48	4.92	2	0.5	1	0.5	4-33 +1/2 MESH	4.52	<1	<0.5	<1	<0.5
5-33 -1/2 MESH	9.5	5.96	1	<0.5	<1	0.5	5-33 +1/2 MESH	3.5	<1	<0.5	<1	0.5
3-35 -1/2 MESH	11.1	5.76	1	0.5	1	0.5	3-35 +1/2 MESH	5.28	<1	<0.5	<1	<0.5
1-37 -1/2 MESH	4.32	1.98	1	<0.5	<1	<0.5	1-37 +1/2 MESH	2.3	1	<0.5	<1	<0.5
2-37 -1/2 MESH	4.04	2.44	1	<0.5	<1	0.5	2-37 +1/2 MESH	1.58	<1	<0.5	<1	<0.5
1-42 -1/2 MESH	6.62	2.62	1	<0.5	<1	0.5	1-42 +1/2 MESH	3.98	<1	<0.5	<1	<0.5
1-44 -1/2 MESH	7.62	3.94	1	0.5	<1	0.5	1-44 +1/2 MESH	3.66	<1	<0.5	<1	<0.5
3-45 -1/2 MESH	7.8	4.1	1	0.5	<1	0.5	3-45 +1/2 MESH	3.68	1	<0.5	<1	<0.5
4-45 -1/2 MESH	8.12	5.02	1	0.5	<1	1	4-45 +1/2 MESH	3.06	<1	<0.5	<1	<0.5
1-52 -1/2 MESH	12.6	6.44	2	0.5	1	0.5	1-52 +1/2 MESH	6.16	1	<0.5	<1	<0.5
2-52 -1/2 MESH	5.8	2.72	2	<0.5	<1	0.5	2-52 +1/2 MESH	3.06	1	<0.5	<1	<0.5
1-54 -1/2 MESH	11.2	7.96	3	<0.5	<1	1	1-54 +1/2 MESH	3.2	1	<0.5	<1	0.5

	Total	-1/2 fraction						+1/2 fraction				
SAMPLE	KG	KG	Au	Pt	Pd	Ag	SAMPLE	KG	Au	Pt	Pd	Ag
DESCRIPTION	kg	kg	ppb	ppb	ppb	ppm	DESCRIPTION	kg	ppb	ppb	ppb	ppm
3-54 -1/2 MESH	3.52	2.28	1	0.5	<1	<0.5	3-54 +1/2 MESH	1.22	<1	<0.5	<1	<0.5
4-54 -1/2 MESH	4.82	2.64	1	<0.5	<1	0.5	4-54 +1/2 MESH	2.16	<1	<0.5	<1	<0.5
5-54 -1/2 MESH	2.02	1.26	2	0.5	1	0.5	5-54 +1/2 MESH	0.74	1	0.5	<1	0.5
6-54 -1/2 MESH	3.48	1.34	1	<0.5	<1	0.5	6-54 +1/2 MESH	1.82	1	<0.5	<1	<0.5

The sampling indicates that the clay and the gypsum both contain substantially less gold, platinum, palladium and silver than what is contained as the natural crustal abundance. This result is in keeping with the geologic conditions prevalent at the site. The geologic conditions conducive to the formation of gypsum are not in general conducive to the deposition of gold, silver or platinum resulting in a lower percentage of these elements in the gypsum formations that in the earth's crust. Based on the data presented, the gypsum and the clay layers are not host to valuable quantities of precious metals. The mining history of the region further supports that neither precious metals nor gypsum are present in sufficient quality or quantity to support a mining operation.

Gypsum Occurrence in the Gypsiferous Horizons

Of the entire claim group, only the following claims contained exposures of gypsum, Annabell 21, 22, 23, 25, 26, 31, 33, 35, 37, 38, 42, 44, 45, 52, 53 and 54. The various outcrops of gypsiferous layers on each of these claims were assayed to determine the percentage of gypsum ($CaSO_4 \cdot 2(H_20)$) in the layer and the percentage of recovery that could be expected under normal mining and beneficiation conditions.

The Applicants state that beneficiation of the gypsum would consist of screening the gypsum to remove sand and clay and then crushing the gypsum to market specifications. This procedure was mimicked in the laboratory by screening the samples with a ½+ screen and then pulverizing the +1/2 fraction to obtain homogeneity and assaying for gypsum. The results of this work are given in the following table and in Appendix 13:

SAMPLE DESCRIPTION	$CaSO_4.2(H_2O)$ %	CaCO %	MgCO %	Total Sample Weight	Weight KG+1/2	% Recovery +1/2 fraction
3-21 +1/2 MESH	88.9	0.69	1.81	6.4	2.7	42.19%
4-21 +1/2 MESH	90.4	0.11	1.58	7.68	2.72	35.42%
5-21 +1/2 MESH	82.3	1.71	3.95	3.82	1.66	43.46%
1-22 +1/2 MESH	52.1	10.12	11.63	5.92	1.76	29.73%
3-22 +1/2 MESH	84.6	1.29	2.7	4.92	1.8	36.59%
4-22 +1/2 MESH	88	1.71	1.47	8.52	2.78	32.63%
5-22 +1/2 MESH	88.1	1.69	1.9	5.82	1.74	29.90%
1.1-23 +1/2 MESH	88.4	1.67	1.68	11.82	4.34	36.72%
1.2-23 +1/2 MESH	89.2	0.92	1.58	5.08	2.7	53.15%
2-33 +1/2 MESH	86.3	2.7	3.05	3.16	1.64	51.90%
3-33 +1/2 MESH	86	2.75	2.67	10.94	6.28	57.40%
4-33 +1/2 MESH	86.3	2.59	2.18	9.48	4.56	48.10%
5-33 +1/2 MESH	1.3	4.28	5.68	9.5	3.54	37.26%

SAMPLE DESCRIPTION	$CaSO_4.2(H_2O)$ %	CaCO %	MgCO %	Total Sample Weight	Weight KG+1/2	% Recovery +1/2 fraction
3-35 +1/2 MESH	88.6	1.87	1.84	11.06	5.3	47.92%
1-37 +1/2 MESH	90.2	2.89	1.69	4.32	2.34	54.17%
2-37 +1/2 MESH	91.2	2.27	1.22	4.04	1.6	39.60%
1-42 +1/2 MESH	89.2	3.94	2.09	6.62	4	60.42%
1-44 +1/2 MESH	86.1	3.47	2.22	7.62	3.68	48.29%
3-45 +1/2 MESH	84.4	3.79	2.96	7.8	3.7	47.44%
4-45 +1/2 MESH	85.4	4.6	3.07	8.12	3.1	38.18%
1-52 +1/2 MESH	84.4	3.08	2.2	12.64	6.2	49.05%
2-52 +1/2 MESH	88.8	2.51	1.7	5.8	3.08	53.10%
1-54 +1/2 MESH	1.5	1.42	6.49	11.18	3.22	28.80%
3-54 +1/2 MESH	83.1	2.99	2.32	3.52	1.24	35.23%
4-54 +1/2 MESH	80.4	3.63	2.26	4.82	2.18	45.23%
5-54 +1/2 MESH	49.6	12.5	3.21	2.02	0.76	37.62%
6-54 +1/2 MESH	83.9	3.42	2.47	3.48	2.14	61.49%

The table shows that the gypsiferous zones do contain a component that is very high in gypsum, but that this component is in most cases under half of the material contained in the horizon. After reviewing these results, it became apparent that some of the horizons contained areas where a gypsum product could be produced if mining costs could be kept at a sufficiently low level.

One of the largest factors to effect mining costs is the percent recovery. Essentially mining costs are inversely proportional to the recovery. If the recovery is halved, the mining costs double, all else being equal. Since the initial results of the ½ inch screening indicate rather low recoveries, it is important to determine if recovery could be increased. To this end, the minus ½ fraction was investigated to determine if there was gypsum in that fraction that could be recovered. The following table presents the data used for this investigation:

SAMPLE DESCRIPTION	CaO %XRF	Multiplier For Gypsum (a)	Calculated Gypsum %	S %	Multiplier For Gypsum (b)	Calculated Gypsum %
4-21 -1/2 MESH	16.15	3.07	49.58	7.2	5.37	39
5-21 -1/2 MESH	12.17	3.07	37.36	7.49	5.37	40
1-22 -1/2 MESH	12.8	3.07	39.3	3.78	5.37	20
3-22 -1/2 MESH	14.56	3.07	44.7	6.46	5.37	35
4-22 -1/2 MESH	17.57	3.07	53.94	8.98	5.37	48
5-22 -1/2 MESH	18.64	3.07	57.22	9.98	5.37	54
1.1-23 -1/2 MESH	16.59	3.07	50.93	7.88	5.37	42
1.2-23 -1/2 MESH	15.09	3.07	46.33	7.07	5.37	38
2-23 -1/2 MESH	16.13	3.07	49.52	9.91	5.37	53
3-33 -1/2 MESH	14.51	3.07	44.55	7.48	5.37	40
4-33 -1/2 MESH	13.44	3.07	41.26	6.65	5.37	36
5-33 -1/2 MESH	4.45	3.07	13.66	0.06	5.37	0

SAMPLE DESCRIPTION	CaO %XRF	Multiplier For Gypsum (a)	Calculated Gypsum %	S %	Multiplier For Gypsum (b)	Calculated Gypsum %
3-35 -1/2 MESH	16.01	3.07	49.15	9.08	5.37	49
4-45 -1/2 MESH	13.94	3.07	42.8	6.5	5.37	35
1-52 -1/2 MESH	13.06	3.07	40.09	6.76	5.37	36
1-54 -1/2 MESH	4.44	3.07	13.63	1.82	5.37	10
5-54 -1/2 MESH	15.16	3.07	46.54	5.05	5.37	27
6-54 -1/2 MESH	13.6	3.07	41.75	7.39	5.37	40
		Average	42.35		Average	35.67
Some of the CaO is complexed with CaC03 and is reporting too high for gypsum.						
Correct by taking 35.67/42.35 or 0.842						
Samples reported at >10%				Correction	Gypsum	
3-21 -1/2 MESH	19.39	3.07	59.53	0.842	50.12	
1-37 -1/2 MESH	21.77	3.07	66.83	0.842	56.27	
2-37 -1/2 MESH	20.85	3.07	64.01	0.842	53.9	
1-42 -1/2 MESH	17.52	3.07	53.79	0.842	45.29	
1-44 -1/2 MESH	17.77	3.07	54.55	0.842	45.93	
3-45 -1/2 MESH	20.96	3.07	64.35	0.842	54.18	
2-52 -1/2 MESH	17.69	3.07	54.31	0.842	45.73	
3-54 -1/2 MESH	14.25	3.07	43.75	0.842	36.84	
4-54 -1/2 MESH	29.12	3.07	89.4	0.842	75.27	

(a) The factor 3.07 was calculated using the atomic weight of gypsum and calcium.
(b) The factor 5.37 was calculated using the atomic weight of gypsum and sulfur.

This table was developed to estimate the total amount of gypsum that could be present in the minus 1/2 fraction. Since the lab was not asked to assay the –1/2 fraction for gypsum, the percentage of gypsum that could be present had to be calculated. The percentage of sulfur present gives a good indication of the amount of gypsum that might be present assuming there are few other compounds besides gypsum in the sample that could be present that would involve sulfur.

For each sample where a sulfur value was reported, the gypsum present was calculated using a ratio of the atomic weight of two substances. As an example for sample 6-54-1/2 mesh the calculation is a follows: 7.39%S * 5.37 = 39.68 or 40% Gypsum. This method worked in all cases except for those samples where the sulfur content was reported as simply >10% sulfur. In these cases, the percentage of gypsum present was calculated using the calcium oxide (CaO) content of the sample.

Calcium oxide does not provide as reliable an estimate of total gypsum as does sulfur. Calcium oxide is also a constituent of calcium carbonate ($CaCo_3$), which is also likely present in the samples and as such an estimate of gypsum based on CaO would likely be high. To compensate, for each sample with a known sulfur value, the gypsum content was calculated using both CaO and S and the results were compared. Overall the value reported using total S was only 84% of the value reported using CaO. For the samples

with over 10% sulfur, the total gypsum content was calculated using CaO and was then adjusted down to 84% to account for $CaCo_3$. For example Sample 4-54-1/2 mesh 29.12% CaO * 3.07 = 89.4% $CaCo_3$ + Gypsum * .842 = 75.27% Gypsum.

From these initial calculations, it is clear that a portion of the minus ½ fraction may be gypsum. The question then is if this gypsum can be recovered in an economical way.

During a recent visit to the Phoenix Cement quarry near Verde Valley, Arizona, it was observed that this firm involves a two-stage wet screening process for the beneficiation of their deposit. This process involves wet screening the gypsum and clay mixture over a double deck screen with the first screen at 3/8 inch and the second screen at 60 mesh. To simulate this process, Chemex was asked to a wet screen the minus ½ fraction of each gypsum sample over a 60 mesh screen and assay the +60 mesh fraction for total gypsum.

The minus ½ fraction was not initially assayed for gypsum as the Applicants indicated that this material was only valuable for its precious metals content. Assay results presented in this section convincingly refute this assertion and the value of this fraction of material, if it is at all valuable, is in its gypsum content.

The results of the wet screen process are presented in the following table:

SAMPLE DESCRIPTION	Dry Weight Kg (a)	Weight +60 Mesh kg	CaSO4*2H2O %	CaCO %	MgCO3 %	Percent Recovery of +60, -1/2 fraction
3-21	2.22	0.54	85.2	0.78	1.67	24.3
4-21	3.12	0.96	63.2	4.25	5.67	30.8
5-21	0.82	0.14	90	0.28	1.71	17.10
1-22	2.62	0.2	71.5	5.29	5.07	7.60
3-22	1.72	0.24	87.5	0.86	1.64	14
4-22	3.98	1.02	85.1	1.67	1.48	25.6
5-22	2.32	0.78	71	3.42	4.96	33.6
1.1-23	5.18	2	61	5.54	5.81	38.6
1.2-23	1.1	0.18	70.4	6.71	7.16	16.4
2-33	0.36	0.06	40.7	10.96	11.79	16.7
3-33	3	1.22	55.4	5.34	5.76	40.7
4-33	3.1	1.04	72.5	2.6	2.08	33.5
5-33	4.24	0.7	0.2	6.58	7.33	16.5
3-35	3.84	1.64	66.2	3.78	5.17	42.7
1-37	0.76	0.32	88.4	1.78	1.33	42.1
2-37	1.14	0.44	78.7	2.47	2.96	38.6
1-42	1.28	0.46	80.7	3.9	2.9	35.9
1-44	2.44	0.78	78.6	3.93	3.21	32
3-45	2.28	0.62	89.4	1.18	1.2	27.2
4-45	3.4	1.3	54.3	11.1	9.42	38.2
1-52	4.78	1.66	57.2	5.33	6.55	34.7
2-52	1.38	0.52	82.9	3.48	2.43	37.7

SAMPLE DESCRIPTION	Dry Weight Kg (a)	Weight +60 Mesh kg	CaSO4*2H2O %	CaCO %	MgCO3 %	Percent Recovery of +60, -1/2 fraction
1-54	5.74	1.02	17.5	1.82	5.39	17.8
3-54	0.78	0.22	77.4	4.31	3.83	28.2
4-54	0.94	0.36	82.3	3.66	2.49	38.3
5-54 (b)	not/ss	not/ss	not/ss	not/ss	not/ss	not/ss
6-54	not/ss	not/ss	not/ss	not/ss	not/ss	not/ss

(a) The sample weight given is for the –1/2 fraction less the weight of material removed to do the assays for precious metals.

(b) not/ss means there was not sufficient amount of sample remaining after previous tests to perform this test.

Again, some of the material contains significant amounts of gypsum but at a significant reduction in recovery. The best hope for producing a viable product is to combine the +1/2 fraction and the –1/2+60 mesh fraction into a single product. This analysis is done in the Economic Analysis section of this report.

The remaining 29 claims in the applications do not have any physical exposures of gypsum and thus were not sampled for this mineral.

ECONOMIC ANALYSIS & CONCLUSIONS

Placer Deposits

For a mining operation to be economic, it must first be shown that a deposit actually exists. The Applicants, in their applications, provided a description of the ore body for placer type deposits on the subject claims as the entire claim surface beginning at the surface to a depth of from 3 to 6 feet thick having a combined gold and platinum content of at least 0.02 ounces per ton. The Applicants also indicate that gold, platinum and other precious metals occur in conjunction with the gypsiferous zones found within the patent area. This is the hypothetical ore deposit model tested by field examinations.

Final Conclusions Concerning Placer Deposits

Based on the foregoing information presented in this report the subject claims do not encompass economic deposits of precious metals in any of the exposed geology types present in the claim group. This conclusion is based on the following facts:

1. Stream sediment samples and even those samples specifically designated by Thorne as being representative of areas of high concentrations of precious metals (several ounces per ton) contain only trace amounts of these metals.

2. The sampling program used by the Applicants suffers from many serious deficiencies such as small sample size and improper drilling techniques.

3. Reputable assay labs, acting as disinterested third parties, were not used by the Applicants to verify their assay results. Because there was no independent verification of the assay results by reputable labs and other relevant factors, the reliability of the Applicant supplied assay results is suspect.

4. The mining history of the region supports the results of the sampling program as prospectors over the last century have not found any promising precious metal deposits in the Tonto Basin area and there is no historical precious metals production from the region. There are no active mines in the region and despite claims to extraordinarily high values of precious metals none of the claims in the application were actively mined.

Based on these conclusions and the information gathered in this report, the placer deposit proposed by the claimant has been refuted and all available evidence suggests that no such deposit exists.

Gypsum Deposits

The occurrence of gypsum and/or gypsiferous layers or horizons within the area of the patent application is undeniable. Gypsiferous horizons outcrop on the Annabell 21, 22, 23, 25, 26, 31, 33, 35, 37, 38, 42, 44, 45, 52, 53 and 54 claims. The remaining 29 claims in the applications do not have any physical exposures of gypsum.

The Applicants provided a description of the gypsum deposits stating that the gypsum occurs over 1,760 acres and in these areas is from 0 to 6 feet deep in a zone about 36 inches thick divided as a total of 6 inches of gypsum in 30 inches of clay and sand. The Applicants also indicate that gold, platinum and other precious metals occur in conjunction with the gypsiferous zones found within the patent area. These are the hypotheses tested by field examinations.

Based on the foregoing information presented in this report the following conclusions can be made concerning the Applicants proposed gypsum deposits:

1. Extensive sampling of the gypsiferous zones and the surrounding drainages indicates the absence of economic quantities of gold, silver, platinum or palladium within these zones. In general the occurrence of these metals is below their natural level of occurrence in the earths crust.

