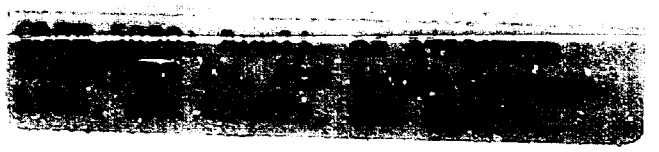


CASE No. 5090

Application,

Transcripts,

Small Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
OIL CONSERVATION COMMISSION CONFERENCE ROOM
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
Wednesday, October 31, 1973

IN THE MATTER OF:

Application of Atlantic Richfield Company for lease commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an Exception to Commission Rule 309-A to permit the commingling of unitized and non-unitized production within applicant's Seven Rivers-Queen Unit Area, Langlie-Mattix Pool, Lea County, New Mexico.

Case No. 5090

BEFORE: RICHARD L. STAMETS
Examiner

TRANSCRIPT OF EXAMINER HEARING

MR. STAMETS: We will call next Case 5090.

MR. DERRYBERRY: Case 5090, Application of Atlantic Richfield Company for lease commingling, Lea County, New Mexico.

MR. HINKLE: Clarence Hinkle of Hinkle, Bondurant, Cox, & Eaton, Roswell, appearing on behalf of Atlantic Richfield Company. We have one witness and four exhibits.

MR. STAMETS: Are there other appearances in this case?

(No Response.)

MR. STAMETS: The witness will stand and be sworn.

WILLIAM T. PORTER

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, your address, and by whom you are employed.

A My name is William T. Porter, I work for Atlantic Richfield Company in Midland, Texas, and I'm an Operations Engineer in the Permian West District, handling Southeast New Mexico.

Q Have you previously testified before the commission?

A No, I haven't.

Q Would you state briefly your educational back ground and experience as a Petroleum Engineer?

A I graduated from the University of Tulsa in 1959 with a BS Degree in Petroleum Engineering. I worked with Sinclair Oil and Gas Company for 10 years in the Mid Continent Area of Oklahoma. My responsibilities were in reservoir, operations, and equipment design. After the merger with Atlantic Richfield Company, I was transferred to New Mexico and then to Midland, Texas. During these last four years, my responsibilities have been in the operations department covering New Mexico.

Q Are you familiar with the Seven Rivers-Queen Unit Area?

A Yes.

Q And have you made a study of that area?

A Yes.

MR. HINKLE: Are the qualifications of this witness acceptable?

MR. STAMETS: In operations, what phases of activity are you dealing with?

WITNESS: We deal with the drilling, workovers, any approval of AFE's concerning various equipment, design. Primarily, that's what it covers.

MR. STAMETS: The witness's qualifications are acceptable.

Q (By Mr. Hinkle) Are you familiar with the application of Atlantic Richfield in this case?
A Yes.
Q What is Atlantic Richfield seeking to accompolish?
A Atlantic is applying for its exception to rule 309-A, B, and C concerning lease commingling and off lease storage of unitized and non-unitized production.
Q Are you prepared or has there been prepared under your direction certain exhibits for introduction into this case?
A Yes.
Q And they are the exhibits that have been marked one thru four?
A Yes.
Q Refer to Exhibit Number 1 and explain what this is and what it shows.
A Exhibit Number 1 is a plat showing all the wells in the unit area. The unit outline is shown in dashes. It also shows the individual flow lines from these producing wells to the test stations. We have two test stations, one located in the North Area of the unit and one located in the South.
Q You call that test headers?
A Test headers, yes sir, as listed on the map here. We also have a central battery located here in Tract 7

each producing well has its own flow line which runs to the test station. Each of the two test stations have 14 producing wells connected to it. Any well can be tested manually or automatically at the station. All of the fluid is measured at the test station and the oil and water is pumped through the main line to the central battery. Oil will be sold through an ACT unit at the central battery.

Q Now, refer to Exhibit Number 2 and explain that.

A Exhibit Number 2 is a schematic drawing of the commingling facility located at each of these test stations mentioned previously. The oil flow path of a well on test is shown in red on the schematic. Oil, water, and gas coming from the well to the tested flows through the electrically-operated three-way valve to the test header, then continues to the three-phase test separator. Gas is metered continously while oil and water is dumped and measured separately through a turbine meter. A probe in the line up stream of the pump is connected to a net oil computer which accounts for any water which maybe carried with the oil.

Measurements of oil, water, and gas are recorded on counters mounted on the test panel. A test schedule is planned which calls for each producing well to be tested for a 24-hour period twice per month; fluid being

produced by the wells not on test passes through a three-way valve through to the three-phase field separator. The total oil and water for the test station is recorded on a separate set of counters on the test panel. The total produced gas is measured at the gas meter.

Q Would an installation of this kind be at each test header?

A Yes, each one is identical.

Q Is this, to the best of your knowledge, in accordance with the provisions of Rule 309-A?

A Yes sir.

Q Now, refer to Exhibit 3 and explain that.

A Exhibit 3 shows a status of sign up both working interest and royalty.

Q You mean, the sign up of the Seven Rivers-Queen Unit?

A Of the Seven Rivers-Queen Unit, of the royalty and working interest as of October 29, 1973, on each of the 11 tracks in the Seven Rivers-Queen Unit. Working interest sign up is 100 per cent; royalty sign up is 99.554 per cent; we have no refusals. Only .446 per cent remain unsigned. This percentage, the majority of this percentage comprises title problems or some legal problem in which they can not sign.

When we filled the application, we expected

opposition from some royalty owners in Tract 2. These differences have been reconciled and we have no opposition from these royalty owners at this time.

Q That was in connection with Tract Number 2?

A In connection with Tract Number 2.

Q So, really, the only ones that are not signed up are tracts where there maybe some small title difficulty, is that right?

A Yes. Well, I wouldn't say, no. There is also some which we expect to receive that have not expressed -- they say they will sign, and it's shown as expected to receive. These people have stated to us that they will sign, but they have not effectively done it at this time.

Q Now, refer to Exhibit Number 4 and explain what this is.

A Exhibit Number 4, since our central battery will have an ACT Unit associated with it, we are also submitting an application for administrative approval, under State Rule 309-A, form C-106, and schematics of the ACT System and treating and storage facilities are included.

Q This is the form which you will file immediately with the commission; that is, the proper number of copies and so forth?

A Yes sir.

Q In accordance with Rule 309-A?

A Yes.

MR. HINKLE: We would like to offer in evidence Exhibits 1 thru 4.

MR. STAMETS: Without objection, these Exhibits will be admitted.

Q (By Mr. Hinkle) In your opinion, if the commission approves this application, will it be in the interest of conservation, prevention of waste, and tend to protect correlative rights?

A Yes sir.

MR. HINKLE: That is all I have.

MR. STAMETS: Are there questions of this witness?

(No Response.)

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Porter, in referring to your schematic diagram, which is Exhibit Number 2, you say the red line represents the well on test and it shows it going through the header into the test separator, and then it comes out of there and the oil and the water are individually metered and the gas is metered; is that right?

A Yes sir. The path shown is the path of the oil shown in red. The water, as you might note on the test separator, dumps from the bottom of the valve and into this common

line. The gas is shown coming off the top of the separator going through a meter. But, only one substance will be dumped at a time, either water or oil, and will be metered with a turbine meter.

