

April 11, 1979

Sascan Oil of Canada, Inc.
406, 435 - 4th Avenue S. W.
Calgary, Alberta
T2P 3A8

Attention: Mr. F. W. Kelly
Vice President
Drilling & Production

Dear Sir:

Re: 1977 Annual Report
East Houtledge Unit No. 1

Receipt of the report on production and injection operations for East
Houtledge Unit No. 1 for the year 1977 is acknowledged.

It would be appreciated if we could receive a second copy plus two (2)
copies of future reports.

Yours sincerely,

H. Clare Moster, P. Eng.,
Director, Petroleum Branch.

HCM/et

DEPARTMENT OF MINES, RESOURCES AND ENVIRONMENTAL MANAGEMENT

ROUTE SLIP

TO <u>J. I. RUSSELL</u>	FROM <u>W. P. Noster</u>
TO	FROM

- | | | |
|--|--|--|
| <input type="checkbox"/> For your approval or revision | <input type="checkbox"/> Reply direct with copy to me | <input type="checkbox"/> Please return |
| <input checked="" type="checkbox"/> For your information | <input type="checkbox"/> Please supply data for my reply | <input type="checkbox"/> Please see me |
| <input type="checkbox"/> Please take action | <input type="checkbox"/> Return with comments and/or recommendations | <input type="checkbox"/> Please phone |
| <input type="checkbox"/> Extracts of minutes for your information and action | <input type="checkbox"/> Investigate and report | |
| <input type="checkbox"/> Please draft reply for signature of | | |

Date Oct. 16/74 Subject Last Routledge Pressure Surveys

Message Ken Bergen of Lamedan has ~~not~~ been in to see me on these surveys and he is presently performing some of the required surveys and shall be conducting others as workovers on the wells are required. This type of scheduling prevents a well having to be shut down only to take a pressure.

MNR-A-94

Use reverse side if necessary

INTER-DEPARTMENTAL MEMORANDUM



DATE August 20, 1974

FROM H. C. Moster

TO The Oil and Natural Gas Conservation Bd.:

Acting Chief Petroleum Engineer

Jas. T. Cawley, P. Eng., Chairman

J. S. Roper, Deputy Chairman

SUBJECT EAST ROUTLEDGE UNIT NO. 1

CONVERSION OF 2 PRODUCING WELLS TO INJECTION WELLS

Samedan Oil of Canada, Inc. as operator of the above unit has made application to convert the following two producing wells to water injection wells:

1. Samedan Routledge^{Prov.} 4-11-9-25 WPM
2. Samedan Routledge 8-14-9-25 WPM

BACKGROUND

East Routledge Unit No. 1 was unitized under Unitization Order No. 13 on May 15, 1972 and pressure maintenance Order No. PM 20 was filed on April 18, 1972. Injection commenced on November 10, 1972 through 5 injection wells. Samedan applied for approval of increased injection pressures in February 1973. The Board granted permission to raise the maximum allowed injection pressure on 3 wells from 1,075 p.s.i.g. to 1,500 p.s.i.g. on October 17, 1973.

The initial "Engineering Report, Proposed East Routledge Unit No. 1 April, 1971" proposed 6 injection wells plus 2 additional wells to be converted at a later day (approximately 1 year). The existing unit has 5 injection wells and this application is to convert the 2 producing wells mentioned in the initial report to injection wells at this time.

DISCUSSION

Attachment 1 shows the unit area and indicates the well pattern and present production characteristics of each well (i.e. - daily fluid production, water-cut, cumulative oil production, daily water injection, injection pressures, and cumulative injection).

Attachment 2 indicates the existing daily oil production rates from the producing wells in the unit plus the two wells for which this application is requesting approval to convert to water injection.

Attachment 3 illustrates the unit's actual production history in comparison to that predicted in early 1970.

Attachment 5 is the unit and individual well production data presented in graphical form.

The above data would indicate that there is little if any response to date being felt from the waterflood. Attachments 3 and 5 would indicate the existing production characteristics fall short of the predicted history under primary recovery. At the time of commencement of water injection the two wells requested for conversion, namely 4-11-9-25 and 8-14-9-25, were producing approximately 25 and 33 BOPD, respectively. It was because of this that the two wells in question were not converted to injection at that time. Presently the wells are producing approximately 12 and 24 BOPD, respectively.

Due to the apparent ineffectiveness of the existing injection volumes, Samedan as unit operator have applied to convert the subject 2 wells at this time. It is worth noting that these 2 wells presently produce approximately 12% of the unit total oil production.

Attachment 2 indicates the well located in 4-11 is situated on the edge of the unit and is offset by four wells capable of production. Three of these wells are Samedans, two of which have received approval to be abandoned. The fourth well is a suspended Chevron well and we have received formal approval from Chevron for the proposed conversion and also Chevron's support to the application as a Working Interest Owner.

During the initial construction of the waterflood facilities in 1972 the subject two wells were tied into the injection system. Therefore no additional pipeline construction is necessary and only conversion of the wells is required (see Attachment 4).

RECOMMENDATION

It is recommended that the application be approved.

A regulation amending Order No. PM 20 to include the subject two wells in the list of injectors for the East Routledge waterflood has been enclosed.

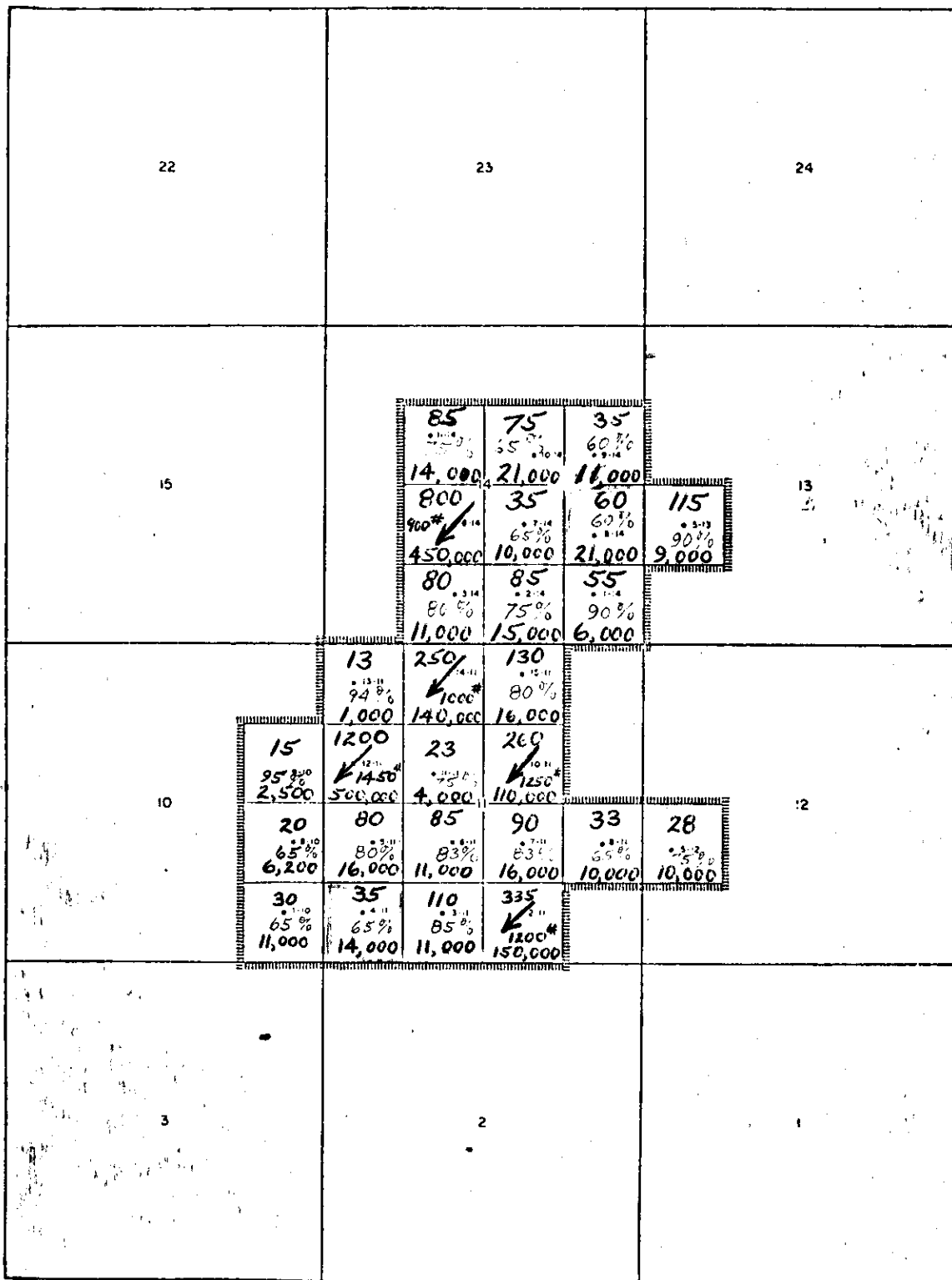


H. C. Moster

HCM/evh
Attachments
c.c. - J.D. Russell ✓

PART XXIII
MAP OF UNIT AREA

ATTACHMENT 1



R-25-W

• PRODUCING WELL
--- UNIT BOUNDARY
* NUMBERED TRACT

EAST ROUTLEDGE UNIT NO. 1
MANITOBA PROVINCE, CANADA

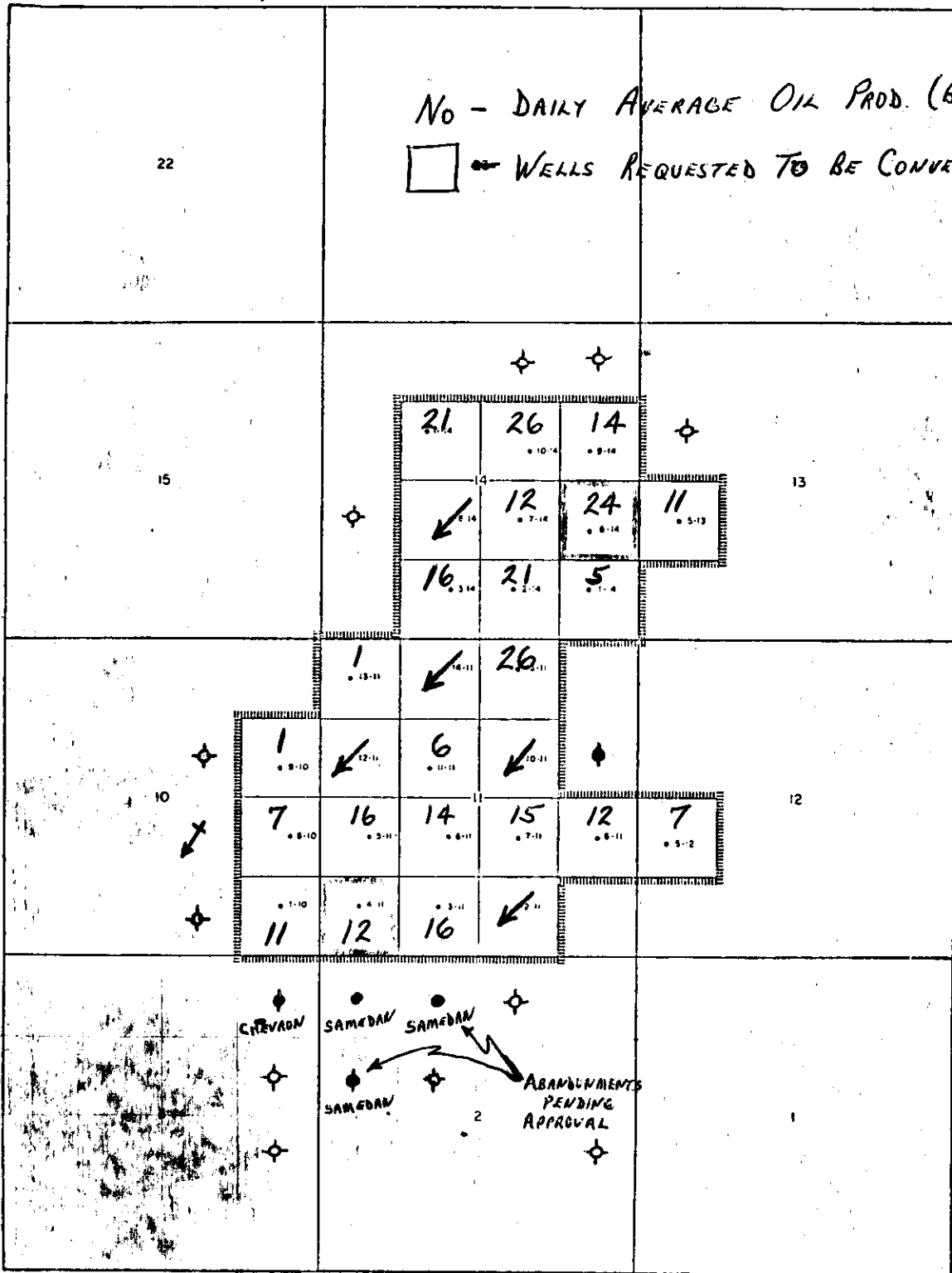
BPD
WATER CUT
CUM. OIL BBLS

BWPD
INS. PRESS.
CUM. WATER INS.

0 1000 2000 3000
SCALE
-36-

PART XXIII
MAP OF UNIT AREA

ATTACHMENT 2



ATTACHMENT

EAST ROUTE UNIT NO. 1

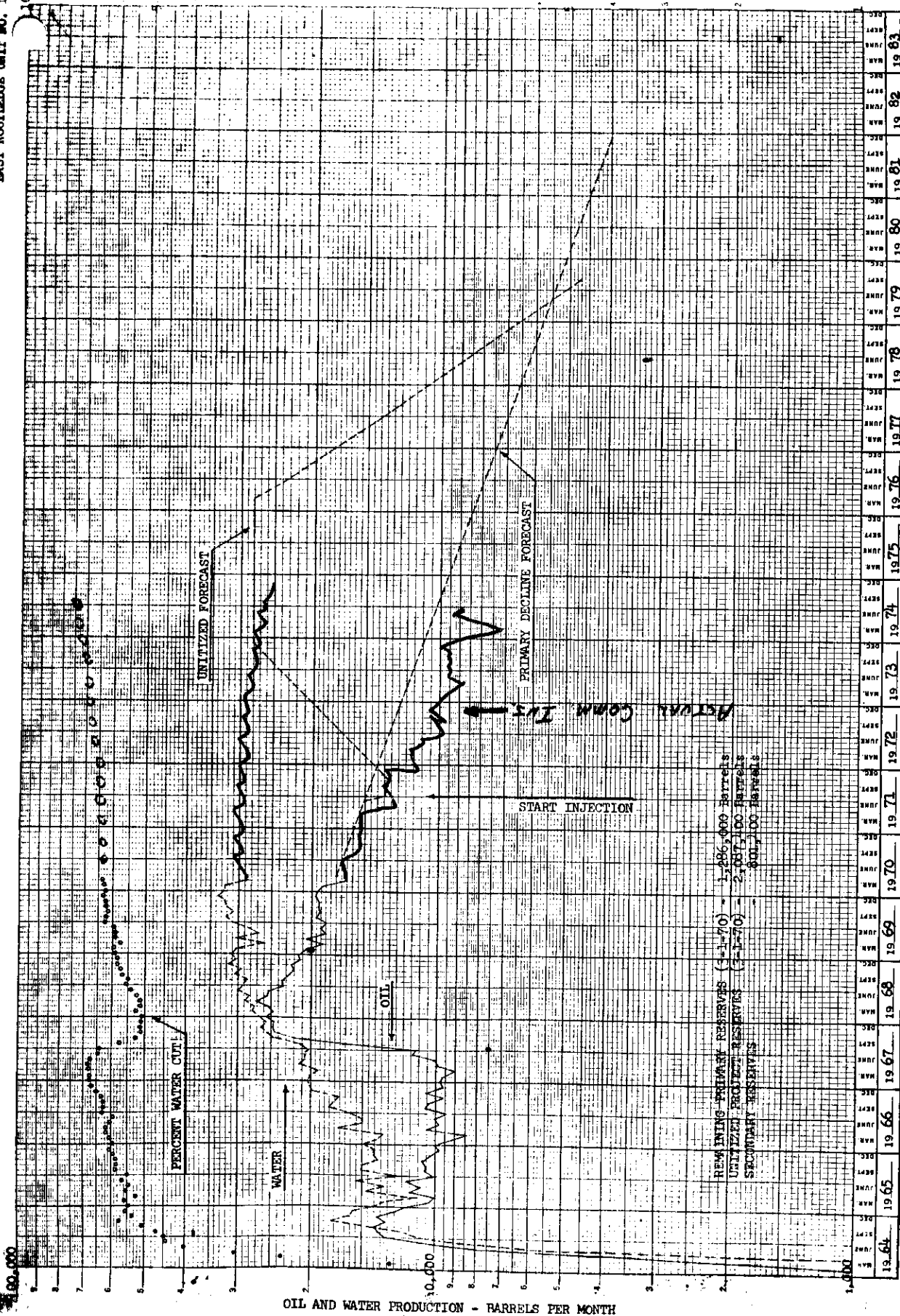
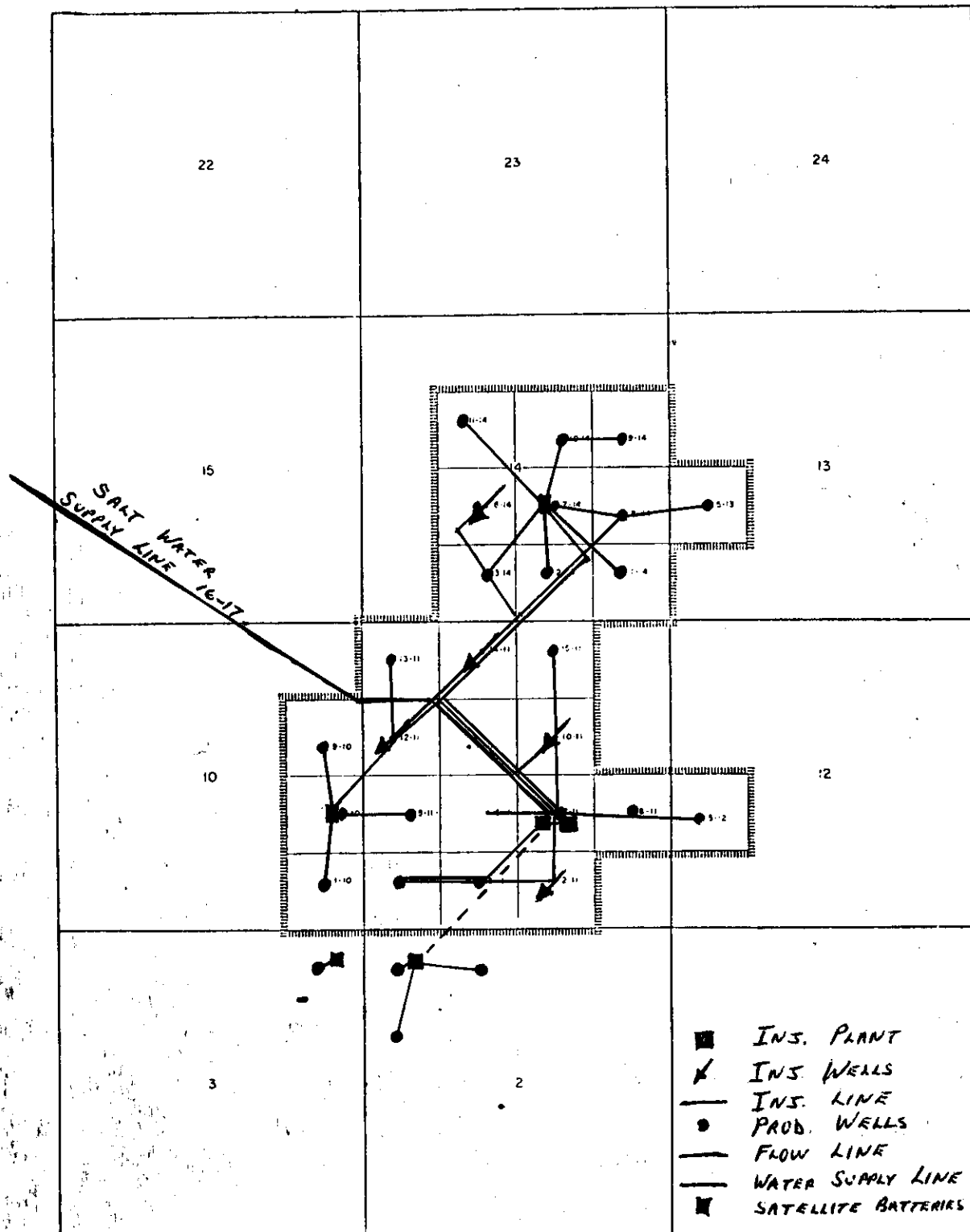


