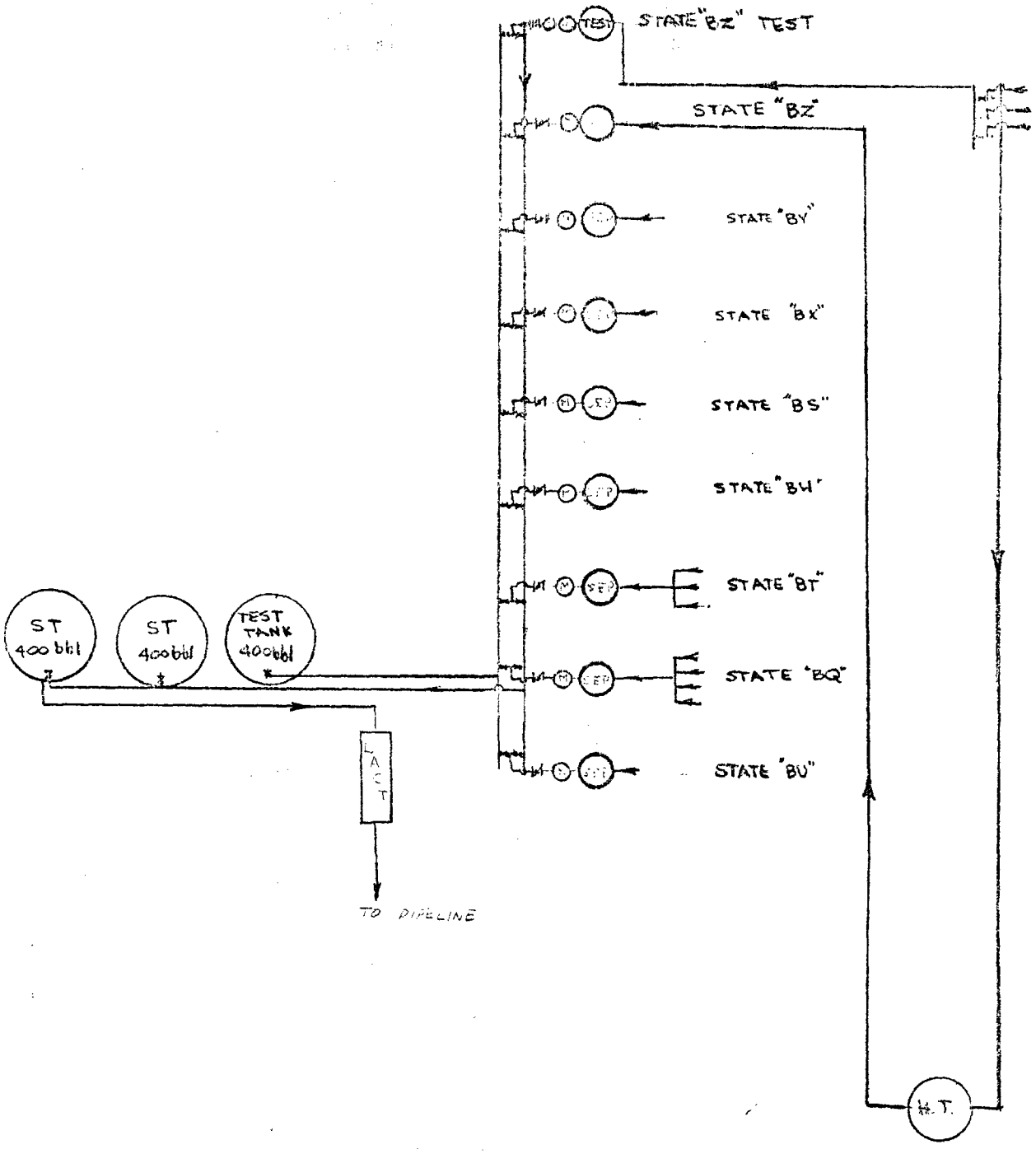

PAN AMERICAN PETROLEUM CORPORATION

SCALE:

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EXHIBIT

PAN AMERICAN PETROLEUM CORPORATION

CENTRAL BATTERY AND AUTOMATIC CUSTODY
TRANSFER FACILITIES
STORAGE SYSTEM V - EMPIRE ABO POOL
EDDY COUNTY, NEW MEXICO

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING
JULY 27, 1960

IX. ATTACHMENTS

1. Lease Plat - Proposed Storage System V

2. Schematic Flow Drawing - Proposed Storage System V

3. Pipeline Company Letter of Approval of Automatic Custody Transfer Facilities - Proposed Storage System V

~~4. Commissioner of Public Lands, State of New Mexico, Letter of Approval, Commingling and LACT, Proposed Storage System V~~

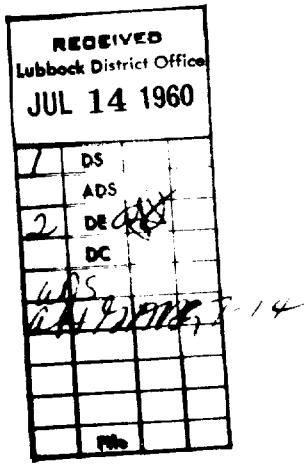
SERVICE PIPE LINE COMPANY

WEST TEXAS DIVISION

C. E. WILSON
DIVISION MANAGER

1628 19TH STREET
LUBBOCK, TEXAS

July 13, 1960



Subject: Commingling and LACT Facilities
Empire Abo Field
Eddy County, New Mexico

Mr. Neil S. Whitmore
District Superintendent
Pan American Petroleum Corporation
Box 268
Lubbock, Texas

Dear Mr. Whitmore:

We have reviewed your July 12 letter which describes your proposed LACT facilities for Storage Systems IV and V in the Empire Abo Field, Eddy County, New Mexico.

Service Pipe Line Company has no objection to your planned method of lease operation and will accept custody of lease produced crude through your proposed meter type LACT unit.

Yours very truly,

Charles E. Wilson

Charles E. Wilson
Division Manager

CEW:lm

cc: Mr. H. G. Mariner
General Manager
Service Pipe Line Company
P. O. Box 1979
Tulsa 2, Oklahoma

EXHIBIT

PAN AMERICAN PETROLEUM CORPORATION

CENTRAL BATTERY AND AUTOMATIC CUSTODY
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CONTENTS

I. INTRODUCTION

Pan American Petroleum Corporation respectfully submits this exhibit in support of its request to the Oil Conservation Commission of the State of New Mexico for

1. Approval to commingle in a central battery, to be located in the NE/4 SW/4 Section 34, T-17-S, R-28-E and to be designated Storage System V, the production from the following Pan American operated State leases in the Empire Abo Pool of Eddy County, New Mexico

State Lease Number	Pan American Lease Name	Description
B-2071-17	BZ	S/2 NW/4, S/2 NE/4, N/2 SE/4 SE/4 SE/4 Sec. 27, T-17-S, R-28-E
B-8814	BW	SW/4 SW/4 Sec. 27, T-17-S, R-28-E
E-7832	BY	NE/4 NE/4 Sec. 34, T-17-S, R-28-E
E-7116	BT	W/2 NE/4, NE/4 NW/4 Sec. 34, T-17-S, R-28-E
647-85	BU	SW/4 NW/4 Sec. 34, T-17-S, R-28-E
647-360	BS	SE/4 NW/4 Sec. 34, T-17-S, R-28-E
B-2071	BX	SE/4 NE/4 Sec. 34, T-17-S, R-28-E
B-2071	BQ	SW/4 Sec. 34, T-17-S, R-28-E

2. Approval to install and operate automatic custody transfer facilities at the site of the central battery to handle the commingled production from the State leases listed above.

Attachment No. I is a plat showing the location of the above described State leases and the proposed central battery and LACT unit installation. The installation of these facilities to accurately record the volumes of lease produced crude and automatically transfer that crude to pipeline custody will:

1. Conserve natural resources in the form of light hydrocarbons which are lost from produced crude oil to the atmosphere during conventional tank gauging operations at which time accumulated light ends escape from the tanks and others flash from the stored oil to the atmosphere.

2. Substantially reduce the crude oil residence time in the storage tanks thereby lessening vapor losses by way of normal tank venting or breathing.

