

From: [McClure, Dean, EMNRD](#)
To: [Schenkel, Beth V](#); [Leung, Steven A](#); [Wrinkle, Justin, EMNRD](#)
Cc: [Montgomery, Kelley A](#); [Wallace, Tiffany A](#); [Prater, Ryan D](#); [Rikala, Ward, EMNRD](#); [Kurkiewicz, Ty J](#); [Ludena, Jose](#); [Garcia, John, EMNRD](#); [Clelland, Sarah, EMNRD](#); [Engineer, OCD, EMNRD](#); [Musallam, Sandra C](#)
Subject: Approval of Oxy's proposal to use MPFM; SCM-900
Date: Tuesday, November 4, 2025 9:10:31 AM
Attachments: [SCM-900_Oxy MPFM approval.pdf](#)
[image001.png](#)
[image002.png](#)

Beth,

The Division has approved Oxy's request to use MPFM within its commingling projects. Please review the conditions of that approval carefully and if you have any questions, feel free to reach out to Justin Wrinkle and CC Dean McClure provided that Sarah Clelland shall be included if the question is related to surface commingling applications.

Dean McClure

Petroleum Engineer, Oil Conservation Division

New Mexico Energy, Minerals and Natural Resources Department

(505) 469-8211

From: Schenkel, Beth V <Beth_Schenkel@oxy.com>
Sent: Wednesday, October 22, 2025 11:08 AM
To: McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>; Leung, Steven A <Steven_Leung@oxy.com>; Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_wallace@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD <JohnA.Garcia@emnrd.nm.gov>
Subject: RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

Dean and Justin,

Thank you for your thoughtful consideration and approval. It's the culmination of years of trials, data collecting, and communication.

We appreciate your patience as we worked through the details, and I believe use of this technology will greatly benefit New Mexico.

Oxy looks forward to the Division's further guidance with finalized approval.

Thanks,

Beth Schenkel

REGULATORY DIRECTOR, PERMIAN AND LCV

Office: 713.497.2055 | Mobile: 713.557.4141

From: McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>
Sent: Wednesday, October 22, 2025 10:31 AM
To: Leung, Steven A <Steven_Leung@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>;
Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A
<tiffany_wallace@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J
<Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD
<JohnA.Garcia@emnrd.nm.gov>
Subject: RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

**WARNING - This message is from an EXTERNAL SENDER - be
CAUTIOUS, particularly with links and attachments.**

Steven,

The Division is satisfied with the data and information that Oxy has provided in its proposal to use multi-phase flow meters (MPFM) in lieu of separators in its surface commingling projects and is working to finalize its approval. The Division will reach out with further guidance as necessary and with approval once it has been finalized.

The conditions of approval may be altered within the final approval, but the current version of them is as follows:

- To utilize MPFM in a surface commingling project as an alternative allocation method pursuant to 19.15.12.10 B.(1)(e) NMAC or 19.15.12.10 C.(1) NMAC, Oxy shall include within its application:
 - a detailed description of the MPFM and its purpose such that a layman will understand; and
 - a reference to this approval using its designation as [SCM NUMBER].
- Additional well tests shall be required as stipulated in the commingling order if:
 - the working, royalty, and overriding royalty interest in the production included in the surface commingling project is diverse as defined in 19.15.12.7 A. NMAC; and
 - any allocation is determined via well test.
- Any MPFM used for allocation shall:
 - belong to the Agar MPFM-50 line of meters;
 - include a Fluidic Flow Diverter (FFD); and
 - be appropriately sized.
- Oxy shall maintain each MPFM used for allocation in accordance with Agar's recommended maintenance schedule as provided to the Division with Oxy's proposal, or

in accordance with 19.15.12.10 C. NMAC, whichever is more frequent. Should Agar's recommended maintenance schedule change, then no later than 60 days after such occurrence, Oxy shall provide the Division with that updated maintenance schedule and await the Division's approval prior to adjusting its maintenance schedule including any modifications the Division may include.