Q The same meter meters the oil and the water?

A Yes sir. But it will be shown on the counters for the particular well, either oil, water, or gas, depending on which one is being dumped.

Q Do you have some literature on that type of an instillation?

A Yes, I do have.

Q Would you be so kind as to furnish us with that?

A Yes.

Q Now, after the remainder of the wells, they will be flowing through a production separator?

A Yes sir.

Q Will the oil and water be metered separately there?

A Yes sir.

Q And then down stream you have a series of pieces of equipment numbered 1 thru 6. The only thing flowing through that series of meters, eliminators, what not, will be oil; is that correct?

A Oil and water.

Q Oil and water?

A Yes. Now, we have two dump valves on each of the

separators, the test separator and the field separator. Electronically, only one valve can be opened at a time. When one of them dumps, it automatically locks out any other valve from dumping. We have sufficient capacity at these valves to hold any fluid coming in during the time one of the valves is dumping, so that we don't have any problem with any fluid running out of the valve. But only one valve can dump and only one fluid is going through the meters at the time, either oil or water, and is being allocated back to these counters at the test panel for what ever well is on test, as well as the total fluid in this installation is also being shown on counters.

Q So you will actually have, talking about three different meters, one on the test separator, one on the production separator, and then one on the line to measure gross volume?

A We have one meter. We have only one fluid going through that meter at a time, being dumped from a valve that is opened.

Q One meter services the whole set?

A Right, one meter services all of it.

Q So that when the test separator is dumping, there is nothing coming out of the production separator?

A Correct.

Q And then you will have separation equipment at your centralized tank battery to separate the oil and water?
A Yes.
Q How much water do these wells make, a lot, a little?
A Right now they are making about 100 barrels total fluid, water.
Q What would that represent as part of the total production?
A Well, this is the total production for the whole unit, about 100 barrels of water and 100 barrels of oil is what we have presently.
Q About 50-50?
A About 50-50 at each one of these stations.
Q Mr. Porter, has this type of metering set up been used in any other type of installation, to your knowledge?
A To my knowledge, there are several installations in Texas, Atlantic Richfield has, in Oklahoma, other operators in New Mexico, to my knowledge, have similar installations. I can obtain this information for you, if you would like to have it specifically.
Q Have you had any direct experience with an installation of this sort?
A No, not as shown on this schematic, I have not.
Q But you do say Atlantic Richfield has this type of operation?
A Yes, I have visited a number of these previous to

designing this, talked with field personnel to see how it's been working, and it has been working very successfully.

MR. STAMETS: Are there any other questions of this witness?

(No Response.)

MR. STAMETS: He may be excused. Do you have any thing further?

MR. HINKLE: That's all.

MR. STAMETS: We will take the case under advisement and take about fifteen minutes for break.

C E R T I F I C A T E

I, JOHN DE LA ROSA, a Court Reporter, in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

COURT REPORTER

October 31 5090 73

Richard L. Stamets

I N D E X

E X H I B I T S

	OFFERED	ADMITTED
Applicant's Exhibit 1	8	8
Applicant's Exhibit 2	8	8
Applicant's Exhibit 3	8	8
Applicant's Exhibit 4	8	8

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

November 16, 1973

Re: CASE NO. 5090
ORDER NO. R-4671
Applicant:
Atlantic Richfield Company

Mr. Clarence Hinkle
Hinkle, Bondurant, Cox & Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC

Other

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5090
Order No. R-4671

APPLICATION OF ATLANTIC
RICHFIELD COMPANY FOR LEASE
COMMINGLING, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 31, 1973, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 16th day of November, 1973, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Atlantic Richfield Company, is the operator of the Seven Rivers Queen Unit, Langlie Mattix Pool, Lea County, New Mexico.

(3) That 100 percent of the working interest owners and 99.554 percent of the royalty interest owners within the area have ratified and joined the unit.

(4) That the applicant seeks an exception to Commission Rule 309-A to permit the commingling of unitized and non-unitized production within said Seven Rivers Queen Unit area.

(5) That the mechanics of the proposed commingling installation are proper and adequate provided that a positive displacement meter is used wherever unitized and non-unitized production is commingled.

(6) That the application should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to commingle unitized and non-unitized production

within the Seven Rivers Queen Unit, Langlie Mattix Pool, Lea County, New Mexico.

(2) That such commingling shall be accomplished in accordance with the Lease Commingling, Diversified Ownership, section of the Commission "Manual for the Installation and Operation of Commingling Facilities," dated September 13, 1961, except that a single positive displacement meter may be utilized to measure all production and a net oil computer may be utilized for net oil determination.

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

I. R. TRUJILLO, Chairman

ALEX J. ARMIJO, Member

A. L. PORTER, Jr., Member & Secretary

S E A L

dr/

AtlanticRichfieldCompany

North American Producing Division
Permian District
Post Office Box 1610
Midland, Texas 79701
Telephone 915 682 8631

November 5, 1973

Mr. Richard L. Stamets
Examiner
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Re: Request for Additional Information
Concerning Case No. 5090
Docket No. 31-73
Atlantic Richfield Company's
Seven Rivers Queen Unit

Dear Mr. Stamets:

I am enclosing the additional information which you requested during the hearing of October 31, 1973, concerning our commingling and testing facilities on the Seven Rivers Queen Unit.

Installations in New Mexico which are similar to the one we are installing, particularly those which use a single meter to measure both oil and water, are as follows:

Skelly Oil Company - Skelly Unit
Mobil Oil Corporation - North Vacuum Unit, Humphrey Queen Unit, and North East Square Lake Unit
Exxon - Paddock Unit

Literature on the main components used in our test system are attached: 1) net oil computer, 2) turbine meter, and 3) a gas swirlmeter.

A detailed account of the test system operation is discussed below (see attachments).

The oil flow path of a well on test is shown in red on Attachment No. 4. Oil, water, and gas coming from the well to be tested flows through the electrically operated 3-way valve to the test header on its way to the 3-phase test separator. All other wells are routed through the production header to the 3-phase field separator.

The separators are equipped with two fluid dump valves which are activated by floats mounted in the vessel at the oil-water and gas-oil interfaces (see attachments No. 5, 6, 7, & 8). This allows the vessel to dump oil or water separately. When one dump valve opens, all other valves on both separators are automatically held closed. The fluid being dumped passes through

the net oil computer probe where it is monitored for oil and water content. The fluid is pumped through the turbine meter which measures the volume and transmits production to the appropriate counters on the test panel. The test panel displays the oil, water, and gas production for the well being tested. Cumulative and daily oil and water production for all of the wells coming into the test station is also shown on the panel.

The amount of fluid being dumped each time can be adjusted at the float. Normally, it is about 1 barrel and can be pumped out in less than 1 minute.

Proving of the turbine meter will be done on a regular basis. This will be done with a master meter or the prover tank located at each test station. The turbine meter is accurate within ± 1% over a 10 to 1 flow range. Even greater accuracy can be obtained in a system like ours where the pump output is held constant by a back pressure valve on the discharge. The net oil computer has an accuracy of ± 1% in the 0-50% SW range and a ± 3% in the 0-100% range. We have overdesigned in sizing our separating equipment so that any emulstion in the oil will be quite small and thus yield high accuracy. We have selected the more expensive gas swirlmeter over orifice or rotary gas meters for the following reasons:

1) No moving parts - less maintenance.
2) 100:1 Operating Range - Allows us to measure gas from wells which have wide ranges in volume.
3) High Accuracy - Linearity is ± 1% of rate.

