

CONFIDENTIAL

Release Date _____

Bob James Drilling, Suncor 1-19
NE NE 19-2N-1W Maricopa 866

RECEIVED

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG AUG 2 1988

DESIGNATE TYPE OF COMPLETION: New Well Work-Over Deepen Plug Back Same Reservoir Different Reservoir Oil Gas Dry

DESCRIPTION OF WELL AND LEASE

Operator: Bob James Drilling & Exploration Company; Address: 7250 S. Kyrene #102, Tempe, AZ 85283

Federal, State or Indian Lease Number or name of lessor if free lease: SunCor Development Company; Well Number: 1-19; Field & Reservoir: Wildcat

Location: 330' FNL & 990' FEL; County: Maricopa

Sec. TWP-Range or Block & Survey: Section 19-T2N-R1W

Date spudded: 6-1-88; Date total depth reached: 6-15-88; Date completed, ready to produce: ---; Elevation (DF, RKB, RT or Gr.): 1062 KB; Elevation of casing hd. flange: --- feet

Total depth: 4000' DRLR; P.B.T.D.: 1650; Single, dual or triple completion?: ---; If this is a dual or triple completion, furnish separate report for each completion.

Producing interval (s) for this completion: 1500-500 to complete as water well; Rotary tools used (interval): 0 - 4000; Cable tools used (interval): ---

Was this well directionally drilled?: No; Was directional survey made?: No; Was copy of directional survey filed?: NA; Date filed: NA

Type of electrical or other logs run (check logs filed with the commission): DLL - BHC - CME-Z Run FO; Date filed: June 88

CASING RECORD

Table with 7 columns: Purpose, Size hole drilled, Size casing set, Weight (lb./ft.), Depth set, Sacks cement, Amt. pulled. Rows include Conductor and Surface.

TUBING RECORD

LINER RECORD

Table with 8 columns: Size, Depth set, Packer set at, Size, Top, Bottom, Sacks cement, Screen (ft).

PERFORATION RECORD

ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD

Table with 4 columns: Number per ft., Size & type, Depth Interval, Am't. & kind of material used, Depth Interval.

INITIAL PRODUCTION

Date of first production: ---; Producing method (indicate if flowing, gas lift or pumping--if pumping, show size & type of pump:)

Table with 7 columns: Date of test, Hrs. tested, Choke size, Oil prod. during test, Gas prod. during test, Water prod. during test, Oil gravity. Includes sub-headers for bbls., MCF, and Gas-oil ratio.

Disposition of gas (state whether vented, used for fuel or sold):

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Contract Rep. of the Bob James Drilling & Exp. (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date: 8-2-88; Signature: [Handwritten Signature]

DETAIL OF FORMATIONS PENETRATED

FORMATION	TOP	BOTTOM	DESCRIPTION*
Quaternary	Surface	74	<u>Water Zones</u>
Pliocene/Miocene	74	1716	Surface - 660'
			695 - 915'
			975 - 1210'
Miocene Salt	1716	4000' TD	1320 - 1550'

* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS:

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the State of Arizona Gas Conservation Commission not later than thirty days after project completion.

Form No. 4

RECEIVED

PLUGGING RECORD				JUN 22 1988	
Operator <u>Bob James Drly Co</u>			Address <u>O & G CONS. COMM.</u>		
Federal, State, or Indian Lease Number or lessor's name if fee lease.		Well No. <u>1-19</u>	Field & Reservoir		
Location of Well <u>NW, NE, NE, Sec 19, T2N, R1W</u>			Sec-Twp-Rge or Block & Survey	County <u>Maricopa</u>	
Application to drill this well was filed in name of <u>SunCo, Bob James Drly</u>		Has this well ever produced oil or gas <u>No</u>	Character of well at completion (initial production): Oil (bbls/day) _____ Gas (MCF/day) _____ <u>Dry?</u>		
Date plugged: <u>6-16-88</u>	Total depth <u>4000'</u>	Amount well producing when plugged: Oil (bbls/day) _____ Gas (MCF/day) _____ Water (bbls/day) _____			
Name of each formation containing oil or gas. Indicate which formation open to wellbore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement		
<u>Top Luke Sst</u>		<u>1720 ~ 4000'</u>	<u>140 sks Neostament ramped @ 2010. spot Plug @ 1650 inside 8 3/8 Casing</u>		
CASING RECORD					
Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
<u>8 3/8</u>	<u>1865</u>	<u>None</u>	<u>1865</u>		<u>Stage Ccd @ 591' Floated @ 1820. Float shoe @ 1865</u>
Was well filled with heavy drilling mud, according to regulations <u>Yes 2010 to TD. 10.1-35 vis mud</u>				Indicate deepest formation containing fresh water. <u>1500'</u>	
NAMES AND ADDRESSES OF ADJACENT LEASE OPERATORS OR OWNERS OF THE SURFACE					
Name	Address			Direction from this well:	
<u>Sun Co. Development</u>	<u>555 E Plaza Cr. Hitchfield Park AZ. 85390</u>			<u>NW</u>	
In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.					
Use reverse side for additional detail.					
CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the <u>OWNER</u> of the <u>James Drilling & Exp Co</u> (company) and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.					
Date <u>6-18-88</u>		Signature <u>Robert James</u>			
Permit No.			STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION Plugging Record File One Copy		
			Form No. 10		

SUNDRY NOTICES AND REPORTS ON WELLS

JUN 22 1988

O & G CONSV. COMMISSION

1. Name of Operator Bob James Drilg Co
 2. OIL WELL GAS WELL OTHER (Specify) Exploration well (WC)
 3. Well Name SunCor. Sunset Point 1-19
 Location NW, NE, NE
 Sec. 19 Twp. 2N Rge. 1W County Maricopa, Arizona.

4. Federal, State or Indian Lease Number, or lessor's name if fee lease _____

5. Field or Pool Name W.C. (Miocene)

6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	MONTHLY PROGRESS <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	DIRECTIONAL DRILL <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	PERFORATE CASING <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(OTHER) _____	ABANDONMENT <input type="checkbox"/>
(OTHER) <u>Plug Back</u>			

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

7. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

Exploratory Well drilled to 4000' Drilg depth. 3998' log depth
 12 1/4" Hole drilled to 1878' - 7 7/8" Hole 1878 to 4000'
 Set and cemented 1865' - 8 5/8" Casing. Cemented to surface
 2 stage's stage col @ 591'.
 T.D. on 6-16-88. (4000') logged well w/ Schlumberger.
 BHC Sonic w/ Gamma Ray and DLH. 6-16-88.
 Plugged Back from 2010. to 1650. w/ 140 sks neat cement
 on 6-16-88. Plugging Complete @ 2:30 PM.
 Drilg Rig Released on 6-17-88 @ 12:00 Noon.

8. I hereby certify that the foregoing is true and correct.

Signed Robert A. James Title Owner Date 6-18-88

Permit No. _____

STATE OF ARIZONA
 OIL & GAS CONSERVATION COMMISSION
 Sundry Notices and Reports On Wells
 Form No. 25 File One Copy

TO: Oil and Gas Conservation Commission
State of Arizona

AUG 22 1988

O & G CONSV. COMMA.

This is to advise you that I accept the abandoned wildcat well, known as the
SunCor 1-19 located on the N.E. ¼-¼

of Section 19 Township 2N Range 1W, County of Maricopa
Arizona, as a water well to be used for domestic purposes.

Further, I accept full responsibility for the proper maintenance and use of
the above well, including final plugging, in full compliance with the Rules
and Regulations adopted by the Oil and Gas Conservation Commission.

I understand that I am responsible for compliance with the provisions of the
State Water Code, Chapter 1, Title 45, Arizona Revised Statutes and with any
applicable requirements of U.S. Geological Survey

Signature *Geoff Appleyard*

Address 555 E. Plaza Circle

Litchfield Park, Arizona 85340

State of ARIZONA

County of Maricopa

On this, the 22 day of August, 1988, before me, _____

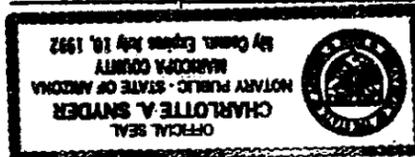
Charlotte A. Snyder, the undersigned officer, personally appeared

Geoff Appleyard, known to me (or satisfactorily proven)
to be the person whose name is subscribed to the within instrument and ack-
nowledged that Geoff Appleyard executed the same for the
purpose therein contained.

In witness whereof I hereunto set my hand and official seal.

Notary Public *Charlotte A. Snyder*

My Commission expires July 10, 1992



State of Arizona
OIL & GAS CONSERVATION COMMISSION
WATER WELL ACCEPTANCE
Form 26 - File one copy

Permit No. 866

June 14, 1988

MEMO TO FILE

James I Suncor
Sec 19, T2N-R1W
Maricopa County, Arizona
Permit No. 866

Bob James called this morning to request permission to drill below 3500 feet (Permit Depth). Permission was granted orally, since surface casing has been set into the salt below 1800 feet, which ought to be adequate to allow drilling to 5,000 feet.

Daniel J. Brennan

JUN 8 1988

O & G COMS. COMM.

June 8, 1988

SUNDRY NOTICE

Bob James Drilling Exp. (Operator)
7250 S. Kyrene #102
Tempe, AZ 85283

TO: Arizona Oil and Gas Commission

REF: Casing program change, Sunset #1-19

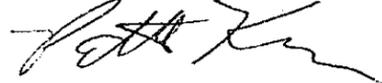
Dear Sir:

Operator request change of surface casing program to
set 8 5/8 24# J55 casing at 1878.

The reason being, operator has encountered top of salt
at approximately 1878.

Cementing procedure and remainder of the program will not
change.

Sincerely,



Patch Karr
Contract Representative

866

RECEIVED

JUN 13 1988

O & G COM.

June 8, 1988

SUNDRY NOTICE

Bob James Drilling Exp. (Operator)
7250 S. Kyrene #102
Tempe, AZ 85283

TO: Arizona Oil and Gas Commission

REF: Casing program change, Sunset #1-19

Dear Sir:

Operator request change of surface casing program to
set 8 5/8 24# J55 casing, at 1878.

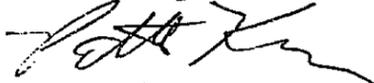
Depth of Casing Shoe is 1865.71

The reason being, operator has encountered top of salt
at approximately 1878.

Cementing procedure and remainder of the program will not
change.

