I have participated in preliminary feasibility studies for two other porphyry copper orebodies in which consideration was given to underground mining at depths in excess of 4000 feet. By comparison with these deposits the depth, character of mineralization, and expected grade in the Birthday Groups would not appear to present insurmountable obstacles to a mining operation if the geology is as interpreted by Phelps Dodge.

My general conclusion is that the Birthday group holes have not blocked out a commercial orebody, but they have indicated the probable existence of an orebody at greater depth which would be minable under current economics if similar in grade to the Doc Pobres orebody. In its present state of exploration the Birthday Group must be considered to be mineral ground.

Yours very truly,

J. David Lowell

J. David Lowell

Registered Professional Engineer (Mining)
CERTIFICATE NO. 6523
J. DAVID LOWELL
Date Signed 1-7-77
Arizona U. S. A.

REGISTERED GEOLOGIST
CERTIFICATE NO. 4482
J. DAVID LOWELL
Date Signed 1-7-77
ARIZONA, U.S.A.

FROM 1972 PHELPS DODGE ANNUAL REPORT

total investment in Metcalf, including $18,000,000 for pre-production overburden removal, to about $180,000,000.

Metcalf concentrates will be smelted at Morenci, and after Metcalf production begins the Morenci smelter will no longer have the capacity to treat the Tyrone concentrates now being smelted there.

New Smelter. In order to have smelter capacity available for Tyrone concentrates after Metcalf production begins, we are building a new smelter in Hidalgo County in southwestern New Mexico. The Hidalgo smelter will be the first in the United States to use the flash smelting process and is being designed to minimize environmental impact. A [illegible] has been acquired and construc[illegible] is under way. This project will also involve a 36-mile railroad connection and a townsite. The project's cost is estimated at well over $100,000,000.

Safford Project. The preliminary development program at Safford, Arizona, where we have a deep orebody containing an estimated 250 million tons of ore with an average grade of 0.92% copper, progressed during 1972. A haulage drift at a depth of 1800 feet was advanced into the orebody, and a test block is being drawn to determine the caving characteristics of the ore. The present program should be completed by mid-1973, at an estimated cost of $15,200,000 of which $12,166,000 had been spent by the end of 1972. A decision on when to continue development of this property to the production stage has not yet been made.

Woodlawn Project (Australia). In 1970 a Phelps Dodge-St. Joe Minerals Corporation joint venture discovered a copper-lead-zinc-silver ore deposit near Tarago, New South Wales, Australia. Drilling completed during 1972 indicates that approximately 10 million tons of ore averaging about 1.5% copper, 3.0% lead, 7.5% zinc and 1.5 ozs. of silver per short ton is minable by open-pit methods. Additional ore grade intersections have been made at depth outside the limits of the proposed open pit; at this juncture, however, their economic significance, if any, cannot be determined. In December 1972 Australia's highest court decided in our favor a lawsuit contesting the joint venture's ownership of the property; this decision has been appealed to the Privy Council in England. Meanwhile, pilot plant metallurgical testing of bulk samples of the ore, and feasibility studies to determine the size and scope of the proposed mining and milling operations, have gone ahead. Although the metallurgical testing has indicated that separation of the minerals in the ore is somewhat more difficult than anticipated, it is hoped to be able to bring the property into production in 1975.

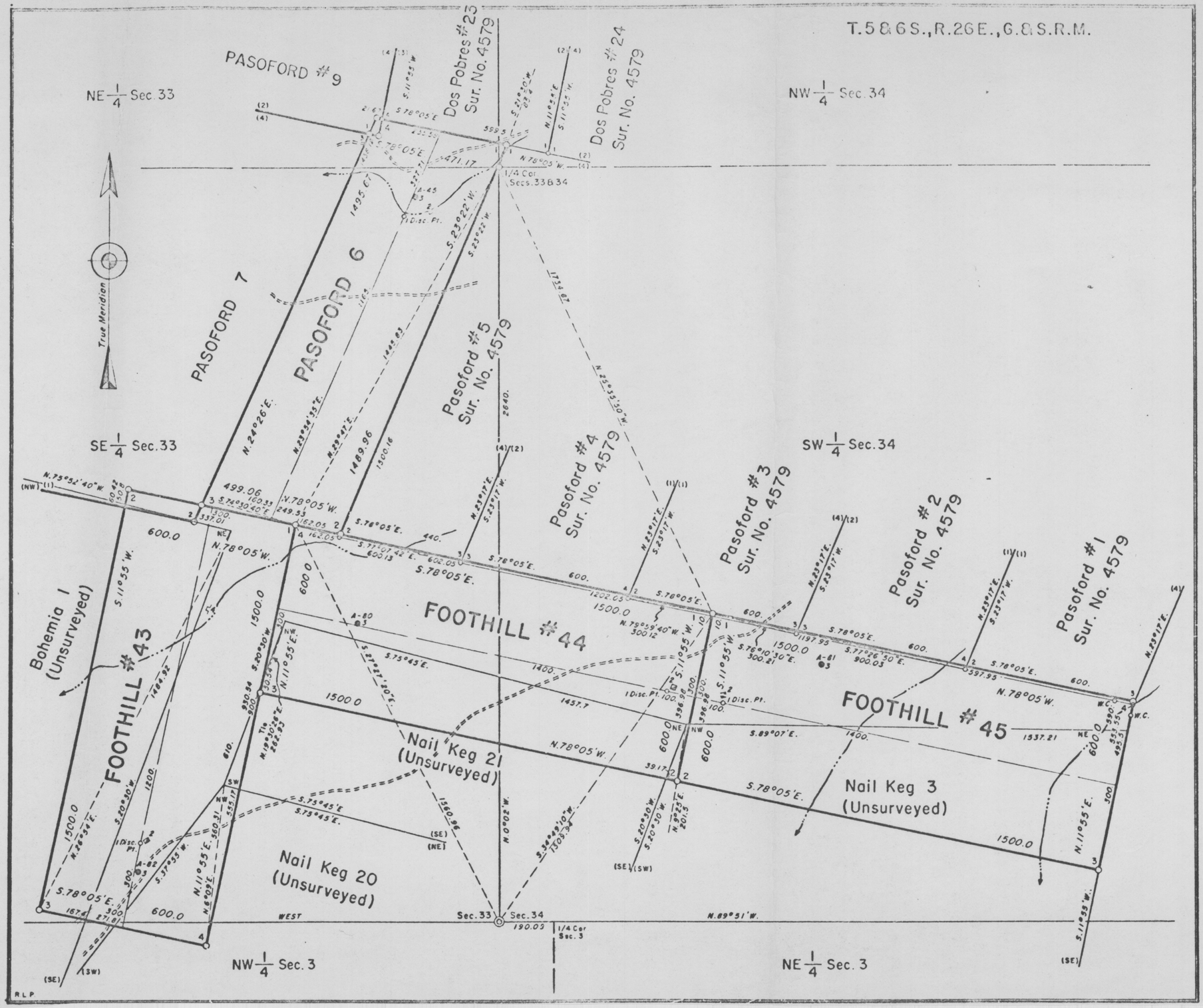
Aggeneys Project (South Africa). In January 1972 we announced that we had discovered two zones containing copper-lead-zinc-silver mineralization on land under option in the northwestern part of the Cape Province of the Republic of South Africa. Drilling continued at an accelerated rate throughout the year, and in August we purchased, through a subsidiary, approximately 34,000 acres of land on which the two zones are situated. Drilling in the first zone prior to the purchase indicated that if the mineralization is continuous in thickness and grade it is possible to infer that the zone may contain some 70 million short tons of ore averaging 0.8% copper, 2.2% lead, 0.44% zinc and ½ ounce of silver per short ton, a significant portion of which would be minable by open-pit methods. In the second zone, about three miles from the first zone, three drill holes completed before the purchase, approximately 500 feet apart and in a straight line, intersected mineralization that appears to be similar in character to that in the first zone, with an average apparent thickness of 60 feet and an average metal content of 0.6% copper, 7.4% lead, 2.3% zinc