When the test station is put into operation the well tests will be checked against the prover tank until we are satisfied that we are getting accurate well tests. This will be repeated on a regular basis and at any time we suspect a problem with our test facility.

We feel we have installed enough safety devices to adequately protect and alert field personnel of a malfunction. The test separator has a third float mounted above the interface floats which will automatically switch the well from test back to the field header if an abnormally high fluid level should occur. At this time, the alarm beacon light will come on and continue to rotate until such time as the pumper has corrected the problem.

The field separator has 4 floats in the vessel. The first float mounted above the interface floats will sense a high fluid level. This normally is the result of a pump failure. If this does occur, the float will actuate a bypass valve allowing the incoming fluid to flow around the pump. This would allow the test to continue. If the main oil line should become plugged, the fluid level in the separator would continue to rise until the highest float would actuate a shut in valve located on the field header. This would cause all of the production lines to the wells to pressure up. High pressure switches located at each producing well would shut down the engine or motor on the pumping unit. If any of these shut downs should fail then the safety relief valve on the header would pop the fluid to the 210 barrel emergency overflow tank. Each separator has a high pressure relief valve which is also tied into this tank. Two "Flow-no flow" devices are installed in the system to notify the pumper that fluid is entering the overflow tank or gas is being vented to the flair pit. The alarm beacon light will come on if this happens.

If you have additional questions please notify us.

Very truly yours,

W. J. Porter

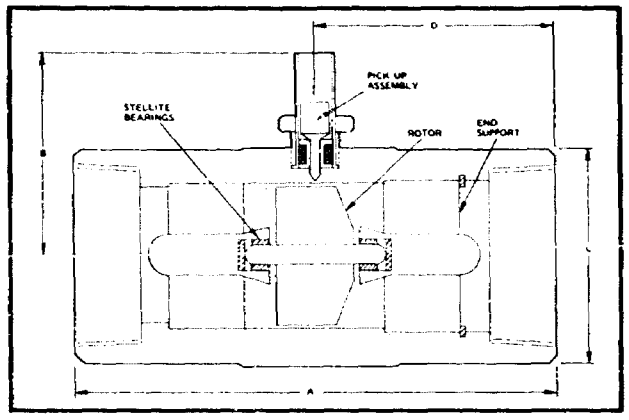
W. T. Porter

WTP/agp

Attachments (8)

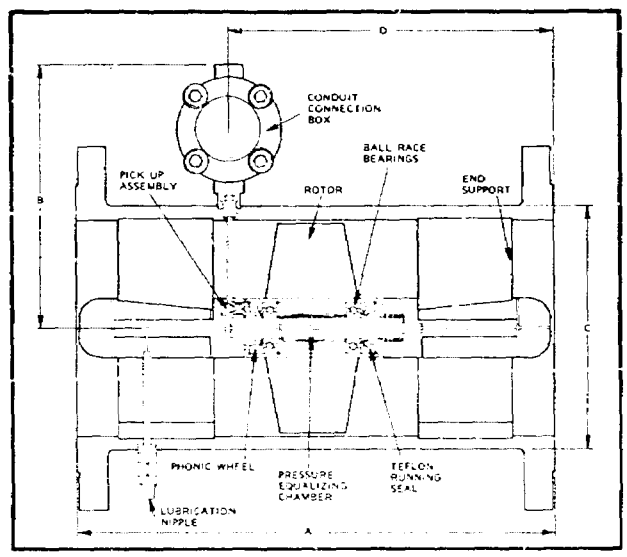
DIMENSIONS (Inches)

Size	A	B	C	D
1"	4.500	2.625	1.625	2.250
1-1/2"	6.750	2.875	2.125	3.375
2"	7.250	3.187	2.750	3.625
3"	10.000	3.750	3.500	5.000



DIMENSIONS (Inches)

Size	A	B	C	D
4"	14.000	6.750	5.000	10.750
6"	14.500	7.750	7.000	11.000



ORDERING INFORMATION

1. Product Number 840-15
2. Line Size
3. End Connections
4. Design Pressure
5. Temperature °F
6. Maximum Flow Rate
7. Minimum Flow Rate
8. Type Fluid

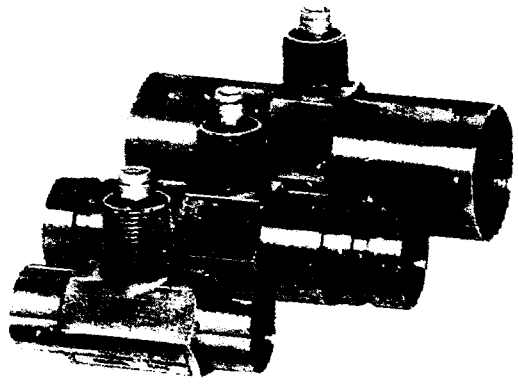
BAKER AUTOMATION SYSTEMS, INC. • 8330 BROADWAY, SUITE 4, HOUSTON, TEXAS 77017
Phone: (713) 641-0351 • Telex: 762-734 • Cable: BAMATION

PB-1 014

Effective October 1971
Printed in U.S.A.

BASIC PRODUCT BULLETIN

BASIC MODEL BWT INLINE WATERFLOOD TURBINE METERS



GENERAL

BASIC waterflood turbine meters are designed to provide a highly accurate and rugged low cost system for measurement of injected and produced water.

The waterflood turbine consists of a free spinning helical multi-bladed rotor that rotates on a polished tungsten carbide pinion and stellite sleeve bearings within a non-magnetic stainless steel body. BASIC TMT-100 totalizers rate of flow indicators, portable flow rate indicators, frequency/DC converters and other turbine meter readout equipment is available to provide almost any desired readout in engineering units.

BASIC turbine flowmeters are available with flanged, threaded or grooved end connections.

SPECIFICATIONS

Size (Inches)	Min GPM	Max GPM	Max BPD	Linearity	Repeat-ability	Max. Working Pressure		
						NPT	Flanged	Grooved
3/4	3	35	1200	±0.5%	±0.05%	4000	ANSI SPECS.	2000
1	6	75	2570					
1-1/2	13	160	5485					
2	25	270	9255					
3	50	500	17140					
4	100	1000	34285					
6	200	2000	68570					
8	400	4000	137525					
10	700	7000	240000					
12	1000	10000	342855					

CONSTRUCTION SPECIFICATIONS

- 316 stainless steel body and straightening vanes for corrosion resistance in oilfield brines.
- 17 - 4 PH stainless steel helical three- or four-bladed rotor for maximum hydraulic efficiency and low pressure drop of 4 psig at maximum flow rate.
- Tungsten carbide polished pinion with stellite sleeves for long life and low bearing friction.
- 4,000 psig pressure rating.
- Temperature range = 50 to 450°C.
- Accuracy ± 1% over 10 to 1 flow range.
- Repeatability better than 0.1%.

