DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.
1/18/07		D. CATANACH	1/22/07	PLC	pTDS0702257203

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

RECEIVED

ADMINISTRATIVE APPLICATION CHECKLIST

JAN 18 2007

Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☑ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify AMENDMENT to PLC

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Print or Type Name	Signature	Title	Date
CAROLYN HAYNIE	Carolyn Haynie	Petro. Eng. Tech Assistant	1-17-07

CHAY@CHEVRON.COM
e-mail Address

Chevron

Carolyn Haynie
Petroleum Engineering
Technical Assistance

Permian Business Unit
Chevron MidContinent, L.P.
15 Smith Road
Midland, TX 79705
Tel 432-687-7261
Fax 432-687-7558
chay@chevron.com

January 16, 2007

New Mexico Oil Conservations Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87504

RE: Amendment to COMMINGLING ORDER PLC-38
Oil, Gas, and Water Production

Attention: Oil and Gas Department

Chevron MidContinent, L.P., formerly Pure Resources, L.P., respectfully requests administrative approval to amend the COMMINGLING ORDER PLC-38, for the Drinkard and Blinebry Oil & Gas Pool production from the following leases:

LEASE NAME: J.G. Randle Lease, Lea County, NM
DESCRIPTION: SW/4 NE/4 Section 20, Township 21 South, Range 37 East, NMPM

LEASE NAME: J.G. Randle "A" Lease, Lea County, NM
DESCRIPTION: SW/4 NE/4 Section 20, Township 21 South, Range 37 East, NMPM

Chevron proposes to amend this order to allow us to measure gas, oil, and water separately, as stated, but not be required to have temperature compensation and samples. Our field Operations Supervisor has reviewed the oil analysis on these wells and they are almost identical, so the value of the production will not be significantly impacted by the proposed action. Due to the low production, setting this battery with the Temperature Compensated Meters with non-reset counters and samplers would be costly and uneconomical. Chevron is the operator of these wells with 86.13% working interest. These batteries are on the same location, and Chevron plans to build the new battery on the same location. Battery analysis and support information is attached, for your review and approval.

For your convenience, I have enclosed an envelope with my return address, so that the decision for this application can be sent directly to me for distribution to the appropriate parties. If you require additional information or have any questions, please contact me by telephone at 452-687-7261, or by email at chay@chevron.com.

Sincerely,

Carolyn Haynie
PE Technical Assistant

Enclosure

cc: NMOCD – Hobbs District 2
Lease File
Jesse Williams
Mike Howell
Reggie Holzer
Nathan Mouser

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

AMENDED
COMMINGLING ORDER PLC-38

Graham
5429 LBJ Freeway, Suite 550
Dallas, Texas 75240

Attention: Jason C. Sizemore

The above-named company is hereby authorized to commingle Drinkard and Blinebry Oil & Gas Pool production from the following leases:

LEASE NAME: J.G. Randle Lease
DESCRIPTION: SW/4 NE/4 Section 20, Township 21 South, Range 37 East, NMPM

LEASE NAME: J.G. Randle "A" Lease
DESCRIPTION: SE/4 NW/4 Section 20, Township 21 South, Range 37 East, NMPM

LEASE NAME: Both in Lea County, New Mexico
DESCRIPTION:

Oil production shall be allocated to each lease by separately metering the production from each lease prior to commingling.

Gas production shall be allocated to each lease by separately metering the gas production from the J.G. Randle Lease and determining the J.G. Randle "A" Lease gas production by subtracting said volume from the total sales meter volume.

NOTE: This installation shall be installed and operated in accordance with the applicable provisions of Rule 309-B of the Division Rules and Regulations and the Division "Manual for the Installation and Operation of Commingling Facilities." It is the responsibility of the producer to notify the transporter of this commingling authority.

REMARKS: Temperature compensated meters with non-reset counters and samplers required.

DONE at Santa Fe, New Mexico, on this 25th day of October, 1991.

WILLIAM J. LEMAY
Division Director

cc: Oil Conservation Division - Hobbs

jc/

New Mexico Area

Randle Commingle Wells

API No.	Lease	Well No.	Status	Pool	Pool Code	Wellbore No.	Unit Letter	Section	Twnship	Range	Location	Co.	TD	Chevno
30-025-06680	J.G. Randle	1	PR	Blinebry	06660	359489	G	20	21S	37E	1980 'FNL & 1980' FEL	Lea	8950'	FA7781
30-025-06681	J.G. Randle A	1	PR	Drinkard	19190	359488	P	20	21S	37E	1980' FNL * 1980' FWL	Lea	6680'	FA7782

CARDINAL LABORATORIES

PHONE (325) 673-7001 · 2111 BEECHWOOD · ABILENE, TX 79603
PHONE (505) 393-2326 · 101 E. MARLAND · HOBBS, NM 88240

ANALYTICAL RESULTS FOR
CHEVRON
ATTN: BOBBY McCURRY
2401 AVE O
EUNICE, NM 88231
FAX TO:

Receiving Date: 09/27/06
Reporting Date: 10/03/06
Project Number: NOT GIVEN
Project Name: NOT GIVEN
Project Location: NOT GIVEN

Sampling Date: NOT GIVEN
Sample Type: CRUDE OIL
Sample Condition: INTACT
Sample Received By: BC

Laboratory No.	Sample ID	API grav. @ 60°F	Weight % Sulfur
H11582-1	J.G. RANDLE A #1	37.3	0.8383
H11582-2	J.G. RANDLE #1	37.2	0.8388
METHODS: ASTM		D287	D4294