Cement was circulated to Surface on Both Stage I and II

Sincerely,



Patch Karr
Contract Representative

Attn

Don Brennan

*Enclosed is the copy of the cementing Report.
Also a copy of My Casing Report to SunCor and McIndy.*

June 9-88

*Sincerely,
J. Hendrickson*

REMARKS:

JUN 13 1988

CASING & CEMENTING DETAIL

Pieces	Item - Make - Description	Make up Length
1	Davis Lynch 8 5/8 Float Shoe 8 Rd Thd	1.67
1	Jt New 8 5/8 Casing J-55 8 Rd Thd (Rector Mfg 24" Casing)	42.28
1	Float Collar (Davis Lynch, 8 Rd Thd. @ 1820.31 Ft.)	1.45
29	Jts New 8 5/8 24" J-55 8 Rd Thd Casing (Rector)	1225.04
1	Stage Collar (Davis Lynch set @ 591.55)	3.72
17	Jts New 8 5/8 Casing J-55 8 Rd Thd Rge 3 24" Casing.	591.55

TD 1878 Cong landed → 12:30 Off Bottom.

No. Jts. Delivered	47	1985.70
No. Jts. Used	44	1858.91
No. Jts. Leftover	3	126.79
Location of Leftover Jts.		

Total Length of String
 Above (-) Below (+) KB
 Casing Landed @ (KBM)

1865.71

CASING EQUIPMENT:

On Loc Davis Lynch Float Shoe, Float Col, 12 centralizers spaced @ 120' intervals and 1 Davis Lynch Cement Stage Col.

CEMENTING DETAIL:

Stage 1 Preceded cement 430 Bbls Fresh water and mixed & pumped 827 St. Next cement (Blue Circle Co) 192 Bbls Slurry mixed @ 15 PPG Density and 1.3 Cu Yield. Slow Pump to Plug Flow (3 BPM w/ 100 Bbls cement mixed and maintain Plug Flow 30 Bbls, Completed Dip @ 6.2 BPM and Pumped Plug @ 118.9 Cu Displacement and 1000 PSI. Float held OK. Open Stage tool and Circ approx 30 Bbls cement to Pit Express. Start 2nd stage after circ hole clean 2 hrs. 2nd Stage 20 Bbls Wtr Head @ Mix Pump 270 Skts @ 15" Slurry 1.3 Cu PPG with returns. Total 66 Bbls slurry. Displaced 438 Bbls Wtr & Close Stage tool. Hold OK.

BUMPER PLUG W/ 1000 gal PLUG DOWN AT 4:15 am/pm
 Close 2nd Stage 200 Second Stage → 7:15 am

RENTAL TOOLS: (include reamers, shock subs, stabilizers, casing, etc.)

ITEM	DATE PICKED UP	DATE LAYED DOWN	TOTAL DAYS

**CEMENTING SERVICE REPORT
SUPPLEMENT LOG**

DWL-496-1 PRINTED IN U.S.A.

SUNCOR Development Co.

DATE 6-9-88

CUSTOMER WELL NAME AND NUMBER
SUNCOR #1-19

LOCATION (LEGAL)
Sunset Point

DOWELL LOCATION
EL Centro

TREATMENT NUMBER 1-04-00
PAGE 2 OF 2 PA

TIME	PRESSURE		VOLUME PUMPED, GAL		PUMP RATE	FLUID TYPE	FLUID DENSITY	SERVICE LOG DETAIL
	IN	OUT	INCREMENT	CUM				
0646	PIA	LN				H ₂ O		START 2nd STAGE
0646		LN	30		7	H ₂ O		Start Pumping H ₂ O ahead
0650		LN	66		7	CMT 15'		Start Cement Slurry
0706		LN			/	" "		Cement Mixed (shut down)
0706		LN			/	" "		Drop Closing Plug 591
0706		LN	37		7	H ₂ O		Start Disp
0715		LN			3			Bump Closing Plug & Close D.U. 100
0715		LN			0			Shutdown
0716		LN						Check For Flow back Ald CIP End of Job

RECEIVED

JUN 13 1988

O & G CONS. CO.

CEMENTING SERVICE REPORT

DS-496 PRINTED IN U.S.A.

DOW SCHLUMBERGER INCORPORATED

TREATMENT NUMBER 17-04-0049 DATE 6-8-88
 DISTRICT FL Centro CA 17-C

WELL NAME AND NO. **SUNCOR #1-19** LOCATION (LEGAL) **SUNSET POINT** RIG NAME **Bob James Drilling Rig #2**
 FIELD-POOL **19-TIAN-R1W** FORMATION **19-TIAN-R1W** WELL DATA: BIT SIZE **2 7/8** CSQ/Liner Size **3 7/8** TOTAL WEIGHT **24** DATE **JUN 18 1988**
 COUNTY/PARISH **Maricopa** STATE **AZ** API. NO. MUD TYPE GRADE MUD DEPTH **45'** MUD VISC. Disp. Capacity
 NAME **SUNCOR Development** ADDRESS ZIP CODE

SPECIAL INSTRUCTIONS **CEMENT 85% CASING IN 2 STAGES**
 IS CASING/TUBING SECURED? YES NO
 LIFT PRESSURE **1300** PSI CASING WEIGHT + SURFACE AREA **12** STAGE **PLUGS**
 PRESSURE LIMIT **1300** PSI BUMP PLUG TO **500** OVER PSI
 ROTATE RPM RECIPROCATE FT No. of Centralizers **12**

TIME	PRESSURE		VOLUME PUMPED BBL		INJECT RATE	FLUID TYPE	FLUID DENSITY	SERVICE LOG DETAIL
	TBG OR D.P.	CASING	INCREMENT	CUM				
2030								PREJOB SAFETY MEETING ARRIVE ON LOC
0300		U						START 1ST STAGE
0300		M	27		7	H2O	8.34	START Pumping H2O ahead
0313		M	127 1/2		7	CMT 15		START Cement Slurry
0331		D	30		4	CMT 15		Lower Pump Rate
0339		D	90		7	CMT 15		Increase Pump Rate
0347					0	CMT 15		Cement Mixed Shutdown
0347		D	30		7	H2O		Drop 1st STAGE Plug Start Disp
0353		A	20	30	4			Lower Pump Rate Plug Going thru
0358		A	50	50	7			Increase Pump Rate
0408		D	16	100	2 1/2			Lower Pump Rate
0411		S		116	0			Bump 1st STAGE Plug/shutdown
0412		S						Bleed PSI off Float Head
0420								Drop Opening BUMP/Wait on Bomb
0422					2 1/2			Pump to OPEN STAGE COLLAR
0423					7			Circ Well open at 400 PSI
0430					0			Shutdown / Let Rig Circ 2 Hrs

SYSTEM CODE	NO. OF SACKS	YIELD CU. FT/SK	COMPOSITION OF CEMENTING SYSTEMS	SLURRY MIXTURE BBL
151	827	1.3	TYPE 3 CEMENT (CUSTOMERS)	192
220	370	1.3	TYPE 3 CEMENT	66

BREAKDOWN FLUID TYPE HESITATION SQ. RUNNING SQ. CIRCULATION LOST YES NO
 PRESSURE MAX. MIN. Cement Circulated To Surf. YES NO
 BREAKDOWN PSI FINAL PSI DISPLACEMENT VOL. BBL TYPE OIL STORAGE BRINE
 OF WELL OF GAS INJECTION WILD
 Washed Thru Parts YES NO TO FT MEASURED DISPLACEMENT WIRELINE
 PERFORATIONS CUSTOMER REPRESENTATIVE **J. Anderson** DS SUPERVISOR **R.S. Hibner**

APPLICATION FOR PERMIT TO DRILL OR RE-ENTER

APPLICATION TO DRILL

RE-ENTER OLD WELL

NAME OF COMPANY OR OPERATOR		
Bob James Drilling & Exploration Company		
Address City State		
7250 S. Kyrene #102, Tempe, Arizona 85283		
Drilling Contractor		
Bob James Drilling & Exploration Co.		
Address 7250 S. Kyrene, #102, Tempe, AZ 85283		
DESCRIPTION OF WELL AND LEASE		
Federal, State or Indian Lease Number, or if fee lease, name of lessor	Well number	Elevation (ground)
SunCor Development Company	1-19	1051.20' GL
Nearest distance from proposed location to property or lease line:	Distance from proposed location to nearest drilling, completed or applied—for well on the same lease:	
330 feet	NA feet	
Number of acres in lease:	Number of wells on lease, including this well, completed in or drilling to this reservoir:	
635.4039 Acres	None	
If lease, purchased with one or more wells drilled, from whom purchased:	Name	Address
NA		
Well location (give footage from section lines)	Section—township—range or block and survey	Dedication (Comply with Rule 105)
330' FNL & 990' FEL	Section 19-T2N-R1W, A.L.T.A.	E ₃ of NE/4
Field and reservoir (if wildcat, so state)	County	
Wildcat	Maricopa	
Distance in miles, and direction from nearest town or post office		
5 miles West of Litchfield Park Post Office		
Proposed depth:	Rotary or cable tools	Approx. date work will start
3500'	Rotary	May 25, 1988
Bond Status <u>Filed</u>	Organization Report	Filing Fee of \$25.00
Amount \$ 5,000 <u>CASH</u>	On file Or attached <u>Attached</u>	Attached <u>yes</u>
Remarks:		
CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the <u>Agent</u> of the <u>Bob James Drilling & Exploration</u> (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.		
Signature <u>[Handwritten Signature]</u>		
Date <u>5-23-88</u>		
Permit Number: <u>866</u>	STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION Application to Drill or Re-enter File Two Copies	
Approval Date: <u>5/23/88</u>		
Approved By: <u>R. A. Yama</u>		
Notice: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.		Form No. 3

1. Operator shall outline the dedicated acreage for *both* oil and gas wells on the plat.
2. A registered professional engineer or land surveyor registered in the State of Arizona or approved by the Commission shall show on the plat the location of the well and certify this information in the space provided. See Attached
3. ALL DISTANCES SHOWN ON THE PLAT MUST BE FROM THE OUTER BOUNDARIES OF THE SECTION.
4. Is the Operator the only owner in the dedicated acreage outlined on the plat below? YES _____ NO xx .
5. If the answer to question four is "no," have the interests of all the owners been consolidated by communitization agreement or otherwise? YES _____ NO xx . If answer is "yes," Type of Consolidation _____
6. If the answer to question four is "no," list all the owners and their respective interests below:

Owner SunCor Development Company - 100% Surface &	Land Description Section 19-T2N-R1W
Mineral Interest Owner	635.4039 [±] Acres - See attached plat

CERTIFICATION

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Name _____

Position _____

Company _____

Date _____

I hereby certify that the well location shown on the plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed _____

Registered Professional Engineer and/or Land Surveyor _____

Certificate No. _____

PROPOSED CASING PROGRAM

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement	Type Neat Cement
8 5/8"	24#/ft.	J-55 Surf.	0	2400'	Two Stage 0 - 2400' 2200 - 3500'	250	Class "G"
5 1/2"	15.5#/ft.	K-55 Prod.	0	2300'			
5 1/2"	17#/ft.	N-80 Prod.	2300'	3300'			
5 1/2"	15.5#/ft.	K-55 Prod.	3300'	3500'			

P/N 866

MAY 25 1988

C. & S. CONS. COMM.

McILNAY & ASSOCIATES, INC.

