CHECK SHEET

Date September 28, 1976

Company ~~North American Resources Co.~~ MONTANA POWER COMPANY ~~THE MONTANA POWER COMPANY~~ ~~230 ELECTRIC BLDG. BILLINGS, MONTANA 59101~~ ~~Montana Power Company~~

Well Name CROFT No. 7-32

County CARBON Field WILDCAT

Location 1500 FNL 2205 FEL (NW SW NE) Sec. 32 Twp. 6S. Rge. 21E.

Permit No. S 7825

Receipt No 13130

Drilling Fee $75.00

Intention to Drill 9-27-76 (Approved 9-28-76)

API No. 009-21084

Permit Expiration Date December 26, 1976

Permit Extended 90 days From ____ To ____

$ 5,000 one well bond

$10,000 blanket bond X

$20,000 blanket bond

Government well Sent to perf 1st Frontier 9-19-83 Suppl Wire History 11/7/86

Sundry Notices Geological Report 2 cop. 1-10-77

" " ~~Instructs~~

" " DST # 1, 2 1-10-77 3 copies.

" " Chg. Operator 11-3-82 Chg. of Operator 7-24-87 Chg of Operator 1-22-88

Log of Well 1-10-77 Chg of Operator 9-30-88 Compl 12-29-76 Shut in gas well T.D. 6475 773 MCFGPD S.I.

Subsequent Report of Abandonment Intent to Abandon 11/9/91 5-26-91 9-11-92

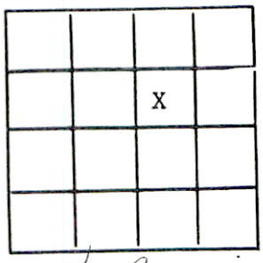
Electric Log ~~Induction~~ Laterolog

Radioactive Log DLOP 1-10-77 Compensated Neutron Formation Density

PLAINTIFFS' EXHIBIT P267

Form No. 4
(Gen. Rule 206.3 and 230)

LOCATE WELL CORRECTLY



(SUBMIT IN TRIPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

COMPLETION REPORT

7

Company ~~The Montana Power Company~~ No. American Resources Co. Lease Croft Well No. 7-32

Address 40 E. Broadway Field (or Area) Dry Creek

The well is located 1500 ft. from (N) (S) line and 2205 ft. from (E) (W) line of Sec. 32

Sec. 32; T. 6S; R. 21E; County Carbon; Elevation 5014' KB (D.F., R.B. or G.L.)

Commenced drilling ~~10-1~~ 6-30-86, 19 76; Completed ~~11-12~~ 8-8-86, 19 76

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as Gas Well (oil well, gas well, dry hole)

Signed Pat Maloney

Title Petroleum Engineer

Date May 29, 1987

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From 5530 to 5545 3rd Fron. G
From ____ to ____
From ____ to ____
From ____ to ____

From ____ to ____
From ____ to ____
From ____ to ____
From ____ to ____

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
8-5/8	24	J55	STC	215 KB	0	215	150	
5-1/2	15.5	K55		6460 KB	0	6460	450	

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2-7/8	6.5	J-55		5432	

COMPLETION RECORD

Rotary tools were used from 0 to 6475
Cable tools were used from ____ to ____
Total depth 6475 ft.; Plugged back to 6300 T.D.; Open hole from ____ to ____

PERFORATIONS			ACIDIZED, SHOT, SAND FRACED, CEMENTED			
Interval From	Interval To	Number and Size and Type	Interval From	Interval To	Amount of Material Used	Pressure
5530	5545	4 spf w/4" Hollow carrier	See attached Sundry Notice			

(If P&A show plugs above)

INITIAL PRODUCTION

Well is producing from 3rd Frontier (pool) formation.

I. P ____ barrels of oil per ____ hours (pumping or flowing)

200 Mcf of gas per 24 hours.

____ barrels of water per ____ hours, or ____ % W.C.

(OVER)

INITIAL PRODUCTION—(Continued)

Initial 10-day average production _____ (bbl./day) (if taken)
Pressures (if measured): Tubing _____ psi flowing; _____ psi shut-in
Casing _____ psi flowing; _____ psi shut-in
Gravity _____ ° API (corrected to 60° F.)

DRILL STEM TESTS

D.S.T. No.	From	To	Tool Open (Min.)	Shut-In	F.P.	S.I.P.	Recovery	Cushion

CORES

No.	Interval	Recovered

LOG RUNS

Type	From	To

FORMATION RECORD

(Need not be filled out if Geologist sample description filed with Commission)

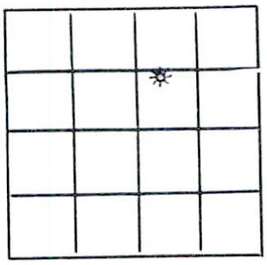
From	To	SAMPLE AND CORE NO. AND DESCRIPTION	Top of Formation
		See Geologist report	

(Use additional sheets where needed to complete description)

NW SW NE
009-21084

Form No. 4
(Gen. Rule 206.3 and 230)

LOCATE WELL CORRECTLY



(SUBMIT IN TRIPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

COMPLETION REPORT

7

Company The Montana Power Company Lease Croft Well No. 7-32
230 Electric Building
Address Billings, Montana 59101 Field (or Area) W.C.

The well is located 1500 ft. from (N) (S) line and 2205 ft. from (E) (W) line of Sec. 32

Sec. 32 ; T. 6S ; R. 21E ; County Carbon ; Elevation 5014'K.B. 5002'G.L. (D.F., R.B. or G.L.)

Commenced drilling October 1, 1976; Completed December 29, 1976

The information given herewith is a complete and correct record of the well. The summary on this page is for the condition of the well at the above date.

Completed as Shut in gas well
(oil well, gas well, dry hole)

Signed R. B. Rhodes
R. B. Rhodes
Title Chief Geologist

Date January 7, 1977

IMPORTANT ZONES OF POROSITY

(denote oil by O, gas by G, water by W; state formation if known)

From to
From to
From to
From to

From to
From to
From to
From to

CASING RECORD

Size Casing	Weight Per Ft.	Grade	Thread	Casing Set	From	To	Sacks of Cement	Cut and Pulled from
8-5/8"	24#	J-55	8 RD	203'	Surface	215'KB	150	--
5-1/2"	15.5#	K-55	8 RD	6448'	Surface	6460'KB	450	--

TUBING RECORD

Size Tubing	Weight Per Ft.	Grade	Thread	Amount	Perforations
2-3/8"	4.7#		8 RD	229 jts	6382.82'KB

COMPLETION RECORD

Rotary tools were used from Surface to T.D.
Cable tools were used from to
Total depth 6475 ft.; Plugged back to T.D.; Open hole from to

PERFORATIONS			ACIDIZED, SHOT, SAND FRACED, CEMENTED			
Interval From	Interval To	Number and Size and Type	Interval From	Interval To	Amount of Material Used	Pressure
6378	6382 w/4 SPF w/3-1/8" steel carrier casing gun.					

(If P&A show plugs above)

INITIAL PRODUCTION

Well is producing from Greybull (pool) formation.

I. P. barrels of oil per hours
(pumping or flowing)

773 Mcf of gas per 24 hours.
barrels of water per hours, or % W.C.

(OVER)

P-0014663

INITIAL PRODUCTION—(Continued)

Initial 10-day average production _____ (bbl./day) (if taken)
Pressures (if measured): Tubing _____ psi flowing; _____ psi shut-in
Casing _____ psi flowing; _____ psi shut-in
Gravity _____ ° API (corrected to 60° F.)

DRILL STEM TESTS

D.S.T. No.	From	To	Tool Open (Min.)	Shut-In	F.P.	S.I.P.	Recovery	Cushion
1	5360	5384	15-30	30-60	55-64-	102-	15' of drilling fluid	
					55-64	102		
1	5534	5578	10-30	30-60	140-	592-	174' sl G&OCM, 261'	
					159-	706	HG & sl. OCM	
					225-			
					262			

CORES

No.	Interval	Recovered
	N	
	O	
	N	
	E	

LOG RUNS

Type	From	To
IES	216'	6458'
FDC/CNL/GR	150'	6458'

FORMATION RECORD

(Need not be filled out if Geologist sample description filed with Commission)

From	To	SAMPLE AND CORE NO. AND DESCRIPTION	Top of Formation
		Formation tops	
		Fort Union	Surface
		Lennep Sandstone	2709'
		Bearpaw Shale	2881'
		Fault	3458'
		Mesaverde	3460'
		Telegraph Creek	3690'
		Cody Shale	3933'
		Frontier	4954'
		1st Frontier Sandstone	5046'
		2nd Frontier Sandstone	5342'
		Mowry "A" Sand	5447'
		Mowry "B" Sand	5521'
		Thermopolis Shale	5733'
		Dakota Silt	6200'
		Dakota Sand	6275'
		Greybull Sand	6364'
		Kootenai	6406'

(Use additional sheets where needed to complete description)

Form No. 2

GENERAL RULES
201, 202, 213,
216, 219, 230,
231, 232

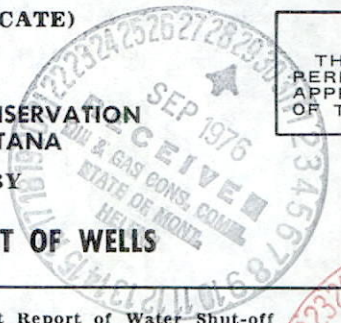
(SUBMIT IN QUADRUPLICATE)

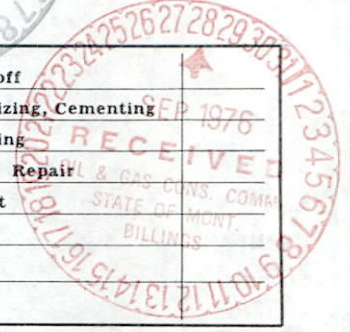
TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.





SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill	X	Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

September 27, 1976

Following is a {notice of intention to do work / ~~report of work done~~} on land {~~owned~~ / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) W.C. (Field)

Well No. 7-32-6-21 NW SW NE 32 (m. sec.) 6S (Township) 21E (Range) MPM (Meridian)

The well is located 1500 ft. from {N / ~~S~~} line and 2205 ft. from {E / ~~W~~} line of Sec. 32

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground ~~XXXXX~~ above the sea level is 4989' G.L. (before grading)

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

AMOUNT RECEIVED $75.00
DRILLING PERMIT NO. $7825
RECEIPT NO. 13130

GAS TEST

Set 200' of 8-5/8" surface pipe and cement to surface.

Drill a 7-7/8" hole to approximately 6000' for a Greybull sand test.

4-1/2" or 5-1/2" production casing will be run and cemented if commercial production is indicated.

FILING WITH THE COMMISSION ALL LOGS REPORTS, SURVEYS AND ANALYSES MADE OR RUN IS REQUIRED IN ACCORDANCE WITH RULE NO. 230.

CORES AND CUTTINGS TO BE DELIVERED TO COMMISSION OFFICE AT 15 POLY DR. BILLINGS, MONTANA IN ACCORDANCE WITH RULE NO 229.

Approved subject to conditions on reverse of form

Date SEP 28 1976

By Blair F. Hawkins Supervisor
District Office Agent Title

Company THE MONTANA POWER COMPANY

By R. B. Rhodes

Title Chief Geologist

Address 230 Electric Bldg. Billings, Montana 59101

BOARD USE ONLY
API WELL NUMBER
25 0019 21101814
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER

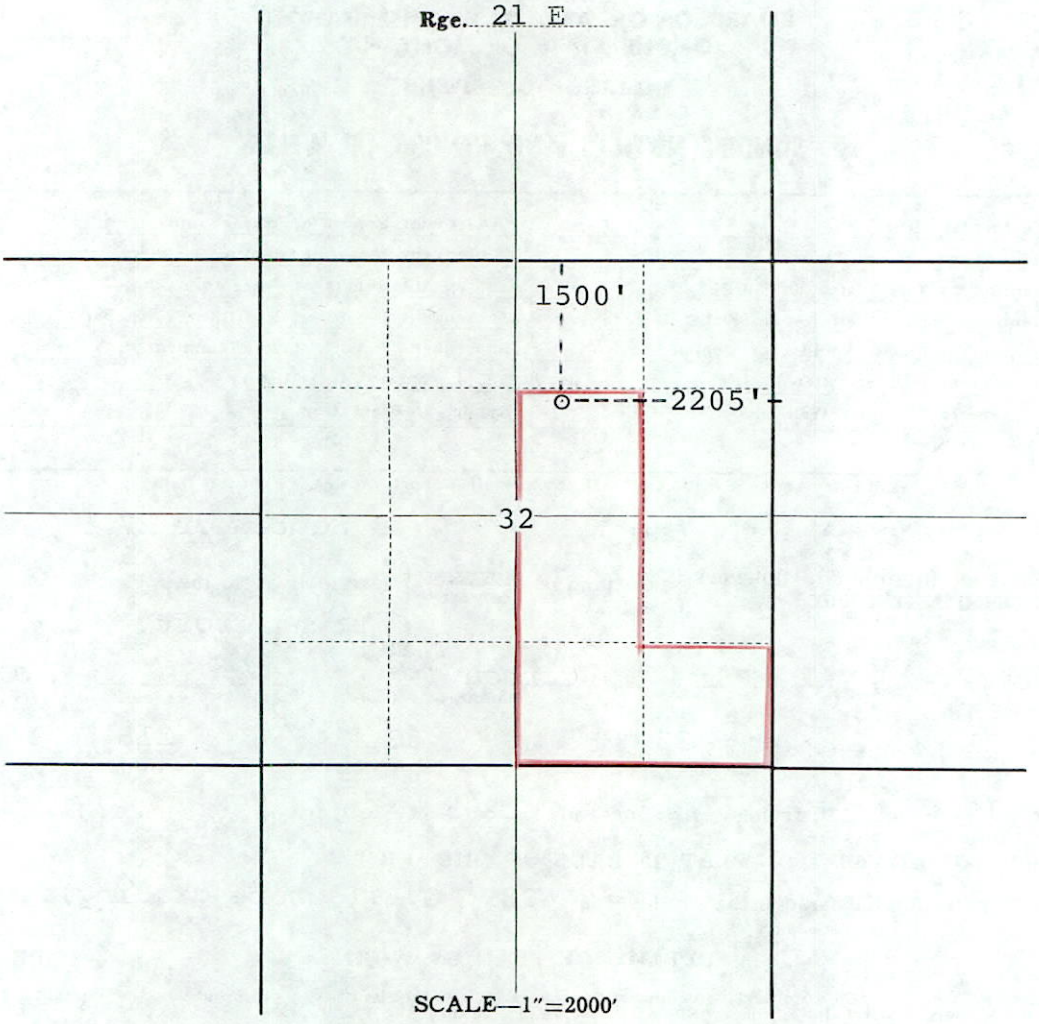
On well card 9-29-76 MLR

P-0014665

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge. 21 E



SCALE—1"=2000'

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6 S

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

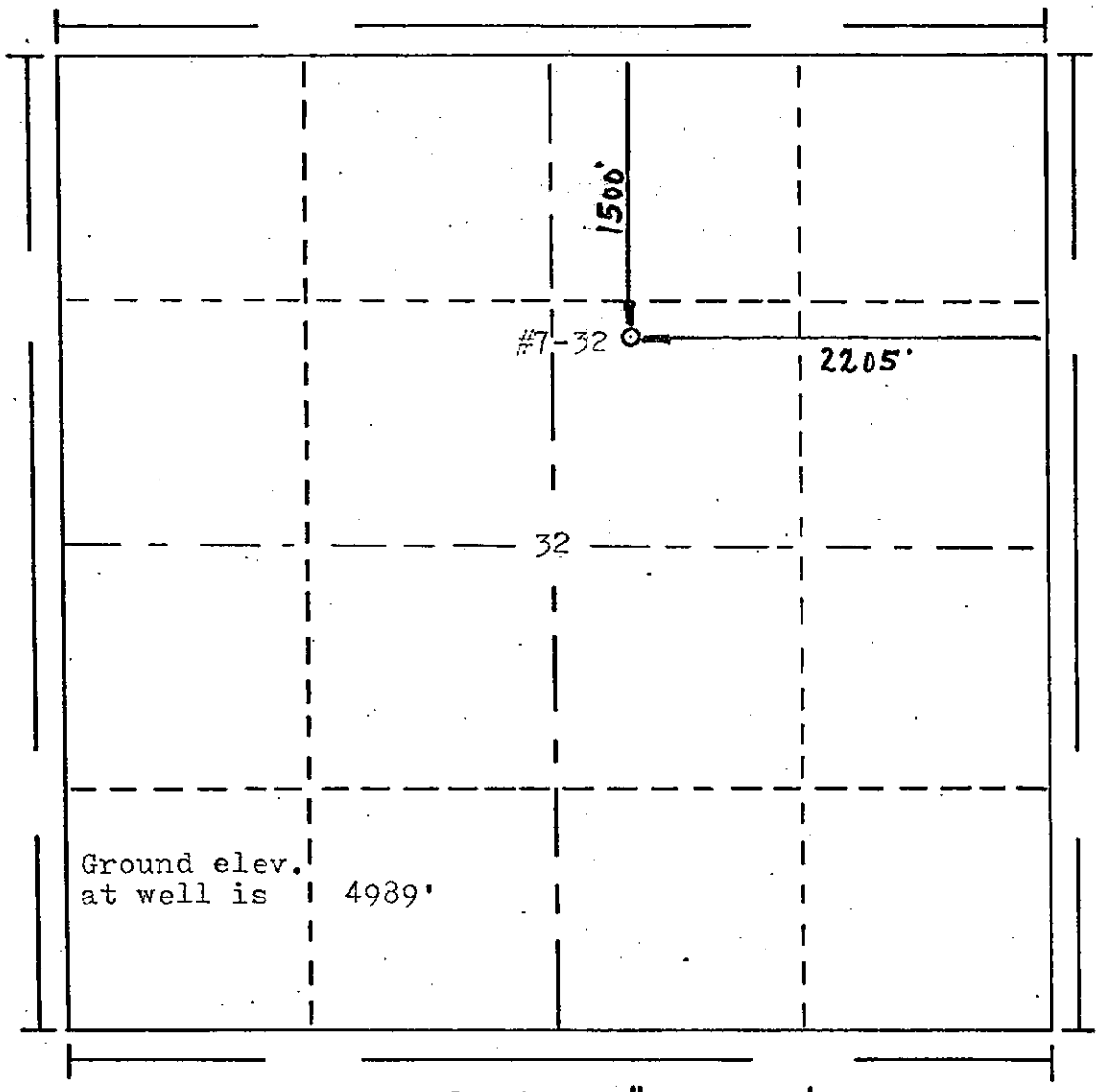
8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 230 and one copy of all cementing records as furnished by the cementing company and described in Rule 234.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

FORM F-106



Scale··· 1" = 1000'

Powers Elevation Company, Inc. of Denver, Colorado has in accordance with a request from Bob Rhodes for Montana Power Co. determined the location of #7-32 Croft to be 1500'FN & 2205'FE Section 32 Township 6 S Range 21 E Montana Meridian Carbon County, Montana

I hereby certify that this plat is an accurate representation of a correct survey showing the location of #7-32 Croft

Date: 7-29-76

Licensed Land Surveyor No. 4657S
State of Montana

P-0014667

Form No. 2 R 4-84

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

RECEIVED NOV 1986 BOARD OF OIL & GAS STATE OF MONTANA BILLINGS

ARM 36.22.307 ARM 36.22.601 ARM 36.22.602 ARM 36.22.603 ARM 36.22.604 ARM 36.22.605
ARM 36.22.1003 ARM 36.22.1004 ARM 36.22.1013 ARM 36.22.1301 ARM 36.22.1306 ARM 36.22.1309

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	XX
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

November 5, 1986

Following is a {~~Notice of Intention to do work~~ / report of work done} on land {~~Fee~~ / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 SW NE 32 (m. sec.) 6S (Township) 21E (Range) MPM (Meridian)

The well is located 1500 ft. from {~~N~~ / ~~S~~} line and 2205 ft. from {~~E~~ / ~~W~~} line of Sec. 32

* For notice of intention to drill, write the API# or the well name of another well on this lease if one exists

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5014' KB.