Phelps Dodge Mining and Copper Production Data

In short tons

	Tons of Ore and Waste Mined		Tons of Ore Mined		Tons of Copper Produced	
Mine	**1972**	**1971**	**1972**	**1971**	**1972**	**1971**
Morenci	50,228,000	52,937,000	17,215,000	16,590,000	119,763	113,598
Ajo	28,310,000	27,442,000	9,792,000	9,244,000	57,876	53,000
Bisbee						
Lavender Pit	5,559,000	11,308,000	3,761,000	4,575,000	21,632	24,017
Underground Mines	—	—	643,000	768,000	26,899	29,003
Tyrone	56,851,000	46,487,000	11,425,000	8,798,000	78,756	60,189
Miscellaneous	—	—	—	—	506	1,425
Totals	140,948,000	138,174,000	42,836,000	39,975,000	305,432	281,232

MINERAL SURVEY No. 4632 ARIZONA



0 50 100 200 300 400 500 600 700 800 900 1000

Feet

Magnetic Declination, 14° E.

Surveyed Nov.11,1965 to Mar.1,1966
By Harvey W. Smith, Mineral Surveyor

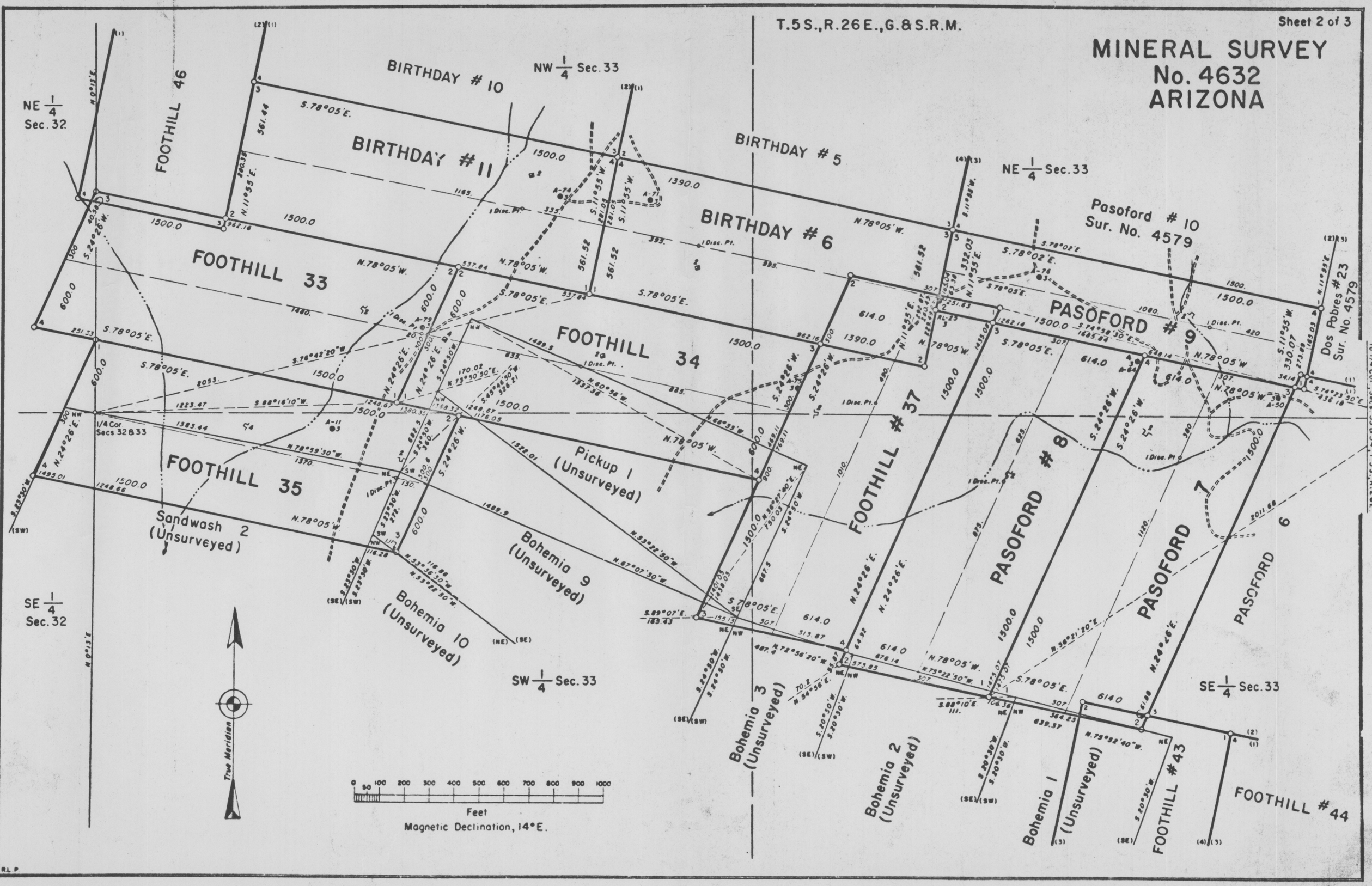
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Phoenix, Arizona, September 13,1966

