

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
AUGUST 16, 1961

IN THE MATTER OF: :

CASE 2356 By call of the Oil Conservation Commission, on: :
its motion, to hear the report of the Industry: :
Study Committee on Commingling of Crude Oil, to: :
consider the adoption of a Manual for the In- :
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303 and 309-B to provide for administrative :
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-TRANSCRIPT OF HEARING-

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BEFORE THE
OIL CONSERVATION COMMISSION
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IN THE MATTER OF:

CASE 2356 By call of the Oil Conservation Commission,
on its motion, to hear the report of the
Industry Study Committee on Commingling of
Crude Oil, to consider the adoption of a
Manual for the Installation and Operation
of Commingling Facilities, and to consider
the revision of Rules 303 and 309-B to pro-
vide for administrative procedures for ob-
taining permission to commingle crude oil
in conformance with said manual.

BEFORE:

Gov. Edwin L. Mechem
E. S. (Johnny) Walker
A. L. Porter

T R A N S C R I P T O F P R O C E E D I N G S

MR. PORTER: We'll take up next Case 2356, and this is the case called by the Commission on its own motion to hear the report of the Industry Study Committee on Commingling of Crude Oil, and for the adoption of a Manual for the Installation and Operating of Commingling Facilities, and to consider the revision of Rules 303 and 309-B to provide for administrative procedures for obtaining permission to commingle crude oil in conformance with said manual.

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Before we begin our testimony, I would like to call for appearances.

MR. MORRIS: At the Commission's request, Dick Morris appearing for the Industry Study Committee on Commingling.

MR. PORTER: Mr. Buell.

MR. BUELL: For Pan American Petroleum Corporation, Guy Buell.

MR. ANDERSON: R. M. Anderson, Sinclair Oil & Gas Company.

MR. CHRISTY: Sim Christy for Humble Oil & Refining Company.

MR. WHITE: Charles White for Texaco, Inc.

MR. JACOBS: Ronald Jacobs for Skelly Oil Company.

MR. KELLAHIN: Jason Kellahin for Amerada Petroleum Corporation and Continental Oil Company.

MR. SETH: Oliver Seth for Shell Oil Company.

MR. TUFFLY: Harry Tuffly, Tidewater Oil Company.

MR. PORTER: Mr. Morris, have you decided on the order of testimony?

MR. MORRIS: Yes, sir. If the Commission please, at the outset, I have a statement I would like to present before the testimony commences.

MR. PORTER: You may proceed.

MR. MORRIS: I refer to Commission's Memorandum No. 2-61, dated March 16, 1961, a copy of which is before you, and ask

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that the Commission take administrative notice of its contents.

MR. PORTER: The Commission will take administrative notice of the Memorandum No. 2-61.

MR. MORRIS: This Memorandum reflects that in March of this year it came to the Commission's attention that abuses of the commingling privilege were probably occurring. The Commission then determined that in order to prevent further abuses, standards for commingling installations should be established. To this end the Commission appointed an Industry Committee to study all phases of commingling with the objective of proposing installations which would be as foolproof as possible.

The Committee thus appointed was requested to file a written report of its recommendations for minimum standards for commingling installation. The Industry Committee was constituted of Shell Oil Company, represented by R. L. Elkins, and R. Sumerwell; Gulf Oil Corporation represented by C. M. Bumpass; Humble Oil & Refining represented by W. M. O'Reilly; Atlantic Refining Company represented by H. T. Frost and N. McCaskill; Benson-Montin-Greer Drilling Company represented by A. Greer; Pan American Petroleum Corporation by A. J. Inderrieden and J. E. York; Continental Oil Company represented by V. T. Lyon; Texaco Inc. represented by J. E. Robinson; Phillips Petroleum represented by R. D. Schropp; Carper Drilling Company represented by C. E. Storm; Texas Pacific Coal & Oil Company represented by J. Yuronka; and New Mexico Oil Conservation Commission represented by Dan Nutter.

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Mr. Elkins of Shell served as Chairman of the Committee until his departure for New York in May, at which time he was succeeded by Mr. Sumerwell, also of Shell Oil Company.

Mr. Bumpass of Gulf served as Chairman of the Sub-committee on measuring methods, and Mr. O'Reilly of Humble as Chairman of the Sub-committee on assembly design. Messrs. Sumerwell, Bumpass and O'Reilly will testify today in presenting the report of the Committee to the Commission.

I would like to make clear at the outset of the testimony that the report of the Committee does not represent the unanimous opinion of all the Committee members. Instead, it represents the majority opinion of the members of that Committee. It should also be pointed out that the witnesses who will present the Committee report are testifying on behalf of the Committee, and their remarks should not be taken as necessarily representative of the position of the companies with which they are employed. With permission of the Commission, in order to facilitate the presentation of this report, the procedure we would like to follow would be to have Mr. Sumerwell, Mr. Bumpass and Mr. O'Reilly each testify before any cross-examination of any of them is permitted. At the conclusion of all of them, they will then answer questions, either as a panel or as individuals, depending on how the question is addressed to them. If that meets with the Commission's approval, we will proceed in that manner.

MR. PORTER: Mr. Morris, as I understand it, you'll

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have the three representatives of the Committee sit as a panel, and you would like for them to conclude their direct testimony before there is any cross-examination of either --

MR. MORRIS: Yes, sir, we will have three witnesses. I will direct questions to them as individuals rather than as a panel.

MR. PORTER: Surely.

MR. MORRIS: Then, at the conclusion of the testimony of all of them, then cross-examination will be allowed.

MR. PORTER: Yes, sir. Before we proceed with the case, I would like to say that the Commission has, by letter, thanked each member of the Committee individually, that is, with the exception of the Commission's Staff members, and we have thanked them personally. They have put in an awful lot of time on this Manual. When we gave them the job, we indicated to the Chairman that there was an urgency, and that they should proceed with due diligence, which they certainly did. We were sorry that Randy Elkins had to leave before the study was completed. Of course, we're also sorry for anybody that has to leave New Mexico and go to New York. But Mr. Sumerwell took over in good style, and the Committee proceeded, and those of you who have seen the Manual which they have come up with, probably realize the amount of work that went in on this thing; there were numerous meetings held.

Regardless of your views as to the Manual and its feasibility, I know that you, along with us, appreciate the work of the individual

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Committee members, and the time that they have sacrificed to put in on this project.

Mr. Morris, we'll have your three witnesses called at this time and have them sworn.

(Witnesses sworn)

R. L. SUMERWELL,

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Sumerwell, will you please state your full name, for the record?

A R. L. Sumerwell.

Q By whom are you employed and in what capacity and where are you located?

A Shell Oil Company as a mechanical engineer, in Roswell.

Q Mr. Sumerwell, did you serve as the Chairman of the Industry Study Committee on commingling of crude oil, appointed by the Commission?

A Yes, sir.

Q Do you have a preliminary statement to present to the Commission at this time?

A Yes, sir, I sure do. This final report of minimum standards for commingling crude oil represents the combined efforts of the Industry Study Committee appointed by the New Mexico

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Oil Conservation Commission in March of this year. To fulfill the Commission's request, the Committee gave primary consideration to the design of commingling installations which would minimize the possibilities of failures or accidental mismeasurements and which would facilitate detection of purposeful mismeasurements of commingled crude oil. However, it was redognized early in the work of the Committee that the design of a completely "foolproof" system would be improbable and impractical. This final report represents the majority opinion of the Committee members and is not in every respect the unanimous opinion of all Committee members. This fact is mentioned since there is difference of opinion among industry representatives regarding the strictness of regulations that should and could be imposed on commingling authorizations.

Ten oil company representatives along with members of the Commission staff attended four, full committee meetings. The first three meetings were held in Hobbs and the fourth and final meeting was held in Santa Fe. In view of the amount and complexity of work to be done by the Committee, it was deemed prudent to divide the Committee into two Subcommittees. The Subcommittee on "Measuring Methods" worked on the written section of the report which covers Proposals for Metering Equipment, Sampling Equipment, Production Allocation and Procedures of Meter Calibration for use in commingling production from different zones having the same royalty interest (Part I), and from different zones or leases having different royalty interest (Part II). Part III of the written section covers



general requirements for zones and leases with common or different royalty interests. API Standards were used, or referred to, where possible. The Subcommittee on "Assembly Design" worked on the drawings or appendix of the report, which covers several proposals for the assembly and design of commingling installations utilizing a variety of equipment and layouts. These drawings and designs include what the Committee considers are minimum requirements for utilizing a common test vessel, routing of nonmerchantable oil from a common storage tank and handling of power oil used in subsurface hydraulic lift systems. In these drawings the actual metering facilities are shown by the symbol MF, and the requirements of the metering equipment, sampling equipment, method of proving, and method of production allocation are covered in the written section of the report.

In the preparation of this report very little consideration was given to existing commingling installations nor to how they might be modified to comply with these recommendations.

It was believed by the committee that such installations, if changed, should be considered individually.

This report, therefore, applies primarily to installations which might be approved in the future.

In addition, the committee believes that these or any other commingling requirements which might be adopted should be reviewed periodically to ascertain whether changes are needed in view of new developments in equipment or techniques.



It might also be noted, in going through the report, that the wording is somewhat general. This was with the purpose -- as most of you might know, it's difficult to come up with any standard without general wording. In addition, trying to be specific would probably date the report at an earlier time than general wording. We've also tried to leave the Commission some leeway to pin down specific items.

(Whereupon, Committee's Exhibit No. 1 was marked for identification)

Q Mr. Sumerwell, I hand you what has been marked for identification as Committee's Exhibit No. 1 in this case, and ask you to state what it is, please?

A This is the Report of Minimum Standards For Commingling Crude Oil prepared By The Industry Study Committee.

MR. MORRIS: If the Commission please, we'll offer Committee's Exhibit No. 1 in evidence at this time.

MR. PORTER: Without objection, the Exhibit will be admitted to the record.

(Whereupon, Committee's Exhibit No. 1 was received in evidence)

MR. MORRIS: If the Commission please, we will direct the testimony at this time to Mr. O'Reilly, and return later to Mr. Sumerwell.

W. M. O'REILLY,

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called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. O'Reilly, will you please state your full name, for the record?

A W. M. O'Reilly.

Q By whom are you employed and in what capacity, and where are you located?

A I am a supervising engineer with Humble Oil & Refining Company in Midland, Texas.

Q Mr. O'Reilly, did you serve on the Commingling Committee as Chairman of the Sub-committee on the assembly design?

A Yes, I did.

Q Now, referring to the Appendix of the Committee report containing assembly diagrams, would you briefly describe all of the diagrams and explain what they're intended to depict?

A The drawings 1 through 8 illustrate arrangements devised by the Committee to minimize or facilitate the detection of missmeasurement of crude oil production where common tests or treating facilities are used.

Basically, the Committee determined there would be three distinct ways in which crude oil could be handled. One would provide individual treaters on zone or leased production. Another would be where common treaters were used, and the third would be the use of a method which is referred to as a subtraction method.



Q Were these drawings intended to cover all the commingling installations that were considered by the Committee?

A No. There are other possible conditions which could arise. Basically, as long as common vessels or common connecting lines are not used ahead of individual production meters, the valving arrangements, which are shown on these drawings, would not be required.

MR. MORRIS: At this point I would like to state that the drawings that we have hung on the wall behind the Commission are intended for purposes of demonstration only, they are not Exhibits in this case. They're identical to the drawings contained in the Appendix of Commission's Exhibit No. 1.

Q (By Mr. Morris) Mr. O'Reilly, now refer to what is labeled as drawing No. 1, and describe its arrangement, please.

A This is drawing No. 1. It is entitled Individual treaters used in commingling common or separate royalties. Individual treaters refers to the fact there is an individual treater provided on each zone or lease before the production from that zone or lease is commingled with other production from other zones or leases. In order to expedite the description of all the drawings, I will go into some detail on this drawing that we will eliminate on the later ones. Schematic flow from individual wells is designated to come in these lines. This flow is then separated, in one instance, to a production manifold header, and the other valve to a test manifold header. Proceeding on, the flow



from the production side is directed through a heater-treater, and then through the metering facilities, which are provided and designated as MF, and after the production from that zone has been metered, it is then commingled with other production which has been treated in a similar manner. This commingled production is then directed to a stock tank for sale to the purchaser.

I will describe the flow where common test facilities are provided. In this case, the common test facility may be either a separator or a heater-treater. In the case of individual wells which are desired to be tested, their flow would be directed, as shown by this red line, and thus a well from Zone "A" would be directed into the proper flow channel directed through this valve, which is labeled Valve "H" in this diagram, directed through this valve, which is also a Valve "H," "H" meaning header, and then into the test separator or treater, as the case may be.

After proper tests have been made, the flow from this vessel is directed through a paired valve, through a second paired valve, and back into its proper production line, after which it proceeds through its heater-treater, is directed through the metering facilities and is handled in the same manner as the ordinary production. In this way all of the oil or production from Zone "A" is retained in the channels of Zone "A", and cannot be misdirected into Zone "B" or "C."