FIGURE NO. 7

PART XXIII
MAP OF UNIT AREA

ATTACHMENT 4

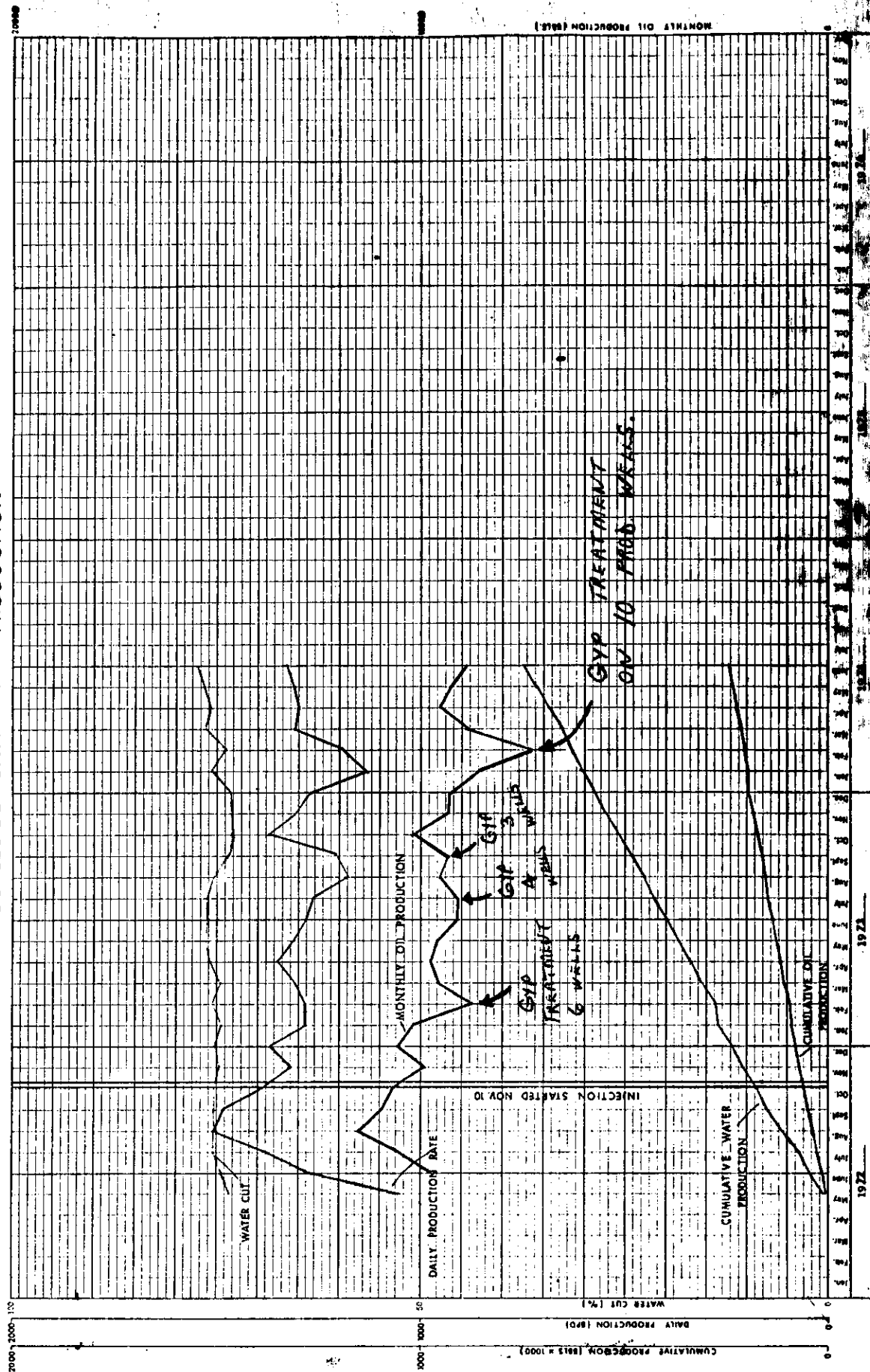


● PRODUCING WELL
 --- UNIT BOUNDARY
 --- NUMBERED TRACT

EAST ROUTLEDGE UNIT NO. 1
 MANITOBA PROVINCE, CANADA

0 1000 2000 3000
 scale
 -36-

EAST ROUTLEDGE UNIT #1 - PRODUCTION



EAST ROUTLEDGE UNIT #1 - INJECTION

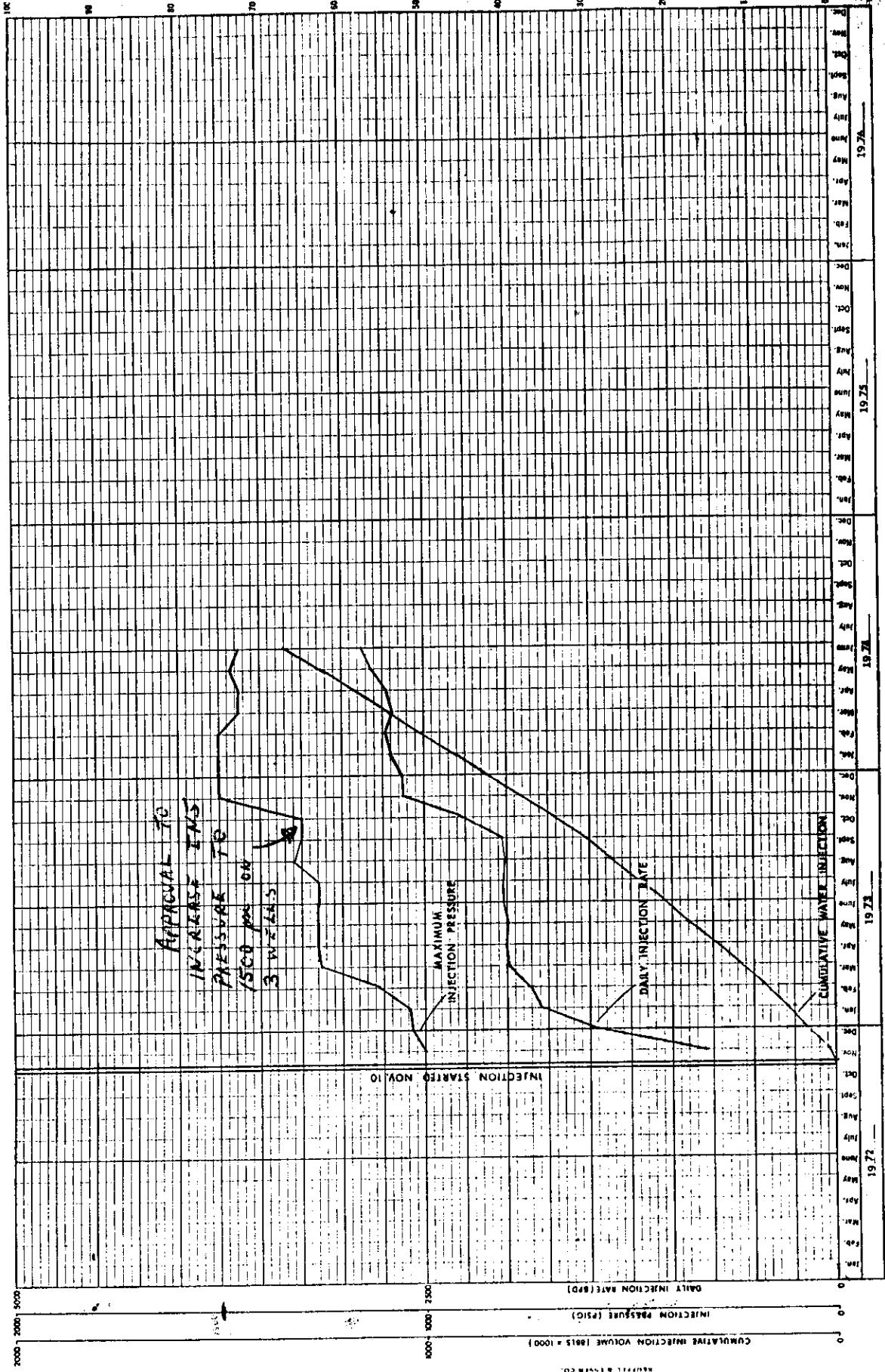


FIGURE 2

September 4, 1974

Samedan Oil of Canada, Inc.,
730 Elveden House,
Calgary, Alberta.
T2P 0Z3

Attention: Mr. K. A. Bergen, P. Eng.

Dear Sir:

Re: East Routledge Unit No. 1
Well Conversions

The Oil and Natural Gas Conservation Board have approved your request to convert the following two wells to water injection wells:

Samedan Routledge Prov. 4-11-9-25 WPM
Samedan Routledge 8-14-9-25 WPM

Enclosed are the duly signed and approved application forms for the subject wells.

Order No. PM 28, adding the subject wells to the original list of injection wells under Order No. PM 20, shall be filed as a regulation and published in The Manitoba Gazette.

I would like to bring to your attention Clause No. 5 under the Pressure Maintenance Rules of Order No. PM 20, which states:

"5. At least annually, unless otherwise directed by the Board, the Unit Operator shall determine the reservoir pressure in the producing wells in the Unit to the satisfaction of the Board."

Our records indicate that no such pressures have been taken

Mr. K. A. Bergen - 2

nor has the Board directed otherwise. The Unit Operator is, therefore, requested to submit to the Board, prior to October 18, 1974, a proposed plan of pressure surveys for wells within the Unit.

Yours truly,

Original Signed by H. C. Møster

H. C. Møster, P. Eng.

Acting Chief Petroleum Engineer.

HCM/11

cc: Mr. J. S. Roper
Mr. J. D. Russell

Sept. 3, 1974

J. D. Russell
A/Director of Mines
993 Century Street

A. C. Balkaran
Registrar of Regulations
249 Legislative Building

Regulations — The Oil and Natural Gas Conservation Board
Order No. PM 28

Attached, hereto, for filing, original and 1 copy of Certificate, and 2 copies of Manitoba Regulation being The Oil and Natural Gas Conservation Board Order No. PM 28, approved by the Minister of Mines, Resources and Environmental Management on August 27, 1974.

Will you kindly ensure that this Board Order No. PM 28 is published in the Manitoba Gazette.

A handwritten signature in dark ink, appearing to be 'JDR' or similar, written in a cursive style.

/evh

Attachments

August 20, 1974

H. C. Moster ✓

Acting Chief Petroleum Engineer

The Oil and Natural Gas Conservation Bd.:
Jas. T. Cawley, P. Eng., Chairman
J. S. Roper, Deputy Chairman

EAST ROUTLEDGE UNIT NO. 1

CONVERSION OF 2 PRODUCING WELLS TO INJECTION WELLS

Samedan Oil of Canada, Inc. as operator of the above unit has made application to convert the following two producing wells to water injection wells:

1. Samedan Routledge ^{Prov.} 4-11-9-25 WPM
2. Samedan Routledge 8-14-9-25 WPM

BACKGROUND

East Routledge Unit No. 1 was unitized under Unitization Order No. 13 on May 15, 1972 and pressure maintenance Order No. PM 20 was filed on April 18, 1972. Injection commenced on November 10, 1972 through 5 injection wells. Samedan applied for approval of increased injection pressures in February 1973. The Board granted permission to raise the maximum allowed injection pressure on 3 wells from 1,075 p.s.i.g. to 1,500 p.s.i.g. on October 17, 1973.

The initial "Engineering Report, Proposed East Routledge Unit No. 1 April, 1971" proposed 6 injection wells plus 2 additional wells to be converted at a later day (approximately 1 year). The existing unit has 5 injection wells and this application is to convert the 2 producing wells mentioned in the initial report to injection wells at this time.

DISCUSSION

Attachment 1 shows the unit area and indicates the well pattern and present production characteristics of each well (i.e. - daily fluid production, water-cut, cumulative oil production, daily water injection, injection pressures, and cumulative injection).

Attachment 2 indicates the existing daily oil production rates from the producing wells in the unit plus the two wells for which this application is requesting approval to convert to water injection.

Attachment 3 illustrates the unit's actual production history in comparison to that predicted in early 1970.

Attachment ⁵ 4 is the unit and individual well production data presented in graphical form.

The above data would indicate that there is little if any response to date being felt from the waterflood. Attachments 3 and 5 would indicate the existing production characteristics fall short of the predicted history under primary recovery. At the time of commencement of water injection the two wells requested for conversion, namely 4-11-9-25 and 8-14-9-25, were producing approximately 25 and 33 BOPD, respectively. It was because of this that the two wells in question were not converted to injection at that time. Presently the wells are producing approximately 12 and 24 BOPD, respectively.

Due to the apparant ineffectiveness of the existing injection volumes, Samedan as unit operator have applied to convert the subject 2 wells at this time. It is worth noting that these 2 wells presently produce approximately 12% of the unit total oil production.

Attachment 2 indicates the well located in 4-11 is situated on the edge of the unit and is offset by four wells capable of production. Three of these wells are Samedans, two of which have received approval to be abandoned. The fourth well is a suspended Chevron well and we have received formal approval from Chevron for the proposed conversion and also Chevron's support to the application as a Working Interest Owner.

During the initial construction of the waterflood facilities in 1972 the subject two wells were tied into the injection system. Therefore no additional pipeline construction is necessary and only conversion of the wells is required (see Attachment 4).

RECOMMENDATION

It is recommended that the application be approved.

A regulation amending Order No. PM 20 to include the subject two wells in the list of injectors for the East Routledge waterflood has been enclosed.

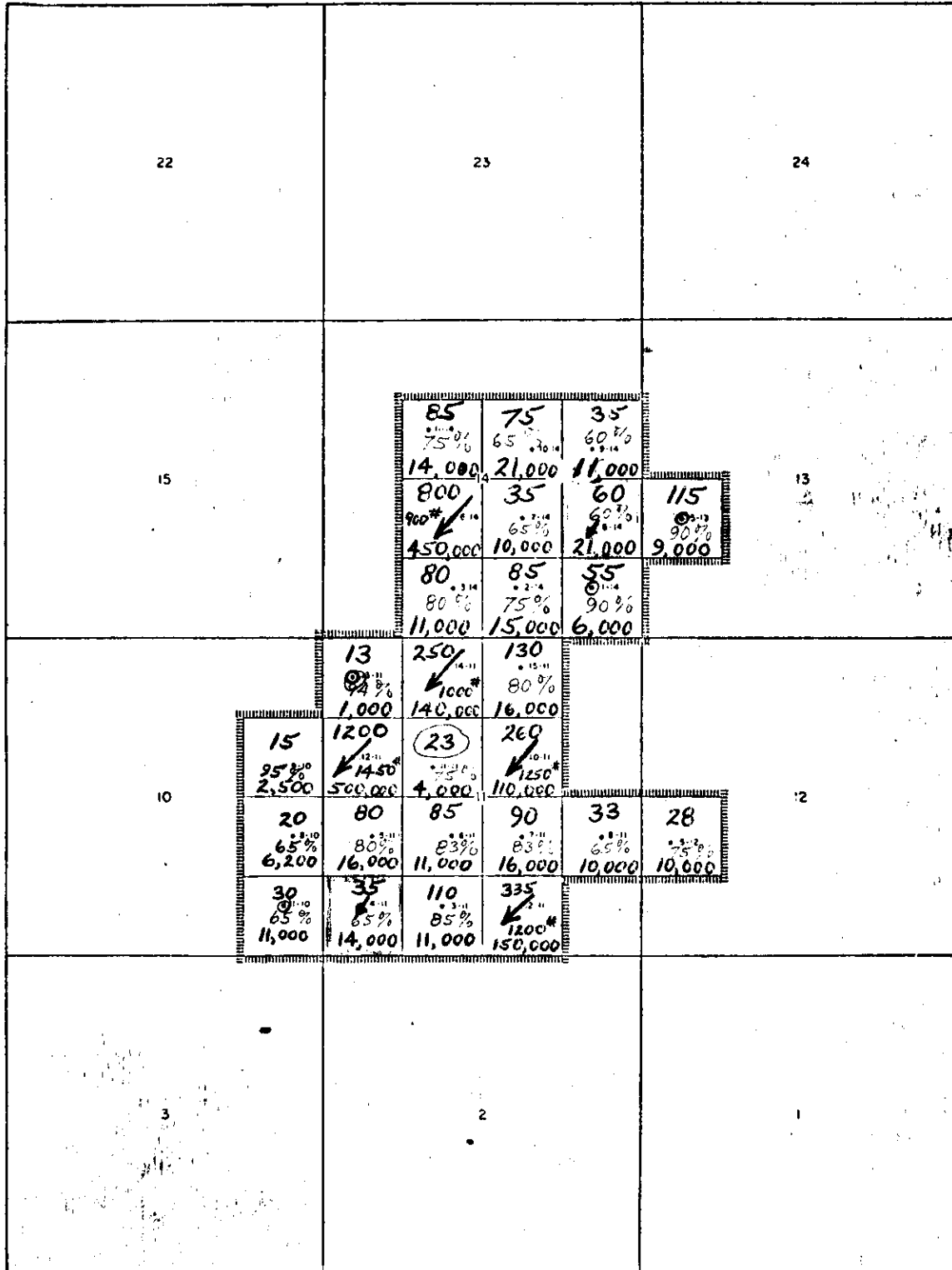


H. C. Moster

HCM/evh
Attachments
c.c. - J.D. Russell

PART XXIII
MAP OF UNIT AREA

ATTACHMENT 1



R-25-W

• PRODUCING WELL
BOLD UNIT BOUNDARY
OF NUMBERED TRACT

EAST ROUTLEDGE UNIT NO. 1
MANITOBA PROVINCE, CANADA

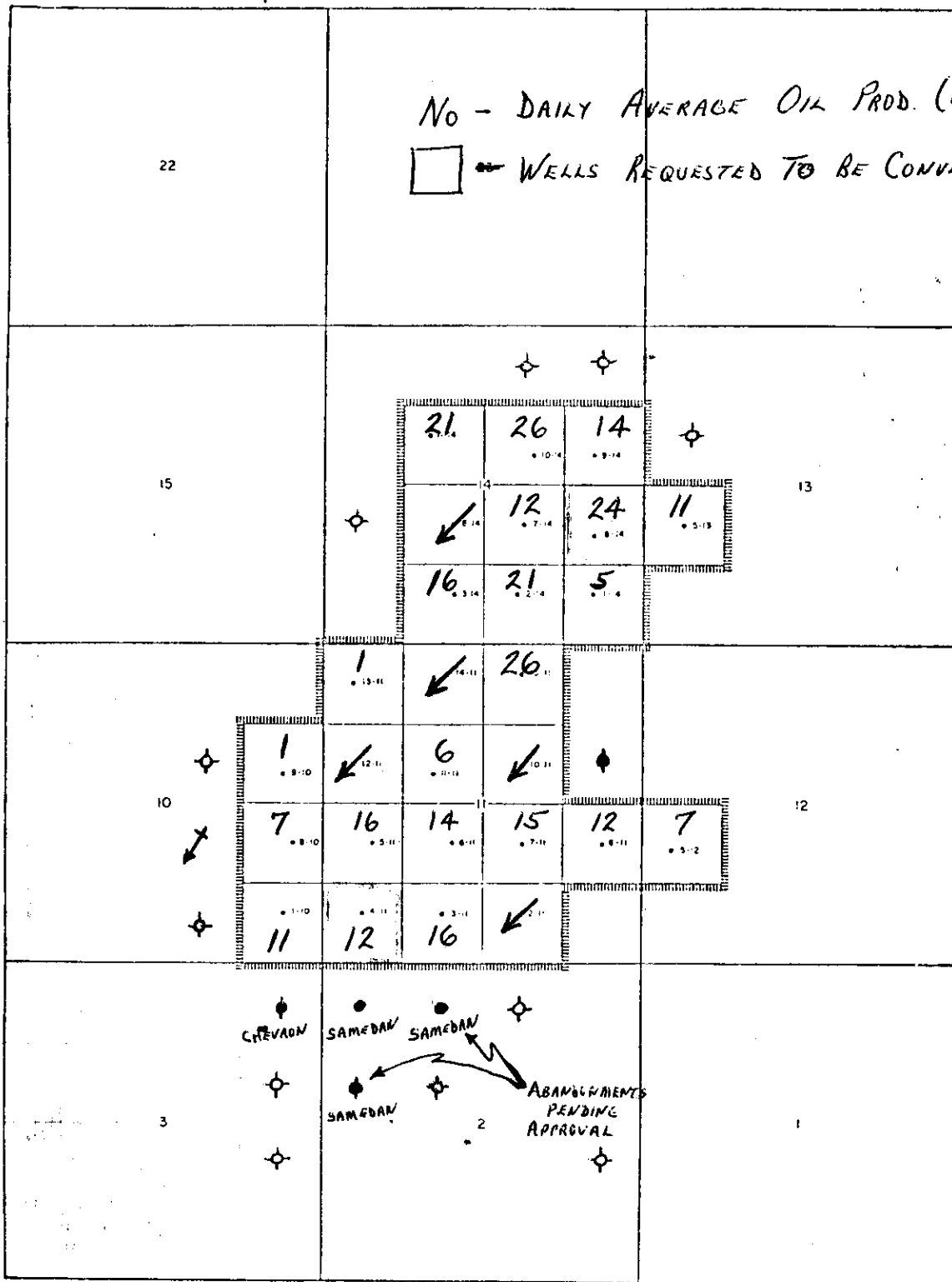
BPD
WATER CUT
CUM. OIL BBLS

BWPD
INS. PRESS.
CUM. WATER INS.

0 1000 2000 3000
SCALE
-36-

PART XXIII
MAP OF UNIT AREA

ATTACHMENT 2



• PRODUCING WELL
--- UNIT BOUNDARY
* NUMBERED TRACT

BOPD.

