

Subsequent Report of Abandonment

FILE NOTATIONS

Entered in NID File

Entered On S R Sheet

Location Map Pinned

Card Indexed

I W R for State or Fee Land

Checked by Chief JAB

Copy NID to Field Office

Approval Letter

Disapproval Letter

COMPLETION DATA:

Date Well Completed 6/14/67

OW _____ WW _____ TA _____

GW _____ OS _____ PA

Location Inspected

Bond released

State of Fee Land

LOGS FILED

Driller's Log 7/26/67

Electric Logs (No.) 5

E. _____ I. _____ E-I 1 GR. _____ GR-N. _____ Micro. _____

Lat. _____ Mi-L. _____ Sonic _____ Others _____

Formation Density Log (2)
Cement Bond Log (2)

LWP
4-21-92

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK DRILL [X] DEEPEN [] PLUG BACK []

b. TYPE OF WELL OIL WELL [X] GAS WELL [] OTHER [] SINGLE ZONE [] MULTIPLE ZONE []

2. NAME OF OPERATOR West Toledo Mines Company

3. ADDRESS OF OPERATOR P. O. Box 44, Salt Lake City, Utah

4. LOCATION OF WELL At surface NW-NE Sec. 12, T.6 S., R.24 E., S.L.M. At proposed prod. zone 757 ft. fr. N-line & 1784 ft. fr. E-line

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE* Approx. 22 miles SE of Vernal

16. NO. OF ACRES IN LEASE 800

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 4500

21. ELEVATIONS (Show whether DF, RT, GR, etc.) Approx. 5360' grd.

23. PROPOSED CASING AND CEMENTING PROGRAM

Table with 4 columns: SIZE OF HOLE, SIZE OF CASING, WEIGHT PER FOOT, SETTING DEPTH. Row 1: 12 1/2", 8 5/8", 28#, 200'

It is planned to drill a well at the above location... gas potential of the Weber formation... consideration will be given to taking the hole deeper... Weber the second time... thrust fault is present... air as a circulating medium... A blow-out preventer plus rotating head will be used... expected to encounter the top of the Dakota formation... sequent tops are expected as follows: Morrison-Cedar... Curtis-2170'; Entrada-2370'; Carmel-2610'; Navajo-... Shinarump-3565'; Moenkopi-3610'; Phosphoria-4150';... Location is on a ridge. The line had to be extended... the location falling on the slope of the ridge or...

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present proposed program... If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured zone.

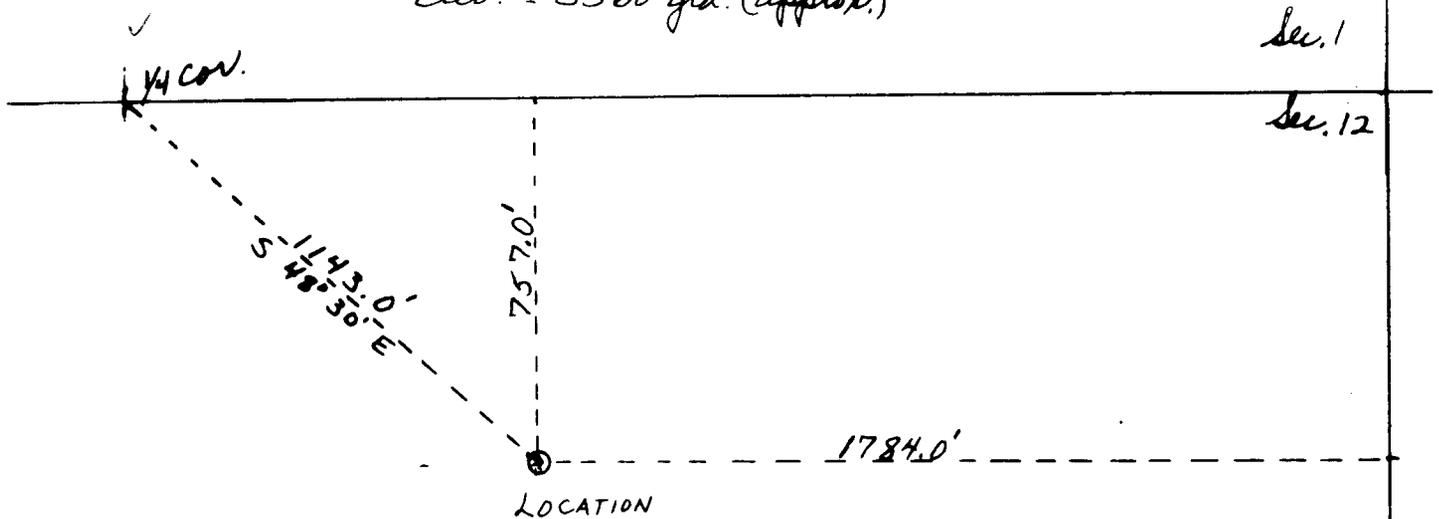
24. SIGNED H. Don Gugler TITLE Consulting Geologist DATE 10/13/1967

PERMIT NO. APPROVAL DATE

APPROVED BY TITLE APPROVAL DATE

Vertical text on the right side of the page, including 'U-0122516', '1784 ft. fr. East', '36', 'Unrecorded', 'SE NW, NE', 'May 13, 1967', 'PMB', 'in accordance with...

Location Plat
 for
 West Toledo Mines Co.
 Grethe #1 Well
 T. 6 S., R. 24 E., S. L. M.
 Uintah County, Utah
 Elev. = 5360'gd. (approx.)



Scale: 1 in. = 400 FT.
 Date: May 10, 1967
 Surveyed by: H. Don Gingley ^{OK}

+ E

+ F Cor.

Utah State

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL [X] DEEPEN [] PLUG BACK []
b. TYPE OF WELL: OIL WELL [X] GAS WELL [] OTHER [] SINGLE ZONE [] MULTIPLE ZONE []
2. NAME OF OPERATOR: West Toledo Mines Company
3. ADDRESS OF OPERATOR: P. O. Box 44, Salt Lake City, Utah
4. LOCATION OF WELL: NW-NE Sec. 12, T.6 S., R.24 E., S.L.M.
14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE: Approx. 22 miles SE of Vernal
16. NO. OF ACRES IN LEASE: 800
17. NO. OF ACRES ASSIGNED TO THIS WELL: 40
19. PROPOSED DEPTH: 4500
20. ROTARY OR TABLE TOOLS: Rotary
21. ELEVATIONS: Approx. 5360' grd.
22. APPROX. DATE WORK WILL START: May 13, 1967

Table with 5 columns: SIZE OF HOLE, SIZE OF CASING, WEIGHT PER FOOT, SETTING DEPTH, QUANTITY OF CEMENT. Row 1: 12 1/2", 8 5/8", 28#, 200', 75 sacks (Sur. Cas.)

It is planned to drill a well at the above location to test the oil and gas potential of the Weber formation. If the first Weber is wet or tight consideration will be given to taking the hole deeper to penetrate the Weber the second time, if there is ample reason and data to indicate a thrust fault is present. The well will be drilled with rotary tools using air as a circulating medium as long as possible before converting to mud. A blow-out preventor plus rotating head will be used on the well. It is expected to encounter the top of the Dakota formation at about 1600'. Subsequent tops are expected as follows: Morrison-Cedar Mountain-1650'; Curtis-2170'; Entrada-2370'; Carmel-2610'; Navajo-2820'; Granite-3350'; Shinarump-3565'; Moenkopi-3610'; Phosphoria-4150'; Weber-4280'. Location is on a ridge. The line had to be extended eastward to prevent the location falling on the slope of the ridge or in a wash.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED: H. Don Gungley TITLE: Consulting Geologist DATE: May 12, 1967

PERMIT NO. APPROVAL DATE

APPROVED BY TITLE

CONDITIONS OF APPROVAL, IF ANY:

May 18, 1967

West Toledo Mines Company
P. O. Box 44
Salt Lake City, Utah

Re: Well No. Grethe #1,
Sec. 12, T. 6 S., R. 24 E.,
Uintah County, Utah.