READ CAREFULLY — **DETAILS OF PLAN OF WORK** — READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Nitrogen fraced the Third Frontier sand from 5530' - 5545' with:

1. 25,000 gallons of fluid.
2. 102,500 lbs 20-40 sand.
3. 25,000 lbs 12-20 sand.
4. 2,000,000 SCF of nitrigen.

The well came back flowing oil and gas and will be connected to Montana Power Company's system.

Approved subject to conditions on reverse of form

Date 11-17-86

By [signature] Petroleum Engineer
District Office Agent Title

North American Resources Co. 5385 ~~5160~~ BO 340 BO 344

Company The Montana Power Company

By G.J. Ogrin [signature]

Title Assistant Engineer

Address 40 East Broadway Butte, MT 59701

BOARD USE ONLY
API WELL NUMBER
25 | 09 | 21084
STATE COUNTY WELL

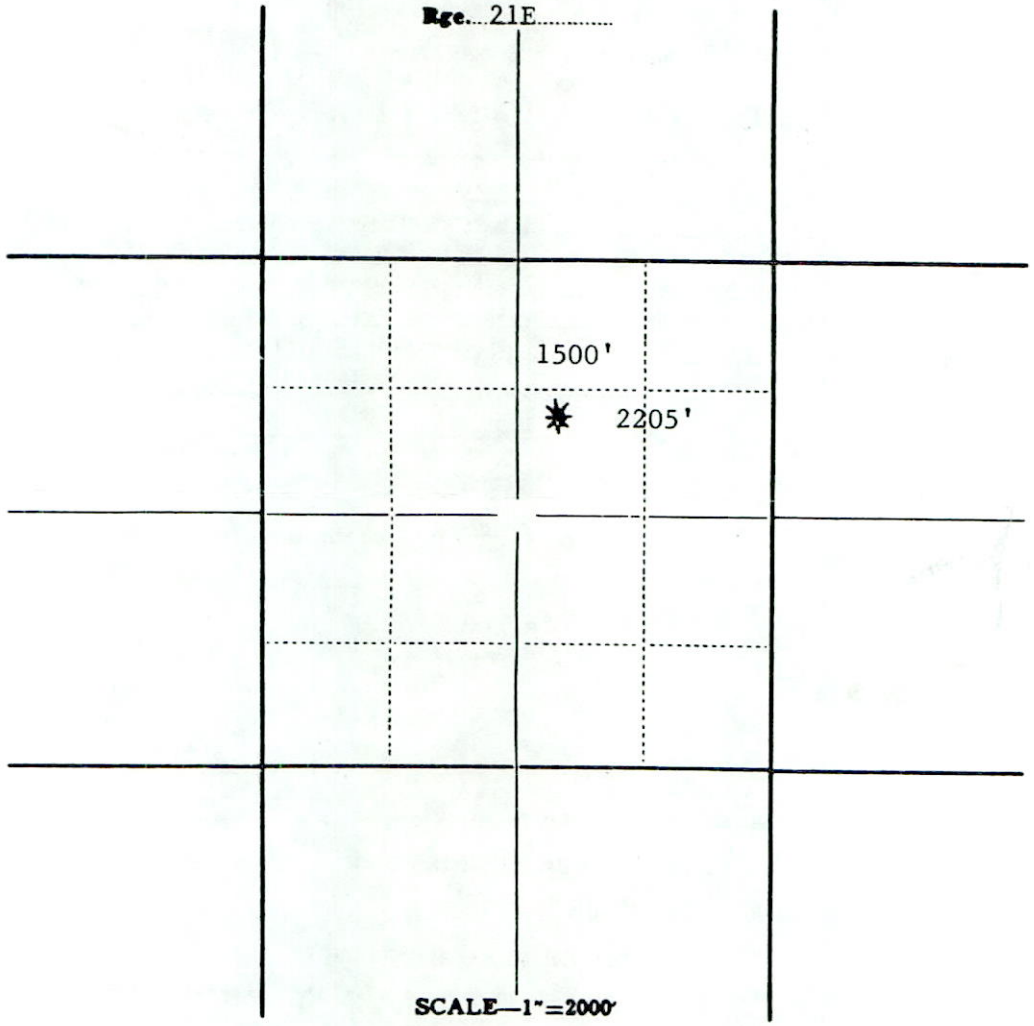
NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

P-0014668

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge. 21E



Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6S

SCALE—1"=2000'

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana. Date of spudding must be reported to the Board verbally or in writing within 72 hours of commencing drilling.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 36.22.1013 and one copy of all cementing records as furnished by the cementing company and described in Rule 36.22.1241.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

Form No. 2 R 4-85

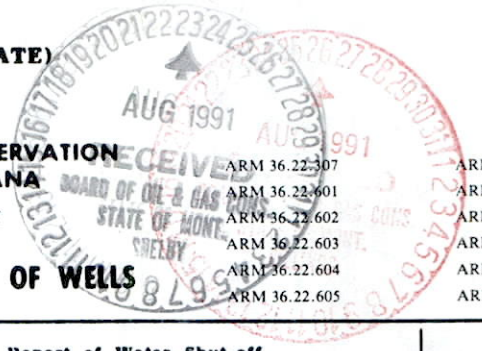
(SUBMIT IN QUADRUPLICATE)

TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.



ARM 36.22.307 ARM 36.22.1003
ARM 36.22.601 ARM 36.22.1004
ARM 36.22.602 ARM 36.22.1013
ARM 36.22.603 ARM 36.22.1301
ARM 36.22.604 ARM 36.22.1306
ARM 36.22.605 ARM 36.22.1309

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment Producer	XXX
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 21, 19 91

Following is a {notice of intention to do work / report of work done} on land {owned / leased} described as follows:

LEASE TYPE Private (Private, State, Federal, Indian) LEASE Croft

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 SWNE (m. sec.) 32 T6S (Township) R21E (Range) (Meridian)

The well is located 1500 ft. from {N / XXSXX} line and 2205 ft. from {E / XXWXX} line of Sec. 32

* For notice of intention to drill, write the API# or the well name of another well on this lease if one exists N/A

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5002 G.L.; 5014 K.B.

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

8/15/91

1. Set CIBP at 5405'.
2. Ran 181 joints of 2-7/8" tubing; landed at 5395'.

LOCATION INSPECTED & APPROVED

8/16/91

1. Circulated hole with water.
2. Spotted 25 sacks at 5395' to 5115'.
3. Pulled 35 joints.
4. Spotted 110 sacks at 4335' to 3100'.
5. Pulled 146 joints.
6. Placed 10 sacks at surface.
7. Cut off well head and restored location.

Approved subject to conditions on reverse of form

Date 9/11/92

By James W. Halvorsen Geologist
District Office Agent Title

Company The Montana Power Company

By John Merkel John MERKEL

Title Petroleum Engineer

Address 40 East Broadway, Butte, MT 59701

BOARD USE ONLY
API WELL NUMBER
25 009 21084
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

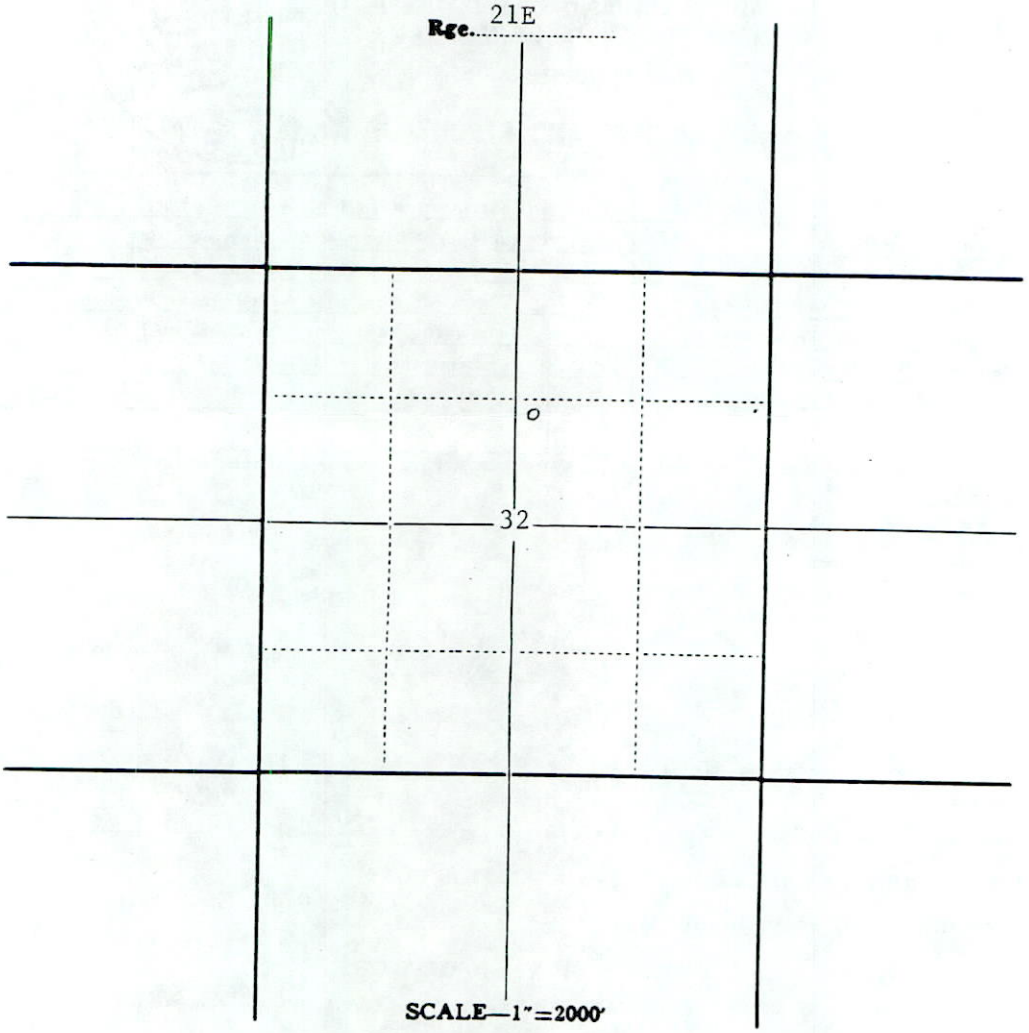
X207

P-0014670

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge. 21E



Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6S

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana. Date of spudding must be reported to the Board verbally or in writing within 72 hours of commencing drilling.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 36.22.1013 and one copy of all cementing records as furnished by the cementing company and described in Rule 36.22.1241.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

Form No. 2 R 4-84

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

SUNDRY NOTICES AND REPORT OF WELLS

RECEIVED
JUL 1991
OIL & GAS CONS. COMM.
STATE OF MONT.
BILLINGS

ARM 36.22.307 ARM 36.22.601 ARM 36.22.602 ARM 36.22.603 ARM 36.22.604 ARM 36.22.605
ARM 36.22.1003 ARM 36.22.1004 ARM 36.22.1013 ARM 36.22.1301 ARM 36.22.1306 ARM 36.22.1309

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well	XX	Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

July 16, 19 91

Following is a {notice of intention to do work / ~~report of work done~~} on land {~~owned~~ / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 SWNE (m. sec.) 32 (Township) T6S (Range) R21E (Meridian)

The well is located 1500 ft. from {N / ~~S~~} line and 2205 ft. from {E / ~~W~~} line of Sec. 32

* For notice of intention to drill, write the API# or the well name of another well on this lease if one exists N/A

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5002 G.L 5014 K.B.

READ CAREFULLY **DETAILS OF PLAN OF WORK** **READ CAREFULLY**

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

1. Circulate the Hole,
2. Pull tubing.
3. Set 5½ CIBP between 2nd and 3rd frontier at 5400'.
4. Run tubing back in the hole.
5. Spot 25 sacks of lite cement across 2nd frontier.
6. Spot 110 sack of lite cement from 4700' to 2850'
7. Pull tubing.
8. Place 10 sacks in 5½ at surface
9. Cut off well head 4' below G.L. and reclaim location.

Approved subject to conditions on reverse of form

Date JUL 24 1991

By Floyd W. Tuckett, Field Supervisor
District Office Agent Title

Company Montana Power Company

By John Merkel
John Merkel

Title Petroleum Engineer

Address 40 East Broadway, Butte, MT 59701

BOARD USE ONLY
API WELL NUMBER
25 009 21057
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

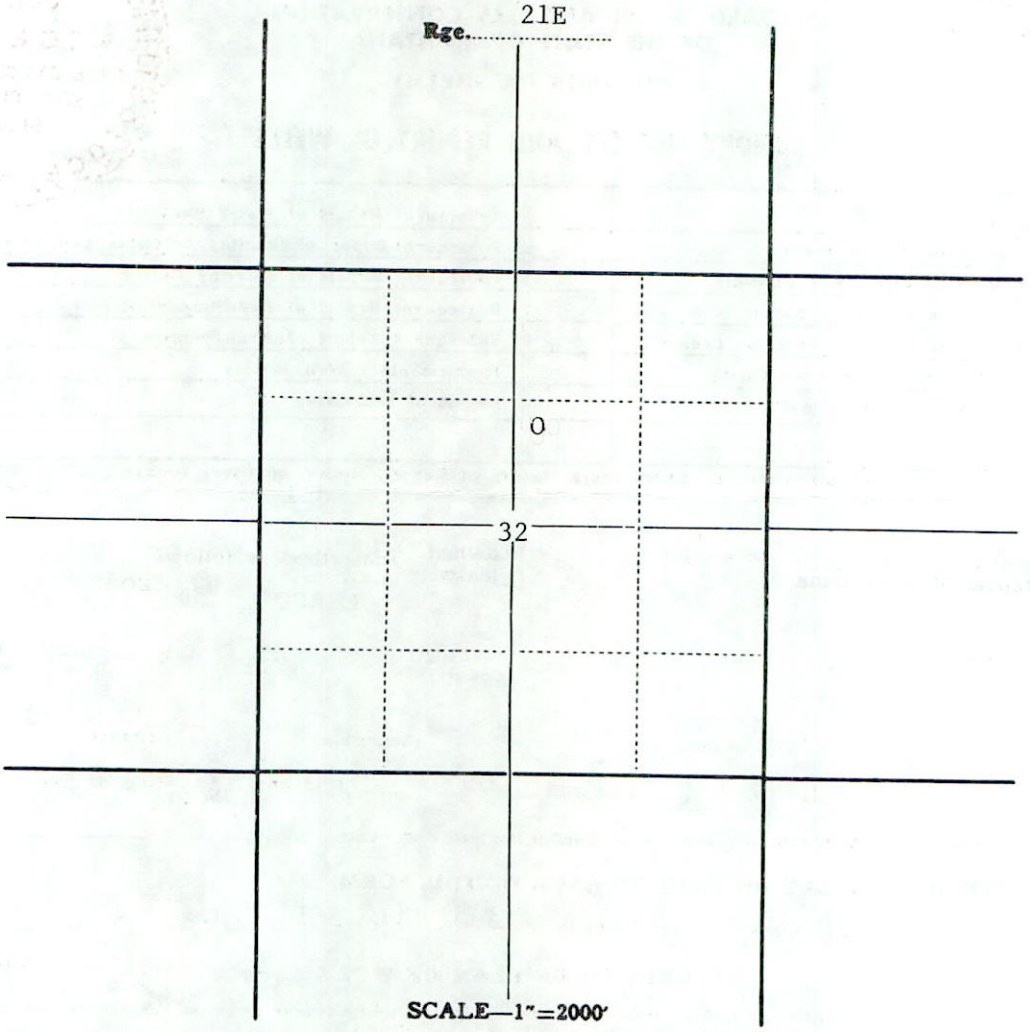
101

P-0014672

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge. 21E



Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6S

SCALE—1"=2000'

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana. Date of spudding must be reported to the Board verbally or in writing within 72 hours of commencing drilling.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 36.22.1013 and one copy of all cementing records as furnished by the cementing company and described in Rule 36.22.1241.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

m No. 2 R 1-83

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

ARM 36.22.307 ARM 36.22.601 ARM 36.22.602 ARM 36.22.603 ARM 36.22.604 ARM 36.22.605
ARM 36.22.1003 ARM 36.22.1004 ARM 36.22.1013 ARM 36.22.1301 ARM 36.22.1306 ARM 36.22.1309

JAN 1988 RECEIVED OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Change of Operator	X

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

January 15, , 19 88

Following is a {notice of intention to do work / report of work done} on land {owned / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 32 (m. sec.) 6S (Township) 21E (Range) MPM (Meridian)

The well is located 1500 ft. from {N / S} line and 2205 ft. from {E / W} line of Sec. 32

* For notice of intention to drill, write the API# or the well name of another well on this lease if one exists.

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5014' KB.

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Change operator from Montana Power to North American Resources Company.

Approved subject to conditions on reverse of form

Date JAN 22 1988

ORIGINAL SIGNED BY:
By Dee Rickman, Executive Secretary
District Office Agent Title

Company North American Resources Company
By Mark Erickson Mark Erickson
Title Petroleum Engineer
Address Butte, Montana 59701

BOARD USE ONLY
API WELL NUMBER
25 0109 21/1984
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

P-0014674

Form No 2 R 4-85

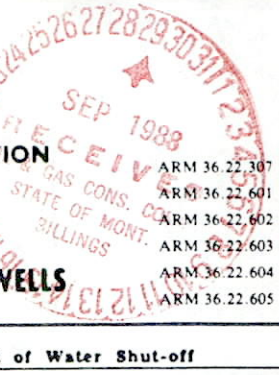
(SUBMIT IN QUADRUPLICATE)

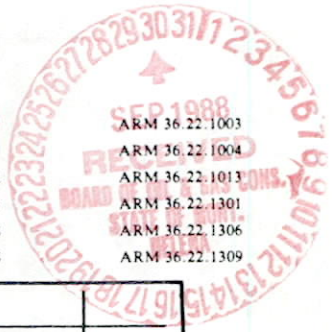
TO

BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA

BILLINGS OR SHELBY

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.





ARM 36.22.307
ARM 36.22.601
ARM 36.22.602
ARM 36.22.603
ARM 36.22.604
ARM 36.22.605
ARM 36.22.1003
ARM 36.22.1004
ARM 36.22.1013
ARM 36.22.1301
ARM 36.22.1306
ARM 36.22.1309

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill *		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
		Change of Operator	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

September 27, 19 88

Following is a {Notice of intention to do work / report of work done} on land {XXXXX / leased} described as follows:

LEASE TYPE Private (Private, State, Federal, Indian) LEASE Croft

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 SWNE (m. sec.) 32 6S (Township) 21E (Range) MPM (Meridian)

The well is located 1500 ft. from {N / XXX} line and 2205 ft. from {XXX / W} line of Sec. 32

* For notice of intention to drill, write the API# or the well name of another well on this lease if one exists.

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5014'.

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

Change of operator from NARCo to The Montana Power Company.