I hereby certify that this plat of Mineral Survey No.4632, Arizona, is strictly conformable to the field notes of said survey which have been examined and approved.

Fred J. Weiler

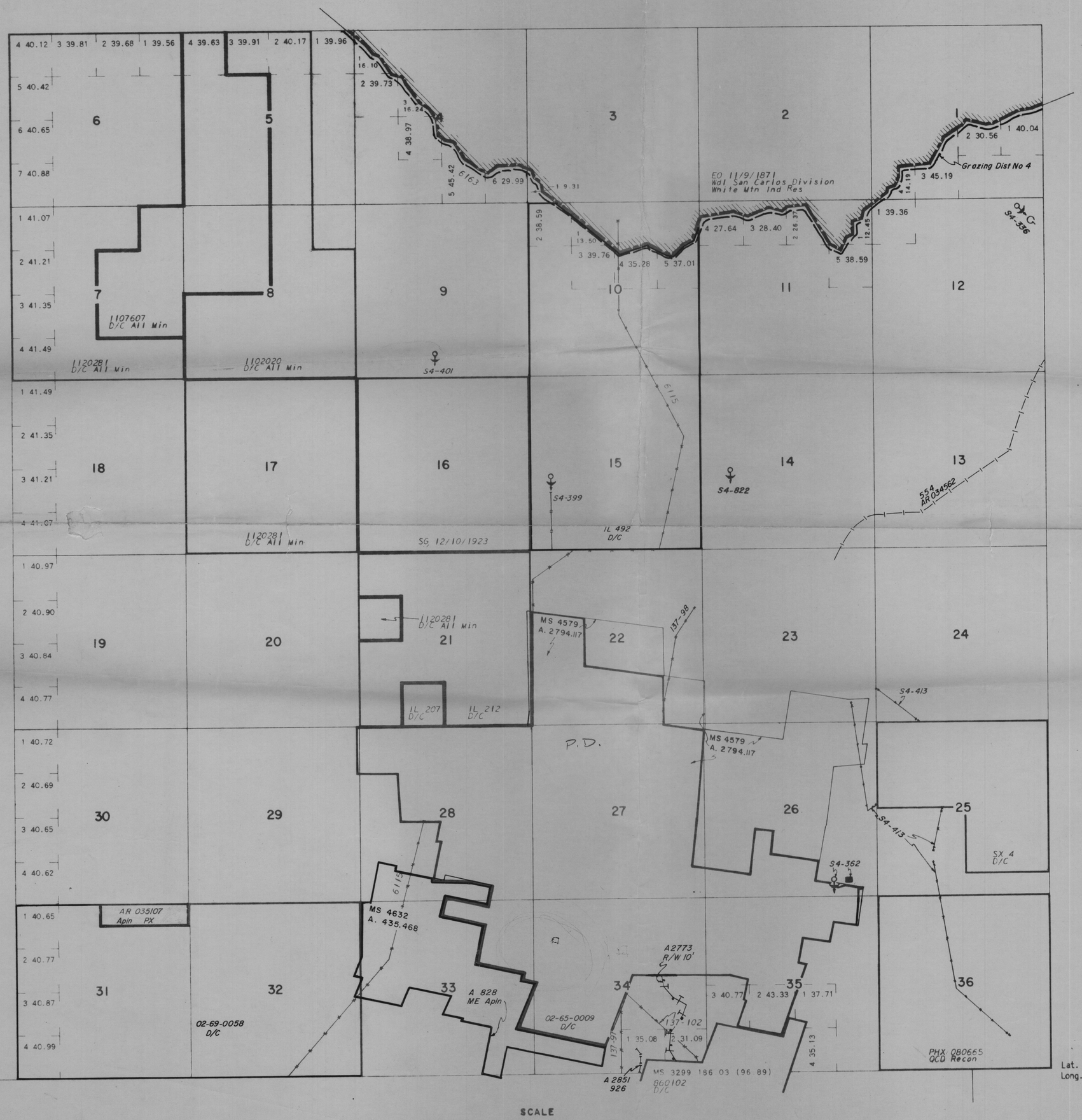
State Director


T.5S.,R.26E.,G.&S.R.M.
Sheet 2 of 3
MINERAL SURVEY
No. 4632
ARIZONA
NE 1/4 Sec. 32
NW 1/4 Sec. 33
NE 1/4 Sec. 33
SE 1/4 Sec. 32
SW 1/4 Sec. 33
SE 1/4 Sec. 33
BIRTHDAY # 10
BIRTHDAY # 11
BIRTHDAY # 5
BIRTHDAY # 6
FOOTHILL 46
FOOTHILL 33
FOOTHILL 34
FOOTHILL 35
FOOTHILL # 37
FOOTHILL # 43
FOOTHILL # 44
PASOFORD # 9
PASOFORD # 8
PASOFORD 7
PASOFORD 6
Pasoford # 10
Sur. No. 4579
Dos Pobres #23
Sur. No. 4579
Pickup 1
(Unsurveyed)
Sandwash 2
(Unsurveyed)
Bohemia 9
(Unsurveyed)
Bohemia 10
(Unsurveyed)
Bohemia 3
(Unsurveyed)
Bohemia 2
(Unsurveyed)
Bohemia 1
(Unsurveyed)
1/4 Cor. Secs 32 & 33
To 1/4 Cor., Secs. 33 & 34, T.5S., R.26E.
True Meridian
Feet
Magnetic Declination, 14°E.

PARTIALLY SURVEYED TOWNSHIP 5 SOUTH RANGE 26 EAST OF THE GILA AND SALT RIVER MERIDIAN, ARIZONA

STATUS OF PUBLIC DOMAIN
LAND AND MINERAL TITLES

GRAHAM COUNTY



INDEX TO SEGREGATED TRACTS				
RESURVEY	ORIGINAL SURVEY			
TRACT NO	T	R	SEC	SUBDIVISION

FOR ORDERS EFFECTING DISPOSAL OR USE OF UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION, MINERALS, WATER AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS.