Gentlemen:

This letter is to confirm verbal approval given by Glenn B. Feight, Executive Director, on May 12, 1967. However, this approval is conditional upon a letter being furnished this office stating that the acreage within a 660' radius is owned by the West Toledo Mines Company (Rule C-3 General Rules and Regulations).

Should you determine that it will be necessary to plug and abandon this well, you are hereby requested to immediately notify the following:

PAUL W. BURCHELL, Chief Petroleum Engineer
HOME: 277-2890 - Salt Lake City, Utah
OFFICE: 328-5771 - 328-5772 - 328-5773

Enclosed please find Form OGCC-8-X, which is to be completed whether or not water sands (aquifers) are encountered while drilling. Your cooperation with respect to completing this form will be greatly appreciated.

West Toledo Mines Company

-2-

May 18, 1967

The API number assigned to this well is 43-047-20229 (see Bulletin D12 published by the American Petroleum Institute).

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

CLEON B. FEIGHT
EXECUTIVE DIRECTOR

CBF:sc

cc: Rodney Smith, District Engineer
U. S. Geological Survey
3416 Federal Building
Salt Lake City, Utah

Best Lardo Company
Box 44
S. L. C., Utah.

Verbal approval was given
on May 12, 1967 to Don Quigley
by Cleon B. Feight to Drill the
Sheth #1 well, located 757 FAK
+ 1784' FEL SE NW NE of Sec. 12,
T. 6 S., R. 24 E Uintah County

46' off spacing for topographical
exception.

4500' Sheth test

43-047-20209

INDUSTRIAL COMMISSION OF UTAH

well file

RIG SAFETY INSPECTION

Name of Company West Toledo Mines Company Date June 7, 1967

Name of Drilling Contractor Willard Pease Drilling Co.

Well Name and Number Grethe #1 Rig No. 4 Field Wildcat
(Blue Mnt. Area)

Section 12 Township 6 S Range 24 E

County Uintah Driller Davis

Number Present 8 Toolpusher Lee Pease
(Two crews present)

Any lost-time accidents while on location 30 Days ago

Items causing lost-time accidents that have been corrected, or which need to be corrected.

Helper lit the high jet gas heater and got burned.

Any new employees in crew No Have instructions been given the new crew members Yes

	(Good) <u>yes</u>	(Poor) <u>no</u>
Escape Line and Slide-----	<u>X</u>	_____
Ladders, Side Rails, Steps-----	<u>X</u>	_____
Walk-Around Floor and Railing-----	_____	<u>X (1)</u>
Engines Guarded-----	<u>X</u>	_____
Rotary Drive Guard-----	<u>X</u>	_____
Fire Control Available-----	<u>X</u>	_____
General Housekeeping-----	<u>X</u>	_____
Hard Hats-----	_____	<u>X (2)</u>
First Aid Kit-----	_____	<u>X (3)</u>
Blowout Preventer Installed-----	<u>X (4)</u>	_____
Cellar clean, No debris-----	<u>X</u>	_____
Cathead-----	<u>X</u>	_____
Safety belts available-----	<u>X</u>	_____

State

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

SUBMIT IN THE REVERSE SIDE (Other instructions on reverse side)

5. LEASE DESIGNATION AND SERIAL NO.

U-0122316

6. INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. WARE OR LEASE NAME

Blue Mountain

9. WELLS NO.

Geoth 01

10. FIELD AND POOL, OR WILDCAT

Wildcat

11. SEC., T., R., M., OR BLE. AND SURVEY OR AREA

NW. NE. - Sec. 12, T 6S., R 24E., S. L.M.

12. COUNTY OR PARISH

Utah

13. STATE

Utah

1. OIL WELL [X] GAS WELL [] OTHER []

2. NAME OF OPERATOR West Toledo Mines Company

3. ADDRESS OF OPERATOR P.O. Box 44, Salt Lake City, Utah

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface NW. NE. - Sec. 12, T 6S., R 24E., S.L.M. 757 ft. from N-line, and 1784 ft. from E-line

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

Grd. 5435'; R.T. 5446'

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF []

FRACTURE TREAT []

SHOOT OR ACIDIZE []

REPAIR WELL []

(Other) []

PULL OR ALTER CASING []

MULTIPLE COMPLETE []

ABANDON* [X]

CHANGE PLANS []

SUBSEQUENT REPORT OF:

WATER SHUT-OFF []

FRACTURE TREATMENT []

SHOOTING OR ACIDIZING []

(Other) []

REPAIRING WELL []

ALTERING CASING []

ABANDONMENT* []

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

17. 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.)*

The subject well was drilled to a total depth of 4333 feet which was 73 feet into the Weber formation. The Phosphoria and Weber were thoroughly tested without success. In fact, casing was wet and the various zones perforated and acid treated with discouraging results. A full detailed report of the work will be submitted later. It is planned to abandon the well in the following manner:

- 1. Place a 30-sack plug across the perforated interval from 4278 to 4150 feet.
2. Shot-off casing at approximately 3500 feet and pull casing.
3. Place a 30-sack plug from 3550' to 3425', across the top of the severed casing.
4. Place a 25-sack plug from 2650 to 2550 across the top of the Navajo.
5. Place a 25-sack plug from 1740 to 1640 feet, across the sand zone in the Dakota formation.
6. Place a 25-sack plug from 250 to 150 feet, across the bottom of the surface casing.
7. Place well marker and cement plug at the surface; clean and level location.

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

SIGNED

H. Don Gugley

TITLE

Consulting Geologist

DATE

June 9, 1967

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

W. DON QUIGLEY

CONSULTING GEOLOGIST

PETROLEUM - MINING WORK

65 South Main
~~308 Newhouse Bldg.~~ - SALT LAKE CITY, UTAH 84111

Mr. Cleon Feight
Oil & Gas Conservation Commission
348 East South Temple
Salt Lake City, Utah 84111

June 13, 1967

Re: Grethe #1 Well
Uintah Co., Utah

Dear Jack,

As you requested in your letter of May 18, 1967, which I just received, the acreage within a 660' radius of the Grethe No. 1 well in Sec. 12, T 6 S, R 24 E., Uintah County is all owned by the West Toledo Mines Co.

Since the well was non-productive for hydrocarbons, it was plugged and abandoned on June 11, 1967. Enclosed are copies of Form OGCC-8-X listing the water zones.

Sincerely,

W. Don Quigley
W. Don Quigley

WDQ:sq
cc. West Toledo Mines Co.

FORM OGCC-8-X
FILE IN QUADRUPLICATE

STATE OF UTAH
OIL & GAS CONSERVATION COMMISSION
348 EAST SOUTH TEMPLE
SUITE 301
SALT LAKE CITY, UTAH

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number Grethe #1

Operator West Toledo Mines, Co. Address P.O. Box 44, S.L.C. Phone 359-7663

Contractor Willard Pease Drlg. Co. Address P.O. Box 548, Grd. Jct. Phone 242-6912

Location NW 1/4 NE 1/4 Sec. 12 T. 6 S N R. 24 E Uintah County, Utah.

Water Sands:

<u>Depth</u>		<u>Volume</u>	<u>Quality</u>
From	To	Flow Rate or Head	Fresh or Salty
1. 1960	1715	3-5 bbl/hr.	Fresh
2. 4220	4333	15 bbl/hr.	Fresh-Artisian flow
3.			
4.			
5.			

(Continued on reverse side if necessary)

<u>Formation Tops:</u>	Mancos - surface	Entrada - 2365'	Shinarump - 3520'
	Dakota - 1620'	Carmel - 2574'	Moenkopi - 2552'
	Morrison - 1717'	Navajo - 2610'	Phosphoria - 4140'
	Curtis - 2283'	Chinle - 3360'	Weber - 4260'

Remarks:

- NOTE:
- (a) Upon diminishing supply of forms, please inform the Commission.
 - (b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form).
 - (c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

WSSGS

West Toledo
Dredge #1 sec 12 T6S R24E
Grant Co.

① 300' play across over Phosphoria & Weber beds.