2. The Applicants do not present any evidence that there is any quantity of gypsum that could be mined for profit. The drill logs presented by the Applicants in the applications are essentially worthless for defining a mineralized zone or mineral deposit. The descriptions of the occurrence of gypsum encountered by the drill holes are insufficient to determine the thickness, depth or quality of the gypsum encountered by drilling. In fact, the drill records are so poorly prepared that is impossible to tell if the drilling encountered beds of gypsum or if they simply drilled through gypsum float material in stream alluvium. Additionally one drill

hole that refers to a "nice hill of pure gypsum" is on a claim where there are no gypsum outcrops.

3. For a mine plan to be drawn, it must first be established that minerals exist in sufficient quantity for mining to occur. Because the gypsum outcrops along Highway 188 are discontinuous along their strike (Figure 7), there is reason to believe that they are discontinuous along their dip as well. Only a well designed exploration program involving drilling or preferably employing exploration pits down dip would suffice to determine the down dip extent of the gypsum deposit. Because of the many problems with the drilling logs submitted, the applications do not establish that the gypsiferous horizons are continuous down dip and what percentage, if any, of gypsum they contain. In essence the occurrence of gypsum is limited to thickness and length along the strike, the third dimension, and hence the total available reserves, is not known.

4. Undoubtedly, there are localized occurrences of gypsum that could be used to form a product of market specifications. However, quality must be accompanied by sufficient quantity for mining to take place. After analysis it is clear that the recovery rates for a market specification product are to low for mining costs to be held to a level that would allow a product to be brought to market at an acceptable, competitive price.

Based on these conclusions and the information gathered in this report, the gypsum deposit proposed by the claimant has been refuted and all available evidence suggests that further exploration must be done before such a deposit can be said with confidence to exist.

Basically the Applicants assume that since there are gypsum outcrops on the claims, they can mine it. They don't even offer assays for the content of gypsum that might be in-place. Instead they rely on assays done by the Department of Mines and Mineral Resources and the Department of Transportation that can't even be traced to the subject claims.

Given the state of information presented in the applications, it is clear that it falls well short of delineating a mineable zone of gypsum and amounts essentially to an unsubstantiated statement that they (the Applicants) will mine. Further exploration must be done before the claims can be mined.

The question now becomes, is the quality of the gypsum that is found to be present sufficient to warrant further exploration? This is the fundamental question that every explorationist must ask when dealing with these types of industrial minerals and should be answered by the time a patent application is filed.

From the assay results obtained by BLM and from information provided by the claimant, the recoverable gypsum content is quite low. Although a fairly high-grade gypsum product could be made, it would constitute a very low percentage of the material that

must be mined to produce it. The horizons that yielded the higher values of gypsum tend to consist of thin layers of gypsum separated by layers of clay and silt. It would be impossible to use large-scale mining equipment such as a scraper or front-end-loader to selectively mine the gypsum lenses. Instead, the entire horizon would have to be mined and then beneficiated. The question then becomes, are the physical (grade, thickness, depth of cover) characteristics of the subject property comparable or superior to other deposits being currently mined?

Comparison to Other Deposits

To determine if the Thorne claims (the subject property) were in fact comparable to other deposits in the vicinity, Costa and Ken Phillips of the ADMMR visited 4 operations in the state. The operations were the Western Organics gypsum pit and Arizona Gypsum near Salome Arizona, the Feldman Quarry operated by National Gypsum near Winkelman Arizona and the Larson Quarry operated by Phoenix Cement near Verde Valley Arizona. Trip reports for these site visits are provided in Appendix 14.

Seam Characteristics

The following table lists the dominant characteristics of the mining horizons at the mines visited and compares them to the typical characteristics of the Gypsiferous zones on the Annabell claimss:

Mine	Thickness	Grade	Description
Feldman Quarry	50 feet	89%	Eastern Pit consists of two zones, the A zone which is 17 to 20 feet of gypsum and the B zone which is 30 feet of gypsum. The A and B zones are separated by a 10-foot clay layer and no stripping is required. The A and B zones are largely massive and contaminants are largely imbedded in the gypsum
	13 feet	79 to 84%	Western pit consists of a 7-foot gypsum layer separated by 3 feet of clay followed by 6 feet of gypsum. The deposit has been core drilled and assay results have shown that any 1-foot interval ranges from 85% to 90% gypsum. See Photos 22, 23, 24 and 25
Phoenix Cement	35 feet	70%	The mined material is a thick layer of selenite crystals in clay. The material runs about 70% pure gypsum with 30% clay. The gypsum occurs as small (just over +1/2 inch to –60 mesh and smaller) crystals down in size to crystals that are very small. The mined zone outcrops and is mined with a paddle-wheel scraper. No drilling or blasting is required. The deposit is between 30 to 35 feet thick.

Mine	Thickness	Grade	Description
			See Photos 26, 27, 28, 29 30 and 31
Western Organics	70 feet	90+%	The exposure of gypsum is 40 feet thick, 70 feet high and about 500 feet long. It appears to be very high in gypsum, estimated in place it is at least 90% and there appears to be very little clay. See Photos 32, 33, 34
Thorne Property	5-7 feet	60 to 70%	The exposures lack continuity along the strike, they are from 5 to 7 feet thick with thin layers of gypsum. See Photos 3, 9, and 11

From this table it is clear that the Gypsiferous zones on the Annabell claims is the least desirable of those in the vicinity.

Recovery and Grade

For the Gypsiferous zones on the Annabell claims the choice is simple, you can produce a small amount of a high-grade product or a large amount of low-grade product. Assay results show that using the beneficiation method proposed by the claimant (screening to remove the clay and sand) the average recovery and grade are as follows:

Unit (a)	% Gypsum in +1/2 Product (b)	% Recovery of +1/2 Product (c)
a1	5.37	n/a
a2	85.23	47.90
a3	87.90	42.80
a4	88.19	50.40
b1	87.40	55.60
b2	85.4	41.70
b3	85.5	40.00
c1	75.50	39.10
c2	21.10	36.60
c3	78.60	35.90

(a) Unit refers to the designations given in this report to the various gypsiferous zones found on the Annabell claims.
(b) Average gypsum excluding unit a1 is 77%.
(c) Average recovery from all units is 43%.

The mines that were visited all produce a product that is at least 92% gypsum (estimating for Western Organics) with very high recoveries in the 70% to high 80% range.

Recovery is important, as mining costs are inversely proportional to the recovery. Assuming that all other factors are equal, the following table illustrates the effect of recovery on mining cost:

Mine	Recovery	Mining Cost as a Function of Recovery
Feldman Quarry	89%	1.00 X (Feldman Mining & Beneficiation Cost)
Phoenix Cement	70%	1.27 X (Feldman Mining & Beneficiation Cost)
Thorne (average)	43%	2.08 X (Feldman Mining & Beneficiation Cost)

All else being equal, because of the decreased recovery, the Thorne units would average a mining cost 208% higher then the Feldman quarry and 27% higher than the Phoenix Cement operation for a product that is 77% gypsum compared to products that are 92% gypsum.

Stripping Ratio

Unfortunately, as mining costs are concerned, all else is not equal between the deposits compared. All of the deposits visited required very little stripping of overburden prior to mining. The deepest cover appeared to be at the Western Organics pit, and here a dozer cut showed that as little as three feet of material covered 70 feet of very pure gypsum. The other operations required no stripping at all. This is in contrast to the subject property where most of the horizons are either perched exposures of limited extent (see Figures 7 & 8) or are under deep cover.

The area of the best exposure and lowest cover is in the area where Thorne initiated his mining operation (Figures 7 & 8). This area contains some of what appears to be the highest quality gypsum with the lowest depth of cover. Photos 19, 20, and 21 show this area in contrast to other areas within the subject claim group. It was probably for this reason that mining began in the area that it did. Of course, that mined area is outside of the patent application (Figure 9).

Within the subject claim group, most of the outcrops of gypsum occur along the bluffs that parallel the highway. In most instances they are from 10 to 30 feet down from the crest of the bluff. This can be clearly seen from the many photographs of the area and from the shaded relief map of Figure 8.

One area along the Annabell 53 and Annabell 54 claims contains a gypsum exposure that occurs along the bottom of a flat lying area. Even here, the grade of the surface is approximately 5%. This means that for every 100 foot along the dip of the bed the grade of the surface alone adds 5 feet of cover. The dip of the bed, although gentle, works to increase this depth.

It is clear from the physical data gathered for this report that any surface mining scenario for the subject property must include an allowance for stripping overburden. It is estimated that this allowance should be from a minimum of 5 feet to 40 feet over much of the subject claim group to even greater depths.

Location and Markets

All of the mines visited, could easily service markets in Maricopa County, Gila County and other counties in the southeast and south central part of the state. Figure 10 shows the location of the various properties visited.

Of all the mines the Feldman quarry could best serve markets in Tucson and Phoenix. The Verde Valley operation could best serve Phoenix and Flagstaff and the Thorne property markets in Scottsdale.

After talking with the representatives at the producing mines, the overall impression of the Arizona gypsum markets is such that the availability of gypsum does not drive the demand. In other words, gypsum mines do not search for markets, gypsum product producers such as wallboard plants and cement plants search for gypsum deposits and in most cases the mines are captive suppliers .

Generally a demand for cement, wallboard or agricultural gypsum is realized in an area and then the producer of these products looks for a gypsum deposit. Gypsum deposits are plentiful in Arizona and the publication Arizona Industrial Minerals lists 62 know occurrences of Gypsum in Arizona. Additionally all of the mines visited were either idle or had excess capacity. The producer at Winkelman had a large supply of agricultural grade material (70% gypsum) on hand that he could not find a market for.

Western Organics, a leading supplier of agricultural grade gypsum products, acquired their mine in the late 1980s to supply gypsum for their agricultural and horticultural mix production that is done at their Phoenix manufacturing plant. They hired contractors to mine, crush, and stockpile gypsum that was hauled to Phoenix as needed. They are currently buying their gypsum from the Superior Materials division of United Metro in Winkleman. They buy a grade of material, which is too low for use in Portland cement (<92%), for $8.00 per ton plus $10.00 per ton in transportation. J & B Trucking provides hauling.

Western Organics has in the past bought a lower grade gypsite from National Gypsum's screened undersize (Feldman Quarry). It contained 50 to 70 percent gypsum and they paid $5.00 per ton plus transportation. Western Organics consumes approximately 6,000 tons of 80% gypsum annually. They have attempted to use scrap wallboard as a gypsum source, but have never used more than a very small amount.

Western Organics produces a number of horticultural and agriculture products, all in the soil conditioner, soil amendment, fertilizer, mulch, and compost line. This product line includes gypsum packaged in 40-pound bags with a labeled minimum sulfur analysis of 14.9 percent, which is equivalent to 80 percent gypsum (See the Phillips report in Appendix 14). Given the grade of +1/2 material at the Thorne site (<92%) the most promising market for the gypsum is in agricultural use. However, suppliers provide material to the agricultural market as a by-product or screened undersize product from their other product lines. Since the screened +1/2 product from the Thorne property has no associated, higher value products or by-products, higher stripping costs and lower

recoveries, there is little chance that Thorne could enter any of the available markets with the +1/2 inch product.

To be competitive, Thorne must adopt a method of beneficiation that will allow both a higher quality product and higher recovery. Such a method would probably employ a wet screening process as discussed and analyzed earlier in this report. For convenience the results of the wet screening analysis and assay presented earlier in this report are repeated as follows:

SAMPLE DESCRIPTION	Dry Weight Kg	Weight +60 Mesh kg	CaSO4*2H2O %	CaCO %	MgCO3 %	Recovery of +60, -1/2 fraction %
3-21	2.22	0.54	85.2	0.78	1.67	24.3
4-21	3.12	0.96	63.2	4.25	5.67	30.8
5-21	0.82	0.14	90	0.28	1.71	17.10
1-22	2.62	0.2	71.5	5.29	5.07	7.60
3-22	1.72	0.24	87.5	0.86	1.64	14
4-22	3.98	1.02	85.1	1.67	1.48	25.6
5-22	2.32	0.78	71	3.42	4.96	33.6
1.1-23	5.18	2	61	5.54	5.81	38.6
1.2-23	1.1	0.18	70.4	6.71	7.16	16.4
2-33	0.36	0.06	40.7	10.96	11.79	16.7
3-33	3	1.22	55.4	5.34	5.76	40.7
4-33	3.1	1.04	72.5	2.6	2.08	33.5
5-33	4.24	0.7	0.2	6.58	7.33	16.5
3-35	3.84	1.64	66.2	3.78	5.17	42.7
1-37	0.76	0.32	88.4	1.78	1.33	42.1
2-37	1.14	0.44	78.7	2.47	2.96	38.6
1-42	1.28	0.46	80.7	3.9	2.9	35.9
1-44	2.44	0.78	78.6	3.93	3.21	32
3-45	2.28	0.62	89.4	1.18	1.2	27.2
4-45	3.4	1.3	54.3	11.1	9.42	38.2
1-52	4.78	1.66	57.2	5.33	6.55	34.7
2-52	1.38	0.52	82.9	3.48	2.43	37.7
1-54	5.74	1.02	17.5	1.82	5.39	17.8
3-54	0.78	0.22	77.4	4.31	3.83	28.2
4-54	0.94	0.36	82.3	3.66	2.49	38.3
5-54	Not/ss	not/ss	not/ss	not/ss	not/ss	not/ss
6-54	Not/ss	not/ss	not/ss	not/ss	not/ss	not/ss

Again, the products produced by the wet screening process have insufficient grades and excessively low recoveries to produce a viable, marketable product. The final combination is to combine the +1/2 product and the –1/2-+60 mesh product into a single

product. This would mimic the process used by Phoenix Cement. The results of that analysis are presented in the following table:

Unit	"+1/2 Gypsum %	Percent Recovery of +1/2	+60 mesh Gypsum %	Percent Recovery Of +60 Mesh	+1/2 +60 mesh Gypsum %	Recovery Of +60 Mesh +1/2 Mesh
a1	1.30%	37.26%	0.20%	16.50%	1.10%	47.60%
a2	85.20%	47.90%	84.10%	29.60%	84.90%	63.30%
a3	87.90%	42.80%	62.40%	36.60%	79.10%	64.00%
a4	88.20%	50.40%	76.40%	35.30%	85.00%	68.00%
b1	87.40%	55.40%	70.30%	40.20%	83.40%	73.40%
b2	85.40%	41.70%	67.20%	30.10%	79.80%	58.90%
b3	85.50%	40.00%	75.80%	27.60%	84.00%	56.60%
c1	75.50%	39.10%	84.00%	21.30%	82.50%	52.20%
c2	21.10%	36.60%	17.50%	17.80%	6.40%	47.90%
c3	78.60%	35.90%	72.70%	21.90%	75.40%	49.60%
Average	77.20%	43.33%	67.82%	28.93%	73.39%	59.32%

From the table it is clear that forming a single product of the +1/2 inch material and the +60 mesh material increases the recovery from 43% to 59 % but the grade of the final gypsum product falls from 77% to 73%.

Based on this analysis, it seems clear that a market specification product for either cement or wallboard cannot be made from the gypsum at the subject property as the grade of the beneficiated products (See Product Matrix & Calculations) is less than the minimum required by these markets. The Applicants assertion that a product could be made from the subject property to sell at the Clarkdale plant operated by Phoenix Cement is effectively refuted by the available analytic data.

An agricultural grade product can be produced as the minimum required gypsum grade is 70 percent for this use, but in this case the attendant recovery is only 59%. The combined effects of recovery, stripping ratio and the fact the major Arizona competitors in this market produce agricultural gypsum as a by-product makes it extremely unlikely that the subject property could be developed on a competitive basis for agricultural grade gypsum. Essentially, while a product could be produced, it could not be sold for a price that would offset costs of mining.

Final Conclusions Concerning the Gypsum Deposits

As stated earlier, the information provided by the Applicants in their two applications falls short of delineating a reserve of mineable gypsum. To delineate a reserve, further exploration must be done. It is unlikely that any explorationist motivated by a desire to develop a profitable mining venture would expend resources in the further exploration of the Annabell claims. This conclusion is based on the following facts:

1. As there is a relative abundance of gypsum in Arizona, markets drive the development of gypsum deposits. Without a readily identifiable and developed market, there is little incentive to develop this gypsum resource with further exploration. The Applicants do state they would produce gypsum for agricultural purposes but other producers in this market have excess capacity and have been unable to sell their presently stockpiled product or their mines are idle. Additionally, most of the producers for the agricultural markets produce agricultural grade gypsum as a by-product of either wallboard grade product or cement grade product. Some producers are using scrap wallboard from construction in Phoenix to produce agricultural gypsum and synthetic gypsum continues to claim an increasing market share of many traditional gypsum markets (Mining Engineering, October 2001, p 14).

2. The Annabell claims cannot produce a grade of gypsum (averaged over the horizons studied) that is of sufficient quality and quantity to be used in the production of either wallboard or cement products. The only use for the Thorne gypsum is in the agricultural gypsum market. Currently, producers with a distinct cost advantage when compared to the Gypsiferous zones on the Annabell claims dominate this market. These producers provide agricultural gypsum as a by-product of either their wallboard or cement grade products and enjoy the benefits of spreading mining and beneficiation costs over two distinct product lines.

3. Over most of the exposures, the Gypsiferous zones on the Annabell claims require stripping of overburden and interburden for mining to occur. The other mines studied do not require stripping to any large extent and any interburden encountered is either mined and processed or easily stripped as a single lift. The Gypsiferous zones on the Annabell claims suffer a distinct cost disadvantage over other producers.

4. The other mines visited had large, massive occurrences of gypsum ranging in thickness from 20 to 70 feet. The Thorne gypsum runs 5 to 7 feet in thickness with several clay layers.

5. The poor overall percentage of gypsum in the depositional zones (Horizons A, B and C) at the Thorn site results in very low recoveries. Even the Applicants recognize this fact when they state in their application " Applicant's and Arizona Department of Transportation show a typical total thickness of gypsum beds of 6 inches and a thickness of non-gypsum material of 30 inches between beds, giving a non-gypsum material to gypsum ratio of 5:1." This amounts to a recovery of 20%. The mines used for comparison have recoveries in excess of 70 or 80%. All else being equal, mining costs are inversely proportional to the recovery.

6. There are no precious metals contained in either the gypsum or associated clay layers that could augment revenues or offset mining costs.

7. The Applicants do not define a reserve of gypsum minerals amenable to mining. The applications contain a description of the gypsum deposit as being 1,760 acres of material with 6 inches of gypsum in 30 inches of non-gypsum material. They do not provide maps showing where this area is or drill hole data that would verify the existence of this material. Additionally, the gypsiferous horizons are discontinuous along their length and are probably discontinuous along their dip as well. Only further exploration could outline a gypsum resource within the claim group.

The conclusions, based on the analysis presented in this report are that the gypsum deposit stated by the Applicants has been refuted by physical and analytical evidence and that the gypsum present has such poor physical and analytical characteristics that a person of ordinary prudence would not be justified in the further expenditure of time and effort in delineating a reserve base. In essence, the property fails the evaluation of results phase of exploration.