Approved subject to conditions on reverse of form

Date SEP 30 1988 ORIGINAL SIGNED BY

By Dee Rickman, Executive Secretary
District Office Agent Title

Company The Montana Power Company

By Pat Callahan Pat Callahan

Title Director Petroleum Engineer

Address 40 East Broadway
Butte, Montana 59701

BOARD USE ONLY
API WELL NUMBER
25 0019 21/01814
STATE COUNTY WELL

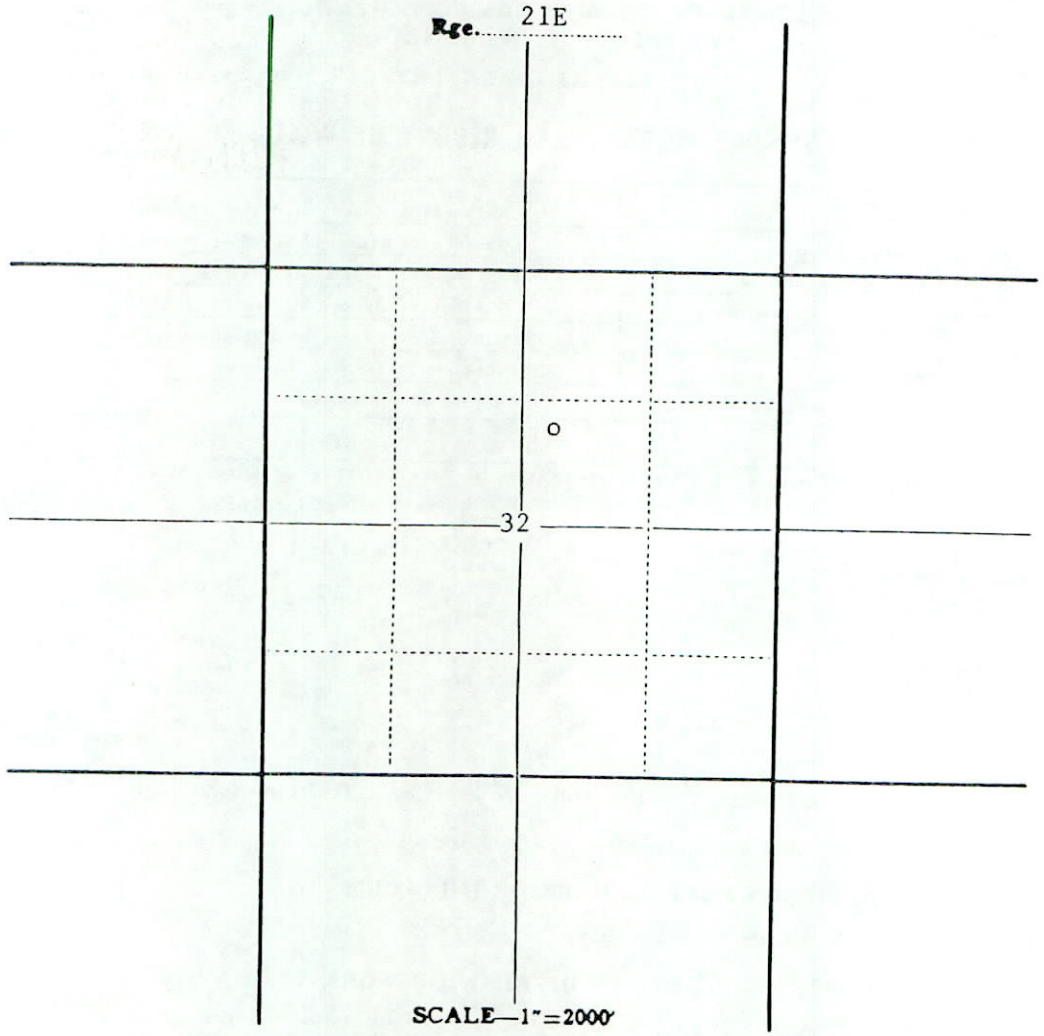
NOTE:—Reports on this form to be submitted to the appropriate District for approval.
DRILLING PERMIT EXPIRES SIX MONTHS FROM DATE OF APPROVAL.

P-0014675

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge. 21E



SCALE—1"=2000'

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6S

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana. Date of spudding must be reported to the Board verbally or in writing within 72 hours of commencing drilling.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 36.22.1013 and one copy of all cementing records as furnished by the cementing company and described in Rule 36.22.1241.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

, No. 2
ENERAL RULES
01, 202, 213,
216, 219, 230,
231, 232

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

JUL 1987
RECEIVED
BOARD OF OIL & GAS CONS.
STATE OF MONT.
BILLINGS

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	XX
Notice of Intention to Abandon Well		Report of Fracturing	
		Change of Operator	XX

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

July 17, 19 87

Following is a ~~Notice of Intention to do work~~ / report of work done } on land } ~~owned~~ / leased } described as follows:

LEASE Croft 7-32

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 SW NE 32 (m. sec.) 6S (Township) 21E (Range) MPM (Meridian)

The well is located 1500 ft. from } ~~N~~ / ~~S~~ } line and 2205 ft. from } ~~E~~ / ~~W~~ } line of Sec. 32

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5014' KB

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

6/30/86-7/25/86 - Drill cement & clean hole to 5700' (CIBP drilled out at 5522')
NOTE: PBTD is @ 6300' - CIBP set w/5 sx

7/16/86 - Perforate 5530'-5545' 4 SPF
- Set PKR on 2-7/8" tubing @ 5432'.

8/08/86 - Fraced w/25000 gal Fluid, 102,500# 20/40 sand, 25000# 12-20 sand, 2,000,000 SCF Nitrogen.

Change of Operator from NARCO to the Montana Power Company.

Approved subject to conditions on reverse of form

Date JUL 24 1987
ORIGINAL SIGNED BY:

By Dee Rickman, Executive Secretary
District Office Agent Title

Company Montana Power Company

By Pat Maloney

Title Petroleum Engineer

Address 40 East Broadway
Butte, Montana 59701

BOARD USE ONLY
API WELL NUMBER
25 0019 21084
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER

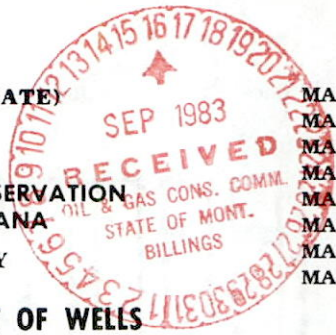
66

P-0014677

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY



MAC 36-3.18(10)-S18020
MAC 36-3.18(10)-S18030
MAC 36-3.18(10)-S18140
MAC 36-3.18(10)-S18170
MAC 36-3.18(10)-S18200
MAC 36-3.18(10)-S18310
MAC 36-3.18(10)-S18330
MAC 36-3.18(14)-S18380

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	XX
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 19, 19 83

Following is a {~~Notice of Intention to do work~~ / report of work done} on land {~~owned~~ / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) West Dry Creek (Field)

Well No. 7-32 NW SW NE (m. sec.) 32 6S (Township) 21E (Range) MPM (Meridian)

The well is located 1500' ft. from {N / ~~S~~} line and 2205 ft. from {E / ~~W~~} line of Sec. 32

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 4989' G.L. before grading

READ CAREFULLY **DETAILS OF PLAN OF WORK** READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

CIBP set at 5500' with 5 sx cement.
Perforate 5348-58' and 5370-74'.

Purpose is to prove potential reserves in the First Frontier formation.

Acidized with 1000 gal. of 12% HCl + 3% HF.

NOTE:

An exception to West Dry Creek Frontier Gas spacing rules must be obtained from the Board prior to producing gas from the Frontier formation.

Approved subject to conditions on reverse of form

Date SEP 20 1983

By Elaine Kaufhold
District Office Agent

Title

Company North American Resources Company

By Jody Bickford Jody Bickford

Title Technician

Address 40 East Broadway
Butte, Montana 59701

BOARD USE ONLY
API WELL NUMBER
25
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

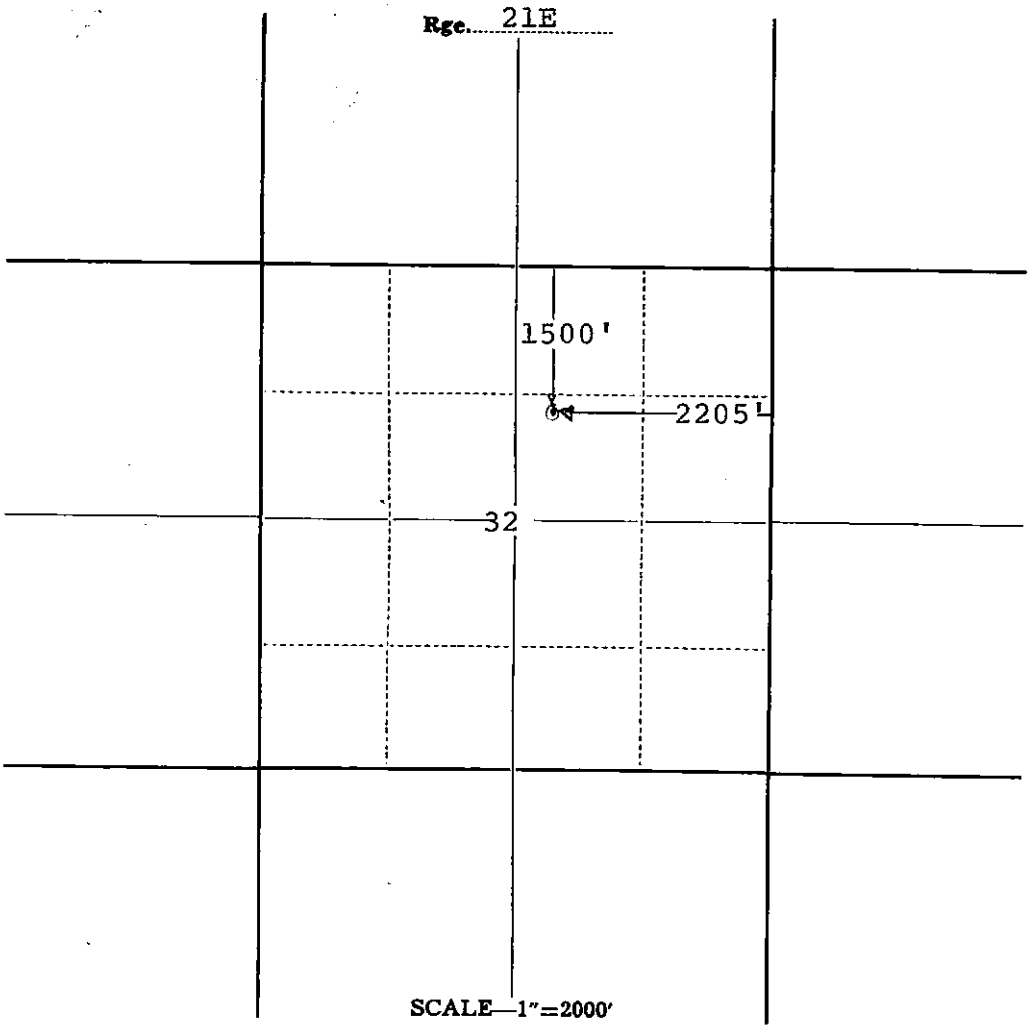
WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

OVER

P-0014678

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby



Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6S

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

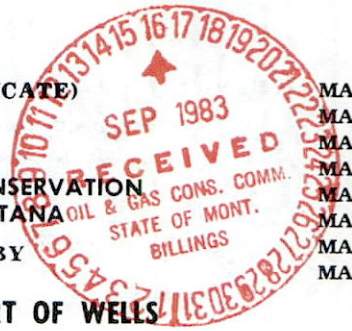
10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 230 and one copy of all cementing records as furnished by the cementing company and described in Rule 234.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY



MAC 36-3.18(10)-S18020
MAC 36-3.18(10)-S18030
MAC 36-3.18(10)-S18140
MAC 36-3.18(10)-S18170
MAC 36-3.18(10)-S18200
MAC 36-3.18(10)-S18310
MAC 36-3.18(10)-S18330
MAC 36-3.18(14)-S18380

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement	XX	Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

August 10, 19 83

Following is a {notice of intention to do work / ~~report of work done~~} on land {~~fee~~ / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) West Dry Creek (Field)

Well No. 7-32 NW SW NE (m. sec.) 32 (Township) 6S (Range) 21E (Meridian) MPM

The well is located 1500 ft. from {N / ~~S~~} line and 2205 ft. from {E / ~~W~~} line of Sec. 32

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 4989' G.L. before grading

READ CAREFULLY — **DETAILS OF PLAN OF WORK** — READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

CIBP will be set at 5500' with 5 sx cement.

Perforations will be done from 5357-66' and 5373-76'.

This will be to prove any potential reserves in the First Frontier formation.

Approved subject to conditions on reverse of form

Date SEP 20 1983

By Claire Vaughey
District Office Agent

Company North American Resources Company

By Jody Bickford Jody Bickford

Title Technician

Address 40 East Broadway
Butte, Montana 59701

BOARD USE ONLY
API WELL NUMBER
25
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

WHEN USED AS PERMIT TO DRILL, PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL IF WELL NOT SPUDDED OR EXTENSION REQUESTED.

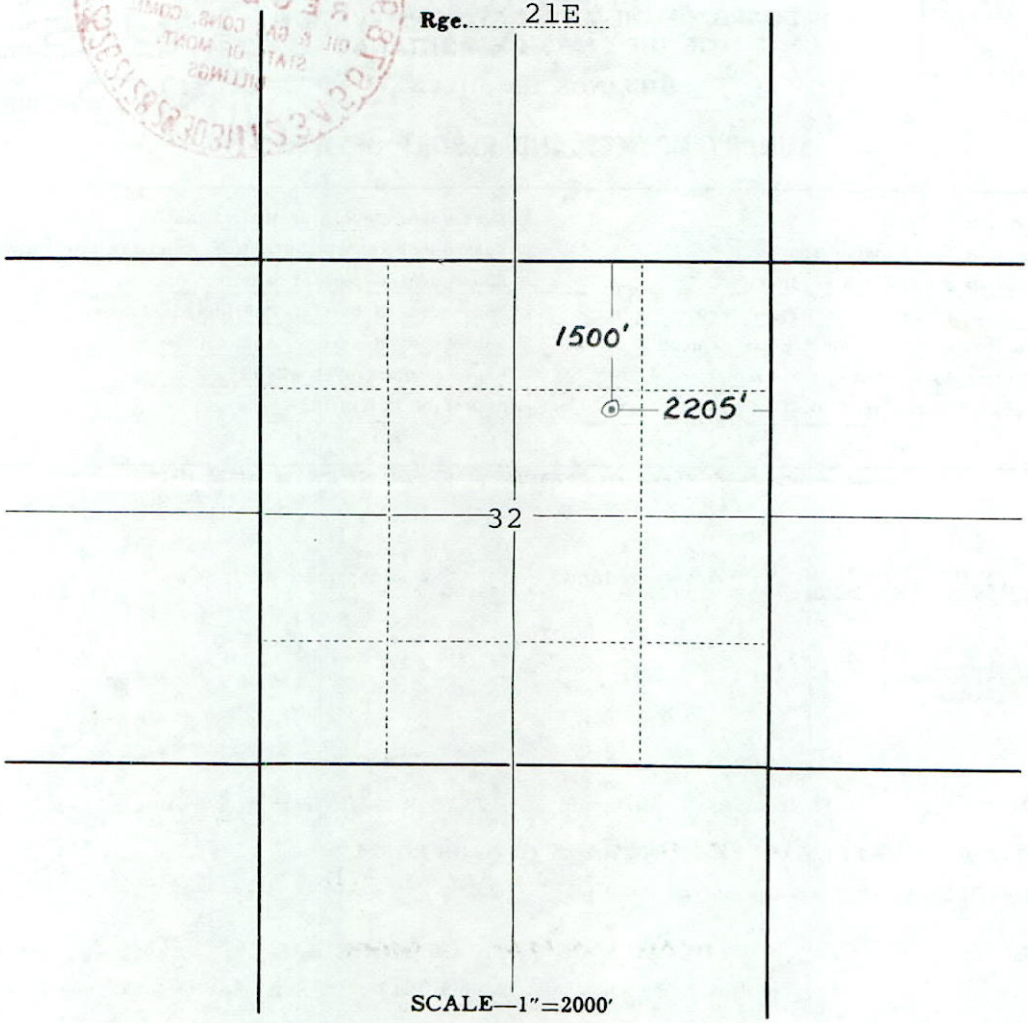
OVER

P-0014680

Locate well by footage measurement from legal subdivision (Section) line and nearest drilling or producible well, if any.

Form No. 2
File at
Billings
or Shelby

Rge. 21E



SCALE—1"=2000'

Form No. 2
File at
Billings
or Shelby

Locate
Well
Correctly

Twp. 6S

THE NOTICE OF INTENTION TO DRILL THIS WELL IS APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

1. Any person, before commencing the drilling of any oil or gas well or water source or injection well shall secure from the Board a drilling permit and shall pay to the Board the following amounts: for each well whose estimated depth is thirty-five hundred (3,500) feet or less, twenty-five dollars ($25.00); from thirty-five hundred and one (3,501) feet to seven thousand (7,000) feet, seventy-five dollars ($75.00); seven thousand and one (7,001) feet and deeper, one hundred fifty dollars ($150.00).

2. No well is to be spudded in unless the proper surety drilling bond has been posted and approved by the Board of Oil and Gas Conservation of the State of Montana.

3. Cable tool operators must construct an adequate sump to contain all mud and water bailed from the hole.

4. Surface or conductor casing must be properly cemented by an approved method and pressure tested to determine a tight bond with the surrounding formations in case an unexpected flow of oil, gas or water should be encountered, unless special permission has been granted for formation shut-off.

5. Any production casing must be cemented unless a formation shut-off or packer is approved by the Board. Sufficient cement must be used to protect the casing and all possible productive and fresh water bearing formations exposed in the process of drilling and not otherwise protected.

6. All production casing must be tested by bailing or pressure to determine if there is a tight bond with the surrounding formations or possible leaks in the casing. The results of the test must be reported on Form No. 2, said report to include the size, weight, thread and length of casing, amount of cement used, and date work is done. If test shows failure, the defect must be corrected before any drilling operations are resumed.

7. Any contemplated change in status of a well such as to plug and abandon, deepen, plug back, redrill, alter casing, etc. must be presented on Form No. 2 for approval by the Board prior to commencement of work.

8. A satisfactory drilling record must be kept for each tour, showing top and thickness of each and all formations drilled and all other information of value, one copy of which is to be kept at the rig while drilling is in progress for examination by any authorized agent of the Board.

9. All producing wells must be marked with name of the operator, number of the well and location, using reasonable precautions to preserve these markings at all times.

10. Delivery to the Board of two copies of all surveys, reports, analyses, logs, tests, samples and core descriptions, etc., as described in Rule 230 and one copy of all cementing records as furnished by the cementing company and described in Rule 234.

11. All work must be done in conformity with the regulations of the Board of Oil and Gas Conservation of the State of Montana, as contained in "General Rules and Regulations," and amendments thereto, as well as regulations prescribed in lieu thereof.

P-0014681

Form No. 2

NOTICE
THIS FORM BECOMES A PERMIT WHEN STAMPED APPROVED BY AN AGENT OF THE BOARD.