- Oxy shall install, maintain, and monitor a SCADA system to:
 - gather and maintain production data;
 - conduct checks and comparisons to prior tests as described in the business checks included in Oxy's proposal to flag tests for review by a technician;
 - conduct comparisons of the recorded gas-oil-ratio (GOR) and water cut to prior tests and flag tests for review by a technician if the either result indicates a change of more than 5% from the prior test;
 - be used by a technician to determine if a test was bad as described in Oxy's proposal; and
 - be used to determine if maintenance, in addition to the maintenance schedule, is required.
- Should additional information or techniques become available to better determine if a test is bad or additional maintenance is required, Oxy shall provide a description of such to the Division and if changes to its procedures are warranted or desired, await approval from the Division before making such modifications to its procedures.
- Oxy shall maintain and provide to the Division upon its request:
 - individual test data for each production test for at least 1 year; and
 - all calibration and maintenance details for at least 3 years.
- If necessary, corrections and adjustments to allocation shall be done in accordance with 19.15.12.10 C.(2)(c) NMAC except that Oxy shall use its gathered data to determine a date to correct production for in lieu of using the last half of the period elapsed since the last calibration date.

Please feel free to reach out to Justin Wrinkle and copy Dean McClure should you have any questions.

Dean McClure

Petroleum Engineer, Oil Conservation Division

New Mexico Energy, Minerals and Natural Resources Department

(505) 469-8211

From: Leung, Steven A <Steven_Leung@oxy.com>

Sent: Monday, October 20, 2025 7:52 AM

To: Schenkel, Beth V <Beth_Schenkel@oxy.com>; Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_wallace@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD <JohnA.Garcia@emnrd.nm.gov>

Subject: Re: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

Good morning, adding to Beth's email:

We received the FFD details from Agar on Friday. Please see attached.

Thanks,

Steven

STEVEN LEUNG

Oxy Regulatory Engineer

Office: 713.497.2503

From: Schenkel, Beth V <Beth_Schenkel@oxy.com>

Sent: Thursday, October 16, 2025 2:35 PM

To: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>; Leung, Steven A <Steven_Leung@oxy.com>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_wallace@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD <JohnA.Garcia@emnrd.nm.gov>

Subject: RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

Justin,

Thanks for the quick response. Please see **my responses below**.

Please note that on your third question regarding the FFD, we are still waiting on information from the manufacturer. Please let me know if what I have provided below is sufficient, and if not, I'll get you additional information as soon as possible.

Feel free to give me a call if you have any questions.

Thanks,

Beth Schenkel

Regulatory director, permian and lcv

Office: 713.497.2055 | Mobile: 713.557.4141

From: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>**Sent:** Tuesday, October 14, 2025 3:01 PM**To:** Schenkel, Beth V <Beth_Schenkel@oxy.com>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>; Leung, Steven A <Steven_Leung@oxy.com>**Cc:** Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_wallace@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD <JohnA.Garcia@emnrd.nm.gov>**Subject:** RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

WARNING - This message is from an EXTERNAL SENDER - be CAUTIOUS, particularly with links and attachments.

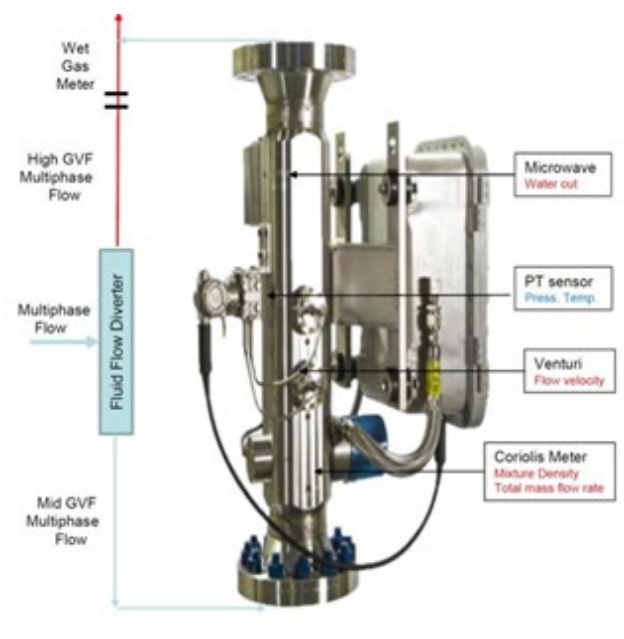
Beth,

Thanks for the clarification. Hopefully these questions can be answered without much effort. The division is interested in timeframes for issues to remedy, to ensure there is enough time for required testing schedules.