Chemist

10/3/06
Date

WELL TEST REPORT

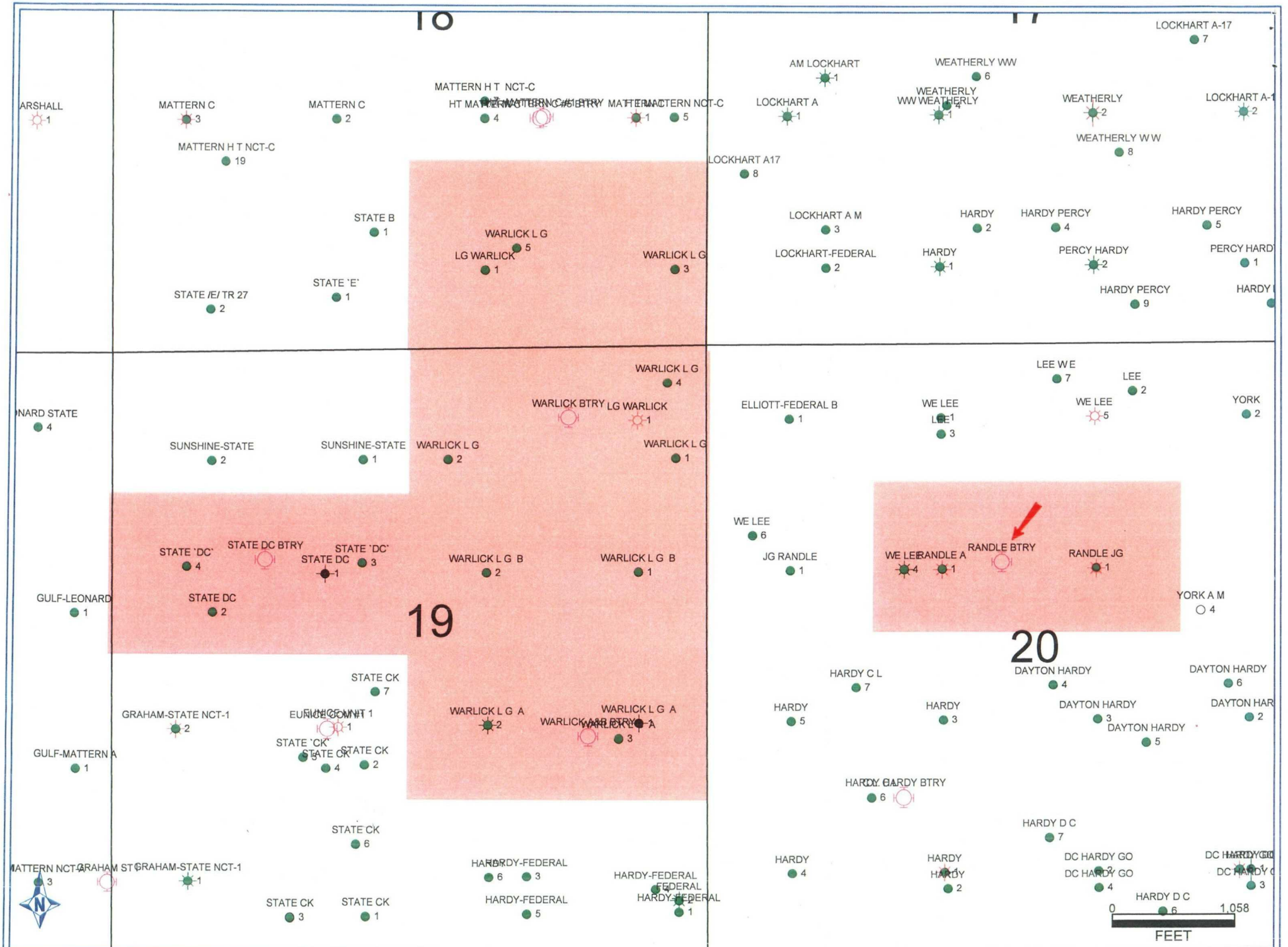
Lease: RANDLE #1	**Field:** BLINEBRY OIL & GAS	**Reservoir:** BLINEBRY	
Well: 1	**Field Code:** U46	**Resv Code:** 0000004532	
	Unique Code: BCU46AD00	**Battery:** RANDLE	
	Wellbore: 359489	**API No:** 300250668000	

Test Date	BOPD	BWPD	MCFPD	Tbg PSI	GOR	% Oil	Comp No.	Status	Remarks	Fluid Level	Fld Lvl Date	BTFPD	% Runtime
12/9/06	4	2	42		10500	66.7	01	PR			8/4/06	6	21.0
11/17/06	4	2	41		10250	66.7	01	PR			8/4/06	6	21.0
11/12/06	4	2	41		10250	66.7	01	PR			8/4/06	6	21.0
10/24/06	4	2	42		10500	66.7	01	PR			8/4/06	6	22.0
10/9/06	5	2	43		8600	71.4	01	PR			8/4/06	7	22.0
9/26/06	5	2	44		8800	71.4	01	PR			8/4/06	7	24.0
9/10/06	6	3	45		7500	66.7	01	PR			8/4/06	9	26.0
8/4/06	7	3	47		6714	70.0	01	PR			8/4/06	10	34.0
7/5/06	12	8	55		4583	60.0	01	PR				20	
6/29/06	17	13	48		2824	56.7	01	PR				30	
6/28/06	14	19	39		2786	42.4	01	PR				33	
6/27/06	12	18	32		2667	40.0	01	PR				30	

WELL TEST REPORT

Lease:	RANDLE A #1	Field:	DRINKARD	Reservoir:	DRINKARD
Well:	1	Field Code:	U41	Resv Code:	0000005817
		Unique Code:	BCU418700	Battery:	RANDLE A
		Wellbore:	359488	API No:	300250668100

Test Date	BOPD	BWPD	MCFPD	Tbg PSI	GOR	% Oil	Comp No.	Status	Remarks	Fluid Level	Fld Lvl Date	BTFPD	% Runtime
12/9/06	3	0	30		10000	100.0	01	PR			8/5/06	3	11.0
11/12/06	4	0	30		7500	100.0	01	PR			8/5/06	4	11.0
10/24/06	4	0	32		8000	100.0	01	PR			8/5/06	4	11.0
10/8/06	4	0	33		8250	100.0	01	PR			8/5/06	4	11.0
9/24/06	4	0	32		8000	100.0	01	PR			8/5/06	4	11.0
9/10/06	5	0	33		6600	100.0	01	PR			8/5/06	5	12.0
8/5/06	3	0	34		11333	100.0	01	PR			8/5/06	3	10.0
7/5/06	4	0	27		6750	100.0	01	PR				4	
6/22/06	3	1	27		9000	75.0	01	PR				4	
6/10/06	3	0	27		9000	100.0	01	PR				3	
6/2/06	3	0	27		9000	100.0	01	PR				3	
5/23/06	3	0	28		9333	100.0	01	PR				3	
5/12/06	3	0	28		9333	100.0	01	PR				3	
4/13/06	3	0	27		9000	100.0	01	PR				3	



PETRA 8/10/2006 1:13:21 PM

Catanach, David, EMNRD

From: Haynie, Carolyn (CHaynie) [Preferred Personnel] [CHAY@chevron.com]
Sent: Tuesday, February 06, 2007 11:12 AM
To: Catanach, David, EMNRD
Subject: RE: Randle Lease

David,
The working interest is different for each lease, so, that answers the question of sending notification to the working interest owners. Also, the two engineers over this project, are going to Eunice tomorrow and they will discuss this with the field Operation Supervisor and then they will let me know what.