3. Conserve manpower and improve lease operations by substantially reducing tank battery attendance time which will in turn release lease operating personnel and pipeline personnel for performance of other duties.

4. Release those monies in excess of the cost of LACT equipment which would otherwise be invested in conventional lease storage facilities for use in finding and developing additional oil reserves in the State of New Mexico.

II. CENTRAL BATTERY EQUIPMENT

In addition to the piping, valves, separators, tanks, etc., that make up a conventional tank battery, the proposed central battery will be equipped with individual automatic well flow control valves, individual lease production meters and an emergency high level float switch in one of the interconnected storage tanks to shut in all wells connected to the central battery in the event of an emergency high fluid level in the storage tanks. All well flowlines will be capable of withstanding pressures in excess of the wellhead shut in pressure.

III. LACT UNIT EQUIPMENT

The positive displacement meter LACT unit to be installed at the proposed Storage System V central tank battery is basically the same as the four other NMOCC approved LACT units Pan American now has in operation in the Empire Abo Pool. The LACT unit will include a pipeline pump; a strainer; an air eliminator; a BS&W monitor; a valve to divert unmerchantable oil into a recycle tank for further treating; a proportional pipeline sampler; a temperature compensated positive displacement meter (equipped with net barrels counter, set-stop counter, electric impulse transmitter to pace the pipeline sampler and a fail-safe safety shut-down switch); a back pressure valve to assure that the line to and from the meter is packed with oil at a pressure in excess of the vapor pressure of the metered liquid; a calibrated meter prover tank; a back flow check valve and a LACT unit control panel.

IV. CENTRAL BATTERY AND LACT UNIT OPERATION

Operation of the central battery and LACT unit is described below and can be followed by reference to the schematic flow drawing included as Attachment 2.

Oil production will flow from each well through individual high pressure flowlines into the tank battery area and then through the individual well automatic flow control valves and into the respective lease production or well flowline headers (A). From the individual lease headers (A) the oil flows through the respective lease production separators (B) and meters (C) into a common header where production from the several leases is for the first time commingled. From this point the commingled stream flows into the LACT unit surge tank (D). When the oil level in the surge tank (D) reaches the high working level float switch (E) the pipeline pump (G) is automatically started. Oil then passes through strainer (H), air eliminator (I) and the BS&W monitor (J). If the oil is of merchantable quality as determined by the BS&W monitor (J), flow continues through the diverting valve (K), sampling point (L), PD meter (M), back pressure valve (N), check valve (P) and on to the pipeline past the meter prover tank (O). When sufficient oil has been transferred to the pipeline to lower the fluid level in surge tank (D) to the low working level float switch (F), power is automatically shut off to the pipeline pump (G) and the transfer of oil to the pipeline is stopped. When the fluid level in the surge tank (D) returns to the high working level float switch (E), automatic transfer of oil to pipeline custody again takes place.

In the event the BS&W monitor (J) detects unmerchantable oil, valve (K) will close to the meter run and direct the flow of oil into the recycle tank (Q). When the BS&W content of the oil entering the LACT unit returns to a satisfactory range as determined by the BS&W monitor (J) the diverting valve (K) will close to the recycle tank and again direct the flow of oil to the LACT meter run and to the pipeline. Any unmerchantable oil which is collected in the recycle tank (Q) will be chemically treated in the tank to break the oil-water emulsion. Following this, water will be drawn from the tank bottom, and the treated oil will be returned to the pipeline surge tank (D) by recycle pump (R).

With the proposed facilities all wells on all leases can be individually tested by the proper manipulation of block valves in the lease production headers (A) and flowing the oil from the single well on test from the header (A) into the well test separator (T) and on through the well test meter (U). After the production from the well on test is metered it is commingled with the production from the other wells and flows into the surge tank (D).

V. PIPELINE OIL SAMPLING

A composite representative sample of all oil delivered to the pipeline will be obtained by the sampler (L). The positive displacement meter (M) will be equipped with an electric impulse transmitter which will cause the electrically driven sampler pump to extract proportionate samples of all oil passing through the meter. Collection of the composite sample will be accomplished in a vapor proof container for

subsequent testing by a representative of the pipeline company. Calibration of the BS&W monitor and adjustment of the treating procedure will be made on the basis of the analysis of the composite sample.