PROTRACTION DIAGRAM NO. 71

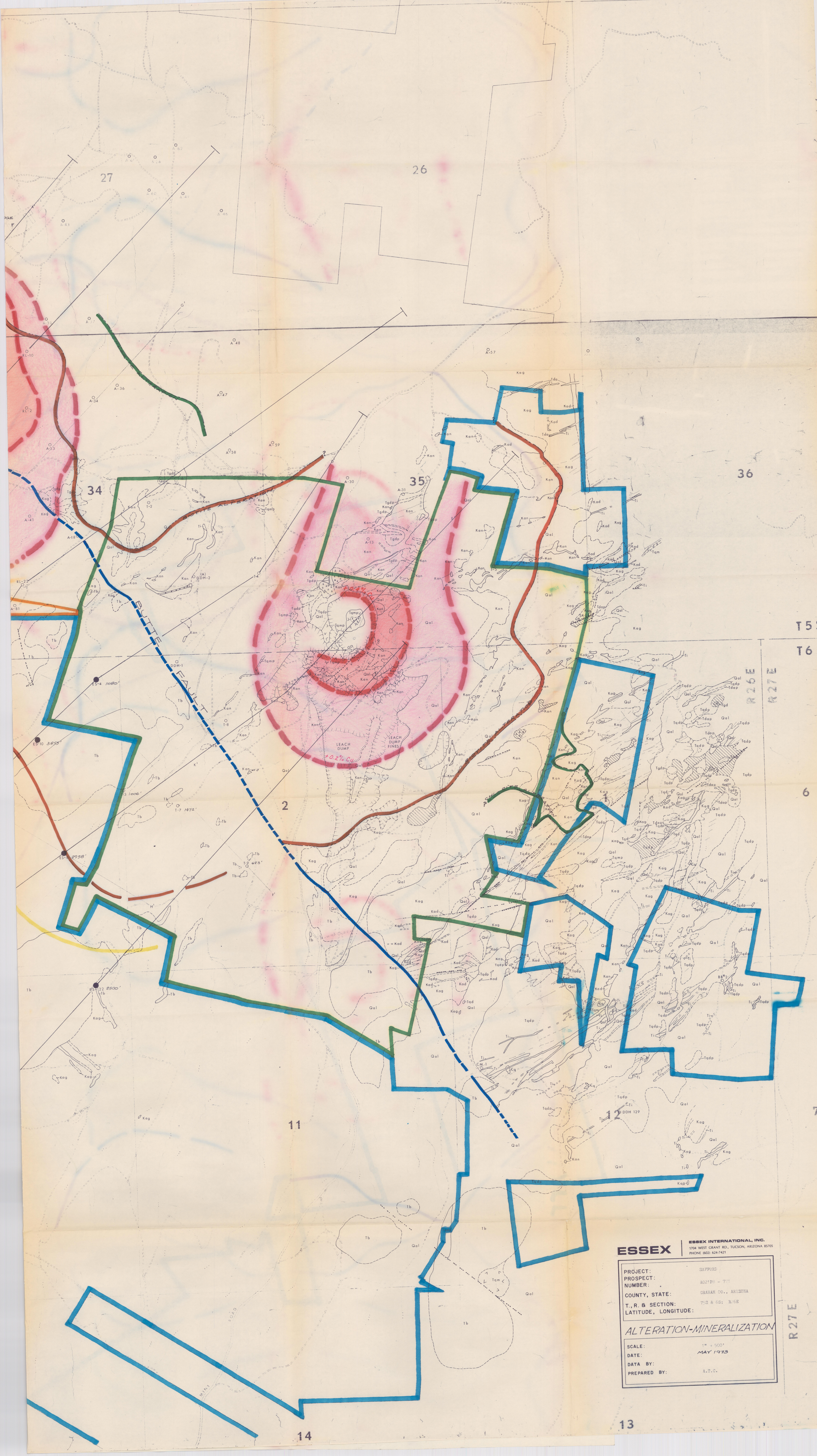
A 467 CL MULTIPLE USE
Sec 1
Sec 3 to 36

DIST NO. 4

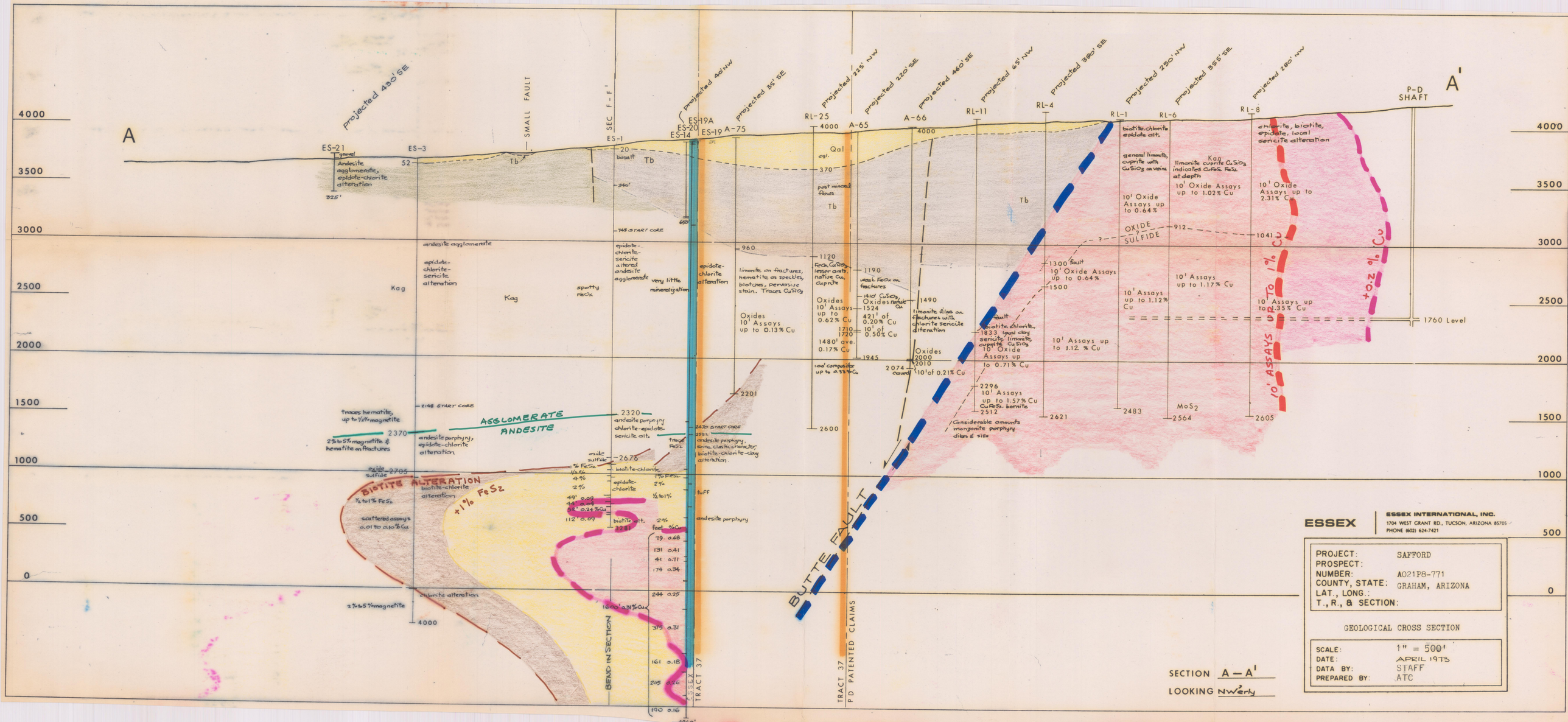
CURRENT TO	BY

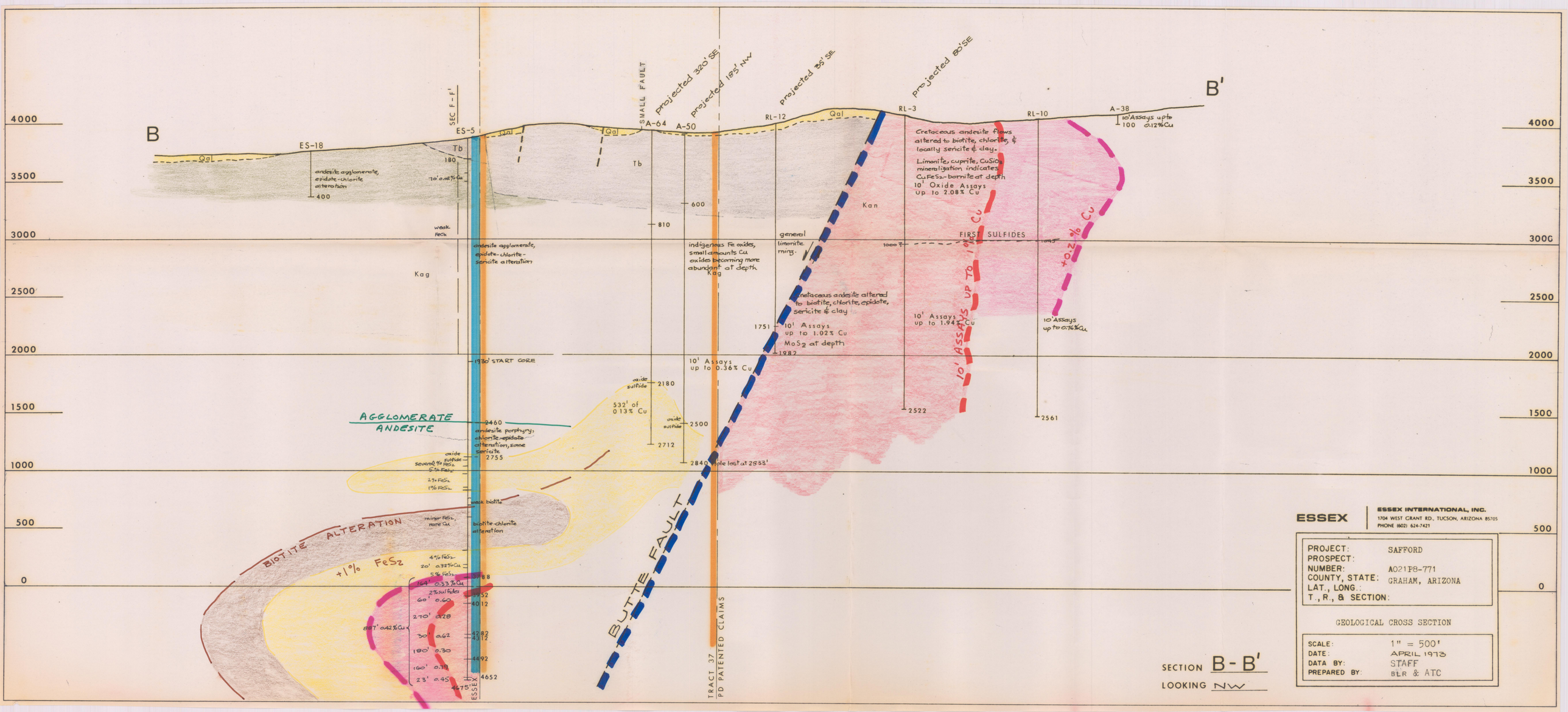
BUREAU OF LAND MANAGEMENT
RECEIVED
BILLINGS, MONTANA
1970 AUG 27 PM 2 47

T. 5 S
R. 26 E


ESSEX
ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421
PROJECT: SAFFORD
PROSPECT:
NUMBER: A021P8 - 771
COUNTY, STATE: GRAHAM CO., ARIZONA
T., R. & SECTION: T5S & 6S: R26E
LATITUDE, LONGITUDE:
ALTERATION-MINERALIZATION
SCALE: 1" = 500'
DATE: MAY 1973
DATA BY:
PREPARED BY: A.T.C.
BIOTITE ALTERATION
BUTTE FAULT
LEACH DUMP
LEACH DUMP FINES
+0.2% Cu
T5S
T6S
R26E
R27E
26
27
34
35
36
2
1
11
12
13
14
DDH-1
DDH-2
DDH 129
ES-4 1080'
ES-10 3855'
ES-6 2958'
ES-22 2500'
T-7 1472'
T-9 623'
MINE ROAD

EXPLANATION
SURFACE FEATURES
Biotite alteration limit
Chlorite alteration limit
Fault
ESSEX ophiered property boundary
San Juan Mine boundary
Tract 37
ESSEX drill holes
Phelps-Dodge drill holes-pre 1967
Phelps-Dodge drill holes-post 1967
other drill holes
SUB-SURFACE FEATURES
Biotite alteration limit
1% FeS2 mineralization limit
0.2% Cu mineralization limit
+0.4% Cu mineralization limit
SECTION I
SECTION C
SECTION D
SECTION E
SECTION B
SECTION A
SECTION J
Biotite Alteration
+1% FeS2
+0.2% Cu
10' assays up to 1%
+0.4% Cu