R-25-W

EAST ROUTLEDGE UNIT NO. 1
MANITOBA PROVINCE, CANADA

0 1000 2000 3000
scale
-36-

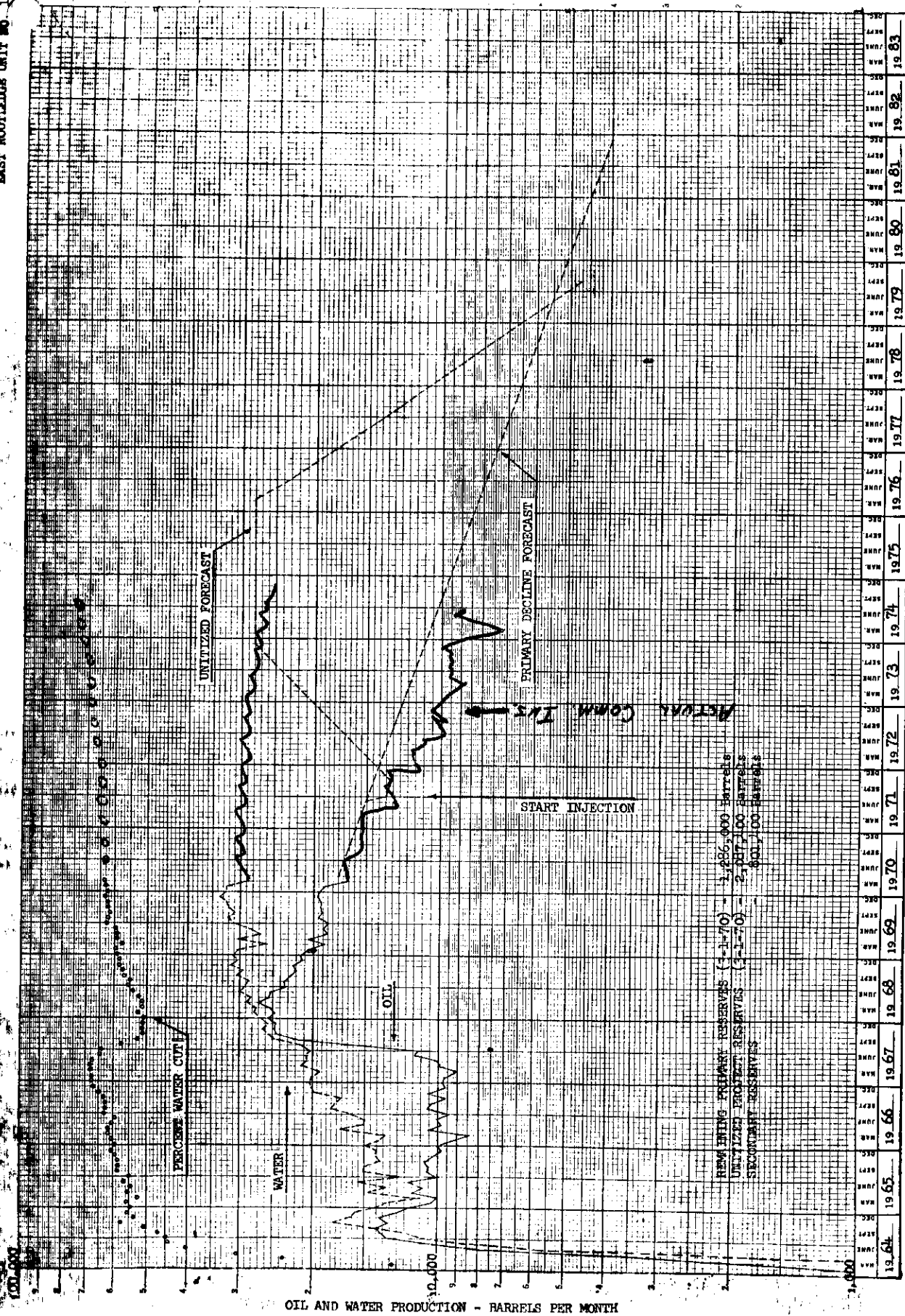
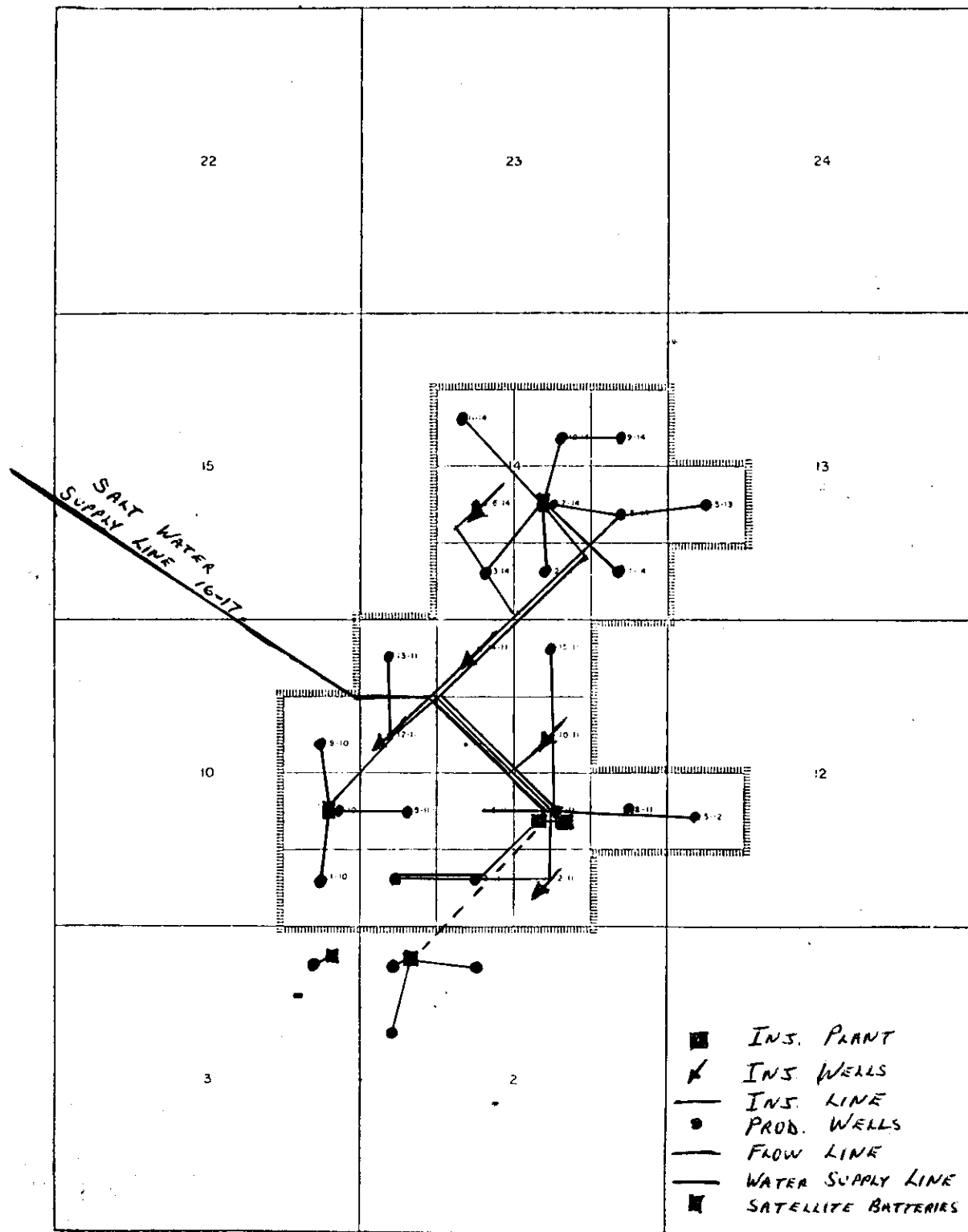


FIGURE NO. 7

PART XXIII
MAP OF UNIT AREA

ATTACHMENT 4



T
9
N

R-25-W

EAST ROUTLEDGE UNIT NO.1
MANITOBA PROVINCE, CANADA

0 1000 2000 3000
scale
-36-

• PRODUCING WELL
--- UNIT BOUNDARY
--- NUMBERED TRACT

ATTACHMENT 5

EAST ROUTLEDGE UNIT #1 - PRODUCTION

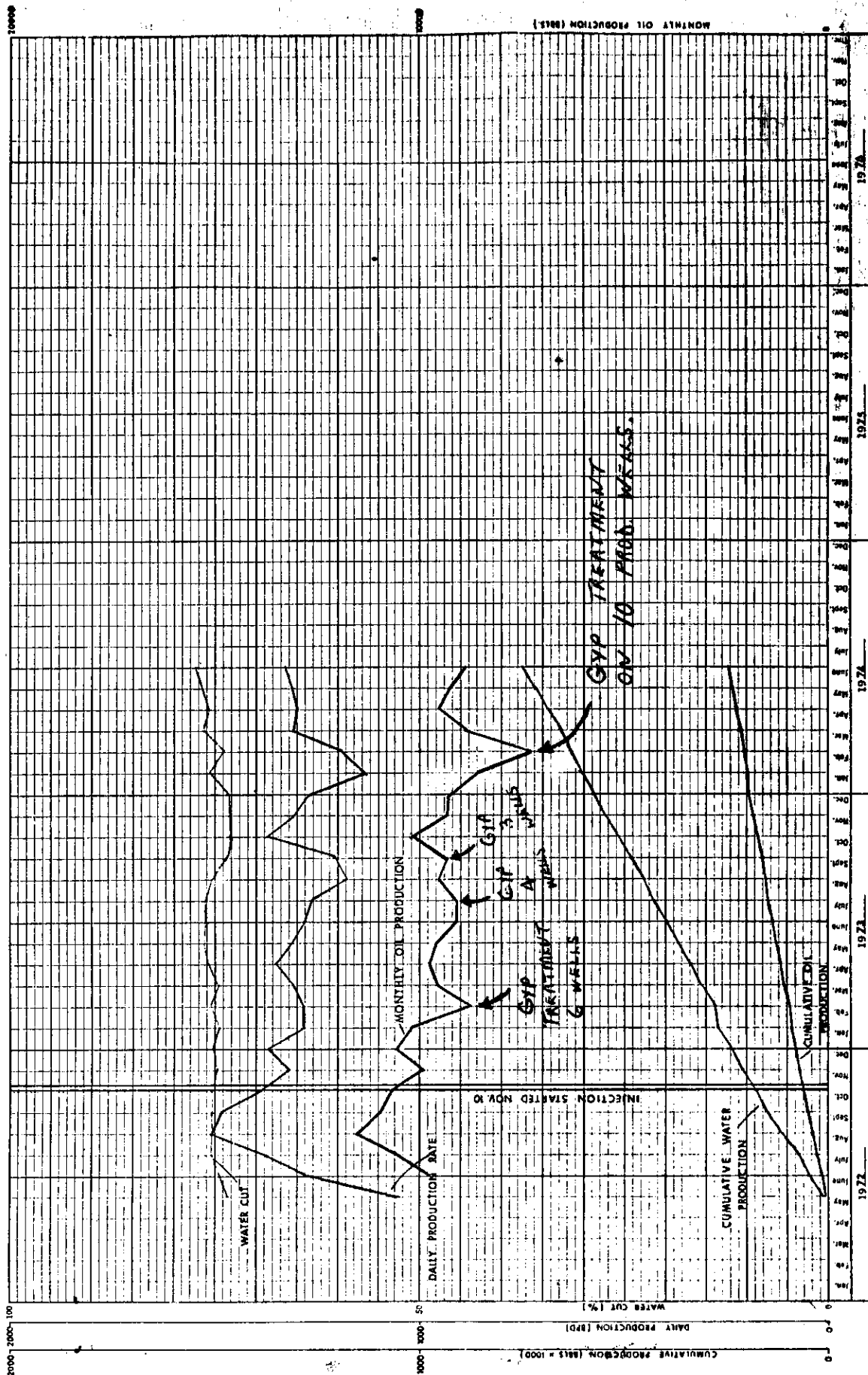


FIGURE 1

EAST ROUTLEDGE UNIT #1 - INJECTION

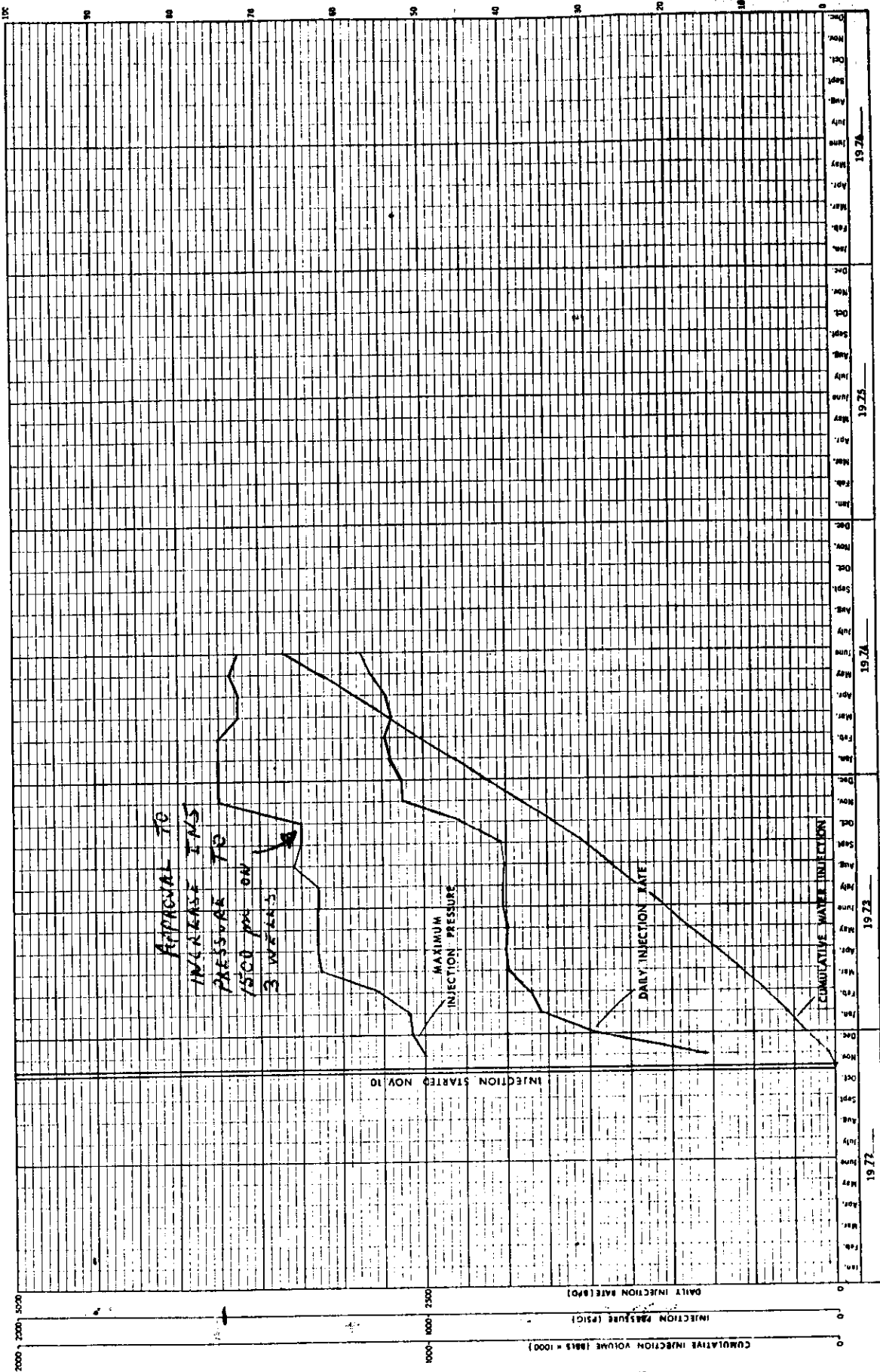


FIGURE 2

SAMEDAN ROUTLEDGE PROV. 3-11-9-25 WPM.

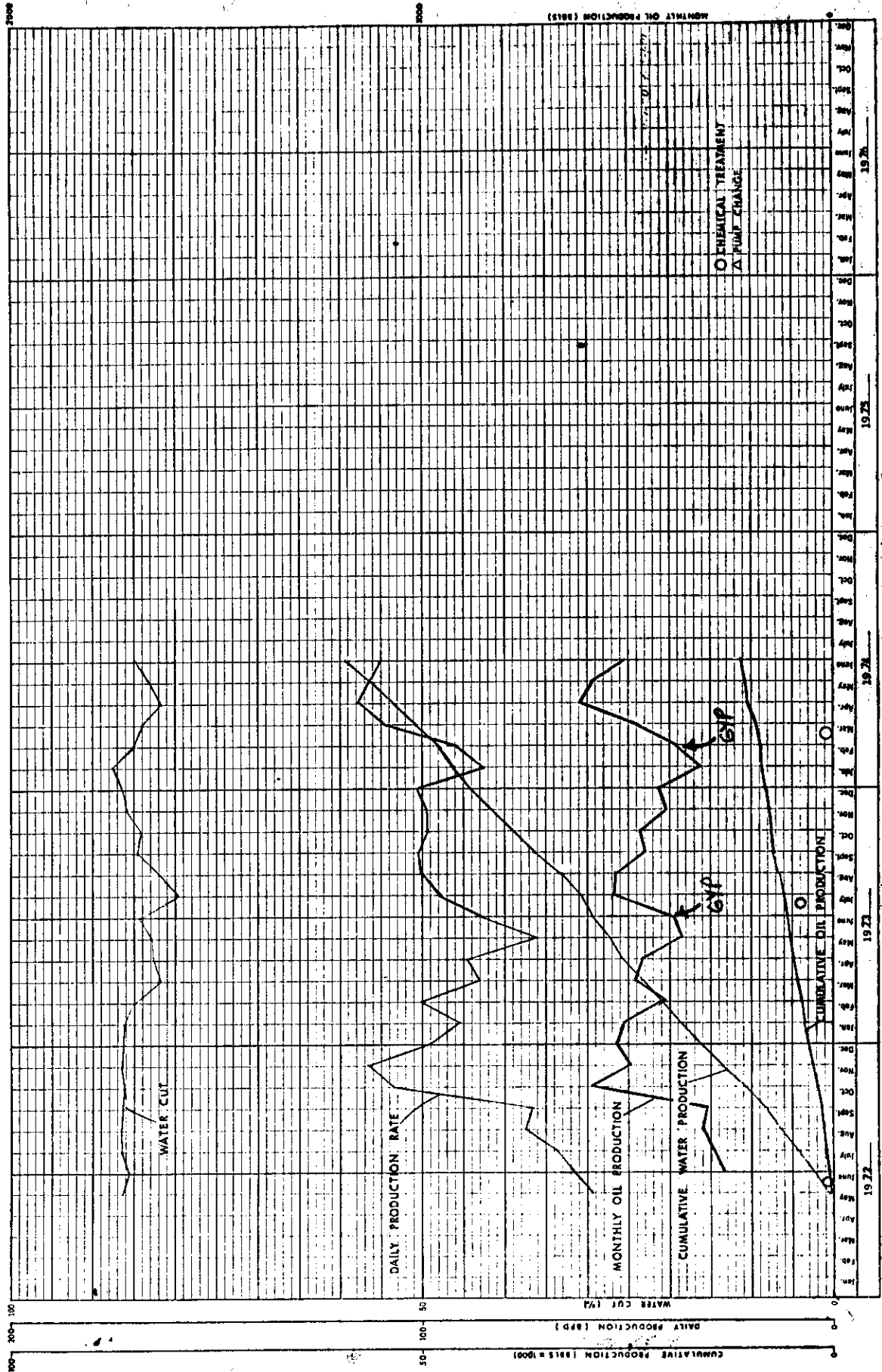


FIGURE 3

SAMEDAN ROUTLEDGE PROV. 4-11-9-25 WPM.

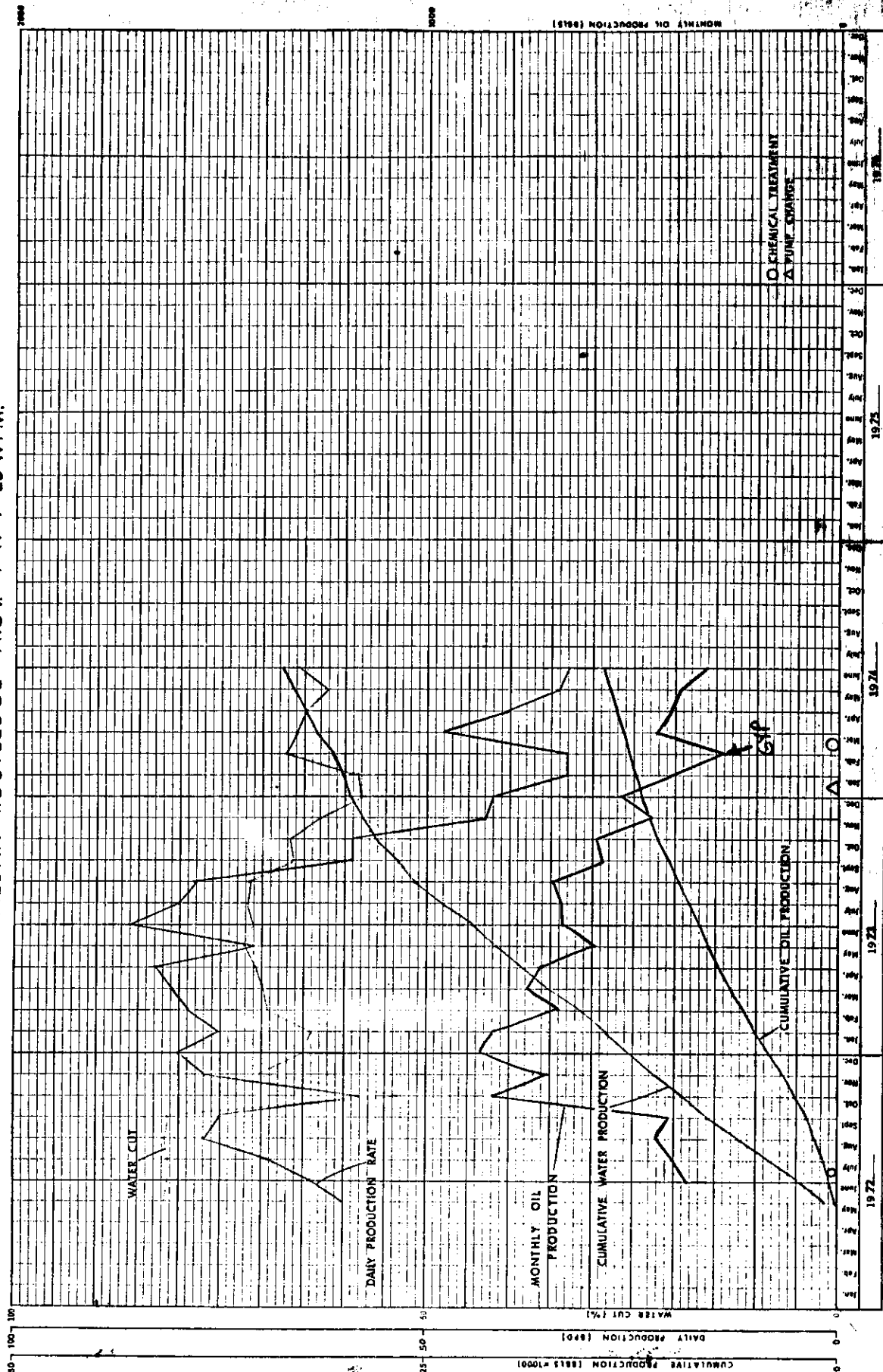


FIGURE 2

SAMEDAN ROUTLEDGE PROV. 5-11-9-25 WPM.