1. Is there any “real time” flagging that a meter has an issue or is the “after a test is complete analysis” the only indicator of an issue? **There are real-time alarms set up on the MPFM to alert (creates call out to) Operations and the Measurement team that one of the meters or associated devices is having an issue. I’m reattaching the alarm list for reference.**
2. If there is no real time flag, what is the turnaround that a competent analysis is

performed on said meter/well and is the meter taken out of service until it can be recalibrated/repared? Once Operations and Measurement troubleshoots the alarm(s), the solution time may vary depending on the cause of the alarm(s). If there is an issue with the MPFM equipment, it is removed from service until repaired. The manufacturer has local personnel that will respond within one day and keep components on hand for expedient repair. If a unit must be taken out of service, it will not impact the required frequency of well tests as Oxy has spare MPFMs that can be deployed if necessary. This philosophy is consistent with well tests being conducted with test separators.

3. Can you also share/ re-share any literature on the “Fluidic Flow Divertor (FFD)”? Please see diagram below, which shows the FFD on the inlet stream to the MPFM. This FFD provides partial separation of the production stream, dividing it into a mostly liquid stream and a mostly gas stream. The mostly liquid stream is measured by Coriolis, venturi, and microwave meters. The mostly gas stream is measured by an orifice and a liquid cut meter. Additional information from the manufacturer is pending. Please let me know if this information is sufficient.



- “Oxy is drafting additional business checks that involve a comparison of GOR and water cut to prior tests; what percentage threshold does Oxy feel is suitable for those checks? Please provide the Division with an amended copy of the business checks document which includes the GOR and water cut checks. These business checks are performed on all well tests, regardless of technology/meter(s) used to obtain the well test. This is the

same process used to review current well tests obtained by test separators. Any thresholds in the business checks are founded by analysis of historical data and are well-specific (dependent on type curve, lift mechanism, stage of life, etc.). “

- The Division is referring to the highlighted portion of the communication with Steven below

From Oxy's Production Analytics team: The business checks are being tailored to better fit the reservoir, recovery method, and past performance of each well, rather than a “one size fits all” percentage deviation in the checks. The default “Within Percent Threshold” is $\pm 5\%$ volume of each O/G/W stream from the last valid test. This inherently validates the GOR and WOR. The updated specific GOR and WOR checks are being worked into the validation logic beginning this month – it requires working extensively with the software developer. This exercise is being performed across Oxy's wells in all regions regardless of well test technology.

Once the division has an idea of the above we can move forward.

From: Schenkel, Beth V <Beth_Schenkel@oxy.com>

Sent: Tuesday, October 14, 2025 12:18 PM

To: McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>; Leung, Steven A <Steven_Leung@oxy.com>; Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_wallace@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD <JohnA.Garcia@emnrd.nm.gov>

Subject: RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

Hi Dean,

I hope you're doing well. Please see my responses below. Hopefully my email will get this approval over the finish line.

I want to emphasize that Oxy engineers have developed our well testing validation process to ensure

accurate and consistent well testing across Oxy's assets, which is independent of well testing technology.

Thanks,

Beth Schenkel

Regulatory director, permian and lcv

Office: 713.497.2055 | Mobile: 713.557.4141

From: McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>
Sent: Wednesday, October 8, 2025 3:53 PM
To: Leung, Steven A <Steven_Leung@oxy.com>; Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_polak@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Garcia, John, EMNRD <JohnA.Garcia@emnrd.nm.gov>; Schenkel, Beth V <Beth_Schenkel@oxy.com>
Subject: RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

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Steven,

Just a couple more clarifications the Division needs before moving forward.

- The Division wishes to ensure that an issue with a meter or sensor is identified and, if necessary, repaired or taken out of service as soon as possible. Does Oxy have a mechanism in place for a speedy response? If not, what is the typical delay after the well test has concluded that it is reviewed by a well analyst and the meter is repaired/calibrated ? **When an issue is identified with an MPFM, the manufacturer has**

local personnel that will respond within one day.