4270-44
4248-58

② 3585 - Cement Pond - well cut

200' across stub

Dakota	1700	} flowing fresh water after
Wagon	2390	
Chert	3360	
Phosphoria	4160	
Weber	4258	

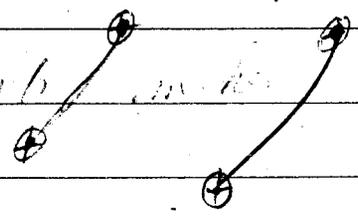
③ ^{Drills} Dia = Well

100' play across Nanyo

④ 100' play across Dakota sand

⑤ 100' in surface pipe - at 196

⑥ 100' in water between pipes.



June 9, 1967
PMP

State

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.
U-0122316

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Blue Mountain

9. WELL NO.
Grethe #1

10. FIELD AND POOL, OR WILDCAT
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 12, T 6S., R 24E., S.L.M.

12. COUNTY OR PARISH
Utah

18. STATE
Utah

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL GAS WELL OTHER

2. NAME OF OPERATOR
West Toledo Mines Company

3. ADDRESS OF OPERATOR
P. O. Box 64, Salt Lake City, Utah

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface **NW. NE. - Sec. 12, T 6S., R 24E., S.L.M.**
757 ft. from N-line, and 1784 ft. from E-line

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
Grd. 5435'; R.T. 5446'

16. 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"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input checked="" type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) _____	
(Other) _____		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. 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.)*

Subject well was plugged and abandoned on June 10-11 in the following manner:

1. A packer on the end of casing was set at 3400 feet. 50 sacks of cement was pumped down the tubing into the perforated zones and squeezed into the formation by displacing with 17 barrels of water. A pressure of about 1200 lbs was used. This pressure was held for 5 hours to let cement thicken and to insure a water shut-off. After 5 hours, the zone was tested with 1400# pressure and with no pressure leak.
2. The casing was shot-off at 3528 feet and pulled to 2650 feet. A 25-sk plug was placed from 2650 to 2550 feet across the top of the Navajo.
3. The casing was pulled to 1740 feet and a 25-sk plug placed from 1740 to 1640 feet, - across the Dakota sand.
4. The casing was pulled to 250 to 150 feet across the bottom of the surface casing.
5. A marker and 10 sks of cement were placed at the surface. The location will be leveled and cleaned in the near future.

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

SIGNED *H. Don Gungley* TITLE Consulting Geologist DATE June 19, 1967

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE*

(See other instructions on reverse side)

Form approved. Budget Bureau No. 42-R355.5.

State 21

WELL COMPLETION OR RECOMPLETION REPORT AND LOG *

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [] DRY [X] Other []

b. TYPE OF COMPLETION: NEW WELL [] WORK OVER [] DEEP-EN [] PLUG BACK [] DIFF. RESVR. [] Other []

2. NAME OF OPERATOR: West Toledo Mines Company

3. ADDRESS OF OPERATOR: P.O. Box 44, Salt Lake City, Utah

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface NW - NE - Sec. 12, T 6S., R 24E., S.L.M. At top prod. interval reported below 757 ft. from N-line and 1784 ft from E-line. At total depth

5. LEASE DESIGNATION AND SERIAL NO. U-0122316

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME: Blue Mountain

9. WELL NO.: Grethe #1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 12, T 6S., R 24E., S.L.M.

12. COUNTY OR PARISH: Uintah 13. STATE: Utah

15. DATE SPUNDED: May 13 16. DATE T.D. REACHED: June 2 17. DATE COMPL. (Ready to prod.): PA 2 6/14/67 18. ELEVATIONS (DF, RKB, RT, GR, ETC.): Grd. 5435'; RT. 5446' 19. ELEV. CASINGHEAD: 5436'

20. TOTAL DEPTH, MD & TVD: 4333' 21. PLUG, BACK T.D., MD & TVD 22. IF MULTIPLE COMPL., HOW MANY* 23. INTERVALS DRILLED BY: 0-4333'

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: None 25. WAS DIRECTIONAL SURVEY MADE: No 27. WAS WELL CORED: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN: I.E.S., Density, and Correlation-Cement Bond log.

Table with 4 columns: CASING SIZE, WEIGHT, LB./FT., DEPTH SET (MD), HOLE SIZE. Rows include 8 5/8" (24#), 5 1/2" (14#) with depths of 214 ft and 4332 ft.

Table with 4 columns: LINER RECORD (SIZE, TOP (MD), BOTTOM (MD), SACKS CEMENT*), SCREEN (MD), TUBING RECORD (SIZE, DEPTH SET (MD), PACKER SET (MD)).

Table with 2 columns: PERFORATION RECORD (Interval, size and number) and ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC. (DEPTH INTERVAL (MD), AMOUNT AND KIND OF MATERIAL USED). Rows include 4220' - 44' w/2 shots/ft. and 4248' - 53' w/2 shots/ft.

33.* PRODUCTION: DATE FIRST PRODUCTION, PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump), WELL STATUS (Producing or shut-in): Abandoned

Table with 8 columns: DATE OF TEST, HOURS TESTED, CHOKER SIZE, PROD'N. FOR TEST PERIOD, OIL—BBL., GAS—MCF., WATER—BBL., GAS-OIL RATIO. Includes test data for June 10, 67, 48 hrs.

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.):

35. LIST OF ATTACHMENTS

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED: H. Don Gungley TITLE: Consulting Geologist DATE: June 28, 1967

*(See Instructions and Spaces for Additional Data on Reverse Side)

INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

Item 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments. **Items 22 and 24:** If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: "Sacks Cement": Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool. **Item 33:** Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

See attached Well History and Geologic Report.

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.	NAME	GEOLOGIC MARKERS
Mancos	Surface	1565'	Gray shale, siltstone and fine-grained sandstone		
Dakota	1565'	1717'	Green-gray and black bent. shale, gray tight sandstone, limestone, purple and red shale, chert, and pyrite		
Morrison	1717'	2283'	Varicolored shale, bentonite, gray ss.		
Curtis	2283'	2365'	Green shale, limestone, and wh. ss.		
Entrada	2365'	2574'	Brown sandstone and red shale		
Carmel	2574'	2610'	Brown to buff medium-grained sandstone and red shale		
Nevajo	2610'	3360'	White fine-grained (well rounded) sandstone, gray and red shale.		
Chinle	3360'	3520'	Gray to white sandstone; green, purple gray shale. Bentonite.		
Shinarump	3520'	3552'	White to grey, v.f.g., sandstone, and reddish shale		
Moenkopi	3552'	4140'	Red shale and siltstone, limestone, vari-colored-purple-solled bentonitic shale.		
Phosphoria	4140'	4260'	Gray - green dolomitic shale, dolomite with fractures, and sucrosic dol. and lms. with vugs and fractures w/oil stain and salt.		
Weber	4260'	4333'T.D.	Brown to buff n.g. cal. ss. w/oil sat. in top 15 feet.		

WELL HISTORY AND GEOLOGIC REPORT

ON

WEST TOLEDO MINES COMPANY

GRETHE NO. 1 WELL

July 1, 1967

By

W. Don Quigley

Consulting Geologist
Salt Lake City, Utah

GEOLOGIC REPORT
ON
WEST TOLEDO MINES COMPANY
GRETHE NO. 1 WELL
UINTAH COUNTY, UTAH

Introduction

The Grethe No. 1 well was located on a surface structural nose running nearly perpendicular (southwesterly) to the Blue Mountain Uplift in the northeastern part of Uintah County, Utah. The detailed surface and plain table work was accomplished by Mr. Robert E. Covington of Vernal, Utah. In addition to the surface structural feature, data were taken which indicated a deeper and much larger sub-surface structural feature was present in the area. The two features were not compatible.

Detailed geophysical work was accomplished on the prospect by the author to determine the possible relationship of the two features, to delineate the faults in the area, and to obtain information on the depth of the structures, possible presence of a thrust, and configuration of the basement rocks. The magnetic data revealed a number of interesting anomalies which could alter the normally accepted interpretation of the geologic structure of the area.