Just wanted to let you know where we stand.

Thanks,

Carolyn Haynie
Petroleum Engineer TA
Room 3320
687-7261

From: Catanach, David, EMNRD [mailto:david.catanach@state.nm.us]
Sent: Tuesday, February 06, 2007 9:54 AM
To: Haynie, Carolyn (CHaynie) [Preferred Personnel]
Subject: Randle Lease

Hi Carolyn,

I'm reviewing your request to eliminate the requirement for temperature compensation and samples from the commingling order for the Randle Lease.
I have a couple of questions. Is the interest ownership different between these two leases? If so, you will have to notify all interest owners of your proposal.
Also, can you please send me a schematic diagram of the battery showing the proposed setup, and a description of the meters that will be used.
Also, what are the producing rates for these wells?

Thanks,

David Catanach
Engineer

Records Act. If you are not the intended recipient, please contact the sender and destroy all copies of this message. -- This email has been scanned by the Sybari - Antigen Email System.

DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

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[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

2007 FEB 15 AM 10 37

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

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☐ DHC ☐ CTB ☑ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify Amendment to PLC / Additional Information 2-13-07

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

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Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Carolyn Haynie	Carolyn Haynie	Petro. Eng. Tech Assistant	1-17-07
Print or Type Name	Signature	Title	Date

CHAY@Chevron.com
e-mail Address

Additional Information

Content List:

Well Test for Production information.

Field schematic diagram of proposed battery setup.

Copy of WIO/RIO/ORRI Letter sent out 2-13-07.

Tech Data Sheet for the Turbine meters with Prover Loop Connections that will be used.

Hi David!

Happy Valentines Day!

Carolyn Laynie

Chevron

Haynie, Carolyn (CHaynie) [Preferred Personnel]

From: Catanach, David, EMNRD [david.catanach@state.nm.us]
Sent: Tuesday, February 06, 2007 9:54 AM
To: Haynie, Carolyn (CHaynie) [Preferred Personnel]
Subject: Randle Lease

Hi Carolyn,

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Also, can you please send me a schematic diagram of the battery showing the proposed setup, and a description of the meters that will be used.
Also, what are the producing rates for these wells?

Thanks,

David Catanach
Engineer

WELL TEST REPORT

Lease: RANDLE #1 | **Field:** BLINEBRY OIL & GAS | **Reservoir:** BLINEBRY

Well: 1 | **Field Code:** U46 | **Resv Code:** 0000004532

Unique Code: BCU46AD00 | **Battery:** RANDLE

Wellbore: 359489 | **API No:** 300250668000

Test Date	BOPD	BWPD	MCFPD	Tbg PSI	GOR	% Oil	Comp No.	Status	Remarks	Fluid Level	Fld Lvl Date	BTFPD	% Runtime
12/9/06	4	2	42		10500	66.7	01	PR			8/4/06	6	21.0
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7/5/06	12	8	55		4583	60.0	01	PR				20	
6/29/06	17	13	48		2824	56.7	01	PR				30	
6/28/06	14	19	39		2786	42.4	01	PR				33	
6/27/06	12	18	32		2667	40.0	01	PR				30	

WELL TEST REPORT

Lease: RANDLE A #1	Field: DRINKARD	Reservoir: DRINKARD	
Well: 1	Field Code: U41	Resv Code: 0000005817	
	Unique Code: BCU418700	Battery: RANDLE A	
	Wellbore: 359488	API No: 300250668100	

