STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

6 November 1985

EXAMINER HEARING

IN THE MATTER OF:

Application of Benson-Montin-Greer Drilling Corporation for authority to conduct a long term Reservoir Pressure Study, Mancos Formation, Rio Arriba County, New Mexico.

CASES 8745

BEFORE: David Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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A. R. GREER

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MR. CATANACH: Call Case Number 8745.

MR. TAYLOR: The application of Benson-Montin-Greer Drilling Corporation for authority to conduct a long term Reservoir Pressure Study, Mancos Formation, Rio Arriba County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. KELLAHIN: Mr. Examiner, I'm Jason Kellahin, Santa Fe, appearing for the applicant, and I have one witness to be sworn.

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

Would the witness please stand and be sworn?

(Witness sworn.)

A. R. GREER,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Albert R. Greer.

Q What connection do you have with the applicant, Benson-Montin-Greer, in this case?

A I'm an officer and an engineer in that company.

Q Have you testified before the Oil Conservation Division and had your qualifications as a petroleum engineer made a matter of record?

A Yes, sir.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. CATANACH: The witness is qualified.

Q Mr. Greer, just what is proposed by Benson-Montin-Greer in Case Number 8745?

A We're asking that some exceptions from the Division ordinary regulations covering allowables, such that allowables could be accumulated and produced at a later date and in some instances that wells could be produced in anticipation of allowables and such that over all, and over a period of months, there will be no difference in the allowables that's otherwise been granted to the well, and what

would occur here by permitting the wells to produce at different times than the regular allowable schedule, will permit us to run an interference test.

Q Now referring to what has been marked as Exhibit Number One, would you identify that exhibit?

A Yes, sir. Exhibit Number One is a plat, area plat, showing the wells of interest in the interference test.

We show on there the, outlined in blue, the Mallon Howard 1-8 Well in the northeast quarter of Section 1, which we would like to be the producing well in the interference test.

And then highlighted in pink, the Canada Ojitos Unit E-6 Well in the northwest quarter of Section 6, which we would like to be an observation well.

And then other wells in the area we would like as much as possible for their allowables and production to be so adjusted as to have a minimum impact on the interference test wells.

Q Now how would you propose to accomplish that?

A We're suggesting that the wells which now are capable of production in this area be permitted to produce both their November and December allowables immediately and then be shut-in in order that the reservoir tend to

reach stabilization prior to the time the Howard 1-8 Well is put on production for the test.

Q Now the Howard 1-8 Well is presently a producing well, is it not?

A Yes, sir, it's presently producing oil.

Q What's the status of your monitoring well?

A The monitoring well is currently being drilled. Casing was run on it yesterday and we would anticipate it to be completed and in shape to serve as a monitoring well by the first of December.

And I might point out that ordinarily we would wait until a well is produced or completed and we know that we have a well suitable to run an interference test before asking for the procedure before the Commission, but in this instance, because of the timing situation, if we wait until the well is completed and then come before the Division for a hearing, it might be too late, and by too late I mean that the Mallon wells could by that time be on permanent production. Right now they are producing with restricted allowables, or rates, because they do not have a way of usefully disposing of the gas.

We anticipate having a gas pipeline in in about a month or so and when that time comes, then they will want to produce the wells at whatever they're permitted to

do, and in running this interference test the important thing in the test is to -- to pick up the pressure pulse through the reservoir during its initial transient, which is estimated to be 30 to 60 days.

If the wells are put on permanent production before the monitoring well is ready to monitor the pressures, then it's possible that the monitoring well will miss that initial transient and then all we would have would be a sort of steady state pressure decline which would not be much help in analyzing the characteristics of the reservoir.

Q Now in connection with this case you're asking for an exception to the no flare order of the Commission. What's the reason for that?

A As we understand it now, the allowables for the wells, pending useful disposition of the gas, is limited to the amount of oil which can be produced with about 30 MCF of gas per day.