Faults

A large number of faults are present, all of which trend in a northeasterly direction. The amount of displacement along the faults varies with each individual fault; but, in most cases, probably amounts to more than 200 feet at the point of maximum displacement. Most of the faults appear to be low angle faults and may be strike-slip faults in some cases. The faults may not be deepseated and probably do not fault the basement rock. They are probably compression faults developed relatively near the surface as a result of gravity slippage of the sedimentary rocks along the mountain fault.

The main fault near the base of the Weber outcrop and parallel to the mountain front is quite obviously a low **angle** fault and hades northwest. The older sediments have slid over the younger sediments. A displacement of several hundred feet is indicated. Another major fault parallel to the above fault is present near the southeast edge of the prospect and could mark the southeastern edge of the thrust area. This fault is complicated and has a number of branch faults, typical of the faults along a thrust front.

Inferred Structural Anomalies

It is quite obvious that the magnetic data are not reflecting the structure indicated by the rocks exposed at the surface. In fact, the regional dip is exactly opposite to the magnetic data. The magnetic data suggest the presence of a prominent but deeply buried basement arch which is located several miles to the south of the mountain front, but which may be roughly parallel to the mountain uplift. The axis of this arch is about 4 miles south of the Bonanza junction and probably trends northeastward. It is so magnetically prominent that it completely masks all other magnetic features in the area. It probably reflects a very old and stable primary fold which may have acted as a buttress against which the sediments to the north were compressed during the orogeny of the Uinta Mountains. The younger folds thus formed would have very small magnetic fields which are masked by the prominence of the anomaly to the south. A rough calculation of the depth to the basement arch indicates a depth greater than 25,000 feet. Because of the prominence of the magnetic field of the suspected basement arch, a derivative map has been prepared in which most of the vertical magnetic intensity due to the basement rock has been eliminated. This leaves the vertical magnetic field intensity of the upper sediments and of the near surface structures. It must be noted that the resultant derivative magnetic structure map reflects only the upper structures which are probably quite young in age. If the migration of potential hydrocarbons took place after the formation of the secondary structures, then these upper folds could well contain accumulated hydrocarbons in porous sediments; on the otherhand, if migration occurred prior to the fold and hydrocarbons were already accumulated in older primary folds then the chances of the younger structures having oil or gas are much less likely.

Location of Grethe #1 Well

As is obvious from the above discussion the structural attitude of the sediments may change with depth, making the choice of a location difficult depending on the intended depth of the well. The Theo Wood well in Section 6, T 6S, R 25E, was nearer the surface axis of the structural nose but closer to some of the faults. Porosity in the Phosphoria and Weber formations in this well was quite limited; possibly due to damage by the faulting.

The Grethe No. 1 well was located so as to obtain better conditions of porosity and permeability as well as to gain a position structurally which would have a chance of reaching both the shallow and deep structures. Since the two structures are not exactly compatible, the choice of an advantageous location on both structures was difficult. The best structural position on the shallow structure is near the north end of the nose, where as the best position on the deep structure is on the south end of the nose.

The results of the well, however, did prove that the conditions of porosity

and permeability were much improved in the Grethe #1 location over the Theo Wood #1 location. Cores taken in the well also indicated a change in the structural attitude of the sediments suggesting even more strongly that a thrust is present in the area.

Drilling Techniques and Results

The area of the prospect has had a history of expensive and slow drilling. Penetration rates have been very slow and a large number of bits have been used in drilling each hole. It was decided, therefore, to change the drilling techniques slightly to improve penetration rate and to decrease the cost. After the surface casing was set, the Grethe #1 well was drilled with air. Penetration was rapid, approximately 1 ft/minute, down to a depth of 1392 feet at which point the dust was lost and it was necessary to begin mist drilling. The mist drilling, however, failed to clean up the hole properly and drilling techniques had to be changed to utilize mud. The penetration rate decreased appreciably but was still of the order of 2-3 min/ft. Mud was used to drill the rest of the hole. Normal drilling was used to the point where the first oil shows were observed in the samples. The oil shows began in the top of the Phosphoria formation. It was decided to core the lower Phosphoria and the upper Weber to obtain the best information possible on conditions of porosity, permeability, and saturation. Accordingly, the well was cored from 4150 feet to a total depth of 4333 feet with the exception of 32 ft. from 4240 to 4272 feet. The penetration rate obtained in the coring operations was far better than normally expected, and core recovery was nearly 100%.

Oil Shows and Significance

Phosphoria Formation

The first oil show obtained in the well was found in the interval 4140 to 4196 feet in the upper part of the Phosphoria formation. This oil show consisted of staining and dark brown residual oil contained in light green dolomitic shale. The shale had little evidence of porosity. Additional shows were obtained in dolomite with numerous vertical fractures and seams filled with black oil and thoroughly stained. The oil had a yellow-brown fluorescence, but gave a good cut. Zones in which there were oil saturated bands in blue-grey sucrosic dolomite were present in the core. Highly fractured and broken dolomite, with some vugular and pin-point porosity, with good oil saturation and bleeding oil was also present.

Additional oil shows were found in the lower Phosphoria from 4217 to 4260 feet. Complete oil saturation in brown sucrosic limestone and in vertical fractures and vugs in limestone and dolomite were contained in this portion of the core. The oil appeared to be live, had a strong odor, but still gave a yellow-brown fluorescence and a white cut. Certain zones appeared to be completely saturated and analysis of the cores suggested that live hydrocarbons were present in a potential reservoir contained in the Phosphoria formation.

Weber Formation

The top 15 feet of the Weber formation contained complete oil saturation in brown calcareous sandstone, medium-grained, with rounded quartz grains. The oil was brown in color, had good odor, gave a yellow-brown fluorescence, and white cut. The lower 60 feet of core taken in the Weber formation was obviously saturated with water, with some shows of oil mixed through the core. The oil-water contact was quite apparent at 4275 feet.

It was felt that the upper portion (15 feet) of the Weber could provide some production but care would have to be exercised in perforating to prevent close contact with the water below.

Formation Tops

The formation tops and thicknesses of the formations observed in the drilling of the Grethe #1 well are as follows:

<u>Formation</u>	<u>Depth</u> <u>Sample</u>	<u>Depth</u> <u>Electric Log</u>	<u>Mean Sea Elev.</u>	<u>Thickness</u>
Mancos	Surface	Surface	+5446'	1565'
Dakota	1550'	1565'	+3881'	152'
Morrison	1750'	1717'	+3729'	566'
Curtis	2270'	2283'	+3163'	82'
Entrada	2370'	2365'	+3081'	209'
Carmel	2580'	2574'	+2872'	36'
Navajo	2610'	2610'	+2836'	750'
Chinle	3370'	3360'	+2086'	160'
Shinarump	3520'	3520'	+1926'	32'
Moenkopi	3550'	3552'	+1894'	588'
Phosphoria	4150'	4140'	+1306'	120'
Weber	4260'	4260'	+1186'	—

Total Depth - 4333 feet.

Drill Stem Tests

The following Drill-Stem-Tests were taken and the results are listed below.

D.S.T. #1 Date - May 31, 1967

Test Interval: 4161 to 4196 feet (35 ft.) (Phosphoria)
 Tool Open: 1 hour
 Tool Closed: 1 hour
 Blow: Weak blow initially - dead in 15 minutes
 Recovery: Recovered 30 feet of mud with flecks of black oil on top.

Pressures: I.H.P. - 2096#; I.F.P. - 50#; F.F.P. - 55#;
 F.S.I.P. - 77#; F.H.P. - 2090#
 Temperature: 105°F.
 Remarks: Some free oil found in the tool

D.S.T. #3 Date - June 2, 1967

Test Interval: 4233 to 4263 feet (30 ft.) (Phosphoria)
 Tool Open: 1 hour
 Tool Closed: 45 minutes
 Blow: Strong blow immediate - gradually decreasing to
 weak in 20 minutes; dead in 35 minutes.
 Recovery: Recovered 390 feet of oil cut mud.
 Pressures: I.H.P. - 2134#; I.F.P. - 28#; F.F.P. - 198#;
 F.S.I.P. - 1899#; F.H.P. - 2129#
 Temperature: 106°F.
 Remarks: The shut-in pressure is unusually high and probably
 indicates an artesian hydrostatic head.

Core Discriptions

Three cores were taken in the well and their complete discriptions item-
 ized below.