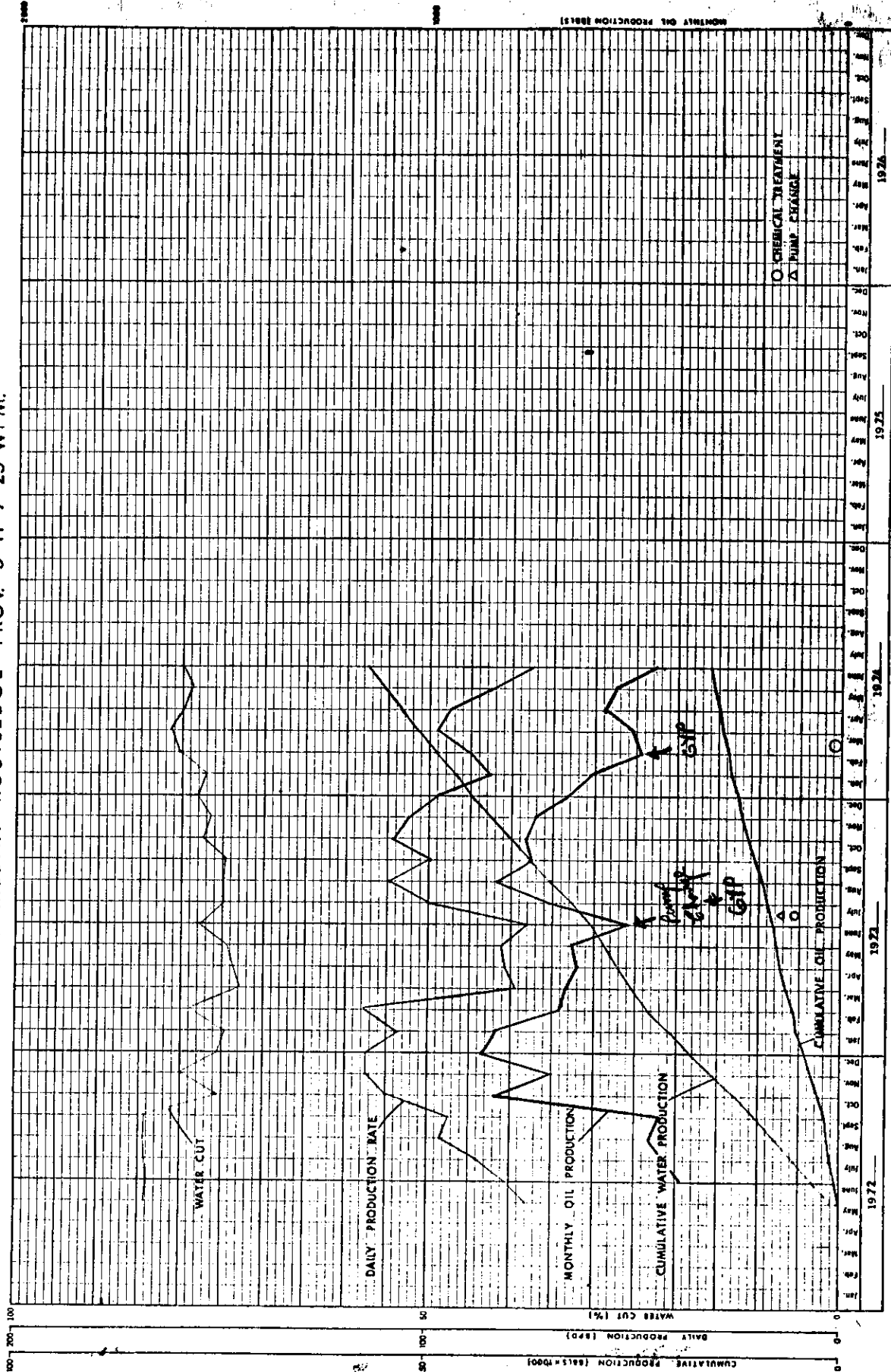


FIGURE 2

SAMEDAN ROUTLEDGE PROV. 6-11-9-25WPM.

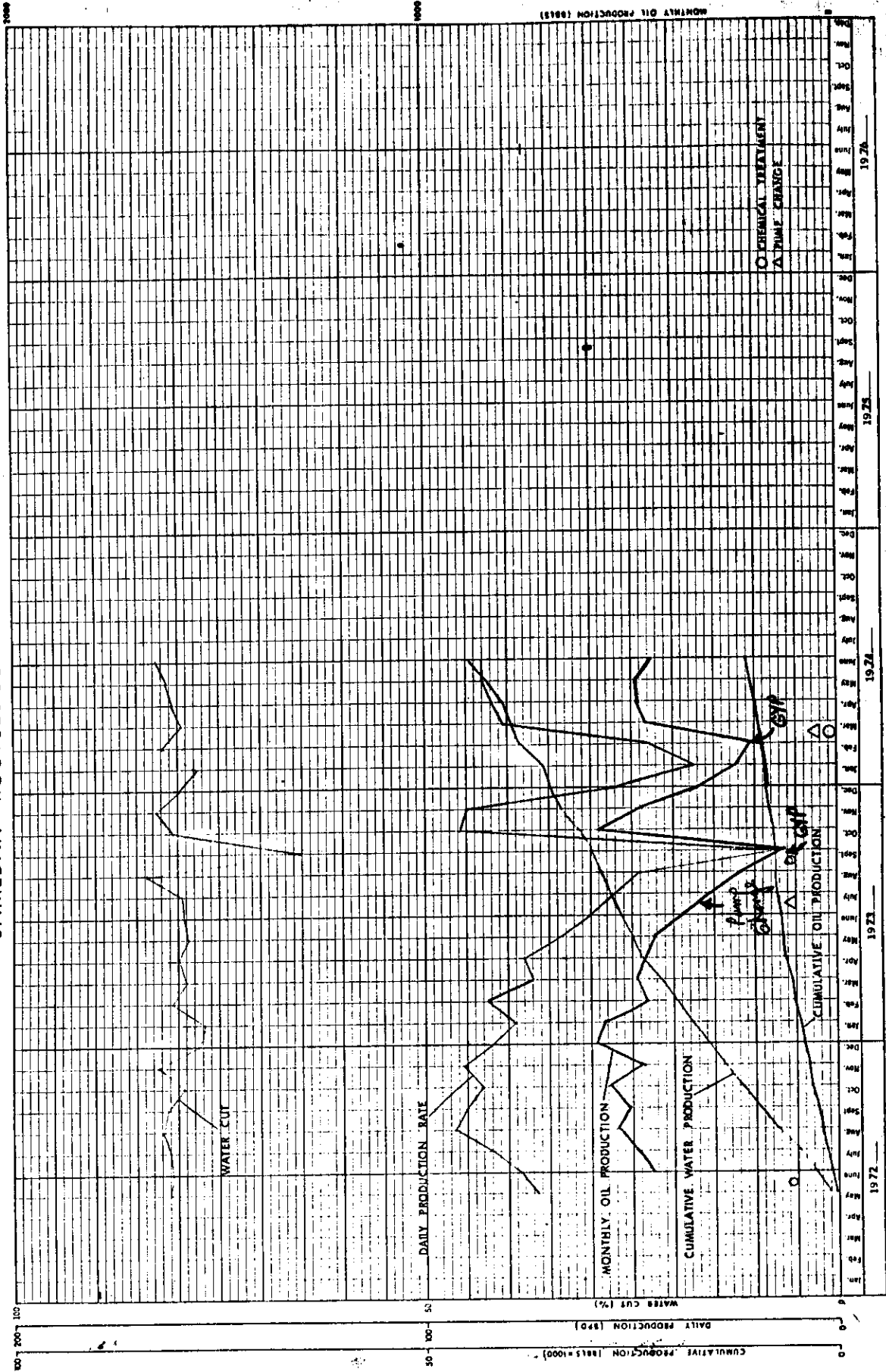


FIGURE 5

SAMEDAN ROUTLEDGE PROV. 7-11-9-25WPM.

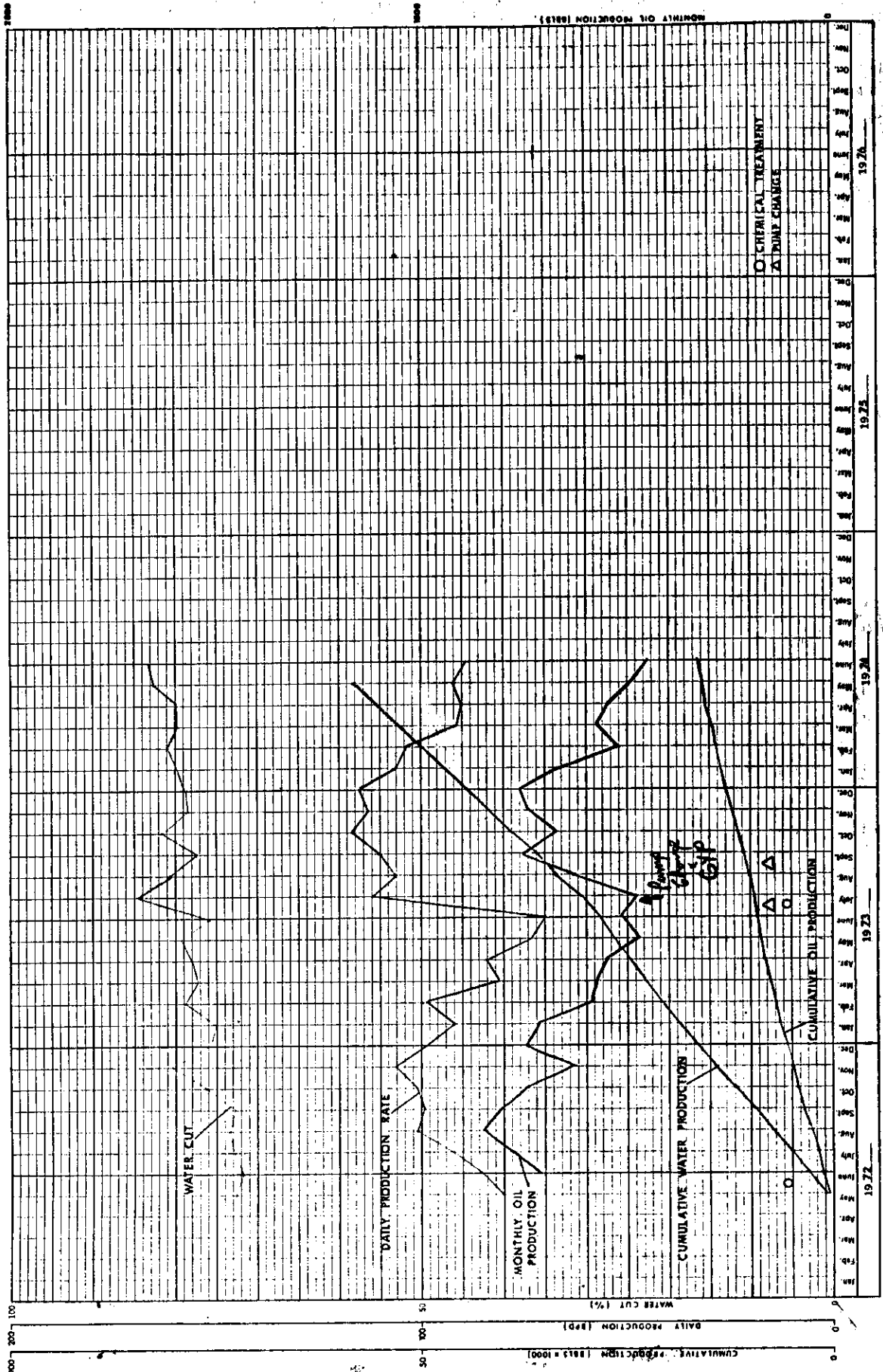


FIGURE 7

SAMEDAN ROUTLEDGE PROV. 8-11-9-25WPM.

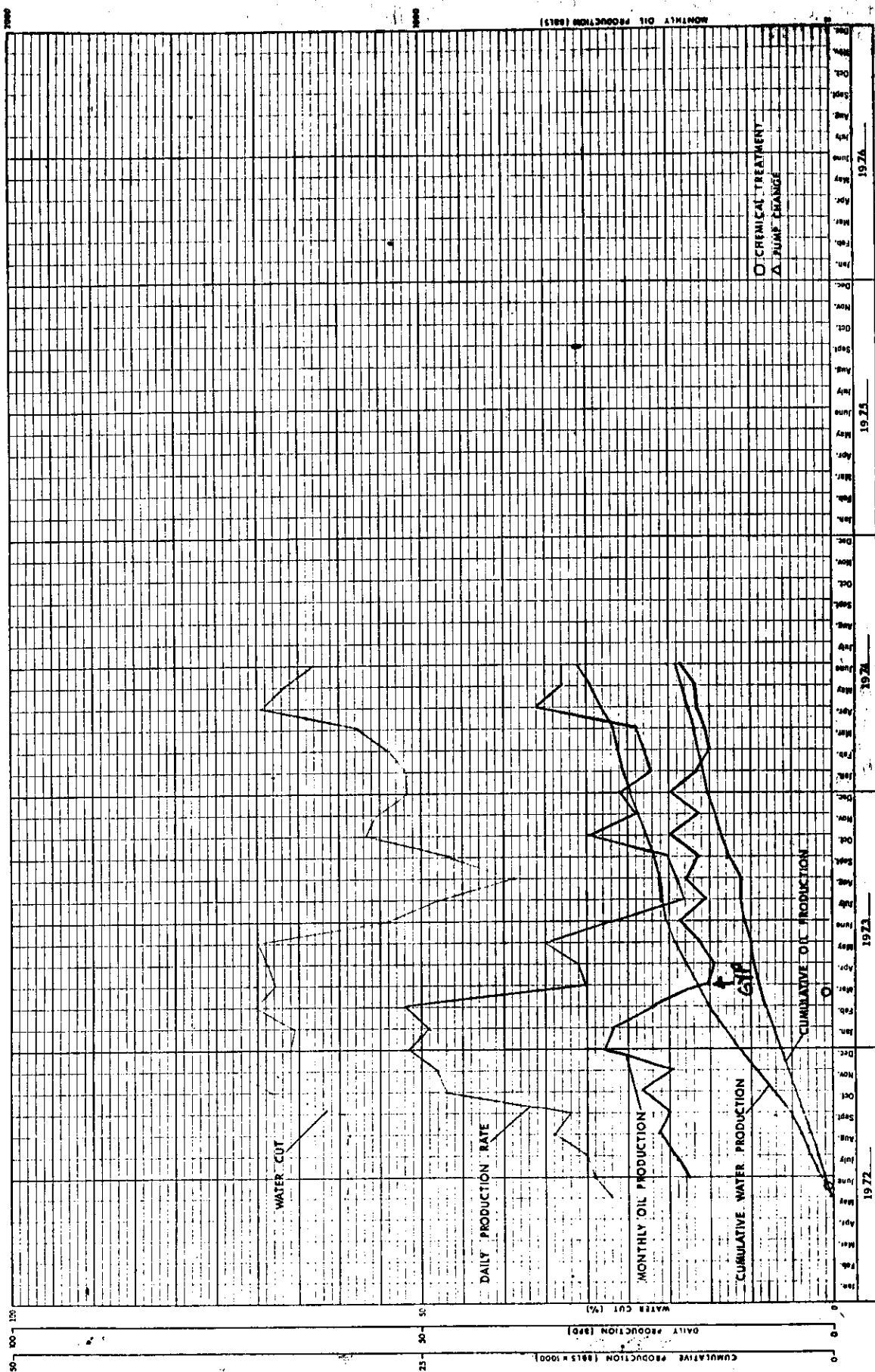


FIGURE 8

SAMEDAN ROUTLEDGE PROV. 11-11-9-25WPM.

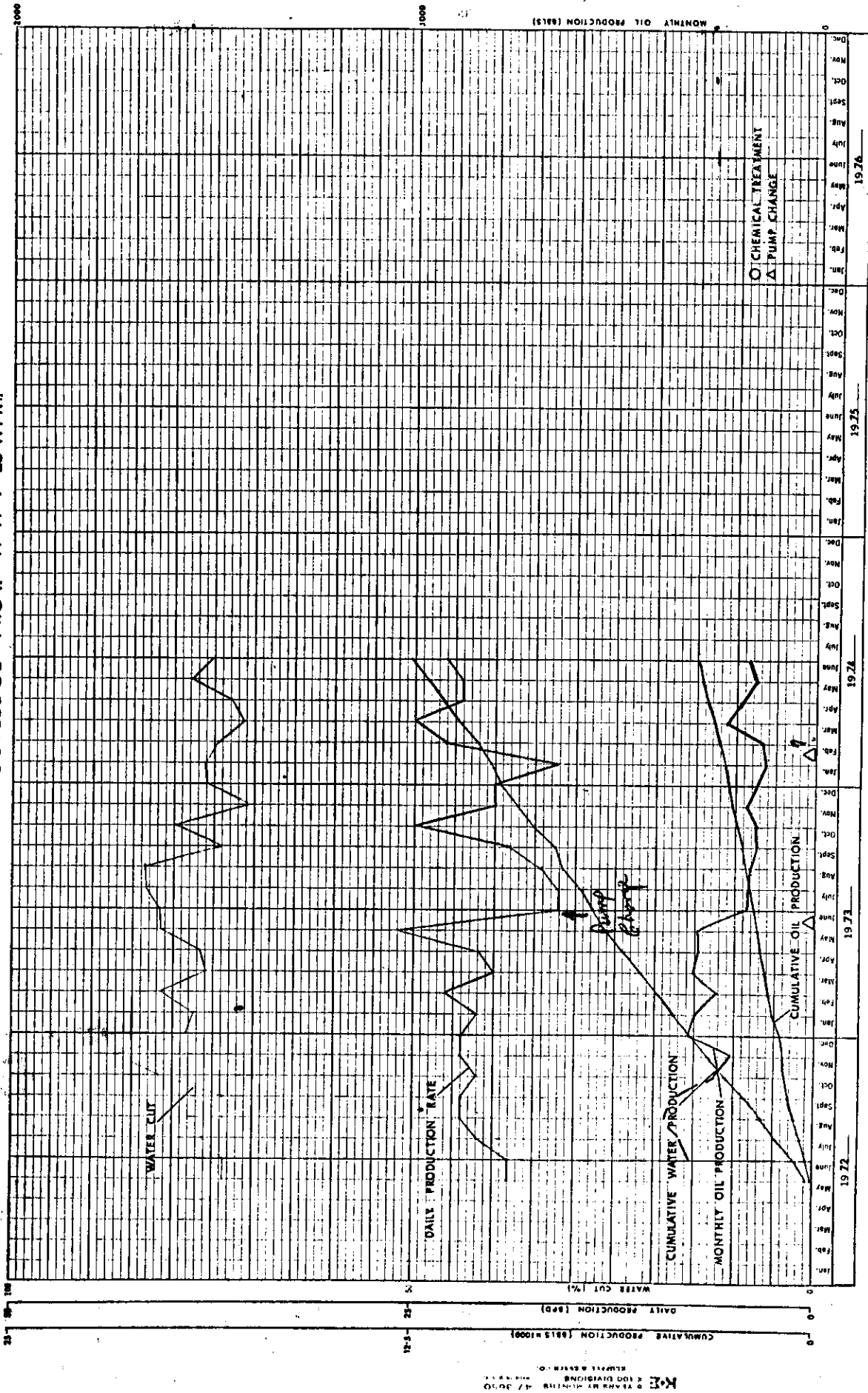


FIGURE 9

SAMEDAN ROUTLEDGE PROV. 13-11-9-25WPM.