Now, before we go further, I would like to read these notes and explain them, such as necessary. The automatic well test



header valves on individual well flowlines, that would refer to the valves shown coming from the individual wells into the test header manifold, may be substituted for valve "H," which is this first valve, interlocking control as shown would then be required between each valve on the manifold and the respective Valve "T."

Now, this interlocking valve or interlocking control referred to is shown by these dotted lines coming from each paired valve set to a Control Panel "C." This is covered in the Note No. 2, which says that "Manual, pneumatic, or electrical interlocks must be provided between the appropriate Valve "H" and Valve "T" as shown. Control panel C and control lines to valves are not required if a mechanical interlock is provided for manual operation."

In this case, these valves would be three-way, two-position valves, and they will be controlled manually, pneumatically or electrically. A mechanical interlock could be a bar connecting the two valves so that when one valve was operated, the other valve would be directed in the same corresponding position. A pneumatic or an electrical interlock would by its characteristic action, take care of this position. In this manner, all the flow would be retained in its proper channel so that no zone could be diverted into another zone accidentally or deliberately. Manual overrides on automatic well test header valves on individual well flowlines may be installed on the production side only. In the event of a mechanical, or, let's say, an electrical or pneumatic failure of these interlocking arrangements, if you have automatic well test

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header valves on individual well flowlines, it would be permissible to install a manual override on the production side only. It could not override manually the valves into the test header manifold. This would permit straight production in the event of such power failure, but it would prohibit testing during these times.

Now, we'll move on down to this break in the line. We have an insert shown here which would provide for the hydraulic sub-surface installation when HS pumps are used.

In such an installation, we would provide a power oil tank in this break. Oil from that oil tank would be directed through a pump, then through a production meter, to the respective zone which it was serving, and at the operator's option, he may install for test purposes a second production meter which would be manifolded in the manner shown.

There is a line shown from the stock tank which is referred to as the Bad Oil Return, and it refers to Drawings 7 and 8, which I will now describe.

In this case, where individual heater-treaters are used, and a separator is used for the test vessel or if a heater-treater is used, and it is desired to reroute the bad oil through the heater-treater of one of the individual zones, this is the alternate which would be employed.

In this case, the bad oil would be directed through a pump, through a meter, through a sampler, a check valve, as shown, and thence back through this open valve into the heater-treater, where



it would be treated in an attempt to provide good oil. This arrangement is shown here which includes a second valve ahead of the heater-treater, which is included for the purpose of permitting calibration of this meter on the return oil line. That's the purpose of this valve, as indicated here. Check valves are required in these instances to prevent oil being directed ahead of this production zone meter, and thence into the stock tank.

In this second alternate we have provided a test heater-treater specifically, and it is desired to use this test heater-treater as the return bad oil vessel for treating. In this arrangement, the meter, the sampler, the check valve arrangement, are eliminated, and this stock tank bad oil is treated in a manner exactly as if there were a fourth zone being handled in this commingling installation.

In this arrangement, when bad oil is being treated from the stock tank, it would preclude the testing of any normal production zone because the bad oil would be handled, as I said, in the manner that a fourth production zone would be handled. So, in the case of bad oil return where this arrangement is used, it would be satisfactory to employ either of those alternates.

Q Mr. O'Reilly, in Drawing No. 1, as in the other Drawings that you will discuss, is it the intent to arrange the valving system so that it would be virtually impossible for the production from one zone to ever be contributed to another zone?

A This is correct.



Q And this was the prime object of this drawing and of all the drawings that were considered?

A That's correct. It was the intent of the Committee, at the Commission's request, to prepare an arrangement in which the production from each zone would be completely independent at all times of production or facilities from another zone.

Q And it's the feeling of the Committee that the valve interlock arrangements, as you have depicted them here, is a feasible method of obtaining that objective?

A Yes, sir.

Q Would you refer, now, to Drawing No. 3, and compare it, its similarities and its differences with Drawing No. 1?

A Drawing No. 3 again includes a separate heater-treater for each zone or lease. In this manner it is identical, the power oil insert is identical, the bad oil return is identical. All things appear to be exactly comparable to Drawing No. 1, except the valving arrangements, as shown for the manifold leading to the common test vessel.

In this case we used what is referred to as a two-way, two-position valve, whereas in Drawing No. 1 we used a three-way, two-position valve, and, as you can see from the drawings, the path of direction of the produced fluid is somewhat different.

In this case it proceeds through a pyramid arrangement to get to the test vessel. In this case it proceeds through a straight line arrangement to get to the test vessel. There is a distinct



difference in this feature, and that is that the control panel, which is employed, is the only control which may be used. A mechanical operation is not tolerable in this arrangement. Control of these valves must be either pneumatic or electrical and cannot be manually controlled. This is the only difference between the arrangement of Drawing No. 3 and Drawing No. 1.

Q Now, in Drawing No. 3, your two-way, two-position valves are normally closed?

A Normally closed, correct.

Q It's only feasible in using this arrangement to operate one pair of the valves at that time. The other pair must remain closed?

A Correct.

Q Whereas, in Drawing No. 1 it's so designed that it wouldn't hurt if both pairs, as depicted there, were operated at the same time, would it?

A They have to operate at the same time.

Q Yes.

A Yes, sir. This is correct. They have to operate at the same time in order to complete the cycle.

Q Would you refer, now, to Drawing No. 2, to show a typical installation using a common heater-treater with individual zone separators?

A In Drawing No. 2 we have provided on each zone or lease a separating vessel, not a heater-treater, the heater-treater being



a vessel common to all zones or leases after commingling has been done.

In this case, as previously described, the wells flow into the individual well flowlines, as shown. The flow is directed through the production side, through the separator, through the metering facilities, and thence commingled with production handled in similar manner from their zones. Wells on test are directed in a manner comparable to Drawing 1, previously described, in the three-way, two-position valves, which may be manually, pneumatically or electrically controlled through the test vessel and directed back to their proper production zone, where they are then joined with wells as they are being produced through the separator. They are all metered through the production meter for that zone, and then commingled.

The difference actually between Drawing 1 and Drawing 2 is the fact that treating occurs after the production from all zones has been metered. In this case, the commingled production from all zones is directed to the common heater-treater; from the common heater-treater it's directed to the stock tank where it's sold to the purchaser. Then again we have a break in this line between the heater-treater and the stock tank, which indicates the insertion of the hydraulic subsurface pumping installation, as shown in the insert, which is identical to that previously described. In these installations, the bad oil, such as may show up in the stock tank, need not be directed back to a zone or lease facility to be cleaned

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up, but may be directed simply as shown through a pump into the line ahead of the heater-treater, where it is treated and redirected to the stock tank.

Q Would you now refer to Drawing No. 4, and point out the similarities and differences of that Drawing to Drawing No. 2?

A No. 4 differs from Drawing No. 2 in the same manner that Drawing No. 3 differed from Drawing No. 1. Specifically, it's in the arrangement of the valves, the type of valves which are used on the test manifold, and in this case, again, we are using two-way, two-position valves, whereas in Drawing 2 we indicate three-way, two-position valves. The same limitations apply. There are no manual controls permitted on this test header installation.

I would like to note that manual overrides on automatic well test header valves, on individual well flow lines, may be installed on the production side.

Q Mr. O'Reilly, now, a point of clarification here as to why manual interlocks cannot be used here. Is it because only one pair of valves can be operated at a time, and if you used manual interlocks, there would be no safeguard against more than one set being operated at a time?

A This is correct. If manual interlocks were permitted and manual operation, the interlock likely would be only between the pair of valves on Zone "A", separate interlock on the "T" Zone between the pair of valves on Zone "B" and between the pair of valves on Zone "C," so that if this were positioned to open at Zone "A,"



Zone "B" were positioned to open feasibly, production from Zone "A" could flow into Zone "B" production line and be metered and allocated to Zone "B." So this is the reason for not permitting the use of a manual interlock on any of these valves shown in Drawings 3 and 4.

Q Mr. O'Reilly, before we leave Drawings 1 through 4, is there any further comment you would like to make on the valving arrangement shown on those Drawings?

A No. I believe I have no further comment, Mr. Morris.

Q Refer, now, to Drawings Nos. 5 and 6, and I believe those drawings deal with the subtraction method of commingling which will be detailed in the written part of the report a little bit later. Will you refer to those Drawings and point out the system that you have devised there?

A All right. In the commingling by the subtraction method, it is calculated that one set of facilities less than the total number of zones to be commingled will be employed.

Q May I interrupt you there, Mr. O'Reilly, --

A Yes, sir.

Q -- for just a moment? The subtraction method, as will be pointed out later, is designed only for use in zone commingling, not on lease commingling, is that correct?

A This is correct. The facilities that I referred to as being one less in this case are the metering facilities as designated in Drawing A. 5, we have shown an installation using in-



dividual heater-treaters on each zone, and only metering facilities on Zone "A" and Zone "B" were non-indicated for Zone "C".

In this case flow would be directed, as previously described on Drawings 1 and 3, through these three-way, two-position valves where tests through a common vessel is obtained, and flow would be as shown from Zone "A" through this three-way, two-position header valve, and, hence, through this second paired valve through the test vessel, and redirected by these interlocks, which have been discussed on previous Drawings. The production from Zone "A" would be metered through the facilities indicated. The production from Zone "B" would be metered through the facilities indicated for Zone "B." Commingled streams from Zone "A", "B" and "C" would then be directed through a stock tank for sale to the purchaser. Production from Zone "C" would be determined by subtracting Zone "A", plus Zone "B" from the total production indicated.

Q If I may interrupt, that allocation procedure will be discussed more fully at a later time?

A This is correct. The power oil is shown in this case to be ahead of the stock tank, and is directed back through appropriate zone meters, production meters, registering power oil return.

In this case where Zone "A" production is metered and Zone "B" production is metered with the meter power oil directed to Zone "A" and to Zone "B" respectively, Zone "C", whose production is determined by the subtraction method, may also receive power oil



by the subtraction method. In this case where you have bad oil in the stock tank and wish to treat this oil, you may employ the heater-treater on Zone "C." Without the facilities previously described in Drawings 7 and 8, you did not require a meter and sampler. This pump directs the oil back through a check valve, as shown through the heater-treater, and thence into the commingled stream.

Q Would you refer, now, to Drawing No. 6 and show how it differs from Drawing No. 5?

A Drawing No. 6 is the installation shown for commingling by the subtraction method in which a common heater-treater is installed to treat commingled production from all leases which have been handled by individual separators, as indicated on zone production. Metering facilities are indicated again for Zone "A" and for Zone "B" and none are shown for Zone "C."

The manner of handling power oil is as described on Drawing 5, in that Zone "A" and "B" respectively are metered. In this case, the bad oil, which may collect in the stock tank, is directed through a pump, returned to the common flow treater, where it is treated and returned to the stock tank for sale.

Q Mr. O'Reilly, I understand that Drawing 9 will be referred to at a later time. Do you have anything further you would like to offer now with respect to Drawings 1 through 8?

A Yes, sir. At this time I would like to comment on Drawings 5 and 6. Drawing 5 is quite similar in arrangement, the three-way, two-position valve, particularly, to Drawings 1 and 2.



Drawing 6 also is similar in the valve arrangement, namely, the three-way, two-position valve, to Drawings 1 and 2. We did not show the subtraction method in drawing form, which may be employed using two-way, two-position valves, as shown on Drawings 3 and 4. These installations would be allowed by the Committee, and there is a note on these drawings which refers to this Note No. 4 on Drawings A-5 and A-6, which says "If normally closed, two-way valves are to be installed, refer to drawing A-3." This Note on Drawing 5 and Drawing 6, it requests that you refer to Drawing A-4.

I point this out so that you will observe that two-way, two-position valves would be an acceptable alternate for these drawings shown.

Q Do you have anything further, Mr. O'Reilly?

A No, sir.

MR. MORRIS: At this point, if the Commission please, we'll proceed with the written portion of the report, and we will have another witness or two to explain this part of the report.

MR. PORTER: You may proceed, Mr. Morris, with your next witness.

C. M. BUMPASS,

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Bumpass, will you please state your full name, for



the record, please?

A My name is C. M. Bumpass.

Q By whom are you employed and in what capacity, and where are you located?

A I am employed by Gulf Oil Corporation as area petroleum engineer of the Hobbs office at Hobbs, New Mexico.

Q Mr. Bumpass, did you serve on the Commingling Committee as Chairman of the Sub-committee on measuring methods?

A Yes, sir, I did.

Q Would you refer to Part I of the Committee report entitled "ZONE COMMINGLING (Common Royalty)" and explain the Committee treatment of this subject, first outlining the general classification of this part of the report?

A Part I is the Committee's minimum standard for commingling of crude oil from different zones of common royalty. This is decided in three main sections, namely, Marginal Zones, Zones With Top Allowable Wells (All zones metered), and, lastly, Zones With Top Allowable Wells (All but one zone metered, referred to as the subtraction method, and in this there are provisions and requirements of metering and sampling equipment, zone production allocation, meter proving and calibration procedures are covered.

Q This section deals only with commingling between zones on the same lease where the royalty is common in all zones?

A That is correct.