- Oxy is drafting additional business checks that involve a comparison of GOR and water cut to prior tests; what percentage threshold does Oxy feel is suitable for those checks? Please provide the Division with an amended copy of the business checks document which includes the GOR and water cut checks. **These business checks are performed on all well tests, regardless of technology/meter(s) used to obtain the well test. This is the same process used to review current well tests obtained by test separators. Any thresholds in the business checks are founded by analysis of historical data and are well-specific (dependent on type curve, lift mechanism, stage of life, etc.).**
- To better understand how an analyst deems a test is “bad” can you provide feedback to the following scenario?
 - If a rate change of greater than 5% occurs which causes the test to be reviewed by a well analyst; is it accurate to say that the well analyst would deem the test bad unless the change is explainable due to a change in operating conditions? If so, and the greater than 5% change cannot be explained by a change in operating conditions; how does Oxy confirm that the greater than 5% change is accurate? Would the answers to these questions apply to a change in GOR and water cut as well? **Again, this is the same process used for all wells that are well tested, regardless of technology/meter(s). If a well has a substantial change in well test that can't be obviously explained, the well is retested to ensure accuracy. One benefit of well testing with an MPFM is we can obtain more granular data throughout the duration of the well test to better identify outliers or events impacting production.**
- Please provide additional material that describes the optional high gas and low liquid subsystems. Do these subsystems include the addition of an optional 2 phase separator and orifice plate for gas measurement? **Per the manufacturer: There is not an additional 2 phase separator – the Fluidic Flow Divertor (FFD) is used to knockout a portion of the gas (on a wet gas stream) and measure it using a combined system, which includes a wetness detector with an Orifice plate.**

I have an additional topic that is unrelated to the Division's current review, but which it would be helpful to have a better understanding of for future reviews. What method is being used by

this MPFM to determine the water cut of the liquid phase? For example, is it being done via conductance, gamma-ray (assuming not since there is no nuclear), spectrology, ultrasonic, ect.? Agar asserts that its meter is unaffected by changes in water salinity; is this due to the type of water cut meter used or because it uses a combination of results from the water cut meter and Coriolis meter, or for another reason?

Per the manufacturer: Agar water cut meter is based on microwave absorption technology. It consists of a transmitter, which sends a 2.45 GHz signal, and 2 receivers, one placed closer to the transmitter than the other. As the microwave signal from the transmitter passes through the multiphase fluid mixture and arrives at the 2 receivers, there is both a phase change and amplitude attenuation of the signal. The amplitude attenuation of the signal is proportional to the salinity, and the signal phase change is proportional to water cut. Agar water cut meter measures signal amplitude attenuation, signal phase change, and the continuity of the media in real time (multiple measurements per second) and uses the amplitude attenuation to compensate for the effect of salinity on phase and therefore the water cut.

Dean McClure

Petroleum Engineer, Oil Conservation Division

New Mexico Energy, Minerals and Natural Resources Department

(505) 469-8211

From: Leung, Steven A <Steven_Leung@oxy.com>

Sent: Wednesday, October 8, 2025 12:06 PM

To: McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>; Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; tiffany_polak@oxy.com; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>

Subject: Re: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

Thanks for the follow up questions Dean. Please see my replies below in blue.

- Within the “Recommended Maintenance Schedule”, there are several checks included. Please provide additional clarity regarding what each of the following checks consist of:
 - PAMS Calibration Check
 - The Phase and Amplitutde Measurement System (PAMS) check validates the

water cut meter readings by:

- Verifying that the long amplitude is more negative than the short amplitude
 - Confirming that the ID sensor reading is within range
 - Ensuring that the water cut reading is accurate in a no-flow condition
- Static Readings Check
 - This check validates pressure transducers all read zero with no flow.
- Self-verification Check
 - The self verification check confirms the accuracy of all primary MPFM instrumentation by circulating liquid through the MPFM. These instruments include:
 - Coriolis meter, water cut meter, low and high range transmitters
 - The AGAR software calculates the permissible tolerances and generates the test results based on the instrument readings.
- Within the “Business Rule Checks”, there are a number of checks listed which will potentially flag the test to be manually reviewed by a well analyst. Please provide additional clarity regarding this process per the questions below:
 - Do these checks only occur once the test has concluded, or are there any flags that will cause an immediate reaction by an operator?
 - All the checks only happen once a test is completed. This allows the business checks to trend a full set of data points.
 - If a well analyst determines that the test is bad, then what occurs?
 - If they determine it is bad, the analyst will apply a validation code that indicates the test is “Bad”. The record still exists but isn’t used for anything other than record keeping.
 - Depending on the test schedule, the well with the bad test will either go right back into test or is queued for the next test, if there is another well currently in test.
 - There appears to be checks which compare the rates to the prior test, “Within Percent Threshold”. Does this check compare the rate of all phases to their prior rate; such as oil to oil, gas to gas, and water to water?
 - The check occurs independently for each fluid stream. The check only “passes” if all the streams meet the condition relative to the volume of that same stream used for comparison from the last test.
 - For example, if oil and water are within threshold but gas is not, then the check has “failed” and will not get marked as a good test based off that check.
 - Are there any comparisons being conducted to compare the current GOR or water cut to a prior test or is this only potentially being considered by the “Within Percent Threshold” check?
 - We are in the process of modifying the logic to include GOR and WOR as specific