VI. LEASE PRODUCTION AND LACT UNIT METER PROVING

Individual proving of the lease production meters (C) will be accomplished by closing a normally open block valve (Y) and opening a normally closed block valve (X) to direct the lease production into the meter prover tank (O). The metered volume will then be compared to the prover tank gauged volume. The oil accumulated in the prover tank (O) during meter proving tests will be returned by way of the recycle pump (R) to the pipeline surge tank (D). For added flexibility piping will be installed so that the lease production meters (C) can also be proved by flowing oil through the meters into the calibrated recycle oil tank (Q).

The LACT unit positive displacement meter will be proven by directing the flow of oil from the LACT unit into the meter prover tank (O). The metered volume will then be compared to the prover tank gauged volume. When excessive meter error is indicated by this procedure, immediate action will be taken to return the meter to a condition that will guarantee the desired measuring accuracy.

The meter prover tank (O) will be constructed to conform to API standards. The inside surfaces of the tank will be plastic coated to prevent corrosion and the adherence of crude products, thereby maintaining the prover tank calibration.

VII. PROTECTIVE FEATURES

The LACT unit will be checked periodically by the producer's representative to assure satisfactory operation. In addition, the following features will be built into the LACT system to protect the royalty owner, the producer, and the pipeline and to prevent waste.

1. During normal operation no oil can be delivered to the pipeline from this battery without first passing through the positive displacement meter (M).

2. The inlet and outlet valves on the LACT unit side of the meter prover tank (O) will be closed and equipped with pipeline company seals during normal operations.

This will prevent inadvertent by-passing of the LACT unit meter and transfer of non-recorded volumes of oil to the pipeline during the lease production meter proving operation.

3. The positive displacement meter (M) will be equipped with set stop controls to prevent over production.

4. The positive displacement meter (M) will be equipped with a non-resettable barrels counter to maintain a positive record of the quantity of oil delivered to the pipeline.

5. The back pressure valve (N) will hold a positive pressure on the meter (M) thereby insuring proper conditions for accurate measurement.

6. The positive displacement meter (M) will be equipped with a safety switch which is geared to the counter shaft. In the event the shaft rotation stops due to shaft failure, the safety switch will assume a position that will cause power to the pipeline pump (G) to be shut off thereby preventing the delivery of non-recorded volumes of oil to the pipeline.

7. All oil produced into the Storage System V central battery will be monitored for BS&W content and only that oil of merchantable quality will be delivered to the pipeline.

8. Performance of the BS&W monitor (J) will be checked by the manual determination of sample BS&W content at the end of each sample collection period.

9. The sampler (L) will collect and store under pressure, a representative composite sample of all oil delivered to the pipeline. Periodically, the sample thus collected will be analyzed for BS&W content and gravity by a representative of the pipeline.