Q Now, if you would refer to Section A. of Part I, en-



titled "MARGINAL ZONES" and explain how this subject is treated in the report, please.

A Section A. MARGINAL ZONES possibly was beyond the scope of the Committee's work. However, as this type of commingling now requires a hearing, for convenience to all, this Section was included. And reading verbatim, is as follows: "MARGINAL ZONES. Zone commingling without metering will be permitted where all wells in the zones to be commingled are below top allowable. Individual zone production will be determined by periodic well tests."

Q Would you proceed?

A The next main item is Item B. ZONES WITH TOP ALLOWABLE WELLS (All zones metered). Continuing on verbatim: Item 1 is Meter Equipment. "Any acceptable meter equipped with a non-reset counter can be used for the transfer of liquid hydrocarbons from one individual -- pardon me -- from individual zones to a central tank battery. The counter and meter registering mechanism shall be readily sealable.

Item 2. Sampling Equipment. Any type of automatic sampler can be used in order to determine the BS&W content of the metered fluid. The sample container shall normally be of sufficient volume to store the sample for one month or such lesser time as the Commission may approve. Both the sampler and sample container are to be readily sealable.

Item 3. is Zone Production Allocation. Sub-paragraph a/ If a sampler is utilized, or if BS&W content is less than two per cent,



the net zone production shall be determined by correcting the gross meter reading for BS&W content and meter factor; however, if a sampler is not utilized and BW&W content is two per cent or more, the net zone production shall be determined by correcting the gross meter reading for meter factor only. If a sampler is installed on any one zone, then a sampler shall be installed on all zones metering fluid containing two per cent or more BS&W.

Q If I may interrupt you there, Mr. Bumpass, the wording in this paragraph assumes that the operator knows whether or not his oil contains more or less than two per cent BS&W. How does he make this determination?

A There are various methods of doing that, and one would be to take a manual grind out of the flow string, and the other would be reference to his periodic well tests. That's two methods that he could use to determine what per cent BS&W his flow stream is.

Q That's not specifically covered in this report, though, is it?

A No, sir.

Q Also referring to this paragraph, the wording is somewhat complicated as to the meaning of this paragraph, that if BS&W content is two per cent or more, that the operator has the option to either take the loss or install a sampler, is that correct?

A That's the intention of the report.



Q I see, BS&W content is less than two per cent whether or not a sampler is used, an operator can produce fluids in excess of the zoned allowable to the extent of that BS&W content, is that right?

A That's correct.

Q Would you proceed on, Mr. Bumpass, please?

A Sub-paragraph b/ under Zone Production Allocation, reads as follows: Such corrections as are necessary to correct for known equipment malfunctions shall be made prior to the determination of net zone production.

Sub-paragraph c/ If the summation of the net production from all zones does not agree with the net pipeline runs, with beginning and ending stock adjustments, then the net pipeline runs, with beginning and ending stock adjustments, will be apportioned to each zone by the ratio that each net zone production bears to the summation of net zone -- pardon me, strike zone -- of net production from all zones.

Q Is this paragraph intended to correct the inherent differences that exist in all metering systems?

A Yes, that is true, and furthermore, to provide a uniform method of handling such inherent errors. This Section, I didn't finish reading it. Parenthesis Roman Numeral III, Paragraph B for Allocation Formula will be covered.

Q Would you proceed, please?

A Item 4 is entitled "Meter Provers and Procedures of



Calibration, Sub-paragraph a/ Any of the following types of provers can be used for calibrating zone meters: (1) Strapped storage tank, (2) To-and-bottom graduated-neck prover, (3) Master meter, (4) Piston displacement meter, (5) Any prover facility that is developed having accuracies equivalent to (1)-(4).

Q Mr. Bumpass, if a strapped storage tank is used as a prover, is it contemplated that the use of auxiliary equipment, such as thermometers or outside sight gauges would have to be used?

A As permanent fixtures on that tank, no, sir.

Q Would you proceed, please?

A Sub-paragraph b/ states: Each meter used in zone accounting shall be proved monthly until adequate history of performance has been established to merit extension of the proving frequency.

Q Is it the intent of the Committee in this paragraph that the Commission would determine when an adequate history of performance had been established, rather than the operator?

A From a review of the data submitted by the operator, the Commission would so determine.

Q Proceed.

A Sub-paragraph c/ The minimum volume for proving shall be sufficient to read volume in prover to the degree of 1 part in 100 parenthesis 1% parenthesis.

Sub-paragraph d/ If prover device is not automatically temperature compensated, the prover volume shall be corrected for temperature by correcting the initial and final volumes to 60 de-



grees Fahrenheit.

Q Now, Mr. Bumpass, if you would please refer to Section C of Part I, entitled "ZONES WITH TOP ALLOWABLE WELLS (All but one zone metered - known as the subtraction method," and please explain to the Commission the Committee treatment of this method. In doing so, please refer back to Drawings 5 and 6 that Mr. O'Reilly has previously referred to.

A I'll be glad to do so. Essentially without repetition providing in paragraph C for the subject you just mentioned, we provided requirements for the subtraction method here in the report as we did in the previous one where all zones metered.

Q In other words, paragraph entitled No. 1. Meter Equipment is the same as under Part B?

A That is correct.

Q I believe also that the first paragraph under 2, Sampling Equipment, is also the same?

A That is correct. That brings us to the Drawings that Mr. O'Reilly has covered, which Drawings are A-5 and A-6, and will be read verbatim: "After this examination of these drawings, the requirements point out that in drawing A-5 where you have the individual heater-treaters, the sampler is not required. However, where we have in Drawing A-6 the metering facilities prior to the treatment of the fluid for BS&W samplers are required.

Q Samplers would be required on the two zones that require metering facilities, but not on the one zone unmetered?



A That is correct. Samplers will be required here and here downstream of each separator, and this zone does not have measuring facilities (indicating).

Continuing with paragraph 2 of sub-paragraph 2, Samplers shall be required on all metered zones if the zones are metered prior to treatment for BS&W; however, samplers will not be required on the metered zones that have individual treating systems for removal of BS&W prior to metering.

Q That just reiterates what you said with reference to Drawings 5 and 6?

A Yes, sir.

Q Would you proceed with an explanation of the allocation procedure in the subtraction method?

A Paragraph 3 Zone Production Allocation. If a sampler is utilized, the net zone production shall be determined by correcting the gross meter reading for BS&W content and meter factor; however, if a sampler is not utilized, the net zone production shall be determined by correcting the gross meter reading for meter factor only. The unmetered zone production will be equal to the net pipeline runs, with beginning and ending stock adjustments, minus the summation of the net production from all metered zones corrected for meter factor and if a sampler is utilized, a correction for BS&W will be applied.

Q Now, in this paragraph where it talks about if a sampler is used or not used, it's referring back, is it not, to the para-



graph, the second paragraph under 2, Sampling Equipment. In other words, the second paragraph under Sampling Equipment specifies what sampler must be used, and when it does not need to be used?

A That's correct.

Q Then, in this paragraph 3 dealing with allocation, you have no further option; your option has been determined?

A That is true.

Q Would you proceed with the method of meter proving and calibration?

A Item 4. Meter Provers and Procedures of Calibration, sub-paragraph a/ The meter shall be calibrated into any vessel which simulates actual run conditions. The prover volume shall be weathered as long as the oil is normally retained in storage, not to exceed 24 hours.

Q Now, Mr. Bumpass, in this sub-paragraph, what reason is there for requiring proving under simulated actual run conditions?

A Well, the thought there is by so doing that we will know that the shrinkage for each zone will be properly taken care of.

Q You are not going to distribute all the shrinkage to the unmetered zone, but rather you are going to try to distribute the shrinkage to each individual zone?

A That is correct. Sub-paragraph b/ Each meter used in zone accounting shall be proved monthly until adequate history of



performance has been established to merit extension of the proving frequency. This is as it was when zones were all metered.

Sub-paragraph c/ The minimum volume for proving shall be sufficient to read volume in prover to the degree of 1 part of 100 (1%).

Sub-paragraph d/ Prover volumes shall be corrected for temperature by correcting the initial and final volumes to 60 degrees Fahrenheit.

Q Do you have anything further to add to your testimony, either with regard to the subtraction method, or with regard to zone commingling where there's common royalty?

A I believe not, Mr. Morris.

MR. MORRIS: If it please the Commission, we will continue to go through the written portion of the written report now and the testimony will be elicited from Mr. Sumerwell.

MR. PORTER: You may proceed, Mr. Morris.

R. L. SUMERWELL,

recalled as a witness, having been previously duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Sumerwell, referring to Part II of the report entitled LEASE OR ZONE COMMINGLING (Royalty not common), what are the basic differences in the requirements of any part compared to the previous part testified to just now by Mr. Bumpass?



A Well, I think the approach of the Committee was entirely different in tackling lease commingling where the royalty was not common, and our detail is probably more detailed and perhaps more stringent than lease commingling requirements.

Q Would you proceed and outline the Committee treatment of this subject?

A In view of the detail, I won't try to read the whole report, but try to read what I think are pertinent parts, and the other parts will be on record.

The first part is GENERAL REQUIREMENTS. The word "lease" used hereinafter shall mean any lease or zone where the royalty is not common. The metering facilities for the transfer of liquid hydrocarbons between individual leases or zones to a central tank battery shall provide proper means for quality determination (where required), net volume determination, fail-safe operation, and shall meet the requirements listed below. The overall accuracy of the system must equal or surpass the present hand-gauging methods used in oil custody transfer.

Q Now, Mr. Sumerwell, what is meant in this paragraph by "quality determination (where required)?"

A The intent of that is to cover commingling installations which might involve two zones on two different leases. In this particular installation, it would be mandatory that gravities from each zone and each lease be determined to properly allocate production. However, where only two leases are commingled, it is



not intended that gravity be determined on each lease.

Q Would you proceed, now, with the requirements for meter equipment?

A The first paragraph I have just read is the premise that we worked on, that fail-safe operation, such as that. Item No. 1 is Meter Equipment. Any meter that has been previously authorized for use in an automatic custody transfer system, or otherwise approved by the New Mexico Oil Conservation Commission, can be used for the transfer of liquid hydrocarbons from individual leases to a central tank battery. The counter and meter registering mechanism shall be readily sealable. The meter shall be equipped with a non-reset counter. All measured volumes shall be corrected to a base temperature of 60 degrees Fahrenheit. The temperature compensation for temperature corrected meters shall conform with ASME-API Code 1101. Temperature measurement for correction of volume measured by tank or nontemperature-compensated meter to standard temperature shall be made in accordance with API Standard 2500, "Part IV - Automatic Temperature Devices."

All types of meter installations must meet certain fundamental requirements. These include accurate proving facilities; adequate protective devices, such as strainers, relief valves, and air or vapor eliminators; and dependable pressure and flow controls. A further fundamental installation requirement is that physical conditions during proving should simulate actual operating conditions.



Q At this point, Mr. Sumerwell, does the Committee report contain more specific requirements on the more common metering installations used in the industry, specifically the positive displacement meter system, and the positive volume or dump meter system?

A Yes, sir. We tried to cover the two most commonly used types, and they are what you indicated, and they are covered in sub-paragraphs a/ and b/.

Q Do you care to read or explain the contents of sub-paragraphs a/ and b/?

A If I could, we'll refer to Drawing A-9, which merely shows the drawing of the components that would be required in a PD meter system, and as, also is shown, some of the items are optional.

a/ Each positive displacement meter system shall be equipped with the following auxiliary equipment, except the items indicated as optional.

(1) BS&W Monitor and Reroute Control Valve. Both of these are optional and up to the operator whether he would like to use them or not.

(2) Strainer - A strainer shall be installed to remove from the liquid, entrained particles which could stop or cause premature wear of the metering mechanism. However, where the liquid is clean, or where the type of meter installed does not require or warrant protection, the elimination of a strainer may be possible.



Q The wording of that sub-paragraph just about makes the strainer optional also?

A Yes, but I think a little more at the discretion of the Commission, rather than the operator.

Q All right.

A (3) Air and Gas Eliminator (Optional) - The system shall be installed in such a manner as to prevent passage of air or vapor through the meter. Combination air eliminators and strainers can be used.

(4) Sample Probe - This will be referred to in section Sampling Equipment for more detailed information on the sample probe.

(5) P.D. Meter has been covered. However, the meter shall be equipped with a counter registering in barrels.

(6) Proving Connections - This will be covered in Meter Provers and Procedures of Calibration.

(7) Is a Flow-Rate Controller. It is essential that the system be so designed as to provide an adequate head at the meter and to provide a sufficiently constant flow through the meter to insure that the rate of flow is in accurate range of the meter.

(8) Dump Valve - In intermittent flow installations, the outlet control valve or dump valve must provide a positive shut-off to prevent drainage of the separator or treating system. Single-seated valves are recommended for this service. In continuous flow installations, pilot-operated or mechanically float-operated valves can be used. Pilot-operated valves shall be of the snap-



acting, normally closed type; i.e., closing with pilot supply failure. The meter will be installed in the stream between the separating vessel and its dump valve to maintain adequate pressure on the liquid while metering.