checks. The other checks that occur in the validation logic indirectly consider changes in the ratios since each stream is getting evaluated independently.

- Within the provided material regarding the “MPFM Compact Standard In-Line” series of meters, there is reference to “Optional subsystems” which are available for “extreme high gas/or low liquid flow ranges”.
 - Is oxy utilizing an optional subsystem? Does it plan to?
 - Yes, Oxy uses the optional subsystems for both high gas and low liquid ranges.

Please let me know if there are any other questions.

Thanks,

Steven

STEVEN LEUNG

Oxy Regulatory Engineer

Office: 713.497.2503

From: McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>

Sent: Wednesday, October 1, 2025 4:29 PM

To: Leung, Steven A <Steven_Leung@oxy.com>; Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_polak@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>

Subject: RE: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

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Steven,

- Within the “Recommended Maintenance Schedule”, there are several checks included. Please provide additional clarity regarding what each of the following checks consist of:

- PAMS Calibration Check
- Static Readings Check
- Self-verification Check
- Within the “Business Rule Checks”, there are a number of checks listed which will potentially flag the test to be manually reviewed by a well analyst. Please provide additional clarity regarding this process per the questions below:
 - Do these checks only occur once the test has concluded, or are there any flags that will cause an immediate reaction by an operator?
 - If a well analyst determines that the test is bad, then what occurs?
 - There appears to be checks which compare the rates to the prior test, “Within Percent Threshold”. Does this check compare the rate of all phases to their prior rate; such as oil to oil, gas to gas, and water to water?
 - Are there any comparisons being conducted to compare the current GOR or water cut to a prior test or is this only potentially being considered by the “Within Percent Threshold” check?
- Within the provided material regarding the “MPFM Compact Standard In-Line” series of meters, there is reference to “Optional subsystems” which are available for “extreme high gas/or low liquid flow ranges”.
 - Is oxy utilizing an optional subsystem? Does it plan to?

Dean McClure

Petroleum Engineer, Oil Conservation Division

New Mexico Energy, Minerals and Natural Resources Department

(505) 469-8211

From: Leung, Steven A <Steven_Leung@oxy.com>

Sent: Wednesday, September 17, 2025 7:46 AM

To: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; tiffany_polak@oxy.com; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>

Subject: [EXTERNAL] Re: Re: RE: OXY MPFM TRIAL // RESULTS

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Justin,

I've attached the documentation you requested to support approval of the Agar MPFM:

- Specification sheet (provided by AGAR)
- Maintenance schedule (provided by AGAR)
- Calibration and verification procedure (provided by AGAR)
 - Please note that Oxy completes the self-verification testing every 6 months, which exceeds AGAR's recommendation of annual testing.
- List of alarms operations will be monitoring for each test
- Oxy well test validation procedure using Nexus (used for both traditional test separators and MPFMs)

Our AGAR-trained operations staff have been using these maintenance plans/procedures, alarms, and allocation checks successfully at Oxy locations in Texas and will be using the same programs in New Mexico if approved.

Please let me know if you have any questions.

Thank you,

Steven

STEVEN LEUNG

Oxy Regulatory Engineer

Office: 713.497.2503

From: Leung, Steven A <Steven_Leung@oxy.com>
Sent: Monday, September 8, 2025 11:02 AM
To: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_polak@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>
Subject: Re: [EXTERNAL] Re: RE: OXY MPFM TRIAL // RESULTS

Justin,

Thank you for the reply and providing us with the next steps towards possible approval to use AGAR's MPFM in lieu of test separators. Our team will begin working on putting these details together for your review.