Variance with Applicant Reported Values

There is a considerable discrepancy between the results garnered by the government and those provided by the claimant. There are several possible reasons for this variance. Some of these reasons are discussed as follows

Sampling Errors

Generally sampling errors such as contamination and poor sampling techniques can be attributed to producing large variances in assay results. In this instance sampling errors are rather unlikely. The area has been shown to be very low in gold content by the systematic sampling done by the BLM. Since there is such a lack of gold or precious metals in the area, it is unlikely that sampling errors involving contamination could occur as there is so little gold or other precious metals in the vicinity of the claims that it simply is not available to contaminate the samples taken.

It is possible that the equipment used for sampling, such as sample bags or sample containers were contaminated with precious metals from previous sampling done at another site.

Assay Errors

Assay errors could easily account for the variance seen in the evidence gathered by the BLM and the information provided by the Applicants. Assay errors could involve contamination from previous assays, contaminated solutions and chemicals used in the assay process and poor lab technique.

BLM and the FS both experienced difficulties with assay results produced by reputable nationally recognized laboratories. For assay results to be acceptable, they must be verified through the use of spot checks (BLM specified that 20% of the samples be re-assayed for verification) and also used standards and blanks to monitor the ability of the lab to produce accurate results.

It is unclear what system of checks or verification Thorne uses to verify the results from his laboratory but the BLM does have evidence to suggest that the results produced by his laboratory have been suspect in the past. The ADMMR provided copies of two assays (Appendix 15) that illustrate the problems with the Thorne laboratory. ADMMR prepared samples and sent them to Thorne and a registered assayer in Arizona. The results of those assays are presented in the following table:

Sample Number	Iron King Assay Arizona Registered Assayer Ounces per ton gold	Clay Thorne Ounces per ton gold
ADMR# 1	.022	2.18
ADMR# 2	Trace	.5
ADMR# 3	Trace	21.69
ADMR# 4	Trace	3.84
ADMR# 5	Trace	30.66

Clearly the results are inconsistent. Given the inconsistencies in assay grade discovered through the preparation of this report coupled with the inconsistencies noted by ADMMR, there is reason to believe that the Thorne lab has had serious problems in achieving assay results in line with accredited assay laboratories.

In addition, one of the assay laboratories that Thorne has employed to do assay work has also had problems with accurate reporting of assay results. The Iseman laboratory has provided assay data for clients with operations on public lands in the past to BLM. Because this assay data is often used by BLM to fulfill its responsibilities under the General Mining Law, Matt Shumaker of NTC was asked to review the accuracy of assay results reported by various laboratories. During the course of this investigation, Shumaker sent 6 samples of known grades (prepared by the Nevada Bureau of Mines and geology, NBMG) of gold, silver and platinum to Iseman labs for analysis. The following table summarizes the result produced by Iseman vs. the known values:

	Iseman Gold Oz/ton	Std. Gold Oz/ton	Iseman Silver Oz/ton	Std. Silver Oz/ton	Iseman Platinum Oz/ton	Std. Platinum Oz/ton
Blank	.435	xx (a)	.268	Xx	0.166	xx
NBMG Std. 2B	.596	0.228	.0204	.02	0.099	NR
NBMG Std. 4B	.258	.012	.204	.03	0.327	NR
NBMG Std. 6B	.316	.023	.245	NR (b)	0.630	1.13
NBMG Std. 6B	.353	.023	.257	NR	0.986	1.13
Blank duplicate	.195	xx	.152	Xx	0.073	xx

(a) xx indicates values below the detection limit of the test procedure.
(b) NR indicates that the value was not reported in the standard.

A complete copy of the information provided by Shumaker is available in Appendix 15.

From the information provided it is clear that Iseman reports values that are clearly high for gold, silver and platinum and that could give the false impression of an ore deposit. Unfortunately, the samples analyzed by Iseman for the Applicants employ a different numbering system than that used by the Applicants for their samples. As such, no direct comparison of assay values developed by the Applicants using their lab can made with the values report by Iseman.

Additional Points of Concern
The statements made in the application(s) and facts on the ground raise suspicion as to the validity of the claims. These statements and facts are discussed below.

Grind to 400 mesh
In "Amendment No. 1 to Application for Mineral Patent No. A 27172", dated August 21, 1992, the Applicants state:

> "10. Assay and Extraction Criticalities. Applicants disclose that the precious metals contained in the Annabell Mines head ores and concentrates exist substantially in the metallic form, and that a critical step in the assaying and/or extraction procedure for the Annabell head ores or concentrates is the milling of the head ore or ore concentrates to 400 mesh minus."

BLM has experienced claimants making this type of statement before. It is common knowledge that a fine grind of material such as 400-mesh can interfere with the most common form of assay, the fire assay. Generally claims that ore must be milled to 400-mesh are made to discredit the work of reputable labs that are subsequently employed by the government to check the results offered by the claimant and to cast doubt on assay results obtained from the most common and reliable assay method, the fire assay.

Assay Results
The Applicants offer their assay results and make wild statements regarding the quantity of precious metals that are present including statements that soils on the claims contain "golden be-bes" and contain as many as 7 ounces per ton of precious metals despite the fact that the area has never been known for precious metals production.

Additionally, evidence that the Thorne lab assay results were ever verified by a reputable 3rd party accredited lab was not provided or does not exist.

Lack of Mining Activity
Despite the claims of a fantastic deposit, the claimants did not engage in any mining activity on the subject claims although the type of ore deposit proposed by the Applicants would clearly warrant mining to take place. If in fact material containing golden be-bes and as much as 7 ounces per ton at the surface actually existed on the claims, there should be considerable evidence of workings with at least hand tools, gold pans and even micro-sluices. There is no evidence on any of the claims that the area is at all popular with recreational miners or was ever used by the Applicants for even such small scale mining purposes.

Lack of a Specific Mining Horizon or Zone
The Applicants offer a description of the placer material that infers that a valuable deposit occurred everywhere on the subject claims. This claim is made in spite of the fact that the geology changes over the claim group and this fact is readily apparent in the field. These changes in geology alone should have caused any reasonable person to question the findings of the initial phase of prospecting. Generally claims of broad or unspecified deposits in patent applications are made to embrace as much land as possible with little regard to any actual mineral concentrations that may exist.

Platinum Group Metals
The Applicants also claim the presence of platinum group metals. Arizona is not known for the production or occurrence of platinum group metals. Sedimentary deposits are also not known for the presence of platinum group metals. Any assay data that indicated the presence of platinum group metals in sedimentary rocks from Arizona would be highly unusual and any prudent individual would examine such results closely and in most cases doubt the finding of the assay rather than conclude that platinum group metals were present.

RECOMMENDATIONS

On the basis of the information developed in this report, the following recommendations are offered:

1. It is recommended that the patent applications be rejected. Grounds for rejection include:

   A. **Failure to Make Necessary Expenditures and Improvements**: The requisite $500 worth of expenditures and improvements was not done as required by 43 CFR 3863.1-2. The work done by the Applicants consists of several small drill holes and one small trench dug on each claim. Collectively the work done by the Applicants does not define "ore blocks" or assist in the development of the property but rather consists of a poorly conceived and executed mode of prospecting that constitutes a primitive "geologic survey" as defined by 43 CFR 3851.2 (b)(1). Statements made by the Applicant, Clay Thorne, verify this conclusion. Pursuant to 43 CFR 3851.2(a)(4), a geologic survey cannot apply toward the statutory provision requiring the expenditure of $500 for each claim for mineral patent. The quantity of work performed in this case is immaterial; the type of work performed does not qualify as an improvement under 43 CFR 3863.1-2.

   Despite claims of high precious metals values in material at or near the surface, readily amenable for excavation, the area encompassed by the two mineral patent applications is barren of all signs of prospecting, mining or milling related activities. There are no drill holes, excavations, tunnels, shafts, adits, stockpiles, equipment, buildings or other forms of mining related infrastructure on any of the claims.

2. Should recommendation 1 be taken, contest of the mining claims within the two patent applications would not be necessary. If however, contest should become necessary, or if contest is a preferred management alternative, it is then recommended that all of the Annabell claims encompassed in AZA-27172 and AZA-27208 be contested with specific charges as follows:

A. **Failure to Make Necessary Expenditures and Improvements**: As stated in recommendation 1.

B. **Lack of Discovery**. Minerals have not been found within the limits of the Annabell claims in patent applications AZA-27172 and AZA-27208 in sufficient quantities and/or qualities to constitute a valid discovery of a valuable mineral deposit. **See Castle v. Womble, 19 L.D. 455 (1894); Jefferson-Montana Copper Mines Co., 41 L.D. 320 (1912).**

C. **Nonmineral Tracts in Placer Claims**. The entirety of the lands encompassed in patent applications AZA-27172 and AZA-27208 is nonmineral in character and therefore, should be excluded from patent.

Taken specifically by claim:

1. The Annabell 25-54 claims in applications AZA-27208 and the Annabell 15-24, 24A, 24B, 24C, 24D, and 24E claims in Application AZA-27172 should be contested for lack of discovery of a valuable placer deposit of gold, silver, platinum or palladium in sufficient quality and quantity to warrant the further expenditure of time and effort in developing a paying mine.

2. The Annabell 15, 16, 17 1, 19, 20, 24A, 24B, 24C, 24D, 24E, 27, 28, 29, 30, 32, 34, 36, 39, 40, 41, 43, 46, 47, 48, 49, 50 and 51 claims do not have an exposure of gypsum and as such were not shown by the claimant to have mineral in place of sufficient quality and quantity to warrant the further expenditure of time and effort in developing a paying mine.

3. The Annabell 21, 22, 23, 25, 26, 31, 33, 35, 37, 38, 42, 44, 45, 52, 53 and 54 claims contain physical exposures of gypsiferous horizons, but the claimant failed to provide sufficient information to show that the exposures were of sufficient quality and quantity to warrant the further expenditure of time and effort in developing a paying mine. Additionally, the further analysis of these exposures in this report indicates that the physical characteristics of these horizons are of sufficiently poor quality that a person of ordinary prudence would not be justified in the further expenditure of time and effort in developing a paying mine based on their occurrence.

D. <u>Failure to Prosecute Application with Diligence:</u> The Applicants have not maintained a tangible presence on the ground and have failed to prosecute the application with diligence as required by 43 CFR 3862.6. Specifically:

3. None of the pits or drill holes made by the Applicants could be located and no "point of discovery" could be found on the claims. When asked to expose the point of discovery, the Applicant, Clay Thorne, refused saying it was the government's responsibility to provide the equipment for such sampling. Thorne also refused to visit all of the claims citing health reasons. Thorne also declined the opportunity to have his agents meet with the mineral examiner and guide him to discovery points or locate sample points on the claims, instead pointing to a few areas he alleged to have high mineral concentration that ultimately proved to be barren of valuable mineralization.

4. If it ever existed, proper claim monumentation as required by Arizona law has not been maintained over time. Claim monuments by law are to be conspicuous monuments of stone not less than 3 feet in height or an upright post securely fixed to the ground and projecting at least 4 feet above the ground. Each placer claim must have 6 such monuments, one at each corner and one at each end-line. For the 45 claims in the two patent applications, a minimum of 270 such monuments should have been in evidence on the ground, but none were found. Additionally, a location notice must also be placed on each claim. No location notices were found.

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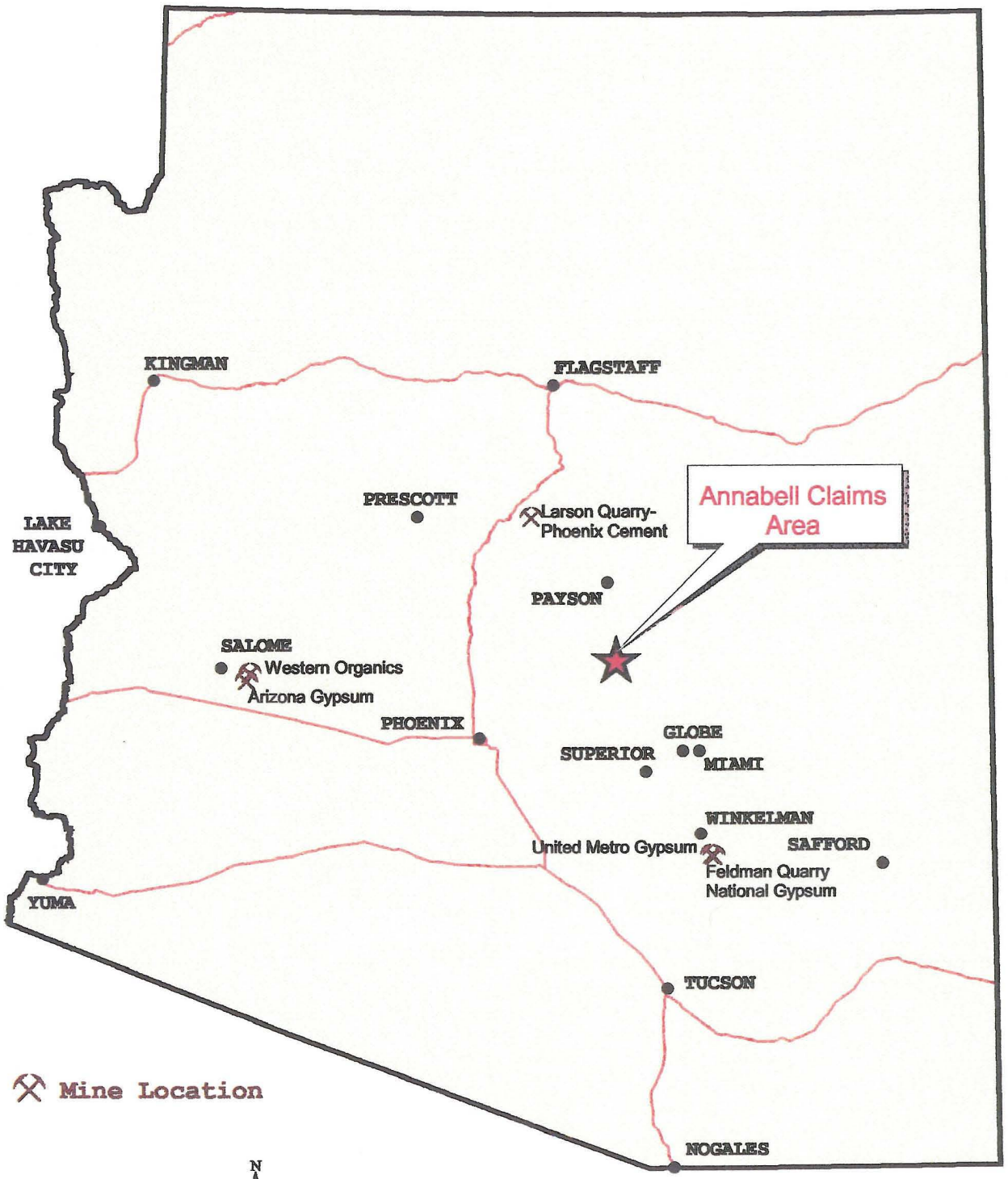

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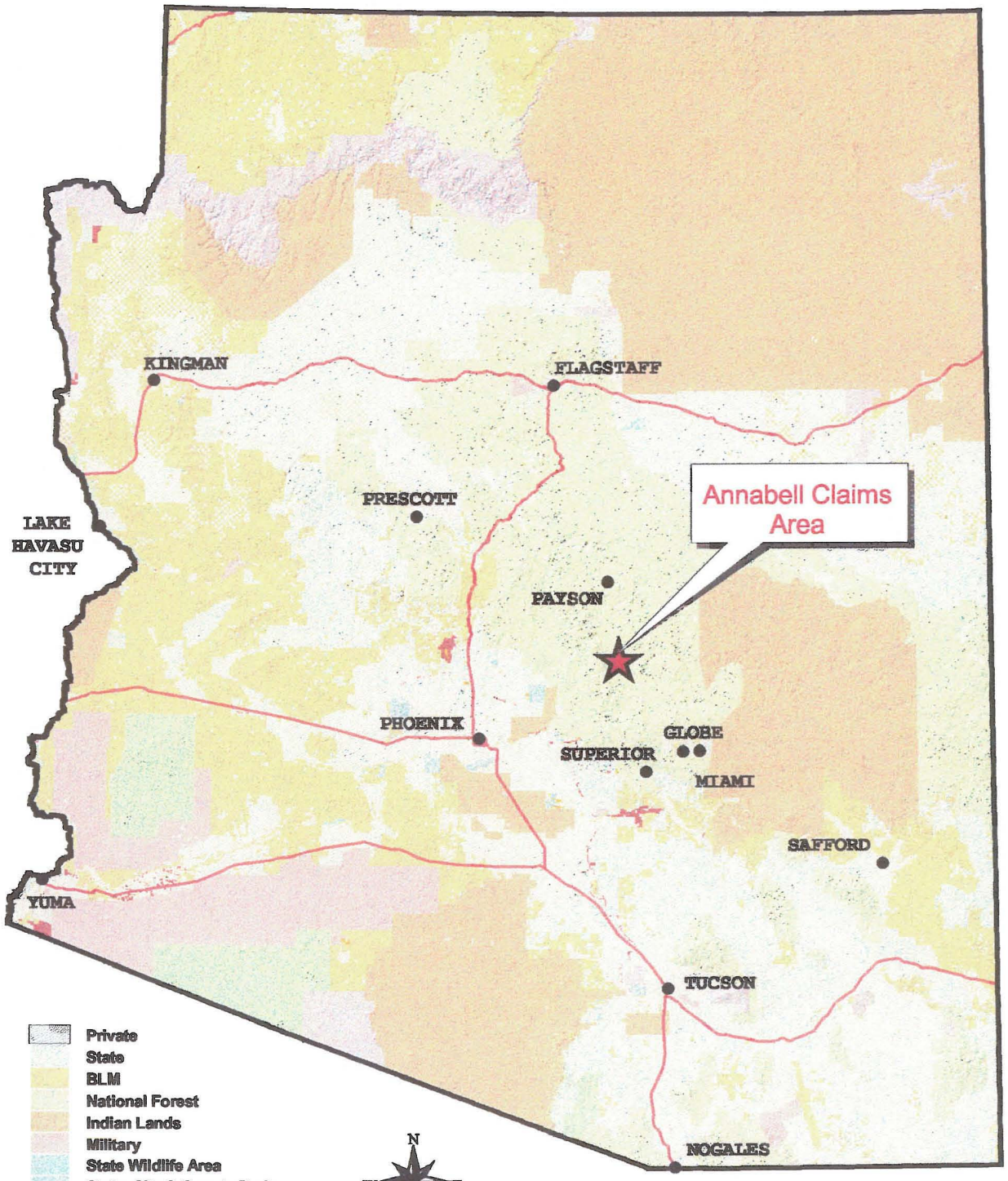
Figure 10- Vicinity Gypsum Producers
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



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Miles

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Figure 1 - General Location Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208