Sub-paragraph b/ covers the positive volume or dump type meter. This system shall be equipped with a sample probe, dump meter and proving connections. (See the following sections on "Sampling Equipment" and "Meter Provers and Procedures of Calibration" for further details on the sample probe and proving connections.) The internal walls of the dump meter should be as self-cleaning as possible in order that corrosion products, paraffin, and foreign matter will not collect inside the tank. Provision must be made for accurate determination in the recording of uncorrected volume and average temperature, or of temperature-corrected volume.

Q In this past paragraph, paragraph b/, what is meant by "self-cleaning?"

A It was the intent of the Committee here that if the crude is of the type that paraffin would form on the walls of the container, that possibly some type of coating should be installed inside the vessel so that the turbulence of the fluid coming in would try to clean the walls of the vessel. However, if the fluid is not a paraffin based type crude, disposable coating would not be needed.

Q In the last sentence of the paragraph, what did the



Committee have in mind by specifying the "average temperature?"

A That merely means that if an automatic temperature device that continuously corrects for temperature is not installed on the meter, that some provision should be made for continuously recording temperature so that an average temperature for each flow rate can be computed to correct the volume to 60 degrees Fahrenheit.

Q It doesn't mean two temperatures taken over a long period of time averaged, or one temperature taken each day at the hottest part of the day, or something like that, it means a continuous temperature?

A Right. It's a recording that can be an average, can be computed for each flow period.

Q Would you continue your requirements for sampling equipment?

A "Provision shall be made for representative sampling of the fluid transferred from each individual lease for determination of the BS&W content and, if needed, for the determination of API Gravity. Again, this Gravity applies to two zones and two leases. The lease oil handling arrangement must remove gas and sufficient free water prior to metering to insure that the oil, when measured, is sufficiently free from volatile fractions and water to permit accurate measurement and sampling. Since acceptable automatic samplers may be designed and constructed in a variety of shapes and forms, no attempt has been made to limit the mechanical design or materials employed to accomplish a satisfactory re-



sult. However, when the metering and sampling system is installed prior to treatment for removal of BS&W, a continuous type sampler shall be employed. A continuous sampler is defined as one which is designed and operated so as to transfer equal increments of liquid from the metered stream to the sample container at a uniform rate."

Q By "uniform rate," you mean a rate sufficient to get a representative sampling?

A Yes, sir, without being real specific we intended that to mean adequate frequency to insure an accurate sampling. "The sample probe and sample container shall meet requirements of API Standard 2500, Part V, Paragraph 1402 through 1403.2; either a closed or atmospheric type container can be used unless determination of API Gravity is necessary, in which case a closed container shall be used. The sample container shall normally be of sufficient volume to store the sample for one month or such lesser time as approved by the Commission and shall be equipped with gauge glasses or some other suitable device for visually determining the amount of sample at any time during the month. Both the sampler and sample container shall be readily sealable.

Section 3. Lease Production Allocation. Such corrections as are necessary to correct for known equipment malfunctions shall be made prior to determination of net lease production. Net lease production shall be determined by correcting the gross meter reading for BS&W content, meter factor and for temperature if an auto



matic temperature compensator is not utilized. If the summation of the net production of all leases does not agree with the net pipeline runs, with beginning and ending stock adjustments, then the net pipeline runs, with beginning and ending stock adjustments, then the net pipeline runs, with beginning and ending stock adjustments, will be apportioned to each lease by the ratio that each net lease production bears to the summation of net production from all leases. Again, this will be covered more explicitly in the Formula later.

Section 4. Meter Provers and Procedures of Calibration.

Part a/ Each meter used in lease accounting shall be proved monthly until adequate history of performance has been established to merit extension of the proving frequency.

b/ The proving system shall, as nearly as possible, simulate actual operating conditions. When open proving equipment is used, a meter-proving connection shall be installed and suitably valved so that flow may be diverted into the prover and still maintain the normal operating meter pressure and flow rate. Where closed proving equipment is used, a meter-proving connection may be installed upstream or downstream of the liquid outlet control valve; however, means shall be provided to maintain the normal operating meter pressure and flow rate. Any of the following types of provers can be used for calibrating lease meters.

(1) Positive Displacement Master Meter - Refer to API Standard 1101, Section III, Paragraphs 3036 and 3037. The master meter



shall be proved at least every six months. The minimum time for proving a lease meter with a master meter is the time required to produce at least 30 barrels or a duration of 24 hours.

Item 2 is a Calibrated Storage Tank, and is an excerpt from an API Standard, I won't read it. There are more requirements on this than the strap storage tank required in zone commingling.

Item 3 All proving devices described in API Standard 1101, Sections II and III can be used; however, all requirements of Sections II and III regarding provers and their calibration and prover procedures shall be met.

Item c/ If prover device is not automatically temperature compensated, the prover volume shall be corrected to 60 degrees Fahrenheit.

Q Mr. Sumerwell, do you have any further comments with respect to commingling zones or leases where the royalty is not common, this part of the report that you have just testified to?

A I think not. I think we have covered it pretty well.

Q Would you refer, now, to Part III of the report, entitled GENERAL REQUIREMENTS FOR ALL METERING SYSTEMS, and explain what is meant by this Section?

A Well, as general applies, it does apply to Part I and Part II of the report. It was written into the report. Some items in it are to enable the Commission to more definitely audit commingling installations, and provides the operator with a clear method of allocating any discrepancies that exist in most any



metering system; slight discrepancies. They're just general comments covering the whole report.

Q Would you proceed with the General Requirements, pointing out the more important ones, if you would?

A Item A. The operator shall be required to submit monthly with the C-115 Form, or as an alternate, keep records of the following items for each meter used for accounting for a period to be specified by the Oil Conservation Commission.

Item No. 1 is: Beginning and ending readings of non-reset meter counter.

2. Meter factor.

3. Per cent BS&W.

4. Load oil movements and/or power oil.

5. Remarks (Explain load oil movements and/or meter or counter malfunction.)

Q Would you explain what you mean a little more specifically on the last two items there?

A Load oil movements and/or power oil. The oil, power oil would just be proper accounting of any oil that's removed from the lease and then returned through a lease meter. That would need to be included with this data. The power oil is the same way. It's required to actually audit the system. Then, the Remarks. It was intended that inevitably we can have malfunctions in any type of meter. The only known way to correct these malfunctions is to estimate any readings that might have been altered by the malfunction.



tion and to record that estimate, and, again, load oil movements must be included in this.

Q Mr. Sumerwell, the next item is ALLOCATION FORMULA AND EXAMPLE. I don't believe it would be necessary to go through the Example in detail, but would you point out the Formula?

A The symbols are quite arbitrary Z'_1 . We've labeled that as the "Adjusted net zone or lease production chargeable to the zone or lease allowable." And that is equal to $Z_1 \times A$, over the summation of Z' 's, where Z_1 one would equal net zone or lease production corrected for meter factor and BS&W, if applicable, and that BW&W if that were in the sample used, it would be applicable.

The summation is merely summation of all zones and leases corrected for meter factor and BS&W. A equal to net pipeline runs with beginning and ending stock adjustments. This is, in essence, the net production from all leases for the month.

Q I believe you can skip the example, it is self-explanatory. It is intended, however, as part of the report, and proceed with paragraph C.

A Item C. Net power oil and/or net bad oil recycled shall be subtracted after the lease or zone meter is corrected for meter factor and BS&W.

D. Meter proving facilities shall discharge downstream of any meter used in accounting.

E. If the piping arrangement submitted with the commingling application does not conform with the piping arrangement actually

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installed, a drawing showing the revised piping arrangement shall be submitted to the Commission for approval.

F. No connecting lines between zones or leases other than those shown in Drawings A-1 through A-8 or lines around meters shall be permitted.

Q Mr. Sumerwell, do you have anything further concerning this Section on General Requirements?

A I think not.

Q Do you have anything further to add concerning the report, as a whole?

A No, sir. I should just like to take this opportunity for Mr. Elkins and myself to thank all the Committee members for the work that they have done. The cooperation was tremendous, everyone cooperated as well as anybody could expect.

MR. MORRIS: Mr. O'Reilly, do you have any comments you would like to make on the report, as a whole, at this time?

MR. O'REILLY: No comment.

MR. MORRIS: Mr. Bumpass?

MR. BUMPASS: I believe not.

MR. MORRIS: If the Commission please, that concludes the direct testimony of the three witnesses, explaining the report of the Industry Study Committee on Commingling. As I pointed out in my opening statement, these witnesses probably after lunch will sit as either a panel or as individuals to answer questions that might be directed to them. I would like to also point out, as



stated at the beginning, that it should be remembered that these witnesses are sitting as a representative of the Committee. Their statements here today have not necessarily reflected the position of their specific companies on this matter, and their testimony on cross-examination should not be so construed.

MR. PORTER: I think I detected a hint there that Mr. Morris was hungry. As I understand Mr. Morris, when we resume the cross-examination, the questions will be directed to an individual on the panel.

MR. MORRIS: This is not necessarily true, Mr. Porter. It is thought that the best arrangement might be for any question coming from the audience to be directed to the panel, as a panel, if at all possible. In that way the person most familiar with the question can give the answer. If you direct a question to one person in particular, he may not be too familiar with that portion of the report.

MR. PORTER: If it's too hot to handle, he can always refer it to the next man.

MR. MORRIS: No. I would like to point out that I don't want that procedure followed, if possible. If a question is directed to a particular member of the panel, then that member of the panel should answer the question.

MR. PORTER: The hearing will recess at this time until 1:15.

(Whereupon, a recess was taken)



MR. PORTER: The hearing will come to order, please.
Does anyone have any questions of the panel?

MR. CHRISTY: Sim Christy of Hervey, Dow & Hinkle. I have one or two short questions to the panel. I wonder if the panel had considered the cost of this installation over and above the cost of installation of commingling facilities that are now being utilized in the New Mexico area?

MR. O'REILLY: Mr. Christy, we will refer as a basis to the use of individual well tests for commingling, and in this case where this type of equipment is employed, we considered cost. We did not detail cost. This was brought up in Committee discussion and in sub-committee discussion. We did arrive at an estimate, and it is the Committee's opinion that approximately a thousand dollars per zone cost would be required to install the facilities on zone commingling, approximately fifteen hundred per lease on lease commingling.

MR. CHRISTY: Mr. O'Reilly, would any additional benefits be gained to the operator or the royalty owner in instances where you had a prudent operator, by the installation of this system as to other leases?

MR. O'REILLY: In the operations of this prudent operator, I'll answer this personally because this was not one of the considerations of the Committee, but in the operations of the operator, I personally can see that there would be no operational advantages to themselves or to the royalty owner in the use of this



equipment.

MR. CHRISTY: Thank you.

MR. PORTER: Any further questions? The panel may be excused.

MR. MORRIS: If the Commission please, I will change hats and represent the Commission Staff, rather than the Committee. On behalf of the Staff, we have one witness that we would like to present to comment on the report of the Committee, and to recommend certain rule changes.

MR. PORTER: You may call your witness.

MR. MORRIS: Mr. Nutter.

(Witness sworn)

DANIEL S. NUTTER,

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Nutter, will you please state your full name and position, for the record?

A Daniel S. Nutter, Chief Engineer for the New Mexico Oil Conservation Commission.

Q Mr. Nutter, have you examined the report of the Commingling Committee and heard the testimony presented by the Committee in this hearing today?

A Yes, sir.



Q What comments do you have concerning the report of the Committee that you would like to offer at this time?

A First of all, on behalf of the Commission Staff, I would like to compliment and to thank the members of the Committee for the work they have done on this report. The Commission was fortunate in having men of their caliber to study this problem and to make such a thorough and comprehensive analysis of it. They have worked hard and done a good job, and certainly deserve much credit.

At the outset of my testimony, I wish to go on record as recommending adoption, by the Commission, of this report, with certain modifications, as a manual for the installation and operation of commingling facilities in the State of New Mexico.

I would like to make it clear, and I believe that the manual itself should make it clear, that these are minimum standards, compliance with which would be mandatory for administrative approval of commingling installations.

Further, I believe that these standards should serve as a guide for the design and operation of any facility for which approval is sought after notice and hearing. I believe that the Commission should give very serious consideration to the matter prior to approving any installation which does not conform in principle to these standards.

People have asked me whether these standards may not be excessive and may not impose too great an expense upon the operator

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who desires to save some money by commingling.

In reply to this, I would first point out that the rules strictly provide that the production from each lease and from each pool shall be measured, stored, and marketed separately. Commingling of production from one or more leases then, or from one or more pools, or from both, becomes an exception to the rules. And when any operator seeks an exception to the rules, he must be willing to go along with certain other rules governing the exception to the rules. This is for the benefit of all, and provides for more orderly development and depletion of our resources. As far as cost is concerned, the installations contained in the Committee's report will cost no more than some of the more elaborate installations heretofore put in. And the operators of those installations saved money on them. The recordkeeping as required by the proposed standards probably is more detailed and probably will cost more money than the records heretofore kept, but certainly some minimum standards of bookkeeping are indicated as required.