PHELPS-DOD SHAFT
pilot hole for production shaft?
P.D. ROAD
9
10
4
3
32
28
29
15


A
A'
projected 430' SE
SMALL FAULT
SEC F-F'
projected 40' NW
projected 35' SE
projected 228' NW
projected 230' SE
projected 460' SE
projected 65' NW
projected 380' SE
projected 250' NW
projected 355' SE
projected 280' NW
P-D SHAFT
ES-21
ES-3
ES-1
ES-19A
ES-20
ES-14
ES-19
A-75
RL-25
A-65
A-66
RL-11
RL-4
RL-1
RL-6
RL-8
4000
3500
3000
2500
2000
1500
1000
500
0
Andesite agglomerate, epidote-chlorite alteration
gravel
basalt
Tb
Qal
cgl.
post mineral flows
Kag
andesite agglomerate
epidote-chlorite-sericite altered andesite agglomerate
epidote-chlorite-sericite alteration
spotty FeOx
very little mineralization
epidote-chlorite alteration
limonite on fractures, hematite as specules, blotches, pervasive stain. Traces CuSiO3
Oxides 10' Assays up to 0.13% Cu
FeOx, CuSiO3, lesser amts native Cu, cuprite
Oxides 10' Assays up to 0.62% Cu
1480' ave. 0.17% Cu
coal composition up to 0.33% Cu
weak FeOx on fractures
Oxides native Cu
421' of 0.20% Cu
10' of 0.50% Cu
limonite films on fractures with chlorite sericite alteration
Oxides
10' of 0.21% Cu
biotite, chlorite epidote alt.
general limonite, cuprite with CuSiO3 on veins
10' Oxide Assays up to 0.64%
OXIDE
SULFIDE
fault
biotite, chlorite, local clay sericite, limonite, cuprite CuSiO3
10' Oxide Assays up to 0.71% Cu