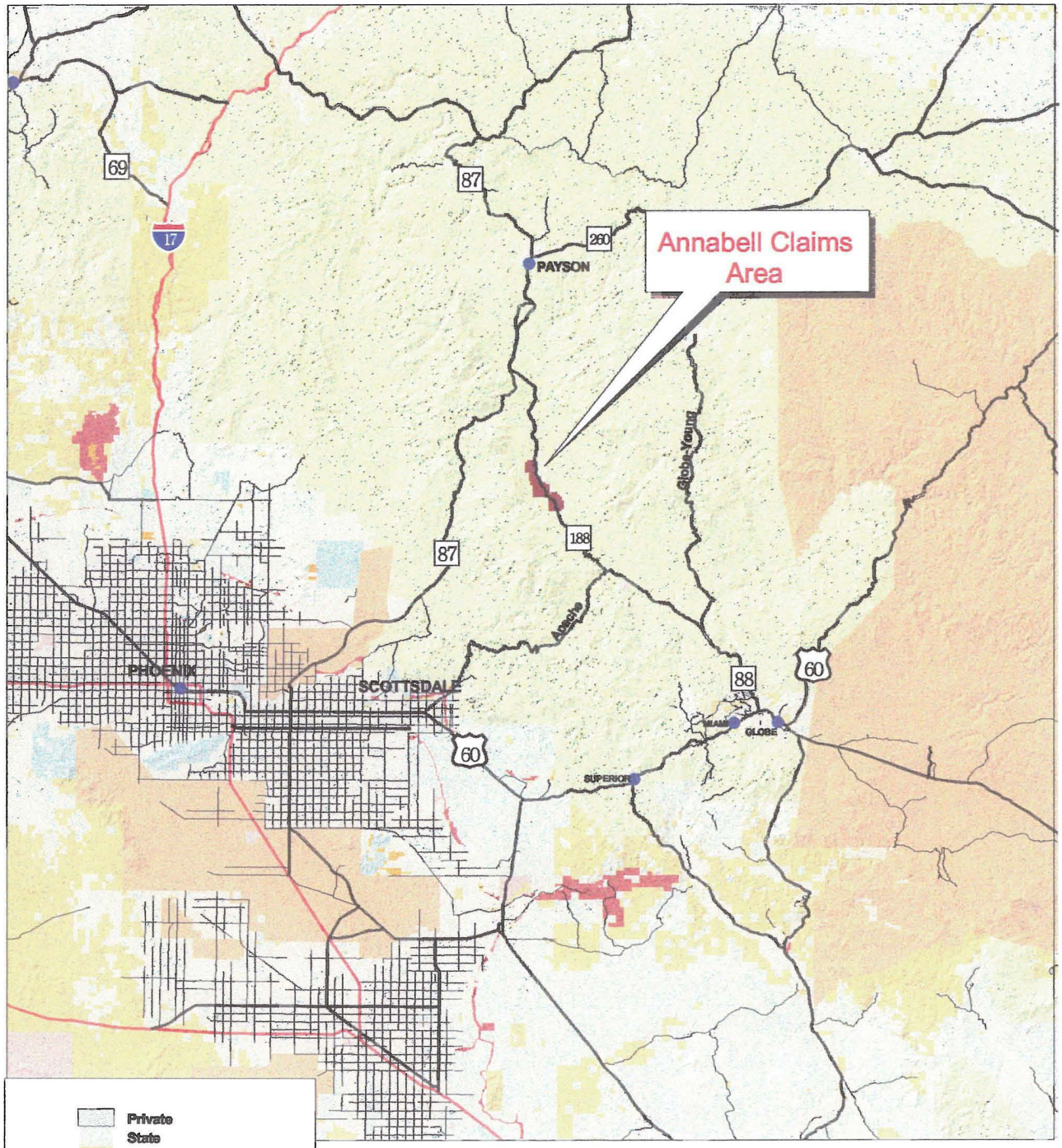

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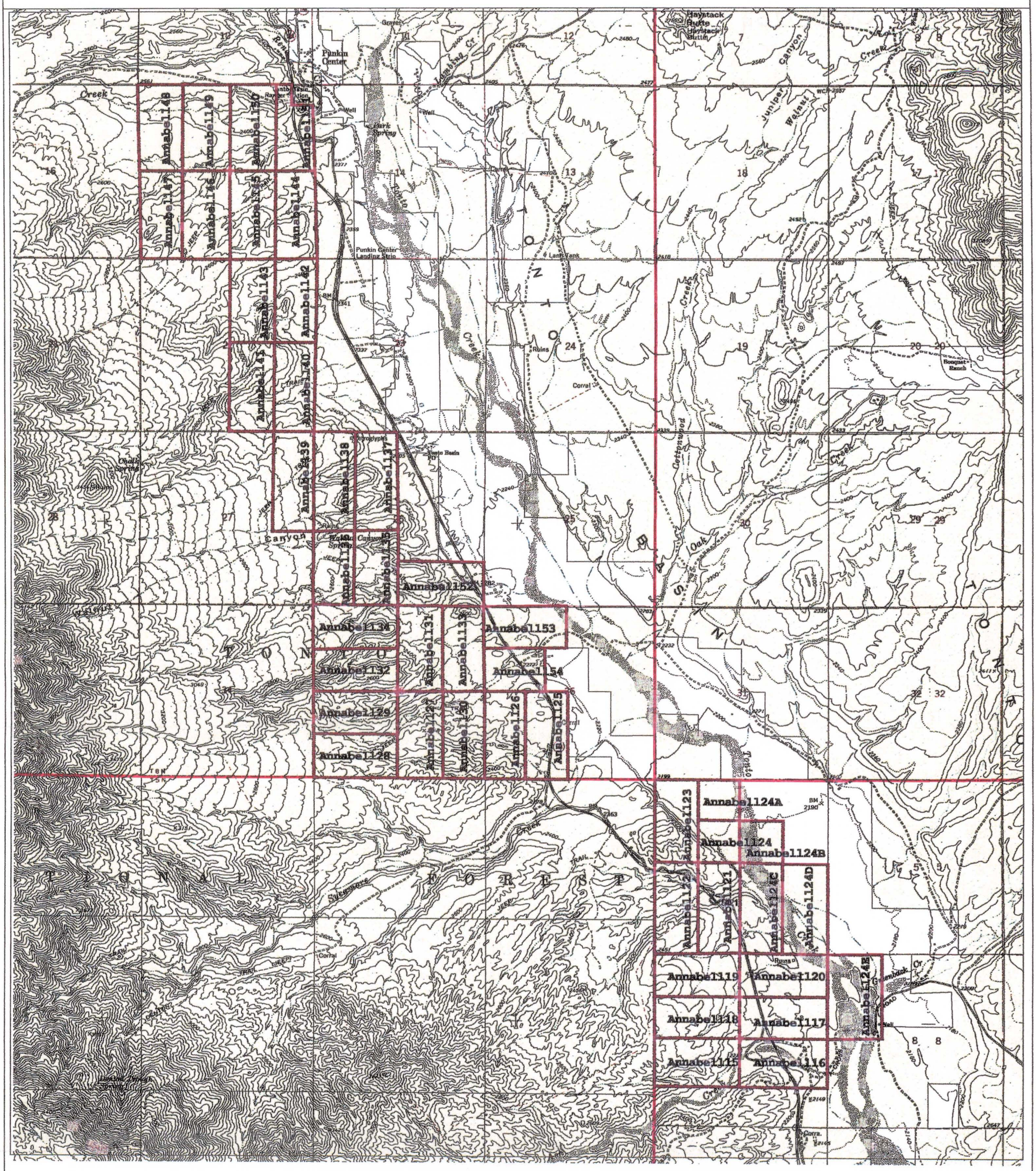
Figure 2 - Area Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Private
State
BLM
National Forest
Indian Lands
Military
State Wildlife Area
State, City & County Park
National Park
F&WS Refuge
County Lands
BOR

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W E
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2000 0 2000 4000

Feet

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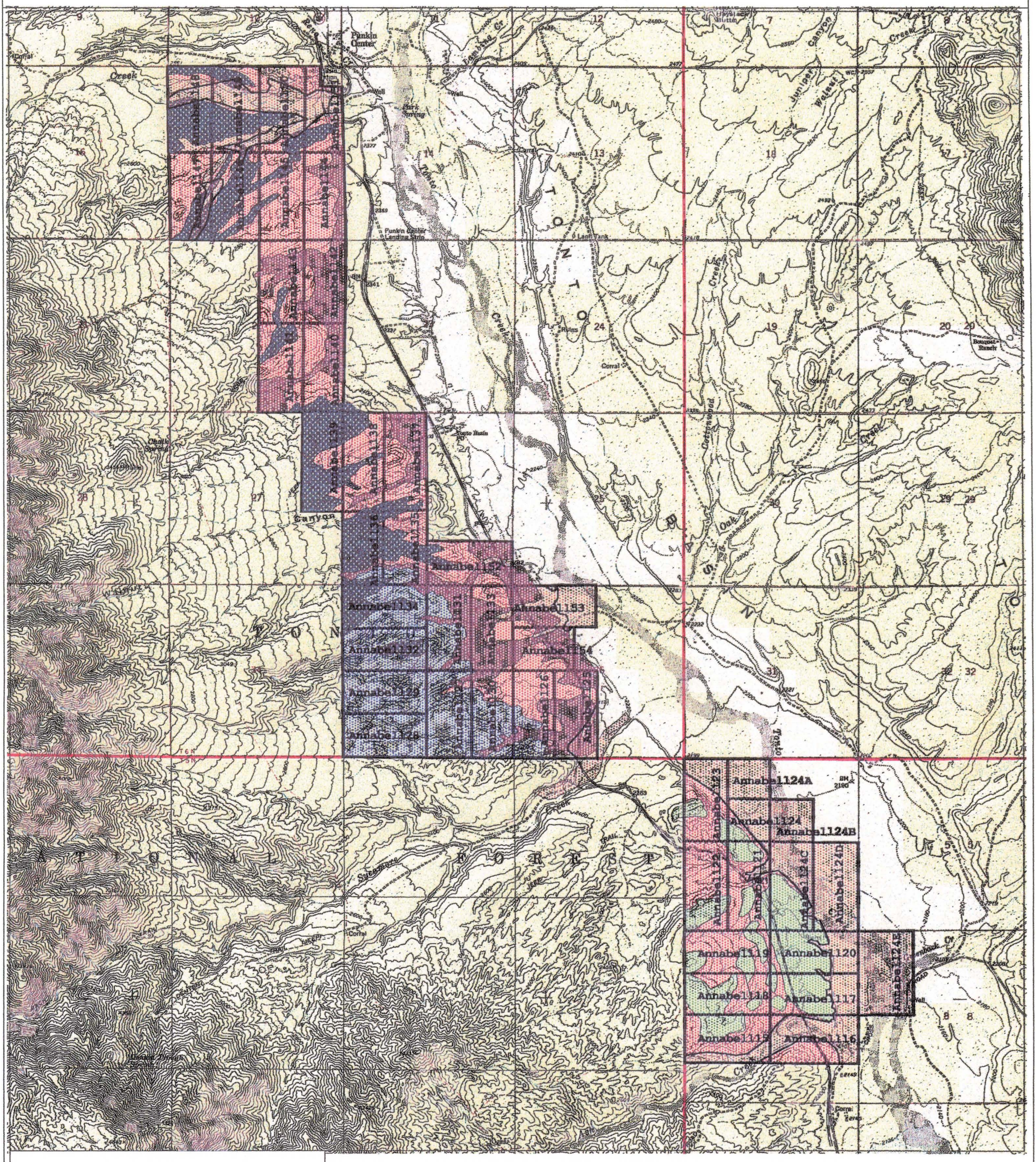
Topography from the U.S.G.S.
7.5' Tonto Basin Quadrangle

Figure 3 - Site Location Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Geologic Explanation

- (Tm) Red Mudstone
- (Tcy) Younger conglomerate
- (Qa) Younger alluvium
- (Qt) Terraced alluvium
- (Qp) Peidmont terraces
- (Qao) Older alluvium

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2000 0 2000 4000

Feet

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Topography from the U.S.G.S.
7.5' Tonto Basin Quadrangle

Geology from the Arizona Geologic Survey
Geologic Map of the Tonto Basin 7.5' Quadrangle

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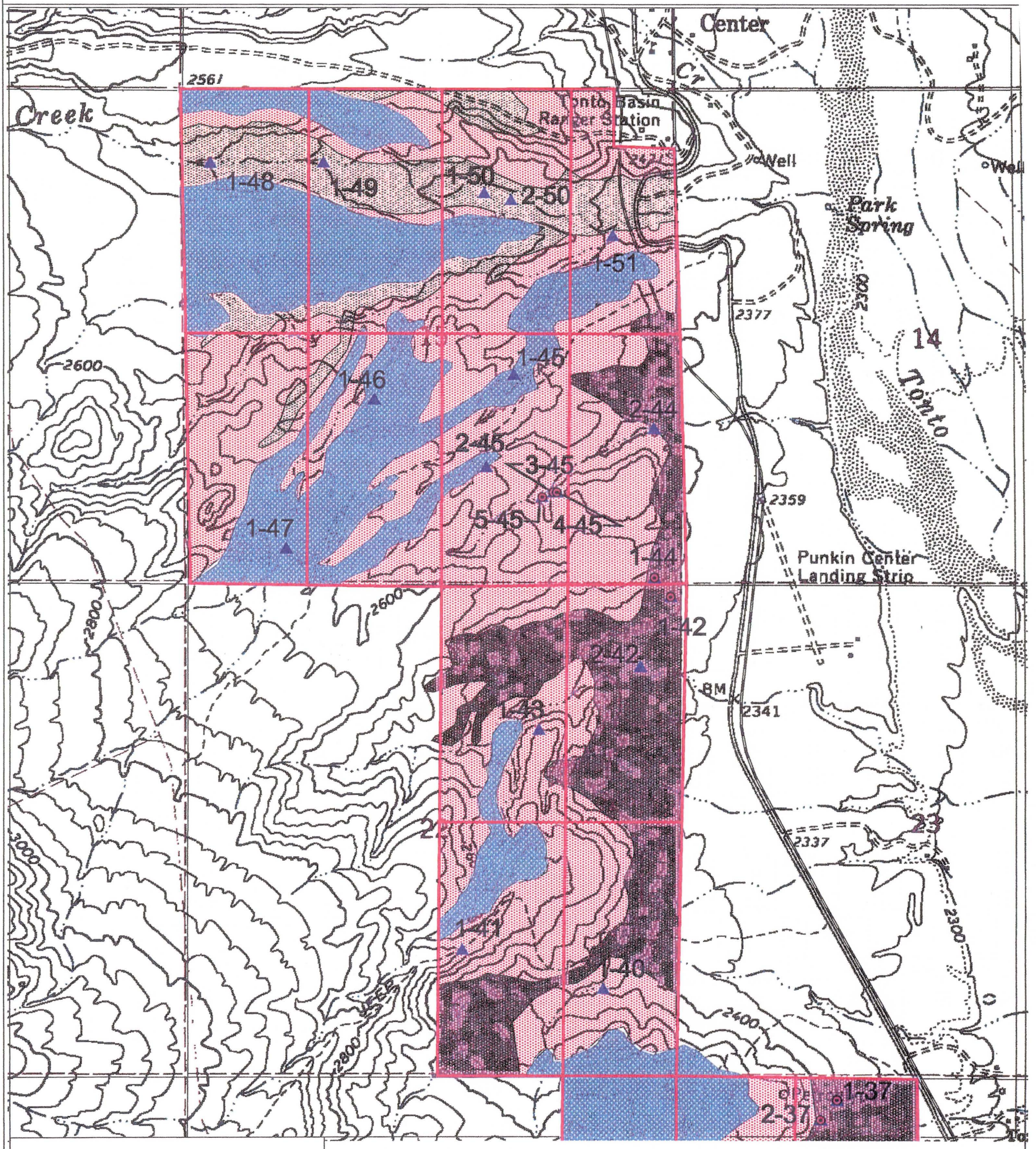
Figure 4 - Geologic Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



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- (Tcy) Younger conglomerate
- (Qa) Younger alluvium
- (Qt) Terraced alluvium
- (Qp) Peidmont terraces
- (Qao) Older alluvium

Sample Points

- Gypsum Sample Locations
- Placer Sample Locations

N
W E
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1:12500

500 0 500 1000

Feet

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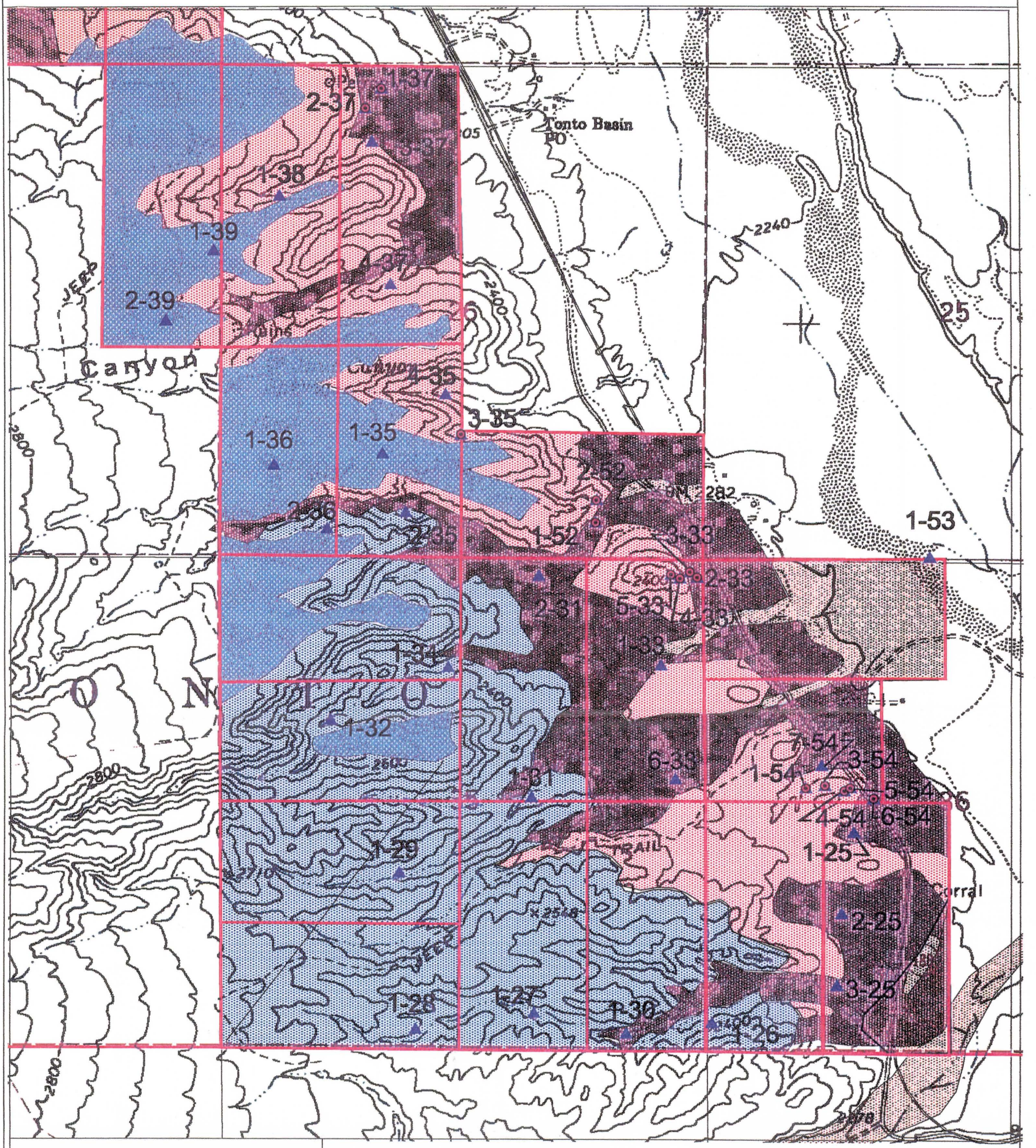
Topography from the U.S.G.S.
7.5' Tonto Basin Quadrangle