McILNAY

2305 OXFORD LANE • CASPER, WY 82604 • 307/285-4351

PETROLEUM CONSULTING ENGINEERS & PROPERTY MANAGEMENT

REGISTERED PROFESSIONAL ENGINEERS

DRILLING PROGNOSIS

May 9, 1988

OWNER: SunCor Development Company
PROSPECT: Sunset Point
WELL: SunCor #1-19
LOCATION: NW NE NE Sec. 19-T2N-R1W
 Maricopa County, AZ
ELEVATION: 1055' Est. G.L.
 1065' Est. K.B.

ESTIMATED FORMATION TOPS:

	<u>Depth-ft</u>
Quaternary -----	Surface
Pliocene -----	150'
Miocene Sands -----	1150'
Luke Salt -----	2405'
Miocene Sands (Base of Salt) -----	3155'
T.D. -----	3500'

ESTIMATED TIME REQUIRED TO COMPLETE PROJECT:

9 days

POTENTIAL DRILLING PROBLEMS:

1. Total estimated depth of 3500' may not be adequate to evaluate objective zones.
2. Deviation as a result of steep dipping formations from surface to T.D.
3. Alluvial fill type deposits (gravel and boulders) from surface to top of salt may cause hole cleaning problems and sloughing.
4. Lost circulation at top of Luke Salt.
5. Flowing salt resulting in sticking problems (Luke Salt).
6. Abnormal or subnormal pressured zones may exist below Luke Salt.

HOLE SIZE:

<u>Interval</u>	<u>Bit Size</u>
0 - 2405'	12 1/4"
2405 - T.D.	7 7/8"

CASING SIZE:

Conductor Casing:

*0 - 60' --- 20' steel casing with 3/8" wall thickness.

*Conductor casing must be set below shallow gravel beds anticipated at 40 to 60'.

Surface Casing:

2405' - 8 5/8", 24#/ft, K-55, New

To be set at top of Luke Salt. Utilize epoxy on shoe & float collar.

Production Casing: (Tentative)

<u>Interval</u>	<u>Net Ft.</u>	<u>Gross Ft.</u>	<u>Specifications</u>
*0 - 2300'	2300'	2325'	5 1/2", 15.5#/ft, K-55, slms, ST&C, "A"
*2300 - 3300'	1000'	1010'	5 1/2", 17#/ft, N-80, slms, LT&C, "A"
3300 - 3500'	200'	205'	5 1/2", 15.5#/ft, K-55, ST&C, "A"
Total	3500'	3540'	

*Assumes Luke Salt at 2405'. 17#/ft, N-80 (Minimum specifications) must be set across salt zone to prevent collapse.

CEMENTING:

MAY 25 1988

Surface Casing:

O & S CONS. COMM.

Two Stage Job (100% excess volume):

First Stage:

Lead: 1000 sx. Class "G" or equivalent.

Second Stage:

Lead: 1000 sx. Class "G" or equivalent w/2% CaCl.

Notes:

1. Check make-up water for compatibility.
2. Surface casing must be cemented to surface. Utilize 1" if necessary.
3. Circulate 2 hours prior to second stage and after opening stage collar.
4. Wait on cement 12 hours prior to nipping up.

Production Casing: (Tentative)

Cement Slurry:

325 sx. Class "G" with 18% salt.

Note: Cement to 200' into 8 5/8" casing. Recalculate slurry volume based on caliper log data.

CASING ACCESSORIES:

Surface Casing (Two Stages):

- 1 - 8 5/8" Guide Shoe
- 1 - 8 5/8" Float collar placed first collar above shoe.
- 1 - 8 5/8" Centralizer placed middle shoe joint.
- 1 - 8 5/8" Centralizer placed first collar above float collar.
- 7 - 8 5/8" Centralizers placed every 4th collar above float collar.
- 1 - 8 5/8" Centralizer placed 3rd collar below surface.
- 1 - 8 5/8" Stage Collar at approximately 1200'.
- 1 - 8 5/8" Centralizer placed first collar above and below stage collar.
- 1 - 8 5/8" Metal Petal Basket second and third collar below stage collar.

Note: Total 12 centralizers.

CORING:

None.

DST's:

One test anticipated.

As determined by wellsite geologist and based on samples, gas logging measurements, etc. Procedure will be determined as per shows, hole conditions, etc. All testing will be conducted during daylight hours only. If hydrocarbons are detected at the surface (includes while pulling test), drill pipe and collars will be reversed into a tank. Obtain grind out of fluid recovered.

OPEN HOLE LOGGING:

- GR-BHCS -- Base of surface casing to T.D.
- GR-SP-DLL -- Base of surface casing to T.D.
- Dipmeter -- Base of surface casing to T.D.

GAS LOGGING UNIT:

Unmanned unit - Base of surface casing to T.D.

SAMPLES:

<u>Frequency</u>	<u>Interval</u>
10'	Surface to T.D.

All cuttings to be washed and sacked in properly marked cloth bags. Tie sacked samples in approximately 100' groups to dry. Store in a clean and dry place. Sample interval maybe changed at discretion of wellsite geologist.

MUD PROGRAM:

	*0' - 2405'	*22405' - 3155'	*33155' - 3500'
Depth			
Wt.-#/gal	8.4-8.6	10-10.2	10 (Max.)
Vis.-sec.	28-45	N.C.	*4 32-34
WL-ml.	*1 N.C.	N.C.	8-10
Ph	8-9	8-9	8-9
PV-cp	6-8	N.C.	9-15
YP-#/100 ft ²	4-6	N.C.	4-9
Solids-%	1-4	----	12-16
Type System	FWG	Saturated Salt Wtr (Approx. 180,000 ppm Cl.)	Salt Gel

R
MAY 25 1988
O & G CONS. COMM.

Notes:

- * Top of Luke Salt
- *1 If clay swell is experienced, control W.L. from 12 to 20 ml.
- *2 Luke salt section. Attempt to maintain laminar flow.
- *3 Base of Luke Salt.
- *4 Raise viscosity to 45 to 50 for logging and DST's.
Circulate reserve pit.

DEVIATION CONTROL SPECIFICATIONS:

Interval	Rate of Change 0/1000'	Maximum Deviation	Measurement Frequency
0 - 2405'	1 1/2°	3° @ 2405'	As required for control
2405 - T.D.	1 1/2°	5° @ 3500'	As required for control

Stabilization equipment will only be utilized if deviation control cannot be maintained with bit weight and rotary speed.
Utilize a shock sub from surface to T.D.

DRILLING RECORDS:

1. Maintain 1' drilling time with Geograph or equivalent.
2. Hook weight and pump pressure to be continuously recorded (minimum requirement).
3. Daily tour reports to be completed each tour.
Record all pertinent information (i.e., mud checks, trips, BOP tests, repairs, down time, stuck drill pipe, fishing jobs, DST's, etc.).

MINIMUM BLOWOUT AND WELL CONTROL EQUIPMENT:

1. One 10", 900 Series, bag type preventor.
2. One 10", 3000 psig preventor with drill pipe and blind rams.
3. One 3" kill line installed below BOP rams.
4. 3000 psig choke manifold (flanged connections preferred) with two chokes installed (one variable and one fixed).
5. One flare line to be placed minimum of 125' from substructure.
6. Adequate clearance for a rotating (drilling) head if necessary.
7. Choke manifold and surface casing BOP stack will be tested to 2500 psig at time it is "nipped up" and thereafter as required every 15 days.
8. A 10,000 psig kelly cock will be utilized.
9. A full-opening drill pipe stabbing valve with proper connections will be on the rig floor at all times, ready to be inserted when the kelly is not in the string.
10. Crews will be well trained and versed in blowout control procedures and will demonstrate their proficiency during periodic drills conducted by the drilling contractor.
11. A daily operational check of the BOP and well control equipment will be required by the drilling contractor, which will be recorded in the daily "tour report".
12. Arizona OGCC and EPA (Ninth District, San Francisco, CA) will be given 24 hr notice and urged to witness the pressure testing of BOP and casing.



PERMIT TO DRILL

This constitutes the permission and authority from the
**OIL AND GAS CONSERVATION COMMISSION,
STATE OF ARIZONA,**

To: Bob James Drilling & Exploration Company
(OPERATOR)

to drill a well to be known as

Suncor 1-19
(WELL NAME)

located 230' FNL R-990th FEL

Section 19 Township 2N Range 1W, Maricopa County, Arizona.

The East 1/2 of NE 1/4 of said
Section, Township and Range is dedicated to this well.

Said well is to be drilled substantially as outlined in the attached Application and must be drilled
in full compliance with all applicable laws, statutes, rules and regulations of the State of Arizona.

Issued this 23 day of May, 19 88.