(SUBMIT IN QUADRUPLICATE)
TO
BOARD OF OIL AND GAS CONSERVATION
OF THE STATE OF MONTANA
BILLINGS OR SHELBY

ARM 36.22.307 ARM 36.22.1003
ARM 36.22.601 ARM 36.22.1004
ARM 36.22.602 ARM 36.22.1013
ARM 36.22.603 ARM 36.22.1301
ARM 36.22.604 ARM 36.22.1306
ARM 36.22.605 ARM 36.22.1309

SUNDRY NOTICES AND REPORT OF WELLS

Notice of Intention to Drill		Subsequent Report of Water Shut-off	
Notice of Intention to Change Plans		Subsequent Report of Shooting, Acidizing, Cementing	
Notice of Intention to Test Water Shut-off		Subsequent Report of Altering Casing	
Notice of Intention to Redrill or Repair Well		Subsequent Report of Redrilling or Repair	
Notice of Intention to Shoot, Acidize, or Cement		Subsequent Report of Abandonment	
Notice of Intention to Pull or Alter Casing		Supplementary Well History	
Notice of Intention to Abandon Well		Report of Fracturing	
Notice of Intention to Change Op.	X		

(Indicate Above by Check Mark Nature of Report, Notice, or Other Data)

October 18, 1982

Following is a {notice of intention to do work / report of work done} on land {owned / leased} described as follows:

LEASE Croft

MONTANA (State) Carbon (County) Dry Creek (Field)

Well No. 7-32 SW NE 32 (m. sec.) 6 S (Township) 21E (Range) MPM (Meridian)

The well is located 1500 ft. from {N / S} line and 2205 ft. from {E / W} line of Sec. 32

LOCATE WELL SITE ACCURATELY ON PLAT ON BACK OF THIS FORM.

The elevation of the ground or K.B. above the sea level is 5014 KB.

READ CAREFULLY — **DETAILS OF PLAN OF WORK** — READ CAREFULLY

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings, cementing points, and all other important proposed work, particularly all details of Shooting, Acidizing, Fracturing.)

DETAILS OF WORK
RESULT

NORTH AMERICAN RESOURCES COMPANY
Operator changed from MPC to NARCO.

Approved subject to conditions on reverse of form

Date NOV 03 1982 ORIGINAL SIGNED BY:

By Dee Rickman, Executive Secretary
District Office Agent

Company NARCO

By Kevin Brakovec

Title Technician

Address 40 E. Broadway Butte, MT

BOARD USE ONLY
API WELL NUMBER
25 009 21084
STATE COUNTY WELL

NOTE:—Reports on this form to be submitted to the appropriate District for approval

DRILLING PERMIT EXPIRES 90 DAYS FROM DATE OF APPROVAL. UPON WRITTEN REQUEST PRIOR TO EXPIRATION DATE, ONE 90 DAY EXTENSION MAY BE GRANTED.

OVER

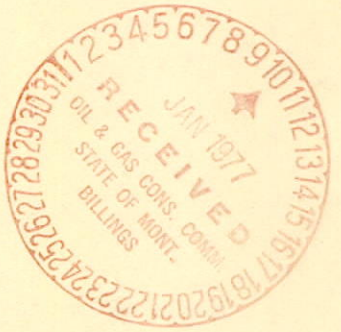
P-0014682

MONTANA POWER COMPANY

CROFT NO. 7-32

NW SW NE Section 32, T6S, R21E

Carbon County, Montana



Durwood M. Johnson
Consulting Geologist
1222 North 27th Street
Billings, Montana 59101
Phone 406-248-3597

TABLE OF CONTENTS

DATA SHEET

OPERATOR:	Montana Power Company
WELL:	Croft No. 7-32
LOCATION:	NW SW NE (1500' FNL - 2205' FEL) Section 32, Township 6 South, Range 21 East, Carbon County, Montana
AREA:	Little Elbow Creek
ELEVATION:	4902 Ground graded 5014 KB
COMMENDED:	Spudded 8:00 PM, October 1, 1976
STATUS:	Apparent Discovery
SURFACE PIPE:	Ran 6 Jts (204') 8 5/8", 24 lb, J-55 casing to 215' KB. Cemented with 150 sxs Regular 2% $CaCl_2$. Plug down 6:30 PM, October 2, 1976.
PRODUCTION CASING:	Ran 167 Jts (6494.93') 5½" 15½ lb, K-55 new casing with differential guide shoe and float collar and centralizers on 1st, 3rd, 24th, and 29th joints. Landed at 6460 KB. Cemented with 450 sacks 1:1 Pozmix, 10% Salt, .5% CFR2. Plugged down 1:30 PM, November 12, 1976.
HOLE SIZE:	12¼" Surface - 228' 7 7/8" 228-6475
DRILLING FLUID:	Fresh water Surface - [illegible] Gel & Chemical [illegible]
TOTAL DEPTH:	6475 Driller 64[illegible] Schlumberger
STOPPED DRILLING:	10:00 AM, November 10, 1976
SMAPLE QUALITY:	Good unless otherwise noted in sample description
SAMPLES:	On deposit with Montana Oil & Gas Commission, Billings, Montana
DRILL STEM TESTS:	DST 1 5360-84 (5350-74 Schl) 2nd Frontier Conventional Test DST 2 5534-78 (5514-58 Schl) 3rd Frontier Conventional Test
CONTRACTOR:	Molen Drilling Rig No. 4 Drawworks: National 50-A Primary Pump: National 250 (5½ X 15) Power: Twin 671 GMC Secondary Pump: National 250 (5½ X 15) Power: Twin 671 GMC Drill Pipe: 4½" XH with 6¼" tool joints Drill Collars: 4½ XH 6" OD 2¼" (15-435') Blowout Preventer: Rucker-Shaffer 10 inch Toolpusher: Red Anderson
LOGGING:	Schlumberger Engineer: Von Hagen Billings, Montana 1. IES w/SP: BSC - T.D. 2. FDC-CNL w/GR & Caliper: 1500 - T.D.
GEOLOGIST:	Durwood M. Johnson, Billings, Montana

FORMATION TOPS

	Depth	Subsea	Reference
TERTIARY			
Fort Union	Surface		
UPPER CRETACEOUS			
Lennep Sandstone	2709	+2305	1385' low
Bearpaw Shale	2881	+2133	1340' low
Fault	3458		
Mesaverde	3460	+1554	
Telegraph Creek	3690	+1324	366' low
Cody Shale	3933	+1081	357' low
Frontier	4954	+60	86' low
1st Frontier Sandstone	5046	-32	75' low
2nd Frontier Sandstone	5342	-328	61' low
LOWER CRETACEOUS			
Mowry "A" Sand	5447	-433	41' low
Mowry "B" Sand	5521	-507	35' low
Thermopolis Shale	5733	-719	
Dakota Silt	6200	-1186	45' low
Dakota Sand	6275	-1261	41' low
Greybull Sand	6364	-1350	40' low
Kootenai	6406	-1392	40' low

LOG ANALYSIS

Formation	Depth	Rt	Rw	F	ØCP	Sw	Remarks
Virgelle	3585-3652	40	1	32	18%	89%	
2nd Frontier	5350-5368	44	.6	85	11%	100%	
3rd Frontier	5522-5534	40	.6	52	14%	89%	
	5534-5540	64	.6	60	13%	75%	
	5540-5547	45	.6	45	15%	77%	Gas Indication
	5547-5554	35	.6	52	14%	94%	
	5554-5559	63	.6	280	6%	100%	
Greybull	6365-6370	40	.6	70	12%	100%	
	6375-6383	200	.6	70	12%	46%	Gas Indication

DRILL STEM TESTS

DST 1 5360-5384 2nd Frontier Sandstone (5350-5374 Schl.) Conventional Test

Packer set at 11:07 AM, October 30, 1976. Surface Choke 1/8" Bottom Choke 3/4"
Pre Flow: 15 mins. ISI 30 mins. Open 30 mins. FSI 60 mins.

Surface Blow

Pre Flow:	Opened with 2 inch blow increased to six inch blow in 3 minutes and remained steady.
ISI:	Gradually decreased to weak bubble in 23 minutes.
Open:	Opened with one inch blow increased to two inch blow in six minutes and gradually decreased to slight bubbles in 25 minutes. NGTS.
FSI:	Dead immediately.

Fluid Recovery

Rec. 15 (.09 bbl.) drilling fluid

MFE Sampler: No pressure
1740 cc drilling mud (no shows)

	Resistivity	Chloride Content
Rec. Mud	2.4 @ 84°F	
Rec. Mud Filtrate	2.2 @ 85°F	350
Pit Mud	2.6 @ 62°F	
Pit Mud Filtrate	2.3 @ 69°F	300

Temperature 121°F

Pressures*

	Top Chart (inside) T-951 Cap. 5000 Depth 5343		Bottom Chart (outside) J-232 Cap. 4700 Depth 5366	
	Initial	Final	Initial	Final
FP	29-29	29-32	55-64	55-64
SIP	54	68	102	102
HP	2715	2704	2752	2724

Comments: Conclusive test

Witnesses: Johnson, Anderson

*Field Calculations

DRILL STEM TESTS (CONTINUED)

DST 2 5534-5578 (5514-5558 Schl.) 3rd Frontier — Conventional Test

Packer set at 1:40 PM, October 1, 1976. Surface Choke $\frac{1}{4}$" Bottom Choke $\frac{3}{4}$"
Pre Flow: 10 mins. ISI 30 mins. Open 30 mins. FSI 60 mins.

Surface Blow

- Pre Flow: Opened with a weak blow (one inch water) increased to strong blow (14 inches water) in two minutes and remained steady.
- ISI: Continued strong for 15 minutes, released pressure and shut in, faint bubble.
- Open: Reopened with very weak blow, gradually increased to strong blow (14 inches water) in two minutes and remained strong. NGTS.
- FSI: Released pressure; slight build up.

Fluid Recovery

174' (1.08 bbls) Slight G & OCM	4% oil	15% gas	8% Sli WCM
261' (1.62 bbls) HG & Sl OCM	7% oil	50% gas	43% Sli WCM

MFE Sampler: 180 PSIG
Rec. .85 cu. ft. gas
90 cc mud cut oil
1405 cc slightly water cut mud

	Resistivity	Chloride Content
Rec. Mud		
Rec. Mud Filtrate	5.0 @ 66°F	1850
Pit Mud	2.3 @ 71°F	
Pit Mud Filtrate	2.2 @ 76°F	350

Pressures*

	Top Chart (inside) T-951 Cap. 5000 Depth 5547		Bottom Chart (outside) J-22 Cap. 4700 Depth 5553	
	Initial	Final	Initial	Final
FP	111-122	185-217	140-159	225-262
SIP	557	674**	592	706**
HP	2800	2789	2846	2827

Comments: Successful test

Witnesses: Johnson, Anderson

*Field Calculations

**Pressure curves didn't break over.

1-32

BIT RECORD

No.	Size	Make	Type	Jets	Serial	Depth Out	Feet	Hours	Wt	RPM	PP
1	7 7/8	HTC	OSC3-A	3-18	VV338	228	228	7	20	150	500
1A	12 1/4	HTC	OSC3-A		RR	228	228	4½			
1	7 7/8	HTC	OSC3-A	3-18	VV338	1305	1077	19	20	150	500
2	7 7/8	HTC	OSC-1G	3-18	TD990	2009	704	13¼	20	100	600
3	7 7/8	HTC	OSC-1G	3-18	TA225	2557	548	19½	20	100	600
4	7 7/8	HTC	J-22	3-18	XW607	3095	538	96	10-20	55	600
5	7 7/8	HTC	OSC-1G	2-22 1-20	XP388	3234	139	24½	10-12	90	600
6	7 7/8	HTC	OSC-1G	2-22 1-16	VD734	3346	112	21	10-12	90	600
7	7 7/8	HTC	OSC-1G	2-22 1-20	SX929	3579	233	25¾	18-25	90	600
8	7 7/8	HTC	OSC-3	3-22	TS526	3783	204	23	15-30	90	600
9	7 7/8	HTC	OSC-3	3-22	TJ619	3960	177	19¾	15-30	90	600
10	7 7/8	STC	DT	2-20 1-24	044AH	4113	153	24¼	12-15	90	600
11	7 7/8	STC	DT	3-22	094BA	4215	102	18	12	90	600
12	7 7/8	HTC	OSC-1G	3-22	SN190	4272	67	19	8	90	600
13	7 7/8	Sec	DS	3-20	689776	4348	76	19½	20	90	600
14	7 7/8	Sec	DS	3-20	688116	4447	99	19¼	20	90	600
15	7 7/8	Sec	DST	3-20	688096	4585	137	24¾	20	90	700
16	7 7/8	Sec	DSS	3-22	683646	4708	123	22¾	20	90	700
17	7 7/8	Sec	DSS	3-22	683381	4802	94	20¼	20	90	800
18	7 7/8	Sec	DM	3-22	627093	4858	53	15¼	20	90	800
19	7 7/8	HTC	OSC3	3-20	T5570	4990	132	14½	20	90	800
20	7 7/8	HTC	OSC-3	3-20	X4717	5071	79	17½	20	90	800
21	7 7/8	HTC	OSC-1G	1-22 2-20	WR412	5177	106	20¼	20	90	800
22	7 7/8	HTC	J-22	1-18 2-22	RR Bit 4	5384	207	35	30	40	800
23	7 7/8	HTC	J-33	1-18 2-22	VL129	5788	404	101	30	40	800
24	7 7/8	STC	F-2	3-22	668DN	6475	687	133¾	30	40	800

DEVIATION SURVEYS

Depth	Deviation	Depth	Deviation	Depth	Deviation	Depth	Deviation
100	1°	2924	5½°	3679	0°	4708	6°
190	1°	2977	6°	3730	¾°	4802	6°
506	1°	3050	6°	3783	½°	4858	6°
1026	1½°	3095	6°	3886	½°	4990	7°
1305	1½°	3134	5¾°	3960	3°	5071	6⅛°
1956	1¾°	3207	6°	4113	3½°	5171	5°
2557	5¼°	3274	6°	4181	5¼°	5348	5¾°
2611	5¾°	3346	4½°	4215	5½°	5384	5¾°
2674	5¾°	3399	3½°	4272	5°	5578	6½°
2737	5°	3462	3½°	4338	5°	5788	6½°
2786	4¼°	3533	2°	4428	5½°	6475	7°
2862	4¾°	3579	1¾°	4585	5½°		

WELL HISTORY

Date 1976	Penetration Depth	Penetration Footage	Time Distribution Drilling	Trips	Repairs	Other	Remarks
Oct. 2	103	103	4	-	-	20	Complete rigging up. Drill rate hole. Spud surface Oct. 1, 8:00 PM. Drill 7 7/8" pilot hole.
3	228	125	5¼	1	-	-	Complete pilot hole. Drill 12¼" surface hole. Run surface casing and cement. WOC. Nipple up.
4	1180	952	17½	½	-	6	Drill mouse hole. Trip in and pressure up to 1000 lbs. Drilling plug. Drill out 3:00 PM, Oct. 3. Drilling.
5	2091	911	17¾	4	2¼	-	Drilling. Trip for Bit #2 and 3. Work on mud line and rotary table.
6	2570	479	19½	4½	-	-	Drilling. Trip for Bit 4 and survey @ 2557 5¼°.
7	2710	140	22½	-	-	1½	Drilling. Survey @ 2611 5¾° and 2674 5¾°.
8	2796	86	22½	-	-	1½	Drilling. Surveys @ 2737 5° and 2786 4¼°.
9	2987	191	22¾	-	-	1¼	Drilling. Surveys @ 2862 and 2924 and 2976.
10	3079	92	23½	-	-	½	Drilling. Survey @ 3050 6°.
11	3171	92	15	5	3	1	Drilling. Trip for Bit #5. Surveys @ 3095 and 3134.
12	3276	105	20	3	-	1	Drilling. Trip for Bit #6. Surveys @ 3207 6°.
13	3382	106	20½	2¾	-	¾	Drilling. Trip for Bit #7. Surveys @ 3274 and 3346.
14	3579	197	19½	2	-	2½	Drilling. Trip for Bit #8. Surveys @ 3399, 3462, 3553 and 3579.
15	3780	201	22	½	-	1½	Drilling. Surveys @ 3679 0° and 3730 ¾°.
16	3954	174	19¾	3	¾	½	Drilling. Trip for Bit #9. Surveys @ 3753 and 3886 ½°.
17	4058	104	19¾	3	½	¾	Drilling. Trip for Bit #10. Surveys 3960 2° and 4022 4½°.
18	4197	139	20¾	2¼	-	1	Drilling. Trip for Bit #11. Surveys @ 4113 4½° and 4181 5¼°.
19	4262	65	20¾	3¼	-	-	Drilling. Trip for Bit #12. Survey @ 4215 5½°.
20	4330	68	19¾	3¼	1	-	Drilling. Trip for Bit #13.
21	4425	95	20	3	-	1	Drilling. Trip for Bit #14. Survey @ 4388 5¼°.
22	4519	94	17¼	3	3¼	½	Drilling. Repairs, trip for Bit #15. Survey @ 4428 5½°.

WELL HISTORY (CONTINUED)

Date	Penetration		Time Distribution				
1976	Depth	Footage	Drilling	Trips	Repairs	Other	Remarks
23	4631	112	20½	3½	-	-	Drilling. Trip for Bit #16. SLM 4585. Board 4585.93. No correction. Survey @ 4585 5½°.
24	4745	114	20¾	3¼	-	-	Drilling. Trip for Bit #17. Survey @ 4708 6¼°.
25	4824	79	20	4	-	-	Drilling. Trip for Bit #18. Survey @ 4802 6°.
26	4971	147	21¼	2¾	-	-	Drilling. Trip for Bit #19. Survey @ 4858 6¼°.
27	5069	98	19½	4½	-	-	Drilling. Trip for Bit #20. Survey @ 4990 7°.
28	5174	105	20½	3½	-	-	Drilling. Trip for Bit #21. Survey @ 5071 6½°.
29	5289	115	19¾	4¼	-	-	Drilling. Trip for Bit #22. Survey @ 5177 5°.
30	5384	95	15½	-	-	8½	Circulate samples and mix mud for DST 1 (4 hrs.). Short trip. Circulate. Trip out (4½ hrs.).
31	5460	76	9½	4	-	10½	Run DST 1 (10½ hrs.). Trip in with Bit #23. Drilling (10½ hrs.).
Nov. 1	5578	118	24	-	-	-	Drilling.
2	5610	32	9½	-	-	14½	Short trip. Circulate for DST #2. Trip out. Run DST 2. Trip in with Bit #23. Drilling.
3	5688	78	24	-	-	-	Drilling.
4	5770	82	24	-	-	-	Drilling.
5	5875	105	19½	4½	-	-	Drilling. Trip for Bit #24. Survey @ 5588 6½°.
6	6004	129	24	-	-	-	Drilling.
7	6119	115	24	-	-	-	Drilling.
8	6239	120	24	-	-	-	Drilling.
9	6352	113	24	-	-	-	Drilling.
10	6467	115	24	-	-	-	Drilling.
11	6475	8	2	-	-	22	Drilling. Short trip. Sur. 6475. Condition hole for logging. Logging. WOP. SLM 6469.51 Board 6475
12	6475	-	-	-	-	24	WOP. Condition hole to run production casing. Run production casing.
13	6475	-	-	-	-	5½	Complete running production casing and cement. Plug down 1:30 PM, November 12, 1976.

MUD PRODUCTS supplied by United Mud Engineering. Don Jackson, Engineer.