VISCOSITY EFFECTS

In choosing a meter for use at high viscosity the following factors should be taken into account.

1. Better accuracy will be obtained at the higher part of the flow range and if necessary into overrange.
2. In using a meter in these higher parts of the flow range there will be a slight increase in pressure drop.

COIL DATA

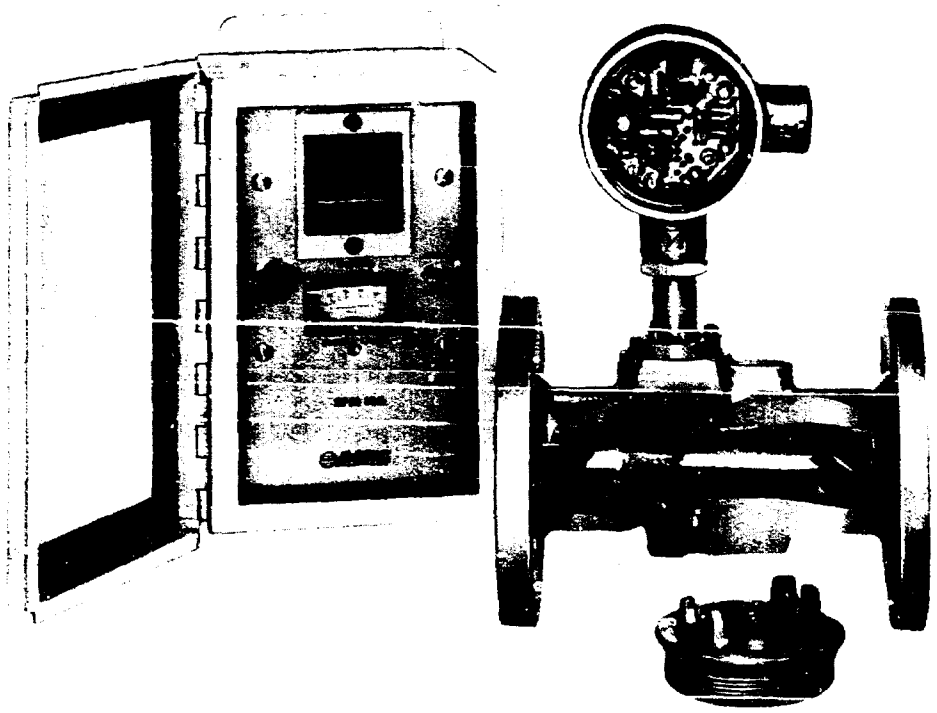
Inductance:
372 mH

DC Resistance:
1400 ohms ± 10%

Temperature Range:
-20° F to +225° F

BASIC PRODUCT BULLETIN

BASIC SFM-100
SWIRLMETER FLOW MEASUREMENT



GENERAL

The SFM-100 Swirlmeter is a new metering principle that provides the capability of measuring high and low gas-oil ratios with one metering device. It eliminates the need for multiple meter runs in conventional orifice metering systems. It has no moving parts thereby reducing maintenance to a minimum. Integration of volumes is by fully integrated circuit electronics providing a digital readout. Ranges of 100:1 with accuracies of ± 1% of rate are obtainable with the SFM-100 Swirlmeter.

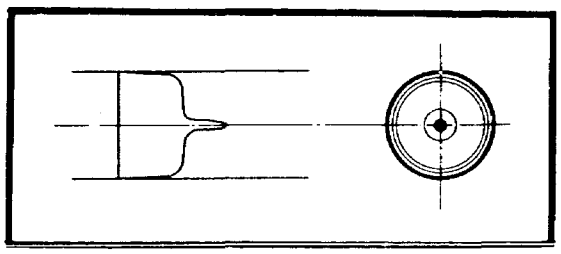
THEORY OF OPERATION

The gas flow measurement made by the Swirlmeter uses a new fluid mechanics principle, Vortex Precession. Vortex Precession is a generic name for the hydrodynamic oscillatory motion generated by the Swirlmeter. The motion is related to the Karman "street patterns," and the Aeolian tones observed when air is blowing past wires. The Swirlmeter has been called a fluidic oscillator, generating a frequency proportional to volumetric flowrate.

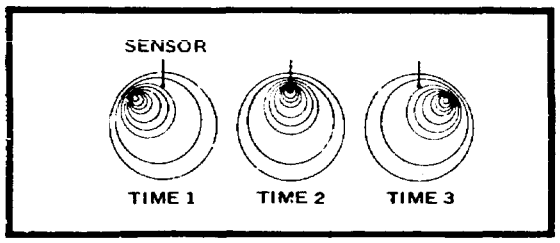
A rotating body of fluid, conditioned so it has rapid rotary motion around the meter centerline (a vortex is developed), precesses when the flow enters an enlargement. The vortex center can be visualized as a higher velocity core. Initially, the axis of fluid rotation is the centerline of the meter, but a change in the direction of the rotational axis occurs (precession) when the rotating flow enters an enlargement. The frequency of the precession is proportional to the volumetric flowrate. The Swirlmeter provides the means for generating the vortex, developing precession, and sensing the frequency of precession.

OPERATION

Fluid enters the meter thru the swirl component which is designed to develop a vortex, the center of which is a region of higher tangential velocity than the rest of the fluid profile. The fluid profile immediately after the swirler can be visualized as shown below:



Downstream, the meter body is shaped to a venturi section which provides the enlargement necessary for Vortex Precession. Using time plots the precession can be visualized as shown:



A sensor is located at the downstream end of the throat of the venturi section (at the beginning of the enlargement). The sensor converts the instantaneous velocity changes to a proportional voltage which is amplified, filtered, and shaped to form a 15 volt peak-to-peak frequency signal proportional to volumetric flowrate.

The sensor is a thermistor to which is applied a constant current so that it is operating in the "self-heat region." The gas passing the thermistor carries energy away. An increase in velocity, as associated with the passing of the vortex, will carry more energy away resulting in an instantaneous voltage increase. The voltage change is detected, amplified, appropriately filtered, using a patented filter-select network, and shaped to form a constant amplitude digital signal, the frequency of which is proportional to volumetric flowrate.

The electronic circuit of the Swirlmeter uses modern solid state components and integrated circuits for optimum reliability.

DESIGN FEATURES

- No moving parts
- 100:1 operating range
- Linearity is ±1% of rate
- Linear range can be as long as 100:1
- Within the linear limits, the meter calibration is unaffected by changing gas properties.
- Intrinsically safe meter is available to meet hazardous conditions.
- Meter is suitable for operation over 125° F span increments of fluid temperatures from -120° F to +220° F.

SPECIFICATIONS

Performance:

Linearity:
±1% of rate.

Repeatability:
0.25% of rate

Operating range:
100:1

Accuracy: ±0.75% of rate relative to Colorado Engineering Experiment Station

Linear range:
Potential 100:1; minimum linearity is the greater of the flow at 10 Hz output or that determined by viscosity and density; maximum linearity is the lesser of the flow at 1000 Hz output or that determined by gas compressibility.

Time constant:
approx. 3 seconds.

Output: 15 volt peak-to-peak square wave of frequency 10 to 1000 Hz; output impedance is 1000 ohms.

Power Supply: 117 VAC (±10%), 50–60 Hz.