OIL AND GAS CONSERVATION COMMISSION

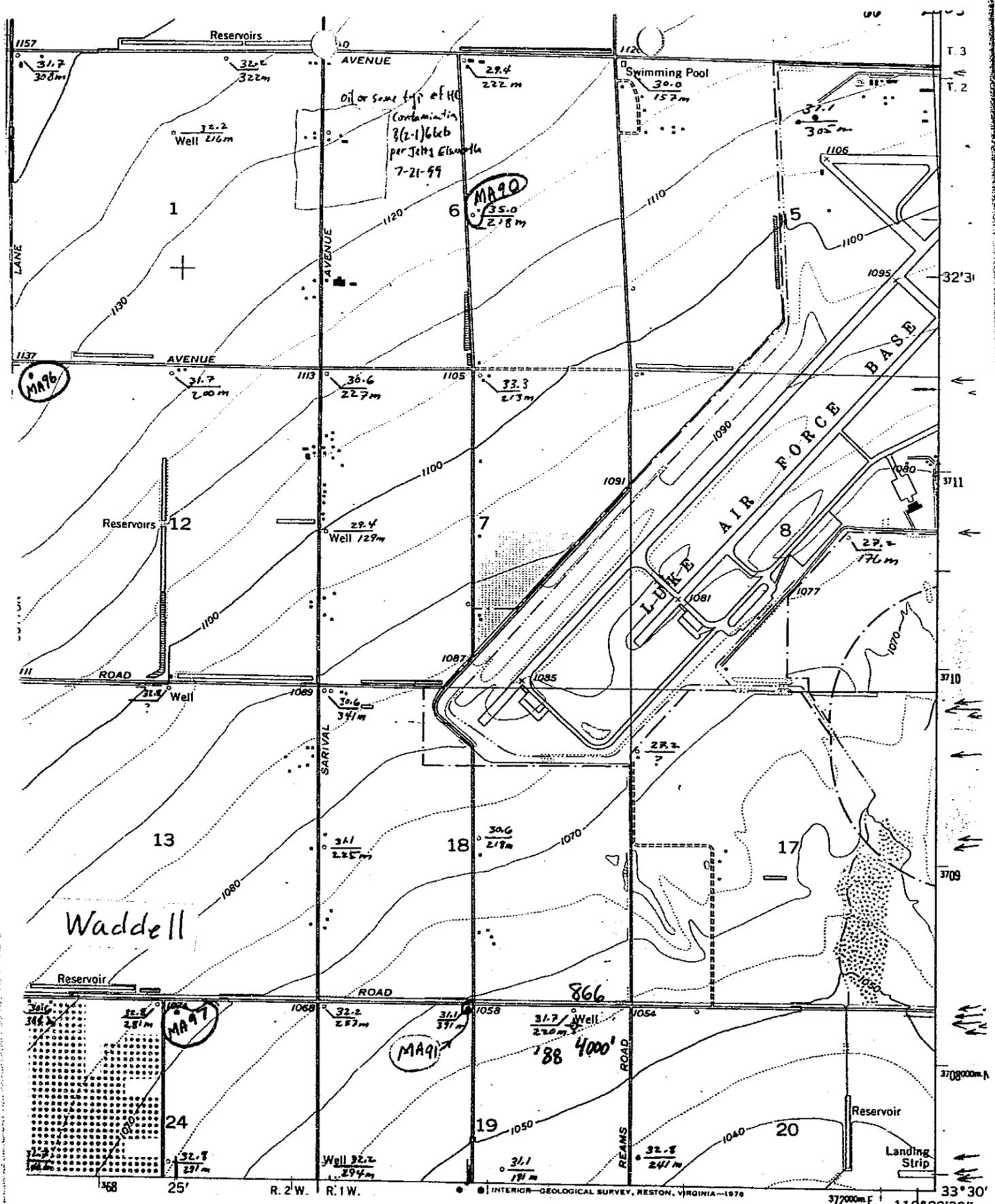
By R. A. Ytana
EXECUTIVE DIRECTOR
Enforcement Director

PERMIT 00866

RECEIPT NO. 2837

A.P.I. NO. 02-013-20024

**State of Arizona
Oil & Gas Conservation Commission
Permit to Drill**
FORM NO. 27

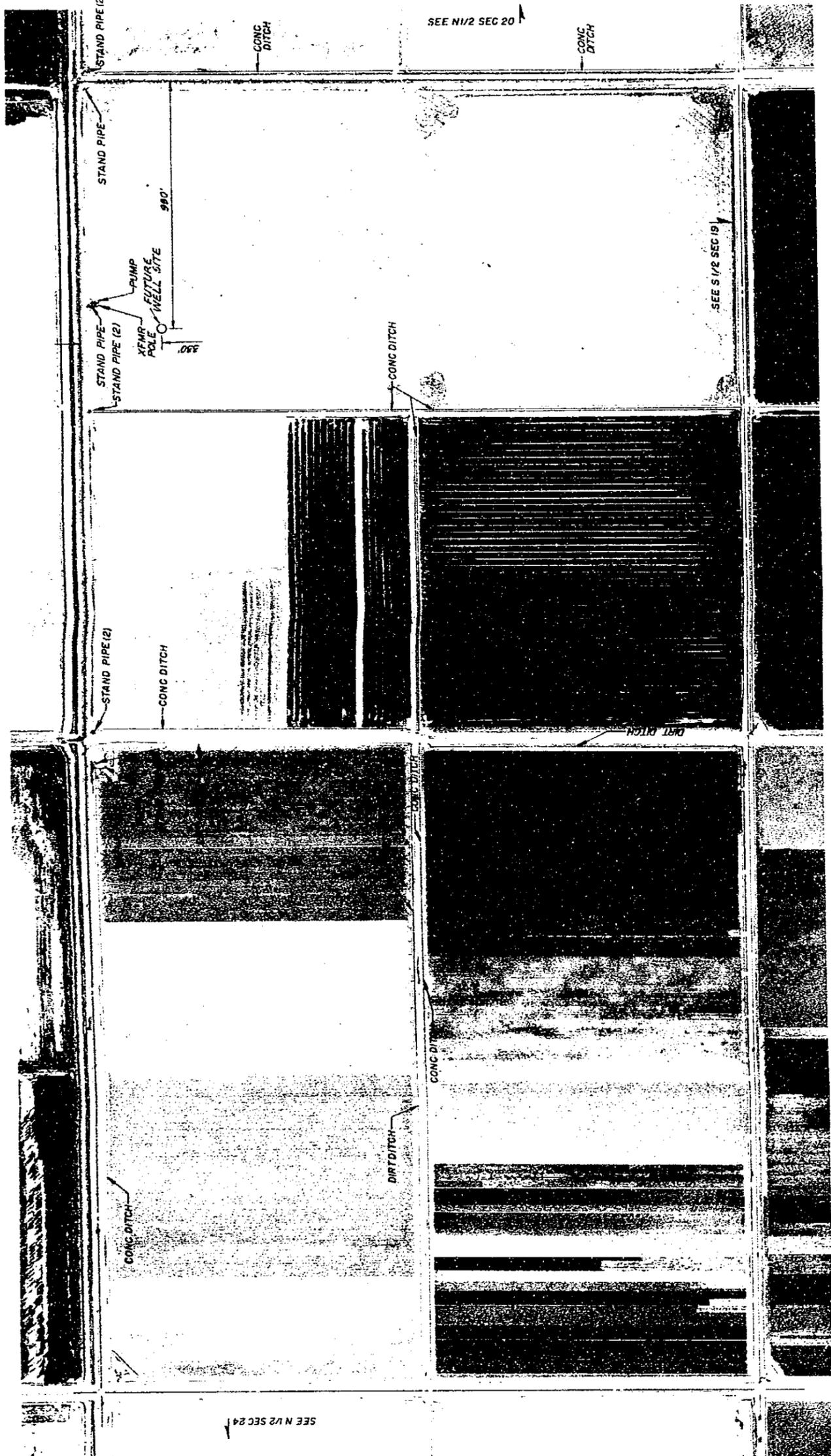


1 MILE
1000 FEET

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1978

ROAD CLASSIFICATION

STOL-3585



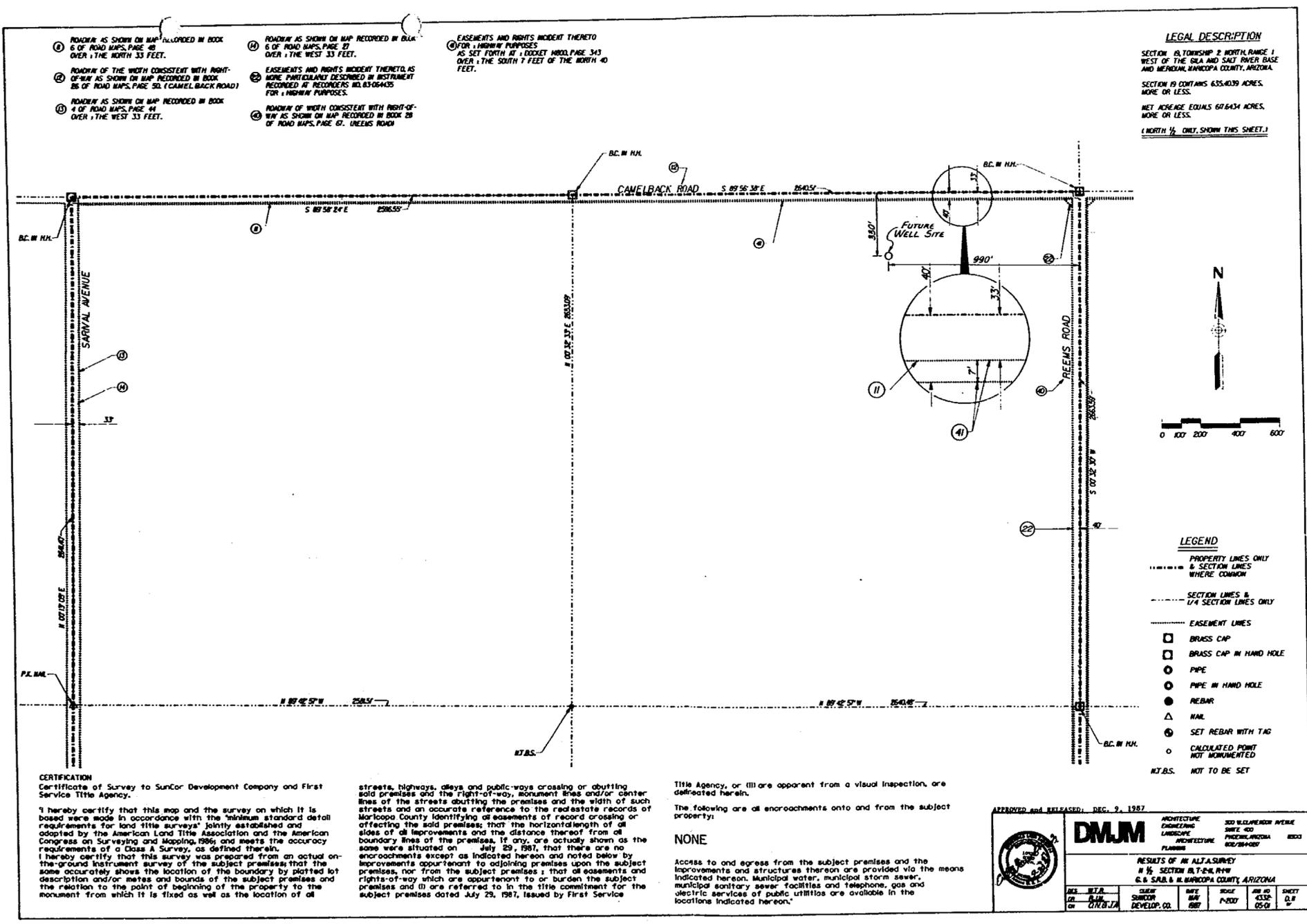
SEE N1/2 SEC 20

SEE S 1/8 SEC 19

SEE N1/2 SEC 24

N1/2 SEC 19
T2N R1W





- ① ROADWAY AS SHOWN ON MAP RECORDED IN BOOK 6 OF ROAD MAPS, PAGE 48 OVER THE NORTH 33 FEET.
- ② ROADWAY AS SHOWN ON MAP RECORDED IN BOOK 6 OF ROAD MAPS, PAGE 27 OVER THE WEST 33 FEET.
- ③ ROADWAY OF THE WIDTH CONSISTENT WITH RIGHT-OF-WAY AS SHOWN ON MAP RECORDED IN BOOK 26 OF ROAD MAPS, PAGE 50. (CAMELBACK ROAD)
- ④ ROADWAY AS SHOWN ON MAP RECORDED IN BOOK 4 OF ROAD MAPS, PAGE 44 OVER THE WEST 33 FEET.
- ⑤ ROADWAY OF WIDTH CONSISTENT WITH RIGHT-OF-WAY AS SHOWN ON MAP RECORDED IN BOOK 29 OF ROAD MAPS, PAGE 61. (GREENS ROAD)