Core #1 - 4150 to 4196 feet - Rec. 46 ft.

4150-51' Lt. grn dolomitic sh. w/concoidal clew.
 4151-56' Lt. grn to gry. ang. dol.
 4156-59' Lt. gry suc. dol w/lots of pyrite and biotite.
 4159-63' Dns hd. gry. grn. dol w/pyr.
 4163-67' Dns grn dol sh w/pyr and gyp filled seams. Oil on frac-
 tures (Vert.) w/ good cut and fluor. and odor. Bands of
 oil sat. in suc. dol.
 4167-69' Oil sat, bands in bl. gry suc. dol.
 4169-75' Gry grn dol. sh w/oil st. and sat, on frac. (vert.)
 4175-78' Highly frac. and broken dol. (some vug. and suc. w/PPP.)
 good sat. and bleeding oil.
 4178-86' Banded grn dol. sh w pyr and bands of oil sat. Numerous
 vert. frac. w/free oil.
 4186-88' Suc. dol. w oil sat. - some PPP. - good oil sat, fluor. and
 cut. Blk oil in mud.
 4188-93' Suc. gry grn dol w/oil sat. and free bleeding oil on vert.
 fract.s - Tgt.
 4193-95' Gry. suc. dol. w/oil sat. sl. PPP.
 4195-96' Soft grn bent. and lms. w/oil st.

Core #2 - 4196 to 4240 feet - Rec. 42 ft.

4196-4212' Dns - gry grn sl. suc. dol. - Oil sat, - gives banded

- to mottled appearance. No frac., lots of fine pyr.
- 4212-13' Gry suc. dol w/oil sat and pyr. - sl. grnubr Pbr.
- 4213-17' Dns. - dol. - grn sh w/lots of pyr. - No st. or frac.
- 4217-21' Brn suc. lms - fine w/oil sat. and vert frac. strong oil odor.
- 4221-28' Gry bl. lms w/nod. and bands of wh. to bl. ch. w/live oil sat. in vugs and frac. (At 4227 - dip is 10°)
- 4228-31' Gry suc. lms - sdy. tex. w/total oil sat. - frac in places.
- 4231-32' Gry chty lms. - wh - crmy ch. w/oil on frac. Highly frac. - pyr. lms has PPP.
- 4232-34' Brn suc. lms w/uniform sat. - good odor.
- 4234-36' Brec. - sh and cal zone w large cllc xls. vugs and geod filled w/oil.
- 4236-37' Dns grn lms w/slick and some oil st.
- 4237-40' Gry highly chty lms. w/ wh to bl. ch. - oil sat. in lms and on frac. - highly frac.

Core #3 - 4272 to 4333 feet - Rec. 60 ft.

- 4272-75' Brn calc ss w/rd'd qtz/ grms - w/good oil st. (brn oil) good live fl. and cut.
- 4275-85' Wh., sl. calc., ss. w/rd'd qtz grns - no oil st. (water)
- 4285-90' Wh. sl. calc. ss. w/rd'd qtz grns. and spotted oil st. w/water in between.
- 4290-95' Wh to gry fg. ss. w some ang. spots. No oil st.
- 4295-4300' Wh. fg. ss. - No oil st.
- 4300-10' Wh. friable clr., m.g. sl. calc. ss. w some oil st.
- 4310-15' Wh. c.g. water ss. - clr. qtz grns - rd'd.
- 4315-20' Hd. flinty v.f.g., lmy ss. - wh.
- 4320-23' Gry. ang. v.f.g. ss.
- 4323-33' Wh., c.g. friable broken ss. w. ang. matrix.
(Dip of Weber is about 20°)

Analyses of Cores

	<u>Depth</u>	<u>Permeability</u>	<u>Porosity</u>	<u>Water Sat.</u>	<u>Oil Residual</u>
	Ft.	Mil/d.	%	%	%
Core #1	4166.5	0.22	8.5	38	0
	68.5	0.35	9.3	21	20
	74.5	0.20	8.4	18	13
	81.5	0.40	9.2	18	12
	84.5	0.30	8.9	25	9
	85.5	0.10	8.2	33	0
	86.5	0.20	9.1	30	21
	88.5	0.18	8.7	28	12
	89.5	0.20	8.4	38	16
Core #2	4221.5	0.15	8.4	29	0

	<u>Depth</u>	<u>Permeability</u>	<u>Porosity</u>	<u>Water Sat.</u>	<u>Oil Residual</u>
	Ft.	Mil/d.	%	%	%
	26.5	1	11.7	17	9
	28.5	2.4	14.2	19	11
	32.5	4.9	16.9	25	15
	33.5	6.65	17.6	14	18
Core #3	4272.5	2.45	14.5	31	44
	73.5	4.1	13.9	60	12
	75.5	8.05	14	46	23
	76.5	16.1	20	55	0
	79.5	7.7	18.8	56	TR
	85.5	14	18.6	51	TR

Bit Record

<u>Bit No.</u>	<u>Size</u>	<u>Make</u>	<u>Type</u>	<u>Serial No.</u>	<u>Depth Out</u>	<u>Feet Drilled</u>	<u>Hours</u>
1	12 $\frac{1}{4}$	Hughs	W7	Retip	215	215	17
2	7 $\frac{7}{8}$	C.P.	Emlc	25131	1149	934	30
3	7 $\frac{7}{8}$	C.P.	E H3	213933	1465	316	18 $\frac{1}{2}$
4	7 $\frac{7}{8}$	C.P.	Emlvg	40733	1636	171	11
5	7 $\frac{7}{8}$	C.P.	Emlvg	42571	1794	158	9
6	7 $\frac{7}{8}$	C.P.	Emlvg	42562	1967	173	9 $\frac{1}{2}$
7	7 $\frac{7}{8}$	C.P.	Emlvg	42565	2199	232	12
8	7 $\frac{7}{8}$	C.P.	Emlvg	42563	2308	109	10
9	7 $\frac{7}{8}$	C.P.	EM 3	139630	2575	267	15 $\frac{1}{4}$
10	7 $\frac{7}{8}$	C.P.	EM 3	139636	2842	267	19
11	7 $\frac{7}{8}$	C.P.	Emlvg	39174	3236	394	18
12	7 $\frac{7}{8}$	C.P.	Emlvg	41611	3392	156	13
13	7 $\frac{7}{8}$	C.P.	Emlv	41553	3552	160	18
14	7 $\frac{7}{8}$	C.P.	Emlv	41555	3692	140	18 $\frac{1}{2}$
15	7 $\frac{7}{8}$	C.P.	Emlv	41550	3840	148	15 $\frac{3}{4}$
16	7 $\frac{7}{8}$	C.P.	Emj	239229	3954	114	19
17	7 $\frac{7}{8}$	C.P.	Emj	239259	4050	96	17
18	7 $\frac{7}{8}$	C.P.	Emlc	242988	4150	100	21
19	7 $\frac{7}{8}$	Reed	YC3GR	RB902504	4272	32	9 $\frac{3}{4}$

List of Perforations

Perforated with 2 shots/ft. with $\frac{1}{2}$ " super-jet shots.

<u>Interval</u>	<u>Test and Results</u>
4220 to 4244 feet (24 ft.)	Spotted 1000 gals. of mud acid in casing across and above zone to be perforated, before perforating. Pushed this acid back into formation after perforating. Formation broke down at 1750# and acid pumped in at 1200# to 1400#. Swab-tested these zones for 15-16 hours, and recovered acid and some
4248 to 4258 feet (10 ft.)	

water with specks of oil - but no strong flow - approximately 1 to 1½ barrel/hr. Treated zones thru tubing with 1200 gals. of 28% acid, and staged rubber balls to obtain differential and multiple breakdown. Acid pumped in slowly at 900#, but increased to 200 lbs when acid was pumped in at 3 bbl/minute rate. Nine separate breakdowns were indicated on the chart, but no complete shut-off occurred. Left acid set for one hour and then started swabbing. Well began flowing immediately and after 5 hours flowed at a steady rate of 15 to 20 barrels of fluid per hour. Fluid was clear, fresh, water with a fractional percent of brown and black oil. Oil was in specks which melted when exposed to sunlight or heat. Water was about 50°F., much cooler than the formation temperature.