The Commission has, in the past, authorized many different types of commingling installations. Some were Model T arrangements. Some were Cadillac-type facilities. Almost all, regardless of the amount of money spent on them, left the door open for the pumper or the farm-boss, whether through innocent error, or because of over-eagerness to make the allowable, or whatever other reason, to cause oil from one lease or pool to be attributed to another. As most systems are presently designed, a pumper could

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in many cases accidentally divert oil from one place to another and not be able to tell it himself the very next day.

We have reason to believe, as the result of our own investigations as well as those of the Federal Petroleum Board, that in quite a number of instances that we know about, and perhaps in other instances which we do not know about, that this accidental or purposeful transfer and mismeasurement of oil has occurred.

Several times I have heard the inquiry, "Well, then, why doesn't the Commission prosecute the violators rather than appoint a Committee to design such costly installations?"

In reply, I might point out that several investigations are being conducted, and have been for some time. Prosecution of several cases can be expected in the near future.

Certain of these investigations, as a matter of fact, helped point out the need for more adequate commingling design and record-keeping. As mentioned before, in some of these systems, which were formerly thought to be adequate, it is impossible to tell from one day to the next which zones or leases produced how much oil or when. In systems like these, it is extremely difficult, if not impossible, for a company itself, let alone the Commission, to detect purposeful mismeasurement of oil.

Without numerous additions to the Commission's field inspection staff, I believe that it will be impossible to properly observe the operation of the existing commingling installations, not to mention the many new ones we can expect in the future.



For these reasons, the Commission, in appointing the Committee, requested it to design installations which would be as fool-proof as possible.

The Committee members accepted this charge, and devoted many hours of work to it. They have designed installations where mis-measurement of oil is possible but not easy. Deliberate tampering and falsification of records would probably be necessary to divert oil. In most cases, this tampering will result in mechanical alterations which we believe can be detected.

For the good of all concerned, and the overall protection of correlative rights, I believe that this report should be considered by the Commission as a criterion for the ideal installation.

I, therefore, urge its adoption, but would also recommend the following changes be made:

On Page 1 of the written report, in Section A. MARGINAL ZONES, I would recommend that the word "below" in the second line be stricken and replaced by "not capable of producing," so that the sentence would read: "Zone commingling without metering will be permitted where all wells in the zones to be commingled are not capable of producing top allowable, and insert the following: This shall not include those cases where wells are capable of producing top allowable for the pool, but are restricted on account of high gas-oil ratios. This has been a matter that we have on several occasions been confronted with at hearings when operators have sought to commingle without measuring the oil, and based the re-

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quest on the ground that the wells weren't making top allowable; however, the wells were actually capable of making top allowable, and without strict control of gas production, it's impossible to tell how much fluid would come from one zone or the other in some cases. For that reason, I believe that the penalized wells should probably be metered.

In Section B. sub-section 1, I would replace the word "acceptable" with "Commission accepted" meters. There are several other minor changes on this page, they're not substantive.

I think it would be well to try to clarify Paragraph 3 a/. Perhaps clarify other points on the page, I don't know. No substantive changes would have to be made, however, outside of the one I mentioned.

Q Mr. Nutter, if I might interrupt. In general, it's anticipated, is it not, that certain wording, as contained in the report, would have to be changed in order to make it acceptable as a manual, just from the standpoint of the type of wording used?

A Yes, sir, I believe that's probably true.

Q You are not going to indicate in each instance where that type of working would have to be changed, are you?

A No, sir. No, sir. As I said, things like that are not substantive, and I think that the wording in some cases may be a little too complex for a manual to be generally distributed.

Q For instance, in Paragraph 3 a/ of Part I, it might be that it would be reworded, but retain the same overall meaning?



A Yes, sir. I wouldn't recommend any change in the Requirements as far as measuring BS&W, and getting credit below 2% and below 2% and all that.

Q Right.

A The meat of the thinking is proper. I have no other suggested changes here for Section A or B. However, when we get down to Section C, ZONES WITH TOP ALLOWABLE WELLS, I'm making no recommendation as to whether this section should be included in the manual or not. At the present time I don't believe there's sufficient evidence on record in the files of the Oil Conservation Commission to support the contention that the subtraction method is accurate enough to rely upon, even when commingling pools underlie a single lease. There's a possibility that this is a suitable method. If the Commission decides it is, and wants to adopt subtraction as a commingling method, Section C should be adequate as contained in the report, with one or two minor changes, neither of which is substantive. I think perhaps another section should be added to this Section 1, which would be D, and cover leases commingling with common ownership in the proposed Rule change that will come through later. We have the situation where the ownership of the leases is identical throughout, and can be commingled without separate measurement of the production from the two leases. In other words, since they are identical leases, the Commission has treated them as a single lease, and perhaps a wording covering that point should be in the manual. It's not in the manual, but

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it would be in the Rule change.

I think this report covers the field very adequately. When we get over to the General Requirements for all metering systems, the Committee has stated that "the operator should be required to submit monthly with the C-115 Form, or as an alternate, keep records of the following items for each meter used for accounting for a period to be specified by the Oil Conservation Commission."

I think it would be well for the Commission to specify that time in its manual, and I would suggest that the words "to be specified by the Oil Conservation Commission" be stricken and substituted with the following words "of not less than two years." Therefore, the records would be kept for two years, at least. The rest of III is adequate, in my opinion, except that I would add one sub-paragraph G to the very end of it there, and it would read as follows: "All schematic diagrams, whether submitted with an application for administrative approval, or as Exhibits at a hearing, shall employ standardized symbols as used on the Drawings in the Appendix." That's just for ease in handling working on these things. Those are the only changes that I would suggest be made in the report.

I think that the report should include a preface which would outline that this is a manual for administrative approval installations, and should be used as a guide in designing and operating systems that you seek after a hearing. Of course, that wouldn't certainly close the door to an application being filed for an in-

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stallation that didn't comply with these.

Q Mr. Nutter, do you contemplate, if this manual, if adopted by the Commission as you've recommended, would have to be changed from time to time as new equipment might be made available or as other conditions might warrant?

A If new equipment came in that wasn't covered by the general language that the Committee attempted to use, then certainly the thing should be amended to take care of that new equipment, providing it was reliable equipment. As circumstances or conditions warranted, maybe the thing would have to be periodically reviewed, I don't know. I don't think we ought to set a time at which it should be reviewed. Just let the need become apparent, and call the hearing.

Q Do you have any further comments you would like to make with regard to the Committee's report before we take up the consideration of Rule changes?

A No, I don't believe so.

Q Now, Mr. Nutter, as presently executed, do the Commission's Rules on commingling take into account compliance with a manual such as you've recommended today?

A No, sir, they don't.

Q What Rules affect the regulation of commingling?

A Rules 303 and 309 are the two Rules that are affected by commingling. 303 is the Rule that requires the production from a pool must be kept separate. 309 is the Rule that requires that



the production from a lease must be kept separate.

Q Are you prepared at this time to recommend proposed Rule changes of both of these Rules?

A Yes, sir.

(Whereupon, Oil Conservation Commission Staff's Exhibit No. 1 was marked for identification)

Q I hand you what has been marked as Oil Conservation Commission Staff's Exhibit No. 1, and ask you if this is a copy of the proposed Rule changes that you are recommending?

A Yes, sir, it is.

Q Referring, now, to your proposed change in Rule 303, would you explain it to the Commission, please?

A Yes, sir. As the Exhibit shows, paragraph (a) would be the same as the existing Rule. Paragraph (b) would be the same as the existing Rule, but add on the end of the first paragraph the words "in accordance with the applicable provisions of the Commission 'Manual for the Installation and Operation of Commingling Facilities,' then current."

Q I might interrupt you there, and ask you why the words "then current" were added on the end of that paragraph?

A This is to take into consideration the point we mentioned a moment ago, that the manual might be changed from time to time as conditions or circumstances warranted.

Q In which event, you wouldn't have to have a Rule change to conform the new Rule to a manual that might be adopted?



A That's right.

Q Proceed.

A Now, I want to make another little change here. It says that the same paragraph would be the same as the existing Rule, but add this on the end.

Coming back to the last sentence of that paragraph; it says -- in essence, it says that the Secretary-Director of the Commission shall have the authority to grant an exception and permit the commingling of two pools without notice and hearing, provided that the production from each pool is accurately measured and determined prior to such commingling. I would suggest that the word "and" be replaced by the word "or." It was pointed out to me that over here in the first section of the manual, or the report, where it provides for marginal zones to be commingled without measure but the allocation to be made on the basis of periodic well test, that wouldn't be in compliance with the existing paragraph (b) of Rule 303, because it says that the production must be measured and determined. Now, I think if we would replace the "and" with an "or" the determination of the production could be on the basis of the well tests. It's just a little point that might ought to be clarified there.

Paragraph 2 of Section 2 would be identical to the existing Rule, and paragraph 3 would be replaced to read as follows: "Applicant shall furnish evidence that all persons owning any interest of record in the subject acreage, which interest appears in the

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Applicant's files have been sent a copy of the application by registered mail." We will replace that with the words, "Applicant shall furnish proof of the fact that all parties owning any interest in the subject lease were notified by registered mail of his intent to commingle production from the separate common sources of supply."

We would leave the fourth paragraph as it is. In 309-B.

Q Mr. Nutter, would you explain why you feel that a revision of the third paragraph is necessary?

A This paragraph was written when we had the hearing back in January of 1960, and at that time we were trying to accommodate several different suggestions in one sentence. The wording is extremely awkward in there. It's difficult to interpret exactly what it means. We have quite a few requests for interpretation of what the paragraph means. I think the way it's suggested here, it may be a little easier to understand.

Q Do you have any further comment with respect to the proposed revision of Rule 303?

A No, sir.

Q Refer, then, please, to your proposed revision of Rule 309-B, and explain that to the Commission.

A 309-B at the present time is the one I was mentioning before, which "permits the commingling of production from two or more"-- I am quoting from the Rule -- "two or more separate State, Federal, Indian or patented oil or gas leases in a common tank



battery without notice and hearing, provided that the application has been filed in due form and provides further several requirements. It does not require the measurement of the oil prior to the commingling. It's based on the fact that the ownership is identical in every respect.

What we're trying to do in changing 309-B is taking care of the situation where there is a diversity of ownership, as well as cover the situation where the leases are identical. Would you like for me to go through the 309-B?

Q Yes, if you would, please.

A 309-B, as proposed, would read as follows: "The Secretary-Director of the Commission shall have authority to grant exceptions to Rule 309-A to permit the commingling of production from two or more separate leases in a common tank battery without notice and hearing, provided application has been filed in triplicate with the Commission and is accompanied by plats of the leases showing thereon the wells on the leases and the formations in which they are completed, and schematic diagrams of the commingling facility, showing it to be of an acceptable design in accordance with the Commission "Manual for the Installation and Operation of Commingling Facilities" then current, and provided further that:"

309-A says, "The production from each lease must be kept separate to permit the commingling".... and so forth.



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Now, we come back to Rule 303, which is the previous Rule we talked about, to get permission to commingle between the Pools. Then, if you had that permission, and you wanted to commingle two leases, which had more than one pool completed on them, you would have to have an exception, of course, to 303 and 309. Paragraph 2. "Adequate facilities will be provided for accurately determining production from each well at reasonable intervals." I think most of it is self-explanatory, without going into any detail, unless you have some questions.

Q Mr. Nutter, some question might be raised with reference to sub-paragraph 3. Would you explain the necessity, in your opinion, of having the consent in writing of all interests in the lease and all operators of adjoining leases?

A I think that any party owning an interest in the lease certainly has the right to the knowledge, at least, that this lease is being commingled with another lease, particularly if it's being commingled with properties belonging to someone else. That is, farmer Jones has a right to know that the production from his lease is being commingled with farmer Smith's production. The operators of adjoining leases shouldn't have any real basis for objection to an operator commingling, providing that his next door operator is a prudent one. That portion, as far as the offsetting operators, could be stricken, I believe. However, I know, as a matter of fact, that the two largest royalty owners in the State, being the Federal Government and the State of New Mexico, want to



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know about it when their leases are commingled. The few patented leases in this State, some of the farmers may want to know about it, and some may not. I think, to take care of the two large royalty owners and the other ones of the patented owners that want to know about it, we ought to have the provision in here. Monies can be affected in here, and where monies are affected, people are interested.

Q Do you have anything further you would like to add with reference to the proposed revision of Rule 309?

A No, sir. Just urge its adoption.

Q Do you feel that an adoption of the proposed Rules 303 and 309 would conform them to be operational if the Commission also decides to adopt a Manual based upon the report of the Commingling Committee?

A I wouldn't recommend that either of these Rules be amended unless the report were adopted.

Q In your opinion, would adoption of the proposed Rules and the Commingling Manual, as you have proposed, tend to protect correlative rights?

A Yes, sir, I believe that it will.

Q Do you have anything further you would like to offer at this time?

A No, sir.

Q Mr. Nutter, did you prepare the proposed revisions of Rules 303 and 309?



A Yes, sir.

MR. MORRIS: At this time, Mr. Commissioner, we would offer Oil Conservation Commission Staff Exhibit No.1, in this case into evidence.