EASEMENTS AND RIGHTS INCIDENT THERETO AS SET FORTH IN DOCKET NO. 83-064035 FOR HIGHWAY PURPOSES.

EASEMENTS AND RIGHTS INCIDENT THERETO AS MORE PARTICULARLY DESCRIBED IN INSTRUMENT RECORDED AT RECORDERS NO. 83-064035 FOR HIGHWAY PURPOSES.

LEGAL DESCRIPTION

SECTION 15, TOWNSHIP 2 NORTH, RANGE 1 WEST OF THE GILA AND SALT RIVER BASE AND MERRILL MARICOPA COUNTY, ARIZONA.

SECTION 19 CONTAINS 635.4039 ACRES, MORE OR LESS.

NET ACREAGE EQUALS 61.6434 ACRES, MORE OR LESS.

(NORTH 1/4 ONLY, SHOW THIS SHEET.)

- LEGEND**
- PROPERTY LINES ONLY
 - SECTION LINES WHERE COMMON
 - SECTION LINES & 1/4 SECTION LINES ONLY
 - EASEMENT LINES
 - BRASS CAP
 - BRASS CAP IN HAND HOLE
 - PIPE
 - PIPE IN HAND HOLE
 - REBAR
 - △ NAIL
 - ⊕ SET REBAR WITH TAG
 - CALCULATED POINT NOT MONUMENTED
 - NT.B.S. NOT TO BE SET

CERTIFICATION

Certificate of Survey to SunCor Development Company and First Service Title Agency.

I hereby certify that this map and the survey on which it is based were made in accordance with the minimum standard detail requirements for land title surveys jointly established and adopted by the American Land Title Association and the American Congress on Surveying and Mapping, 1966, and meets the accuracy requirements of a Class A Survey, as defined therein.

I hereby certify that this survey was prepared from an actual on-the-ground instrument survey of the subject premises; that the same accurately shows the location of the boundary by plotted lot description and/or metes and bounds of the subject premises and the relation to the point of beginning of the property to the monument from which it is fixed as well as the location of all

streets, highways, dikes and public-ways crossing or abutting said premises and the right-of-way, monument lines and/or center lines of the streets abutting the premises and the width of such streets and an accurate reference to the redstate records of Maricopa County identifying all easements of record crossing or affecting the said premises; that the horizontal length of all sides of all improvements and the distance therefrom from all boundary lines of the premises, if any, or as actually shown as the same were situated on July 29, 1987, that there are no encroachments except as indicated hereon and noted below by improvements appurtenant to adjoining premises upon the subject premises, nor from the subject premises; that all easements and rights-of-way which are appurtenant to or burden the subject premises and (l) are referred to in the title commitment for the subject premises dated July 29, 1987, issued by First Service

Title Agency, or (ll) are apparent from a visual inspection, are delineated hereon.

The following are all encroachments onto and from the subject property:

NONE

Access to and egress from the subject premises and the improvements and structures thereon are provided via the means indicated hereon. Municipal water, municipal storm sewer, municipal sanitary sewer facilities and telephone, gas and electric services of public utilities are available in the locations indicated hereon.

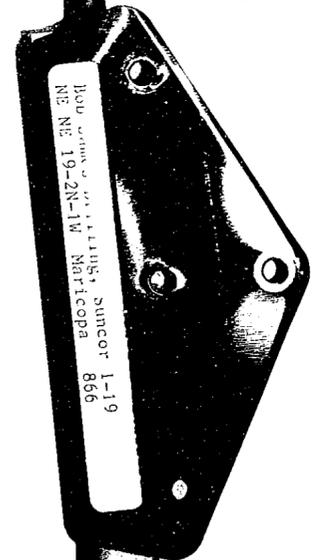
APPROVED AND RELEASED: DEC. 9, 1987

DMJM ARCHITECTURE 300 WILLOWBROOK AVENUE
ENGINEERING SUITE 402
LANDSCAPE PHOENIX, ARIZONA 85004
INTERIOR DESIGN 602/944-0007
PLANNING

RESULTS OF AN ALTA SURVEY
N 1/4 SECTION 15-T2N-R1W
G. & S.A.B. & M. MARICOPA COUNTY, ARIZONA

DATE	BY	CHECKED	DATE	SCALE	DATE	SHEET
07/29/87	DMJM	DMJM	08/07/87	1"=200'	05-01	1-19

DMJM
1987
05-01



ARIZONA GEOLOGICAL SURVEY
416 W. CONGRESS, SUITE 100, TUCSON, AZ 85701

ARIZONA GEOLOGICAL
SURVEY

416 W. CONGRESS, SUITE 100, TUCSON, AZ 85701

FAX

Date: 4-15-02

Number of pages including cover sheet: 5

To: Yves Duchaine

Phone:

Fax phone: 819-377-8888

CC:

From: Steve Rauzi

Arizona Geological Survey

416 W. Congress, Suite 100

Tucson, AZ 85701

Phone: (520) 770-3500

Fax phone: (520) 770-3505

REMARKS: Urgent For your review Reply ASAP Please comment

Completion and plugging reports
for the Bob James hole. Sonic and
Lateralos are available. - hole did
not penetrate salts

RE: Information about wells GoodYear water wells Suncor 1-19 also in section 19-2N-1W

Subject: RE: Information about wells GoodYear water well drilled on section 19-2N-1W and James Suncor 1-19 also in section 19-2N-1W

Date: Mon, 15 Apr 2002 11:29:02 -0400

From: Yves Duchaine <yduchaine@INTRAGAZ.com>

To: 'Steve Rauzi' <steve.rauzi@azgs.az.gov>

Steve,

Thank you very much.

Is it possible to get the completion and plugging reports with formation tops for the Bob James hole?

My fax number is 819-377-8888

Are logs available also for this well?

Best regards Yves Duchaine

-----Message d'origine-----

De : Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]

Envoyé : 15 avril, 2002 10:00

À : Yves Duchaine

Objet : Re: Information about wells GoodYear water well drilled on section 19-2N-1W and James Suncor 1-19 also in section 19-2N-1W

No additional information - no water analysis. A completion and plugging reports with formation tops are available for the Bob James hole.

Yves Duchaine wrote:

Steve.,

I would like to double check the information you have on well Good Year drilled on section 19-2N-1W in 1951-53.

We have following documents:

- well completion or recompletion and well log data sheet
- water well information sheet
- summary of exploration well (half page paragraph)
- 2 pages of samples description up to 2784'
- 4 pages of more detailed sample description up to 2240' only

Do you any more information like water analysis?

We have nothing about the well James Suncor 1-19 drilled in section 19-2N-1W. This well have been drilled in 1988 and I believe lot of informations are available.

ARIZONA GEOLOGICAL
SURVEY

416 W. CONGRESS, SUITE 100, TUCSON, AZ 85701

FAX

Date: 4-9-02

Number of pages including cover sheet: 6

To: Matt Reid
CEGS

Phone:

Fax phone: 602-250-3628

CC:

From: Steve Rauzi

Arizona Geological Survey

416 W. Congress, Suite 100

Tucson, AZ 85701

Phone: (520) 770-3500

Fax phone: (520) 770-3505

REMARKS:

Urgent

For your review

Reply ASAP

Please comment

Bob James 1-19 hole completion rpt, plugging record, plugging and drilling summary, and water-well acceptance form

ARIZONA GEOLOGICAL SURVEY

416 W. CONGRESS, SUITE 100, TUCSON, AZ 85701

FAX

Date: 3-22-02

Number of pages including cover sheet: 6

To: Jim Lingafelter

Blaumier Easts

Phone:

Fax phone: 318-429-2295

CC:

From:

Arizona Geological Survey

416 W. Congress, Suite 100

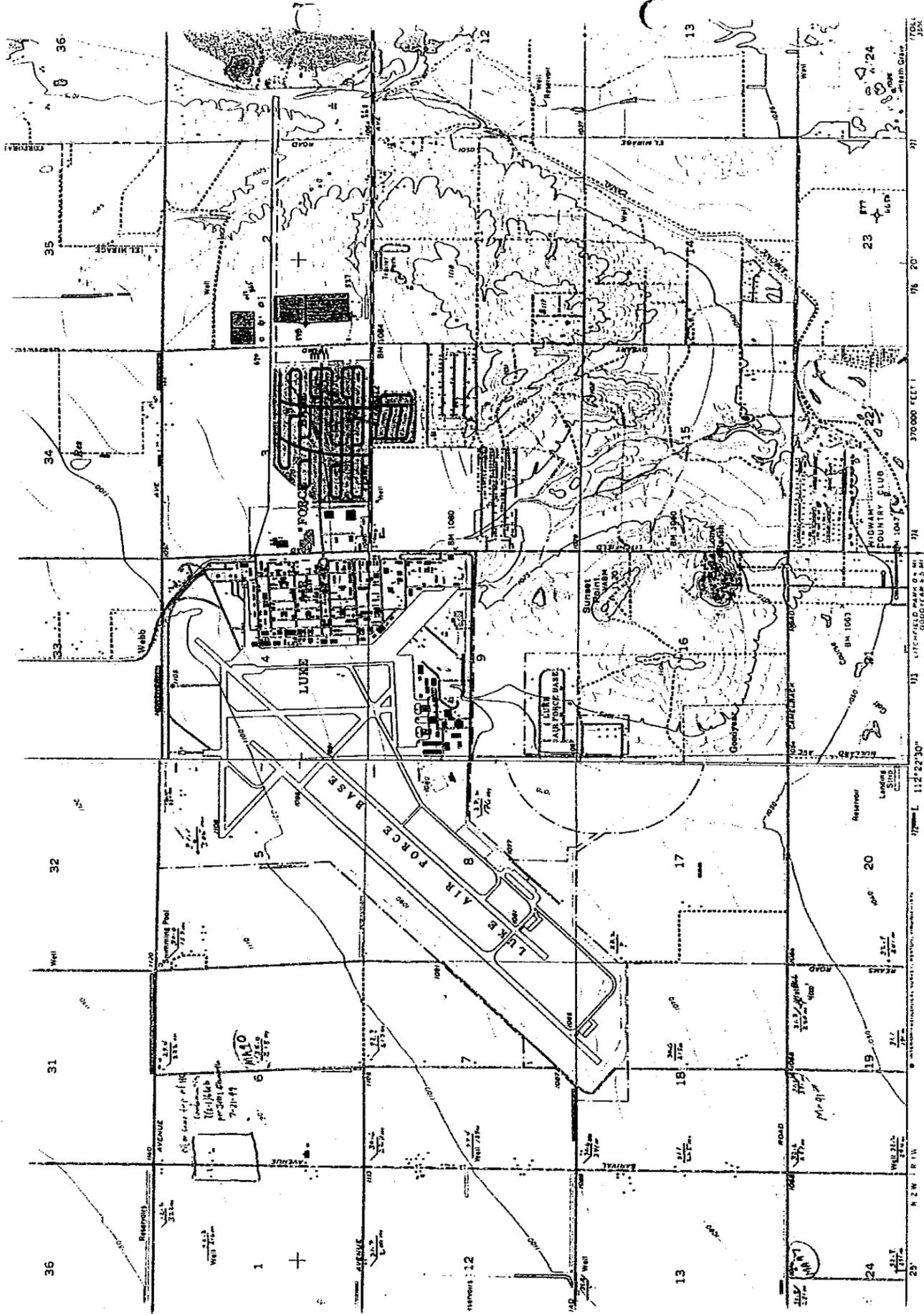
Tucson, AZ 85701

Phone: (520) 770-3500

Fax phone: (520) 770-3505

REMARKS: Urgent For your review Reply ASAP Please comment

Bob James hole Completion rpt, plugging record,
Plugging and drilling summary, and water-well
responsibility form. (i.e. was not plugged to surface but
only up to ~1650')



Published by the Geological Survey
DAA

ROAD CLASS

file P/N 866

7-21-99

Jerry Ellsworth called

Reported slug of oil or some type of HC contamination in Wtr well
located 8(2-1)6 bcb - 2 wells near each other

Adrian wtr system, DEQ, County Health smelled oil in tank.

Recommended shut down or advise customers drink bottled wtr.

Not turbine oil = vegetable oil is used

No gas stations or other source of contamination nearby

Warm water in that area ~ 90°

Pet-fo 700-1200', wtr table @ 300'

SLR/7-21-99

EXPLORATION

file 866

Clues point to oil in Arizona's deep Tertiary

Wittmann area exploratory drilling

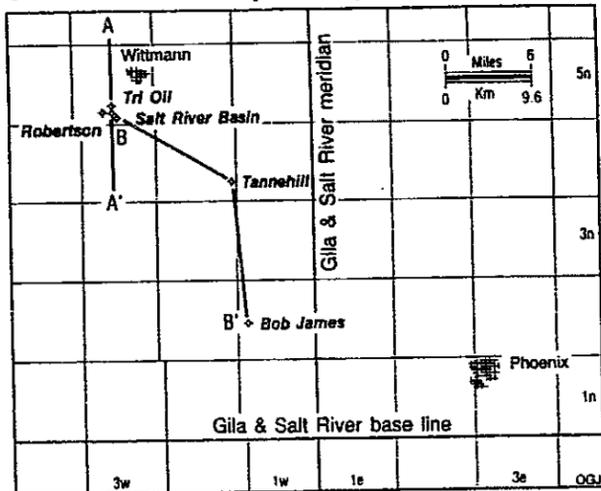


Fig. 1

Steven L. Rauzi
Arizona Oil & Gas
Conservation Commission
Phoenix

Evaluation of several wells near Wittmann, Ariz., suggests the need for additional drilling in the deep Tertiary basins of central Arizona.

In one of the earlier wells, 1 Wittmann, the driller reported as much as 1,600 ft of light oil in a test. Unfortunately, an unsuccessful water shut-off attempt prevented this well's completion.

Later drilling in 1981 and 1982 yielded mixed results and provided information on rotary drilling conditions and costs and basin stratigraphy.

Four of the wells described were drilled on private land and the fifth on a state lease.

Federal land is found in several, mostly isolated, areas in the valley but predominates in the mountains and to the west. One small federal tract, surrounded by private land, over a large salt deposit was picked up in the March 1991 U.S. Bureau of Land Management lease sale.

State land is available on a non-competitive basis and carries a 5 year term with a one eighth royalty on any production.

A major concern is the apparent lack of a good oil and gas source rock in the area. However, a thick section of deeply buried salt at the southern end of the valley is recognized by some to be

just such a source.

In the most recent well, the 1-19 Suncor, more than 2,000 ft of salt was drilled, but no well has penetrated the base of the salt.

Seismic data over the salt suggest that it may extend to a depth of 12,000-15,000 ft. On a more regional basis, gravity and magnetic data show this valley to be one of the deepest in the southern part of Arizona.

The current report provides a summary of the data available in the well files and sample repository of the Arizona Oil & Gas Conservation Commission.

The well data are listed (see table), and the location of the wells and Sections A-A' and B-B' in Maricopa County are shown (Fig. 1).

Wittmann area

The Wittmann area is a broad, flat valley floored with Tertiary sediments.

The valley is both topographic and structural in that it is bounded by upfaulted, erosionally subdued mountains of Precambrian to Tertiary crystalline and metamorphic rocks.

The Vulture and Hieroglyphic mountains bound the area on the north and northeast, the White Tank Mountains are on the southwest, and the South Mountains are on the southeast. The Salt River drains the area at the south end of the valley (Fig. 2).

Wittmann area features*

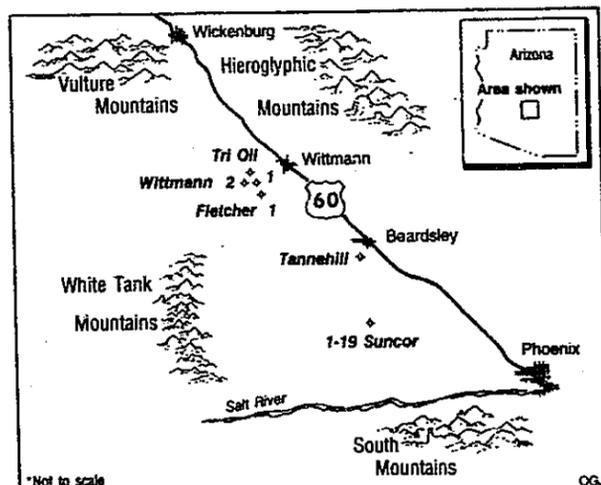


Fig. 2

Selected wells, Wittmann area, Maricopa County, Ariz.

Operator	Well	Location	Year drilled	Total depth, ft	Formation at total depth	Remarks
Tannehill	1 Beardsley	SE NE 25-4n-2w	1923	3,350	Tertiary sediments*	Shows in two sands, no tests
Robertson	1 Wittmann	NE NE 33-5n-3w	1944	4,280	Volcanic rock†	1,600 ft oil recovered in test
Robertson	2 Wittmann	NE NW 33-5n-3w	1946	4,970	Volcanic rock†	Shows at 4,650 ft, no tests
Salt River	1 Fletcher	SW NW 34-5n-3w	1981	3,980	Precambrian schist	No shows or tests
Tri Oil	78-28 State	SE SE 28-5n-3w	1982	4,520	Precambrian schist	Swabbed trace to show of oil
Bob James	1 Suncor	NE NE 19-2n-1w	1988	4,000	Tertiary salt	Show at 3,000 ft, no tests

*Probable. †Questionable.

The Tertiary sediments just southwest of Wittmann are about 4,000 ft thick. They thicken to more than 11,000 ft 20 miles to the southeast, where the Tertiary section includes a large volume of relatively pure nonmarine salt (Fig. 4).

The valley slopes gently southward toward the Salt River. Elevations of the valley floor range from 1,600 ft near Wittmann to 900 ft at the river.

Elevations exceed 4,000 ft in the Vulture and Hieroglyphic Mountains, 3,500 ft in the White Tank Mountains, and 2,500 ft in the South Mountains.

These ranges contain Proterozoic schist similar to and herein correlated with the schist in the Tri Oil and Salt River Basin wells near the town of Wittmann (Fig. 1).

Early wells

The Tannehill 1 Beardsley was the earliest well to be drilled in the study area.

This well was drilled in 1923 and is located near the small town of Beardsley in SE NE 25-4n-2w (Fig. 1).

Tannehill drilled the 1 Beardsley with cable tools. His driller reported a gray sand with globules of oil at 2,208-10 ft. He also reported shows in a brown sand at 2,518-40 ft.

A black shale saturated with oil and showing gas was reported at 3,252-80 ft. The TD of the 1 Beardsley is 3,350 ft in probable Tertiary sediments (Fig. 4).