Appreciate your time and patience working with Oxy,

-Steven

From: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>
Sent: Monday, September 8, 2025 10:03 AM
To: Leung, Steven A <Steven_Leung@oxy.com>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_polak@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>
Subject: RE: [EXTERNAL] Re: RE: OXY MPFM TRIAL // RESULTS

Steven/All,

The Division is concluding its review of Oxy's proposal to utilize MPFM in lieu of separators. The data provided by several operators has indicated that MPFM has the potential to be relatively accurate provided that a careful monitoring, calibration, and maintenance program is maintained. Towards that end, provide additional information and documents as detailed below. Please be as thorough as possible in your preparation of the material.

- Documentation from the manufacturer of the MPFM including:
 - basic details regarding the MPFM product line that was used in the conducted tests of the sort that may be included in sales material circulated by the manufacturer (an example is attached); and
 - a breakdown of the MPFM manufacturer's recommended maintenance and calibration schedule (an example is attached).
- Statements from Oxy detailing how it intends to ensure that each MPFM remains accurate that should include such things as:
 - monitoring of data for each test received via SCADA and a very detailed description of how the details of each test will be examined to determine if additional calibration or maintenance is needed (attached is an example showing a drift in the operating point although further explanation was provided during a meeting);
 - monitoring of allocation totals and check/sales meters totals with details of how those will be used to identify potential problems; and
 - other methods that Oxy intends to use to ensure each MPFM remains accurate.

Once the above requests for information have been adequately provided, the Division will provide further guidance on how Oxy should submit for MPFM use in future commingles.

Attached are examples of:

- COA that may be imposed by the Division
- Basic details regarding the Schlumberger product line that was used by Civitas in its tests.
- A breakdown of Schlumberger's recommended maintenance and calibration schedule for its product line that was used by Civitas in its tests.
- An example of a drift in the operating point that indicated to Civitas that the MPFM needed to be checked to ensure it was calibrated correctly.

If you have any questions, please feel free to reach out.

From: Leung, Steven A <Steven_Leung@oxy.com>
Sent: Thursday, August 21, 2025 12:22 PM
To: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; tiffany_polak@oxy.com; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>
Subject: [EXTERNAL] Re: RE: OXY MPFM TRIAL // RESULTS

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Justin,

Thank you for your review - I apologize for the delay in getting back to you. Please see the attached revision 2 of our supplemental data that includes tank data.

We added a brief narrative that explains the tank comparison methodology and the graphs. Please let us know if you'd like to schedule some time to discuss the additional tank data.

As always, thank you for your time and consideration,

-Steven

From: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>
Sent: Monday, August 11, 2025 12:54 PM

To: Leung, Steven A <Steven_Leung@oxy.com>; McClure, Dean, EMNRD <Dean.McClure@emnrd.nm.gov>
Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Wallace, Tiffany A <tiffany_polak@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>
Subject: RE: [EXTERNAL] RE: OXY MPFM TRIAL // RESULTS

Steven,

A quick question that will help me review. Is the Cedar Canyon LACT a single well facility? If so, is it tankless? If the location is a single well facility and has storage tanks, the division will also need the total tank Oil stock at the time of meter data collection each day. Otherwise the division cannot review this data as a mission critical variable would be missing from the production accounting.

Please see **highlighted** text from guidance

Allocation via Multi-Phase Flow Meter

Summary

Data Gathering

The Division will require the Operator to gather data comparing allocations derived from MFPM to allocations determined by normal allocation methods. Provided that the Operator is using an already approved method to determine the actual allocation, it does not need approval from the Division to install MFPM into its facilities for the purpose of data collection only. When gathering data, the Operator should aim to produce as robust of a data set as possible to increase the likelihood of approval from the Division and decrease the likelihood of limiting the scope of that approval. An ideal data set will demonstrate that MFPM has an error of less than 5% for wells and operational practices that are representative of most wells and operations found within the Permian Basin.

Well Selection

An Operator should seek to include as wide a range of wells as possible which are

representative of wells typically encountered in the Permian Basin. At minimum, the following variables should be considered when selecting wells:

- Gas-Oil-Ratio (GOR)
- Water Cut
- Flow Rates
- Oil Composition (gravity)

Allocation Method used for Comparison

Two primary methods of comparison are commonly considered. However, an Operator should feel free to propose another methodology for consideration by the Division.