MR. PORTER: Any questions concerning Exhibit 1? It will be admitted, for the record.

(Whereupon, Oil Conservation Commission Staff's Exhibit No. 1 was received in evidence)

MR. MORRIS: That concludes the direct examination of Mr. Nutter.

MR. PORTER: Anyone have a question of Mr. Nutter? Mr. Christy.

MR. CHRISTY: I have one or two questions.

CROSS-EXAMINATION

BY MR. CHRISTY:

Q I notice the word "registered mail" has remained in your proposed revision. Would there be any objection to "certified mail?" There's a substantial saving.

A No, sir, there is no objection to the substitution of "certified" and/or "registered."

Q As I understood your direct examination, you did not feel it was necessary to notify offset operators?

A No, sir. I have given this some serious thought lately, Mr. Christy, and the Commission periodically puts out a memorandum listing all of the administrative approval, whether it be for no-



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flare exceptions, dual completions, any kind of an exception to the rule that is handled administratively, and I think that any prudent operator is going to be interested in knowing what the next-door operator is doing, but he's not going to object to this operator's commingling, I don't believe, but he does want to know that the man is commingling just so he can keep his eye on the installation, and he can get this information from the periodic memorandum that comes out. I don't think it's necessary to notify the man at the time that you are making the application.

Q I quite agree with you, at least that far. The last question I had, I noticed in Rule 303-B, in your third paragraph substitution, that you have provided for proof of the fact that all parties owning an interest have been notified. In the present Rule, am I correct that it says "all parties owning an interest as reflected by the files of the operator shall be notified;" my question being, how can the operator know at the last moment that he has notified all persons owning an interest unless he checks the records every time he gets ready for a hearing?

A The other one would depend on him checking his files, wouldn't it?

Q Yes. I wonder why you deleted that provision.

A Because his files might not be complete.

Q So, do I understand you, that you are proposing that we would have to check the records every time we made an application under this Rule?



A If the files weren't complete, that's possible.

Q Don't you think that would be an onerous burden on an operator to have to check the records every time under 303 or 309?

A Well, I have to answer the question, Mr. Christy, by asking a question, can you rely on the operators' files as being complete as to the ownership of the lease?

Q We feel our files are complete before we pay royalty on them.

A Well, perhaps the old Rule, then, in that respect is more suitable.

Q I noticed that you deleted it, and I wondered why. We might be in a position here of having to run to Aztec or Lovington every time we want to file an application.

A Yes, sir. Well, we wouldn't have to abstract the whole record there to find out who owns it.

MR. CHRISTY: Thank you very much.

MR. PORTER: Anyone else have a question of Mr. Nutter? He may be excused.

(Witness excused)

MR. PORTER: Is that all you have, Mr. Morris? Mr. Morris, have you used up all your hats?

MR. MORRIS: I think I have used up all my hats except one, and at the end of the testimony if there is to be any more from other sources, I have several communications I would like to read into the record on behalf of various interested parties, stat-



ing their position, for the record.

MR. PORTER: Mr. Morris, the Commission will give you an opportunity to do that as soon as the testimony has been concluded. Does anyone else desire to present testimony in this case at this time?

MR. KELLY: Booker Kelly, substituting for Mr. White, who was called away. I would like to present some testimony from Texaco.

MR. PORTER: You may proceed, Mr. Kelly. Have your witness sworn.

MR. KELLY: I have one witness.

(Witness sworn)

J. E. ROBINSON, JR.,

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, employer and position, please?

A I am J. E. Robinson, Jr. I am employed by Texaco, Inc., Midland, Texas, as a petroleum engineer.

Q Have you previously testified before this Commission --

A Yes, sir, I have.

Q -- and been qualified?

A Yes.

Q Were you a member of the Industry Study Committee?



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A Yes, I was.

Q What does Texaco seek in your proposed testimony today, Mr. Robinson?

A If any part or parts of the proposed minimum standards are adopted, Texaco wishes to go on record in supporting Part I, C of the minimum standards of commingling crude oil. In other words, we are supporting the subtraction method for commingling.

Q Part I of zone commingling is for zones with common royalty. You are proposing the subtraction method for zones of common royalty, and not for zones of anything under common royalty?

A Yes, we are proposing the subtraction method for zones of common royalty only.

Q What is the subtraction method?

A The subtraction method is an accurate method of allocating production to different zones by using one less meter than the total number of zones being commingled, and proportioning the difference between the pipeline runs and the summation of all meter readings to the zone that is unmetered.

Q In using the subtraction method, you always use one less zone meter from the total number of zones that you are commingling, is that correct?

A Yes, that's correct. When commingling two zones only, one meter would be used, and when commingling three zones only, two meters would be used, and so forth.

Q Is the subtraction method an accurate method for deter-



mining the zone's production?

A Yes, we believe it's an accurate method. Not only is it accurate, but economical.

Q Has Texaco previously been on record in supporting this subtraction method?

A Yes, sir. At the Statewide Hearing to revise Rule 303, on January 13, 1960 Texaco proposed the subtraction method. At that time there was some doubt in the Commission's mind that this was an accurate method since the unmetered side would account for all weathering, and the request was not granted. We believe that if a meter is proven into a stock tank, that any evaporation losses will be included in the meter factor. A large percentage of evaporation occurs as the oil is initially flashed into the stock tank. Any weathering losses can be incorporated into the meter factor by allowing the crude to stand for any determined length of time. If necessary, the crude could be weathered for the average length of time that it takes for a tank to go on pipeline stream.

Q Has Texaco run any weathering tests on different gravity crude, and, if so, will you explain how the tests were run and what the results were?

A We have run weathering tests on crudes in the Monument, the Vacuum, and the Justis Ellenburger and McKee Pools. The tests were run by Texaco engineers using the presently installed lease tanks. Gravities and temperatures were taken at a depth of 3 feet

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below the top of the liquid. The engineers used an engineering scale to mark the gauge line to measure the depths. All tanks were top filled, and were being filled prior to the start of the test, and were isolated at the start of the test. We selected three different gravities, ranging from 31.9 degrees to 44.9 degrees API to conduct our weathering losses. These ranges were selected since the larger part of New Mexico crudes are within this range.

(Whereupon, Texaco's Exhibit No. 1 was marked for identification)

Q Will you explain the weathering tests for the crudes in the Monument Pool, and in so doing, refer to what has been marked Exhibit 1?

A The lowest gravity crude that we tested was on the State of New Mexico "G" Lease in the Monument Pool. On all of our charts, we start on the left-hand side. We have our "Hours" that each measurement was taken. The next is the "Gauge" depth that we found the crude to be occupying in the tank. Next is the "Temperature" in the degrees Fahrenheit that we observed from three feet below the top of the fluid. The next is the "Observed Gravity." The next column is our "Tank Chart Volume." These charts are from the strap table that were made from each of the individual lease tanks. Our next column is the "Gravity" corrected at 60 degrees Fahrenheit, and our next column is our "Volume in Barrels" at 60 degrees. This is based from the 1952 ASTM Petroleum Crude



Measurement Tables. And our last column is the "% Change in Initial Volume at 60 degrees Fahrenheit." So, on our lowest crude that we tested, which was a 31.9 degree crude in the Monument Field, $2\frac{1}{2}$ hours before we started our test, we had 13 feet 5/12/16" in the tank. The observed temperature was 81 with the gravity corrected at 31.8, and we had a volume of 441.75.

Now, after the tank had been filling for $2\frac{1}{2}$ hours, we started our test. We started out with an initial gauge of 14 feet, 7-12/16". The initial temperature was 90 degrees. The observed gravity was 34.0. The tank chart volume was 483.97 barrels. The gravity was 31.9. We started this test with initial volume of 478.21 barrels. After the crude had weathered for one hour, our engineers measured the tank again. This time it was 1/16th of an inch less. The temperature was 96 degrees, the gravity was the same. The corrected volume was 476.87 barrels. So, you see, roughly, that we have a weathering loss of about a barrel and a half if you disregarded any of the other tests. If you only had these two figures, well, you would look, and you would say, "Well, we have, oh, about .2800 of 1 percent weathering loss." We don't believe that this is necessarily true, and I believe I can point it out later on.

After two hours, we had the identical gauge depth reading as we had before, but our temperature has risen to 101 degrees. Our gravity in this measurement was 32.3, our volume is 475.95 barrels. So we have lost about ninety-two hundredths of another barrel from



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the end of one hour to the end of two hours. This is equal to about forty-seven hundredths of one percent change in the total volume.

We let our crude weather another two hours, or at the end of four hours, we still had the same measurement here, but our oil has cooled down one degree. We have a gravity of 31.8 degrees. We now have a volume of 476.15 barrels, or actually in these two measurements we have gained about two-tenths of one barrel between the two-hour figure and the four-hour figure, or this represents about forty-three hundredths of one percent change in total volume.

The next we allow the crude to weather another four hours, or at the end of eight hours we still have the same gauge depth here. Our crude has cooled off some more. It has cooled off to 98 degrees. Our gravity is 31.7, but we have started showing an increase now in volume of 476.53 barrels, or about thirty-eight hundredths of a barrel increase between the end of the four-hour and the eight-hour test. This represents about thirty-five hundredths of one percent change.

Now, we allowed the crude to weather another four hours, or at the end of twelve hours we have lost about one-sixteenth inch in depth, but our crude has cooled off considerably. This measurement was taken at night, and when the ambient temperatures had fallen. We have a gravity of 31.7, but our volume corrected back to 60 degrees now is 479.63 barrels. Actually, we have gained about a barrel and a half from our initial start of our weathering



test, so at the end of twelve hours, we're actually showing a gain of twenty-nine hundredths of one percent in our total volume.

After the crude was weathered for twenty-four hours, it now has a temperature of 83 degrees. The gravity is still 31.9. We have a volume of 478.21, which is identical to the volume that we started out with, after this crude had weathered for twenty-four hours. There is no difference in the percent change. Now, we allowed the crude to weather an additional twenty-four hours, or after forty-eight hours we have a height of 14 feet, 7 1/16" in the tank. Our temperature is 85 degrees, we have a gravity of 31.9, our volume is 477.31 barrels, which is, roughly, about nine-tenths of a barrel loss, or a net change of 18/100ths of one percent. We started out with a test where the temperatures were fairly high. We ended our test when the temperature of the crude was down. Now, we have no accurate method of measuring the temperature of the shell of the tank. However, we have to make the basic assumption that our temperature in our tank and the temperature of the shell of the tank have to be associated. So the coefficient of steel expanding and contracting with the degree change has to accommodate this percentage change here. We know that weathering has taken place, but yet after twenty-four hours we don't show any weathering. So the only thing that this can be based on is that as the tank heats up it will expand, and then as it cools off, it will contract. On all of these temperatures, each time the temperature went up, we had a larger percent loss, but as

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it started cooling down, we started gaining on volume again.

Q Do you want to go on to Exhibit 2 in the Vacuum Pool, now?

(Whereupon, Texaco's Exhibit No. 2 was marked for identification)

A Exhibit 2 was the intermediate gravity that we tested. This was taken on our State of New Mexico "L" & "M" Leases. When we started out, the tank was being filled, and at 9:00 o'clock on June 1st they shut the tank in. It was isolated. The initial temperature was 79 degrees, and our initial volume was 242.13 barrels. At 10:00 o'clock A. M. the temperature had raised four degrees. We now have a volume of 241.64 barrels, or a loss of approximately a half a barrel. This results in a net percent change of about two-tenths of one percent.

At 11:00 o'clock A. M. our temperature was 82 degrees; our volume was 241.76. So, actually, even though weathering has been taking place between one and two hours, we have gained about twelve-hundredths of a barrel from the one-hour reading, and this results in a net change of fifteen-hundredths of one percent.

At 12:00 o'clock noon the temperature was 84 degrees, the volume was 241.52 barrels. We are now showing a loss between 11:00 o'clock and 12:00 o'clock. This is equal to twenty-five-hundredths of one percent.

At 1:00 o'clock, or at the end of four hours, we have a temperature of 83 degrees, our volume is 241.64. We have now gained

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twelve-hundredths of a barrel back, and in our weathering loss which results in a reduction in the percentage change to approximately twenty-hundredths of one percent.

After the crude had weathered for eight hours, or at 5:00 P. M. on June 1, the temperature was 84 degrees, the volume was 241.69 barrels. Now, this shows that our crude is one degree warmer. Normally, you would expect that we would have lost some volume here, but that may not be necessarily so.

At 1:00 P.M. the shell of the tank could have been possibly a hundred or maybe a hundred ten degrees, whereas the crude was only 83, because the shell of the tank has to heat up first to then heat the crude, and then as it cools off, the shell of the tank will be the first one to cool off, too.

After weathering for eight hours, we now have a difference of about forty-three-hundredths of a barrel, or eighteen-hundredths of one percent of the total volume.

After weathering for twelve hours, or at 9:00 P.M., our temperature was 81 degrees, for a reduction of three degrees from the previous reading. We have now gained thirty-seven-hundredths of a barrel from the previous reading, and this represents two-hundredths of one percent change in the total volume.