I think the allowables -- or the gas/oil ratios have been running something like 500 to 600-to-1, which means about a, oh, about 50 barrels a day allowable, and for this test we would like for the test well, the producing well, to produce at a maximum reasonable rate, and the higher the rate at which it produces, the greater will be the pressure drop that can be measured in the interfer-

ence test well, and 50 barrels a day probably would not get us enough of a pressure drop to be measurable.

I'm anticipating that at 400 barrels a day, which we think the well will be capable of sustaining, that even at those rates in 30 to 60 days test period that we will still have pressures which are going to be difficult to measure to determine what we want to determine.

Q Now this no flare exception would apply to the Howard 1-8 Well, is that so?

A That's the only well that there would need to be an no flare exception for.

Q Do you have anything else in connection with Exhibit Number one?

A I believe that's -- that's probably all on it.

Q Now turning to Exhibit Number Two, would you identify that exhibit, please?

A Exhibit Number Two simply shows the status as of November 1 of all the wells listed on the plat on Exhibit One.

Q Now in connection with those wells on Exhibit Number One, the operators -- what operators would be affected by this test in the immediate area?

A The operators affected besides our company, Benson-Montin-Greer Drilling Corp., as operator of

Canada Ojitos Unit, is the operator of the tract to the west, Mallon Oil Company; and to the northwest, Dugan Production Company.

Q Do you have the cooperation of Mallon and Dugan as to this test?

A Yes, sir, both companies have indicated they would like to -- to support the test and of course it's just a question of each company as to whether their drilling and producing operations could be -- might be unduly influenced by the test, which under our present tentative schedule they see no problem with.

If something happens and we don't complete our well as we have planned and run into a long completion or difficulty, then we might just have to abandon the test, in which instance we see that no harm has been done by granting these exceptions for the allowables.

In a sense what we're asking for is an option on the part of Mallon and Dugan to cooperate when the time comes if at that time it is compatible with their operations.

Q Is there anything to add to Exhibit Number Two?

A I think not. I might just point out that with respect to Exhibit Two that Dugan's well, proposed well in the southeast quarter of Section 36 is still waiting on

the rotary, and the particular exception from the allowable rules that we're asking for this well would be that if Dugan drills the well, has it ready for completion, but in order to support the test, if at that time the test is progressing and appears to be a productive test, that we might get some useful information from, then if Dugan would elect to delay completing his well by delaying fracing the well so as not to send a pressure pulse through the reservoir, then Dugan will be granted an exception to the allowable rules such that he would not suffer loss of allowable by supporting the test.

And what we're thinking about there is again where his allowable would probably be limited by 30 MCF a day production, something like 50 barrels a day or 1500 barrels a month, if he were to delay completing his well, say, for 45 days, then he would have an additional 2250 barrels allowable that could be produced when the well is completed, over and above what he otherwise would have.

Q Turn to Exhibit Number Three. Would you identify that exhibit?

A Exhibit Three is a summary of what we're asking for in this case, which I might run down right quick.

Item A, we ask that the project be allowed four months and not to exceed four months.

That the test well production would not

exceed sixty days, and that's, of course, because of an exception to a no flare order and generation of -- or anticipation of allowables.

Shut-in monitoring well not to exceed ninety days but it could accumulate allowable to be produced at a later date, which in connection with this monitoring well, the Canada Ojitos E-6, we've already laid our gas gathering line to this well and once it's completed, if we can make a successful completion, then it would as of the time it's completed be -- have useful disposition of the gas and its allowable would be whatever the allowable is at that time would not be limited by the no flare order (not clearly understood.)

And Item B we identify the production test well as the Howard 1-8, Mallon Oil Company's Howard 1-8 Well and the monitoring well is identified as Canada Ojitos Unit E-6.

In Item C we set out the option which we just discussed for Dugan Production Corp.

In Item D we list the wells which might be shut in and allowed to produce initially in anticipation of allowable, in anticipation of December's allowable, they would be permitted, of course, to produce November's now, and then if shut in longer than December, that they would be allowed to make up allowable in the following six months.

Q And those are the wells which you have listed on Exhibit Number Three.

A It wouldn't affect any other wells in the area?