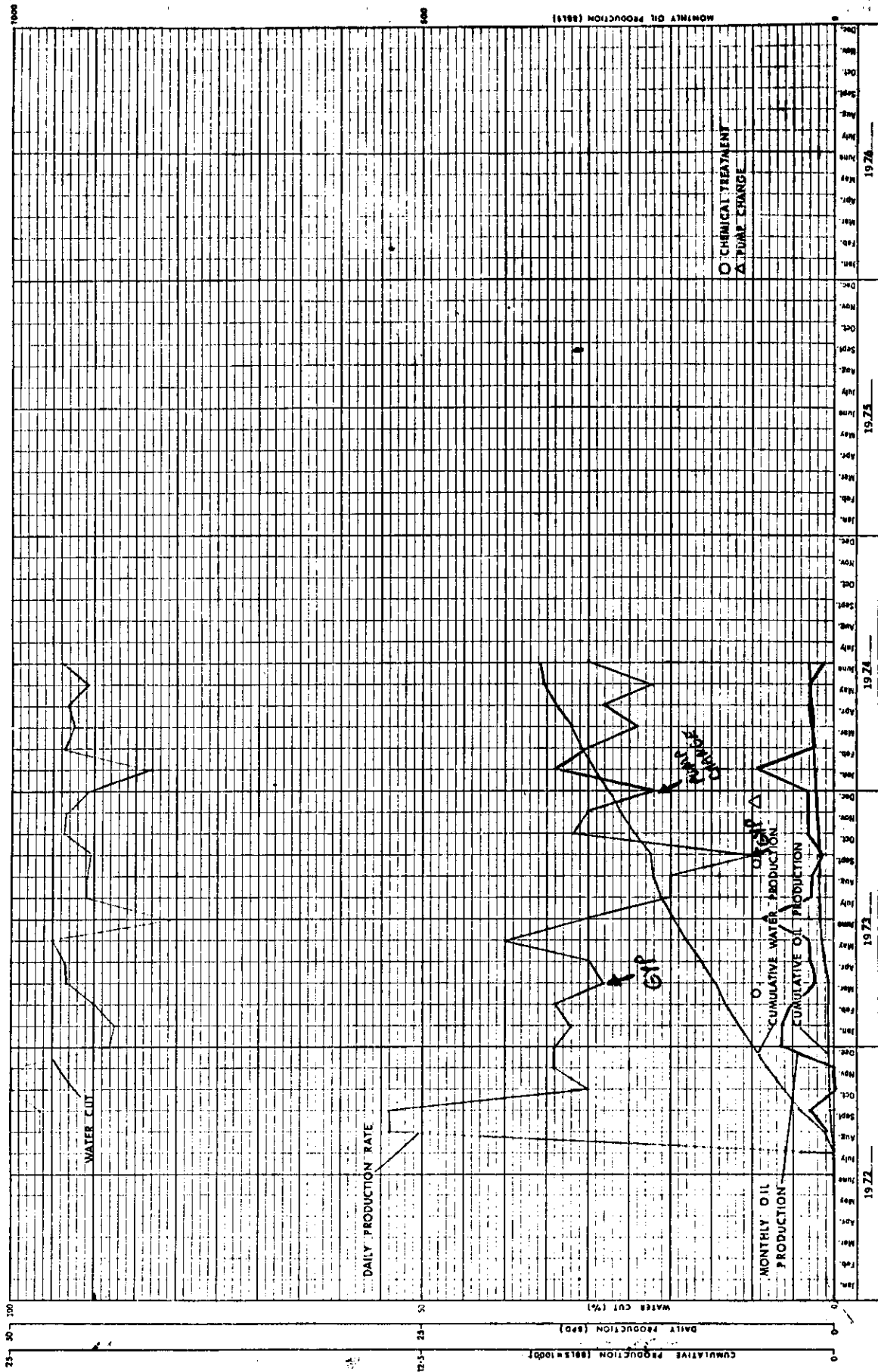


FIGURE 10

SAMEDAN ROUTLEDGE PROV. 15-11-9-25 WPM

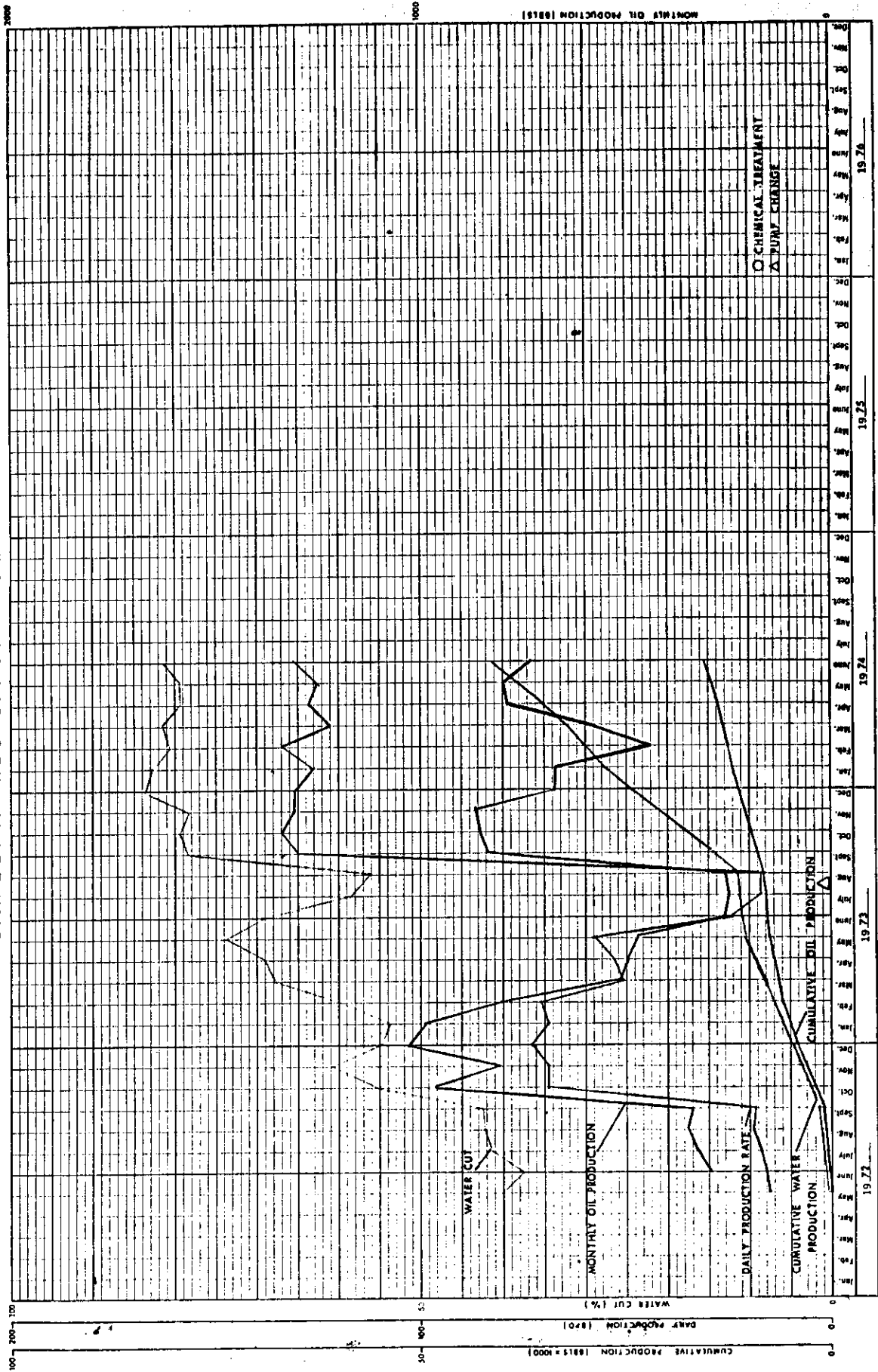


FIGURE 11

SAMEDAN ROUTLEDGE PROV. 3-14-9-25WPM.

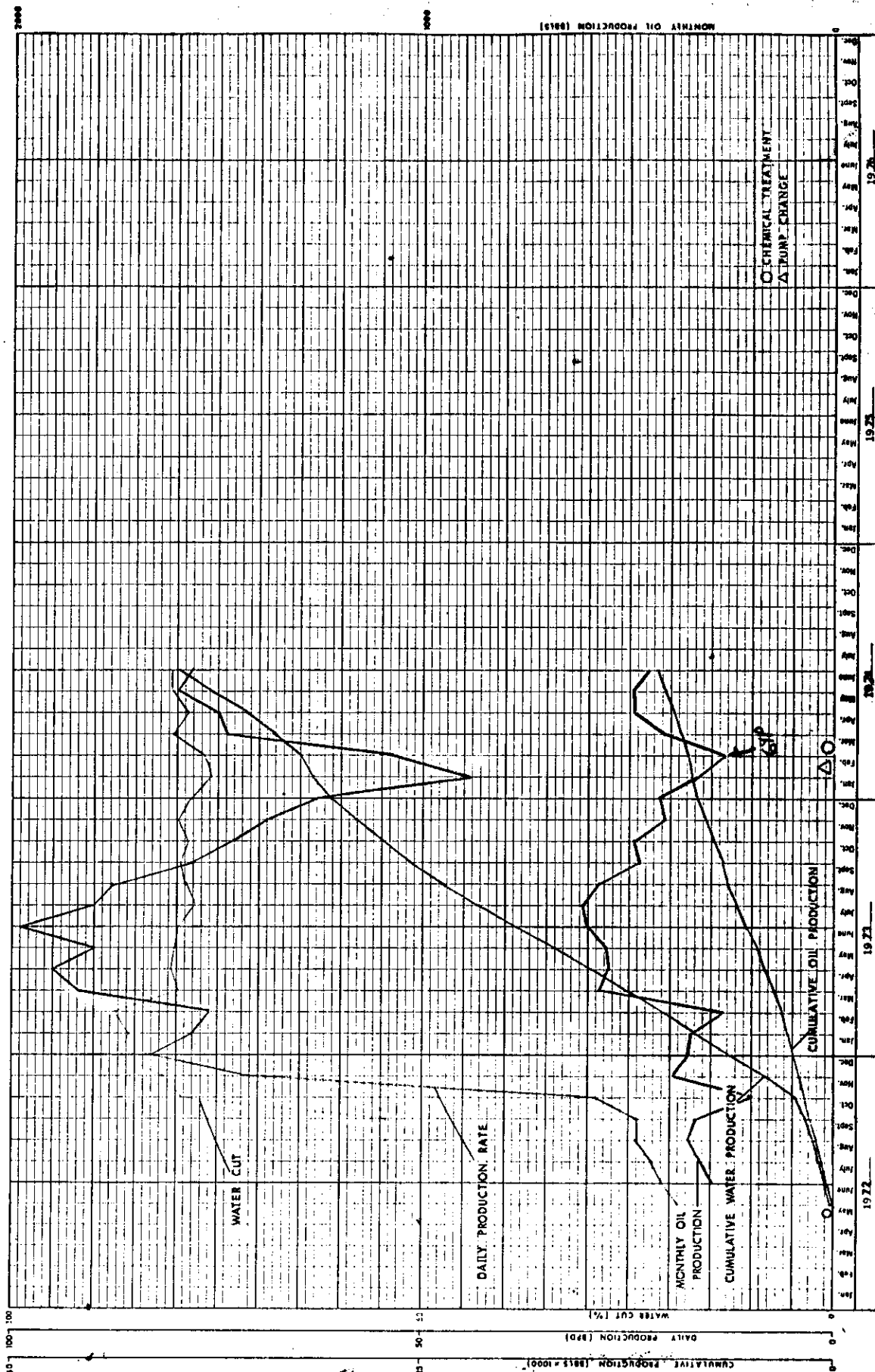


FIGURE 32

SAMEDAN ROUTLEDGE 5-12-9-25WPM.

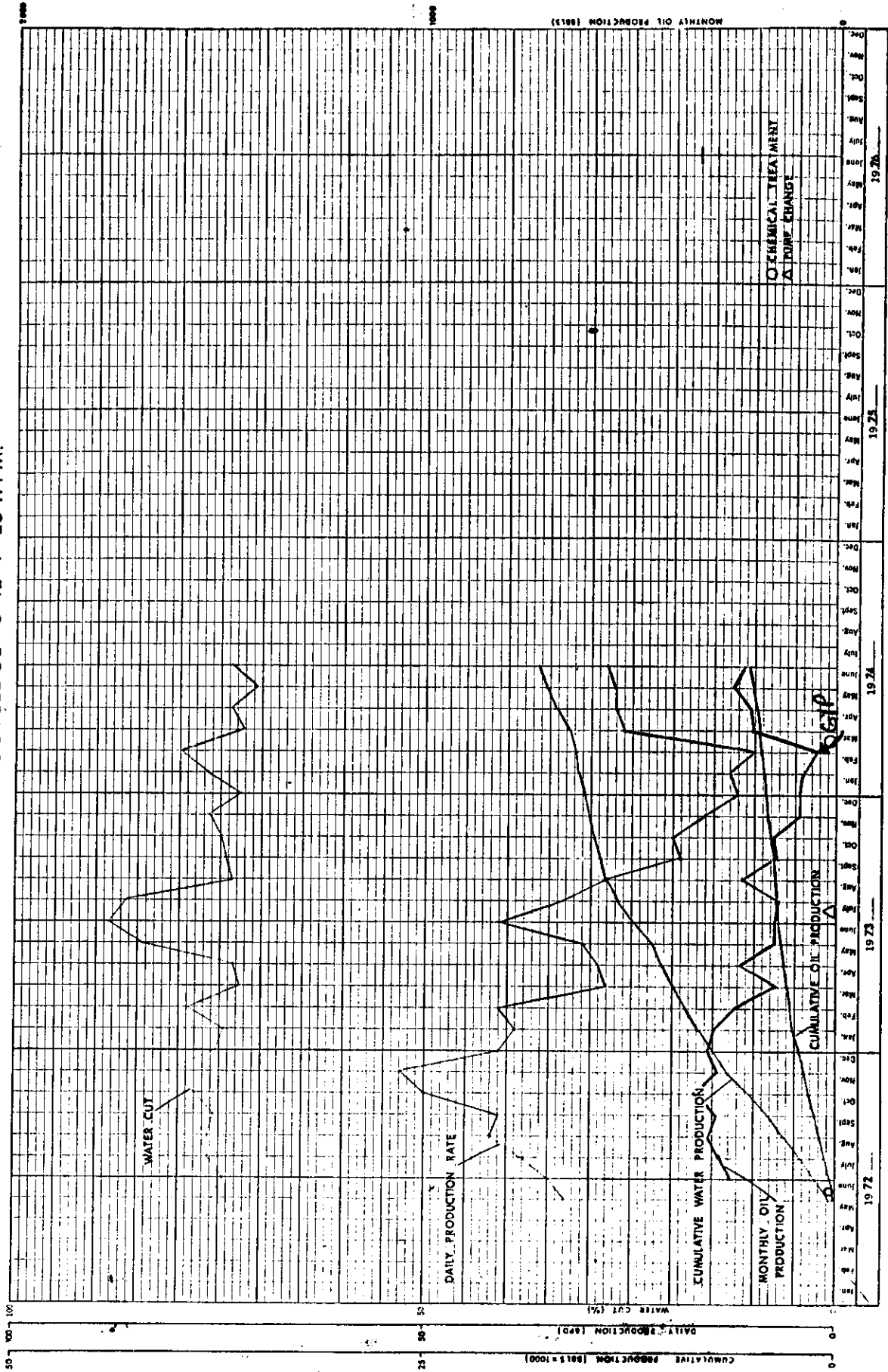


FIGURE 13

SAMEDAN ROUTLEDGE 5-13-9-25WPM.

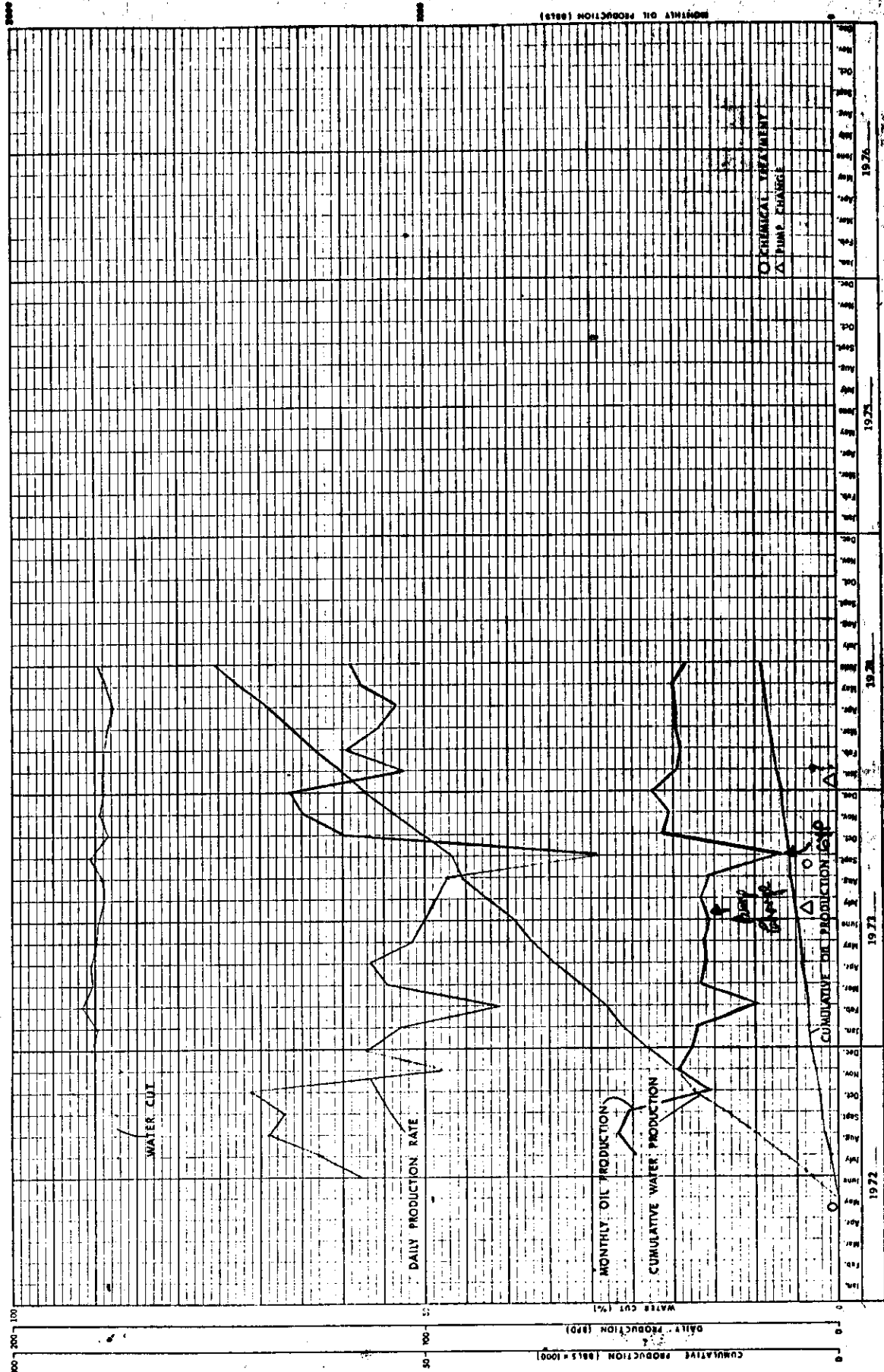


FIGURE 18

SAMEDAN ROUTLEDGE 1-10-9-25WPM.

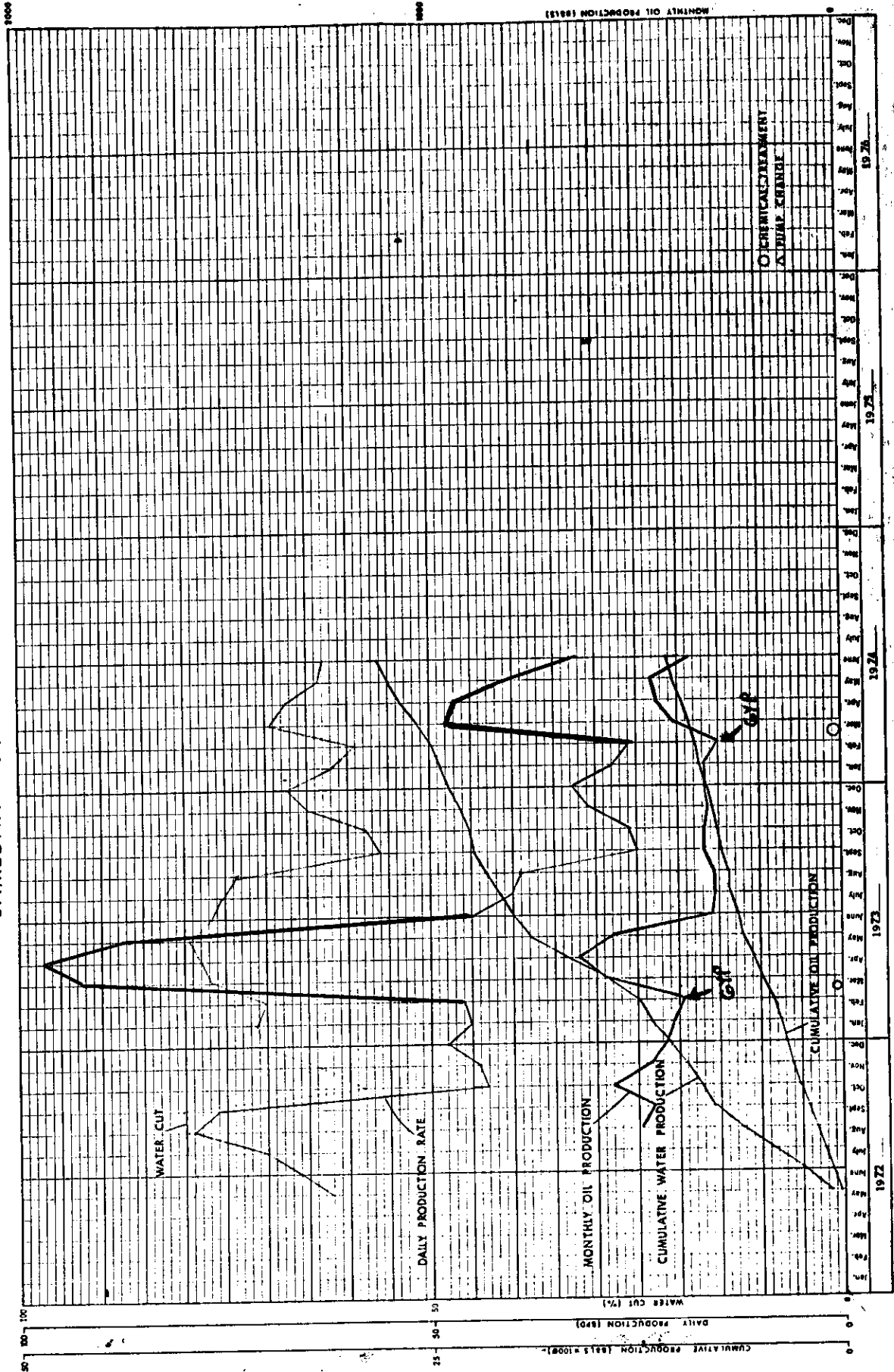


FIGURE 15

SAMEDAN ROUTLEDGE 8-10-9-25WPM.