Geological Results

The results of the core analyses, drill-stem-tests, oil and gas shows obtained on the Grethe #1 were extremely encouraging and warranted further checking and testing by running casing, perforating, and treatment with acid to eliminate any contamination through drilling operations. The 1899 lbs shut-in pressure obtained in Drill-Stem-Test #2 suggested unusual energy in a potential reservoir. This pressure is higher than normal and suggests that an artesian drive might be present. There was no way, however, of ascertaining whether or not a quantity of fluid hydrocarbons was present above the artesian pressure. Consequently, the well had to be tested further to determine this fact.

Most of the cores taken thru the Phosphoria and upper Weber indicated nearly flat dips. A gouge zone was present in the Phosphoria at 4196 feet, which could indicate a shear zone and dips of 10° were measured at one spot beneath this zone, suggesting an unconformable attitude between the upper and lower sediments of the Phosphoria.

The results of the tests performed thru the perforations were most discouraging. The reservoir apparently contained little free oil. Most of the oil must have been residual; however, the water did contain a fraction of a percentage of oil. The oil was primarily black and brown specks, which became fluid when exposed to sunlight or heat. To make certain that the water was not channeling up along side the casing from the water saturated section of the Weber below., the various zones were isolated and it

was ascertained that the water was entering the hole through the upper perforations, thus eliminating any possibility of by-passing fluid hydrocarbons adjacent to the well bore.

It is quite obvious that the Blue Mountain nose, as indicated by the surface exposures of the formations is a fairly recent structure in which hydrocarbons have been flushed by encroachment of fresh waters from the Blue Mountain and Split Mountain Uplifts. It is possible that these waters are in contact with a major hydrocarbon reservoir some where within the area and are carrying minute quantities of oil which become trapped against impervious barriers in favorable structural features. This possibility is partially confirmed by the total lack of any gas associated with the hydrocarbons. The gas detector used on the well gave practically no indication of gas in the mud. It is therefore concluded that the oil observed was dead oil and residual in nature. This is a very common occurrence in the area and has been repeated in a number of wells drilled on similar favorable structures. It is quite probable that the structures are young and that the hydrocarbons were accumulated in primary older structures prior to a more recent period of folding. Other older primary structures, similar to Ashley Valley & Rangely, may be obscured by some of the more recent folds. As indicated earlier, the Blue Mountain uplift may well be a thrust from the north over younger sediments and older folds.

The Grethe #1 well certainly proved the favorable nature of the prospect. The flushing nature of the waters in the area unfortunately remove the possibility of commercial production. The conditions of porosity and permeability were favorable as was the structural position; however, it is felt that the feature represented a secondary fold and thus decreased the favorable nature of the potential reservoir rocks.

Conclusions

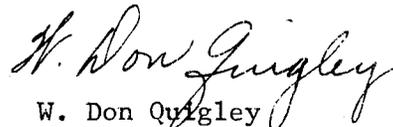
The geophysical work accomplished on the Blue Mountain prospect disclosed some very interesting geological details not readily discernible from surface studies. The area is highly faulted and two major fault systems are present; one at the base of Blue Mountain, and another approximately 4 miles to the SE. Most of the faults appear to be low angle and may not be deep-seated. Data strongly suggest the presence of a large thrust from the north which obscures the true structural configuration of the sediments beneath the sole of the thrust. These conditions were partially confirmed by the data developed by the drilling of the Grethe #1 well. Flat dips, gouge zones, and changes in structural elevations all tend to confirm the presence of abnormal geologic conditions. The geophysical data indicated a number of small secondary structures at or near the surface, which are probably superimposed over a much larger and deeper primary feature below. It is suspected that the secondary structures may not continue below a depth of 6500 feet. It is also understood that Sinclair Oil & Gas Co. has accomplished geophysical work in the area and based on the data obtained feel that a thrust is present, and that wells might re-enter Triassic red

beds below a segment of the Weber formation of undetermined thickness.

A test well through this upper section to the potential primary structure below would have definite merit. However, it is not believed that the position of either the Grethe #1 well or the Theo Wood #1 well is the most favorable to test the primary structural possibilities at depth. Several attempts have been made to test these deeper possibilities in wells located just east of the Utah-Colorado line. Four of these wells encountered highly thrust structures which were penetrated, and undisturbed sediments were encountered below.

Nearly all of the shallow wells drilled in the area have encountered the same residual oil saturation in the Phosphoria and Weber, suggesting that the migration of oil and/or water with slight oil specks have migrated through most of the section. The oil, if present, has now been flushed out by the fresh water in most of the structures.

Certainly considerable information could be obtained by deepening the Theo Wood #1 well. However, this information could be primarily academic in nature rather than leading to a successful completion of the well. The information, however, could lead to a later commercial discovery.



W. Don Quigley
Consulting Geologist
Salt Lake City, Utah

WELL HISTORY
OF
WEST TOLEDO MINES COMPANY
GRETHE #1 WELL

Location: NW. NE. - Section 12, T 6S., R 24E., S.L.M., Uintah County, Utah
(757' from N-line and 1784' from E-line)
Elevations: 5435' grd. and 5446' R.T.
Spudded: May 13, 1967
Plugged and Abandoned: June 11, 1967

Well History

May 10 Making location - moving in rig.
May 11 Finished location work, graded road, and moved in more rig units. Began rigging up.
May 12 Finished moving in rig. Rigging up.
May 13 Rigging up. Drilled rat hole. Spudded in. Drilling 12 $\frac{1}{4}$ " hole.
May 14 Drilled hole to 215 feet. Ran 7 jts. of 8 $\frac{5}{8}$ " casing (214 ft.) Landed casing at 196' from casing head level. Cemented with returns to surface with 70 sacks of cement. Drilled mouse hole. Nippling-up.
May 15 Drilled 650 feet (215 to 865 feet). Drilling 7 $\frac{7}{8}$ " hole below surface casing. Nippled-up and installed blow-out preventor. Began drilling ahead at 5:30 A.M. Drilling with air at rate of 1 ft/min. Survey at 852' was 1 $\frac{3}{4}$ $^{\circ}$.
May 16 Drilled 517 feet (865 to 1382 feet). Made round trip at 1149 feet for Bit #3. Bit #2 made 934 feet in 30 hours. Survey at 1067 feet was 2 $^{\circ}$. Survey at 1283 feet was 2 $\frac{1}{2}$ $^{\circ}$. Drilling in Mancos shale, - dark gray, calcareous shale. Hit white, fine grained, sandstone at 1320 feet. This is probable top of Mowry section.
May 17 Drilled 213 feet (1382 to 1595 feet). Lost dust at 1392 feet and had to rig up injector pump and booster. Drilled to 1465 feet and pressure kept increasing. Couldn't clean up hole and got stuck for short time. Decided to mud up. Took 12 hours to mud-up and circulate and clean hole for 60-ft. back to bottom. Bit #3 made 316 feet in 18 $\frac{1}{2}$ hours. Survey at 1593 feet was 2 $\frac{1}{4}$ $^{\circ}$. The water zone at 1392 - 1430 was in the Mowry. Purple bentonitic shale showed up in samples at 1550. This could be the base of the Braneros and top of the Dakota formation. Drilling in limestone, dolomite and varicolored bentonitic shale from 1550' on. A reverse drilling break occurred at 1551' which could also indicate the top of the