Test Date	BOPD	BWPD	MCFPD	Tbg PSI	GOR	% Oil	Comp No.	Status	Remarks	Fluid Level	Fld Lvl Date	BTFPD	% Runtime
12/9/06	3	0	30		10000	100.0	01	PR			8/5/06	3	11.0
11/12/06	4	0	30		7500	100.0	01	PR			8/5/06	4	11.0
10/24/06	4	0	32		8000	100.0	01	PR			8/5/06	4	11.0
10/8/06	4	0	33		8250	100.0	01	PR			8/5/06	4	11.0
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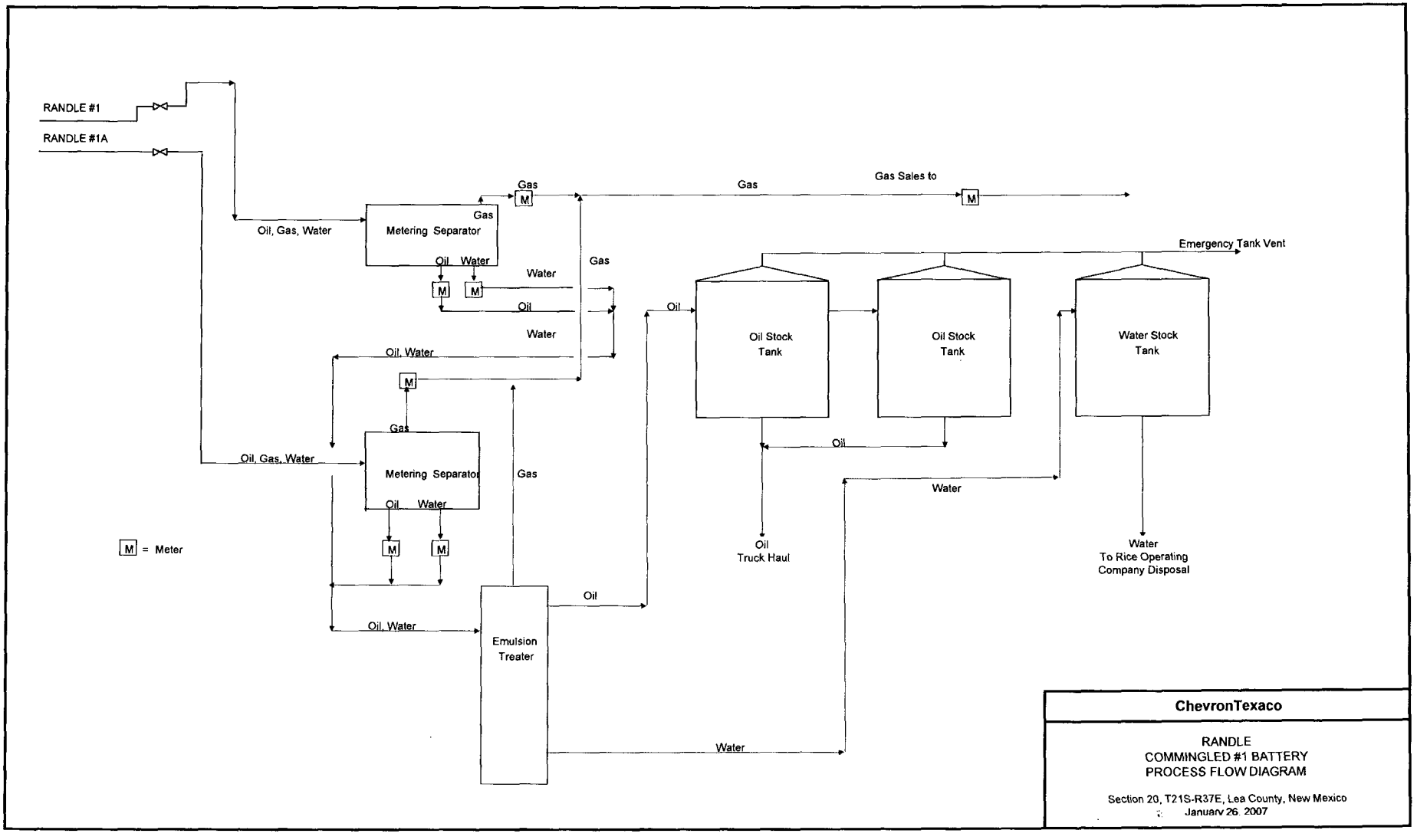
6/10/06	3	0	27		9000	100.0	01	PR				3	
6/2/06	3	0	27		9000	100.0	01	PR				3	
5/23/06	3	0	28		9333	100.0	01	PR				3	
5/12/06	3	0	28		9333	100.0	01	PR				3	
4/13/06	3	0	27		9000	100.0	01	PR				3	


RANDLE #1
RANDLE #1A
Oil, Gas, Water
Metering Separator
Gas
Oil
Water
Gas
Gas Sales to
Emergency Tank Vent
Oil Stock Tank
Oil Stock Tank
Water Stock Tank
Oil, Water
Oil, Gas, Water
Metering Separator
Oil
Truck Haul
Water
To Rice Operating
Company Disposal
M = Meter
Emulsion Treater
Oil, Water
Water
ChevronTexaco
RANDLE
COMMINGLED #1 BATTERY
PROCESS FLOW DIAGRAM
Section 20, T21S-R37E, Lea County, New Mexico
January 26, 2007

Chevron

Carolyn Haynie
Petroleum Engineering
Technical Assistance

Permian Business Unit
Chevron MidContinent, L.P.
15 Smith Road
Midland, TX 79705
Tel 432-687-7261
Fax 432-687-7558
chay@chevron.com

February 13, 2007

Pool Lease Commingle
J.G. Randle Lease & the J.G. Randle "A" Lease
Section 20, T21S, R37E,
Lea County, New Mexico

RE: Notice of Intent to Amend Commingle Order PLC-38

Working Interest, Royalty Interest, and Overriding Royalty Interest Owners:

Chevron MidContinent, L.P., formerly Pure Resources, L.P., respectfully gives notice of intent to amend Commingle Order PLC-38, for the Drinkard, and Blinebry Oil & Gas pool production from the following leases:

J.G. Randle Lease, SW/4 NE/4 Section 20, Township 21 South, Range 37 East, NMPM, Lea County, NM

J.G. Randle "A" Lease, SW/4 NE/4 Section 20, Township 21 South, Range 37 East, NMPM, Lea County.

Chevron proposes to amend this order to allow us to measure gas, oil, and water separately, as stated on the commingle, but not be required to have temperature compensation and samples. The value of the production will not be significantly impacted by the proposed action. Due to the low daily oil production, setting this battery with the Temperature Compensated Meters with non-reset counters and samplers would be less economical. A well list and map for this commingle amendment is enclosed.

Any objections to this commingle amendment, must be sent to the **New Mexico Oil Conservation Division; 1220 South St. Francis Drive; Santa Fe, NM 87504**, within 20 days of receipt of this notification.

If you require additional information or have any questions, please contact me by telephone at 432-687-7261, or by email at chay@chevron.com.