Process Connections: 150 lb or 300 lb standard flanges.

Pressure Limits: 275 psig at 100° F for 150 lb flanges; 720 psig at 100° F for 300 lb flanges.

Product Number: 840-31

BASIC

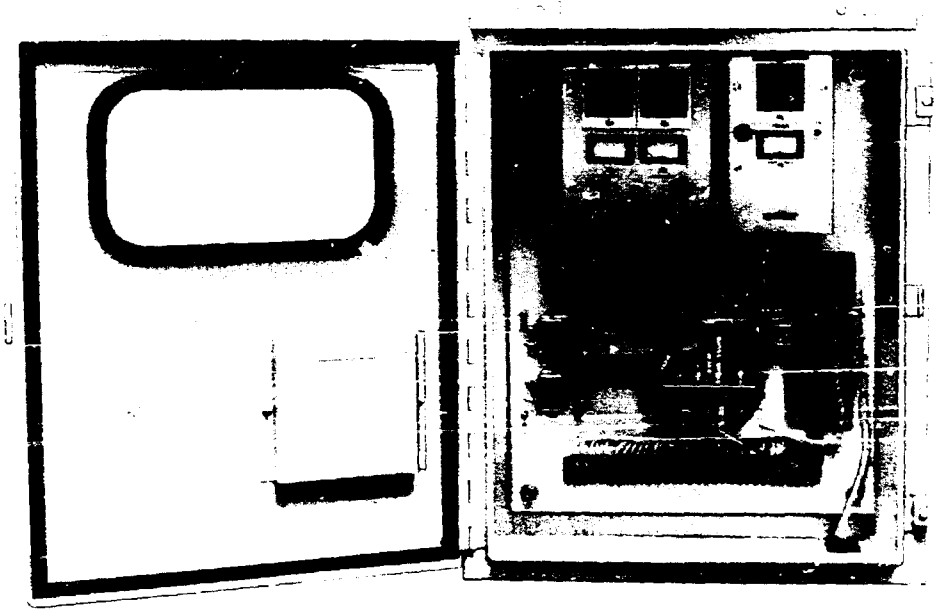
BAKER AUTOMATION SYSTEMS, INC. • 7130 HARWIN DRIVE • HOUSTON, TEXAS 77036
Phone: (713) 781-5600 • Telex: 762-734 • Cable: BAMATION

PB-1005

Effective October 1971
Printed in U.S.A.

BASIC PRODUCT BULLETIN

BASIC CM-510 NET OIL COMPUTER



GENERAL

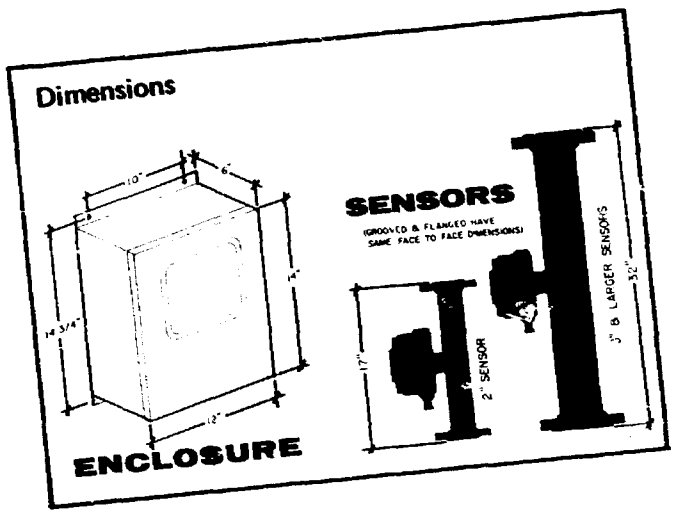
The BASIC CM-510 net oil computer is intended to be used with any metering device which will supply a contact closure of 4 ms or longer representing a unit of measured flow. The CM-510 may be used with either a positive displacement or turbine meter by changing only the meter input card. It is not necessary to install a high speed pulser on P.D. meters. Turbine meter input card may be coded for any size or type turbine. Solid state I.C. cards are available for combining or time sharing the net oil computer.

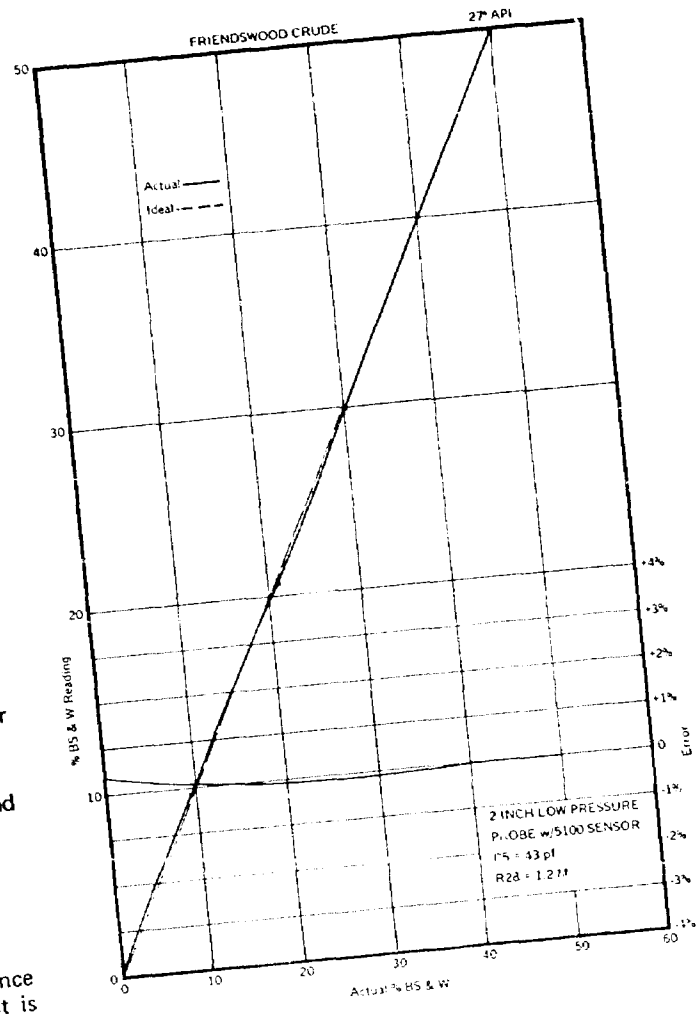
THEORY OF OPERATION

The CM-510 net oil computer and probe complete with sensor card is an all solid-state device used to provide a digital readout of barrels of oil and water in an emulsified stream. An analog signal proportional to the BS&W percentage is fed to the net oil computer and a pulsed signal from either a P.D. meter or a turbine meter is also fed to the computer. For each incoming pulse, a pulse chain generator generates a series of 256 pulses. These pulses are routed to either an oil accumulator or water accumulator based on the analog signal present in the computer. Each accumulator must accumulate 256 pulses before providing a pulsed output to drive the oil and water counters. The 6 digit oil and water counters are equipped with remote readout contacts as standard. Normal readout on counters is in 1/100 barrel increments and remote readout transfer to R.T.U.'s or other panels is 1/10 barrel increments. When the CM-510 is used with a P.D. meter, the input card is a CM-5101. When used with a turbine meter, the input card is a CM-5114. A percent BS&W indicating meter on the computer is standard; percent flow rate for turbines is optional.