Geology from the Arizona Geologic Survey
Geologic Map of the Tonto Basin 7.5' Quadrangle

Figure 5A- Sample Location Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Geologic Explanation

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Sample Points

- Gypsum Sample Locations
- Placer Sample Locations

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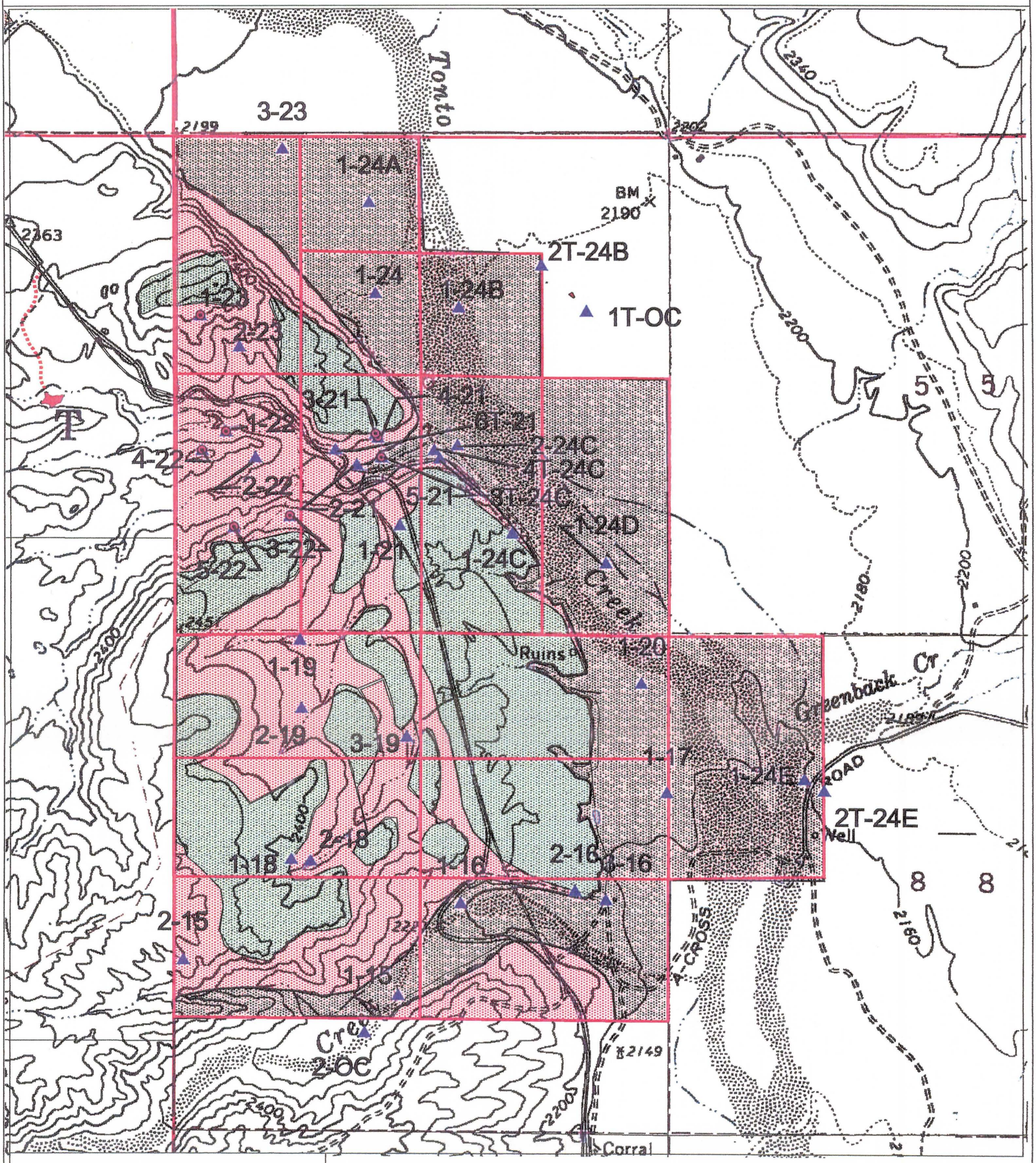
Topography from the U.S.G.S.
7.5' Tonto Basin Quadrangle

Geology from the Arizona Geologic Survey
Geologic Map of the Tonto Basin 7.5' Quadrangle

Figure 5B- Sample Location Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Geologic Explanation

- (Tm) Red Mudstone
- (Tcy) Younger conglomerate
- (Qa) Younger alluvium
- (Qt) Terraced alluvium
- (Qp) Peidmont terraces
- (Qao) Older alluvium

Sample Points

- Gypsum Sample Locations
- Placer Sample Locations

N
W E
S

1:12500

500 0 500 1000

Feet

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Map produced by the BLM, Arizona State Office, Mapping Sciences Group.

July 9, 2002

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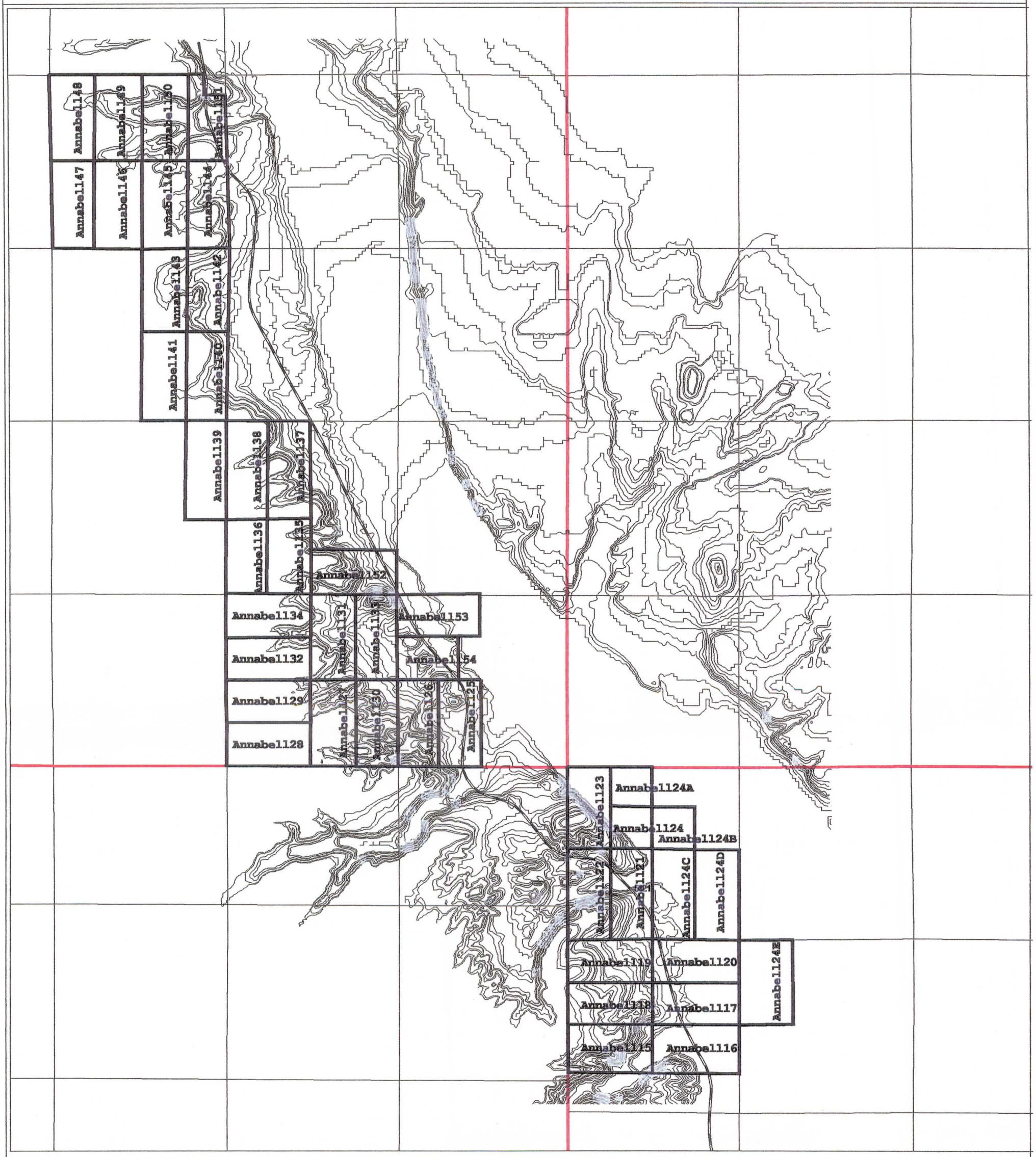
Topography from the U.S.G.S. 7.5' Tonto Basin Quadrangle

Geology from the Arizona Geologic Survey Geologic Map of the Tonto Basin 7.5' Quadrangle

Figure 5C- Sample Location Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Topography from the U.S.G.S. Digital Elevation Model for the Tonto Basin Area.

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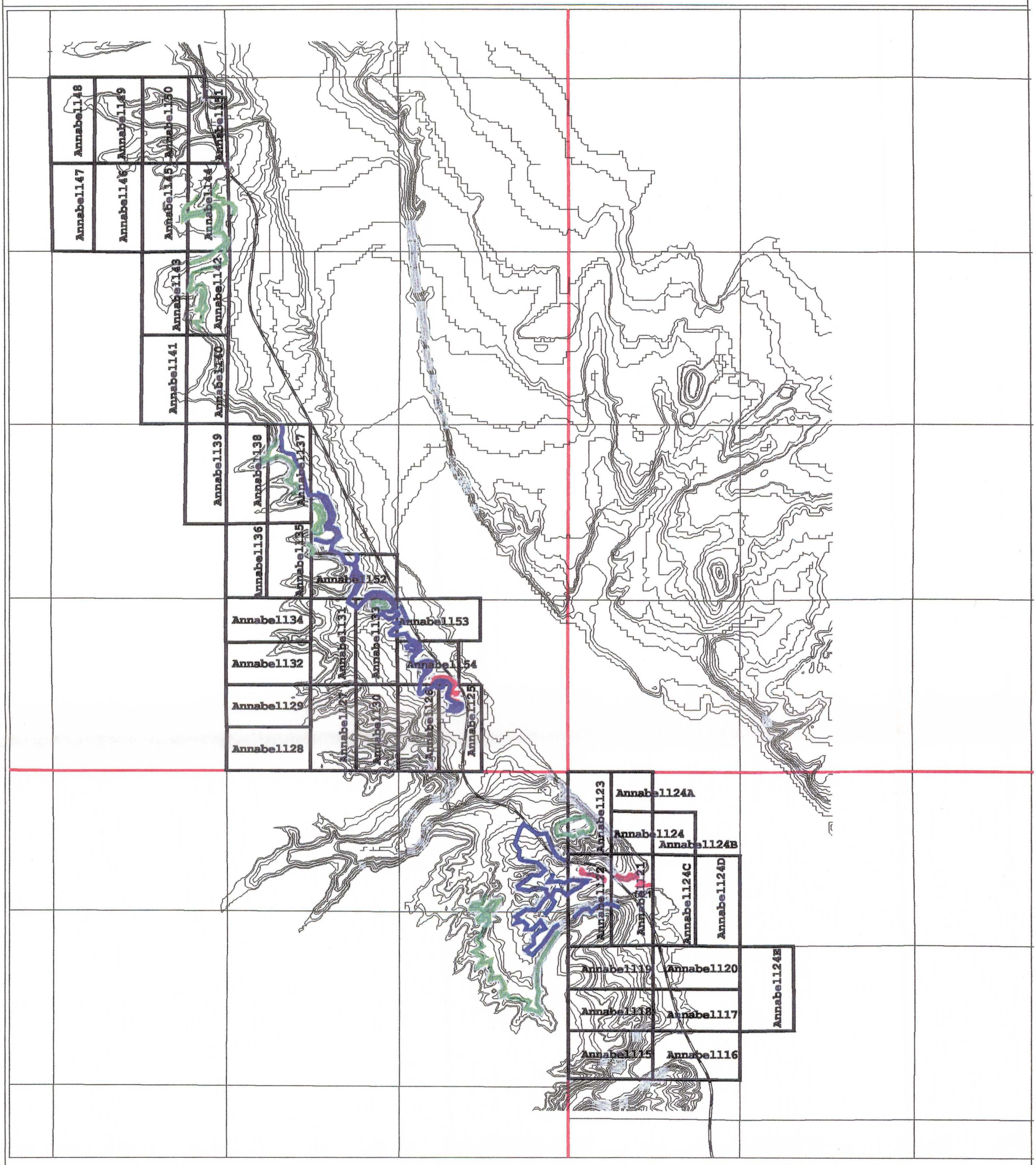
Figure 6 -Areas for Potential Gypsum Occurrence
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Actual Gypsum Outcrops

A Horizon

B Horizon

C Horizon

Topography from the U.S.G.S. Digital Elevation Model for the Tonto Basin Area.

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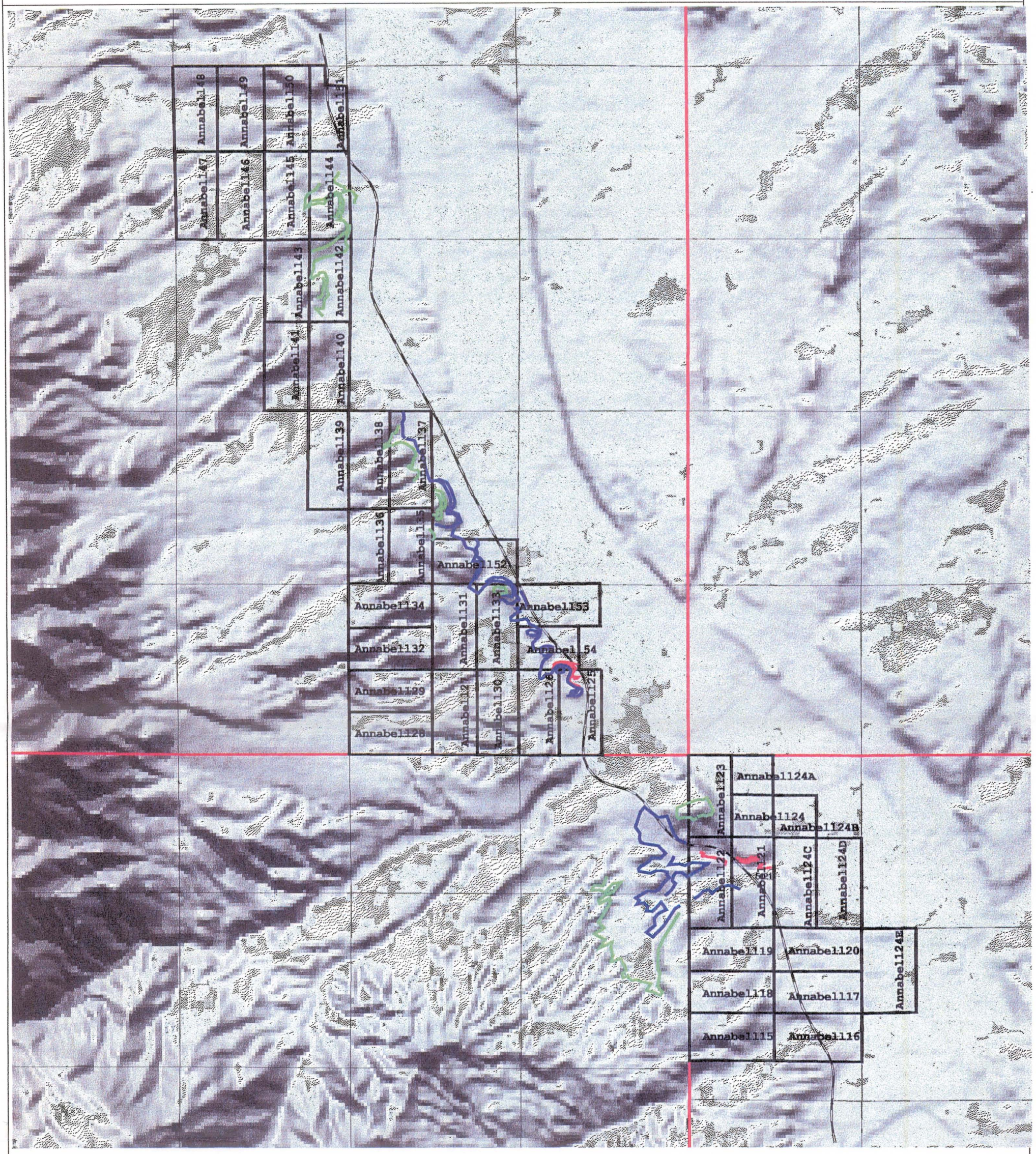
Figure 7 -Areas of Actual Gypsum Occurrence
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208



Actual Gypsum Outcrops

A Horizon

B Horizon

C Horizon

Topography from the U.S.G.S. Digital Elevation Model for the Tonto Basin Area.