Sincerely,

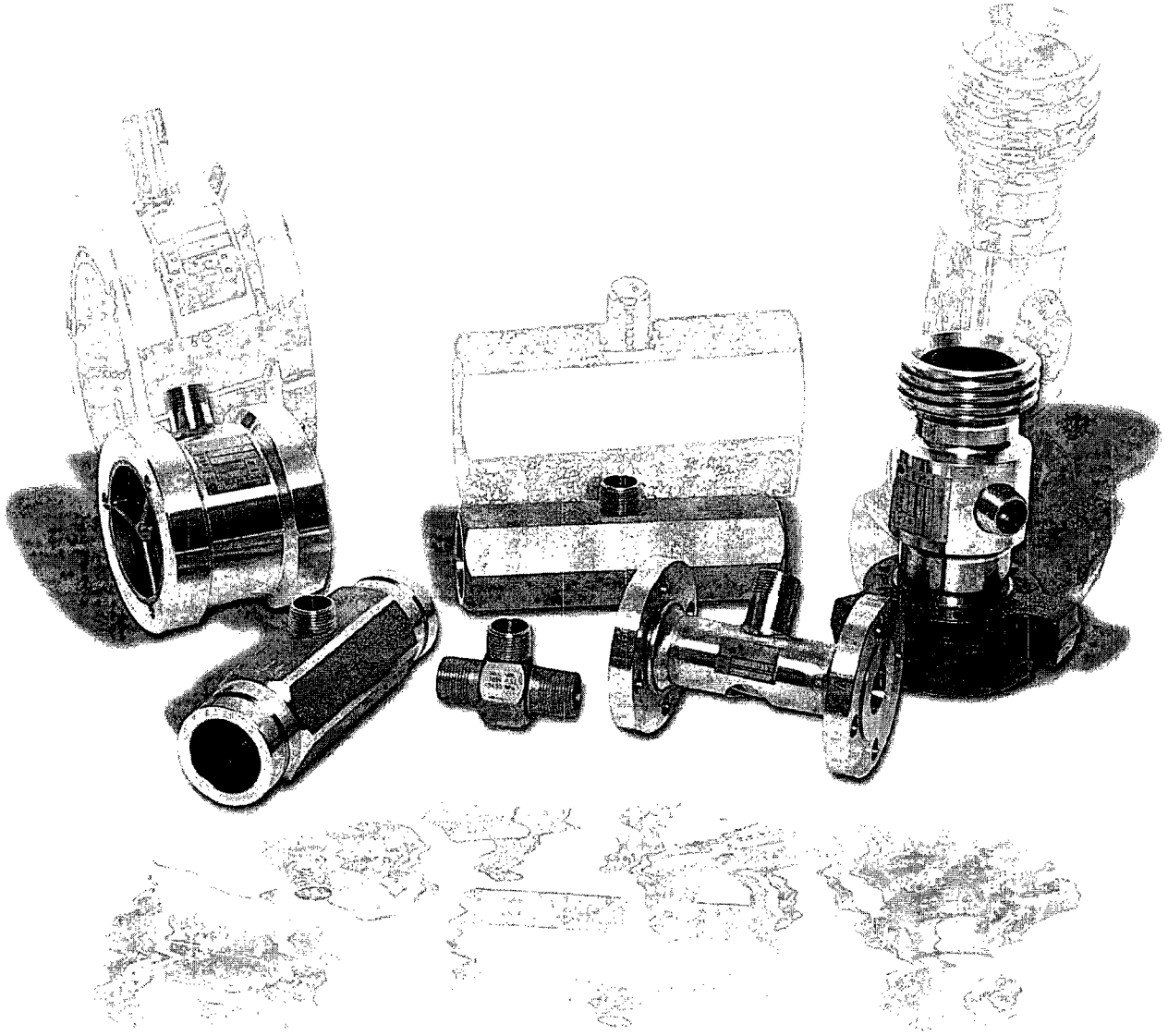
Carolyn Haynie
PE Technical Assistant

Enclosure
cc: NMOCD – Hobbs District 2

NUFLO™

Liquid Turbine Flowmeters

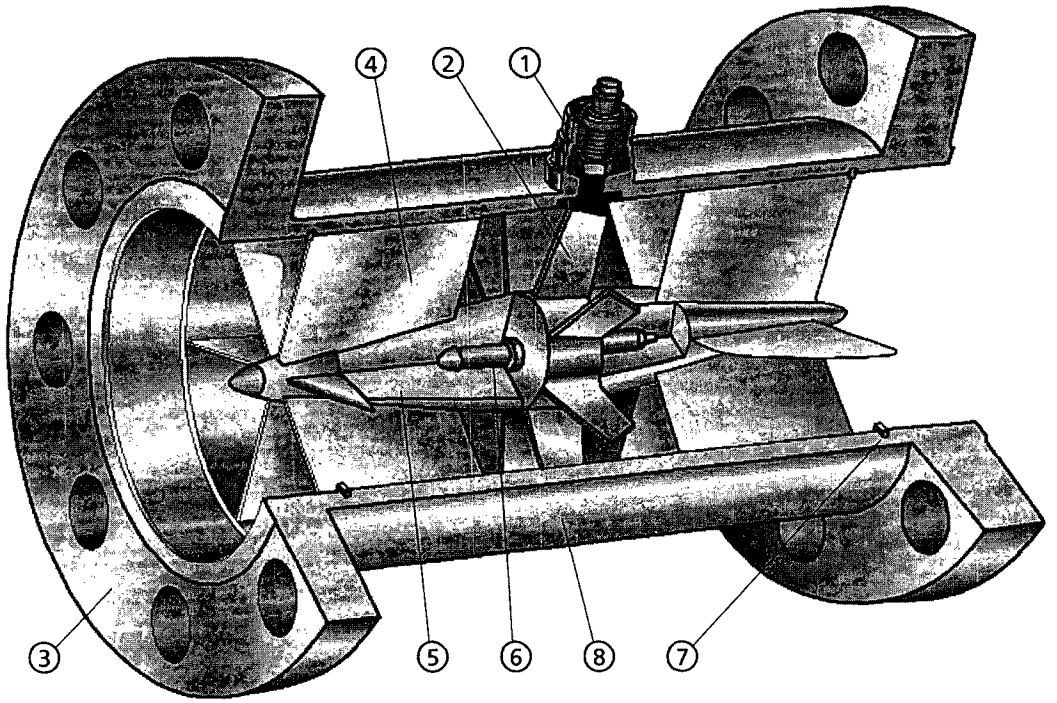
Accurate Flow Measurement



NuFlo developed its first flowmeter for oilfield applications in 1957. The meter incorporated a tungsten-carbide shaft and bearing to withstand the rugged conditions of the oilfield environment. Over the years, this flowmeter has built an unsurpassed reputation for withstanding severe punishment while maintaining operational and measurement integrity.

NuFlo turbine flowmeters indicate flow rate and measure total throughput of a liquid line. As liquid flows through the meter and over the rotor, the rotor turns at a speed that is directly proportional to the flow rate. A magnetic pickup senses the rotor blades as they pass and generates an electrical (sine wave) signal. These electrical pulses are then transmitted to the flow measurement readout equipment.