Date	Depth	Wt	Vis	PV	YP	GS	Ph	WL	FC	CL	CA	SS	Solids	Cost
10- 6	2611	9.6	47	25	5	2-6	10.0	8.0	2/32	20	20	Tr	9%	749
10- 7	2727	9.4	28	16	4	1-3	10.0	8.4	2/32	Tr	Tr	Tr	6%	1164
10- 8	2838	9.4	41	15	5	2-5	10.0	7.8	2/32	-	-	Tr	5%	1626
10- 9	3015	9.3	40	15	4	2	10.0	7.6	2/32	-	-	Tr	4%	2017
10-10	3084	9.3	44	23	6	2-4	10.0	7.6	2/32	-	-	Tr	6%	2510
10-11	3185	9.3	55	30	8	2-4	9.0	7.6	2/32	Tr	Tr	Tr	6%	3070
10-12	3313	9.3	50	26	8	2-4	10.0	7.6	2/32	-	-	Tr	5%	3495
10-13	3407	9.3	52	35	8	2-4	10.0	7.2	2/32	-	-	Tr	5%	3936
10-14	3638	9.4	48	30	6	2-3	9.5	7.4	2/32	-	-	Tr	6%	4356
10-15	3783	9.4	58	35	10	2-4	9.5	7.6	2/32	-	-	Tr	6%	4822
10-16	3960	9.5	47	25	5	2-3	10.0	7.6	2/32	-	-	Tr	8%	5329
10-18	4212	9.5	45	25	5	2-4	9.5	7.2	2/32	-	-	Tr	6%	6082
10-19	4266	9.6	45	23	5	2-3	10.0	7.2	2/32	-	-	Tr	8%	6346
10-20	4338	9.7	44	23	4	2-3	9.0	6.0	2/32	-	-	Tr	9%	6479
10-21	4428	9.7	47	25	5	2-4	9.5	6.4	2/32	Tr	Tr	Tr	9%	6788
10-22	4532	9.7	60	35	10	2-5	10.5	6.2	2/32	Tr	Tr	¼%	9%	7252
10-23	4671	9.5	42	19	4	2-5	10.0	5.4	2/32	-	Tr	¼%	9½%	7666
10-24	4781	9.6	42	18	8	2	10.0	7.2	2/32	-	40	¼%	9.2%	8030
10-25	4847	9.7	70	35	8	2-5	9.5	5.2	2/32	Tr	Tr	Tr	9.0%	8430
10-26	4990	9.6	45	22	5	2-4	9.5	6.0	2/32	Tr	Tr	Tr	8%	8895
10-27	5099	9.7	52	30	6	2-4	9.5	6.2	2/32	Tr	Tr	Tr	9%	9022
10-28	5199	9.7	52	22	5	2-4	10.0	6.4	2/32	Tr	Tr	¼%	9%	9325
10-29	5305	9.6	46	18	4	2-4	9.5	6.8	2/32	Tr	Tr	¼%	3%	9592
10-30	5384	9.6	75	50	10	3-5	9.0	5.6	2/32	Tr	Tr	¼%	8%	10,251
10-31	5467	9.6	53	30	5	2-4	9.5	6.0	2/32	Tr	Tr	¼%	8%	10,431
11- 1	5578	9.5	70	30	5	2-4	9.5	5.6	2/32	Tr	Tr	¼%	7%	10,849
11- 2	5618	9.5	51	30	5	2-4	10.0	6.0	2/32	Tr	Tr	¼%	7%	11,054
11- 3	5694	9.5	50	25	5	2-4	10.0	6.4	2/32	Tr	Tr	¼%	6½%	11,479
11- 4	5780	9.4	57	24	5	2-4	10.5	5.6	2/32	Tr	Tr	¼%	6%	11,881
11- 5	5891	9.4	48	24	5	2-5	10.0	7.2	2/32	Tr	Tr	¼%	6%	12,279
11- 6	6022	9.4	45	16	5	2-4	10.0	7.0	2/32	Tr	Tr	¼%	5½%	12,899
11- 7	6129	9.3	44	20	4	2-4	7.0	2-0	2/32	Tr	Tr	¼%	5%	13,341
11- 8	6255	9.4	44	28	4	2-4	10.0	7.6	2/32	Tr	Tr	¼%	5½%	13,853
11- 9	6374	9.5	47	23	11	1-4	10.0	7.6	2/32	Tr	Tr	¼%	8½%	14,250
11-10	6475	10.6	92	59	23	1-3	10.0	6.8	2/32	Tr	40	¼%	9½%	14,865

Product	Units	Size	Unit Cost	Total
Hydrogel	1637	100#	4.65	7,612.05
Caustic Soda	22	50#	22.50	495.00
Lime	2	50#	4.50	9.00
Soda Ash	57	100#	21.00	1,197.00
Lignite Caustic	146	50#	20.00	2,920.00
Rayvan	5	50#	25.00	125.00
Drill-Sol	44	5 gal	45.00	1,980.00
Cottonseed Hulls	23	50#	5.50	126.50
Mica	4	50#	9.50	38.00
Pro Fiber	33	40#	11.00	363.00
			Total Material	14,865.55
Water 42 days @ 50.00/day	2100.00		Prepaid Freight	1,968.20
Total mud and freight	16,833.75		Total	16,833.75
	18,933.75			

Cost per day $450.80. Cost per foot $2.92.

SAMPLE DESCRIPTION

MONTANA POWER COMPANY
CROFT NO. 7-32
NW SW NE Section 32-6S-21E
Carbon County, Montana

Samples examined on location by Durwood Johnson. Samples examined wet for lithology, dry for porosity, caught from shale shaker at the following intervals: 30' 500-2600, 15' 2600-2800, 10' 2800-6380, 5' 6380-6475. Sample description begins in the Fort Union formation of Tertiary age.

500- 530 Sandstone, very fine grained, gray, gray-tan, subangular, fair-good sorting, argillaceous to shaly in part, carbonaceous, clay cement, tight; siltstone, gray, shaly; streaks shale, gray-green, brown, waxy, lumpy, bentonitic.

530- 560 Shale, light gray, tan, green, lumpy, carbonaceous, very silty in part; streaks siltstone and very fine grained sandstone as above, tight.

560- 590 Shale, brown, occasionally gray, chunky, carbonaceous, silty in part; trace sandstone, fine grained, light gray, slight salt and pepper appearance, subangular, poor sorting, clay cement; trace fair porosity, no show.

590- 710 Siltstone to very fine grained sandstone, light gray-gray, argillaceous, tight; shale, gray, gray-tan, green, waxy, silty; @ 560 increased shale as above.

710- 800 Siltstone to very fine grained sandstone, light gray, slightly salt and pepper, subanular to subrounded, fair-good sorting, argillaceous, occasionally shaly, carbonaceous and micaceous; trace sandstone, very fine to fine grained, white, subangular to subrounded, poor-fair sorting, clay,cream, fair porosity, no show; shale as above; @ 740 slightly increased sandstone, very fine grained to fine grained as above, fair porosity, no show; trace coal; shale as above.

800- 830 Sandstone, fine grained, light gray-white, subrounded to subangular, poor sorting, friable, clay cement, no visible porosity, no show.

830- 860 Shale, light gray, tan, green, chunky, bentonitic, occasionally silty, slightly carbonaceous; trace sandstone as above, fair porosity, no show; occasional streaks siltstone, light gray-tan, shaly.

860- 890 Shale, medium gray, gray-green, chunky, waxy, silty in part.

890- 920 Siltstone to very fine grained sandstone, light gray, tan, argillaceous, tight; trace sandstone, very fine grained, white, subangular to subrounded, poor-fair sorting, clay cement, possible poor porosity, no show. Shale as above.

920- 980 Shale, pale gray, tan, green, chunky, silty; trace siltstone as above; @ 950 slight increase in siltstone to very fine grained sandstone, white, good sorting, subangular, clay cement, tight.

980-1010 Shale, pale green, light gray, tan, chunky, silty in part; influx of coal.

1010-1040 Shale, gray, light gray-green, chunky, silty; streaks coal.

1040-1100 Shale as above; streaks siltstone, light gray, argillaceous-shaly; trace coal.

1100-1370 Shale, gray-brown, light gray-green, chunky, waxy, silty.

1370-1430 Shale as above; streaks siltstone, light gray-green, good sorting, argillaceous, slightly carbonaceous, tight.

1430-1550 Shale, gray-brown, brown, chunky, waxy, silty in part.

1550-1610 Siltstone to very fine grained sandstone, white, good sorting, subrounded, clay cement, slightly micaceous and glauconitic, appears tight; trace poor porosity, no show; shale, gray, gray-green, gray-brown, chunky, waxy, silty; @ 1580 increase in siltstone to very fine grained sandstone as above, tight; trace poor porosity, no show.

1610-1640 Sandstone, very fine grained, white, occasionally grades to fine grained, subangular to subrounded, fair-good sorting, streaks poor sorting, clay cement, appears tight; shale as above.

1640-1700 Shale, medium to dark gray, occasionally brown, green, chunky, waxy, silty; occasional streaks of sandstone as above, appears tight, no show.

1700-1730 Shale, light to medium gray, dark gray, chunky, waxy, silty; trace sandstone as above.

1730-1820 Shale, gray-brown, as above; influx sandstone, white, light gray, fair sorting, silty in part, micaceous, occasional black accessory minerals, clay cement, tight, no show; @ 1790 trace coal.

1820-1940 Shale, light medium gray, gray-tan, chunky, waxy; trace siltstone to very fine grained sandstone, light gray, argillaceous, tight; trace coal; @ 1850 influx siltstone, light gray-tan, argillaceous.

1940-1970 Shale, brown, gray-brown, chunky, waxy, silty; occasional streaks very fine grained sandstone, light gray-white, silty, subangular to subrounded, fair sorting, occasional scattered black accessory minerals, appears tight, no show.

1970-2030 Shale, medium gray, gray-brown, light green, chunky, waxy, silty in part; trace siltstone, light gray, argillaceous.

2030-2060 Shale, brown, gray-brown, gray-green, chunky, waxy, silty in part; streaks siltstone to very fine grained sandstone, white, fair-good sorting, subangular, tight, no show.

2060-2120 Shale, gray, gray-brown, green, chunky, silty; trace siltstone to very fine grained sandstone as above.

2120-2330 Shale as above; streaks siltstone to very fine grained sandstone, light gray, pale green, fair-good sorting, subangular, tight, no show.

2330-2420 Shale, gray-tan, gray, brown, silty in part; @ 2360 streaks siltstone, very fine grained sandstone, light gray to gray, subangular, fair-good sorting, scattered orange accessory minerals, appears tight, no show.

2420-2450 Shale, light gray to gray, tan, green, chunky, lumpy, bentonitic, silty in part.

2450-2600 Shale, brown, gray-brown, gray, green, chunky, silty, occasionally very silty.

15' samples @ 2570

2600-2645 Shale, dark gray, gray-green, green, chunky, blocky, very silty in part; streaks siltstone, light green-gray, argillaceous-shaly.

2630-2645 Shale, medium to dark gray, light gray-green, gray-brown, chunky, waxy, silty, occasionally very silty and sandy; occasional streaks siltstone to very fine grained sandstone, light gray, gray-green, argillaceous, tight, no show.

2645-2660 Shale as above; slightly increased sandstone, very fine to fine grained, light gray-white, subrounded to subangular, fair-good sorting, argillaceous in part, streaks fine grained sandstone, poor sorting, tight.

2660-2690 Shale, gray-brown, dark gray, occasionally green, chunky, waxy, silty in part; trace siltstone to very fine grained sandstone as above.

2690-2705 Shale, gray-brown, tan, light gray-green, waxy, occasionally silty; trace siltstone, light gray-green, argillaceous, tight.

2705-2740 Sandstone, very fine grained, light gray, tan, subangular, fair-good sorting, few clusters fine grained, poor sorting, silty and argillaceous in part, clay cement, tight; shale, gray-green, gray-tan, gray, chunky, waxy.

2740-2750 Shale, brown, light gray-tan, gray-green, waxy, chunky, silty in part; trace siltstone to very fine grained sandstone as above, tight.

2750-2770 Siltstone to very fine grained sandstone, light gray, gray-tan, good sorting, argillaceous, slightly carbonaceous, tight; @ 2760 slight increase in shale as above.

2770-2810 Siltstone, occasionally grades to very fine grained sandstone, gray-tan, light gray, argillaceous, slightly carbonaceous, tight; streaks shale as above.

2810-2830 Siltstone as above, grades to silty, gray-tan, carbonaceous shale.

2830-2850 Shale, gray-brown, chunky, slightly carbonaceous, very silty in part, occasionally grades to siltstone as above.

2850-2890 Siltstone, light gray, gray-tan, gray, slightly carbonaceous and micaceous, occasionally grades to very fine grained sandstone, good sorting, argillaceous, tight; streaks shale as above; @ 2880 slightly increased shale, gray, gray-green, chunky.

BEARPAW 2881 (+2133)

2890-2950 Shale, dark gray, dark gray-brown, chunky, silty in part; @ 2930 shale becomes very silty; @ 2940 shale, pale gray-medium gray, tan, bentonitic.

2950-3010 Shale, light to dark gray, gray-brown, occasionally gray-green, lumpy, bentonitic; trace shale, dove gray, occasional streaks siltstone, light gray-green, carbonaceous, argillaceous to shaly; @ 2960 shale as above, becomes very silty and sandy; @ 2970 trace sandstone, very fine grained, light gray-tan, silty, argillaceous to shaly in part; @ 2990 influx shale, tan, cream, bentonitic, soft.

3010-3020 Shale as above, streaks sandstone, very fine to fine grained, light gray, angular to subangular, fair sorting, few scattered black and brown accessory minerals, argillaceous, tight, no show.

3020-3040 Shale, gray-brown, gray, gray-green, chunky, waxy, silty, carbonaceous in part; trace sandstone, very fine to fine grained, light gray-white, rounded to subrounded, fair sorting, occasional poor sorting, silty in part, no visible porosity, no show; trace bentonite, cream, light gray, soft; @ 3030 slightly increased sandstone as above, no show.

3040-3060 Shale as above; trace sandstone as above, no visible porosity, no show; @ 3050 slightly increased shale, dark brown, chunky, silty, carbonaceous.

3060-3110 Shale, dark brown, chunky, carbonaceous, silty, occasionally very silty; occasional streaks of sandstone, fine grained, light gray, occasionally white, subrounded to subangular, poor-fair sorting, micaceous, light green, accessory minerals, appears tight, no show; @ 3080 slightly increased sandstone as above, tight, no show; @ 3090 increased shale as above; trace bentonite, tan, pale green, creamy, soft.

3110-3180 Shale, dark gray-brown, gray, chunky, waxy, silty, carbonaceous in part; streaks of siltstone to very fine grained sandstone, light gray, light gray-tan, good sorting, carbonaceous, argillaceous, occasionally fine grained, poor sorting, black and pale orange accessory minerals, clay cement, tight; @ 3150 trace sandstone, very fine grained, pale green, poor sorting, clay, tight, no show.

3180-3200 Shale, as above, very silty and sandy in part; streaks siltatons, light gray-tan, argillaceous, slightly carbonaceous; trace sandstone as above, tight, no show; @ 3190 few clusters sandstone, fine grained, subangular, fair-good sorting, fair porosity, no show.

3200-3220 Shale, brown, gray, chunky, silty, occasional streaks siltstone, light gray, light green, argillaceous, tight, no show; trace sandstone as above.

3220-3240 Shale as above, influx of sandstone, very fine to fine grained, light gray, white, subrounded to subangular, fair sorting, scattered brown and black accessory minerals, clay cement, streaks poor porosity, no show, occasional streaks of siltstone, light gray-green, argillaceous; @ 3230 slightly increased siltstone as above.

3240-3270 Siltstone to very fine grained sandstone, light gray, gray-tan, argillaceous, slightly carbonaceous, subrounded to subangular, fair-good sorting, occasional streaks of fine grained sandstone, poor sorting; shale as above, very silty; @ 3260 slightly increased very fine to fine grained sandstone, light gray, slightly salt and pepper appearing, argillaceous, poor to fair sorting, clay cement; trace poor-fair porosity, no show.

3270-3300 Shale, dark gray, gray-brown, chunky, waxy, silty in part; occasional streaks siltstone, light gray, argillaceous, slightly carbonaceous; @ 3280 occasional streaks sandstone, very fine grained, light gray-white, subangular to subrounded, clay cement, poor sorting, appears tight, no show.

3300-3340 Sandstone, very fine grained, light gray-white, slight salt and pepper appearance, subrounded, poor-fair sorting, silty streaks, micaceous, scattered black accessory minerals, occasional green and orange accessory minerals, clay cement; trace fair porosity, no show; shale as above.

3340-3380 Siltstone to very fine grained sandstone, light gray-white, gray-brown, slightly salt and pepper, good sorting, argillaceous streaks, streaks poor porosity, no show; shale as above.

3380-3390 Sandstone, very fine to fine grained, light gray-white, slightly salt and pepper, fair sorting, subangular to subrounded, glauconitic, occasional black and dark brown accessory minerals, streaks fair porosity, no show; streaks siltstone, gray-brown, very argillaceous to shaly; shale as above.

3390-3400 Siltstone, gray-brown, argillaceous, shaly; streaks shale and sandstone as above.

3400-3430 Sandstone, very fine to fine grained, white, slightly salt and pepper, fair sorting, subrounded to subangular, occasionally glauconitic, argillaceous, dark gray and black accessory minerals; siltstone, gray-brown, very argillaceous; trace bentonite, tan, lumpy; streaks shale, gray-brown, brown, chunky, carbonaceous, silty; @ 3410 trace coal, slightly increased shale, brown, gray-brown.

3430-3450 Siltstone to very fine grained sandstone, white, gray-tan, fair-good sorting, argillaceous to shaly in part; trace poor porosity, no show; shale, gray-brown, chunky, carbonaceous.

MESAVERDE 3460 (+1554)

3450-3470 Siltstone, light gray-tan, argillaceous, slightly carbonaceous, occasionally grades to very fine grained sandstone as above; trace poor porosity, no show; shale as above, very carbonaceous in part; trace coal.

3470-3480 Shale, medium-dark gray, pale gray-green, chunky; brown carbonaceous shale as above; siltstone as above; trace bentonite, light cream-green, waxy.

3480-3540 Shale, gray-brown, light-medium gray, gray-green, waxy, chunky, occasionally silty; occasional streaks siltstone as above; trace bentonite, light cream-green, waxy; @ 3500 slightly increased siltstone as above and brown carbonaceous shale, silty; @ 3510 influx coal.

3540-3550 Shale as above, coal as above; occasional streaks sandstone, very fine grained, light gray-white, subangular, fair sorting, clay cement, tight.

3550-3590 Shale, dark brown, brown, chunky, occasionally silty, very carbonaceous in part; much coal.

3590-3600 Sandstone, very fine to fine grained, fair-good sorting, subrounded, occasionally medium grained, poor sorting, clay cement, primarily tight; trace poor porosity, no show; shale as above.

3600-3640 Sandstone, very fine to fine grained, light green-white, slightly salt and pepper, fair sorting, subangular to subrounded, black and occasionally orange accessory minerals; trace poor porosity, no show, occasional streaks shale and coal as above.

3640-3670 Sandstone, fine grained, white, slightly salt and pepper, fair-good sorting, subangular to subrounded, scattered dark gray, and occasionally green and orange accessory minerals, clay cement, probably fair-good porosity, no show; streaks shale, dark gray, gray-brown, chunky.

3670-3690 Sandstone, very fine to fine grained, white-light gray, subrounded, fair-good sorting, scattered black and brown accessory minerals, clay cream, streaks good porosity, no show; increased shale, gray, gray-brown, chunky, silty, carbonaceous in part; trace coal, @ 3780 increased shale as above.

TELEGRAPH CREEK 3690 (+1324)

3690-3750 Shale, brown, gray-green, gray, chunky, silty; occasional streaks siltstone to very fine grained sandstone, light gray, white, good sorting, appears tight, no show; trace coal; @ 3840 increased siltstone, light gray, gray-tan, occasionally grades to very fine grained sandstone, slightly salt and pepper appearing, argillaceous, tight, no show.

3750-3780 Siltstone to very fine grained sandstone, salt and pepper, light gray-tan, micaceous, scattered black accessory minerals, appear primarily tight; trace poor porosity, no show; occasional streaks shale, gray-brown, chunky, carbonaceous, silty; trace coal.