N

W E

S

1:36000

2000 0 2000 4000

Feet

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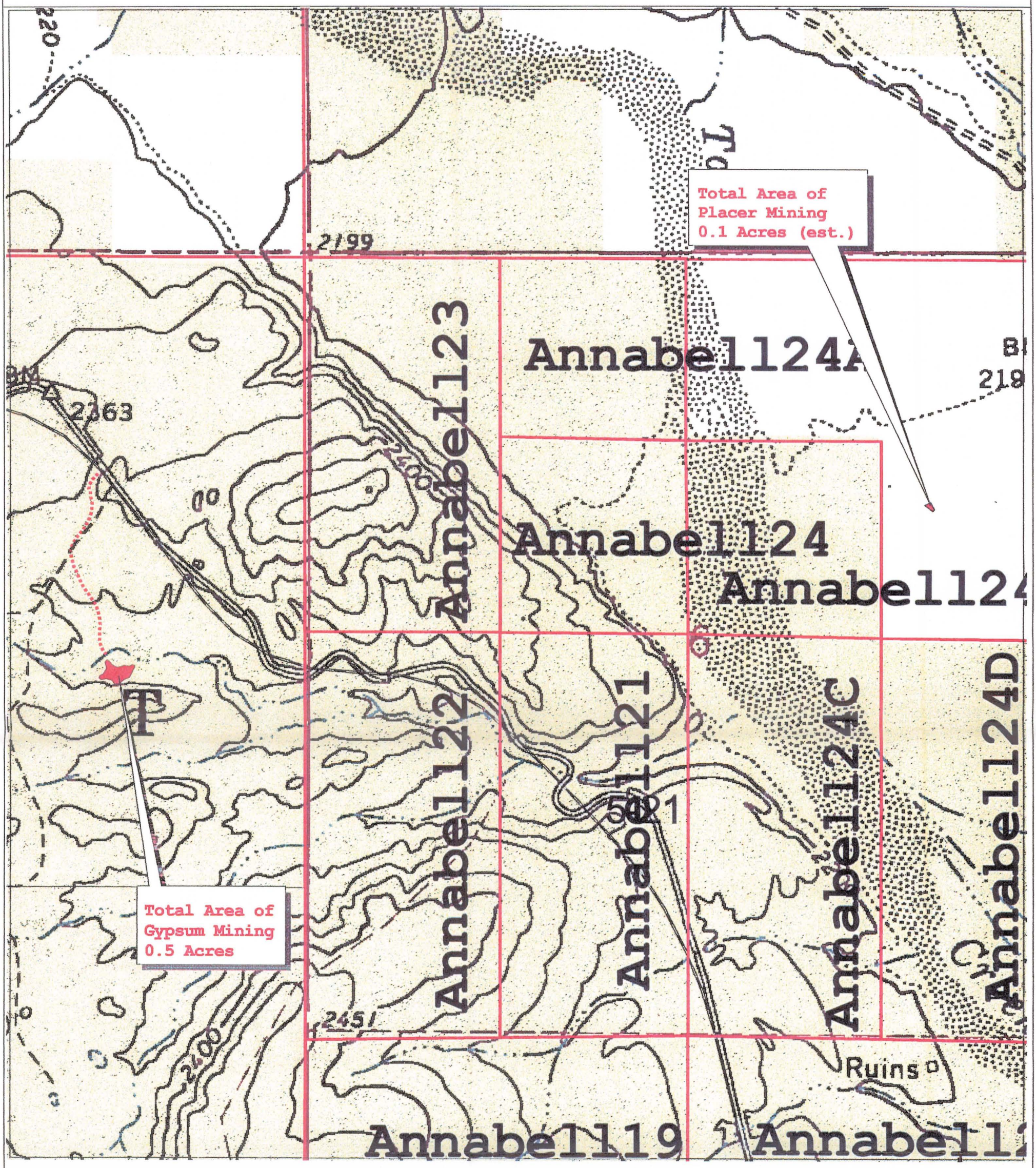
Figure 8 -Areas of Actual Gypsum Occurrence On Shaded Relief Surface



Private
State
BLM
National Forest
Indian Lands
Military
State Wildlife Area
State, City & County Park
National Park
F&WS Refuge
County Lands
BOR

N
W E
S

1:8000

500 0 500 1000

Feet

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Map produced by the BLM, Arizona State Office,
Mapping Sciences Group.

July 9, 2002

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Topography from the U.S.G.S.
7.5' Tonto Basin Quadrangle

Figure 9 - Mining Disturbance Map
Mineral Report for
Patent Application AZA-27172
Patent Application AZA-27208

Use	Typical Specifications	Specification Limits and Discussion	Source
General Discussion		Arizona currently has 7 gypsum producers. Two produce gypsum for Arizona cement plants, one of which also sells agricultural gypsum. Two producers sell only agricultural gypsum, but one of them occasionally sells alabaster to sculptors. One exclusively supplies its own wall board factory. One exclusively supplies its own horticultural mix (potting soil) factory. One ships almost all of its production out-of-state to Las Vegas area wall board and stucco factories and California agriculture markets. Six of them essentially sell only to Arizona markets. About 200,000 tons is used by current and proposed Arizona cement plants as setting time retarder. Wall board manufacture by Arizona's only wallboard plant ranks second, About 40,000 tons go to instate agricultural and horticultural markets agricultural and horticultural uses rank third, and miscellaneous uses (stuccos, plasters, functional fillers, and other very small uses) combine to rank fourth.	
Agriculture	$CaSO_4 \cdot 2H_2O$ - - 88.0% Ca - - - - - - - - - -21.0% S - - - - - - - - - - -16.0%	$CaSO_4 \cdot 2H_2O > 70\%$	Western Fertilizer Handbook
Wallboard and Plaster (Stucco?)	$CaSO_4 \cdot 2H_2O$ - - - - - - 94-95% Calcium Sulfide - - 0.5-2.0% Na - - - - - - - - - - 75-250 ppm Cl - - - - - - - - - 120-400 ppm Mg - - - - - - - - - 50-250 ppm K - - - - - - - - - - - - - 75 ppm Free Water - - - - - - - 10-15% Particle size - - - - - 100 mesh (for feed to calciner)	Gypsum ($CaSO_4 \cdot 2H_2O$) in any variety (selenite, alabaster, satin spar) may be used, but Anhydrite ($CaSO_3$) content must be as low as possible. Use in wallboard, stuccos, and plasters requires calcination of gypsum to hemihydrate ($CaSO_4 \cdot H_2O$) also known as plaster-of-Paris.	miningtrading.com

Portland Cement	Class 1 - - - - - - - >30% SO_3 Class 2 - - - - - - - >25% SO_3	There should be limits on clay mineral contents as well as chloride contents. Maximum content of Portland cement is usually limited to 2%, but some cements can be up to 2½% SO_3. This is typically accomplished by adding 85 to 100 pounds of Class1 gypsum per ton of clinker. Although the SO_3 content of the gypsum is the important factor in cement retarder anhydrite cannot be freely substituted for gypsum. Portland cement plants commonly require that gypsum used for retarder be 92 to 93 percent. However material as low as 85% gypsum has been used. Some cement plants require "pebble" gypsum of plus 1/2" minus 1" while some may require finely ground gypsum.	Japanese Standards Association – Japanese Industrial Standard JIS R 9151-1979 "Gypsum for Portland Cement Retarder" California Division of Mines and Geology Bull. 163
Functional fillers and flame-heat retarders.			
Specialty food, chemicals and pharmaceutical uses	> 99.0% $CaSO_4$ on a dry basis	Arsenic < 3ppm Fluoride < 0.003% Heavy Metals (as Pb) < 10 ppm Selenium < 0.003% Loss on drying $CaSO_4$ (anhydouus) < 1.5% $CaSO_4 \cdot H_2O$ (dihydrate) between 19% and 23%	

										Grade	Percent	Average Gr
					-1/2	Grade	Percent	Grade	Percent	+1/2	Recovery	Recoverable
	SAMPLE	KG Total	KG -1/2	KG+1/2	+60 m.	+1/2 Gypsum	Recovery	"+ 60 mesh	Recovery	+60 mesh	of +60 mesh	Gypsum In-
Unit	DESCRIPTION	kg	kg	kg	kg	%	of +1/2 mesh	Gypsum %	of +60 mesh	Gypsum %	"+1/2	%
a1	5-33 +1/2 MESH	9.5	5.96	3.54	0.98	1.30%	37.26%	0.20%	16.50%	1.10%	47.60%	0.50%
a2	1-44 +1/2 MESH	7.62	3.94	3.68	1.26	86.10%	48.29%	78.60%	32.00%	84.20%	64.80%	
a2	3-45 +1/2 MESH	7.8	4.1	3.7	1.12	84.40%	47.44%	89.40%	27.20%	85.60%	61.80%	
a2	Total & Averages	15.42	8.04	7.38	2.38	85.20%	47.90%	84.10%	29.60%	84.90%	63.30%	53.80%
a3	1.1-23 +1/2 MESH	11.82	7.48	4.34	2.89	88.40%	36.72%	61.00%	38.60%	77.40%	61.20%	
a3	1.2-23 +1/2 MESH	5.08	2.38	2.7	0.39	89.20%	53.15%	70.40%	16.40%	86.80%	60.80%	
a3	3-35 +1/2 MESH	11.06	5.76	5.3	2.46	88.60%	47.92%	66.20%	42.70%	81.50%	70.20%	
a3	4-45 +1/2 MESH	8.12	5.02	3.1	1.92	85.40%	38.18%	54.30%	38.20%	73.50%	61.80%	
a3	Total & Averages	36.08	20.64	15.44	7.66	87.90%	42.80%	62.40%	36.60%	79.10%	64.00%	50.90%
a4	1-42 +1/2 MESH	6.62	2.62	4	0.94	89.20%	60.42%	80.70%	35.90%	87.60%	74.60%	
a4	2-37 +1/2 MESH	4.04	2.44	1.6	0.94	91.20%	39.60%	78.70%	38.60%	86.60%	62.90%	
a4	4-33 +1/2 MESH	9.48	4.92	4.56	1.65	86.30%	48.10%	72.50%	33.50%	82.60%	65.50%	
a4	Total & Averages	20.14	9.98	10.16	3.53	88.20%	50.40%	76.40%	35.30%	85.00%	68.00%	57.90%
b1	1-37 +1/2 MESH	4.32	1.98	2.34	0.83	90.20%	54.17%	88.40%	42.10%	89.70%	73.40%	
b1	2-52 +1/2 MESH	5.8	2.72	3.08	1.03	88.10%	53.10%	82.90%	37.70%	86.80%	70.90%	
b1	3-33 +1/2 MESH	10.94	4.66	6.28	1.9	86.00%	57.40%	56.40%	40.70%	79.10%	74.80%	
b1	Total & Averages	21.06	9.36	11.7	3.76	87.40%	55.60%	70.30%	40.20%	83.40%	73.40%	61.10%

	SAMPLE	KG Total	KG -1/2	KG+1/2	+60 m.	+1/2 Gypsum	Recovery	"+ 60 mesh	Recovery	+60 mesh	of +60 mesh	Gypsum In-
Unit	DESCRIPTION	kg	kg	kg	kg	%	of +1/2 mesh	Gypsum %	of +60 mesh	Gypsum %	"+1/2	%
b2	1-52 +1/2 MESH	12.64	6.44	6.2	2.23	84.40%	49.05%	57.60%	34.70%	77.30%	66.70%	
b2	3-22 +1/2 MESH	4.92	3.12	1.8	0.44	84.60%	36.59%	87.60%	14.00%	85.20%	45.50%	
b2	5-22 +1/2 MESH	5.82	4.08	1.74	1.37	88.10%	29.90%	71.00%	33.60%	80.60%	53.40%	
b2	Total & Averages	23.38	13.64	9.74	4.04	85.40%	41.70%	67.20%	30.10%	79.80%	58.90%	47.20%
b3	2-33 +1/2 MESH	3.16	1.52	1.64	0.25	86.30%	51.90%	40.70%	16.70%	80.30%	59.80%	
b3	4-22 +1/2 MESH	8.52	5.74	2.78	1.47	88.00%	32.63%	85.10%	25.60%	87.00%	49.90%	
b3	4-54 +1/2 MESH	4.82	2.64	2.18	1.01	80.40%	45.23%	82.30%	38.30%	81.00%	66.20%	
b3	Total & Averages	16.5	9.9	6.6	2.73	85.50%	40.00%	75.80%	27.60%	84.00%	56.60%	46.70%
c1	3-54 +1/2 MESH	3.52	2.28	1.24	0.64	83.10%	35.23%	77.40%	28.20%	81.20%	53.40%	
c1	5-21 +1/2 MESH	3.82	2.16	1.66	0.37	82.30%	43.46%	90.00%	17.10%	83.70%	53.10%	
c1	5-54 +1/2 MESH (a)	2.02	1.26	0.76	0.22	49.60%	37.62%	**84.00%**	17.10%	**82.50%**	48.50%	
c1	Total & Averages	9.36	5.7	3.66	1.23	75.50%	39.10%	84.00%	21.30%	82.50%	52.20%	40.60%
c2	1-54 +1/2 MESH	11.18	7.96	3.22	1.42	1.50%	28.80%	17.50%	17.80%	6.40%	41.50%	
c2	6-54 +1/2 MESH (a)	3.48	1.34	2.14	0.24	83.90%	61.49%	**17.50%**	17.80%	**6.40%**	68.40%	
c2	Total & Averages	14.66	9.3	5.36	1.66	21.10%	36.60%	17.50%	17.80%	6.40%	47.90%	9.70%
c3	1-22 +1/2 MESH	5.92	4.16	1.76	0.32	52.10%	29.73%	71.50%	7.60%	55.10%	35.10%	
c3	3-21 +1/2 MESH	6.4	3.7	2.7	0.9	88.90%	42.19%	85.20%	24.30%	88.00%	56.30%	
c3	4-21 +1/2 MESH	7.68	4.96	2.72	1.53	90.40%	35.42%	63.20%	30.80%	80.60%	55.30%	
c3	Total & Averages	20	12.82	7.18	2.75	78.60%	35.90%	72.70%	21.90%	75.40%	49.60%	38.20%
	(a) Samples 5-54 and 6-54 could not be west screened due to insufficient sample size. Their 60 mesh characteristics were estimated as the average of the											

Unit	"+1/2 Gypsum %	Percent Recovery of +1/2 mesh	"+ 60 mesh Gypsum	Percent Recovery of +60 mesh	+1/2 +60 mesh Gypsum	Percent Recovery of +60 mesh +1/2
a1	1.30%	37.26%	0.20%	16.50%	1.10%	47.60%
a2	85.20%	47.90%	84.10%	29.60%	84.90%	63.30%
a3	87.90%	42.80%	62.40%	36.60%	79.10%	64.00%
a4	88.20%	50.40%	76.40%	35.30%	85.00%	68.00%
b1	87.40%	55.60%	70.30%	40.20%	83.40%	73.40%
b2	85.40%	41.70%	67.20%	30.10%	79.80%	58.90%
b3	85.50%	40.00%	75.80%	27.60%	84.00%	56.60%
c1	75.50%	39.10%	84.00%	21.30%	82.50%	52.20%
c2	21.10%	36.60%	17.50%	17.80%	6.40%	47.90%
c3	78.60%	35.90%	72.70%	21.90%	75.40%	49.60%
Average	77.20%	43.33%	67.82%	28.93%	73.39%	59.32%

SAMPLE DESCRIPTION	CaSO4.2H %	CaCO3 %	60 mesh CaSO4.2H2O %
3-21 +1/2 MESH	88.9	0.69	85.2
4-21 +1/2 MESH	90.4	0.11	63.2
5-21 +1/2 MESH	82.3	1.71	90
1-22 +1/2 MESH	52.1	10.12	71.5
3-22 +1/2 MESH	84.6	1.29	87.6
4-22 +1/2 MESH	88	1.71	85.1
5-22 +1/2 MESH	88.1	1.69	71
1.1-23 +1/2 MESH	88.4	1.67	61
1.2-23 +1/2 MESH	89.2	0.92	70.4
2-33 +1/2 MESH	86.3	2.7	40.7
3-33 +1/2 MESH	86	2.75	56.4
4-33 +1/2 MESH	86.3	2.59	72.5
5-33 +1/2 MESH	1.3	4.28	0.2
3-35 +1/2 MESH	88.6	1.87	66.2
1-37 +1/2 MESH	90.2	2.89	88.4
2-37 +1/2 MESH	91.2	2.27	78.7
1-42 +1/2 MESH	89.2	3.94	80.7
1-44 +1/2 MESH	86.1	3.47	78.6
3-45 +1/2 MESH	84.4	3.79	89.4
4-45 +1/2 MESH	85.4	4.6	54.3
1-52 +1/2 MESH	84.4	3.08	57.2
2-52 +1/2 MESH	88.8	2.51	82.9
1-54 +1/2 MESH	1.5	1.42	17.5
3-54 +1/2 MESH	83.1	2.99	77.4
4-54 +1/2 MESH	80.4	3.63	82.3
5-54 +1/2 MESH	49.6	12.5	
6-54 +1/2 MESH	83.9	3.42	

SAMPLE DESCRIPTION	Dry Weigh kg	Weight +60 Mesh kg	% 60 mesh material
3-21	2.22	0.54	24.30%
4-21	3.12	0.96	30.80%
5-21	0.82	0.14	17.10%
1-22	2.62	0.2	7.60%
3-22	1.72	0.24	14.00%
4-22	3.98	1.02	25.60%
5-22	2.32	0.78	33.60%
1.1-23	5.18	2	38.60%
1.2-23	1.1	0.18	16.40%
2-33	0.36	0.06	16.70%
3-33	3	1.22	40.70%
4-33	3.1	1.04	33.50%
5-33	4.24	0.7	16.50%
3-35	3.84	1.64	42.70%
1-37	0.76	0.32	42.10%
2-37	1.14	0.44	38.60%
1-42	1.28	0.46	35.90%
1-44	2.44	0.78	32.00%
3-45	2.28	0.62	27.20%
4-45	3.4	1.3	38.20%
1-52	4.78	1.66	34.70%
2-52	1.38	0.52	37.70%
1-54	5.74	1.02	17.80%
3-54	0.78	0.22	28.20%
4-54	0.94	0.36	38.30%
5-54	not/ss	not/ss	
6-54	not/ss	not/ss	

Western Organics and Arizona Gypsum

Western Organics:

We visited the Western Organics quarry near Salome Arizona on June 3, 2002. A property representative was not present and the pit was not operating. Present were Ralph Costa, Bureau of Land Management (BLM) and Ken Phillips of the Arizona Department of Mines and Mineral Resources (ADMMR). No equipment was on site.

Phillips, who is familiar with this property, said that a very large stockpile had been removed. There is some evidence of exploration along the side of the hill where the pit is located. Thin overburden has been removed to expose the top of gypsum that appears to run parallel to the gypsum already mined. Additionally there are some visible drill hole collars that suggest a limited amount of delineation drilling may have occurred.

The exploration consists of several dozer cuts that expose the gypsum. These cuts are very shallow, about 1 to 2 feet deep and expose the gypsum. The exposure of gypsum is 40 feet thick, 70 feet high and about 500 feet long. It appears to be very high in gypsum, we estimated that in place it is at least 90% and there appears to be very little clay. The most likely deleterious material is limestone. Western Organics sells this product in the agricultural market and bags the material and blends it into a number of soil conditioners, mulches, and composts for sale in lawn and garden stores.

Phillips speculated that mining was slow at this pit as Western was using a considerable amount of "scrap" wallboard to make its product. It was learned in later interviews with Western Organics by Phillips that they were not using any appreciable amounts of secondary gypsum from wallboard waste. They are instead purchasing gypsum from Superior Materials division of United Metro near Winkleman, Arizona.

At one point in time the deposit was mined by underground methods and a portal and some room and pillar development can still be seen at the site. This deposit appears to be a very high quality deposit and appears to rival that of the Feldman quarry and appears to be a higher quality that the deposit mined by Phoenix Cement. The deposit is currently idle because Western Organics is presently able to source gypsum from Superior Materials division of United Metro near Winkleman, Arizona for about $5.00 less per ton than the cost of having a contract miner and trucker deliver gypsum from their own deposit.