First Class Design Delivers First Class Performance



1. Permanent conduit connection is standard.
2. ROTOR is pitched and pre-calibrated to determine accuracy.
3. END CONNECTIONS available, flanged or threaded, standard or special.
4. FLOW VANES increase performance at low rates.
5. FLOW VANE HUB supports rotor assembly.
6. ROTOR SHAFT, BEARINGS, AND THRUST BALL are made of tungsten carbide for long service without lubrication other than by the liquid being measured.
7. RETAINING RINGS make disassembly easy.
8. FLOWMETER BODY is sturdy, one-piece construction, precision finished.

Applications

NuFlo offers turbine flowmeters in a variety of end connections and accuracy levels. Typical applications are:

- Water-injection measurement
- Heater treaters
- Test and production separators
- Disposal wells
- CO2 injection
- Steam generator fuel and feed water
- Metering liquid fertilizer
- Water, fuel, and chemical measurement in plant settings
- Chemical tank loading and unloading
- Measuring liquid propane
- Insitu mining and leaching

Accuracy

NuFlo meters are classified as Standard Grade and Industrial Grade, based on the linearity of the meter. The Standard Grade meter provides a cost-effective measurement solution for applications where higher accuracy is not required. For higher accuracy applications, an Industrial Grade meter can be used. Such meters can achieve even greater accuracy if the range of the flow through the meter is specified.

Meter Grade	Linearity	Repeatability
Standard*	± 1% of reading	± 0.05%
Industrial*	± 0.5% of reading	± 0.02%
Enhanced accuracy	Consult factory	Consult factory

* For 3/8 in. meters, linearity is ± 2% of reading (standard) and ± 1% of reading (industrial).

Temperature Range (magnetic pickup)

Temperature Range			Flowmeter Size
Standard	-67 to 225°F	-55 to 107°C	3/8 in. through 3/4 in.
Standard	-67 to 250°F	-55 to 121°C	7/8 in. through 8 in.
Medium	-67 to 450°F	-55 to 232°C	all sizes

Note: Consult NuFlo Measurement Systems for any use of turbine flowmeters above 450°F (232°C).

Compliances

- CSA Certified Hazardous Locations Class I, Group A,B,C,D, Div. 1
- NACE MR01-75 (NACE traceability available on pressure containing components - on request)
- EZ-IN® meters and 1502 WECO® union meters available with CE mark for Pressure Equipment Directive (PED, 97/23/EC)

Materials of Construction

- Meter Body & Vanes — Grade 316L stainless steel
- Rotor — CD-4MCu
- Shaft & Bearings — Tungsten Carbide

Optional Materials

- Shaft — Binderless carbide for enhanced corrosion resistance to selected chemicals
- Shaft & Bearings — Silver brazing to withstand temperatures to 550°F and chemicals that attack epoxy bonding bearing materials
- Rotor — Nickel plating for enhanced corrosion resistance to selected chemicals (especially acids that corrode ferrous materials)

Benefits

- More accurate and repeatable measurement
- An economical solution for turbine flowmeter applications
- Easy installation and a variety of end connections
- Minimum maintenance required
- Long service life even in severe applications

Meter Size Selection

Flowmeter size selection should be based on the instantaneous flow rate of the line into which the meter will be mounted. Meter size should never be based on the nominal piping size of the installation. Refer to Linear Flow Range Chart for meter size selection. The meter will remain accurate at flow rates higher than its rating, but bearing wear and pressure drop across the meter can shorten the life span of the meter. NuFlo flowmeters can be over-ranged by 10% for short periods without damage.

Installation

- The meter should be installed with the arrow on the meter body corresponding to flow direction of the line.
- A 10-diameter length of straight unrestricted pipe must be upstream and a 5-diameter length of straight unrestricted pipe must be downstream of the flowmeter. Both pipe sections should be the same nominal pipe size as the flowmeter's end connection.
- Throttling/Control valves should be located downstream of the flowmeter.

Linear Flow Range [1, 2, 3]

Flow-meter size (3)	mm	GPM	m³/HR	BPD	Nominal (2) Calibration Factor		Maximum Output Frequency (Pulses/Sec)	ΔP at Maximum Flow (2)	
					Pulses Gallon	Pulses x 1000/m³		psi	kPa
3/8	10	0.3 - 3	0.068 - 0.68	10 - 100	22000	(5812)	1100	4.0	28
1/2	13	0.75 - 7.5	0.17 - 1.70	25 - 250	14500	(3830)	1815	12.0	83
3/4	19	2 - 15	0.45 - 3.41	68 - 515	2950	(780)	740	18.0	124
7/8	22	3 - 30	0.68 - 6.81	100 - 1000	2350	(621)	1175	20.0	138
1	25	5 - 50	1.14 - 11.36	170 - 1700	900	(238)	750	20.0	138
1-1/2	38	15 - 180	3.41 - 40.88	515 - 6000	325	(86)	975	16.0	110
2	51	40 - 400	9.09 - 90.85	1300 - 13000	55	(14.5)	365	22.0	152
3	76	80 - 800	18.16 - 181.66	2750 - 27500	57	(15.2)	760	20.0	138
4	102	100 - 1200	22.71 - 272.55	3400 - 41000	30	(7.9)	600	10.0	69
6	152	250 - 2500	56.78 - 567.82	8600 - 86000	7	(1.8)	290	10.0	6
8	203	350 - 3500	79.49 - 794.94	12000 - 120000	3	(.8)	175	6.0	41

1. The linear flow range of liquids with non-lubricating characteristics is limited to the upper 60% of rating.
2. Based on water.
3. Consult NuFlo Measurement Systems for engineering assistance with applications involving liquids of viscosities greater than 5 centistokes on 3/8-in. through 3/4-in. meters.

Conduit Thread Data

Temperature Rating	250°F (121°C)	450°F (232°C)
Thread Size	1" NPT	1" NPT

Note: Consult NuFlo Measurement Systems for any use of turbine flowmeters above 450°F (232°C).

End Connections

NuFlo flowmeters are available in a variety of end connections:

- threaded
- grooved
- flanged
- EZ-IN®
- WECO® 1502

Threaded (NPT) End Connection

- Threaded meter sizes range from 3/8-in. to 2-in.
- Meter sizes from 3/8-in. to 1-in. pipe all have 1-in. NPT end connections to simplify meter size changes.
- All meter sizes other than the 2-in. have male threads.