- All Comparisons
 - Volumes will be totaled at minimum every 12-hour period and at maximum every 72-hour period.
 - If a malfunction or outside influence causes a test period to be non-representative of a typical test, then that period may be excluded from consideration to determine the error associated with the MFPM for that well, but the Operator should provide the results and include the reason for its exclusion of that test in the computation
- Direct In-line Comparison
 - This is done by installing a MFPM in-line upstream of a separator at which the phases are separated and measured.
 - It is presumed that the conditions (temperature, pressure, etc.) is similar at both the MFPM and separator.
 - If the MFPM utilizes a form of separation such as separating most of the gas off prior to then measuring the liquid, it is presumed that the gas will be added back into the line and sent to the separator.
 - If the well is not continuously in test, then a test should at minimum be a 12-hour period after the vessel is stabilized.
 - It is presumed that the separator is of sufficient size to accurately measure each separated phase.
- Sales Volume Comparison
 - This is done by isolating a single well to its own facility or segregated portion of a facility and comparing the measurements from the MFPM to the sales totals from that well.
 - Volumes will still need to be totaled at maximum every 72-hour period, but ideally will be totaled every 24-hour period.
 - Stock on hand will need to be considered each time volumes are totaled. For

instance, if a tank has 10 more STB on hand at the end of a period than at the beginning, then that 10 STB should be added to the total sold via a LACT, etc.

- A shrinkage factor will need to be considered between the MFPM measurements and the sales totals, but this factor should be consistent across all tests for a well and facility.

19.15.12.10 B.(e) NMAC

Alternative methods. An operator may **determine production from each pool or lease to be commingled by other methods the division has specifically approved prior to commingling**. The division shall determine what evidence is necessary to support a request to use an alternative method.

-

19.15.12.10 C.(1) NMAC

Measurement and allocation methods. Where there is diversity of ownership between two or more leases, two or more pools or between different pools and leases, the division shall only permit surface commingling of production from the leases and pools if the operator accurately meters production from each of such pools or leases or **determines the production by other methods the division has specifically approved prior to commingling**.

From: Leung, Steven A <Steven_Leung@oxy.com>

Sent: Friday, August 8, 2025 7:10 AM

To: Wrinkle, Justin, EMNRD <Justin.Wrinkle@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; tiffany_polak@oxy.com; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>

Subject: [EXTERNAL] RE: OXY MPFM TRIAL // RESULTS

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Justin,

Thank you for your candid feedback regarding our Agar MPFM trial results we presented in June. Per your feedback, we've prepared additional data (attached) for your review that supports Oxy's request for approval to use the Agar MPFM in all ranges of allocation, including allocation of commingled production by well test of both identical and diverse ownership.

I also included the previous data results for easy reference.

Please let me know if you have any questions or would like me to schedule a follow up discussion.

Thank you Justin,

Steven

STEVEN LEUNG

Oxy Regulatory Engineer

Office: 713.497.2503

From: Leung, Steven A <Steven_Leung@oxy.com>

Sent: Tuesday, June 10, 2025 10:41 AM

To: Wrinkle, Justin, EMNRD <justin.wrinkle@emnrd.nm.gov>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Polak, Tiffany A <Tiffany_Polak@oxy.com>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Schenkel, Beth V <Beth_Schenkel@oxy.com>

Subject: OXY MPFM TRIAL // RESULTS

Justin,

Please see the attached results from the trial we proposed at our last meeting in April.

Supported by the data presented, Oxy is requesting approval for the Agar MPFM to be accepted in all applications in which conventional testers are currently approved, including allocation of commingled production by well test of both identical and diverse ownership.

Oxy appreciates NMOCD for their consideration of this proposal. Please let us know if you have any questions or would like a follow up discussion.

Thank you Justin,

Steven

STEVEN LEUNG

Oxy Regulatory Engineer

Office: 713.497.2503

From: Schenkel, Beth V <Beth_Schenkel@oxy.com>

Sent: Friday, April 11, 2025 7:24 AM

To: Wrinkle, Justin, EMNRD <justin.wrinkle@emnrd.nm.gov>; Prater, Ryan D <Ryan_Prater@oxy.com>; Kurkiewicz, Ty J <Ty_Kurkiewicz@oxy.com>; Ludena, Jose <Jose_Ludena@oxy.com>; Leung, Steven A <Steven_Leung@oxy.com>

Cc: Montgomery, Kelley A <Kelley_Montgomery@oxy.com>; Polak, Tiffany A <Tiffany_Polak@oxy.com>

Subject: OXY MPFM Trial Proposal

Justin,

Please see the attached trial proposal we plan to review next Tuesday.