- Dakota. Drilling rate decreased measurably with the mud. Drilling at about 4 min/ft.
- May 18 Drilled 290 feet (1595 to 1885 feet). Made round trip at 1636 feet for Bit #5. Bit #4 made 171 feet in 11 hours. Survey at 1794' was $2\frac{1}{2}^{\circ}$. Made another round trip at 1794' for Bit #6. Drill stem was torquing-up. Bit #5 made 158 feet in 9 hours. Some gray, fine-grained sandstone with oil stain found in samples at 1720 feet as well as oil saturated siltstone along with white to green conglomeratic sandstone. This is probable base of Dakota - the so-called Buckhorn member. Morrison top about 1740 feet.
- May 19 Drilled 307 feet (1885 to 2192 feet). Made round trip at 1967 feet for Bit #7. Bit #6 made 173 feet in $9\frac{1}{2}$ hours. Survey at 1967 feet was $2\frac{1}{2}^{\circ}$. Survey at 2175 feet was $1\frac{3}{4}^{\circ}$. Drilling in varicolored bentonitic shales, gray limestone, fine-grained, gray to green, glauconitic sandstone, conglomeratic sandstone, and bentonite, along with chert and pyrite.
- May 20 Drilled 194 feet (2192 to 2386 feet). Made round trip at 2199 feet for Bit #8. Bit #7 made 232 feet in 12 hours. Made another round trip at 2308 feet for Bit #9. Bit #8 made 109 feet in 10 hours. Drilling rate decreasing - about 5 to 6 minutes/ft. Much more green bentonitic calcareous shale in samples at 2270 feet. This probably marks top of the Curtis. Drilling rate decreased at this point also. White to gray medium-grained, calcareous clear to glauconitic sandstone with rounded quartz grains was found in the samples at 2370 feet. This is the probable top of the Entrada formation.
- May 21 Drilled 264 feet (2386 to 2650 feet). Made round trip at 2575 feet for Bit #10. Bit #9 made 267 feet in $15\frac{1}{2}$ hours. Survey at 2425 feet was $1\frac{3}{4}^{\circ}$. Survey at 2642 feet was $2\frac{1}{4}^{\circ}$. Drilling rate was slow most of time - about 5 min/ft. Only two or three zones of 20-40 ft. broke down to 2 min/ft. Entrada was real shaly - had lots of red, and gray, and green bentonitic, calcareous shale. At 2580' a buff to amber colored, medium-grained, quartz sandstone was encountered. This is probably the top of the Carmel. Gray and black shale with a few brownish, rounded, quartz sand grains were found in the cuttings at 2610 feet. This may be the top of the Navajo. (Samples are very poor. The grey and black shale are probably Mancos cavings.)
- May 22 Drilled 485 feet (2650 to 3135 feet). Made round trip at 2842 feet for Bit #11. Bit #10 made 267 feet in 19 hours. Survey at 2842 feet was $2\frac{1}{2}^{\circ}$. Survey at 3074 feet was 3° . Drilling in Navajo sandstone. Samples still very poor; - contain lots of grey and black shale which looks like Mancos shale; also lots of gray-green shale. However, drilling rate was also erratic, suggesting changing lithology.
- May 23 Drilled 242 feet (3135 to 3377 feet). Made round trip at 3236 feet for Bit #12. Bit #11 made 394 feet in 18 hours. Survey at 3293 feet was $3\frac{3}{4}^{\circ}$. Drilling rate decreased measurably at 3355 feet. Rate decreased to 8 min/ft. This is probable top

- of Chinle. Samples also changed at 3370 feet. Brick red, green, and gray silty calcareous shale were found in the samples at this point.
- May 24 Drilled 163 feet (3377 to 3540 feet). Made round trip at 3392 feet for Bit #13. Bit #12 made 156 feet in 13 hours. Drilling rate remained slow - about 8 to 10 min/ft. Drilled in red and buff colored siltstone and shale most of the day. Some white, medium-grained sandstone and oolitic limestone were present in samples at 3530 feet. This is probably the Shinarump. Survey at 3508 feet was 3°.
- May 25 Drilled 100 feet (3540 to 3640 feet). Started out of hole at 3552 feet for Bit #14. Stuck drill pipe at 3300 feet and spent 3 hours working loose. Had to wash and ream six stands out before free. Had to ream out section 3250 to 3350 feet. Went into Moenkopi at about 3550 feet and drilled red-brown and buff, calcareous shale and siltstone, along with varicolored shale, anhydrite, and chert. Installed gas detector on mud stream at 6 P.M. this date.
- May 26 Drilled 173 feet (3640 to 3813 feet). Made round trip at 3692 feet for Bit #15. Bit #13 made 160 feet in 18 hours and Bit #14 made 140 feet in 18½ hours. Still drilling in Moenkopi in red-brown siltstone; fine-grained, argillaceous, sandstone; and some anhydrite. Survey at 3754 feet was 2¾°. No gas reading on gas detector.
- May 27 Drilled 117 feet (3812 to 3930 feet). Made round trip at 3840 feet for Bit #16. Bit #15 made 148 feet in 15¾ hours. Still drilling in Moenkopi. No gas or oil shows. Drilling rate is about 10 min/ft.
- May 28 Drilled 100 feet (3930 to 4030 feet). Made round trip at 3954 feet for Bit #17. Bit #16 made 114 feet in 19 hours. Still in Moenkopi. No gas readings or oil shows. Survey at 4030 feet was 3°.
- May 29 Drilled 93 feet (4030 to 4123 feet). Made round trip at 4050 feet for Bit #18. Bit #17 made 96 feet in 17 hours. Drilling very slow - about 12 to 15 min/ft. Samples show some limestone and mottled purple and pink bentonitic shale. Must be near top of Phosphoria. No gas readings or oil shows.
- May 30 Drilled 62 feet (4123 to 4185 feet). Decided to core at 4150 feet. Limestone with oil stain, and black tarry oil appeared in samples at 4130 feet. Dull yellow fluorescence. Dark brown sucrose limestone with oil stain found at 4140 feet. Came out of hole and put on core barrel and head. Bit #18 made 100 feet in 21 hours. No gas readings on detector. Cored 4150 to 4185 feet. Cored at rate of 4 feet/hour.
- May 31 Cored 35 feet (4185 to 4220 feet). Cored to 4196 feet and core barrel jammed, so had to come out of hole. Recovered 46 feet of core. Gas detector showed some gas in mud (about 2 units) from 4190 to 4196 feet. Core was mostly dolomite. Oil in vertical fractures were present in the core at 4163 feet, and oil shows, saturation,

odor, and bleeding oil continued to the bottom of the core. Some sucrosic dolomite and sugary limestone, with pin-point porosity were present, as well as highly fractured and broken sections. Decided to test the interval cored.

June 1 Ran D.S.T. #1 and tested the interval 4161 to 4196 feet. Tool open 1 hour and shut-in for 1 hour. Weak blow initially - died in 15 minutes. Recovered 30 feet of mud with flecks of black oil on top. Final shut-in pressure was 77 lbs. Went back in hole with core barrel and head to take another core. Cored and drilled 52 feet (4220 to 4272 feet). Cored to 4240 feet and pump pressure increased from 100 lbs to 1200 lbs and rotary torque increased considerably. Decided to pull core before head was damaged. Recovered 42 feet of core. Core head was worn smooth and broken in places. Gas detector had a gas reading of over 5 units after test was run and while coring from 4196 to 4208 feet. Core was dolomite with oil stain, but tight, from 4196 to 4217 feet; then changed to vugular cherty limestone with live oil in the vugs and fractures. Brown sucrosic limestone with uniform saturation, brecciated limestone and calcite geodes filled with oil, and saturated highly fractured sections were present in the core. The base of the core was chert and was responsible for wearing out the core head. Had to go back in hole with insert bit to clean up hole and drill chert section before coring further. Drilled to 4272 feet. Samples showed Weber sandstone with oil saturation beginning at 4260 feet. Oil gave yellow-brown fluorescence, but white cut. Decided to take another core.