10' Assays up to 1.12 % Cu
10' Assays up to 1.12% Cu
Considerable amounts monzonite porphyry dikes & sills
limonite cuprite CuSiO3 indicates CuFeS2, FeS2 at depth
10' Oxide Assays up to 1.02% Cu
10' Assays up to 1.17% Cu
MoS2
chlorite, biotite, epidote, local sericite alteration
10' Oxide Assays up to 2.31% Cu
10' Assays up to 0.35% Cu
10' ASSAYS TO 1% Cu
10' ASSAYS 0.2% +
1760 Level
traces hematite, up to ½% magnetite
2% to 5% magnetite & hematite on fractures
andesite porphyry, epidote-chlorite alteration
AGGLOMERATE ANDESITE
andesite porphyry chlorite-epidote-sericite alt.
andesite porphyry, some clastic character, biotite-chlorite-clay alteration.
tuff
andesite porphyry
oxide sulfide
BIOTITE ALTERATION
biotite-chlorite alteration
½ to 1% FeS2
+1% FeS2
scattered assays 0.01 to 0.10% Cu
biotite-chlorite
epidote-chlorite
biotite alt.
chlorite alteration
2% to 5% magnetite
BEND IN SECTION
ESSEX TRACT 37
TRACT 37
P.D. PATENTED CLAIMS
BUTTE FAULT
feet %Cu
79 0.68
131 0.41
41 0.71
174 0.34
244 0.25
375 0.31
161 0.18
205 0.26
190 0.16
SECTION A—A'
LOOKING NW'erly
ESSEX
ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421
PROJECT: SAFFORD
PROSPECT:
NUMBER: A021P8-771
COUNTY, STATE: GRAHAM, ARIZONA
LAT., LONG.:
T., R., & SECTION:
GEOLOGICAL CROSS SECTION
SCALE: 1" = 500'
DATE: APRIL 1973
DATA BY: STAFF
PREPARED BY: ATC