After weathering for twenty-four hours, or at 9:00 o'clock the next morning, the temperature is at 82 degrees, or three degrees warmer than when we started out. It has a volume of 241.85 barrels, or a percent change of approximately eleven-hundredths of

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one percent.

After weathering for forty-eight hours, we now have a temperature of 80 degrees, or one degree more than what we originally started with. We have a volume of 241.84 barrels, and this represents approximately twelve-hundredths of one percent change in the total volume.

(Whereupon, Texaco's Exhibit No. 3 was marked for identification)

Q Now, going on to Exhibit 3, would you explain that to the Commission?

A Exhibit No. 3 was taken on our C. E. Penny NCT-4 Lease. This is a commingled battery commingling Justis Ellenburger and Justis McKee Pools. In this test here we have tried to select different tests to show the Commission what the differences are. This particular test over here, we started out with a higher temperature and ended up with a lower temperature. This one is more or less constant, but this one here, we start out with a temperature that is fairly low, and then end up at a higher degree temperature. We took our first measurement at 1:20 A.M. in the morning. We did not start our test, though, until 3:55 A.M. We had eight feet 11 and 7/8ths inch with a temperature of 71 degrees. The gravity was 44.6. The volume was 184.59 barrels. One hour later, at approximately 5:00 o'clock in the morning, we have the same gauge depth, our temperature has cooled off one degree. We now have a volume of 184.68 barrels, or nine-hundredths of a barrel



increase. This represents four-hundredths of one percent increase in the change from our original volume.

Two hours and twenty minutes later, at 6:15 in the morning, which is probably about the coolest part of the day, at least, our test got our minimum degrees at this time. The temperature was 68 degrees, we had 184.66 barrels. We have shown two-hundredths of one barrel loss from the measurement of one hour, but we're still ahead of the original volume, or three-hundredths of one percent.

At 7:30 in the morning, three hours and thirty-five minutes later, our temperature is 74 degrees. We now have a volume of 184.10 barrels, or a loss of about a half a barrel. This represents twenty-six-hundredths of a percent change.

After four hours thirty-five minutes, our temperature is one degree warmer, we're showing more loss now. We're showing thirty-one-hundredths of one percent change.

After eight hours and fifteen minutes' weathering, or 12:10 P.M., our temperature is 81 degrees, our volume is 183.26 barrels. The percent change is seventy-two-hundredths of one percent. Now, as the temperatures go up, we show more percent change in our total volume.

At 4:00 P.M., after the crude had weathered for twelve hours, we reached our highest temperature of 83 degrees. We now have 182.50 barrels, or about two barrels less than what we originally started with. This represents 1.13 percent change in total volume.

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After this crude had weathered for twenty-five hours, or 5:00 o'clock the next morning, the temperature has dropped down to 76 degrees, or an eleven-degree change in temperature. We have now increased our volume from $182\frac{1}{2}$ barrels to 183.29 barrels, or an increase of about seventy-nine-hundredths of one barrel. We now have a loss of about seventy-hundredths of one percent.

After weathering for forty-eight hours, our temperature is 78 degrees. We have 182.92 barrels, or about a barrel and seven-tenths barrel change. This represents a change of ninety-hundredths of one percent.

More or less assuming all of the tests, the lowest test, or the lowest gravity, naturally, we don't have very much weathering. This is what you would normally expect in a lower gravity crude that you don't have as much volume tolerance in the lower crude as you do a higher gravity, but after twenty-four hours it was zero. On the intermediate gravity we are showing approximately twelve-hundredths of one percent, which is a very small percentage, and then in our higher gravity it would be all dependent upon when you selected your weathering loss. If you wanted to select after two hours, you can actually show an increase in volume, or if you selected at that time when the temperatures were extremely high, then you would have more loss than you would at a cooler temperature.

Q What conclusions do you draw from these tests?

A In our opinion, the tests firmly established the follow-



ing facts: That weathering losses are not nearly as great as some in industry would believe. (2) That the variation of the tank volumes caused by the changes of the ambient temperature is a much greater contributing factor to the total volume of the crude than is the weathering factor. (3) That the weathering factor is of but minor importance. (4) Even though we feel that weathering is of little importance, we feel that it can be combined in the meter factor to accurately account for all weathering losses.

Q Why did you select these particular pools for your tests?

A We attempted to select different gravities that the larger percent of New Mexico crudes would fall in.

Q In your opinion, are these tests fairly representative of the weathering of crudes in the various pools throughout New Mexico?

A Yes, we believe that they are. But, of course, as the ambient temperature in the warmer summer months increases, as in August, one would expect more weathering to occur than these tests indicate. However, during the fall and the winter months, when the seasonal temperature is lower, there is less weather.

Q When were these tests conducted?

A June of this year.

Q What economic advantages do you see in the use of the subtraction method?

A The economical advantages will be dependent upon the



method of production of a particular lease. The subtraction method will eliminate one zone meter, plus the bad oil return meter, and a sampler for all installations, and this savings is approximately one thousand dollars per installation. Using the subtraction method on a lease where the production is obtained by the use of hydraulic subsurface pumping installation, it is possible to eliminate two samplers and three meters; this savings is approximately sixteen hundred dollars.

Q At the beginning of your testimony, you stated that you served on the Industry Committee. Do you offer your testimony today as a member of that Committee?

A No, sir. I offer it only on behalf of Texaco, Inc.

Q Do you have anything else you wish to state?

A No, that's all.

Q Were Exhibits 1, 2 and 3 prepared by you or under your direction?

A The Exhibits were run by Texaco engineers who submitted the data to me, and I prepared it in this form.

MR. KELLY: I offer the Exhibits 1, 2 and 3 in evidence.

MR. PORTER: Without objection, the Exhibits will be admitted in evidence.

(Whereupon, Texaco's Exhibits Nos. 1, 2 and 3 were received in evidence)

MR. PORTER: Does anyone have a question of Mr. Robinson? Mr. Nutter.



CROSS-EXAMINATION

BY MR. NUTTER:

Q These tanks which you were conducting these tests on, were they pressure tanks or vented to the atmosphere?

A They were carrying a small amount of back pressure on them. It was run under normal operating conditions.

Q Assuming that the Commission should adopt the Manual, and assuming that they would adopt the subtraction method, do you think it would be appropriate that the requirement be that this subtraction method be limited to the tanks that did hold a back pressure on them?

A No, sir. You can't limit all of them. I would have no objections to it, but there might be some operators that on a low gravity oil, he might not have at this time tanks with back pressure vents on them, what not. I'd have no objection to having it stipulated in it.

Q Well, as a matter of fact, don't most tanks have pressure vents on them?

A Yes, sir.

Q What is the standard practice now?

A As a general rule, they do unless you get into some of the old fields where maybe the tanks are corroded, and they are not capable of holding back pressure on the tank, and then I would think that you would probably find quite a few installations where they didn't have it.

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Q You mentioned that you would expect more loss by weathering from the higher gravity crudes than you would from the lower gravity. Do you think that the provision in the Manual should be to limit it to any particular gravity range?

A No, sir. I think that all New Mexico crudes should be included in it. We're proposing this for a lease of common royalties, and we are testing or proposing to prove our meters into a tank which even though the higher gravity oil will have more weathering losses as it is initially flashed and as it is allowed to stand and weather, however, the meter factor on a higher gravity oil would have a larger meter factor than a lower gravity oil would. So I think the method would be accurate for all crudes.

Q How about the case where high gravity gas well liquids are commingled with oil?

A I would think as long as the meter is proven into a tank, then you could incorporate in the meter factor the weathering losses, and you could be very accurate with these losses.

Q So you feel that the gravity of the crude or whether it's crude or distillates doesn't matter as long as your meter factor contains the weathering factor?

A That's correct.

MR. PORTER: Anyone else have a question? Mr. Morris?

BY MR. MORRIS:

Q Mr. Robinson, would Texaco concur, then, with the recommendation of the Committee concerning the subtraction method?



A They would, if it is adopted.

Q Texaco would concur with the report as it is submitted?

A I'll leave my comments for my closing statement. When I started my testimony, I stated that we were supporting this part of the minimum standards, if any part or parts of it are adopted.

Q I wasn't trying to ask a trapping question. I just wondered if Texaco had any recommendation beyond those of the Committee's recommendations.

A No, sir, we do not. We are supporting the subtraction method. We would like to see the operators at least be given the advantage of what we believe to be an accurate method, but have one which is also economical, if any part is adopted.

MR. MORRIS: Thank you.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused)

MR. PORTER: Does anyone else desire to present testimony in the case?

MR. MORRIS: If the Commission please, before any statements are taken, I would like to read into the record several communications that I have received in the statements might like to be based upon the statements that I would read.

MR. PORTER: You may go ahead and read those statements, Mr. Morris.

MR. MORRIS: I have a communication from Shell Oil



Company, signed by Mr. C. A. Nyhof, Crude Oil Department - Midland. It's quite lengthy, but I'll read it into the record in its entirety. Addressed to the New Mexico Oil Conservation Commission, Attention: Mr. A. L. Porter, Jr.

Gentlemen:

It is noted that the final report by the Industry Study Committee on Minimum Standards for Commingling Crude Oil and Hydrocarbons in New Mexico has been submitted to the Oil Conservation Commission and that at the regular hearing on August 16, 1961 the Commission probably will consider incorporating such standards as part of Rules 303 and 309-B.

There is no doubt that the adoption of the Committee's study would be a big help to the Commission and to the operators in establishing uniform procedures. However, in cases where the interest ownership is diversified the commingling of crude oil from wells, zones, or leases presents a problem to the purchaser of the production insofar as proper allocation for payment is concerned. Due to difference in price the commingling of high gravity condensate with crude also presents another problem. It is our feeling that the purchaser has the right to refuse to purchase any commingled production if means or facilities are not available to properly determine quality and ownership at the time and place of receipt. In other words, the purchaser, in taking the commingled production, will not rely upon breakdown data compiled and furnished by the operator.

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It is therefore recommended that even though the Commission may grant permission to commingle it should be with the understanding that the operator should not start commingling operations until he has first consulted and made satisfactory arrangements with the purchaser of the production.

In the case of diversified ownership one possible solution is for the purchaser to require that the operator assume the full responsibility of disbursing payments to all interest owners. For protection and indemnity to the purchaser this would require that the operator, in some cases, obtain approval from each interest owner whereby such interest owner would agree to look to the operator for payment. This could possibly be done at the time the operator obtains consent to commingle as is now provided in Rule 309-B.

We respectfully call this to your attention so that our recommendation may be given proper consideration when the matter comes up for hearing on August 16, 1961.

MR. PORTER: Mr. Morris, I would assume that any operator would do that because it would seem to be a rather futile gesture for an applicant to get approval for a commingling installation and then not be able to sell his oil.

MR. MORRIS: I think that's a reasonable assumption. I have a further communication from Gulf Oil Corporation, signed by Mr. W. A. Shellshear. Addressed to the Oil Conservation Commission, Attention Mr. A. L. Porter, Jr., Reference Case No. 2356 Scheduled for Consideration at the Statewide Hearing to be Held in



Santa Fe on August 16, 1961

Gentlemen:

The following are Gulf's comments in regard to the above referenced case.

The Industry Study Committee on Commingling of Crude Oil has done an excellent job in setting up standards to minimize the possibilities of failure and accidental or purposeful mismeasurements of commingled crude oil. However, it is our opinion that the standards which were set up to comply with the Commission's directive add to the cost of installations at a time when producers are attempting to reduce costs by commingling. The standards do tend to minimize the possibilities of purposeful mismeasurements; however, prudence on the part of the producer has been and still will be a prime factor.

Gulf desires the opportunity to commingle crudes from multi-pay leases having common royalty on top allowable zones as well as on marginal zones without prior metering, with allocation of production being made to the respective pays based on well tests. Based on increasing cost trends an operator must continually exploit all means of reducing or minimizing costs. By the elimination of individual measurement a great saving can be realized in investment, operating and maintenance costs and also a substantial reduction in reporting and keeping of records would result in further savings. It is our opinion that this approach is a practical one.

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It is recommended that the new rules, if adopted, not require seals on metering facilities because of the burden of resealing that would be placed on the Commission and the operator.

It is further recommended that provided the new rules apply to installations already installed as approved by the Commission that the need for any modifications be determined after individual consideration.

Reference is made to the portion of the proposed revision to Rule 309-B which reads, "All parties owning an interest in the leases and all operators of adjoining leases have consented in writing to the commingling of production from the separate leases." We feel that the obtaining of approval from offset operators of the adjoining leases is not necessary and only serves to add a paper-work burden upon the producer.

I have a communication addressed to the New Mexico Oil Conservation Commission, Attention: Mr. A. L. Porter, Jr., from Mr. J. D. Wheeler, Division Manager, The Ohio Oil Company, Houston Division. "Reference Case 2356, August 16 Hearing. The Ohio Oil Company concurs in the proposal to authorize administrative approval of applications to commingle crude oil provided the safeguards and minimum standards recommended by the June 21 report of the Industry Committee are complied with. We agree that consent of royalty owners should not be required and that notice to royalty owners and offset operators may be dispensed with if those safeguards and minimum standards are adopted."