Flowmeter Size x End Connection Size	Length in.	Length mm	Working Pressure psi	Working Pressure MPa
3/8 x 1 in.	4.0	102	7500	51.71
1/2 x 1 in.	4.0	102	7500	51.71
3/4 x 1 in.	4.0	102	7500	51.71
7/8 x 1 in.	4.0	102	5000	34.48
1 x 1 in.	4.0	102	5000	34.48
1-1/2 x 1-1/2 in.	6.0	152	5000	34.48
2 x 2 in.	10.0	254	5000	34.48

Flanged End Connection

Turbine flowmeters with flanged end connections are available in both raised-face (RF) models and ring-type joint (RTJ) models. Flanged materials can be carbon steel or stainless steel. All flanged NuFlo meters are equipped with slip-on flanges, which are then welded to the outside of the meter rather than being welded to the end of the meter body. Thus, the flange never comes into contact with the fluid being measured.

Flowmeter Size x End Connection Size	Length in.	Length mm
3/8 x 1/2 in.*	5.0	127.0
1/2 x 1/2 in.*	5.0	127.0
3/4 x 3/4 in.*	5.0	127.0
7/8 x 1 in.	6.0	152.4
1 x 1 in.	6.0	152.4
1-1/2 x 1-1/2 in.	7.0	177.8
2 x 2 in.	8.5	215.9
3 x 3 in.**	10.0	254.0
4 x 4 in.	12.0	304.8
6 x 6 in.***	12.0	304.8
8 x 8 in.***	12.0	304.8

* 3/8 in. through 3/4 in. 900#, 1500#, 2500# is 6-1/4 in. (158.8 mm)

** 3 in. 2500# is 12 in. (304.8 mm)

*** 6 in. and 8 in. 2500# is 14 in (355.6 mm)

ANSI B16.5 Pressure Rating

CS = Carbon Steel SS = Stainless Steel

Flange Classification	150 #		300 #		600 #		900 #		1500 #		2500 #	
Flange Material	CS	SS	CS	SS	CS	SS	CS	SS	CS	SS	CS	SS

Design-Operating Temperature Range

-20 to 100° F (28.8 to 37.7° C)	Max Working Pressure	psi	285	275	740	720	1480	1440	2220	2160	3705	3600	6170	6000
		mPa	1.96	1.89	5.10	4.96	10.2	9.92	15.3	14.9	25.5	24.8	42.5	41.3
-20 to 200° F (28.8 to 93.3° C)	Max Working Pressure	psi	260	235	675	620	1350	1240	2025	1860	3375	3095	5625	5160
		mPa	1.79	1.62	4.65	4.27	9.31	8.54	13.9	12.8	23.2	21.3	38.8	35.5
-20 to 400° F (-28.8 to 204.4° C)	Max Working Pressure	psi	200	195	635	515	1270	1030	1900	1540	3170	2570	5280	4280
		mPa	1.38	1.34	4.38	3.55	8.76	7.09	13.1	10.6	21.8	17.7	36.4	29.5
-20 to 600° F (-28.8 to 315.5° C)	Max Working Pressure	psi	140	140	550	450	1095	900	1640	1355	2735	2255	4560	3760
		mPa	0.96	0.96	3.79	3.10	7.55	6.20	11.3	9.34	18.8	15.5	31.4	25.9

Test Pressure: 1.5 times maximum working pressure at -20 to 100° F (28.8 to 37.7° C)

Grooved End Connection

Flowmeters with grooved end connections are available in 7/8-in. through 8-in. sizes.

Flowmeter Size x End Connection Size	Length		Working Pressure	
	in.	mm	psi	MPa
7/8 x 1 in.	4.0	102	1000	6.9
1 x 1 in.	4.0	102	1000	6.9
1-1/2 x 1-1/2 in.	6.0	152	1000	6.9
1-1/2 x 2 in.	6.0	152	1000	17.2
2 x 2-1/2 in.	10.0	254	1000	17.2
3 x 3 in.	12.5	318	1000	6.9
4 x 4 in.	12.0	305	1000	6.9
6 x 6 in.	12.0	305	800	5.5
8 x 8 in.	12.0	305	800	5.5

WECO® 1502 Union End Connection

Flowmeters with 1502 end connections are commonly used in high-pressure oilwell service applications. Meter sizes 1", 11/2" and 2" have 2" union end connections, and 3" meters have 3" union end connections. All 1502 union end meters have two pickup adapters.

Flowmeter Size x End Connection Size	Length		Working Pressure	
	in.	mm	psi	MPa
1 x 2 in.	8.00	203.3	15000	103
1-1/2 x 2 in.	8.60	218.4	15000	103
2 x 2 in.	9.00	228.6	15000	103
3 x 3 in.	13.0	330.2	15000	103

WECO® is a federally registered trademark of FMC Technologies, Inc.

Specialized Flowmeters

- High-pressure
- Nitrogen
- CO_2
- Cement-slurry
- Corrosive-service
- Drilling fluids

Contact NuFlo Measurement Systems for application assistance.