A No, sir. Then Item E, we just note there that if, as of the time the test well is put on production, that Mallon does not have their pipeline in to usefully dispose of the gas, that the test well be granted an exception from the no flare order.

Q Now, Mr. Greer, just what is the purpose of this interference test? What do you hope to accomplish?

A It is to develop reservoir information that would be useful in the continued development and operation of the two pools in this area. The Canada Ojitos Unit lies in the West Puerto Chiquito Pool. The Mallon wells lie in what we presume will soon be the Gavilan Pool.

The boundary between the two pools is the north/south boundary between Townships -- or Ranges 1 West and 2 West, as shown on our Exhibit One.

And as to the Canada Ojitos Unit properties, those in the West Puerto Chiquito Pool, this pool is on 640-acre spacing and we recently asked that for the west two rows of sections that we be permitted to drill two wells on a proration unit, and if that application is approved, then we would have the option as we see fit to drill a

second well on each of those sections, and the purpose of drilling a second well would be to protect the unit from drainage.

The big question that we have is do we really need a second well on all of those sections. Perhaps we only need that second well on the first row of sections joining the Gavilan Pool, and perhaps we don't even need that. It might be possible that only one well on 640-acre spacing in West Puerto Chiquito could -- could pretty well prevent drainage from the two wells on the west side, depending on reservoir conditions, and that's what we would like to determine if we can in this area and perhaps by now to determine for other parts of the area whether we're going to need to drill that second well on a section.

If we can save the drilling of the second well on a section, there's roughly a ten-mile boundary between the two pools, we could save from ten to twenty wells, and for their depth these are expensive wells, $6-to-$800,000 apiece, would be a substantial savings for the -- for the unit.

And as far as the Gavilan properties are concerned, where Howard's wells are located, in about a year and a half this Division will be considering the proper spacing for the Gavilan Pool. It's presently on a temporary order of 320 acres. It would be good to have as much infor-

mation as possible for the Gavilan owners and for this Division in making that determination at that time as to what the proper spacing is for Gavilan.

So for those two purposes we ask that we be allowed to run this interference test and to have allowable changes from the regular rules in order to do, make the test.

Q Is the producing formation in the Puerto Chiquito and the Gavilan Pools the same?

A Yes, sir.

Q So the test would be actually affecting the same formation under each pool.

A Yes, sir.

Q In your opinion is the conduct of this test important for the protection of correlative rights and the prevention of waste?

A Yes, sir.

Q Were Exhibits One, Two, and Three prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time I would offer Exhibits One, Two, and Three.

MR. CATANACH: Exhibits One, Two, Three will be admitted as evidence.

MR. KELLAHIN: That concludes

the testimony, Mr. Examiner.

QUESTIONS BY MR. CHAVEZ:

A Mr. Greer, you've said that the Howard 1-8 Well should be produced at a maximum reasonable rate of production.

How would that be determined?

A As I understand in the month of August they produced from that well 8000 barrels in 20 days, which would be about 400 barrels a day, and this is the rate that I'm thinking about as far as the maximum reasonable rate.

I don't know whether the well is capable of producing at a higher rate than that or not. I presume that they were producing it pretty much at capacity, but it's substantially in excess of the otherwise 50 barrels a day that they would -- would be allowed to produce, and we would -- we would hope that during the test that the well would be produced at a uniform rate. In other words, if it's capable of producing 500 barrels a day a the beginning of the test and 300 barrels a day at the end of the test, we would prefer that it be produced at 400 barrels a day throughout the test uniformly rather than at a declining rate just simply to have the best information possible to analyze.

That's what I was thinking about, about

400 barrels a day.

Q Mr. Greer, I notice that it doesn't appear that you're asking for a compensatory allowable for the Canada Ojitos Unit No. 6 Well.

A Well, I guess I didn't make myself clear. We would like to have whatever allowable that it would accumulate during the test, that it be allowed to produce that, if it's capable of doing it, above its normal allowable after the test is over and be given a period of six months in which to produce that.

Q How would that be determined in volume?