June 2 Cored 61 feet (4272 to 4333 feet). Cored real rapidly at rate of 2 to 3 minutes per foot. Cored 60 feet in about 3½ hours. Pulled core and recovered 60 feet. The first three feet (4272' to 4275') was medium grained to coarse grained, rounded, sandstone, with complete oil saturation. Saturation gave dull fluorescence but good live-white cut. Oil-water contact was evident at 4275 feet. Rest of core was water saturated sandstone with good porosity. No gas shows were recorded by the gas detector in this cored interval. D.S.T. #2 was run to test interval 4233 to 4263 feet. A straddle packer was used to insure testing only the oil saturated section and not the water zone. Tool was open 1 hour and shut-in for 45 minutes. A strong blow was obtained immediately - gradually decreasing to weak in 20 minutes and dead in 35 minutes. Recovered 390 feet of oil cut mud (brown and black oil). No water. Final shut-in pressure was 1882 lbs. This pressure is unusually high and could indicate artesian water pressure. Decided that it was necessary to run casing and try to complete the well due to the excellent shows and favorable results of the core analyses. The core analyses indicated good porosity, low water content, good permeability and low residual oil saturation. Casing was ordered and Schlumberger was called to log

- the well.
- June 3 Ran logs. Ran Induction-Electrical log from bottom to top. Ran Density log from bottom (4335 feet by Schlumberger) to 3600 feet. Got density sonde stuck at this point and had to work for $\frac{1}{2}$ hour to free tool. When it came loose, tool was pulled out of hole immediately to avoid further sticking. Went back in hole with bit to circulate and condition hole and mud prior to running casing. Waited on casing for 12 hours.
- June 4 Started out of hole laying down drill pipe. Layed down rest of drill pipe and ran in casing. Ran 102 joints of $5\frac{1}{2}$ " , 14 lb, J-55-Range 1 casing. Float collar at top of first joint, scratchers every 15 feet from bottom to 250 feet above bottom of string, and centralizers every other joint for first 1000 feet. Landed casing at 4332 feet; moved casing up and down thru 15-ft. interval to scratch mud off walls before cementing. Cemented casing with 125 sacks of 50% Pozmix - 50% Ideal cement, with 6% salt and 2% gel. Displaced with 106 barrels of water. Plug down at 7 A.M. this date. Waiting on cement.
- June 5 Waiting on cement.
- June 6 Waiting on cement.
- June 7 Waited on cement to cure for 72 hours. Had McCullough run correlation log and cement bond log from bottom to 3500 feet. Found cement inside of casing at 4278 feet and top of cement outside casing at 3585 feet. Bond log showed excellent bond between casing and cement. Ran tubing in hole to 4275 feet and had Dowell spot 1000 gal. of mud acid on bottom before perforating. Pulled tubing out of hole. Perforated intervals, 4220 to 4244 feet, and 4248 to 4258 feet, with 2 shots per foot using $\frac{1}{2}$ " super jets. Had Dowell squeeze mud acid back into perforations by displacing with water down casing. Formation broke down at 1750#, and pumped in at $\frac{1}{2}$ bbl/minute rate at 1200 lbs; at 1 bbl/min rate at 1300 lbs; and at $3\frac{1}{2}$ bbl/min rate at 1400 lbs. Ran tubing back in hole with Parrish Oil Tool Co. packer. Set packer at 4195 feet. Rigged swab and began swabbing.
- June 8 Swabbed down to 3000 feet in about 5 hours. Recovered gas cut, acid water, and active acid. Pulled swab from 3000 ft. level every $\frac{1}{2}$ hour and recovered approximately 1 barrel of fluid each time. (Swab line was damaged at the 3000 ft. point and had to be spliced.) Waited on splicer - Got Mr. Bacon from Rangely to splice line. Line was spliced at 2:30 P.M. and began swabbing hole to bottom. Swabbed out more frothy acid water and swabbed to bottom in about four runs; then began swabbing once every $\frac{1}{2}$ hour and recovered about $1\frac{1}{2}$ to 2 barrels each time. Found that packer or tubing was leaking at midnight and had to start out of hole with tubing.

- June 9 Came out of hole with packer and went back in with a different packer (Halliburton - RTTS).
Decided to treat the perforations with a small amount of 28% acid and break down perforated intervals successively by using balls. This treatment of 1200 gallons would be pumped down the tubing.
Ran tubing and packer to 4173 feet. Let packer unseated until water in tubing had been displaced, then set packer, and started acid treatment. Dropped 75 balls in stages (3 balls per bbl of acid). Acid pumped in at 950 lbs initially at $\frac{1}{2}$ bbl/min rate, and then decreased to 900 lbs. Final 6 barrels was pumped in at 3 bbl/min rate and pressure increased to 2000 lbs. There were approximately 9 separate break downs indicated on the chart, but the perforations did not ball out. Well tried to flow back immediately, but shut well in and held pressure for 1 hour. Released pressure and well started flowing back at about a 1 inch stream immediately. Pulled one swab and well started flowing at uniform rate of 15 barrel of fluid per hour. The fluid was spent acid water, cut with flecks of black oil at first. After 4 hours the fluid was mostly slightly sulphurous clear, fresh water with black oil particles. There was less than a tenth of a percent oil in the water. The oil was black and tarry but would melt when exposed to the sun. The water was cool-probably about 50 degrees. The well was allowed to flow for many hours, approximately 20 hours, and there was no change to the volume or content of the fluid.
- June 10 To be absolutely certain that the water was not coming up through the bottom of the casing and directly from the Weber without passing thru the oil-saturated section of the Phosphoria, it was decided to set the packer below the perforations and pressure up on the casing and cement plug at the bottom. The tubing was pulled and a casing scraper was run thru the perforated interval. The packer was then set at 4265 feet below the perforations. The water continued to come up the casing on the outside of the tubing. The pump was connected to the tubing and a pressure of 1200 lbs was applied with no apparent leaks or bleed-off. This pressure was reached in about 6 strokes of the pump, thus proving that no leaks or openings were present in the casing below the perforations. The packer was then set at 4246 feet between the lower and upper set of perforations and the full volume of the water continued to flow out the casing outside the tubing, indicating that the water was coming thru the upper perforations and not thru the bottom set at all. Consequently, the water is flowing thru the very top of the oil-saturated section and is not coming up along the side of the casing from the Weber below.

The negative results of the above tests left no alternative but to plug and abandon the well. Halliburton was called and the well was plugged in the following manner:

1. The packer was set at 3800 feet and 50 sacks of cement were squeezed into the interval 3800 to 4278 feet. This was held for 5 hours to insure setting and sealing off the perforations and the water flow. The tubing was layed down.
2. The 5½" casing was shot-off at 3528 feet and pulled to 2650 feet. A 25-sack plug was set from 2650 to 2550 feet across the top of the Navajo formation.
3. The casing was pulled to 1740 feet and another 25-sack plug was set from 1740 to 1640 feet across the Dakota sand.
4. The casing was pulled to 250 feet and another 25-sack plug was set from 250 to 150 feet across the bottom of the surface casing.

June 11 Plugged and abandoned. Last plug pumped down at 12:30 A.M.
Started rigging down and preparing to move the rig.

W. Don Quigley

W. Don Quigley
Consulting Geologist

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.
U-0122316

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Blue Mountain

9. WELL NO.

Grethe #1

10. FIELD AND POOL, OR WILDCAT
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
NW. NE. Sec. 12, T.6 S., R.24 E., S.L.M.

1. OIL WELL GAS WELL OTHER

2. NAME OF OPERATOR
West Toledo Mines Company

3. ADDRESS OF OPERATOR
P. O. Box 44, Salt Lake City, Utah

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface **NW. NE. Section 12, T.6 S., R.24 E. S.L.M.
757' from N-line & 1784' from E-line of Sec. 12.**

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

Grd. 5435'; R.T. 5446'

12. COUNTY OR PARISH
Uintah

13. STATE
Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETE

ABANDON*

CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

SHOOTING OR ACIDIZING

(Other) **Clean-up**

REPAIRING WELL

ALTERING CASING

ABANDONMENT*

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

17. 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.)*

The marker on the above well has been securely cemented and the spare cable left on the location has been removed.

Please notify the bonding company to release the bond and bring this matter to a conclusion.

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

SIGNED

W. W. Fungley

TITLE

Consulting Geologist

DATE

August 8, 1963

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

December 4, 1967

MEMO TO THE COMMISSIONERS

Re: West Toledo Mines
Grethe #1
Sec. 13, T. 6 S, R. 24 E,
Uintah County, Utah

On November 30, 1967, the above named well site was visited. The abandoned location has been cleaned, leveled, and properly identified. However, the marker was found loose, and before approval can be given to the operator, it will be necessary for them to set a few sacks of cement to make the marker more permanent.

PAUL W. BURCHELL
CHIEF PETROLEUM ENGINEER

PWB:SD