CM-510 probes available in 2" – 3" – 4" – 6" nominal pipe sizes with flanged, grooved or screwed ends. Also may be furnished 150 psi wp to 1,000 psi wp. inner walls of the probe are coated with a baked on epoxy coating and the inner electrode is a stainless steel rod Teflon encapsulated.

Dimensions





SPECIFICATIONS

Power Requirements:
115 V AC, 60 Hz, ±15%

Power Consumption:
Less than 10 watts

Operating Temperature Range:
0 to +150° F

Outputs:
Remote readout from counters 1/10 bbl increments
% BS&W – 0 to 5 volts
% Flow Rate – DC voltage proportional to turbine meter frequency

Calibration:
Field adjustments of zero and span on BS&W sensor and computer with TS-510 test set

Accuracy:
±1% 0 – 50% range
±3% 0 – 100% range

BS&W Sensor:
The CM-5100 is of integrated circuit design, capacitance type sensor that provides a 0 to 5 V DC signal that is proportional to percent BS&W passing through the probe. The CM-5100 sensor card has a linear output through the 0 to 50% range as illustrated by the curve showing actual percent versus indicated percent BS&W. The CM-5100 may be used as a direct replacement for the CM-5107 sensor.

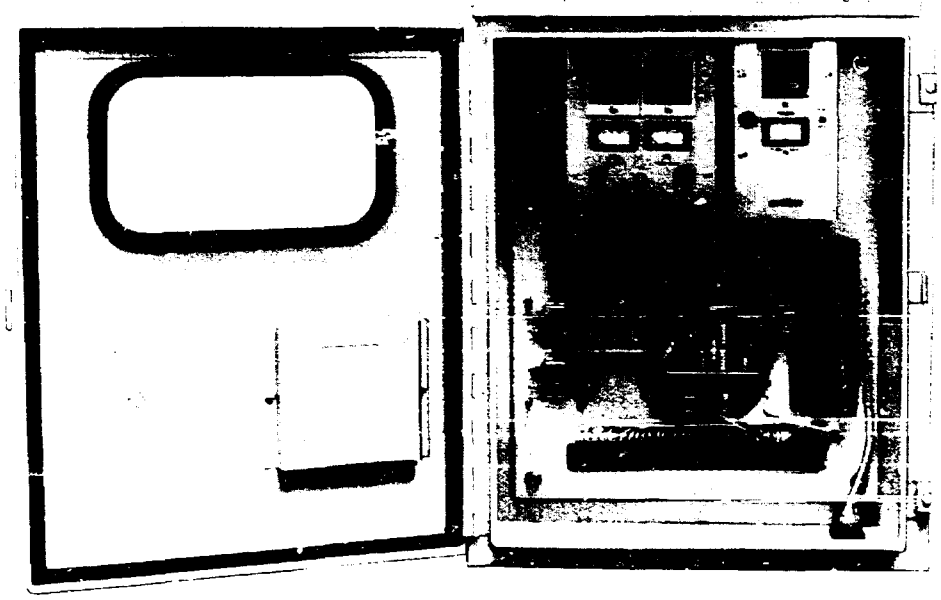
Product Number: 840-01

BAKER AUTOMATION SYSTEMS, INC. • 8330 BROADWAY, SUITE 4, HOUSTON, TEXAS 77017
Phone: (713) 641-0351 • Telex: 762-734 • Cable: BAMATION

Effective October 1971
Printed in U.S.A.

BASIC PRODUCT BULLETIN

BASIC CM-510 NET OIL COMPUTER



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CM-510 probes available in 2" – 3" -- 4" – 6" nominal pipe sizes with flanged, grooved or screwed ends. Also may be furnished 150 psi wp to 1,000 psi wp. Inner walls of the probe are coated with a baked on epoxy coating and the inner electrode is a stainless steel rod Teflon encapsulated.

Docket No. 31-73

DOCKET: EXAMINER HEARING - WEDNESDAY - OCTOBER 31, 1973

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 5076: (Continued from the October 17, 1973, Examiner Hearing)

Application of David Fasken for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill a well at an unorthodox location 1980 feet from the North line and 660 feet from the West line of Section 7, Township 18 South, Range 26 East, West Atoka-Morrow Gas Pool, Eddy County, New Mexico, the N/2 of said Section 7 to be dedicated to the well.

CASE 5086: Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Myers Langlie-Mattix Unit Area comprising 9924 acres, more or less, of Federal, State, and Fee lands in Townships 23 and 24 South, Ranges 36 and 37 East, Lea County, New Mexico.

CASE 5087: Application of Skelly Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Myers Langlie-Mattix Unit Area, Langlie-Mattix Pool, Lea County, New Mexico, by the injection of water into the Queen formation through 84 injection wells in said unit area.

CASE 5088: Application of Amini Oil Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface of the ground down to and including the Pennsylvanian formation underlying the S/2 of Section 32, Township 20 South, Range 33 East, South Salt Lake-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to a well to be drilled at a standard location in Unit N of said Section 32. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5089: (This case will be dismissed)

Application of Coquina Oil Corporation for an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its proposed Cities Service State Well No. 3, at an unorthodox location 1325 feet from the South line and 660 feet from the East line of Section 27, Township 14 South, Range 34 East, High Plains-Pennsylvanian Pool, Lea County, New Mexico.

CASE 5090: Application of Atlantic Richfield Company for lease commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Commission Rule 309-A to permit the commingling of unitized and non-unitized production within applicant's Seven Rivers-Queen Unit Area, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 5091: Application of Superior Oil Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the E/2 of Section 2, Township 18 South, Range 25 East, West Atoka-Morrow Gas Pool, Eddy County, New Mexico, to be dedicated to a well presently being drilled at a point 2080 feet from the South line and 660 feet from the East line of said Section 2. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5092: Application of Gulf Oil Corporation for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the base of the Wolfcamp formation to the base of the Morrow formation underlying the E/2 of Section 9, Township 16 South, Range 35 East, Townsend-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to its Hulda Townsend Well No. 2 located in Unit I of said Section 9. Also to be considered will be the present value of said well and the cost of deepening and completing same and the allocation of such values and costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in deepening said well.

CASE 5093: Application of Morris R. Antweil for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the N/2 of Section 17, Township 22 South, Range 27 East, South Carlsbad Field, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location in Unit B of said Section 17. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5094: Application of Cities Service Oil Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Azotea Mesa Unit Area comprising 5686 acres, more or less, of Federal and State lands in Township 23 South, Range 24 East, Eddy County, New Mexico.

CASE 5095: Application of Cities Service Oil Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Loafer Draw Unit Area comprising 5844 acres, more or less, of Federal, Fee, and State lands in Township 21 South, Ranges 21 and 22 East, Eddy County, New Mexico.

CASE 5096: Application of H. L. Brown, Jr. for a non-standard gas proration unit and unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 320-acre non-standard gas proration unit comprising the SE/4 of Section 15 and the E/2 NE/4, SW/4 NE/4, and NE/4 SE/4 of Section 22, all in Township 17 South, Range 29 East, Grayburg-Morrow Gas Pool, Eddy County, New Mexico, to be dedicated to a well to be drilled at an unorthodox gas well location 330 feet from the South and East lines of said Section 15.