A Well, when -- when the well is completed, let's say that -- that it's a comparable well to the Mallon well, which I hope it is. Of course in this pool it might only be a tenth as much, but let's just say that it was 300 barrels a day, potentialed for 300 barrels a day.

Its present allowable is -- is, I think, about 600 barrels, might be, in one of our cases, if the Commission rules on it, it might be 700 barrels a day maximum allowable. If the well's capable of making only 300 barrels a day then its allowable, as I understand, would be limited to its ability to produce, so that would be 300 barrels a day.

So if it's shut in for 60 days then that would be 18,000 barrels that we have another -- we would

have six months to produce over and above its other regular allowable, if it's capable of doing it.

The chances are very good with the allowables as high as we think they will be and the productivities probably being less than the allowable, it may be entirely academic that the E-6 is allowed to accumulate allowable. Even so, it seems to me that the unit owners need to have the right to make up the allowable even though the well couldn't do it.

Q Mr. Greer, I notice that you're asking for two offset operators you said have agreed to this test, and you're asking for an exception on their behalf.

Do you have any written correspondences that will show that they are in agreement with your application on their behalf?

A No, sir. They asked if we wanted them either to appear at the hearing today and testify or give us anything in writing and I told them I just didn't think it was necessary for the reason that we're not asking these operators to be bound to anything. We're just asking for options on their part to participate if they so desire, and so we would hope that all that's necessary, for instance, for Mallon, would be for them to write the Aztec Office and say that in line with this case that they would like to produce their November and December allowable now and that

would be all they would have to do at this time, and then ask for the right to produce their well at 400 barrels a day, or whatever, when it comes time to start the test.

So the answer is no, I do not have anything in writing.

Q As concerns the Dugan Production Corporation well which has not been drilled, as far as accumulating an allowable for that well after it's drilled, however not completed, would a reasonable date to start accumulation be perhaps the date the casing is perforated?

A Either -- well, I hadn't given any thought to this. They might choose to run casing and yet not perforate it until it's time to frac it, so perhaps a better date would just be an arbitrary period of -- of some reasonable time between the time at which they start completion operations and they have it completed, and I believe you could -- you could probably get that from whatever actually happens when they do complete it.

You could choose a starting point; perhaps it would be when they do perforate it. Say, for instance, they run the casing and elect not to perforate until they're going to complete it. Then they move in, perforate, complete the well, and say that takes three weeks, then you would just allow that same amount of time.

I would think it could be fairly easily

determined by the date between the time at which they run production casing and when they move the completion rig in. I believe that would be the time at which they would be delayed. Dugan on occasion moves in his completion rig within two or three days after the rotary rig moves off, so I believe you could use from the time the rotary rig sets casing until he sends in a completion ate.

Q In fairness to the operators, the offset operators in the pool, isn't there usually a delay of some time, which under normal operations would exist between setting pipe and moving in a completion rig?

A That's true. I think you have to go by a particular operator. We visited about that yesterday. Dugan's engineer said that the earliest he can remember them perforating was something like 24 hours after they ran cement.

But I think Dugan has his own completion rigs so he has a lot of flexibility there; he has at least one completion rig, so I would think this would not be a difficult thing to come by. I don't think you're talking about more than a week's difference one way or another, and at 50 barrels a day that's only 300 barrels allowable.

Q But would it be unfair to use the date of perforation, say should he intend to come in with a completion rig within a week afterwards but he'll go ahead and

perforate and then hold off on completion?

A Well, it that's the way he did. Ordinarily we don't perforate until we've got a completion rig on, and of course it's possible that what we're thinking about, really, is fracing, and perhaps we can tie it to that, but it would be possible, of course, for him to go in and put a completion rig on and, of course, as you know, this two or there stages that we're running now in that area, why a completion rig necessarily has to be on the hole to drill out the bridge plugs before you -- before you can perforate.

Of course it would be possible that he would go ahead and do that and perhaps make an actual test on the well and then elect in support of the test not to frac. This is what we're concerned about, is how long he's delayed fracing the well.