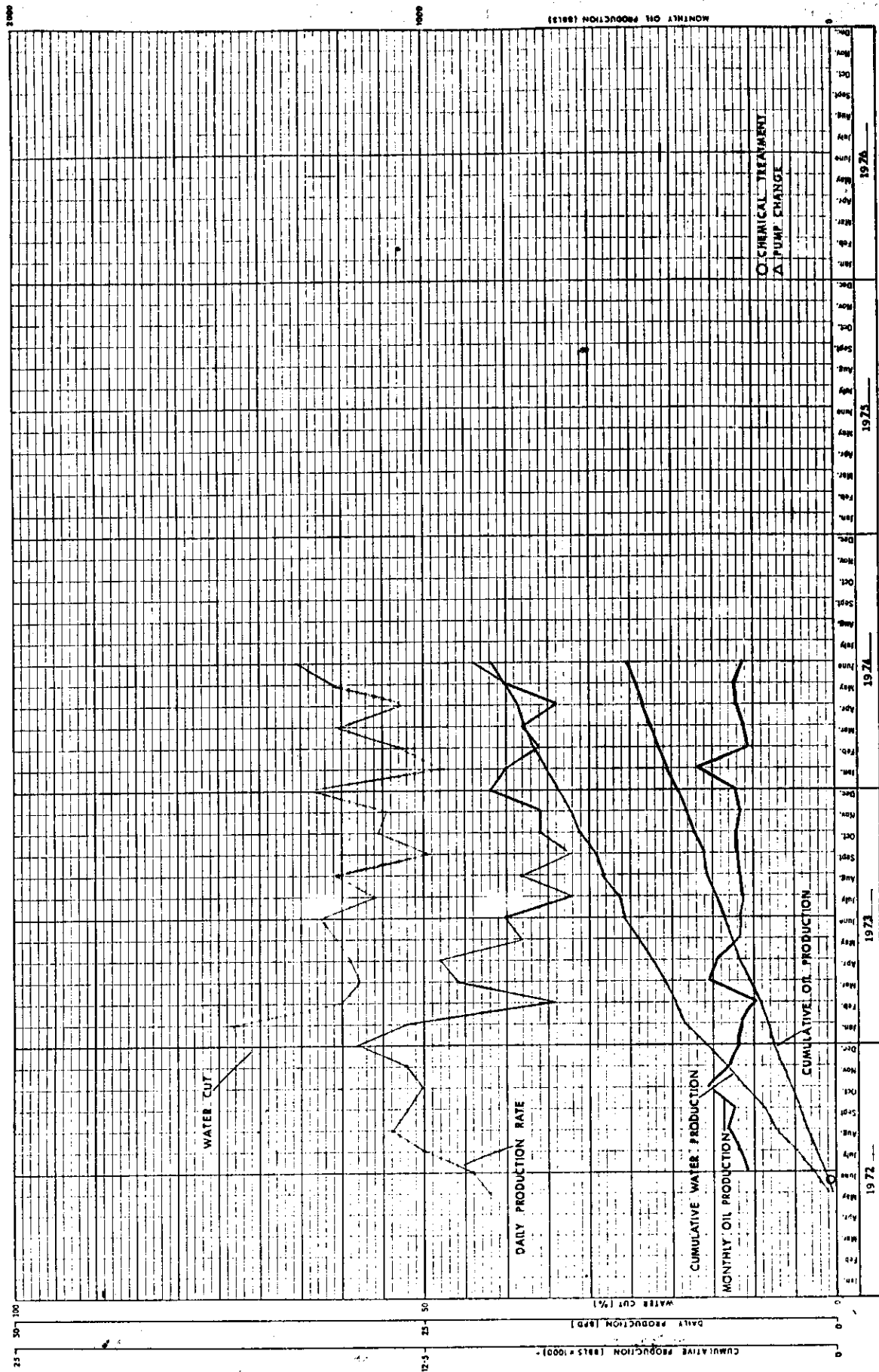


FIGURE 16

SAMEDAN ROUTLEDGE 9-10-9-25WPM.

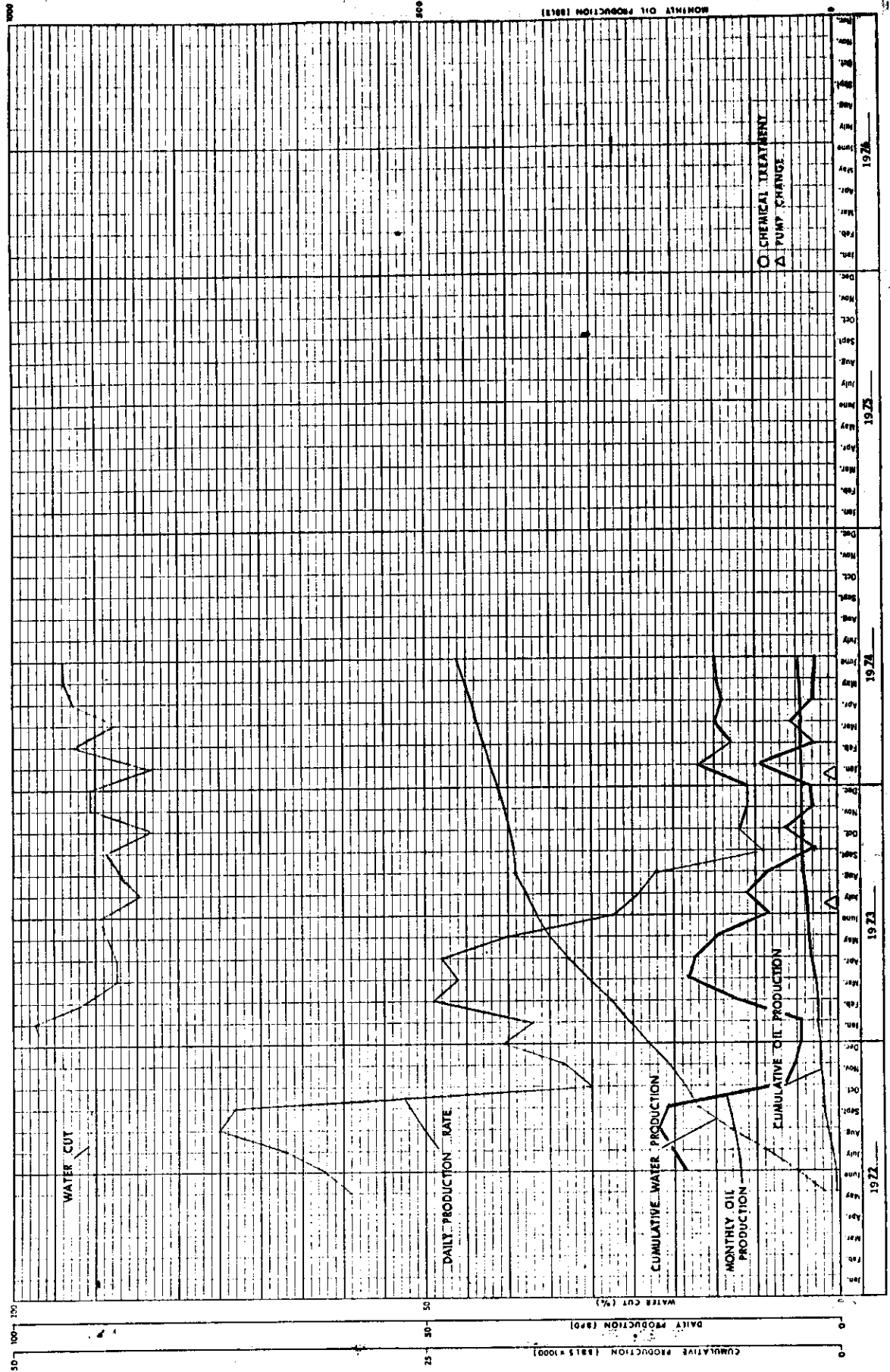


FIGURE 17

SAMEDAN ROUTLEDGE 1-14-9-25WPM.

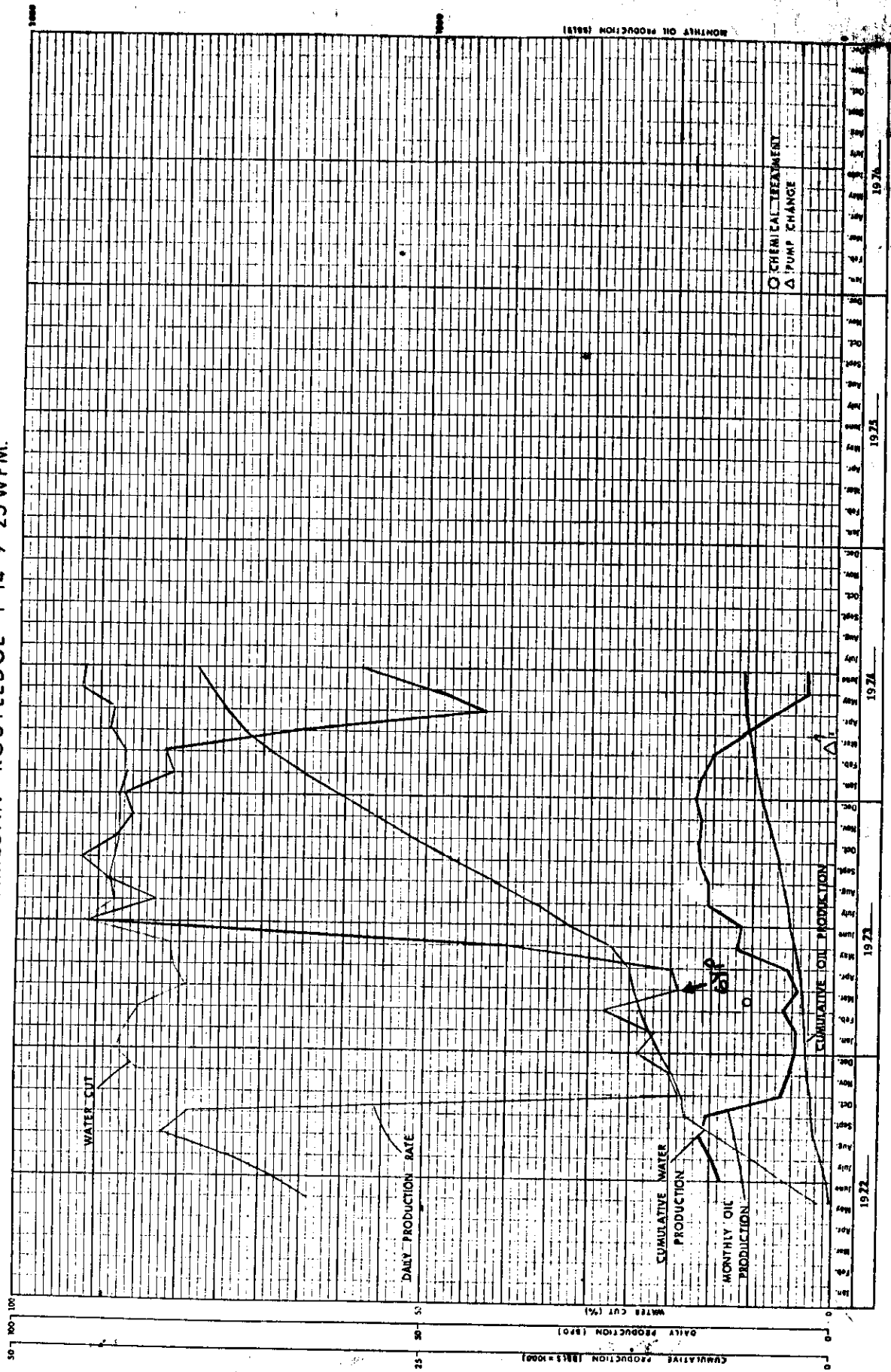


FIGURE 1

SAMEDAN ROUTLEDGE 2-14-9-25 WPM.

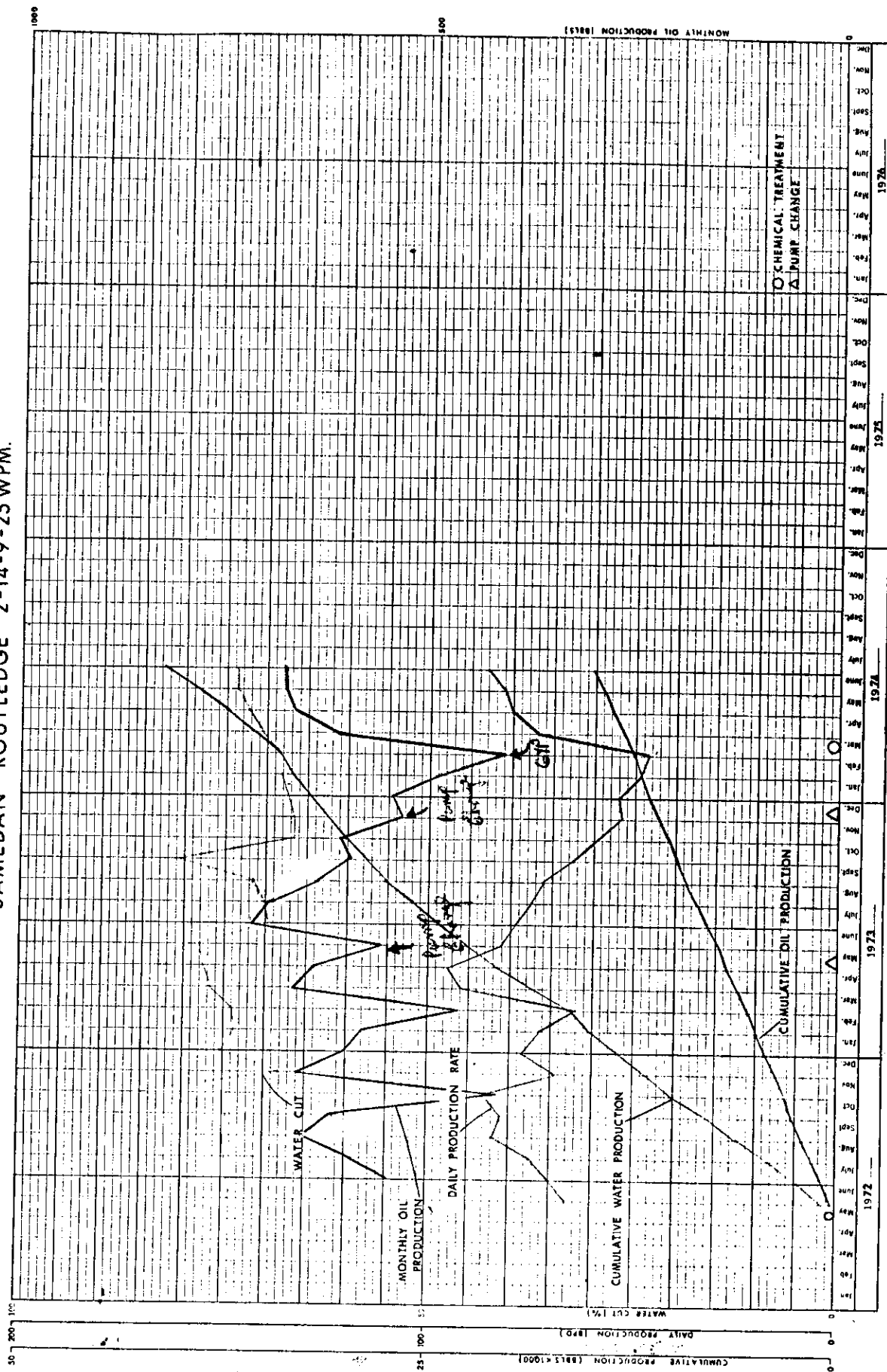


FIGURE 19

SAMEDAN ROUTLEDGE 7-14-9-25WPM.

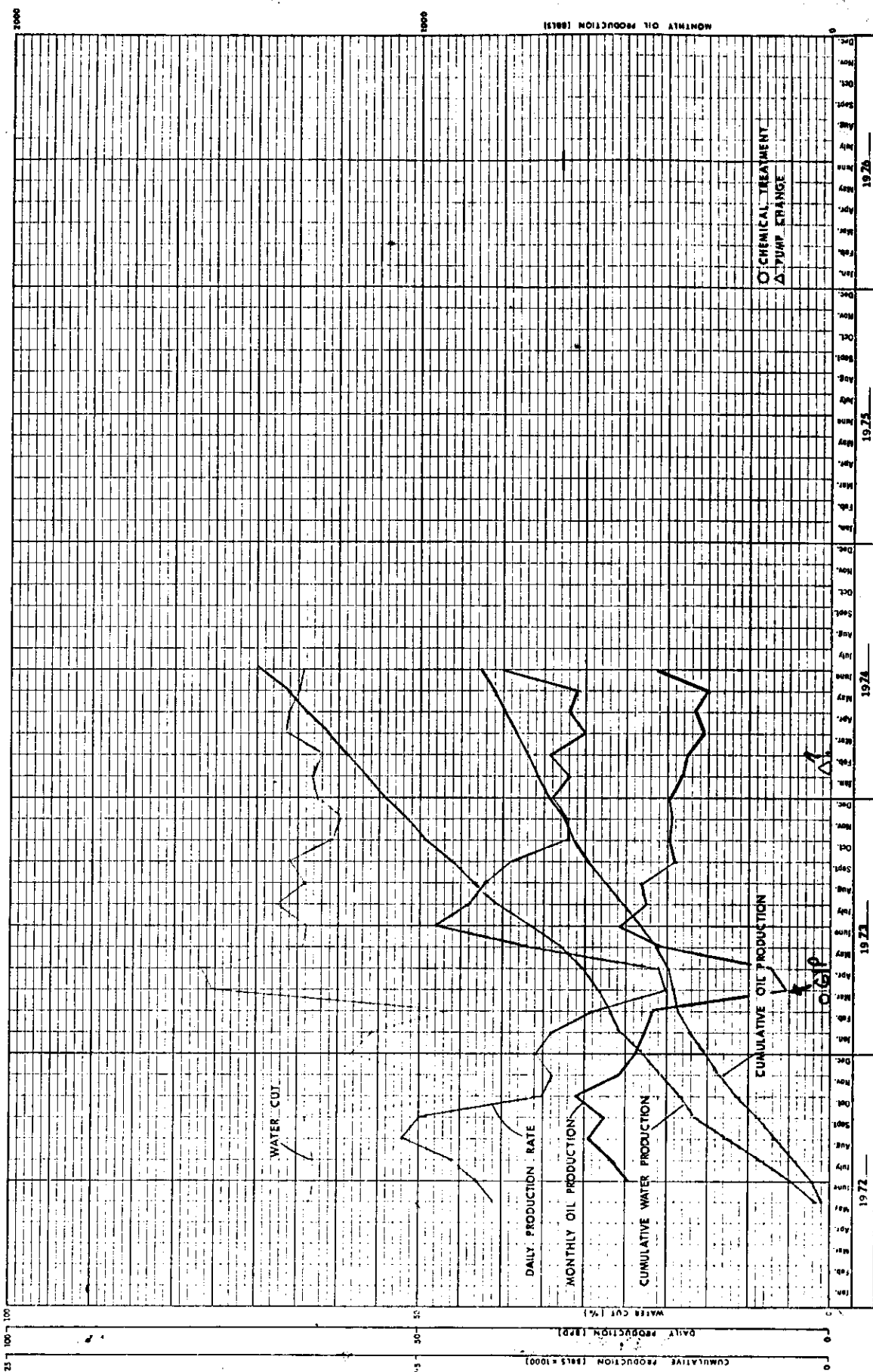


FIGURE 20

SAMEDAN ROUTLEDGE 8-14-9-25WPM.