CASE 5097: Application of Dorchester Exploration Company for pool creation and special pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new gas pool for Wolfcamp production for its well located in Unit F of Section 35, Township 19 South, Range 28 East, and the promulgation of special rules therefor including a provision for 320-acre spacing and standard 320-acre well locations.

CASE 5073: (Continued and Readvertised)

Application of Belco Petroleum Corporation for a non-standard gas proration unit and unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 320-acre non-standard gas proration unit comprising the E/2 SW/4 and SE/4 of Section 30 and the N/2 NE/4 of Section 31, all in Township 20 South, Range 33 East, South Salt Lake Field, Lea County, New Mexico, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South line and 1300 feet from the East line of said Section 30.

SIGN-UP STATUS
SEVEN RIVERS-QUEEN UNIT
LEA COUNTY, NEW MEXICO
AS OF OCTOBER 29, 1973

Tract No.	Working Interest Sign-Up	Royalty Owner Sign-Up
Tract 1		
Total	100%	12.59389%
Signed	100%	12.59389% (100%)
Tract 2		
Total	100%	12.5000%
Expect to Receive		.4708%
Title Problems		.1116%
May Receive		.0744%
Signed	100%	11.8432% (94.74%)
Tract 3		
Total	100%	19.59380%
Signed	100%	19.59389% (100%)
Tract 4		
Total	100%	12.50020%
Expect to Receive		.00520%
May Receive		.00030%
Signed	100%	12.49470% (99.96%)
Tract 5		
Total	100%	12.50000%
Expect to Receive		.00263%
May Receive		.00014%
Signed	100%	12.49723% (99.97%)
Tract 6		
Total	100%	12.50000%
Expect to Receive		.00263%
May Receive		.00014%
Signed	100%	12.49723% (99.97%)
Tract 7		
Total	100%	18.55470%
Expect to Receive		.01051%
May Receive-Title Problems		.00056%
Signed	100%	18.54363 (99.94%)
Tract 8		
Total	100%	20.31251%
Expect to Receive		.01162%
May Receive-Title Problems		.00056%
Signed	100%	20.30033% (99.9%)
Tract 9		
Total	100%	12.89060%
May Receive		.00080%
Expect to Receive		.01570%
Signed	100%	12.87410% (99.8%)

44 6% unsigned

SIGN-UP STATUS
SEVEN RIVERS-QUEEN UNIT
LEA COUNTY, NEW MEXICO
AS OF OCTOBER 29, 1973

Tract No.	Working Interest Sign-Up	Royalty Owner Sign-Up
Tract 10		
Total	100%	12.50000%
Signed	100%	12.50000% (100%)
Tract 11		
Total	100%	12.50000%
Signed	100%	12.50000% (100%)

UNIT WIDE SUMMARY

	Working Interest	Royalty
Signed	100%	99.554%
Refusal	-	-0-
All Others	-	.446%

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-106
4-28-61

NOTICE OF INTENTION TO UTILIZE AUTOMATIC CUSTODY TRANSFER EQUIPMENT

ACT Permit No. _____

Operator Atlantic Richfield Company Field South Eunice & Langlie-Mattix

Address P. O. Box 1610, Midland, Texas 79701 County Lea

Lease(s) to be served by this ACT Unit Seven Rivers-Queen Unit

Pool(s) to be served by this ACT Unit South Eunice and Langlie-Mattix Oil Pools

Location of ACT System: Unit I Section 34 Township 22S Range 36E

Order No. authorizing commingling between leases if more than one lease is to be served by this System P-309B as amended by R-2060 Date September 13, 1961

Order No. authorizing commingling between pools if more than one pool is to be served by this system R-663 Date May 18, 1955

Authorized transporter of oil from this system Texas-New Mexico Pipeline Company

Transporter's address P. O. Box 1510, Midland, Texas 79701

Maximum expected daily through-put for this system: Present 100 bbls./day, future 1400 Bbls/day

If system fails to transfer oil due to malfunction or otherwise, waste by overflow will be averted by:

CHECK ONE

A. [ ] Automatic shut-down facilities as required by Section (3) h-1 of RULE 309-A

B. [X] Alternative (3) h-2, providing adequate available capacity to receive production during maximum unattended time of lease operation.

If "A" above is checked, will flowing wells be shut-in at the header manifold or at the wellhead? _____ Maximum well-head shut-in pressure _____

If "B" above is checked, how much storage capacity is available above the normal high working level of the surge tank 750 BBLS. Will add more reserve tankage as production increases.

What is the normal maximum unattended time of lease operation? 24 Hours.

What device will be used for measuring oil in this ACT unit?

CHECK ONE

[X] Positive displacement meter

[ ] Weir-type measuring vessel

[ ] Positive volume metering chamber

[ ] Other; describe _____

FORE EXAMINER STAMPS
CONSERVATION COMMISSION
EXHIBIT NO. 3
NO. 5626

Remarks: See letter attached from Transporter.

I hereby certify that the information given above is true and complete to the best of my knowledge and that the subject ACT system will be installed and operated in accordance with RULE 309-A.

Approved, Oil Conservation Commission

By _____

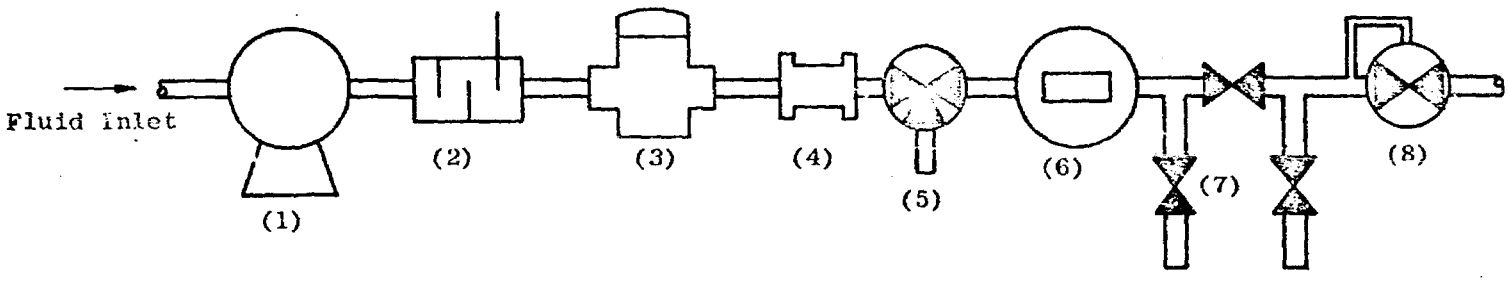
Title _____

J. R. Rhotenberry

Title District Engineer

Date October 19, 1973

Approval of Form C-106 does not eliminate the necessity of an approved C-104 prior to running any oil or gas from this system.