3780-3810 Shale, gray-brown, dark gray, chunky, very silty and carbonaceous in part; streaks siltstone to very fine grained sandstone as above; @ 3890 slightly increased siltstone to very fine grained sandstone as above, tight, no show.

3810-3870 Siltstone to very fine grained sandstone, light gray-gray, gray-tan, micaceous, slightly carbonaceous, argillaceous, tight; streaks shale as above; @ 3840 increased shale, dark gray, gray, brown, chunky, silty.

3870-3880 Shale, dark gray, brown, gray-green, chunky, very silty, grades to siltstone to very fine grained sandstone as above; trace bentonite, cream-tan.

3880-3900 Siltstone to very fine grained sandstone, light gray-gray, gray-tan, argillaceous, micaceous, tight; shale as above; trace bentonite, pale gray-cream, pale green, waxy.

3900-3930 Shale, brown, dark green, silty; interbedded siltstone to very fine grained sandstone as above; trace bentonite as above; @ 3910 decrease in siltstone to very fine grained sandstone as above.

CODY SHALE 3933 (+1081)

3930-3950 Siltstone to very fine grained sandstone, light gray, fair-good sorting, occasionally poor, micaceous, slightly argillaceous and calcareous; shale, gray-brown, gray, chunky, silty in part, occasionally very silty; carbonaceous shale and coal (caving?).

3950-4010 Shale as above; occasional streaks siltstone to very fine grained sandstone as above, tight, no show.

4010-4040 Shale, gray-brown, gray-dark gray, silty in part; occasional streaks siltstone to very fine grained sandstone as above.

4040-4060 Siltstone to very fine grained sandstone, light gray, gray-tan, argillaceous, slightly calcareous, micaceous, tight, no show; shale as above; @ 4050 increased shale as above.

4060-4070 Shale, gray-dark gray, gray-brown, silty, carbonaceous in part; occasional streaks sandstone, very fine grained, light gray, silty, micaceous, argillaceous, tight; coal and carbonaceous shale common (cavings?).

4070-4090 Siltstone to very fine grained sandstone, light gray, subangular, fair sorting, argillaceous, micaceous, light; streaks shale as above; coal and carbonaceous shale common (cavings?).

4090-4120 Shale, light brown, gray, chunky, silty; trace siltstone to very fine grained sandstone as above.

4120-4150 Shale, light brown, gray-dark gray, chunky, silty in part; trace siltstone to very fine grained sandstone as above.

4150-4240 Shale, gray-brown, gray, chunky, micaceous, silty in part; trace bentonite, cream, light green, waxy; @ 4210 trace siltstone, light gray, micaceous, argillaceous.

4240-4310 Shale, brown, gray-brown, gray, chunky, silty, occasionally very silty, occasional streaks bentonite, pale green, waxy; @ 4290 occasional streaks siltstone to very fine grained sandstone, light gray, argillaceous, tight.

4310-4430 Shale, gray, gray-brown, chunky, silty in part, occasionally very silty; trace bentonite, light green, pale green, waxy; trace siltstone, pale gray, argillaceous; @ 4360 occasional streaks siltstone to very fine grained sandstone, light gray, gray-tan, argillaceous, slightly calcareous.

4430-4580 Shale, gray, gray-brown, chunky, silty, occasionally very silty; trace siltstone to very fine grained sandstone as above; trace bentonite, cream, tan, waxy; @ 4510-20 slightly increased bentonite as above; @ 4550 trace siltstone, light gray, argillaceous, occasionally shaly, slightly calcareous; @ 4560 streaks bentonite, light gray-tan, pale green, soft.

4580-4630 Shale, gray-brown, chunky, blocky, occasionally silty; trace bentonite as above; @ 4590 increased bentonite, cream-white, soft; @ 4600 streaks siltstone, tan, argillaceous to shaly, slightly calcareous; trace bentonite as above.

4630-4720 Shale, gray-brown, gray, occasionally gray-green, chunky, silty; trace siltstone as above; trace bentonite as above; @ 4640 slightly increased siltstone, light gray, argillaceous to shaly, slightly calcareous; @ 4650 increased bentonite, tan-cream, soft.

4720-4740 Shale as above, occasionally silty, slightly glauconitic; trace siltstone as above, slightly glauconitic; @ 4730 increased bentonite, pale gray, waxy; shale as above becomes very silty, slightly glauconitic.

4740-4760 Shale, gray-brown, blocky, cherty, very silty in part, slightly glauconitic, occasional streaks very glauconitic; trace bentonite as above; @ 4750 trace siltstone, light gray, tan, argillaceous, slightly calcareous; slightly increased bentonite, tan, cream.

4760-4810 Shale, dark gray-brown, blocky, very silty and sandy, grades to argillaceous siltstone, light gray, slightly glauconitic, slightly calcareous; streaks bentonite, cream, tan, waxy.

4810-4910 Shale, gray-brown, blocky, chunky, silty; trace siltstone as above.

4910-4950 Shale, gray-brown, gray, blocky, chunky, very silty and sandy in part; trace siltstone, light gray, gray-tan, argillaceous, glauconitic; trace bentonite, light gray, gray-green, waxy.

FRONTIER 4954 (+60)

4950-4990 Shale, gray-brown, chunky, occasionally silty, slightly glauconitic, soft; bentonite as above; @ 4980 trace siltstone, light gray, argillaceous, hard and tight.

4990-5030 Shale, dark gray-brown, gray, blocky, chunky, silty, trace bentonite, cream, tan, soft; @ 5010 trace siltstone to very fine grained sandstone, light gray, gray-tan, argillaceous, micaceous, hard and tight.

1ST FRONTIER 5047 (-33)

5030-5100 Shale, dark gray-brown, blocky, tabular, very silty in part; streaks sandstone, very fine grained, light gray, pale cream, silty, subangular to subrounded, fair-poor sorting, micaceous, clay cement, hard and tight.

5100-5120 Shale as above; streaks siltstone, occasionally grades to very fine grained sandstone, light gray, fair-good sorting, micaceous, argillaceous, occasionally fine grained, poor sorting, clay cement, hard and tight; trace coal.

5120-5150 Shale, gray-brown, blocky, chunky, carbonaceous, very silty and sandy in part; increased siltstone -very fine grained sandstone, light gray, fair-good sorting, argillaceous, subrounded to subangular, micaceous; trace pale green and scattered brown accessory minerals, clay and siliceous cement, hard and tight.

5150-5170 Shale as above; trace siltstone, light gray, argillaceous, tight; trace bentonite, tan, soft.

5170-5190 Shale, gray-brown, brown, chunky, blocky, silty, occasionally very silty and sandy; trace bentonite, tan, soft; trace sandstone, very fine grained, light gray-tan, subrounded to rounded, good sorting, argillaceous in part, clay cement, hard and tight; @ 5180 slightly increased sandstone as above, hard and tight.

5190-5210 Shale as above, very silty and sandy in part, slightly carbonaceous; streaks siltstone to very fine grained sandstone, light gray-tan, subangular to subrounded, fair-good sorting, micaceous, scattered brown accessory minerals, clay cement, hard and tight.

5210-5250 Siltstone to very fine grained sandstone, tan, light gray-tan, good sorting, occasional streaks of poor sorting, subrounded to subangular, micaceous, slightly carbonaceous, scattered pale green and brown accessory minerals, clay and siliceous cement, tight; occasional streaks shale, brown, gray-brown, blocky, very silty and sandy; trace coal.

5250-5290 Siltstone to very fine grained sandstone as above; hard and tight; increased shale, gray-brown, silty, carbonaceous; @ 5260 increased shale as above.

5290-5310 Sandstone, very fine grained, light gray-tan, good sorting; trace poor sorting, subrounded, occasional pale green and scattered brown occassory minerals, clay and siliceous cement, hard and tight; shale as above.

5310 5330 Sandstone, very fine grained, light gray, gray, fair-good sorting, subrounded to subangular, few carbonaceous interbeds, brown and light gray accessory minerals, tight, no show; @ 5320 grades to siltstone to very fine grained sandstone, argillaceous to shaly; @ 5330 increased shale, dark gray-brown, chunky, silty.

2ND FRONTIER 5343 (-329)

5340-5360 Sandstone, very fine grained, light gray-white, fair-good sorting, streaks poor sorting, subrounded to subangular, brown accessory minerals common, clay and siliceous cement, tight, no show, occasional streaks shale, brown, very silty and sandy in part.

5360-5370 Sandstone as above; appears tight, possible poor porosity with low permeability, scattered light yellow to dull yellow fluorescence with greenish cast; trace faint pale bluish-white fluorescence, no cut (good gas odor).

5370-5384 Sandstone as above; trace poor porosity appears primarily tight, increased fluorescence (30% sample); no cut to occasional slow light yellow cut when crushed (strong gas odor).

5384 Circulation samples. Sandstone, very fine to fine grained, light gray, tan, slightly salt and pepper appearing, fair-good sorting, subangular to subrounded, gray and brown accessory minerals common, clay and siliceous cement, appears tight; trace poor porosity, strong gas odor in samples, fluorescence and occasional cut as above.

5384-5400 Sandstone, very fine grained, light gray, occasionally tan, slight salt and pepper appearance, fair-good sorting, occasional streaks fine grained sandstone, poorly sorted, micaceous, slightly glauconitic, black and brown accessory minerals, clay and siliceous cement, no stain, no visible porosity, scattered dull yellow fluorescence; trace light bluish pale yellow fluorescence (5-10% sample), no cut; streaks siltstone, gray, argillaceous, carbonaceous; occasional streaks shale, dark gray, brown, very silty, carbonaceous, firm; @ 5390 slightly increased shale as above.

5400-5420 Sandstone, very fine grained, light gray-white, slightly salt and pepper appearing, subrounded, fair-good sorting, argillaceous in part, scattered brown and black accessory minerals, clay and siliceous cement; no visible porosity, scattered fluorescence as above, (5% sample), no cut to occasional faint light yellow cut; occasional streaks shale, dark brown, very silty, carbonaceous; occasional streaks bedded bentonite, white.

5420-5440 Sandstone, very fine grained, light gray, slight salt and pepper appearance, silty, good sorting, argillaceous, siliceous cement and clay cement, no visible porosity, no show; increased shale, black, brown, blocky, silty, sharp.

5440-5450 Shale, dark gray-brown, blocky, siliceous; trace betnonite, white-cream, firm.

MOWRY A 5447 (-433)

5450-5470 Sandstone, very fine grained, light gray-white, slight salt and pepper appearance, fair sorting, subangular to subrounded, carbonaceous in part, streaks argillaceous to shaly, brown and gray accessory minerals, siliceous cement, no visible porosity, no show; trace betnonite, white, firm; shale as above.

5470-5490 Sandstone, very fine grained, light gray, gray-tan, silty, argillaceous to shaly, micaceous, carbonaceous, siliceous cement, no visible porosity, no show; streaks shale, dark gray-brown, blocky, silty, carbonaceous in part, firm. Streaks bentonite, white-cream, tan, soft to firm.

5490-5500 Shale, dark gray-brown, blocky, silty, siliceous in part; trace siltstone to very fine grained sandstone as above.

5500-5520 Shale, dark gray-brown, blocky, siliceous, occasionally very silty in part; trace bentonite, cream, waxy, moderately soft to firm.

5520-5560 Sandstone, fine grained, salt and pepper, white, fair-good sorting, streaks poor sorting, subrounded to subangular, gray to dark brown, accessory minerals, siliceous and clay cement, appears tight; trace poor granular porosity, no stain, bright light bluish white to pale yellow fluorescence (90-95% sample), no cut to faint slow light yellow cut, leave excellent bright white-yellow ring in spot plate.

5560-5578 Sandstone as above, becoming more argillaceous to shaly, decrease in fluorescence as above; streaks sandstone, very fine grained, light gray, silty, argillaceous, siliceous, tight.

5578-5590 Shale, dark gray-brown, blocky, siliceous, very silty and sandy in part; trace bentonite, cream, white, firm.

5590-5630 Siltstone to very fine grained sandstone, light gray-brown, fair sorting, subangular, siliceous, argillaceous, hard and tight; streaks shale as above; @ 5620 influx shale, dark gray-brown, chunky, blocky, silty, siliceous in part; trace bentonite, as above.

5630-5650 Shale, dark gray-brown, dark gray, silty, occasionally siliceous; occasional streaks siltstone to very fine grained sandstone, light gray, gray, argillaceous, siliceous; bentonite, cream, firm; @ 5640 shale becomes very silty and sandy.

5650-5680 Shale, dark gray, gray-brown, chunky, very silty and sandy in part; trace siltstone to very fine grained sandstone as above, argillaceous to shaly; @ 5670 slightly increased siltstone to very fine grained sandstone, light gray-brown, very argillaceous-shaly; trace bentonite, cream, waxy.

5680-5730 Shale, dark gray, gray-brown, chunky, silty, occasionally very silty and sandy; trace bentonite, cream, waxy, soft.

THERMOPOLIS 5733 (-719)

5730-5820 Shale, dark gray-brown, chunky, occasionally silty; trace bentonite, cream, waxy; @ 5780 trace siltstone, light gray, very argillaceous-shaly, hard and tight; @ 5810 slightly increased bentonite, cream-tan, waxy.

5820-5850 Shale, dark gray, blocky, chunky, occasionally silty; trace bentonite as above; @ 5840 shale becomes less silty.

5850-5910 Shale, dark gray, black, chunky, platy, fissile, slightly silty; @ 5960 trace siltstone, light gray-grah, argillaceous, tight; trace bentonite, white, soft.

5910-5990 Shale, dark gray, black, platy, chunky, fissile, occasionally silty in part; trace bentonite, white, soft; @ 5960 increased bentonite as above.

5990-6020 Shale as above, occasionally silty; occasionally bentonitic as above.

6020-6050 Shale, black, dark gray, chunky, occasionally silty; influx bentonite, white-cream, soft; trace siltstone to very fine grained sandstone, gray, argillaceous, siliceous; @ 6030 decreased bentonite.

6050-6110 Shale, dark gray, black, chunky, silty in part; occasional streaks siltstone, gray, dark gray-tan, shaly, siliceous; bentonite, white-cream, soft; trace sandstone, very fine grained, light gray-gray, fair-poor sorting, siliceous, argillaceous-shaly.

6110-6190 Shale, dark gray, gray-brown, chunky, smooth, very silty and sandy in part, slightly glauconitic, carbonaceous, much bentonite, cream-white; trace siltstone as above; @ 6140 occasional streaks siltstone to very fine grained sandstone, light gray, green, fair-poor sorting, slightly glauconitic, argillaceous, to shaly; @ 6170 streaks shale, black, platy; streaks bentonite as above; @ 6180 increased bentonite, white-cream, soft.

6190-6240 Shale, dark gray, black, platy; occasional streaks bentonite, white, cream, soft.

6240-6280 Shale, black, dark gray, platy, chunky, occasionally silty.

DAKOTA 6275 (-1261)

6280-6310 Shale as above; streaks shale, dark gray-brown, slightly glauconitic, very silty in part, grades to shaly siltstone.

6310-6320 Shale as above; occasional streaks siltstone, light gray, argillaceous, hard and tight.

6320-6365 Siltstone, occasionally grades to very fine grained sandstone, light gray, slightly argillaceous, hard and tight; shale as above; @ 6330 streaks light gray-brown, siltstone to very fine grained sandstone, subangular, good sorting, argillaceous, hard and tight; trace laminar bentonite, light gray-white, soft.

GREYBULL 6364 (-1350)

6365-6380 Sandstone, very fine to fine grained, white, subangular to subrounded, good sorting, siliceous cement, occasional streaks of fine grained, fair sorted sandstone, interlocking quartz grains, siliceous cement; trace poor granular porosity; several clusters have faint questionable light tan stain, 20% scattered dull white-yellow fluorescence with greenish cast; trace bright white yellow fluoescence, slow weak light yellow cut.

6380-6395 Sandstone as above, fluorescence and cut as above (10% samples); @ 6390 streaks siltstone, gray-dark gray, argillaceous to shaly, hard and tight; shale as above.

6395-6400 Sandstone, very fine grained, light gray-white, subangular to subrounded, fair-good sorting, occasional poor sorting, rounded to subangular; trace clay, primarily siliceous cement, no stain, 30% bright light yellow fluorescence, slight greenish cast; trace siltstone as above, gray, gray-tan, siderite nodules, tight.

6400-6405 Shale, dark gray, gray-brown, chunky, silty; occasional streaks siltstone, gray-brown, argillaceous, hard and tight; trace shale, gray-green, waxy, silty.

KOOTENAI 6406 (-1392)

6405-6415 Shale as above; occasional streaks siltstone as above; trace shale, pale tan, salmon, light gray-green, chunky bentonitic; trace bentonite, pale tan-light gray, soft; trace sandstone, very fine, light green, occasionally grades to fine grained, poor sorting; clay cement and very siliceous in part, hard and tight, occasional streaks sandstone as above.

6415-6420 Shale, pale tan, brown, light green, red-brown, bentonitic, lumpy, chunky.

6420-6430 Shale as above; streaks sandstone, very fine to fine grained, cream, angular, poor sorting, clay cement, no show.

6430-6440 Shale, pale green, tan, light brown, bentonitic, silty in part, much uphole caving, occasional streaks sandstone, very fine grained, siliceous, no visible porosity, no show.

6440-6450 Shale, red-brown, light gray-green, chunky, silty, much uphole shale cavings.

6450-6460 Shale, pale green, red-brown, lavender; trace sandstone, fine grained, light gray-white, slightly salt and pepper, poor sorting, subrounded to angular, clay cement, occasionally siliceous, no visible porosity, no show, uphole davings common.

6460-6470 Shale as above; streaks sandstone, very fine to fine grained, light gray, greenish cast, subangular to subrounded, poor sorting, black and green accessory minerals, clay cement, no visible porosity, no show.

6470-6475 Shale, pale lavender, green, red-brown, chunky, silty; trace sand as above.

Durwood M. Johnson

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SURFACE INFORMATION

Description (Rate of Flow)	Time	Pressure (P.S.I.G.)	Surface Choke
Opened Tool	1107	-	-
BLOW, 2" IN WATER			
INCREASING			
BLOW, 6" IN WATER	1110	-	-
CLOSED FOR INITIAL SHUT-IN	1122	-	-
FAINT SURFACE BLOW	1145	-	-
FINISHED SHUT-IN	1152	-	-
RE-OPENED TOOL	1154	-	-
BLOW, 1" IN WATER			
BLOW, 2" IN WATER	1200	-	-
BLOW, 1" IN WATER	1207	-	-
BLOW, 1/2" IN WATER	1212	-	-
BLOW, 1/4" IN WATER	1220	-	-
VERY WEAK BLOW, 1/8" IN WATER	1224	-	-
CLOSED FOR FINAL SHUT-IN	1225	-	-
FINISHED SHUT-IN	1325	-	-
PULLED PACKER LOOSE	1328	-	-

Cushion Type	Amount	Pressure	Bottom Choke Size
	-		3/4"

MUD DATA

Mud Type: GEL - CHEMICAL Wt.: 9.6
Viscosity: 75 Water Loss: 5.6 C.C.
Resist: of Mud: 2.6 @ 62 °F; of Filtrate: 2.3 @ 69 °F
Chloride Content: 300 PPM

EQUIPMENT & HOLE DATA

Type Test: M.F.E. OPEN HOLE
Formation Tested: SECOND FRONTIER
Elevation: 5001 Ft.
Net Productive Interval: 10 Ft.
Estimated Porosity: 12 %
All Depths Measured From: KELLY BUSHING
Total Depth: 5384 Ft.
Main Hole/Casing Size: 7 7/8"
Rat Hole/Liner Size: -
Drill Collar Length: 435' I.D. 2.5"
Drill Pipe Length: 4882' I.D. 3.8"
Packer Depth(s): 5356' & 5360' Ft.