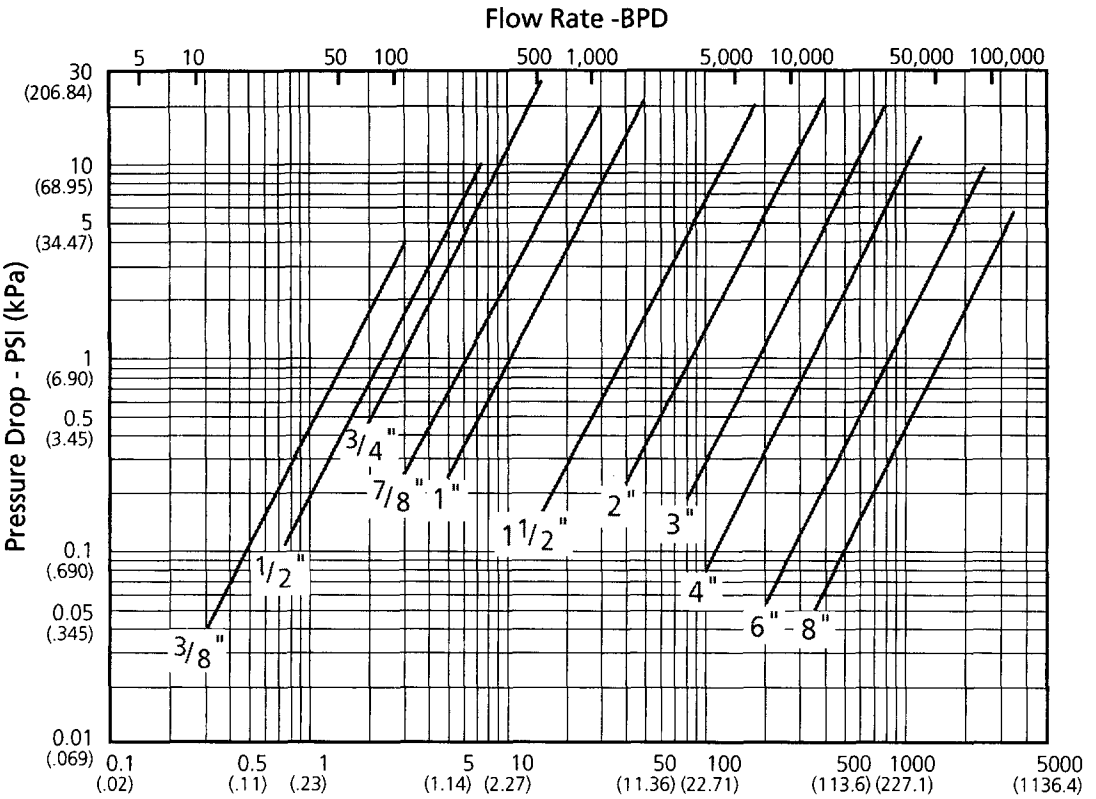
EZ-IN® End Connection

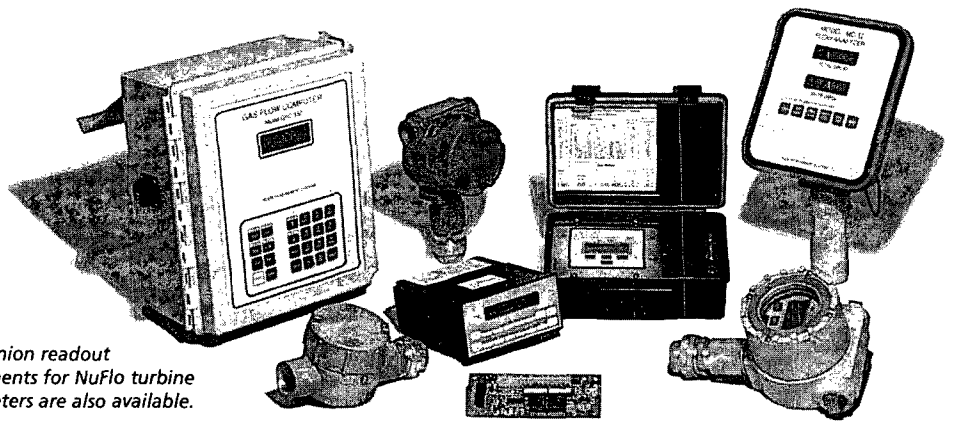
Series BF turbine flowmeters with EZ-IN connections provide a cost-effective alternative to typical flanged-meter applications. Series BF meters with EZ-IN connections offer the accuracy, rugged construction, and maintenance-free operation of conventional NuFlo flowmeters plus the following advantages:

- Lower installation cost.
- Less expensive than a conventional, flanged meter.
- Spreader nuts enable easy removal and inspection.
- The raised-face EZ-IN meter will mate to any flange rated ANSI 150# to 1500#. The ring-joint (RTJ) version will mate to ANSI 900#, 1500# or 2500# RTJ flange. Specify flange type when ordering.
- CE-marked 8 x 8-in. EZ-IN RF requires special centering rings.

Flowmeter Size x End Connection Size	Raised Face Flange Lengths, in. (mm)					
	1 in.	2 in.	3 in.	4 in.	6 in.	8 in.
3/8 x 1 in.	4.0 (102)	—	—	—	—	—
3/8 x 2 in.	—	2.5 (63.5)	—	—	—	—
1/2 x 1 in.	4.0 (102)	—	—	—	—	—
1/2 x 2 in.	—	2.5 (63.5)	—	—	—	—
3/4 x 1 in.	4.0 (102)	—	—	—	—	—
3/4 x 2 in.	—	2.5 (63.5)	—	—	—	—
7/8 x 1 in.	4.0 (102)	—	—	—	—	—
7/8 x 2 in.	—	2.5 (63.5)	—	—	—	—
1 x 1 in.	4.0 (102)	—	—	—	—	—
1 x 2 in.	—	2.5 (63.5)	—	—	—	—
1-1/2 x 2 in.	—	2.5 (63.5)	—	—	—	—
2 x 2 in.	—	2.5 (63.5)	—	—	—	—
3 x 3 in.	—	—	4.25 (108)	—	—	—
4 x 4 in.	—	—	—	5.0 (127)	—	—
6 x 6 in.	—	—	—	—	5.75 (146.1)	—
8 x 8 in.	—	—	—	—	—	6.25 (158.8)
	Ring Joint Flange Lengths, in. (mm)					
1 x 2 in.	—	3.5 (88.9)	—	—	—	—
1-1/2 x 2 in.	—	3.5 (88.9)	—	—	—	—
2 x 2 in.	—	3.5 (88.9)	—	—	—	—
3 x 3 in.	—	—	4.25 (108)	—	—	—
4 x 4 in.	—	—	—	5.0 (127)	—	—
6 x 6 in.	—	—	—	—	5.75 (146.1)	—
8 x 8 in.	—	—	—	—	—	6.25 (158.8)

Pressure Drop Curve for NuFlo Turbine Flowmeters





Companion readout instruments for NuFlo turbine flowmeters are also available.

MEASUREMENT SYSTEMS

Formerly: NuFlo Measurement Systems • Barton Instrument Systems • Caldon, Inc.

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