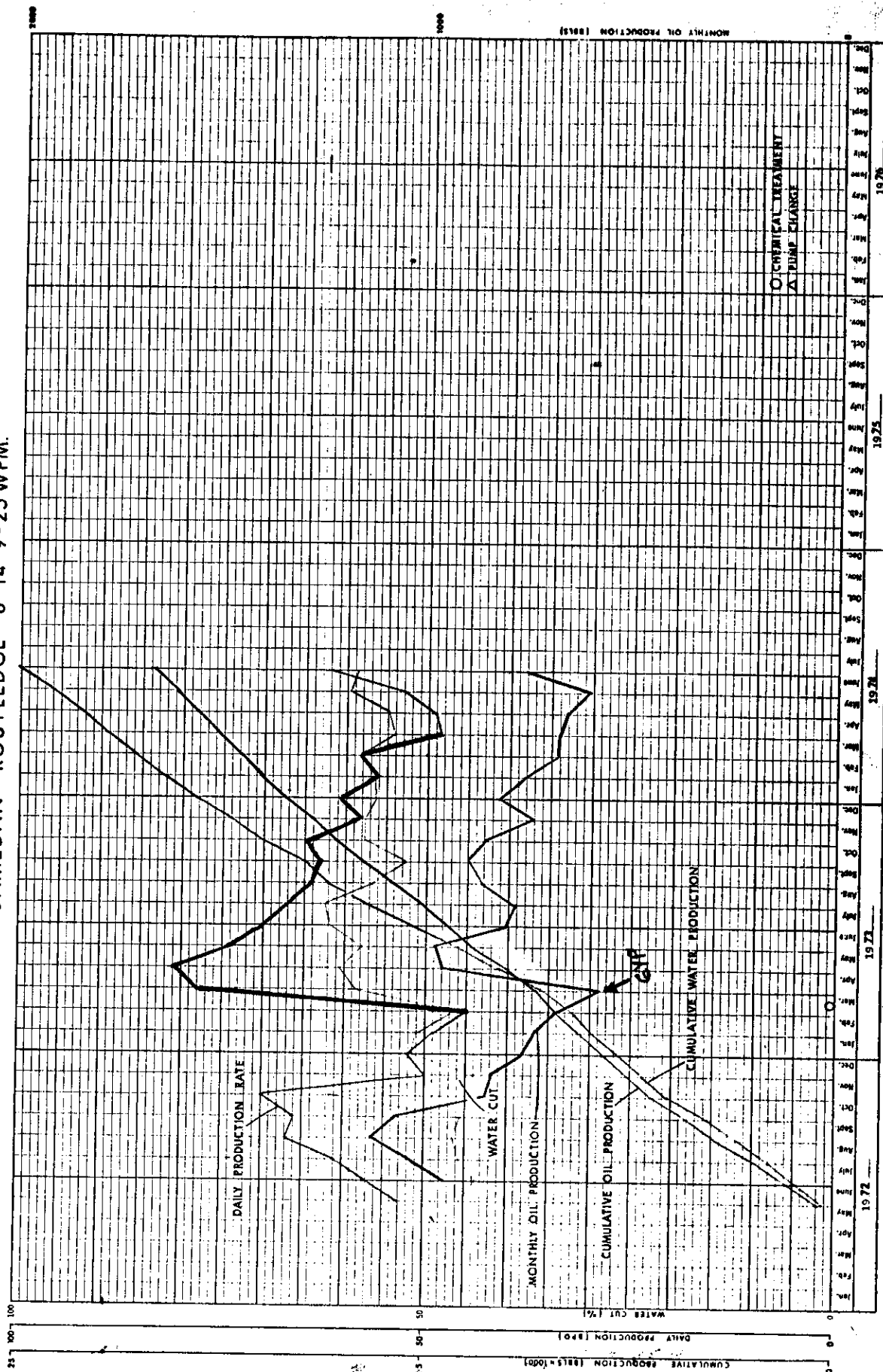


FIGURE 23

SAMEDAN ROUTLEDGE 9-14-9-25WPM.

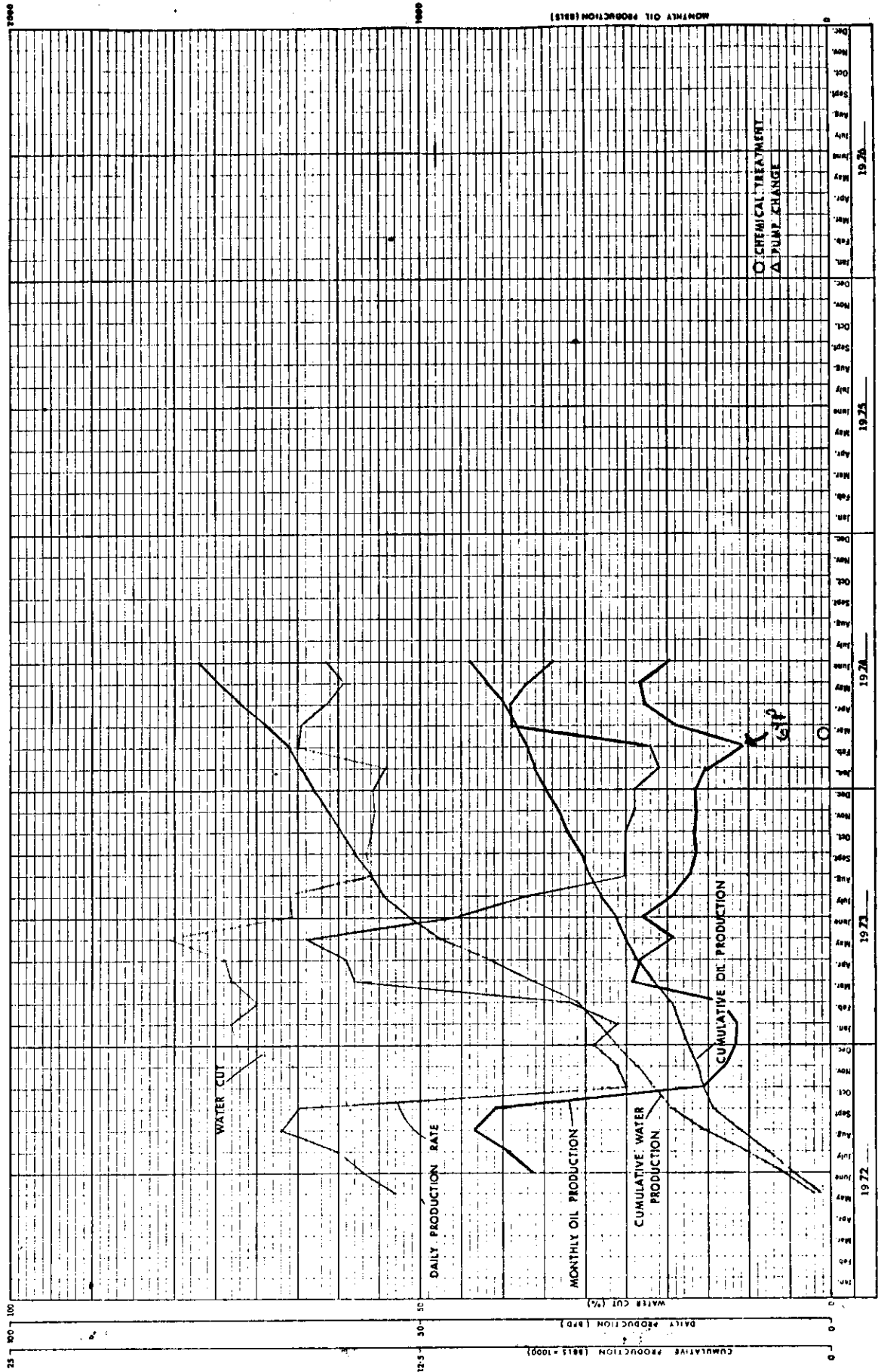


FIGURE 22

SAMEDAN ROUTLEDGE 10-14-9-25WPM.

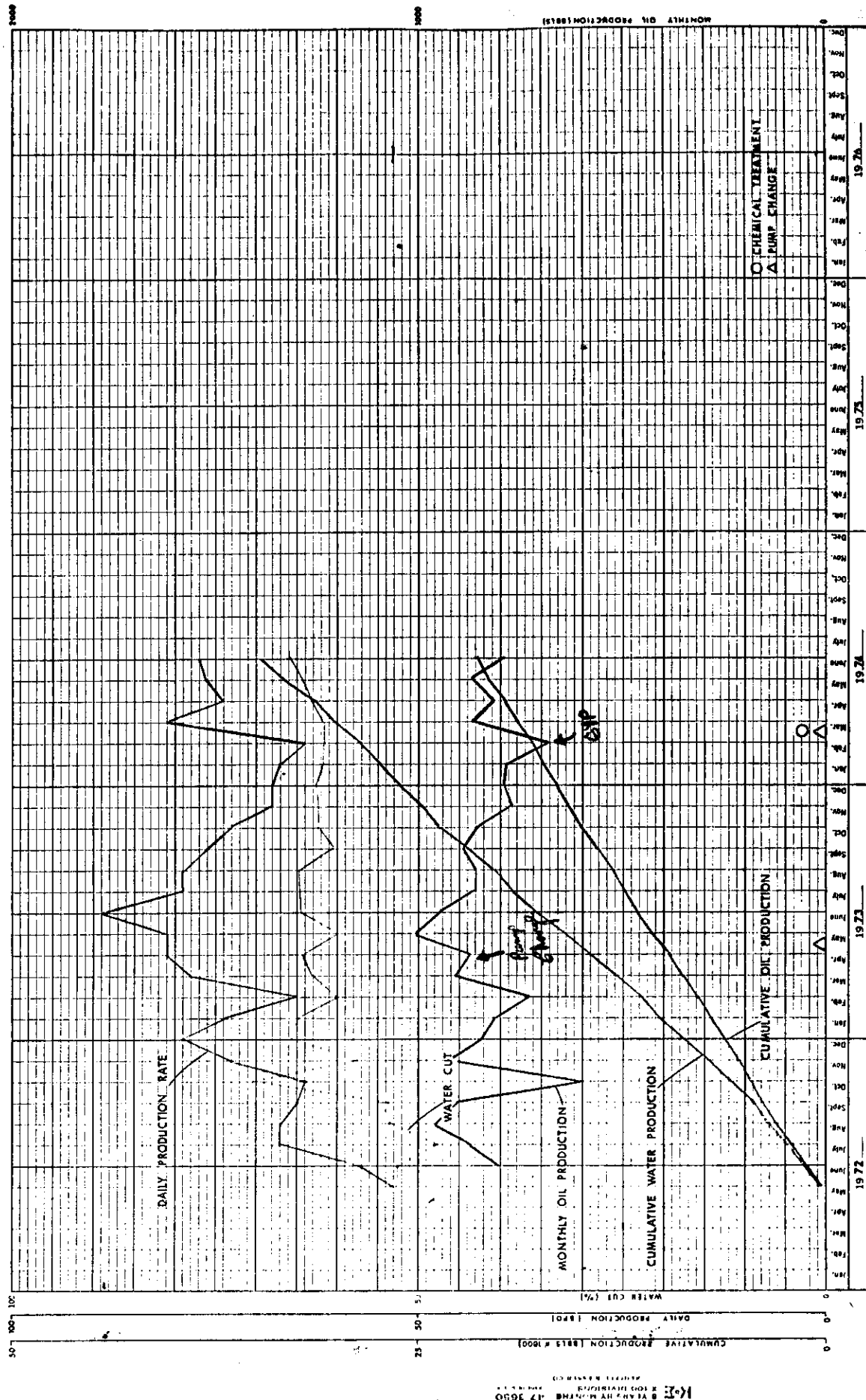


FIGURE 23

SAMEDAN ROUTLEDGE 11-14-9-25WPM.

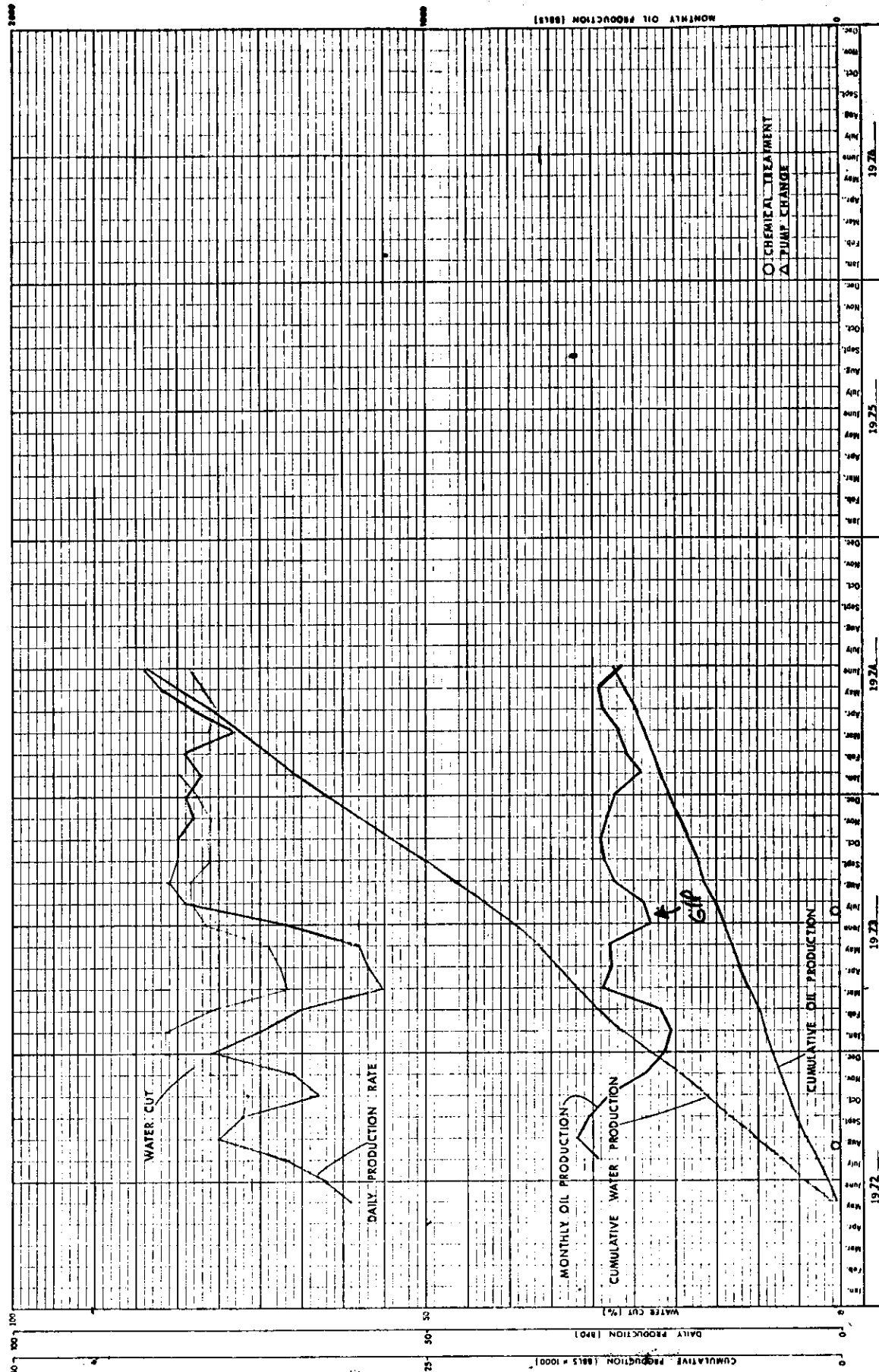
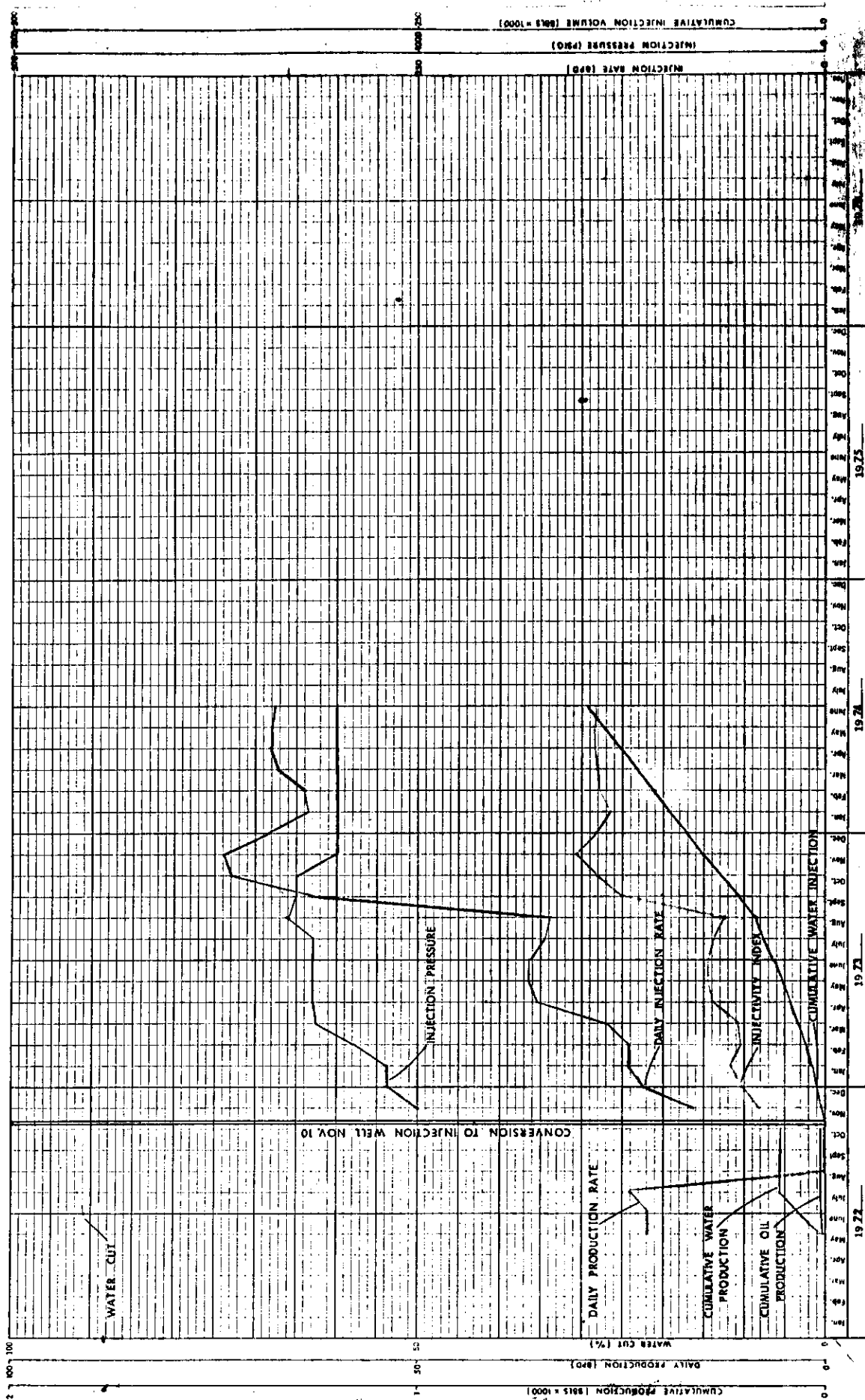


FIGURE 26

SAMEDAN ROUTLEDGE PROV. 2-11-9-25 WPM.



SAMEDAN ROUTLEDGE PROV. 10-11-9-25WPM.

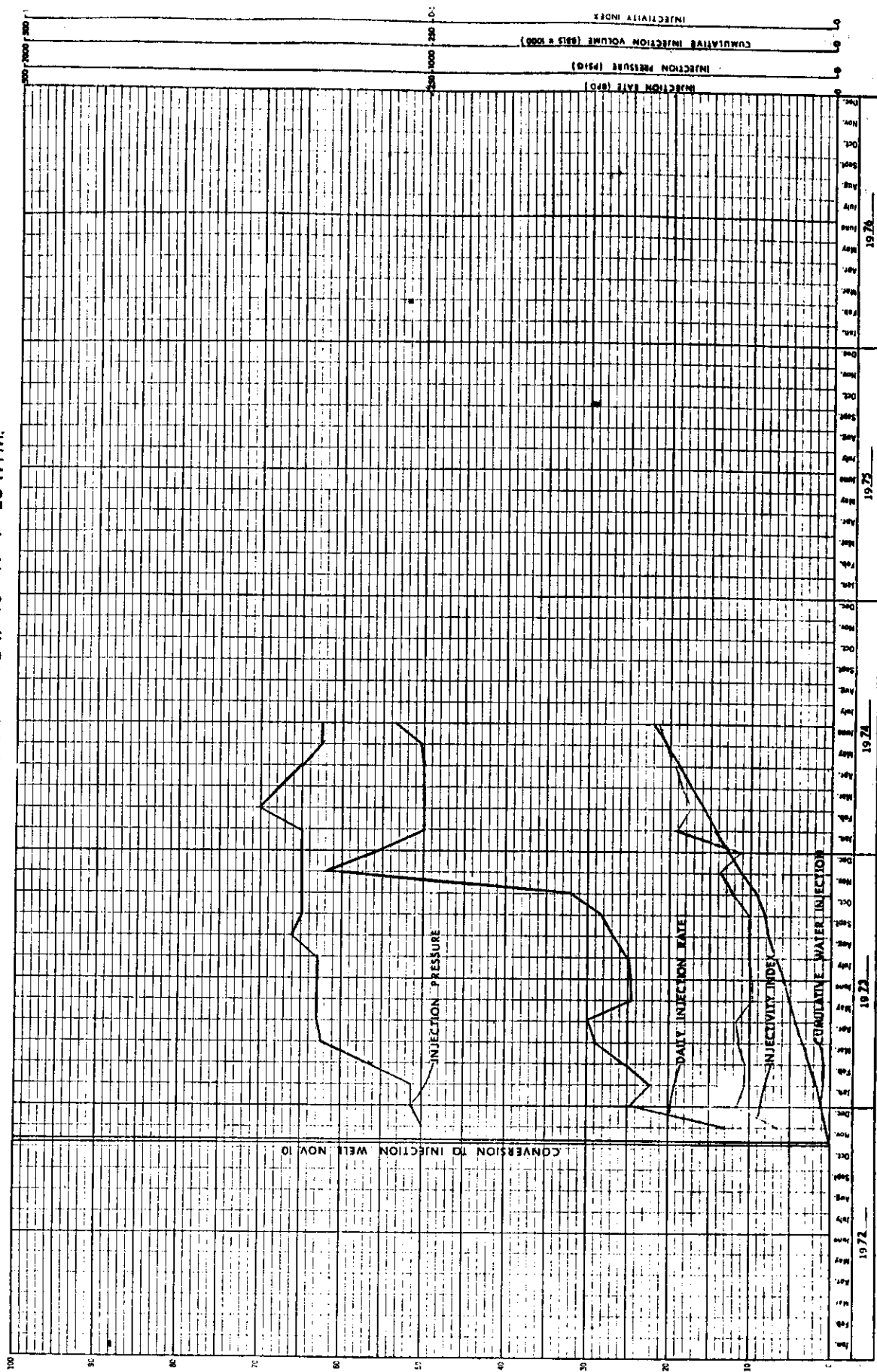


FIGURE 26

SAMEDAN ROUTLEDGE PROV. 12-11-9-25WPM.