SECTION B-B'

LOOKING NW

ESSEX

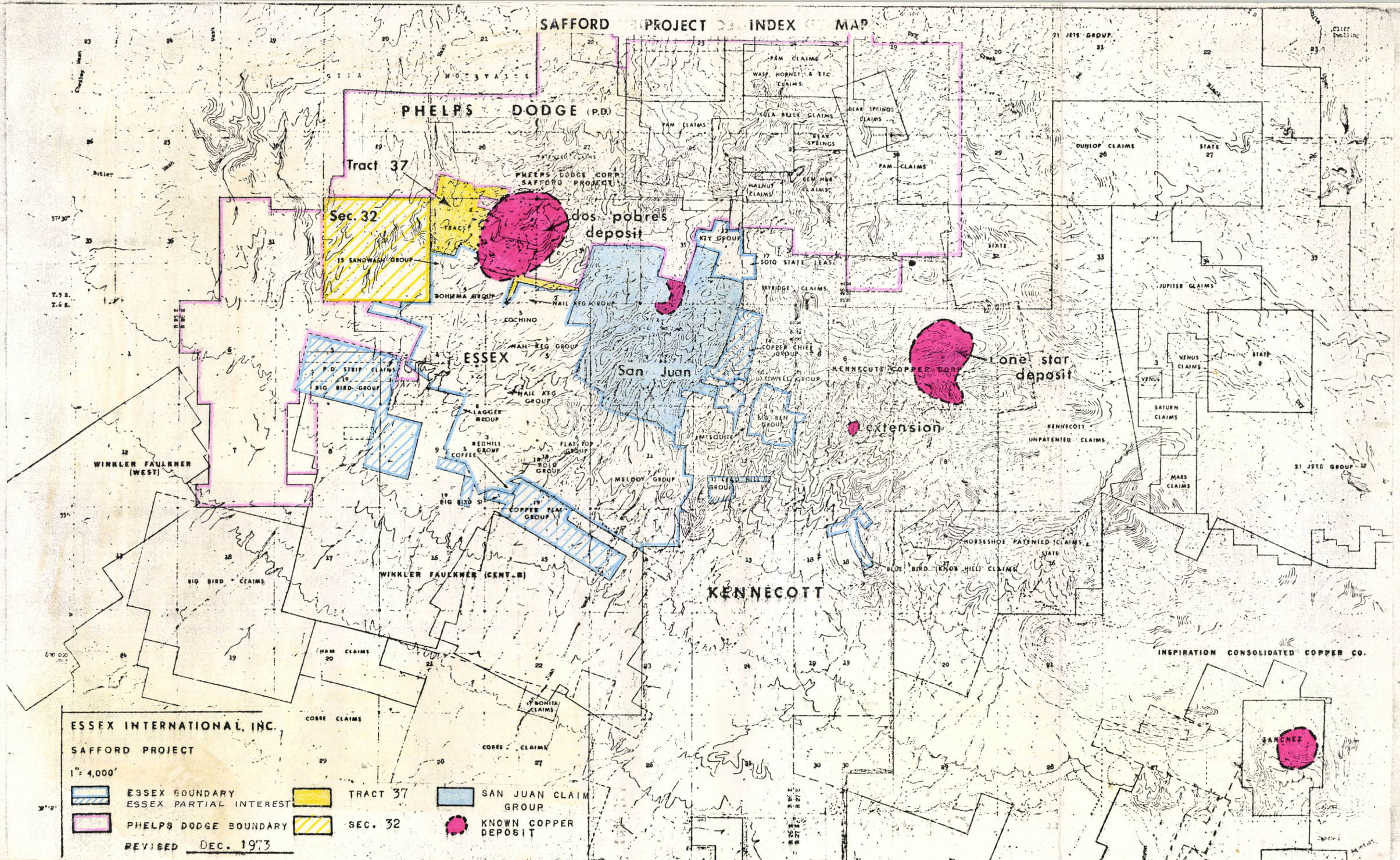
ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421