MULTI-FLOW EVALUATOR FLUID SAMPLE DATA

Sampler Pressure: - P.S.I.G. at Surface
Recovery: Cu. Ft. Gas: -
cc. Oil: -
cc. Water: -
cc. Mud: 1740
Tot. Liquid cc.: 1740
Gravity: - °API @ - °F.
Gas/Oil Ratio: - cu. ft./bbl.

		RESISTIVITY	CHLORIDE CONTENT
Recovery Water	- @ - °F.	-	ppm
Recovery Mud	2.4 @ 84 °F.		
Recovery Mud Filtrate	2.2 @ 85 °F.	350	ppm
Mud Pit Sample	2.6 @ 62 °F.		
Mud Pit Sample Filtrate	2.3 @ 69 °F.	300	ppm

RECOVERY DESCRIPTION	FEET	BARRELS	% OIL	% WATER	% OTHERS	API GRAVITY	RESISTIVITY	CHL. PPM
DRILLING MUD	15	0.09				@ °F.	2.4 @ 84 °F.	350
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	

Remarks:

Address: ELECTRIC BUILDING; BILLINGS, MONTANA 59101
Company: MONTANA POWER COMPANY Field: WILD CAT
Well: CROFT # 7-32 Location: SEC. 32-6-21
Test Interval: 5360' TO 5384' Test #: 1 Date: 10-30-76
County: CARBON State: MONTANA #1
Technician: SIGURDSON (POWELL) Test Approved By: MR. D. M. JOHNSON
Field Report No.: 12178 C
No. Reports Requested: 10

P-0014707

JOHNSTON Schlumberger

BOTTOM HOLE PRESSURE AND TIME DATA

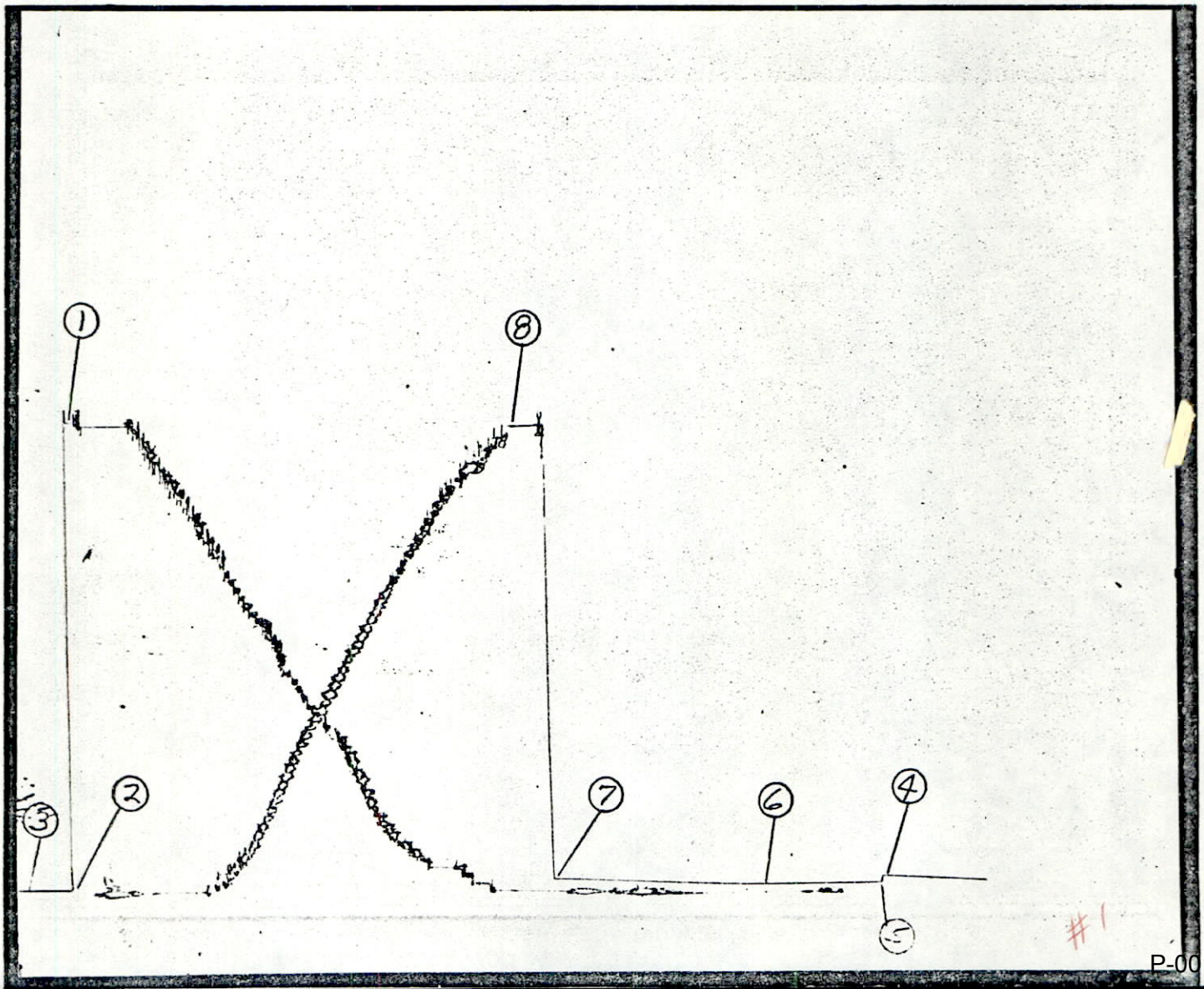
INSTRUMENT NO.: J-252 CAPACITY (P.S.I.): 4700# DEPTH 5366 FT.

PORT OPENING: OUTSIDE BOTTOM HOLE TEMP.: 121°F. FIELD REPORT NO. 12178 C

DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	2738		
INITIAL FLOW (1)	2	37		
INITIAL FLOW (2)	3	37	15	
INITIAL SHUT-IN	4	69	30	
SECOND FLOW (1)				
SECOND FLOW (2)				
SECOND SHUT-IN				
FINAL FLOW (1)	5	33		
FINAL FLOW (2)	6	29	31	
FINAL SHUT-IN	7	72	60	
FINAL HYDROSTATIC MUD	8	2699		

REMARKS:

10-



JOHNSTON

PRESSURE LOG*

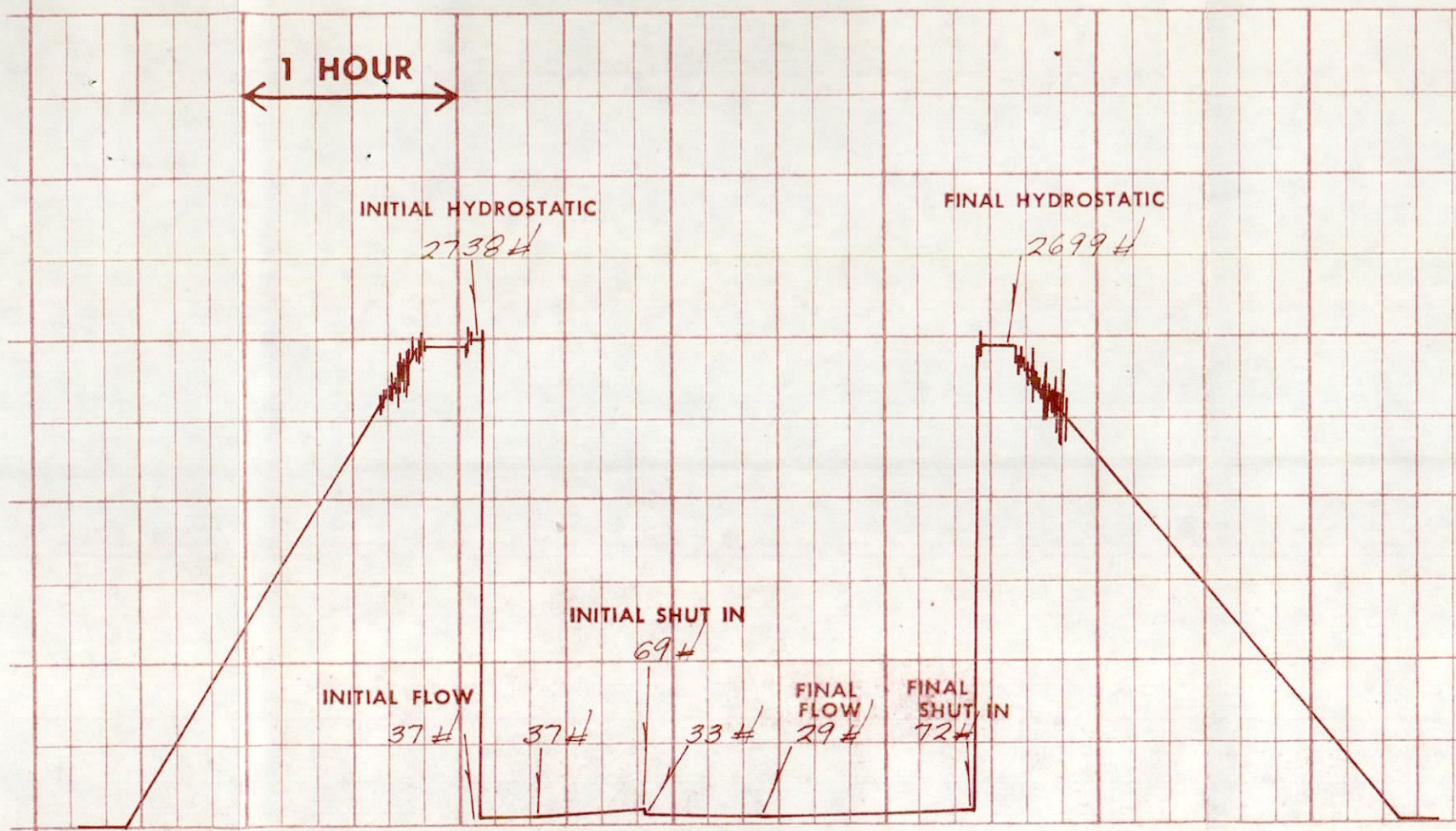
Field Report No. 12178C

Instrument: Number T-252

Capacity 4700 p.s.i.

Depth 5366 ft.

*a continuous tracing of the original chart



P-0014709

Form J-228a

JOHNSTON
Schlumberger

SURFACE INFORMATION

Description (Rate of Flow)	Time	Pressure (P.S.I.G.)	Surface Choke
Opened Tool	1343	-	-
BLOW, 1" IN WATER			
BLOW, 14" OFF BOTTOM OF			
BUCKET	1345	-	-
CLOSED FOR INITIAL SHUT-IN	1353	-	-
FINISHED SHUT-IN	1423	-	-
RE-OPENED TOOL	1425	-	-
WEAK BLOW, 1/2" IN WATER			
INCREASED TO BLOW 3" IN			
WATER	1426	-	-
BLOW, 5" IN WATER	1427	-	-
BLOW, 14" OFF BOTTOM OF			
BUCKET	1428	-	-
CLOSED FOR FINAL SHUT-IN	1455	-	-
FINISHED SHUT-IN	1555	-	-
PULLED PACKER LOOSE	1605	-	-

Cushion Type	Amount	Pressure	Bottom Choke
	-		Size 3/4"

MUD DATA

Mud Type GEL CHEMICAL Wt. 9.5
Viscosity 55 Water Loss 5.6 C.C.
Resist: of Mud 2.3 @ 71 °F; of Filtrate 2.2 @ 76 °F
Chloride Content 250 PPM

EQUIPMENT & HOLE DATA

Type Test M.F.E. OPEN HOLE
Formation Tested 3RD FRONTIER
Elevation 5001 Ft.
Net Productive Interval 30 Ft.
Estimated Porosity 12 %
All Depths Measured From KELLY BUSHING
Total Depth 5578 Ft.
Main Hole/Casing Size 7 7/8"
Rat Hole/Liner Size -
Drill Collar Length 435' I.D. 2.5"
Drill Pipe Length 5065' I.D. 3.8"
Packer Depth(s) 5530' & 5534' Ft.

MULTI-FLOW EVALUATOR FLUID SAMPLE DATA

Sampler Pressure 180 P.S.I.G. at Surface
Recovery: Cu. Ft. Gas .85
cc. Oil 90
cc. Water -
cc. Mud 1405
Tot. Liquid cc. 1495
Gravity - °API @ - °F.
Gas/Oil Ratio 502 cu. ft./bbl.

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	- @ - °F.	- ppm
Recovery Mud	- @ - °F.	
Recovery Mud Filtrate	5.0 @ 66 °F.	1850 ppm
Mud Pit Sample	2.3 @ 71 °F.	
Mud Pit Sample Filtrate	2.2 @ 76 °F.	250 ppm

RECOVERY DESCRIPTION	FEET	BARRELS	% OIL	% WATER	% OTHERS	API GRAVITY	RESISTIVITY	CHL. PPM
SLIGHTLY GAS & OIL CUT MUD	174	1.06	4			@ °F.	@ °F.	
HEAVILY GAS & SLIGHTLY OIL						@ °F.	@ °F.	
CUT MUD	261	1.59	7			@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	

Remarks: ADDED 20' OF MUD TO ANNULUS DURING TEST.

Address ELECTRIC BUILDING; BILLINGS, MONTANA 59101
Company MONTANA POWER COMPANY Field WILD CAT
Well CROFT #7-32 Location -
Test Interval 5534' TO 5578' Test # 2 Date 11-1-76
County CARBON State MONTANA #2
Technician JOHNSON (POWELL) Test Approved By -
Field Report No. 12179 C
No. Reports Requested 10

RECEIVED JAN 1977 OIL & GAS CONS. COMM. STATE OF MONT. BILLINGS

P-0014710

JOHNSTON Schlumberger

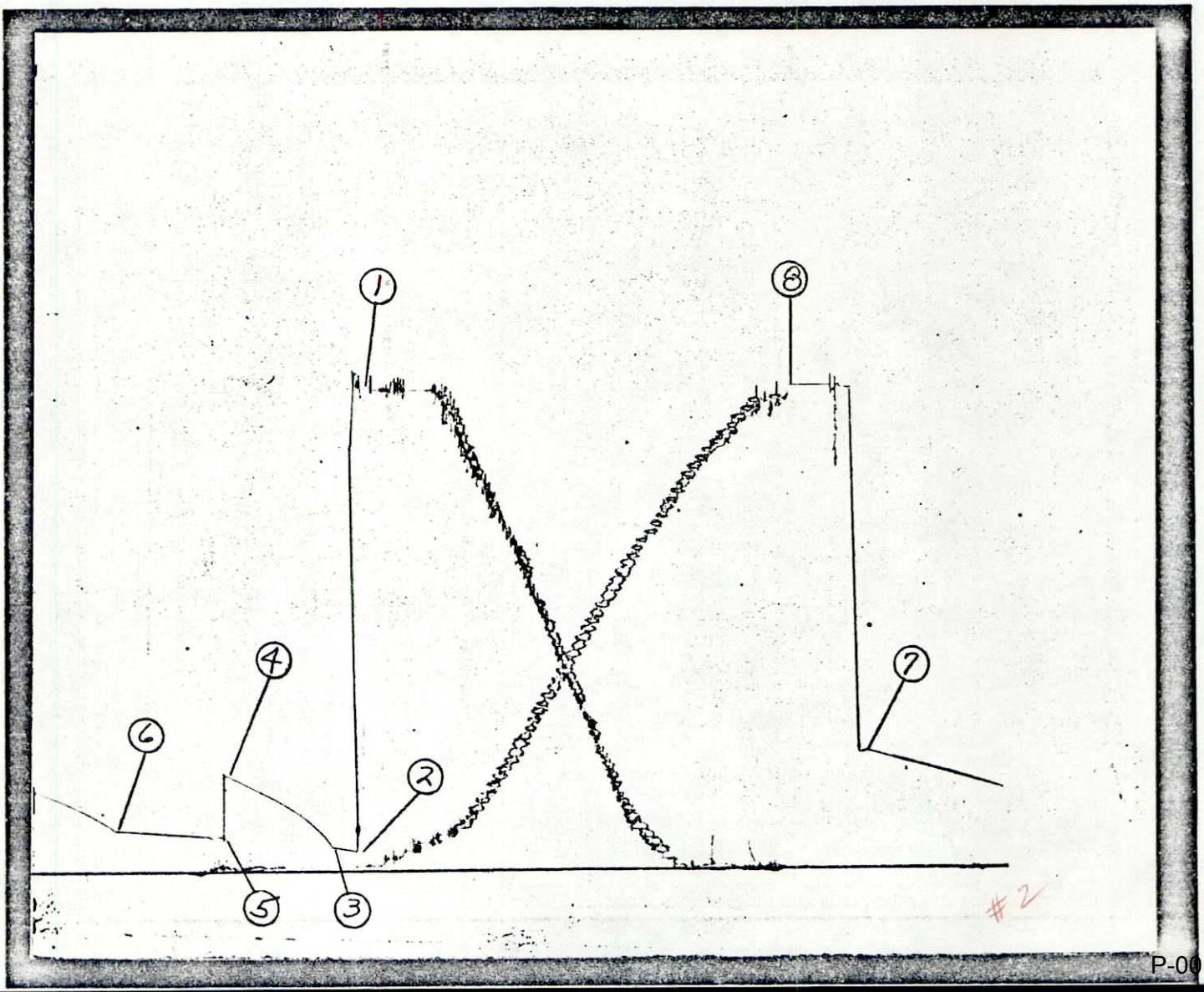
FIELD REPORT NO.: 12179 C

INSTRUMENT NO.: J-252

CAPACITY: 4700#

NO. OF REPORTS: 10-

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA

JOHNSTON Schlumberger

INSTRUMENT NO.: J-252 CAPACITY(P.S.I.): 4700 DEPTH: 5553 FT.

PORT OPENING: OUTSIDE BOTTOM HOLE TEMP.: 117

DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	2797.0		
INITIAL FLOW(1)	2	109.2		
INITIAL FLOW(2)	3	136.5	10	7
INITIAL SHUT-IN	4	547.3	30	29
FINAL FLOW(1)	5	193.8		
FINAL FLOW(2)	6	238.0	30	31
FINAL SHUT-IN	7	679.9	60	62
FINAL HYDROSTATIC MUD	8	2797.0		

INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1		2797.0				HYDROSTATIC MUD
2	0	109.2				INITIAL FLOW(1)
	3	120.5				
	6	132.7				
3	7	136.5				INITIAL FLOW(2)
3	0	136.5				STARTED SHUT-IN
	3	213.6	3.333	0.523	77.1	
	6	270.9	2.167	0.336	134.4	
	9	319.8	1.778	0.250	183.3	
	12	361.2	1.583	0.200	224.7	
	15	397.8	1.467	0.166	261.3	
	18	430.7	1.389	0.143	294.3	
	21	461.8	1.333	0.125	325.3	
	24	491.9	1.292	0.111	355.4	
	27	522.9	1.259	0.100	386.4	
4	29	547.3	1.241	0.094	410.8	INITIAL SHUT-IN
5	0	193.8				FINAL FLOW(1)
	3	186.3				
	6	201.4				
	9	207.9				
	12	212.6				
	15	217.3				
	18	221.1				
	21	225.8				
	24	229.6				
	27	232.4				
	30	237.1				
6	31	238.0				FINAL FLOW(2)
6	0	238.0				STARTED SHUT-IN
	1	254.0	39.000	1.591	16.0	
	2	266.2	20.000	1.301	28.2	
	3	279.4	13.667	1.136	41.4	
	4	291.6	10.500	1.021	53.6	
	5	302.9	8.600	0.934	64.9	
	6	315.1	7.333	0.865	77.1	

FIELD REPORT NO. 12179C

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	7	325.5	6.429	0.808	87.4	
	8	336.7	5.750	0.760	98.7	
	9	347.1	5.222	0.718	109.1	
	10	356.5	4.800	0.681	118.5	
	12	376.2	4.167	0.620	138.2	
	14	394.1	3.714	0.570	156.1	
	16	411.0	3.375	0.528	173.0	
	18	427.9	3.111	0.493	189.9	
	20	443.9	2.900	0.462	205.9	
	22	458.9	2.727	0.436	220.9	
	24	468.3	2.583	0.412	230.3	
	26	482.5	2.462	0.391	244.4	
	28	495.6	2.357	0.372	257.6	
	30	508.8	2.267	0.355	270.7	
	35	539.8	2.086	0.319	301.8	
	40	569.9	1.950	0.290	331.9	
	45	598.1	1.844	0.266	360.1	
	50	625.3	1.760	0.246	387.3	
	55	651.7	1.691	0.228	413.6	
	60	676.1	1.633	0.213	438.1	
7	62	679.9	1.613	0.208	441.8	FINAL SHUT-IN
8		2797.0				HYDROSTATIC MUD

BJ-HUGHES Inc.