LEGEND

(1) Pump

(2) Sample Probe

(3) Air & Gas Eliminator with check in Vent and Strainer Combination

(4) B. S. & W. Monitor

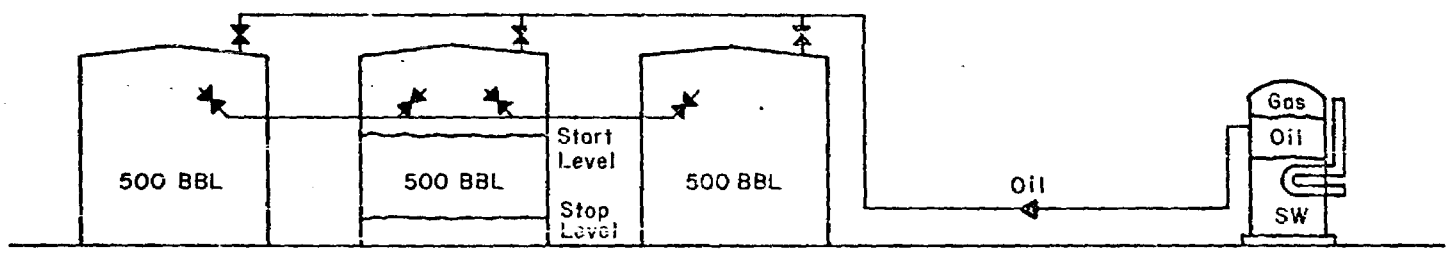
(5) Re-route Valve for re-routing Non-Merchantable Oil

(6) P. D. Meter with non-reset counter
A. O. Smith S-13 Meter (max. capacity 130 GPM)

(7) Proving connections

(8) Flow Rate Controller (Back Pressure Valve)

SCHEMATIC OF ACT FACILITY
SEVEN RIVERS-QUEEN UNIT
LEA COUNTY, NEW MEXICO



TREATING & STORAGE FACILITY
SEVEN RIVERS-QUEEN UNIT
LEA COUNTY, NEW MEXICO

TEXAS-NEW MEXICO PIPE LINE COMPANY

C. T. MATTHEWS
DIVISION MANAGER

P. O. BOX 1510
MIDLAND, TEXAS 79701

October 24, 1973

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

Atlantic Richfield Company advises that it plans to make application to the New Mexico Oil Conservation Commission for permission to install and operate a LACT unit on its Seven Rivers Queen Unit, Section 34, T22S, R36E, Lea County, New Mexico.

Texas-New Mexico Pipe Line Company will gather the production from this unit and concurs with the operator's application for approval to install and operate this LACT unit.

Please direct any correspondence regarding this unit to Texas-New Mexico Pipe Line Company, P. O. Box 1510, Midland, Texas 79701.

Yours very truly,

TEXAS-NEW MEXICO PIPE LINE COMPANY

By C. T. Matthews
C. T. Matthews
Division Manager

WDB-GMN

JDS(2)

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLCIATION OF ATLANTIC RICHFIELD COMPANY FOR EXCEPTION TO RULE 309-A APPROVING LEASE COMMINGLING AND OFF-LEASE STORAGE OF UNITIZED AND NON-UNITIZED PRODUCTION IN CONNECTION WITH AUTOMATIC CUSTODY TRANSFER EQUIPMENT AS PROVIDED BY RULES 309-A, 309-B AND 309-C FOR HANDLING OF PRODUCTION FROM WELLS WITHIN THE SEVEN RIVERS-QUEEN UNIT AREA EMBRACING LANDS IN SECTIONS 27, 34, W½ SECTION 35, TOWNSHIP 22 SOUTH, RANGE 36 EAST AND THE N½ SECTION 2 AND N½ SECTION 3, TOWNSHIP 23 SOUTH, RANGE 36 EAST, LEA COUNTY, NEW MEXICO

Case 5-090

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Atlantic Richfield Company, acting by and through the undersigned attorneys, and hereby makes application for exception to Rule 309-A approving lease commingling and off-lease storage of unitized and non-unitized production in connection with automatic custody transfer equipment as provided by Rules 309-A, 309-B and 309-C for handling of production from wells within the Seven Rivers-Queen Unit Area embracing lands in Sections 27, 34, W½ Section 35, Township 22 South, Range 36 East and the N½ Section 2 and N½ Section 3, Township 23 South, Range 36 East, Lea County, New Mexico, and in support thereof respectfully shows:

1. Applicant is the unit operator of the unit area covering the lands hereinabove described. Applicant contemplates installing central tank batteries and automatic custody transfer equipment for the handling of production of unitized and non-unitized substances from the unit area in accordance with the provisions of Rule 309-A of the Oil Conservation Commission. Such facilities will be installed so as to permit the testing of each well at reasonable intervals with a maximum of 14 proration units producing into each test header, with a single tank battery for the entire unit, all of which is more particulalry shown by the plat attached hereto as Exhibit "A".

2. The owners of more than 97% of the leasehold, royalty and overriding royalty interests in the unitized production have committed their interests to the unit agreement and a portion of the small interests which are not committed are due to title defects. For this reason, exceptions are desired to Rules 309-A, 309-B and 309-C.

3. In installing the automatic custody transfer equipment, new gathering lines will be installed and the equipment will protect against the loss of vapors during production and in the handling of the same; all of the production will be handled by one pipeline company; all of which will be in the interest of conservation and the prevention of waste and the protection of correlative rights.

4. Applicant requests that this matter be set down for hearing at the examiner's hearing to be held on October 31, 1973.

ATLANTIC RICHFIELD COMPANY

By _____
Member of the Firm of
HINKLE, BONDURANT, COX & EATON
P.O. Box 10
Roswell, New Mexico 88201

Application of Atlantic Richfield Company for lease commingling and offlease storage, Lea County, New Mexico.

Applicant in the above styled cause seeks an exception to Commission Rule 309-B and Rule 309 C to perm. offlease storage and the commingling of unitized and non-unitized production within applicant's Seven Rivers - Queen Unit ~~area. Applicant seeks an exception to Commission Rule 309 C to permit the off~~

area, Lea County New Mexico

Clarence Hinkle

Application of Atlantic Richfield Company for exception to Rule 309 B and Rule 309 C to permit lease commingling and off lease

A

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 5090

Order No. R-4671

APPLICATION OF ATLANTIC RICHFIELD COMPANY FOR LEASE COMMINGLING, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 31, 1973, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of November, 1973, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Atlantic Richfield Company, is the operator of the Seven Rivers Queen Unit, Langlie Mattix Pool, Lea County, New Mexico.

(3) That 100 percent of the working interest owners and 99.554 percent of the royalty interest owners within the area have ratified and joined the unit.

(4) That the applicant seeks an exception to Commission Rule 309-A to permit the commingling of unitized and non-unitized production within said Seven Rivers Queen Unit area.

(5) That the mechanics of the proposed commingling installation are proper and adequate provided that a positive displacement meter is used wherever unitized and non-unitized production is commingled.

(6) That the application should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant, Atlantic Richfield Company, is hereby authorized to commingle unitized and non-unitized production within the Seven Rivers Queen Unit, Langlie Mattix Pool, Lea County, New Mexico.

(2) That such commingling shall be accomplished in accordance with the ~~Diversified Ownership~~ Diversified Ownership, Lease Commingling section of the Commission Manual for the Installation and Operation of Commingling Facilities, dated September 13, 1961, except that a single positive displacement meter may be utilized to measure all production and a net oil computer may be utilized for net oil determination.

(3) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.