I just don't believe it would be difficult to come up with a figure for -- for the time that has elapsed that he's lost by delaying the frac treatment.

I believe that you can review the records and I don't believe you'll have any difficulty in determining what's a fair, fair time for that.

Q Mr. Greer, you said that the fracing of the Tapacitos No. 4 might interfere with the -- with the test by causing a pressure transient.

Might not it also contribute to the test

by installing an articifical pressure impulse that --

A Well, the problems that we have in this reservoir, it it's like the reservoir back to the east, is that we don't know the reservoir transmissibility but we've found that the wells appear to be completed in little, tight blocks, and yet the whole reservoir interconnected with a high capacity system. This makes it impossible to calculate from an interference test like one would in, say, most reservoirs, and in a lot of reservoirs it's possible to run individual well tests; from those individual well tests determine the transmissibility of the formation in the area of those tests, and that will be fairly uniform.

In those instances, then, you can send a pressure pulse through the reservoir and the time that it takes to -- for the pulse to move and by this separate information, separately determined information of transmissibility, then you can go back and make a lot of the calculations you need to make.

In this reservoir you just can't do it and we need the -- to determine the transmissibility if it's at all possible, the reservoir transmissibility by the interference test itself, and that's most difficult to do unless you have -- unless the interference producing well produces at a fairly constant rate and over a period of time such that the well, the monitoring well, the presssures in

it, we can determine not only when the pulse first hits, but then the shape of the curve as the pressure drops in the monitoring well, from those data then we can go back and determine the reservoir transmissibility, and without that, you're just at a loss in this reservoir.

Now we can do that but the calculations are fairly simple where we have these conditions. The well produces at a steady rate, at a high enough rate that when the pulse hits the monitoring well, that the pressure differences that are measured are such that you can actually determine the shape of the curve, and this, of course, requires fairly accurate measurement.

For instance, I'm hoping for a 20 to 25 pounds pressure drop; might only be 10 pounds. We need a spread of at least 100 points over that 10 pounds in order to determine the shape of the curve. That means you've got to measure down within a tenth of a pound. It takes some pretty sophisticated instruments to do this and the way we did it in years past was to measure the drop in fluid level because it was much more sensitive than the pressure equipment that was available at that time.

We now have more sensitive pressure gauges. We hope they're reliable enough to do the job. The advantage we had 20 years ago in the tests we ran then, we had only one zone perforated and we could load the hole with

dead oil, measure fluid levels, and the fluid levels we could measure within half a foot, which is roughly 16/100ths of a pound, and have very accurate pressure differentials to work with.

In this instance, where the offset wells are completed in all three zones, and even more than that, we have to do the same thing in our well, and whether we can load the hole with dead oil and the oil will stay relatively unchanged, we don't know. Over that several hundred foot of interval, if the fractures have been so connected in the perhaps different permeabilities and the different streaks, it's possible for the oil to tend to swop out in the sense the dead oil goes into one zone and comes back, live oil back another, such as this could affect the density of the overall column and then it would make our fluid level measurements not as dependable as they were in the tests in bygone days.

So, for that reason we're planning to use one of the new essentially pressure gauges, but even there I'm not -- I don't want to rely entirely on them, and so -- so we'll be running probably three days with a pressure gauge and maybe three days with fluid levels and such as that in order to get it.

But the answer then to your -- to this whole question can we take a pressure pulse and determine

what by frac treatment, we cannot calculate from it. We can determine interference, you know, it will show a bump, but there's no way to -- to really take that information and calculate back to determine the characteristics that we need to know.

Q Do you ask that the wells which will be produced could exceed what would be top allowable for those wells within the pool during the production phase?

A Oh, I think we would not need to do so. I would hesitate for them to produce at a higher rate than that. If the allowable, well, first if the Division approves the application to extend the Gavilan, the allowable becomes 700 barrels a day, I think it would be best not to produce in excess of that for the simple reason that the well might not be able to produce steadilyl for 60 days.

If we knew it could produce, say, 800 barrels a day for 60 days, then that would be great, but if it starts off with 800 barrels a day and dwindles down to 400, then we'd have a much more difficult problem to calculate; probably couldn't solve what we need to know.