ONE OF THE HUGHES TOOL COMPANIES

P.O. BOX 2250, LONG BEACH, CALIFORNIA 90801

INVOICE

TERMS: PAYABLE AT HOUSTON, TEXAS NET 30 DAYS. STATEMENT ON REQUEST ONLY.

23072

FOR OFFICE USE ONLY: 08-12-83

SERVICE CONTRACT NO. S 13965

DATE OF JOB: MM 8 DD 12 YY 83 | DISTRICT Pocatello | DIST. NO. 01-36011

NEW WELL ☐ OLD WELL ☒ | CUSTOMER ORDER NO.

CUSTOMER North American Resources Co

WELL NO. 7-32 | LEASE Gratt

ADDRESS 40 E. Broadway

COUNTY/PARISH Carbon | STATE MT

CITY Butte | STATE MT | ZIP 59701

FIELD NAME Dry Creek

AUTHORIZED BY MR. Dan Hickman

WELL OWNER Same

CUSTOMER ACCOUNT NO. 4129017

OFFICE USE ONLY

32 6N 21E

NORTH AMERICAN RESOURCES CO
40 E. BROADWAY
BUTTE MT 59701

BULK OR N_2 TICKET NO.

	CODE	TAXABLE
STATE	25	YES ☐ NO ☒
COUNTY PARISH	99	YES ☐ NO ☒
CITY	99	YES ☐ NO ☒

FLOW LINE

SALESMAN NUMBER D0255

PUMPING EQUIPMENT	TIME (A OR P)	DATE
TRUCK CALLED	1300 A	MM 8 DD 12 YY 83
ARRIVED AT JOB	1320 P	8/12/83
START OPERATION	1440 P	8/12/83
FINISH OPERATION	1830 P	8/12/83
TIME RELEASED	0900 P	8/12/83

MILES FROM STATION TO WELL 75 | TOTAL BJ EMPLOYEES 3

CEMENT DATA BULK ☐ SACKS ☐

STAGE NO.

TYPE JOB HCl-HCl-HF Acid | WORKING DEPTH 5362 FT.

1 SURFACE ☐ 2 INTERMEDIATE ☐ 3 PRODUCTION ☐ 4 REMEDIAL ☒

TOTAL PREV. GALS.

SIZE HOLE DEPTH FT.

SIZE & WT. CASING 5 1/2, 15.5 DEPTH FT.

TOTAL MEAS. DEPTH 5445 FT.

SIZE & WT. DRILL PIPE OR TUBING 2 3/8 DEPTH FT.

PUMP TRUCK NUMBER 1465 | FLUID PUMPED Acid

PRESSURE: AVG. P.S.I. | MAX. P.S.I. 1500

MAX. BPM

JOB TYPE 121 | JOB CLASS 4

OTHER EQUIPMENT (UNIT NUMBERS): 8489 + 3952

AUG 17 1983

TOTAL PIECES OF BJ EQUIPMENT USED 2

SACKS	BRAND	TYPE	% GEL	ADMIXES

LEAD SLURRY: WEIGHT LBS/GAL | VOLUME LBS/CU. FT. | BBLS

TAIL SLURRY: WEIGHT LBS/GAL | VOLUME LBS/CU. FT. | BBLS

SACK CEMENT TREATED WITH % OF | TOTAL DISPLACE'T BBLS

RECEIVED SEP 1983 OIL CONS. COMM. STATE OF MONT.

CONTRACT CONDITIONS: (This contract must be signed before the job is commenced or merchandise is delivered)

The undersigned is authorized to execute this contract as an agent of the customer. As such, the undersigned agrees and acknowledges that this contract for services, materials, products, and/or supplies includes all of and only those terms and conditions appearing on the front and back of this document. No additional or substitute terms and/or conditions shall become a part of this contract without the written consent of an officer of BJ-HUGHES Inc.

SIGNED: Paul D Hickman (WELL OWNER, OPERATOR, CONTRACTOR OR AGENT)

PRICE BOOK RM 84

PRICE BOOK REF. NO.	QUANTITY	DESCRIPTION	UNIT PRICE	U/M	PRICE EXTENSION
30102505	1	Acid Pump 1st 4 hrs	625.00	EA	625 00
	1	Acid Transport 1st 4 hrs	154.50	EA	N/C
30109005	150	Mileage rd trip 1 unit	1.65	MI	247 50
30420330	1250	500 gal 15% HCl + 750 gal 15.4% for 12-3	.84	gal	1050 00
30420370	300	3% HCl	.78	gal	234 00
30422503	750	12% HCl-3% HF Acid Conversion Dg.	.59	gal	442 50
30423420	4	C-15 Corrosion Inhibitor	28.08	gal	112 32
30423760	4	J-Sol II demulsifier	26.70	gal	106 80
30424560	4	Clatrol Clay Stabilizer	24.95	gal	99 80
				SUB	2917 92
30909411		less 30%			875 38
		Total			2042 54
					Net

SERVICE REPRESENTATIVE Will Taylor

THE ABOVE MATERIAL AND SERVICE ORDERED BY CUSTOMER AND RECEIVED BY: Paul D Hickman (WELL OWNER, OPERATOR, CONTRACTOR OR AGENT)

☐ CHECK IF CONTINUATION IS USED

P-0014714

BJ-HUGHES Inc.
ONE OF THE HUGHES TOOL COMPANIES

P.O. BOX 2250, LONG BEACH, CALIFORNIA 90801

INVOICE

TERMS: PAYABLE AT HOUSTON, TEXAS
NET 30 DAYS. STATEMENT ON REQUEST ONLY.

23073

08-13-83

SERVICE CONTRACT NO. S 13966

DATE OF JOB 08/13/83 | DISTRICT Powell | DIST. NO. 01-36061

NEW WELL ☐ | OLD WELL ☒ | CUSTOMER ORDER NO.

CUSTOMER North American Resources

WELL NO. 7-32 | LEASE Croft

ADDRESS 40 E. Broadway

COUNTY/PARISH Carbon | STATE MT

CITY Butte | STATE MT | ZIP 59701

FIELD NAME Dry Creek

AUTHORIZED BY Mr. Dan Hickman

WELL OWNER Same

CUSTOMER ACCOUNT NO. 4/290017

OFFICE USE ONLY

32 6N 21E

NORTH AMERICAN RESOURCES
40 E. BROADWAY
BUTTE MT 59701

BULK OR N_2 TICKET NO.

	CODE	TAXABLE
STATE	25	YES ☐ NO ☒
COUNTY PARISH	99	YES ☐ NO ☒
CITY	99	YES ☐ NO ☒

FLOW LINE

SALESMAN NUMBER

PUMPING EQUIPMENT	TIME (A OR P)	DATE (MM DD YY)
TRUCK CALLED	0930P	08/12/83
ARRIVED AT JOB	0130P	08/13/83
START OPERATION	0200P	08/13/83
FINISH OPERATION	0345P	08/13/83
TIME RELEASED	0415P	08/13/83

MILES FROM STATION TO WELL 75 | TOTAL BJ EMPLOYEES 3

CEMENT DATA BULK ☐ SACKS ☐

STAGE NO.

TYPE JOB 15% HCl - 12-3% HCl-HF ~~ACID~~ WORKING 5362 FT.

1 SURFACE ☐ | 2 INTERMEDIATE ☐ | 3 PRODUCTION ☐ | 4 REMEDIAL ☒

TOTAL PREV. GALS.

SIZE HOLE DEPTH FT.

SIZE & WT. CASING 5½, 15.50 DEPTH 5448 FT.

TOTAL MEAS. DEPTH 5448 FT.

SIZE & WT. DRILL PIPE OR TUBING 2⅜, 4.7 DEPTH 5326 FT.

PUMP TRUCK NUMBER 1767 | FLUID PUMPED Acid

PRESSURE: AVG. P.S.I. 1500 | MAX. P.S.I. 1500

MAX. BPM 2

JOB TYPE 101 | JOB CLASS 4

OTHER EQUIPMENT (UNIT NUMBERS): 3952 | 8489

AUG 17 1983

TOTAL PIECES OF BJ EQUIPMENT USED 2

SACKS	BRAND	TYPE	% GEL	ADMIXES

LEAD SLURRY: WEIGHT LBS/GAL | VOLUME LBS/CU. FT. | SKS

TAIL SLURRY: WEIGHT LBS/GAL | VOLUME LBS/CU. FT. | SKS

SACK CEMENT TREATED WITH % OF | TOTAL DISPLACEMENT | GALS

SEP 1983 RECEIVED OIL & GAS CONS. COMM. BILLINGS, MONT.

CONTRACT CONDITIONS: (This contract must be signed before the job is commenced or merchandise is delivered)
The undersigned is authorized to execute this contract as an agent of the customer. As such, the undersigned agrees and acknowledges that this contract for services, materials, products, and/or supplies includes all of and only those terms and conditions appearing on the front and back of this document. No additional or substitute terms and/or conditions shall become a part of this contract without the written consent of an officer of BJ-HUGHES Inc.

PRICE BOOK RM | C4

SIGNED: _____
(WELL OWNER, OPERATOR, CONTRACTOR OR AGENT)

PRICE BOOK REF. NO.	QUANTITY	DESCRIPTION	UNIT PRICE	U/M	PRICE EXTENSION
30102505	1	Acid pump 1 to 4 hrs	625.00	EA	625 00
30109005	150	Mileage 1 unit rd. trip	1.65	MI	247 50
30423420	4	C-15 corrosion inhibitor reinhibited	28.08	GAL	112 32
	1	Acid transport 1 to 4 hrs	154.50	0/4HR	N/C
					984 82
30909411		Less 30%			<295 45>
		Total			689 37

Pat

SERVICE REPRESENTATIVE _____

THE ABOVE MATERIAL AND SERVICE ORDERED BY CUSTOMER AND RECEIVED BY: _____
(WELL OWNER, OPERATOR, CONTRACTOR OR AGENT)

☐ CHECK IF CONTINUATION IS USED

P-0014715

NORTH AMERICAN RESOURCES COMPANY
GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701
TELEPHONE 406 / 723-5421

September 15, 1983

Board of Oil and Gas Conservation
of the State of Montana
2535 St. Johns Avenue
Billings, Montana 59102

Re: Croft 7-32-6S-21E

Dear Sir:

Enclosed please find the Intention to Shoot, Acidize, or Cement and also the Subsequent Report of Shooting, Acidizing, Cementing for the above mentioned well.

If anything further is needed, please notify this office.

Sincerely,

Darlene Allen
Secretary

da

Enclosures

APRIL 28, 1990

MONTANA POWER COMPANY
40 EAST BROADWAY
BUTTE, MT 59701

ATTN: MR. PAT CALLAHAN, MANAGER
EXPLORATION & DEVELOPMENT

RE: CROFT 16-32 WELL
SECTION 32-6S-21E
CARBON COUNTY, MONTANA

DEAR MR. CALLAHAN:

IT WAS GOOD TO VISIT WITH YOU AND I ALSO ENJOYED THE NOON LUNCH. I HAVE BEEN THINKING ABOUT THE BUDGET THAT YOU HAVE TO WORK WITH. MAYBE WE CAN HELP YOU OUT BY TAKING PART PAYMENTS ON THE CROFT 16-32 WELL, WHEREBY MONTANA POWER COMPANY WOULD PAY $133,000.00 THE FIRST YEAR AND $100,000.00 THE SECOND AND THIRD YEAR,PAYABLE ON JUNE 1ST OF EACH YEAR.

THE OFFER IS FOR 200 ACRES, MORE OR LESS, IN THE SE¼ AND SE¼/NE¼, CONTAINING THE FIRST, SECOND AND THIRD FRONTIER FORMATIONS ONLY. THIS PERTAINS TO THE 12.5% ROYALTY OWNED BY US AND FOUR OTHER PARTIES.

ALSO WE REQUEST THAT YOU RELEASE THE THREE LEASES HELD BY MONTANA POWER COMPANY THAT BELONG TO TOM & JENETTE CROFT & JOE & MARION ALBERI; THAT YOU PLUG THE CROFT 7-32 WELL LOCATED IN THE SW¼ OF THE NE¼ OF SECTION 32-6S-21E BY CEMENTING OFF ALL OPEN PERFERATIONS AND CASING THAT YOU THINK MIGHT BE SPLIT AND THAT YOU CLEAN & RESEED THE LOCATION.

RESPECTFULLY SUBMITTED,

Tom Croft

TOM CROFT

TC/jc

CC: JOE ALBERI

5-3-90

if well is plugged have alan wilson plugging

BJ SERVICES

REMITTANCE ADVICE

INVOICE DATE
08/16/91

DIRECT BILLING INQUIRIES TO:	TERMS	REMIT TO:
711-8905-5921	NET AMOUNT DUE 30 DAYS FROM DATE OF INVOICE	B.J. SERVICES P.O. BOX 297476 HOUSTON, TX 77297

PAGE	INVOICE NO.
1	604761

AUTHORIZED BY
604761

PURCH. ORDER REF. NO.
N/A

MONTANA POWER COMPANY

Carlad C1131

40 E BROADWAY
BUTTE MT 59701

WELL NUMBER : 7-32 CUSTOMER NUMBER : 2116 - 3

LEASE NAME AND NUMBER	STATE	COUNTY/PARISH	CITY	DISTRICT NAME	DISTR. NO.
CROFT	25			Powell	671

JOB LOCATION/FIELD	MTA DISTRICT	DATE OF JOB	TYPE OF SERVICE
WILDCAT-RED LODGE		08/16/91	LAND-PLUG AND ABANDON

PRODUCT NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	U/M	EXTENDED PRICE
10102132	1.00	CEMENTING THRU TUBING 5,001 TO 5,5	1989.00		1,989.00
10109005	70.00	MILEAGE CHRG, FROM NEAREST BASE OF	2.47		172.90
10410507	98.00	CLASS G CEMENT	8.49	CF	832.02
10415018	47.00	FLY ASH	4.80	CFT	225.60
10420145	1704.00	BJ-TITAN GEL, BENTONITE, BULK SALE	0.15	LB	255.60
10880001	173.00	MIXING SERVICE CHRG DRY MATERIALS,	1.16		200.68
10940101	490.00	DRAYAGE, PER TON MILE	0.79		387.10
			SUBTOTAL		4,062.90
			DISCOUNT		0.00

ACCOUNT
38 37207 53 .23

TAX EXEMPTION STATUS:	PAY THIS AMOUNT	4,062.90

SB-3020 (12/89)

P-0014718

JOHNSTON

PRESSURE LOG*

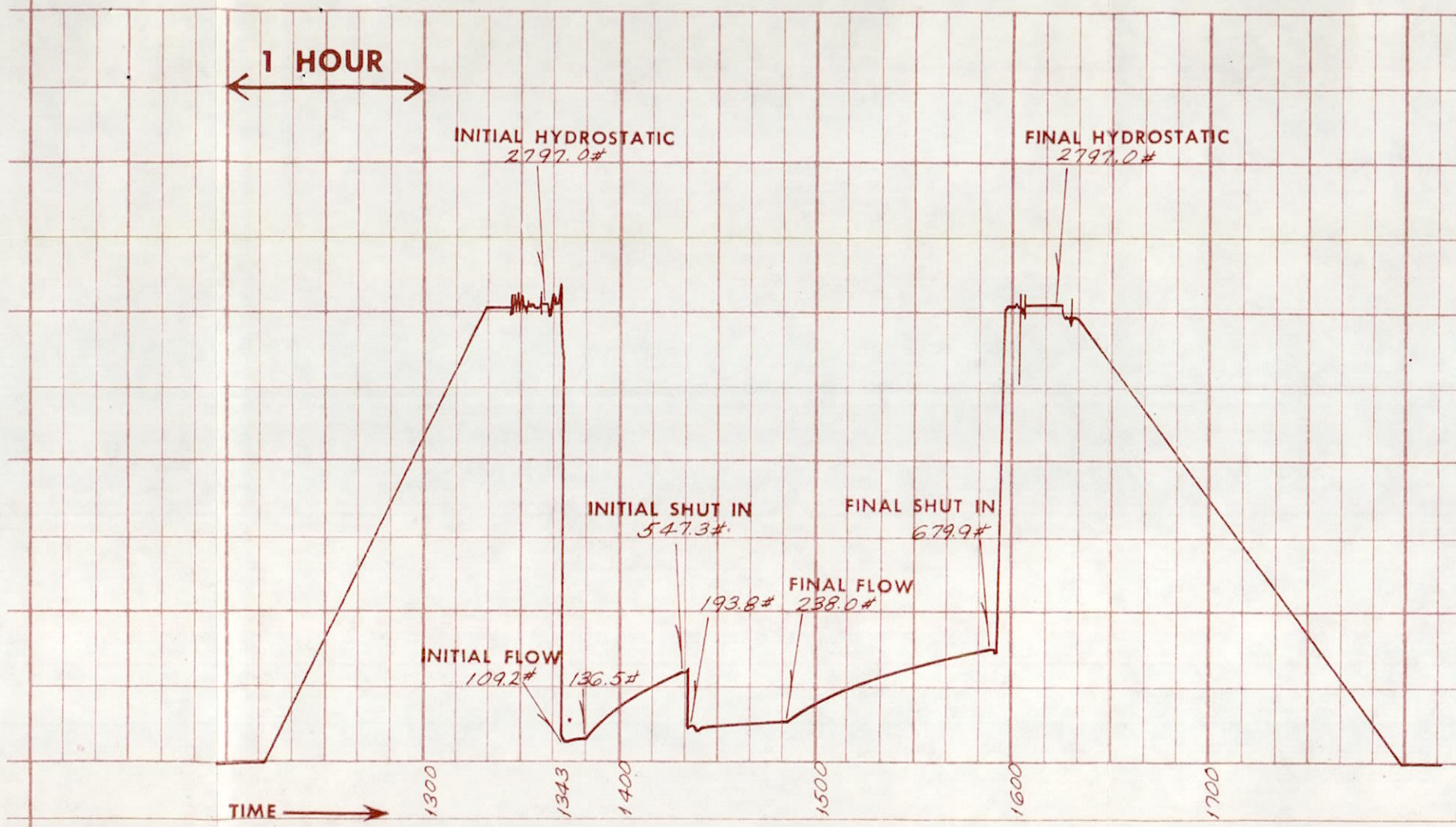
Field Report No. 12179 C

Instrument: Number J-252

Capacity 4700 p.s.i.

Depth 5553 ft.

*a continuous tracing of the original chart



1 HOUR

P-0014719

Form J-228a