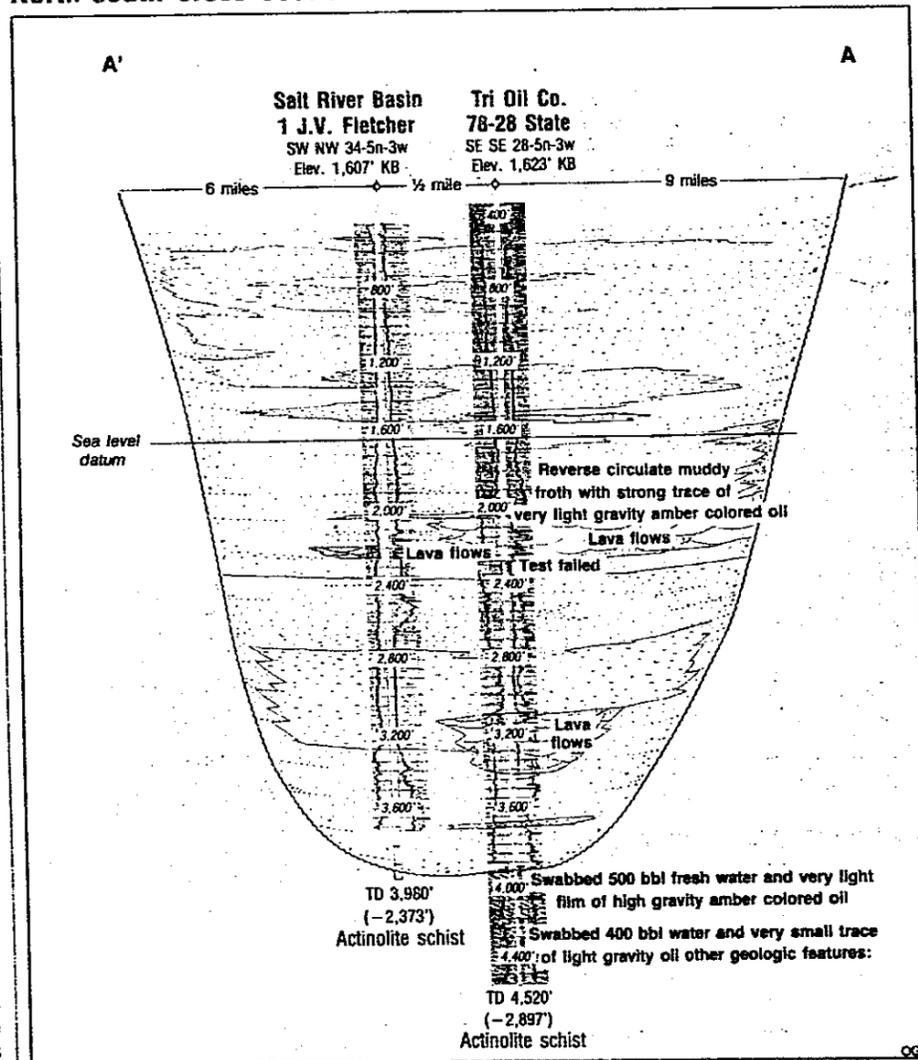
A note on the driller's log records the static water level in the hole. It stood at 138 ft and was drawn down to 183 ft after pumping.

J.J. Robertson drilled the first well near the town of Wittmann in 1944. His well, the 1 Wittmann, is located just southwest of Wittmann in NE NE 33-5n-3w (Fig. 1).

The logs, cores, and cuttings are not available for 1 Wittmann. However, the file on this well does contain the driller's recollection of the operation.

His account describes light oil recovered in a test and a show of oil in a conventional core. He claimed that this core was analyzed at the

North-south cross section



Tucson School of Mines, where it was considered to be of Permian age.

This driller, Lance Fletcher, provided the financial backing for the nearby 1 Fletcher well drilled in 1981. That he returned to finance this later well lends credence to his recollection of the test in the 1 Wittmann.

In a letter in the well files of the Arizona Oil & Gas Conservation Commission, Fletcher recalled the test as follows:

"A medium to strong blow was immediate, it became stronger until oil surfaced after about a minute."

He went on to report the amount of fluid recovered in the test: 1,600 ft of 36° gravity

oil and 1,600 ft of salt water. When the crew tried to shut off the water, they cemented the tubing in the hole.

The core description, the scenario of the test, and the tubing being cemented in the hole suggest that a light oil is trapped at this location.

That it was not developed was due to mechanical problems. Alternatively, these reports suggest that oil has migrated through the Wittmann area.

TD of the 1 Wittmann is reported to be at 4,280 ft in volcanic rock.

Robertson drilled the 2 Wittmann in 1946 in NE NW 33-5n-3w, about 1,500 ft west of the 1 Wittmann (Fig. 1).

He apparently drilled this well to re-enter the oil zone that was lost when tubing was cemented in the 1 Wittmann. However, it seems unusual to the author that he would have stepped out so far from the original hole.

The 2 Wittmann file contains a very general lithologic summary. It reports sand and gravel to 3,100 ft, conglomerate to 3,800 ft, and volcanic rock from 3,800 ft to TD 4,970 ft. It also records a show of oil from 4,650-60 ft in the volcanic rock. No tests are reported.

Modern drilling

Salt River Basin Joint Venture drilled the 1 Fletcher in 1981 in SW NW 34-5n-3w,

Fig. 3

above
Witt
La
ous
1
lea
the
rec
que
gra
and
volc
2,2
Th
is r
indic
an e
the
olite
3,5
tom
(Fig

Northwest-southeast cross section

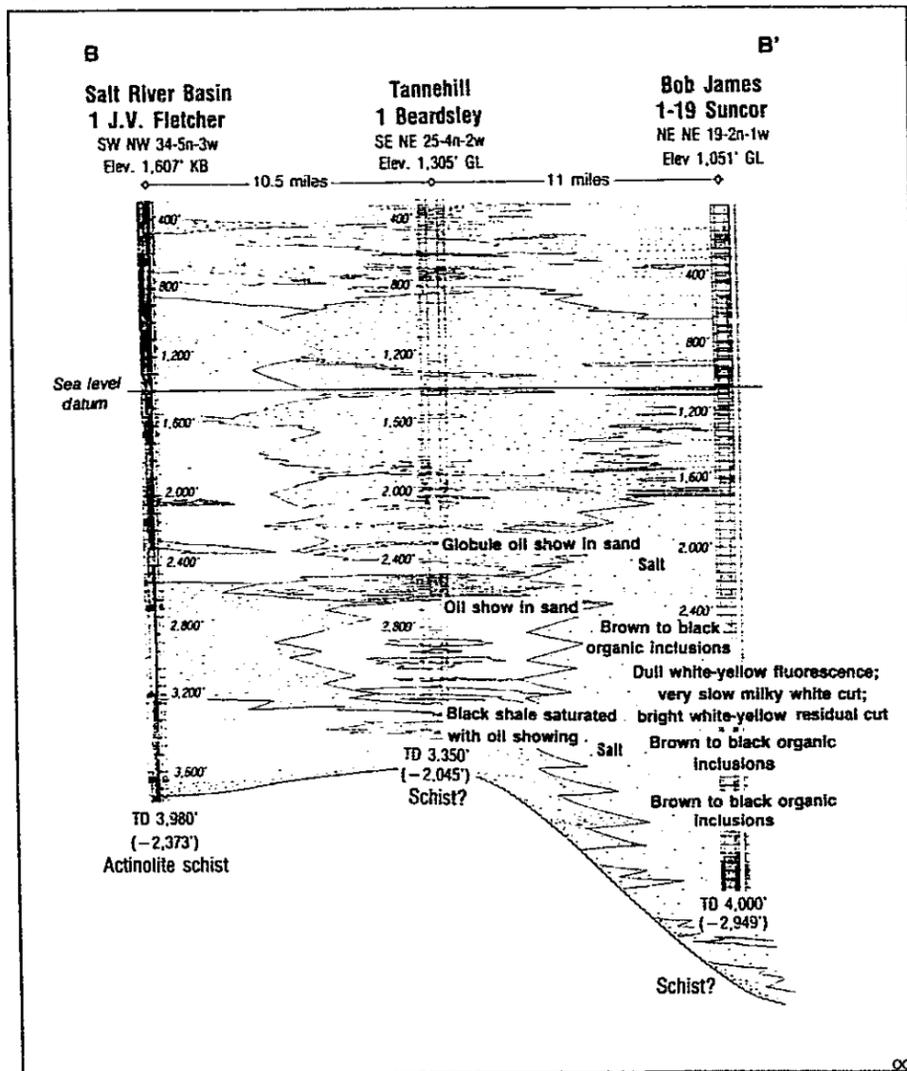


Fig. 4

control the inflow of water. The operator admitted such and wrote that he had no doubt that he had failed to find and produce a significant oil and gas saturation in this well.

The Bob James 1-19 Suncor well is in NE NE 19-2n-1w (Fig. 1).

This well is included here because it provides information on the probable source for the oil and gas reported in the wells drilled near the towns of Wittmann and Beardsley.

The 1-19 Suncor was drilled in 1988 to test sand objectives below a large deposit of salt near Luke Air Force Base (Fig. 4).

The Suncor well penetrated salt at 1,720 ft and was still in salt at TD 4,000 ft.

The mud log records sandstone, claystone, and several beds of anhydrite overlying the salt. It also records several thin beds of orange to brown claystone within the salt and a thin bed of black shale encased in salt at 3,950 ft.

Several zones of brown to black organic inclusions are reported in the salt, and a particularly interesting zone of very slightly calcareous to clayey siltstone is reported at 3,000 ft.

This siltstone has a dull white to yellow fluorescence with a very slow milky white cut. The siltstone also has a bright white to yellow residual cut but no odor or visible stain.

Since the Suncor well was still in salt at TD, its primary objective of testing sands below the salt was not accomplished. Testing of the supposed sands is still a valid objective.

Additional objectives include salt overhangs, stratigraphic intertonguing around the periphery of the salt, and faulted wedges of sediment within the salt.

This well offers a probable source for the oil and gas reported in the several wells in the Wittmann area.

Possible oil source rocks

The oil and gas shows reported in the Tannehill, Wittmann, and Tri Oil Co. wells indicate that oil and gas are

this one being Wittmann.

so on-ogic and ner-anic TD s a ft in asts

ling /en-er in -3w,

about 1,350 ft southeast of 1 Wittmann (Fig. 1).

Lance Fletcher, the previously mentioned driller on the 1 Wittmann well, was the lease holder and financier for the 1 Fletcher.

The mud and electric logs record a continuous sequence of fine- to coarse-grained, varicolored alluvium and colluvium. A 50 ft thick volcanic flow is present at 2,200 ft.

The interval 2,700-3,400 ft is notably silty and clayey, indicating the development of an effective seal in this part of the basin. Precambrian actinolite schist was penetrated at 3,940 ft, and the well bottomed in schist at 3,980 ft (Figs. 3, 4). No shows or

tests are reported.

In 1982, the Tri Oil 78-28 State was the most recent well to be drilled in the vicinity of Wittmann (Fig. 1). The 78-28 State is in SE SE 28-5n-3w, about 1,350 ft due north of 1 Wittmann and about one half mile northwest of 1 Fletcher.