Q Will you work with the operators, say, with Mallon, to determine the rate of flow or will they have --

A Yes, I have in mind visiting with him about all the details and we have talked about some of them

so far but we will probably want to monitor pressures in their well in the southwest of 1. At this point they've indicated that if for instance their pipeline is completed while the test is still going on, and they could otherwise produce all of their wells, that they might still leave the well in the southwest of 1 shut in in order to support our test, and so in connection with that and the production rate and all these details, we'll be working closely with Mallon, yes.

MR. CHAVEZ: That's all the questions that I have.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Greer, you asked for in your application a project not to exceed 4 months, yet you stated that the test would probably be completed in 30 to 60 days?

A Well, I'm thinking of 60 days of production for the producing well. We might want the monitoring well to continue beyond that, depending on what the -- what it shows, and all that would happen at the end of the test then, if that happens, insofar as Mallon is concerned, at the end of 60 days, then Mallon might put its other well in the southwest quarter of 1 on production. We might choose to continue monitoring pressures and not put our E-6 on pro-

duction for another 20 or 30 days, because I think it would take that long for the pressure pulse from the southwest of 1 to reach the well. So we might be able to monitor it for a little bit longer.

So that would be 3 months and we just asked for 4 months as a cushion to cover everything.

Q You asked for an exception to the no flare rule. That is just for the test well itself?

A Well, let's see, unless there's a requirement again for the other wells, for the other Mallon wells to produce their December allowable now, I don't know whether that requires -- I guess that does not require an exception. Well, it requires the same exception to the no flare order that they currently are given to determine their allowable.

The main well would be the test well.

Q Do you have any idea how much gas is being flared?

A Well, let's see, if -- if the test well is produced at 400 barrels a day and it has a, say, a 500-to-1 gas/oil ratio, that would be 200,000 feet a day and if it goes for 30 days before they get their pipeline, then that would be 6-million feet or if it goes for 60 days, which I think very unlikely that it would be that long, that would be 12-million feet.

Q At this stage you don't know if the Mallon wells are going to be affected as far as having to shut them in, do you know how long they're going to have to be shut in?

A Well, what we're suggesting is that all the Mallon wells now capable of production be permitted to produce their November and December allowables and then shut in, and then hopefully we can complete our E-6 and it will be a well suitable for testing by the first of December. Then we would have 30 days of the test behind us before we come up with an allowable problem then for the Mallon wells and by that time, say it's the first of January, the chances are very good that they will have their pipeline system in and then they could go ahead and produce the wells in Section 2 and I would see no problem in that because they're over a mile from -- from the monitoring well, and we've got a few days of testing started before they're put on permanent production. I just don't believe they would affect the test.

QUESTIONS BY MR. CHAVEZ:

Q Mr. Greer, would you also like the no flare exception to extend through the make up time of the allowable after the wells are put back on production?

A Well, our thinking has been that that

would not be necessary after the -- Mallon feels that they will have their pipeline in by the first of December, so I would think that that would not be necessary.

Q Might it be necessary for your No. 6 well and the Dugan Tapacitos No. 4 Well?

A It would not be for our Canada Ojitos E-6 because we already have a gas line there.

Let's think about Dugan's Tapacitos. I don't know what Dugan's plans are for disposing of the gas, so he could need whatever exception he was otherwise entitled to to produce -- to produce whatever allowable that accumulates.

Q Thank you.

MR. CATANACH: I have no further questions of Mr. Greer.

MR. KELLAHIN: That concludes our case, Mr. Examiner, thank you.

MR. CATANACH: Mr. Kellahin, may I ask you to submit a rough order for us?

MR. KELLAHIN: I will submit a rough order, yes, sir.

MR. CATANACH: Thank you.

MR. KELLAHIN: And I'll count on you to smooth it out.

MR. CATANACH: Anything further

in Case 8745?

If not, it will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8215, heard by me on November 6 1985.

David Catanach, Examiner
Oil Conservation Division