Arizona Gypsum:
This deposit is down the hill from the Western Mine in the flats. It is somewhat closer to Interstate 10 than the Western deposit.

This deposit is somewhat reminiscent of the Phoenix Cement deposit near Camp Verde. The deposit consists of soils, clay, and selenite crystals mixed together. The area is known for its crystals and many people visit the site to collect them.

The area is probably under claim as many claim monuments were found in the area, but the site does not have any equipment on it at the present time. There is some evidence of small-scale mining. There are no visible pits, but there are many small piles of material that have been dozed up. It appears that anyone could enter the site and remove loads of material. The material in its present form could possibly be used for agricultural purposes by simply dumping it into ditches carrying irrigation water. The material appears to be from 30 to 70% gypsum with the remainder being clay and soil.

Prepared by Ralph Costa.

Supplied by Ken Phillips of the Arizona Department of Mines and Mineral Resources

HARQUAHALA GYPSUM **LA PAZ CONTY**

(also known as Salome Gypsum, Western Organics Inc. Gypsum, Western Gypsum [not to be confused with Western Gypsum of St. George, Utah])

Adrian Cluff at Western Organics was contacted for information to update the *Directory of Active Mines in Arizona.* Adrian reported that they are currently purchasing their gypsum requirements from United Metro Materials - Superior Materials because it is less expensive than mining their own at their Harquahala Gypsum claims. They are maintaining the claims on the deposit and regularly review mining and transportation costs from their own deposit verses the purchasing gypsum.

On June 3rd in the company of Ralph Costa with the State Office of the Bureau of Land Management a visit was made to the Harquahala Gypsum Mine. Mr. Costa took a large number of photographs that will be added to this report when they are received and a select sample for analysis.

Current information for the Directory of Active Mines is:

WESTERN ORGANICS INC.

420 East Southern, Tempe, AZ 85282, P.O. Box 25406, Tempe, AZ 85285-5406 - Phone (480) 966-4442 - Plants located on 51st Avenue between Van Buren and Buckeye Roads and at 27th Avenue and Lower Buckeye Road in Phoenix – 625 S. 51st Avenue, Phoenix, AZ 85043 Phone (602) 269-5756 - Fax (602) 269-7621 – and 2807 S. 27th Avenue, Phoenix, AZ 85009 – Phone (602) 269-5784 - Employees: 100.

President	James Porter
Vice President/Operations Manager	Doug Henchett
Marketing	Paul Hess
Sales Manager	Dave Diehnelt
Office Manager	Adrian Cluff
Controller	David Hancock

Salome Gypsum Mine T5N R11W Sec. 30
Open pit gypsum mine operated by contractors – as needed. Gypsum for agricultural and horticultural uses, bagged and bulk - Used and sold directly and in horticultural blends.

The following information is from the June 3, 2002 field visit, June 4, 2002 and June 27, 2002 telephone conversations with Adrian Cluff and Paul Hess of Western Organics and a review of the Arizona Dept. of Mines and Mineral Resources (ADMMR) Harquahala Gypsum file.

The stockpile of crushed gypsum has all been shipped and no new material has been mined. The last of the stockpile was shipped in 2001. The old underground room and pillar workings are still open and appear to be standing well. Production over the last 20 plus years has been from open quarries. Quarry faces in the open pit portion of the deposit are partially developed. It site, measurable, open pit ore is exposed over a 500 foot length, 40 feet wide, with an exposed depth of 70 feet. This equals nearly 100,000 tons. There are surface exposures developed by trenching and indications of drilling that likely indicate a much larger resource. Estimates of reserves

reported to the Arizona Department of Mines and Mineral Resources by previous owners and promoters have ranged around 3,000,000 tons of gypsum.

Development of the mine by underground methods began in the mid 1940s. In the mid 1960s it was operational at approximately 100tpd, but only operating on an intermittent basis. Initial development was for any possible gypsum use in the Phoenix area. By the mid to late 1960s the market was for agricultural gypsum in the Harquahala and McMullen valleys.

Western Organics acquired the mine in the late 1980s to supply gypsum for their agricultural and horticultural mix production that is done at their Phoenix manufacturing plant. They hired contractors to mine, crush, and stockpile gypsum that was hauled to Phoenix as needed. They are currently buying their gypsum from the Superior Materials division of United Metro in Winkleman. They buy a grade of material, which too low for use in Portland cement, for $8.00 per ton plus $10.00 per ton in transportation. J & B Trucking provides hauling.

Western Organics has in the past bought a lower grade gypsite from National Gypsum's screened undersize. It contained 50 to 70 percent gypsum and they paid $5.00 per ton plus transportation. Western Organics consumes approximately 6,000 tons of 80% gypsum annually. They have attempted to use scrap wallboard as a gypsum source, but have never used more than a very small amount.

Western Organics produces a number of horticultural and agriculture products, all in the soil conditioner, soil amendment, fertilizer, mulch, and compost line. This product line includes gypsum package in 40-pound bags with a labeled minimum sulfur analysis of 14.9 percent, which is equivalent to 80 percent gypsum. Arizona Revised Statutes require that label claims as to nitrogen, phosphorus, potassium, and sulfur (NPKS) contents of fertilizer or agriculture minerals sold for agricultural or horticultural uses conform to stated label contents. The State Chemist function of the Arizona Department of Agriculture has the authority to collect samples, and analyze such products for their NPKS content. Manufactures are required to pay a $0.25 per ton fee to the Arizona Department of Agriculture for agricultural mineral and fertilizer products sold in Arizona.

Summary of Mine Visit to the Feldman Quarry, Winkelman Arizona

Met with Richard Foster, Quarry Superintendent of the Feldman Gypsum Mine owned by the Gold Bond Building Products Division of National Gypsum near Winkelman Arizona on June14, 2002 concerning the mining and beneficiation of gypsum at the quarry. Present were Ralph Costa, Bureau of Land Management (BLM) and Ken Phillips of the Arizona Department of Mines and Mineral Resources (ADMMR).

We informed Foster that BLM was processing a patent application and that we were trying to obtain information on other gypsum deposits being mined in Arizona. Foster was forthcoming with a lot of valuable information.

The gypsum from the deposit is used in its entirety to make wallboard. The mine consists of two pits, the Western pit and the Eastern pit. The mined zones in the Western pit run between 79% to 84% gypsum and in the Eastern pit the gypsum runs 89% and higher. Because of its lower quality, the Western pit has not been mined since 1989. Foster indicated that the two significant impurities are CaCO3 and clay. If clay is present in the mix then it interferes with bonding the paper necessary to manufacture wallboard. If CaCO3 is present then the mine run is to hard and doesn't crush well.

The gypsum deposit in the Western pit consists of a 7-foot gypsum layer separated by 3 feet of clay followed by 6 feet of gypsum. The deposit has been core drilled and assay results have shown that any 1-foot interval ranges from 85% to 90% gypsum. The gypsum deposit in the Eastern Pit consists of two zones, the A zone which is 17 to 20 feet of gypsum and the B zone which is 30 feet of gypsum. The A and B zones are separated by a 10-foot clay layer and no stripping is required. No mining has been done in the Western pit since 1989 as the Eastern pit is better gypsum. Foster was vague if the Western pit would ever be mined again.

Of considerable interest in the Eastern pit is the clay layer separating the A and B zones in the Eastern pit. This layer consisted mainly of clay but also contained several large lenses of mineral identified in the field as Selenite. This clay seam was very reminiscent of, and comparable to, many of the outcrops of gypsiferous materials present on the Thorne property. Foster told us that the clay material would not be processed and is stripped and wasted to expose the lower B zone. In essence the most comparable zone at this mine to the deposit at the Thorne site is interburden or waste.

Beneficiation of mined material from the Eastern pit consists of crushing the mined gypsum to ½ inch and dry screening the crushed product over a ½-inch screen to remove the clay. The clay is in the minus ½-inch fraction and usually this procedure removes about 35% of the clay. Sometimes this process removes up to 40 to 60% of the clay. Considering that the mine product runs 89% gypsum and assuming that the remainder is 11% clay, the beneficiated product runs 92.9% gypsum and 7.1% clay. The clay in the gypsum appears as dark banding in the solid matrix of the mined ore and is liberated by crushing.

Foster was asked about the dry screening process and he said that gypsum is very soft and breaks up easily. He said that if you took a truckload of clay and gypsum and dumped this load on a dry screen, a very high percentage of the gypsum would be lost since gypsum is such a soft mineral (2 on Mohs Hardness Scale).

At his mine, 3 people work to mine (move) 250,000 tons to produce 160 to 170,000 tons of shipped product per year. All of this production is from the Eastern pit. Again, that pit has 20 feet of gypsum and 10 feet of clay followed by 30 feet of gypsum. Using a density of 2.37 tons/yd3 for gypsum and 1.02 tons/yd3 for clay, calculations indicate that 0.086 tons of clay are moved for each ton of gypsum. Of the 250,000 tons moved each year, 21,500 tons are clay from the interburden. This leaves 228,500 tons of material sent for beneficiation. Of this, an additional 50% of the 11% clay content remaining is removed or 12,600 tons. This leaves 215,900 tons of gypsum and clay that should pass over the screens assuming 100% recovery. The figure reported as shipped is 170,000 tons which yields an approximate loss of 45,900 tons per year of material that is undersize and lost through the screen. This is a loss rate of 21%.

Foster provided some information concerning the United Metro (UM) operation about three miles away from his site. He stated that UM sells product for $10.00 per ton and utilizes 4 people in the mining process. Production

costs are estimated at about $6.00 per ton. Because of varying geologic conditions, the pit at UM is better as the gypsum is lower in clay content and is shallower than the deposit at the Feldman Quarry. All of the product at UM is sold for use as wallboard.

There is a considerable amount of Gypsite (CaSO4.3(H2O)) and lower quality gypsum in a stockpile at the Feldman site. Historically very little of this material has sold, but Pinal Gypsum purchased some for the agricultural market at $5.00 per ton. This stockpiled material runs 60 to 70% gypsite and Foster said that they would still sell the material in the $5.00 range.

Prepared by Ralph Costa

Summary of Phoenix Cement – Verde Valley Quarry

Met with Jim Wells Vice President of Cement Operations and Bruce McDonald, Gypsum Mine Supervisor, of Phoenix Cement Company near Verde Valley Arizona on June17, 2002, concerning the mining and beneficiation of gypsum at the mine. Present were Ralph Costa, Bureau of Land Management (BLM) and Ken Phillips of the Arizona Department of Mines and Mineral Resources (ADMMR). McDonald gave a short overview and then turned the tour over to Wells.

The mine employs a 3-man crew that performs all aspects of mining including all repair and maintenance of equipment except for the Caterpillar equipment. Repair of the Cat equipment is done by a local supplier. All of the material mined is used in the cement plant or is sold in bulk as an agricultural additive. None of the agricultural product is sold locally and all of it is shipped in bulk form.

The mined material is a thick layer of selenite crystals in clay. The material runs about 70% gypsum with 30% clay. The gypsum occurs as small (just over +1/2 inch to –60 mesh and smaller) crystals down in size to crystals that are very small. The mined zone outcrops and is mined with a paddle-wheel scraper fitted with 4"-6" ripper teeth. No drilling or blasting is required. No stripping is required as the material outcrops over a large area and has very shallow cover. The deposit has been sampled extensively on 5-foot lifts and the grade of gypsum remains constant to a depth of 30 to 35 feet. The deposit does have one layer of white tuff about 10 feet thick that does not have a considerable amount of gypsum. This material is stripped and mined anyway and is removed through the beneficiation process. There is a considerable amount of gypsum present.

The cement plant produces around 1.1 million tons of cement each year and roughly 5.5 to 6% of it is gypsum. Beneficiation consists of feeding a 24" X 36" jaw crusher and a set of rolls crushing the mine run material to –2 inch and then employing a wet separation process. The wet process consists of passing the material through a log washer to dislodge the clay from the selenite, separating the pulped clay from the selenite in a sand screw, and then passing the sand screw oversize over a double deck screen under spray washers. The material is washed with water. The first screen is a 3/16-mesh screen that removes the larger pieces of gypsum. The lower screen is a 60-mesh screen that removes the +60 mesh gypsum and rock and screens out the clay particles that were not removed by the sand screw. Recovery is about 79% with a 21% reject.

The agricultural product has to be dried and there was a gas-fired drier for this purpose. The cement material is transported to the cement plant at Clarkdale Arizona where it is spread in the sun and allowed to dry. The agricultural product is in the 3/16 size range as this is the size necessary for a seed drill as a seed drill is used to implant the gypsum in the fields. Both products are in the 92 to 93% gypsum range.

The agricultural product sells in the low $20's. Prior to purchasing the gypsum operation from Superior Companies, Phoenix Cement calculated that to buy gypsum from United Metro south of Winkleman would cost about $20.00 per ton plus $12-15 per ton in freight.

Prepared by Ralph Costa

Supplied by Ken Phillips of the Arizona Department of Mines and Mineral Resources

LARSON QUARRY **YAVAPAI CONTY**
(also known as Phoenix Cement Gypsum Verde Gypsum, and Superior Gypsum)

On June 174, 2002, in the company of Ralph Costa, Mining Engineer, US Bureau of Land Management, a visit was made to the Larson Quarry operated by the Phoenix Cement Company. We met with Bruce McDonald, Quarry Superintendent and Jim Wells, Vice President Cement Operations. Ralph Costa took numerous photographs that will be included when available.

Arizona Department of Active Mines information for this operation is as follows.

PHOENIX CEMENT COMPANY
Owned by Salt River Pima-Maricopa Indian Community
Phoenix Office
, - http://www.phoenixcement.com/ - Employees: 11 -
President Roger Smith, Jr.

Verde Gypsum T13N R5E Sec. 11
P.O. Box 786, Camp Verde, AZ 86322 - Phone (520) 567-3854 - Gypsum and clay quarry five miles east of Camp Verde on State Highway 260 - Supplies gypsum to cement plant at Clarkdale, also agricultural and horticultural uses - Clay for pond, ditch, and liner uses – Employees at Verde Gypsum operations: 3.
Foreman Bruce McDonald

Operations at Verde Gypsum consist of a selenite quarry made up of six pits, a crushing and beneficiation plant, dryers, storage, and shipping facilities. All production is blended from the six pits. The mine employs a 3-man crew that performs all aspects of mining including all repair and maintenance of equipment except for the Caterpillar equipment. A local supplier does repair of the Cat equipment. All of the material mined is used in the cement plant or is sold in bulk as an agricultural additive. None of the agricultural product is sold locally and all of it is shipped in bulk form.

Gypsum Mining

- Six pits are operated to blend feed to the mill
- The intersection of sections 1,2,11, and 12, T13N,R5E is located in the middle of the northeast portions of the pits
- Section 2, T13N,R5E is a State section, the others are in the Prescott National Forest
- Pits are not mineable in wet weather due to the clay content of the ore – Scraper-loader traction is impossible when the clay is wet
- As mined gypsum content of ore is 60 to 70 percent gypsum, maybe a bit higher
- Mining is accomplished with a scraper-loader with 4" ripping teeth which takes 4-5" per cut
- Each cut is hoped to contain 72-73% gypsum and higher clay areas are blended at the crusher feed stockpile with loads from lower clay areas in other pits.
- The thickness of higher clay content areas is seldom over 2 feet

- Some areas of the deposit contain a 4-5 foot thick layer of partially welded tuff
- During July-August 1997, Don Ross, a consulting geologist supervised a drilling program of approximately 20 holes to a depth of 35'
- The holes were sampled and analyzed every 5 feet
- The drilling and sampling program verified a reserve of 300 acres of 70-72% gypsum to a depth of 35'. This is 33.1 million tons; a 275 year reserve.
- When the expansion project at Phoenix Cement is complete its capacity will be 1,123,000 million tons per year, Gypsum shipped to the cement will be 5.5-6.0 percent or 62,000 to 67,000 tons per year.
- Total gypsum production for cement and Agriculture is approximately 90,000.
- Since 25 percent of mined ore is washed out, crude ore product is about 120,000 tons per year.
- The current mine and plant expansion project includes replacing the loader scraper and front end loader with new equipment

Plant

- The plant and office, warehouses are located at N 34°31"59.2" W111°46"59.9"Mined ore is loaded to a crusher feeder across a 12" grizzly which then feeds a 24" X 36" jaw crusher
- The jaw crusher feeds a set of 30" X 40" rolls set at 2"
- The rolls feed –2" to a washing plant feed stockpile material to the washing plant
- A belt supplies the washing plant from a reclaim feeder under the stockpile
- Feed from the stockpile is fed to a log washer
- The logwasher discharges to a sand screw
- The sand screw oversize is discharged to a double screen and the sand screw under size goes to a cyclone then to reclaim tailings
- The double deck screen is fitted with a 3/16" upper screen, a 60 mesh lower screen, and a high pressure spray bar
- The discharge from both screen decks is stockpiled for shipment to the Phoenix Cement plant at Clarkdale
- The material that passes 60 mesh is added to the undersize from the sand screw sent to the tailings cyclone
- Washout from the wet processing plant ranges between 5 and 7 tons per hour
- Final product shipped to the cement plant is +90 percent gypsum on a dry matter basis (not including water of hydration/crystallization)
- A 3/16" product is rescreened from the stockpile and dried in a 50 tph propane fired drier for agricultural use
- At the time of this visit the plant has been shut down, and dismantled for a two week modernization project to double its capacity
- The new plant will consist of new and larger equipment. The log washer, sand screw, and double deck screen are being replaced
- A wash water cyclone is being added to reduce concentrate the washed out clay and the pumping volume to the clay pond and reduce the amount of wash water that must be pumped back to the plant

General Comments Larson Quarry

- Approximately 75% of production goes to the Phoenix Cement Plant at Clarkdale
- The remaining 25% is sold for agricultural and horticultural uses
- Final product shipped to the cement plant is +90 percent gypsum on a dry matter basis (not including water of hydration/crystallization)
- The 3/16" agricultural product is sold in bulk truck load quantities and bagged by the purchaser or used in bulk
- Packagers of horticultural products in Central Arizona purchase the agricultural gypsum in bulk and bag it for distribution to retail garden centers and home improvement stores
- The bulk agricultural product is shipped out-of-state for use in Idaho and Colorado where its unique size and shape allow it to be applied to farm fields use grain drills and similar soil injection devices
- The 3/16" agricultural product is 92% to 93% gypsum and 1-2% water with the remaining being fine clay
- The gypsum mine and plant produce gypsum for the cement plant at a delivered price of under $15.00 per ton.
- Before acquiring the Larson Quarry from Superior Companies, Jim Wells explained that Phoenix Cement determined that it would cost them $20.00 per ton in freight and $10.00-$12.00 per ton for the gypsum to purchase it from the United Metro gypsum operation south of Winkleman (*although my notes have it $10.00-$12.00 for the gypsum and $20.00 for freight, I believe it's the other way around*)

General Related Comments – Phoenix Cement Company

- The expansion project at the Phoenix Cement plant at Clarkdale is expected to be completed before the end of 2002.
- Nameplate kiln capacity is 3,000 tons per day. Based on a kiln safety factor of 15%, a cement equivalency of 108%, and an estimated operating time of 95%, the expanded capacity is specified at 1,123,000 tons of cement per year
- Gypsum content of the cement will be 5.5-6.0 percent or 62,000 to 67,000 tons per year
- The optimal amount of gypsum is determined by the SO_3 content of the cement clinker
- The clinker contains some sulfur from the coal used as kiln fuel
- The majority of the kiln fuel is coal from the National King Mine near Hesperous, Colorado with a sulfur content of 0.7-0.8%. Fuel used includes some petroleum coke from Wyoming with a sulfur content of 4.5%
- It is preferable to get SO3 into the final ground cement product from gypsum as it coats C3A (cement industry nomenclature for calcium aluminates) content of the cement

1-14

UNIVERSITY OF NEVADA RENO

NEVADA BUREAU OF MINES AND GEOLOGY

Mail Stop 178
Reno, Nevada 89557-0088
Telephone: (702) 784-6691
FAX: (702) 784-1709

STANDARD REFERENCE MATERIAL NBM-2b

(Jerritt Canyon, Nevada carbonaceous Au, Ag ore)

Accepted gold and silver values are based on mean results from 13 separate laboratories. Data are in troy ounces/short ton and parts per million by weight; precision figures are for 95% confidence. Each laboratory (with few exceptions) assayed three splits in triplicate (9 determinations) resulting in n = 50-55 for this SRM. This material is nominally >95% -200 mesh:

Gold (Au) = 0.228 ± 0.008 oz/ton (7.81 ± 0.27 ppm)

Silver (Ag) = 0.02 ± 0.03 oz/ton (0.68 ± 1.03 ppm)

For questions or comments contact: Dr. Paul J. Lechler
702-784-6691 ext. 123
702-784-1709 fax
plechler@nbmg.unr.edu

BUREAU OF LAND MANAGEMENT * U.S. DEPARTMENT OF THE INTERIOR * CERTIFIED MINERAL EXAMINER Matthew W. Shumaker REVIEW 028

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS CERTIFICATE NUMBER 7319 AIPG MATTHEW W. SHUMAKER CERTIFIED PROFESSIONAL GEOLOGIST

I certify that the mineral matter in this package consists of the standard reference material described above.