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I have another communication, addressed to the New Mexico Oil Conservation Commission, signed by Mr. R. D. Hanley, vice president, Mobil Oil Company, entitled "Socony Mobil's statement on commingling at August 16, 1961 NMCCC Hearing. Socony Mobil Oil Company, Inc. recommends adoption of the proposed commingling standards. We also urge that the Commission not require the notification of royalty owners and offset operators for administrative approval of commingling requests. We support Shell Oil Company's position regarding notification of royalty owners and offset operators. We feel that the notification requirements are unnecessary and a burden that should not be placed on the industry. Where minimum requirements are not to be followed, the Commission, after proper public notice, should require a hearing prior to approval."

One further communication, addressed to the New Mexico Oil Conservation Commission, signed by R. W. Ely, Assistant Division Superintendent, Cities Service Petroleum Company. Attention: A. L. Porter, Jr: Cities Service Petroleum Company recommends the revision of Rules 303 and 309-B to provide for administrative procedure for obtaining permission to commingle crude oil under the minimum standards as proposed by the Committee on Commingling of crude oil June 21, 1961. Cities Service Petroleum Company further recommends that the Commission consider revision of that portion of these Rules whereby it is necessary to obtain consent in writing from royalty owners and owners of adjoining oil and gas leases to commingle production from separate leases or separate producing

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zones."

MR. PORTER: Does anyone else have a statement to make in the case? Mr. Seth.

MR. SETH: If the Commission please, I would like to read a statement on behalf of Shell Oil Company which relates to the notice provisions of the proposed rule change.

"Shell Oil Company endorses the proposal by the New Mexico Oil Conservation Commission to adopt minimum standards for commingling installations and to provide in the regulations for administrative approval of same. We respectfully and urgently request, however, the Commission's reconsideration of the proposal that operators be required to inform all royalty interest owners and offset operators of the proposed installation.

As you are aware, many leases are on record with hundreds of separate interests. We are sure that the Commission will appreciate the enormous amount of nonproductive paper work that will be created if operators are required to solicit approval of these interest owners for their operations. Under an oil and gas lease, the lessee is granted the privilege of operating the property in any reasonable and proper manner and is accountable under the law to see that the royalty owner receives his share or interest in the production from his lease. We feel that the royalty owner is adequately protected and that the practice of commingling is prudent and in the interest of both the lessee and the lessor. Therefore, the operator should be allowed to apply this practice without the

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specific permission or notification of the royalty owner.

With regard to notification of offset operators, it is our opinion that no operator would object to a proposed commingling installation but only to the improper operation of same. Virtually all of the representatives of the industry whom we have asked have indicated that they would consider such notification unnecessary. We urge, therefore, that this notification not be required.

We would like to reiterate that among the many problems facing the industry today is the enormous amount of routine paper work which is adding steadily to our already large overhead. We believe that it is in the interest of the State of New Mexico, the lessors, and the industry in general to make every attempt to minimize non-productive efforts and costs.

We therefore urge the Commission's reconsideration of the requirements to notify royalty interest owners or offset operators when requesting administrative approval of commingling installations.

Now, if the Commission please, over the past years, we have all seen a number of attempts to suggest that the Commission interest itself in the relationship between the operator and the royalty ownership. In this case, Case 1850, that was referred to here, this suggestion is accomplished, it's incorporated in the Rule, and it's been done before, but I think more and more recently we're seeing this attempt to push the Commission into this area of a relationship which is strictly a legal matter. Obviously, the

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relationship between the royalty owner and the operator is a legal one, contractual one, determined by the lease, and all the case law and statute law that surrounds them.

If the Commission gets into that area and attempts to adjudicate these rights, I think it's getting into a whole new and entirely different world, as far as its past history is concerned. If these royalty owners, in response to the notices, should come in before the Commission and object to the installation of a commingling facility, they will object on the ground it's a violation of their terms of the lease, the obligation of the operators. It's difficult to see how the Commission is going to decide that question without deciding whether it's entirely a contractual or legal matter. We feel this notice is not necessary, because the royalty owner is entirely, otherwise, entirely protected by this large body of case law, and the statutory law, and the contractual arrangement that has been created. I don't believe the Commission really wants to get into this matter of possible contention and dispute. The parties ought to be left to the negotiation and the Court in that area rather than the Commission hearing the matter. That's why we are going a little bit overboard on this notice. We see it coming in in other areas of Regulation by the Commission. We think it's going to cause the Commission some serious administrative trouble if it's pursued any further. Thank you.

MR. PORTER: Anyone else have a statement?

MR. HUGHES: R. N. Hughes, representing Phillips Petroleum



Company. Phillips wishes to state its endorsement of the New Mexico Oil Conservation Commission proposal to adopt minimum standards for commingling installation and to provide for administrative approval. We further endorse at the close of the Texaco, Inc. testimony the subtraction method be adopted for administrative approval. We respectfully request the Commission's approval of this proposal.

MR. SCHNEIDER: A. E. Schneider, Amerada Petroleum Corporation. Amerada is generally in agreement with the report that has been submitted, and we hope that the Commission will see fit to adopt these recommendations. We feel that satisfactory installations have been made and can be made along this line in an economic manner. The one thing that the Texaco presented about the subtraction method, we agree with them on that. We believe that the subtraction method can accurately be used. Also, we are in agreement with the letter that Mr. Seth read from Shell proposing that we not have to notify the royalty interests, especially in the leases that we are attempting to commingle.

MR. PORTER: Mr. Jacobs.

MR. JACOBS: Ronald J. Jacobs, attorney and engineer for Skelly Oil Company. I have a statement I would like to read, and then file with the Commission.

Skelly Oil Company favors the proposed changes in Rules 303 and 309-B. We feel that providing for administrative approval of commingling applications according to established minimum standards will aid both the Commission and the operators.

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We have examined the report by the Industry Study Committee setting forth minimum standards for commingling crude oil. The Committee is to be commended for its excellent report which entailed many hours of meetings, thought and effort. We do feel, however, that especially in the case of zone commingling on the same lease with common ownership and interests, the drawings set out in the Appendix are too restrictive.

We are attaching a schematic diagram of the commingling facilities actually installed on one of our leases. The diagram is self-explanatory, but briefly, it provides for separate heater treater or separator facilities for each zone with facilities downstream of the meter, but before commingling, for diverting a zone's production into a stock tank separate from the other zones. This allows not only testing of each individual zone, but also at the same time, allows us to check the meter reading against stock tank gauges.

We feel that this system, as outlined, is as accurate and fool-proof as any outlined in the Committee's report. A separator on the gas line provides a fail safe feature on the system in that it prevents oil being lost to the gas pipeline by a malfunction of the dump meters. Although this will allow unmetered oil to be produced into the tank battery, it would prevent unmetered oil from going down the gas pipeline.

We believe a system of this type to be of good design, and earnestly urge consideration of it.

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MR. PORTER: Mr. Buell.

MR. BUELL: Guy Buell, for Pan American Petroleum Corporation. We would like to make two suggestions in this case. First, the minimum standards as presented here today, provide that any time you meter downstream of the treater, you must install a sampler. Samplers are expensive. For that reason, we would recommend to the Commission that that language be amended to provide that a sampler only be installed when the water production from that lease is in excess of two percent. We would further recommend that none of these standards be applied retroactively to previous installations already approved by the Commission, and certainly under no conditions without notice and full hearing on changes.

MR. PORTER: Mr. Christy.

MR. CHRISTY: Sim Christy for Humble Oil & Refining Company. I might say at the start to the Commission that Humble, at the request of the Commission, was pleased to furnish a member to serve on the Industry Commingling Committee. First, it appears evident that the arrangements devised before this Committee may be employed to minimize or to facilitate detection of mismeasurement of crude oil production. Humble does not advocate the adoption of mechanical standards for a commingling. Periodic well tests are believed to be satisfactory for this purpose. It is recommended by Humble that the arrangements devised by this Committee not be required of any operator unless the Commission finds in a specific case that such is necessary in specific instances for proper regu-

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lation of commingled production. Secondly, we would mention that in the event the proposed minimum standards for commingling are adopted by the Commission, that it is recommended that the notification to the royalty owners and the offset operators not be required when requesting administrative approval for commingling installations. This later matter seems to have support from Amerada, Shell, Mobil, Ohio, Gulf, and as to the offset operator, Mr. Nutter.

I could not personally close without one comment in support of Mr. Seth's position. I think it would be unnecessary to advise this Commission that the State and the Federal Government, as royalty owners, have sufficient rules and powers to protect themselves. As to the fee royalty owners, the practicalities are that about ninety percent of them don't even know what you sent them, two percent never receive it, and the other seven or eight percent are in a fight or an agent on a lease contract problem, and that would mean that this Commission is going to be right into a law suit type of hearing as to contractual rights between the operator and the royalty owners. For that reason, I would strongly recommend to the Commission the deletion of notification to the offset operators and royalty owners.

MR. PORTER: Mr. Robinson.

MR. ROBINSON: J. E. Robinson. Texaco, as an operator in the State of New Mexico, does not agree with the minimum standards that have been proposed here today by the Industry Study Com-



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mittee. The adoption of such minimum standards will destroy much of the economic advantage that is gained by commingling these minimum standards which have been proposed because of the operations of the imprudent operator. The operator who diligently strives and obeys all laws and regulations of this Commission must now be penalized with an economic burden because of the actions of a few imprudent operators. We believe that the Commission should require operators that are guilty of unethical practices to install these minimum standards, if they are adopted. However, we urge the Commission not to require these standards for the prudent operator. If the Commission now sees that it must adopt strict commingling standards to minimize the illegal transfer of oil from one zone to another, Texaco strongly recommends that the Commission adopt, as one system, the subtraction method.

We believe that the testimony given here today clearly indicates that this method accurately measures each individual zone's production, and reaches the objectives that are being sought here by this hearing. We join with other operators in urging that the requirement of the notification of the royalty owners and that offset operators be deleted. Thank you.

MR. PORTER: Mr. Anderson.

MR. ANDERSON: R. M. Anderson, Sinclair Oil & Gas Company. We believe that the proposed commingling Manual will be restrictive to an operator and unnecessarily so, but in the event that it is adopted, Sinclair would like to join with Texaco and



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some of the others in recommending that the subtraction method be retained in the Manual. We would like to concur with the recommendations made here today concerning not notifying royalty owners and other owners of an interest in a property, to get their approval, or to notify them of the matters pertaining to the commingling. We concur with that sentiment. We would also like to recommend that in the event that the Manual is adopted, that it delete any requirement for samplers whenever they are required, except if an operator elects to meter or measure the production prior to treating, and then at that time if the production exceeds two percent water, I believe then that samplers should be required, or at least should be left to the option of the operator. I have also a position I would like to make on behalf of Sinclair Crude Oil Company, who purchases crude in this State, and they would like to concur with the sentiments that were expressed with regard to getting the purchaser's approval prior to commingling in these installations. Possibly written requirements similar to the requirement in the LACT unit Rule, requiring a letter from the pipeline company approving the LACT unit, possibly a similar requirement should be put in the proposed Rule changes to require the applicant to get approval from the purchaser to commingle prior to making his application. Thank you.

MR. PORTER: Mr. Lyon.

MR. LYON: V. T. Lyon with Continental Oil Company.

Continental Oil Company would like to urge three points for con-



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sideration by the Commission on the matter under discussion. No. 1, we concur with the position of Shell Oil Company in regard to requiring consent of interested parties and notification of offset operators. No. 2, we fear that the adoption of the Manual may serve to force more expensive and complicated equipment that may be necessary for a particular application, and place an excessive burden of proof on any applicant at hearing wishing to deviate from any of the installations illustrated. No. 3, we observe several instances of a lack of clarity in the wording of the report, and rather than burden this record with a lengthy discussion, would like to submit a letter to the Commission for their consideration in drafting a final form of any formal directive or order.

MR. PORTER: Mr. Lyon, you will be permitted to submit any suggested wording that you would like, but we urge you to do that immediately, as soon as you possibly can.

MR. LYON: Yes, we will.

MR. PORTER: Anyone else?

MR. TUFFLY: A. J. Tuffly with Tidewater Oil Company. Tidewater wishes to concur in the adoption of installations and operation of commingling facilities and revisions of Rules 303 and 309 to provide for administrative procedures for obtaining permission to commingle crude oil in connection with the proposed Manual. Thank you.

MR. PORTER: Anyone else have a statement? Mr. Shoemaker.



MR. SHOEMAKER: Glenn Shoemaker, Indiana Oil Purchasing Company. We concur with Mr. Nyof and Sinclair's Crude Oil statements, that purchaser approval should be required for commingling.

MR. PORTER: Does anyone else have any statement to make? The Commission will take the case under advisement and take a short break.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in machine shorthand and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record, to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this, the 30th day of August, 1961,
in the City of Albuquerque, County of Bernalillo, State of New
Mexico.

John D. [Signature]
NOTARY PUBLIC

My Commission expires:

June 19, 1963

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