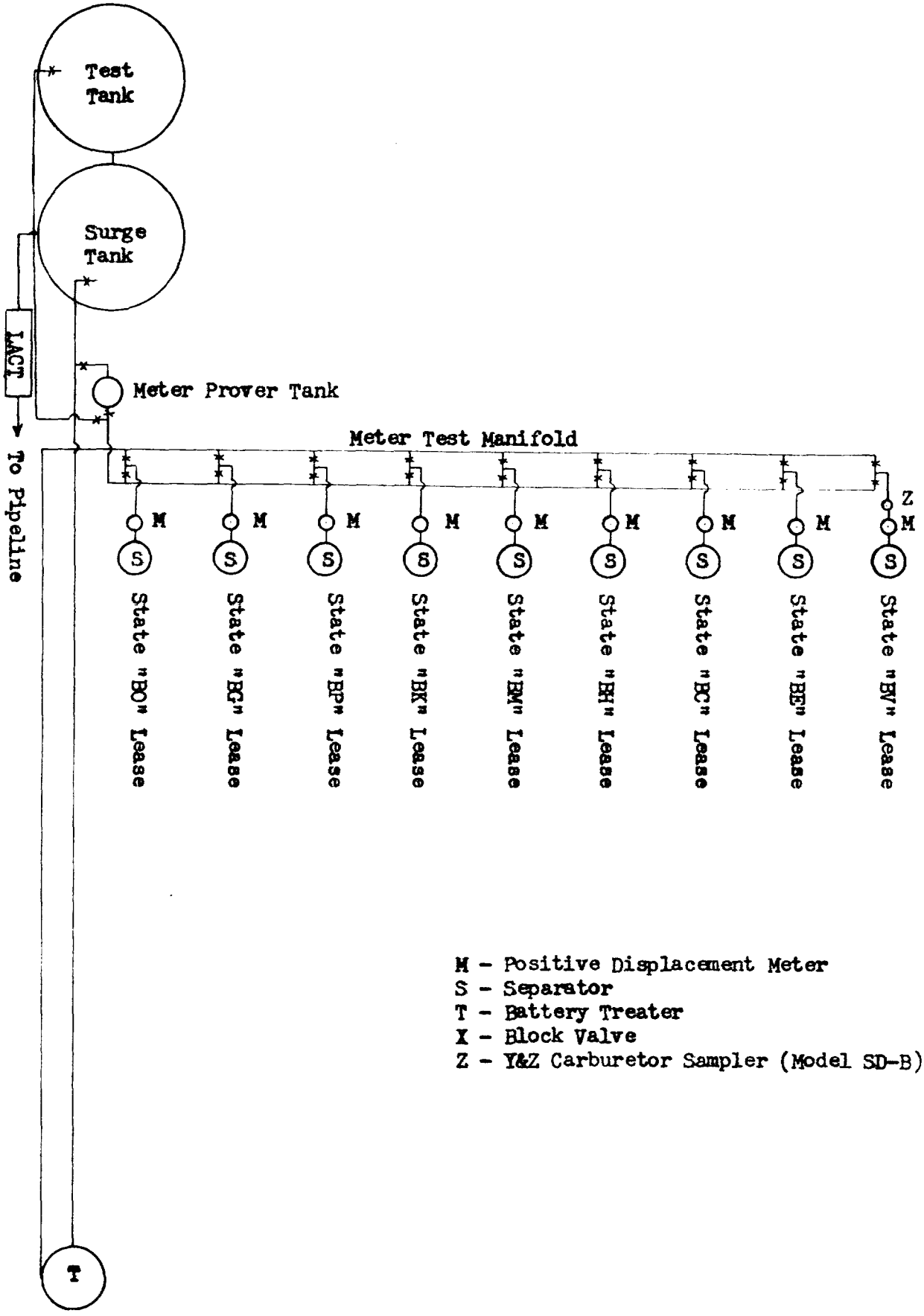
10. In the event of failure of the low working level float switch (F) the fluid level in the surge tank (D) will be drawn down to the point at which vapors will be drawn into the pipeline pump suction. Because the pump (G) will then lose suction, flow through the

meter (M) will immediately drop below the predetermined rate range and the safety switch built into the meter will cause the power to be shut-off to the pipeline pump.

11. In the event of failure of high working level float switch (E) the pipeline pump will not be energized by the rising fluid level in the surge tank (D). Subsequently, the incoming oil will rise to the point where it will overflow through an equalizing line into the recycle tank (Q). With continuing production into the tanks, the oil level in the recycle tank will rise and actuate the emergency high level float switch (S) which will in turn cause all of the flow control valves to close and shutin all wells connected to the central battery. All well flowlines will be constructed to withstand pressures in excess of wellhead shutin pressures.

VIII. TAMPER PROOF DESIGN OF LACT UNIT

The BS&W monitor controller will be locked against tampering and the block valves on the LACT unit side of the proving tank will be sealed at all times except during proving runs by authorized personnel.



M - Positive Displacement Meter
S - Separator
T - Battery Treater
X - Block Valve
Z - Y&Z Carburetor Sampler (Model SD-B)

PAN AMERICAN PETROLEUM CORPORATION	SCALE:
Empire Abo Storage System IV Battery Installation Plat Showing State "BV" Lease With Continuous Sampling Facilities, Eddy County, New Mexico.	DRG. NO.