Hope you've had safe travels this week. Have a good weekend!

Thanks,



Beth Schenkel

Regulatory Manager | Surface Commingling and Injection

O: 713.497.2055 | C: 713.557.4141

Beth_Schenkel@oxy.com

From: [Schenkel, Beth V](#)
To: [McClure, Dean, EMNRD](#); [Wrinkle, Justin, EMNRD](#)
Cc: [Kurkiewicz, Ty J](#); [Prater, Ryan D](#); [Ludena, Jose](#)
Subject: [EXTERNAL] Multiphase Flowmeter Follow Up
Date: Tuesday, January 10, 2023 8:32:45 AM
Attachments: [image001.png](#)
[Agar MPFM Slides for NMOCD.pdf](#)
[Agar Data for NMOCD.xlsx](#)
[SPE-201184-MS OGCL Trial.pdf](#)
[SPE-36594-MS Conoco and Amoco Trial.pdf](#)
[SPE-442 Impact of Backpressure on Gas Lift Wells.pdf](#)
[API MPMS20.5.pdf](#)

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Hi Dean and Justin,

Happy New Year! Hope you had a safe and restful holiday season. Thank you again for taking the time to call in for our presentation on the Agar multiphase flowmeters. We were encouraged by the discussion and look forward to receiving further direction.

As promised, attached are the following:

- **Presentation from 12/13/22**
- **Excel Database with All Data** – tabs in the workbook are as follows:
 - “Well Test Database” – Shows all data besides LACT unit location. Tests noted as “no” in column Z were rejected.
 - “Well Summary” – Summarizes well data from “Well Test Database” tab
 - “Meter Cumulative Data” – Rolls up all data from each meter
 - “LACT Location Data – MPFM-9” – Data from the LACT unit trial
 - “Phase Envelopes” – Shows the envelopes for each meter used in the trials
- **SPE-201184-MS OGCL Trial**
 - A 2019 Agar trial in Pakistan where MPFM oil, water, and gas readings across multiple wells were within 5% of a tester. The meter performed satisfactorily, was permanently deployed, and was gave OGCL confidence to use meters in future developments.
- **SPE-36594-MS Conoco and Amoco Trial**
 - A 1996 paper with Conoco and Amoco detailing the effectiveness of Agar’s inlet fluid flow diverter design in high GVF applications. The details of the paper agree with our findings, which show no correlation between meter accuracy and GVF/GOR. The inlet FFD places the Agar MPFM in a group called “partial-separation” devices. Many of the other MPFM’s on the market, including ones previously tested by Oxy, are/were not partial-separation devices. The Agar meter used in this trial 1996 was an older style that utilized a PD meter instead of a Coriolis.
- **SPE-442 – Evaluation of Surface Back Pressure for Continuous and Intermittent Gas Lift**
 - Test data that details production increases resulting from reduced surface back pressure. Concluding statements include “Production can be greatly increased by eliminating surface back-pressure and surface restrictions. A two or threefold increase is possible on high-productivity wells.”
- **API MPMS 20.5 - Recommended Practice for Application of Production Well Testing in**

Measurement and Allocation

- Establishes a framework to conduct and apply production well testing for well rate determination in measurement and allocation. This is the standard Texas relies on for well testing and allocation. Multiphase meters (including partial-separation MPFM's) are included as an acceptable method of conducting well tests.

Please let me know if you'd like to set up any further discussion or have any questions. We appreciate your consideration.

Thanks,



Beth Schenkel | Manager | Regulatory Compliance
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CONDITIONS

Action 522863

CONDITIONS

Operator: OXY USA INC P.O. Box 4294 Houston, TX 772104294	OGRID: 16696
	Action Number: 522863
	Action Type: [IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

CONDITIONS

Created By	Condition	Condition Date
dmcclure	Please review the content of the order to ensure you are familiar with the authorities granted and any conditions of approval. If you have any questions regarding this matter, please contact me.	11/4/2025