The operator ran dual-induction, sonic, neutron, and dipmeter logs and set and cemented 7 in. casing to 4,517 ft. He then perforated and attempted to test several zones.

The first test at 2,020-21 ft failed because of a loose joint.

The second test at 2,337-38 ft recovered seven stands of hole fluid in 1 hr from an-

other loose joint.

The third test at 4,216-17 ft recovered 3,800 ft of fresh water in 41 min. It had a final flowing pressure of 1,597 psi.

After these three tests, 221 holes were shot across two large intervals, 2,024-2,343 ft and 3,935-4,514 ft.

The well was then fractured using 52 tons of sand. Swabbing recovered fresh water with strong traces of slight shows of gas and light oil.

Unfortunately, the large interval of perforated pipe made it difficult for the operator to tell which zone in the well was effectively stimulated. Tri Oil could not determine which perforations were yielding the oil, and it failed to

The author . . .



Rauzi

Steven L. Rauzi grew up in Moab, Utah, and received BS and MS degrees in geology from Utah State University in Logan. From 1980-87 he worked for Texaco in Los Angeles as an exploration and development geologist. Since 1988 he has been the oil and gas program administrator for the Arizona Oil & Gas Conservation Commission in Phoenix.

present in this area.

At the least, these shows record a period of oil and gas migration through the basin. If a potential source rock for oil and gas can be described, then the reported shows in these wells take on a greater significance.

At least two possible source rocks for oil and gas have been identified. The first is the "black shale saturated with oil" in the Tannehill well.

The second, and more likely source, is the thick section of salt, and intimately associated sediments, in the Suncor well (Fig. 1).

In fact, the shows in the Wittmann area wells suggest that oil migrated out of and away from the deeply buried salt at Luke Air Force Base. At least 20 miles of oil migration is indicated.

Luke salt

The salt at Luke, or Luke salt, is at least Miocene in age.

It is overlain by basalt that has been age dated at about 10.5 million years.¹

The average bromine content of the Luke salt is about 2 ppm. Values of less than 30 ppm bromine tend to represent nonmarine salt, and the Luke salt deposit is probably of lacustrine or playa origin.² The sheer volume of relative-

ly clean salt at Luke tends to suggest a lacustrine deposit.

The organisms in saline lakes normally include a narrow range of species that grow in remarkable abundance.³ These authors cite several examples of abundant biotas in saline lakes.

For example, they describe saline lakes that provide sufficient food for enormous flocks of flamingos, in some cases a million or more birds.

Most species of flamingos obtain their food from organic rich bottom muds. These saline lakes must therefore maintain a high productivity of phytoplankton, which settle and are incorporated into the bottom muds.

Under the right conditions, these muds, along with significant amounts of bird droppings, can be preserved and become good source rocks for oil and gas.

Like modern saline lakes, the lake, or lakes,⁴ in which the Luke salt was deposited could very well have sustained an abundance of organisms that accumulated as organic rich bottom muds.

In the case of Luke, organic rich muds may have been concentrated during volcanic-associated phytoplankton "blooms." Thus extra-rich muds in the Luke salt could correlate with periods of increased volcanic activity.

The "oil-saturated black shale" reported in the Tannehill well could represent just such a relationship. Salt-associated source beds may well be a significant factor not just in the oil and gas play of the Wittmann area but in the entire Phoenix basin as well.

Heat source, stratigraphic trap

Gravity and magnetic data suggest that the Luke salt is at least 10,000 ft thick.^{2,5}

Seismic data suggest that it may extend to a depth of 12,000-15,000 ft.⁵ These depths are sufficient to generate oil and gas.

Sufficient heat and pressure necessary to generate oil and gas from salt-associated source beds also may have been provided by Tertiary intrusion and volcanism. Such was the case at Dinehbi-Keyah field in northeastern Arizona.

There, a Tertiary sill was intruded into Pennsylvanian carbonate rocks. That sill was intruded into Pennsylvanian carbonate rocks. That sill has produced more than 17 million bbl of oil.⁷

Concrete evidence of such intrusive relationships has not been documented in the study area, but a sill intruded into either the black shale described in the Tannehill well or organic-rich muds associated with the Luke salt offers the same possibility for stratigraphic traps in the Wittmann area.

Conclusion

The 1 Wittmann was reported to have produced 1,600 ft of light oil and 1,600 ft of salt water in a cased hole test.

Unfortunately, mechanical problems and an unsuccessful water shut-off attempt prevented development of the Wittmann well.

Shows of oil also were reported in two sands in the Tannehill Beardsley well. If these sands pinch out laterally into clay, stratigraphic traps are possible in the undrilled parts of this basin.

Two possible sources for

oil and gas in the Wittmann area include the "oil-saturated black shale" in the Tannehill well and the thick section of Miocene salt in the Suncor well.

The salt in the Suncor well may serve as a trapping mechanism to oil and gas below the salt.

References

1. Eberly, L.D. and T.B. Stanley, Cenozoic stratigraphy and geologic history of southwestern Arizona: Geol. Soc. America Bull., Vol. 89, 1978, pp. 921-940.
2. Eaton, G.P., D.L. Peterson, and H.H. Schuman, Geophysical, hydrological, and geochemical reconnaissance of the Luke salt body, Central Arizona: U.S. Geological Survey Prof. Paper 753, 1972, 28 p.
3. Kirkland, D.W., and R. Evans, Source-rock potential of evaporitic environment: AAPG Bull., Vol. 65, 1981, pp. 181-190.
4. Lowery, C.J., Sedimentation of Cenozoic deposits in western Salt River Valley, Arizona: unpublished master's thesis, Arizona State University, Tempe, 1984.
5. Oppenheimer, J.M., Gravity modeling of the alluvial basins, southern Arizona: unpublished master's thesis, University of Arizona, Tucson, 1980.
6. Gary Stewart, personal communication, 1991.
7. Arizona Oil & Gas Conservation Commission, well files and sample cuttings.

KANSAS

Caribou Resources, Denver, has staked eight 2,000 ft geological wildcats in Pomona and North Pomona fields of Franklin County. Targeting Cambro-Ordovi-

cian Arbuckle, the wells are in 35- and 36-15s-18e; 13-, 24-, and 25-16s-17e; and 8-, 16-, 18-, and 20-16s-18e.

Sites are 5-7 miles west and northwest of Ottawa.

KENTUCKY

Equitable Resources Exploration Co., Kingsport, Tenn., reported completing two western Kentucky discoveries during 1990.

The K10001 John Hopkins Hospital, 16-K-27, Hopkins County, pumped 50 b/d of oil from Mississippian Cypress perforations at 2,171-91 ft. The discovery opened East Earle Creek field.

Total depth is 4,243 ft. The well encountered noncommercial gas shows in New Albany at 3,820-46 ft and 3,968-4,052 ft, Petroleum Information reported.

Equitable has drilled five other wells nearby. It plugged

two, completed one as an oil producing well, and was placing the other two on the pump. It has also staked a seventh test in the area.

Equitable also completed K10002 Andrew Mast, 7-K-18, 4 miles north of Marion in Crittenden County.

It flowed 40 Mcfd of gas from Devonian New Albany shale at 2,260-2,458 ft and 2,518-2,620 ft. Total depth is 2,841 ft.

Well site is about 6 miles northwest of Tribune field, which produces oil from Mississippian McClosky.

The discovery well is more than 30 miles northwest of

STATE OF ARIZONA

21 80878935

NOT GOOD AFTER
VOID DATE SHOWN

DATE ISSUED	VOID AFTER
MO - DAY - YR 12/29/88	MO - DAY - YR 12/29/90

WARRANT NO.
21 80878935

120450 4931

FUND RESP ORG MULTIPLE ACCT

WG0057

1449

PAY TO THE
ORDER OF

CLAIMED BY ORG OBJ TASK CPT. ACTIVITY

BOB JAMES DRILLING
BOX 158
LITCHFIELD PARK AZ 85340

PAY THIS AMOUNT

\$*****5,000.00

William R. Egan
GOVERNOR
William W. Millford
GOVERNOR

PAYABLE THROUGH STATE SERVING BANK TO STATE TREASURER OF ARIZONA

⑈80878935⑈ ⑆122101133⑆

21⑈

OVER

2180878935

STATE OF ARIZONA REMITTANCE ADVICE

CLAIM NO.	INVOICE DATE	INVOICE NUMBER	GROSS AMOUNT	TEDL 815	NET AMOUNT
WG0057	12/22/88 REFUND	CASH BOND DEPOSIT FOR PERMIT 866	5,000.00	.00	5,000.00
FUND NO. 120450	AGENCY WG	VENDOR'S NAME AND NUMBER BOB JAMES DRILLING		WARRANT DATE 12/29/88	WARRANT AMOUNT 5,000.00

MÉLANGE ASSOCIATES, INC.

821 17th Street
Suite 614
Denver, Colorado 80202
Telephone: 303/298-9415

RECEIVED
SEP 16 1988
O & G CONS. COMM.

September 14, 1988

Arizona Oil & Gas Commission
3110 N. 19th Avenue
Suite 190
Phoenix, AZ 85015

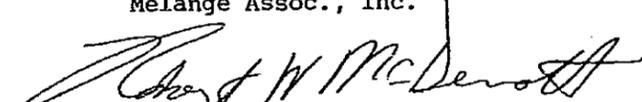
Attn: Rudi Ybarra

Dear Rudi:

I apologize for the delays in getting these logs to you. The problems are worked out now so if additional logs are required please give me a call and I will get them sent out to you.

Respectfully,

Melange Assoc., Inc.


Robert W. McDermott



SUNCOR
DEVELOPMENT
COMPANY

AUG 22 1988

O & G COMS. COMM.

August 22, 1988

Mr. Daniel J. Brennan
Executive Director
Oil and Gas Commission
State of Arizona
Suite 190
3110 N. 19th Avenue
Phoenix, Arizona 85015

RE: SunCor Water Well 1-19

Dear Mr. Brennan:

Enclosed is an executed Statement of Responsibility for
the referenced water well.

If you have any questions, please do not hesitate to
call me.

Sincerely,

Daniel Haas

Daniel G. Haas, P.E.

DGH:cs
Enclosure

From Desk of

Ed McInay

Dear Patch

These two copies, as indicated, need to be hand carried to the Arizona Oil & Gas Conservation Commission. Do not take to the Commission until Steve has taken care of the \$5000 bond. Either Steve or I will let you know when the bond is in place. I have also enclosed a check for the \$25 Filing Fee.

Best personal regards,

Ed McInay