Matthew W. Shumaker

5-2-2002

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1-24F

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

National Training Center
9828 North 31st Avenue
Phoenix, AZ 85051

In reply refer to:
3800

May 29, 2001

Complex Blank Reference Material

(Maricopa County, Arizona, residential yard landscape material)

The values listed below are the result of replicated analyses by laboratories denoted below. Data are in troy ounces per ton, where above lower detection limits.

XX indicates below lower detection limits. NT denotes element was not analyzed.

Au	Ag	Pt	Pd	Rh	Ir	Ru	Os	Lab
XX	XX	XX	XX	XX	XX	XX	XX	Legend[1]
XX	XX	XX	XX	XX	XX	XX	XX	Chemex (two separate submissions at different dates)
0.00015	XX	XX	XX	XX	XX	XX	XX	Bondar-Clegg[2]
XX	NT	XX	NT	NT	NT	NT	NT	Alfred H. Knight
XX	XX	XX	XX	NT	NT	NT	NT	Florin Analytical Services[3]
XX	XX	XX	XX	NT	NT	NT	NT	Inspectorate – Rocky Mountain Geochemical, Sparks, NV[3]
XX	XX	XX	XX	XX	XX	XX	XX	Nevada Bureau of Mines & Geology

Notes:

1. Legend ceased performing assays and analyses in September, 1999. They performed for replicate analyses of this material at different times under different sample numbers.
2. Bondar-Clegg's method had a lower detection limit of 1 ppb (part per billion) or 0.00003 troy ounces per ton. The result reported for gold is within the expected average crustal abundance for that element.
3. Submitted together as blind duplicates with different identifying numbers.

I certify that the mineral matter in this package consists of the Complex Blank Reference Material described above.

Matthew W. Shumaker

5-2-2002

Date

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS CERTIFICATE NUMBER 7319 AIPG MATTHEW W. SHUMAKER CERTIFIED PROFESSIONAL GEOLOGIST

BUREAU OF LAND MANAGEMENT CERTIFIED Matthew W. Shumaker REVIEW 028 MINERAL EXAMINER U.S. DEPARTMENT OF THE INTERIOR

1-55

UNIVERSITY OF NEVADA RENO

NEVADA BUREAU OF MINES AND GEOLOGY

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Reno, Nevada 89557-0088
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FAX: (702) 784-1709

Standard Reference Material NBM-6b

(Stillwater Mine, Montana J-M Reef ore)

Accepted gold, platinum, and palladium values based on mean results from 8 to 11 separate laboratories (depending on element). Data are in troy ounces/short ton and parts per million by weight; precision figures are for 95% confidence. Each laboratory (with few exceptions) assayed 3 splits in triplicate (9 determinations) resulting in n = 70 to 100 for this SRM. This material is nominally >95% -200 mesh:

Gold (Au) = 0.023 ± 0.003 oz/ton (0.793 ± 0.091 ppm)

Platinum (Pt) = 0.352 ± 0.083 oz/ton (12.1 ± 2.85 ppm)

Palladium (Pd) = 1.13 ± 0.136 oz/ton (38.6 ± 4.66 ppm)

For questions or comments contact: Dr. Paul J. Lechler
702-784-6691
702-784-1709 fax
plechler@comstock.nbmg.unr.edu

I certify that the mineral matter in this package consists of the Standard Reference Material described above.

Matthew W. Shumaker

5-2-2002

Date

ASSAY RESULTS OF OXBOW SAMPLE

TAKEN JULY 9, 1980, AND RUN BY GLAY THORNE

OXBOW=	ADMR=	WT AU (MILLIGRAMS)	AU (TR.OZ/TON)	WT AG (MILLIGRAMS)	AG (TR.OZ/TON)
5	1	0.374	2.18	0.463	2.70
1	2	0.086	0.50	2.546	14.85
2	3	3.719	21.69	0.747	4.36
4	4	0.659	3.84	0.281	1.64
6	5	5.256	30.66	0.760	4.43

Figured from beads supplied by Clay Thorne.

Weights by Mike Jacobs.

Each assay sample had 2 beads, each from 2-1/2 grams of ore run by Clay Thorne of Payson, using 15:1 and/or 21:1 litharge to ore ratios, secret fluxes and secret Russian methodology.

KAP.mw
9/26/80

OXBOW MINE FILE
GREEN VALLEY DIST.
GILA CO.

IRON KING ASSAY OFFICE
ASSAY CERTIFICATE

BOX 247 — PHONE 632-7410
HUMBOLDT, ARIZONA 86329

REGISTERED ASSAYER
CERTIFICATE NO. 2978
WALTER G. STATLER
Date Signed 10-7-80
ARIZONA, U.S.A.

ASSAY MADE FOR
Dept. of Mineral Resources
Mineral Bldg, Fairgrounds.
Phoenix, 85007

Oct. 7, 1980

REF. NO.	DESCRIPTION	oz/ton Au	oz/ton Ag		% Fe	% Pb	% Zn	% Cu
3-4-22	DMR #1	.022	0.14					
	" #2	Tr	0.10					
	" #3	Tr	0.02					
	" #4	Tr	0.02					
	" #5	Tr	0.18					

CHARGES #46.25

ASSAYER

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
NATIONAL TRAINING CENTER
9828 North 31st Avenue
Phoenix, Arizona

IN REPLY REFER TO:
3890 (300)

July 1, 2002

Memorandum

To: Director, National Training Center

Through: Chief, Division of Minerals, Realty, and Resource Protection (TC-300)

From: Senior Technical Specialist, Division of Minerals, Realty, and Resource Protection

Subject: Assay Information Request from the Arizona State Office

The Deputy State Director for Resources has requested certain information in our files regarding assays done by Gregory J. Iseman and Iseman Consulting, referred to hereinafter as Iseman. This memorandum is intended to provide the requested information.

Iseman Consulting operates and performs assays out of Gilbert Arizona, but appears to use a mailing address in Henderson, Nevada. The assay "certificate" that we received used a Henderson, Nevada address, but the letter was postmarked Phoenix, AZ with an envelope return address of Gilbert, AZ. The Henderson, NV address used is apparently a commercial mailboxes facility.

As a part of the Bureau's ongoing responsibilities on public lands with respect to the General Mining Law, 30 U.S.C. 22, et seq, and the regulations promulgated thereunder, we became aware that Iseman was performing assays for clients that may involve public lands. Additionally, it is a responsibility of the Bureau to assure that laboratories used in Bureau work report accurate results.

Therefore, as a part of ongoing Bureau work assigned to us by WO-320, I arranged to send a suite of six samples of mineral matter to Iseman. The six samples sent to Iseman consisted of two splits of the complex blank sample used in this project, two standard reference samples of known gold content, and two splits of a standard reference material containing known gold, platinum and palladium content.

One sample sent to Iseman consisted of Nevada Bureau of Mines and Geology (NBMG) Standard Reference Material 4b. This "standard" consists of pulverized and homogenized gold ore from the Mesquite mine in southeastern California. Multiple analyses of this ore material showed that it contains

gold and silver as follows (Attachment 1):

Gold: 0.012 troy ounces per ton of ore, plus or minus 0.002 troy ounces per ton.
Silver: 0.03 troy ounces per ton of ore, plus or minus 0.04 troy ounces per ton.

A second sample sent to Iseman consisted of NBMG Standard Reference Material 2b. This standard consists of pulverized and homogenized gold ore from the Jerritt Canyon Mine, in Nevada. Multiple analyses of this ore showed that it contains precious metals as follows: (Attachment 2):

Gold: 0.228 troy ounces per ton of ore, plus or minus 0.008 troy ounces per ton.
Silver: 0.02troy ounces per ton of ore, plus or minus 0.03 troy ounces per ton.

A third sample sent to Iseman consisted of NBMG Standard Reference Material 6b, and was sent as two differently-numbered splits. This standard consists of pulverized and homogenized platinum ore from the J-M Reef, at the Stillwater Mine in Montana. Multiple analyses of this ore showed that it contains precious metals as follows (Attachment 3):

Gold: 0.023 troy ounces per ton of ore, plus or minus 0.003 ounces per ton.
Platinum: 0.352 troy ounces per ton of ore, plus or minus 0.083 ounces per ton.
Palladium: 1.13 troy ounces per ton of ore, plus or minus 0.136 ounces per ton.

All of the standard reference materials obtained from the Nevada Bureau of Mines and Geology are readily available for purchase from them, by any member of the public. We obtained our stock of standard reference materials from the Nevada Bureau of Mines and Geology by purchasing them.

The remaining samples consisted of two splits of a complex blank reference material developed for Bureau work. This "blank" was developed to resemble ore material, and consists of front yard landscaping material from central Arizona. It was pulverized at NTC. Analyses of this blank material shows that it contains insignificant concentrations of gold, silver, platinum, and other precious metals (Attachment 4). One laboratory used a very exacting test with a very low lower detection limit, which is not routinely used in mining assay work. That one sample of this blank material was reported to contain 0.00015 troy ounces of gold per ton of material. Spelled out, that is *one point five ten thousandths* of a troy ounce per ton. That infinitesimal value is the "background" concentration of gold expected from a sample of any crustal material of the Earth. In other words, using that same exacting method, an analysis of dirt from just about anywhere would be expected to yield a similar concentration.

The results returned by Iseman are portrayed in Attachment 5, and are summarized in Table1, below. Attachment 5 has been redacted to remove reference to the source and BLM numeration of the samples. Iseman used what was purported to be a "Microwave Technique," but did not provide details as to what that method entailed, nor any detection limits Expected results are provided for comparison in Table 2.

Table 1 **Results reported by Iseman**
Results reported in troy ounces per ton.

What the sample was	Gold	Silver	Platinum	Palladium	
Blank	0.435	0.268	0.166	0.487	
NBMG Standard 2b, Jerritt Canyon Gold Mine, Nevada	0.596	0.0204	0.099	0.309	
NBMG Standard 4b, Mesquite Gold Mine, California	0.258	0.204	0.327	0.338	
NBMG Standard 6b, Stillwater Platinum Mine, Montana	0.316	0.245	0.630	1.971	
NBMG Standard 6b, Stillwater Platinum Mine, Montana	0.353	0.257	0.986	1.971	
Blank, duplicate	0.195	0.152	0.073	0.017	

Table 2 **Expected results for samples reported in Table 1.** [2] Troy ounces per ton.

	What the sample was	Gold	Silver	Platinum	Palladium	
	Blank	XX	XX	XX	XX	
	NBMG Standard 2b, Jerritt Canyon Gold Mine, Nevada	0.228	0.02	NR	NR	
	NBMG Standard 4b, Mesquite Gold Mine, California	0.012	0.03	NR[3]	NR	
	NBMG Standard 6b, Stillwater Platinum Mine, Montana	0.023	NR	0.35	1.13	

Notes for Tables.

[1] XX indicates that the presence of that element, if it is there at all, is below the lower detection limit of the analytical method. Iseman did not disclose the lower detection limits of his method.

[2] See Attachments 1, 2, 3, and 4

[3] NR indicates that the presence or absence of that element was not reported by NBMG.

NEVADA BUREAU OF MINES AND GEOLOGY

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Standard Reference Material NBM-4b

(Mesquite Mine, California low grade ore)

Accepted fire-assayable gold and silver values based on mean results from 14 separate laboratories. Data are in troy ounces/short ton and parts per million by weight; precision figures are for 95% confidence. Each laboratory assayed 3 splits in triplicate (9 determinations) resulting in 126 assays. This material is nominally >95% -200 mesh:

Gold (Au) = 0.012 +/- 0.002 oz/ton (0.41 +/- 0.07 ppm)

Silver (Ag) = 0.03 +/- 0.04 oz/ton (1.0 +/- 1.4 ppm)

For questions or comments contact:

Dr. Paul J. Lechler
702-784-6691
702-784-1709 fax
plechler@comstock.nbmg.unr.edu

Attachment 1

NEVADA BUREAU OF MINES AND GEOLOGY

UNIVERSITY OF NEVADA RENO

Mail Stop 178
Reno, Nevada 89557-0088
Telephone: (775) 784-6691
FAX: (775) 784-1709

STANDARD REFERENCE MATERIAL NBM-2b

(Jerritt Canyon, Nevada carbonaceous Au, Ag ore)

Accepted gold and silver values are based on mean results from 13 separate laboratories. Data are in troy ounces/short ton and parts per million by weight; precision figures are for 95% confidence. Each laboratory (with few exceptions) assayed three splits in triplicate (9 determinations) resulting in n = 50-55 for this SRM. This material is nominally >95% -200 mesh:

Gold (Au) = 0.228 ± 0.008 oz/ton (7.81 ± 0.27 ppm)

Silver (Ag) = 0.02 ± 0.03 oz/ton (0.68 ± 1.03 ppm)

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Standard Reference Material NBM-6b

(Stillwater Mine, Montana J-M Reef ore)

Accepted gold, platinum, and palladium values based on mean results from 8 to 11 separate laboratories (depending on element). Data are in troy ounces/short ton and parts per million by weight; precision figures are for 95% confidence. Each laboratory (with few exceptions) assayed 3 splits in triplicate (9 determinations) resulting in n = 70 to 100 for this SRM. This material is nominally >95% -200 mesh:

Gold (Au) = 0.023 ± 0.003 oz/ton (0.793 ± 0.091 ppm)

Platinum (Pt) = 0.352 ± 0.083 oz/ton (12.1 ± 2.85 ppm)

Palladium (Pd) = 1.13 ± 0.136 oz/ton (38.6 ± 4.66 ppm)

For questions or comments contact: Dr. Paul J. Lechler
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702-784-1709 fax
plechler@comstock.nbmg.unr.edu

Attachment 3

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

National Training Center
9828 North 31st Avenue
Phoenix, AZ 85051

In reply refer to:
3800

May 29, 2001

Complex Blank Reference Material

(Maricopa County, Arizona, residential yard landscape material)

The values listed below are the result of replicated analyses by laboratories denoted below. Data are in troy ounces per ton, where above lower detection limits.

XX indicates below lower detection limits. NT denotes element was not analyzed.

Au	Ag	Pt	Pd	Rh	Ir	Ru	Os	Lab
XX	XX	XX	XX	XX	XX	XX	XX	Legend[1]
XX	XX	XX	XX	XX	XX	XX	XX	Chemex (two separate submissions at different dates)
0.00015	XX	XX	XX	XX	XX	XX	XX	Bondar-Clegg[2]
XX	NT	XX	NT	NT	NT	NT	NT	Alfred H. Knight
XX	XX	XX	XX	NT	NT	NT	NT	Florin Analytical Services[3]
XX	XX	XX	XX	NT	NT	NT	NT	Inspectorate – Rocky Mountain Geochemical, Sparks, NV[3]
XX	XX	XX	XX	XX	XX	XX	XX	Nevada Bureau of Mines & Geology

Notes:

1. Legend ceased performing assays and analyses in September, 1999. They performed for replicate analyses of this material at different times under different sample numbers.
2. Bondar-Clegg's method had a lower detection limit of 1 ppb (part per billion) or 0.00003 troy ounces per ton. The result reported for gold is within the expected average crustal abundance for that element.
3. Submitted together as blind duplicates with different identifying numbers.

Attachment 4

Iseman Consulting

LABORATORY REPORT

(ANALYTICAL)

CLIENT: [redacted]	SAMPLE: # 0112250
PROJECT:	DATE: 12/28/2001

PROCESS	CONDITIONS
ASSAY	STRENGTH OF REAGENTS
CYANIDE	% SOLIDS
THIOUREA	TIME OF TEST
OTHER Microwave Technique	AGITATION
	TEMPERATURE
ORE/MATERIAL USED	MILLIVOLT
see below	Ph
	SAMPLE WEIGHT
ORE SIZE USED	ORE WEIGHT USED

RESULTS

Listed in Troy Ounces per Ton (or as stated below)

ID OF SAMPLE	Au	Ag	Pt	Pd	Rh	Os	Ir
[redacted] Ore	0.435	0.268	0.166	0.487			
[redacted] Ore	0.596	0.204	0.099	0.309			
[redacted] Ore (Hanging Wall)	0.258	0.408	0.327	0.338			
[redacted] Ore	0.316	0.245	0.630	1.971			
[redacted] Ore (Foot Wall)	0.353	0.257	0.986	1.801			
[redacted] Ore	0.195	0.152	0.073	0.017			

The foregoing results were ran using standard analytical procedures and are based solely on the samples submitted. Iseman Consulting strives to do the best to its knowledge and ability but makes no warranties or promises, written or implied.

Attachment 5