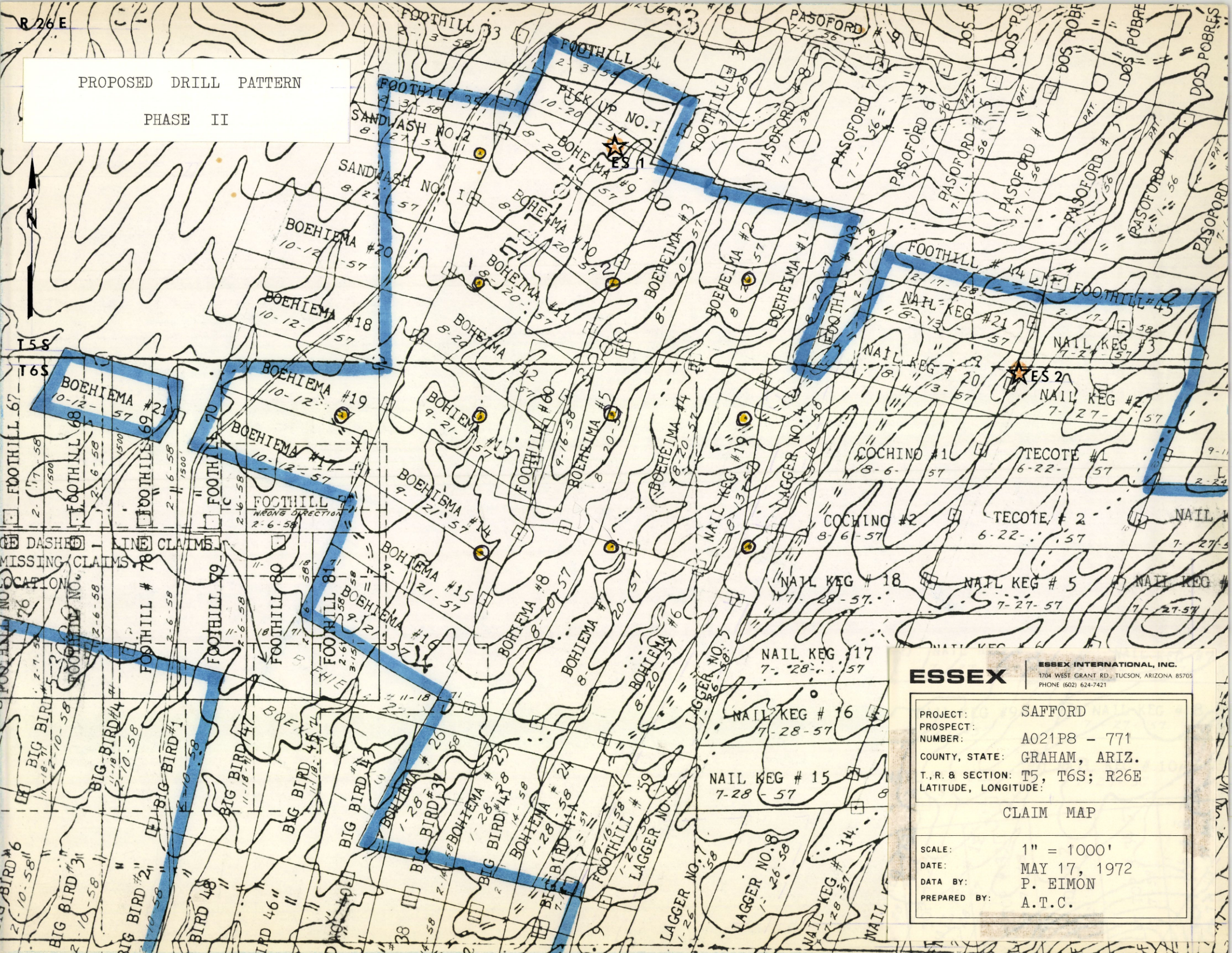
PROJECT:	SAFFORD
PROSPECT:	
NUMBER:	A021P8-771
COUNTY, STATE:	GRAHAM, ARIZONA
LAT., LONG.:	
T., R., & SECTION:	

GEOLOGICAL CROSS SECTION

SCALE:	1" = 500'
DATE:	APRIL 1973
DATA BY:	STAFF
PREPARED BY:	BLR & ATC

SAFFORD PROJECT INDEX MAP




R 26 E
PROPOSED DRILL PATTERN
PHASE II
T5S
T6S
N
ES 1
ES 2
FOOTHILL 33
FOOTHILL 34
FOOTHILL 35
PICK UP NO. I
SANDWASH NO. 2
SANDWASH NO. I
BOEHIEMA #20
BOEHIEMA #18
BOEHIEMA #21
BOEHIEMA #19
BOEHIEMA #1
BOEHIEMA #14
BOEHIEMA #15
BOEHIEMA #16
BOEHIEMA #5
BOEHIEMA #4
BOEHIEMA #3
BOEHIEMA #2
BOEHIEMA #8
BOEHIEMA #6
BOEHIEMA #37
BOEHIEMA #41
BOEHIEMA #41A
BOEHIEMA #25
BOEHIEMA #26
PASOFORD #9
PASOFORD #8
PASOFORD #7
PASOFORD #6
PASOFORD #3
PASOFORD #2
DOS POBRES
FOOTHILL #14
FOOTHILL #45
NAIL KEG #21
NAIL KEG #3
NAIL KEG #20
NAIL KEG #2
COCHINO #1
TECOTE #1
COCHINO #2
TECOTE #2
NAIL KEG #18
NAIL KEG #5
NAIL KEG #17
NAIL KEG #16
NAIL KEG #15
LAGGER NO. 4
LAGGER NO. 5
LAGGER NO. 6
LAGGER NO. 7
LAGGER NO. 8
FOOTHILL #59
FOOTHILL #60
FOOTHILL #67
FOOTHILL 68
FOOTHILL 69
FOOTHILL 70
FOOTHILL 79
FOOTHILL 80
FOOTHILL 81
FOOTHILL #78
FOOTHILL
WRONG DIRECTION
2-6-58
DASHED - LINE CLAIMS
MISSING CLAIMS
LOCATION
BIG BIRD #5
BIG BIRD #4
BIG BIRD #1
BIG BIRD 47
BIG BIRD 45
BIG BIRD #3
BIG BIRD #6
BIG BIRD #2
BIRD 48
BIRD 46
ESSEX
ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421
PROJECT: SAFFORD
PROSPECT:
NUMBER: A021P8 - 771
COUNTY, STATE: GRAHAM, ARIZ.
T., R. & SECTION: T5, T6S; R26E
LATITUDE, LONGITUDE:
CLAIM MAP
SCALE: 1" = 1000'
DATE: MAY 17, 1972
DATA BY: P. EIMON
PREPARED BY: A.T.C.