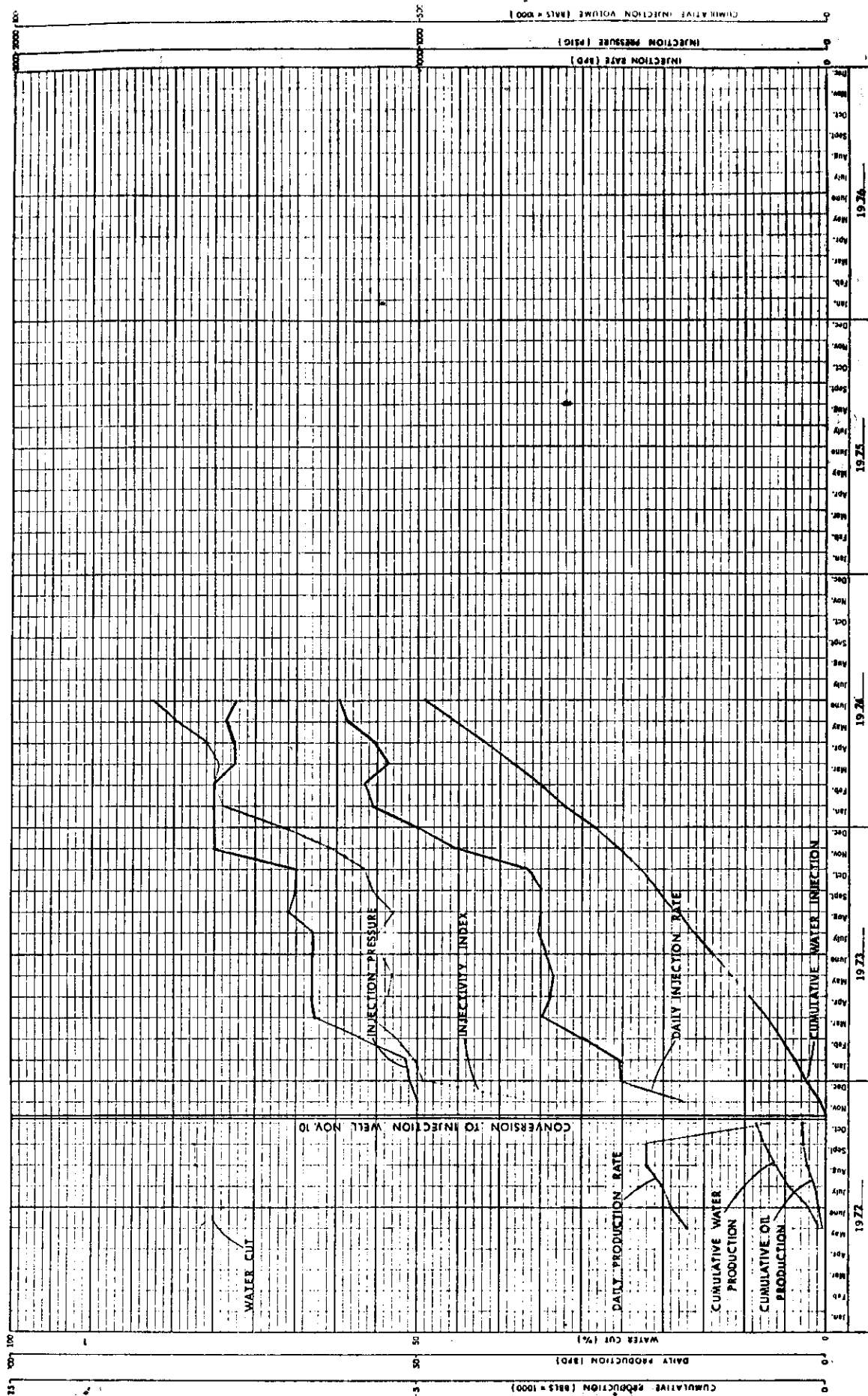


FIGURE 27

SAMEDAN ROUTLEDGE PROV. 14-11-9-25WPM.

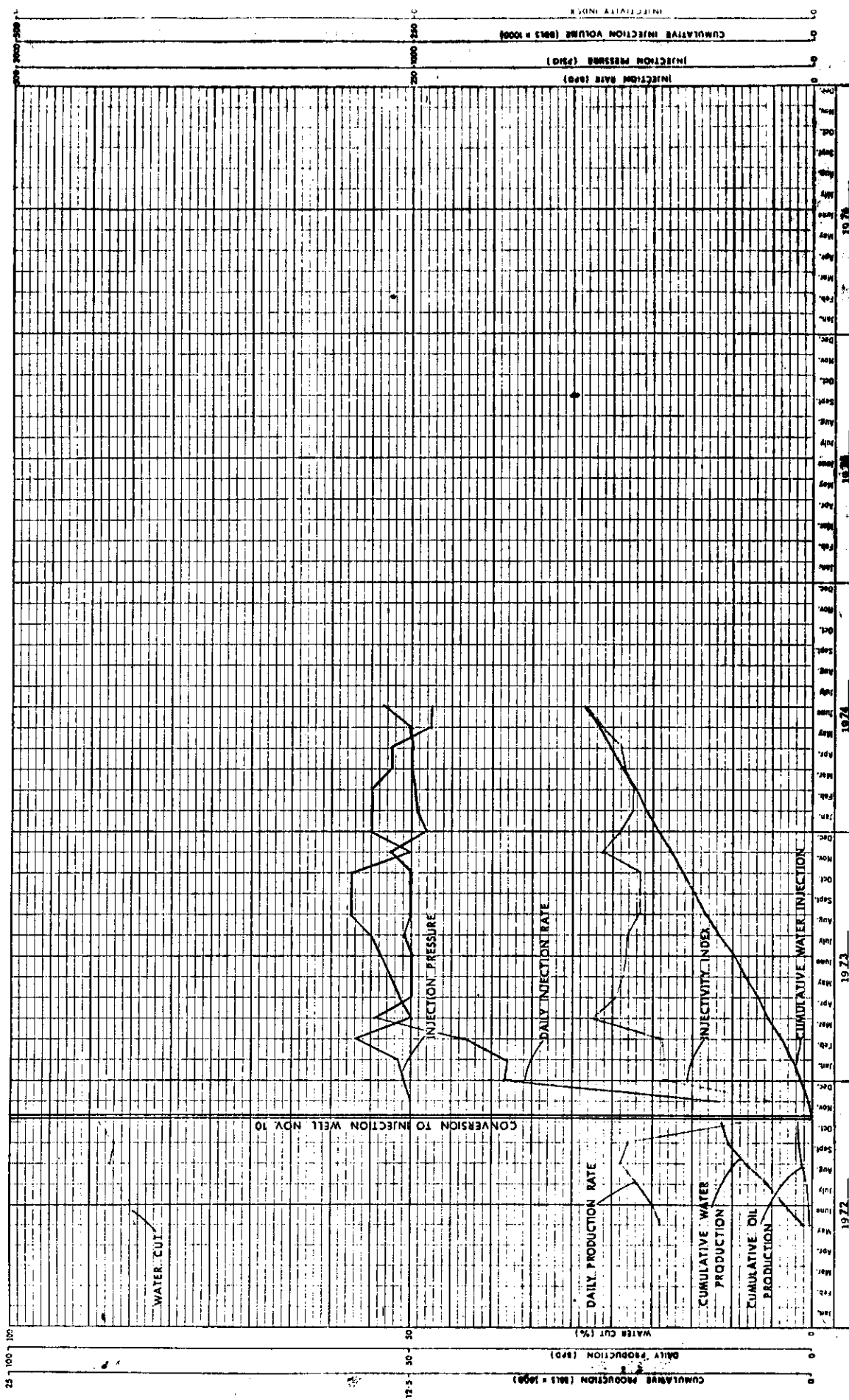


FIGURE 26

SAMEDAN ROUTLEDGE PROV. 6-14-9-25WPM.

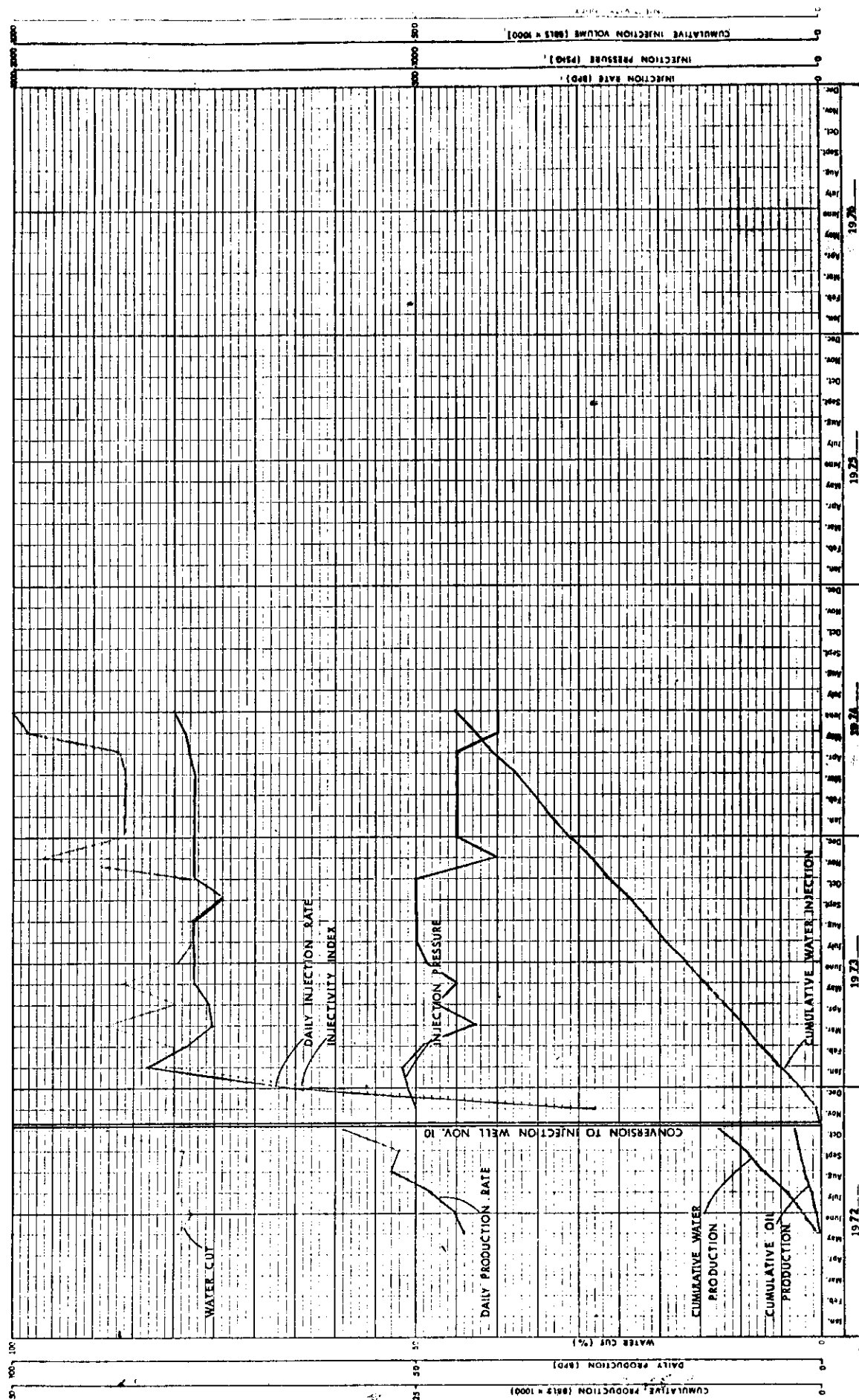


FIGURE 29



Chevron Standard Limited

400 - Fifth Avenue S.W., Calgary, Alberta T2P 0L7

August 12, 1974

J. ZEDDE
MANAGER - PRODUCTION

J. G. TROWELL
ASSISTANT MANAGER
UNITS AND JOINT VENTURES

Chevron West Routledge CPR
16-3-9-25

Province of Manitoba
Department of Mines, Resources and
Environmental Management
Mines Branch
Petroleum Engineering Division
993 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Mr. H. C. Moster, P.Eng.

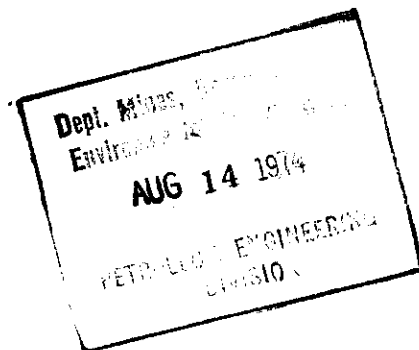
Gentlemen:

In reply to your letter of August 9, 1974 Chevron Standard Limited advises that we have no objection to Samedan's proposal to convert Samedan Routledge Prov. 4-11-9-25 to an injector and as a Working Interest Owner in the East Routledge Unit No. 1 we support Samedan's application.

Yours very truly,


J. G. TROWELL

AAHamberg/em



August 9, 1974

Chevron Standard Limited
400 - Fifth Avenue S. W.
CALGARY, Alberta
T2P 0L7

ATTENTION: Mr. J.G. Trowell

Dear Sir:

Re: Chevron West Routledge CPR 16-3-9-25

The Oil and Natural Gas Conservation Board of Manitoba have received an application from Samaden Oil of Canada, Inc. as operator of East Routledge Unit No. 1 to convert two producing oil wells within the unit to water injection wells. The one well, Samaden Routledge Prov. 4-11-9-25, is an offset well to your producing well located in 16-3-9-25.

It is therefore requested that Chevron Standard Limited submit to the Board prior to August 16, 1974 any objections it may have with regards to the proposed application or a formal notification of its support of same.

Yours truly,



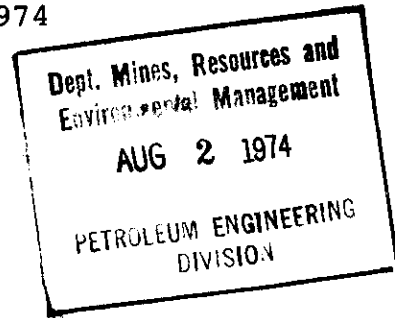
H. C. Moster, P. Eng.,
Acting Chief Petroleum Engineer

HCM/eh

SAMEDAN OIL OF CANADA, INC.
730 ELVEDEN HOUSE
CALGARY, ALBERTA
T2P 0Z3

August 1, 1974

Department of Mines, Resources and
Environmental Management
Petroleum Engineering Division
993 Century Street
Winnipeg, Manitoba
R3H 0W4



Attention: Mr. H. C. Moster, P. Eng.
Acting Chief Petroleum Engineer

Dear Sirs:

With respect to our telephone conversation of July 31, 1974, Samedan submits information concerning East Routledge Unit No. 1 production and injection statistics to the end of June, 1974.

The initial proposed injection system of five (5) injection wells located at LSD's 2-11, 10-11, 12-11, 14-11, and 6-14 is currently in effect. Locations 4-11 and 8-14 were not initially converted solely due to their production of 59 barrels of oil per day. It was therefore planned in the Engineering Report not to convert these two locations until after flood response. However, an injection pressure of 1500 psia, which was not anticipated, restricted input and no flood response has been noted in the Unit. It is essential that injection rates be increased to sustain a more economic flood life. Conversion of LSD's 4-11 and 8-14 will take away 36 BOPD or 13% of Unit production.

Since these additional wells were planned as injection wells during the initial injection phase, all plant construction and flowline considerations required by these additions have already been completed. No further changes, except for wellbore considerations, are required.

Yours very truly,

SAMEDAN OIL OF CANADA, INC.

A handwritten signature in black ink, appearing to read "Ken A. Bergen".

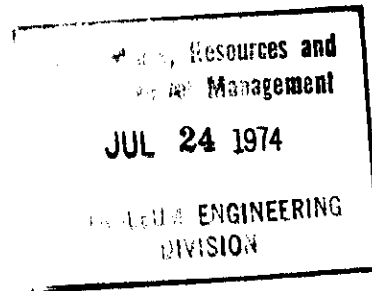
Ken A. Bergen
P. Eng.

KAB/caf
Enclosures

SAMEDAN OIL OF CANADA, INC.
730 ELVEDEN HOUSE
CALGARY, ALBERTA
T2P 0Z3

July 22, 1974

Department of Mines, Resources and
Environmental Management
Petroleum Engineering Division
993 Century Street
Winnipeg, Manitoba
R3H 0W4



Attention: Mr. H. C. Moster, P. Eng.
Acting Chief Petroleum Engineer

Dear Sirs:

Samedan Oil of Canada, Inc. hereby submits application
to abandon:

1. Samedan Routledge 12-2-9-25 WLM
2. Samedan Routledge 14-2-9-25 WLM
3. Samedan W. Routledge 9-11-9-25 WLM
4. Samedan Routledge 7-10-9-25 WLM (W.D.W.)

During 1969 to 1971, Samedan Routledge 12-2 produced in the order of 45 BOPM with a water cut greater than 95 percent as shown in EXHIBIT 1. Since 1971, 12-2 has been shut-in due to its uneconomic oil-water production ratio. Similarly, Samedan Routledge 14-2 is currently producing with a water cut greater than 95 percent as shown in EXHIBIT 2. During June, 1974, 14-2 produced 28 barrels of oil and 2912 barrels of water (water cut of 99%).

Samedan W. Routledge 9-11-9-25 WLM has never been economically feasible to produce crude. The well tested 80 percent water on swabbing after a 250 gallon MCA and 500 gallon 15% HCl acid treatment.

Due to the uneconomic nature of the production displayed by 12-2, 14-2 and 9-11, Samedan Oil of Canada, Inc. requests permission to abandon these locations.

See NEXT PAGE FOR CONVERSION REQUEST!

Department of Mines, Resources and
Environmental Management
July 22, 1974
Page 2

Samedan Routledge 7-10 was drilled in 1964 as a water disposal well for producing wells in Township 9, Range 25 WLM. Due to the formation of East Routledge Unit No. 1, all produced water previously disposed of at 7-10 is currently being injected at various locations within the Unit. Since the secondary recovery project eliminates the usage of 7-10, Samedan Oil of Canada, Inc. requests permission to abandon 7-10-9-25 WLM.

Samedan Oil of Canada, Inc. also submits application to convert to water injection wells:

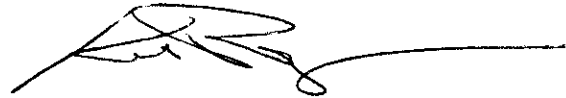
1. Samedan Routledge 4-11-9-25 WLM
2. Samedan Routledge 8-14-9-25 WLM.

The conversion to water injection status in these two wells is required to effectively support the pressure maintenance by water flooding project currently in effect at East Routledge Unit No. 1.

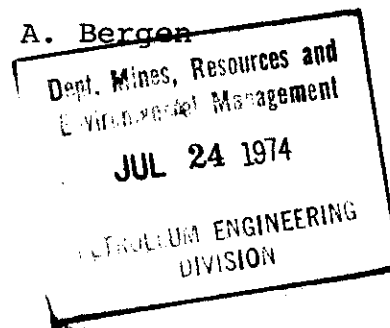
CONVERSION
REQUEST

Yours very truly,

SAMEDAN OIL OF CANADA, INC.



Ken A. Bergen



KAB/caf
Enclosures
files: 12-2
14-2
9-11
7-10
4-11
8-14

INTER-DEPARTMENTAL MEMORANDUM

FROM H. C. Moster

Acting Chief Petroleum Engineer

SUBJECT

EAST ROUTLEDGE UNIT NO. 1



PROVINCE
OF
MANITOBA

DATE August 21, 1974

TO J. D. Russell, A/D of Mines
The Oil and Natural Gas Conservation Board:
Jas. T. Cawley, P. Eng., Chairman
J. S. Roper, Deputy Chairman

CONVERSION OF 2 PRODUCING WELLS TO INJECTION WELLS

Attached herewith is the following Board Order for signatures:

1. Order No. PM 28 --

original and 2 copies

Certificate for Regulation of Order No. PM 28 --

original and 2 copies

Regulation of Order No. PM 28 --

3 copies

After signatures have been affixed, will you kindly return all the above listed material to the Director of Mines' Office for further processing.

H. C. Moster

/evh
Attachments

THE OIL AND NATURAL GAS CONSERVATION BOARD

²⁸
ORDER NO. PM ²⁷

An Order pertaining to Pressure Maintenance by Water Flooding

~~EAST ROUTLEDGE~~ ¹
~~VIRIDEN ROSELEA~~ UNIT NO. ¹

Made and passed pursuant to "The Mines Act", Cap. M160, R.S.M., 1970, and amendments thereto, by The Oil and Natural Gas Conservation Board, of Manitoba.

²⁰

Order No. PM ¹, of The Oil and Natural Gas Conservation Board, made and passed on the ³⁰19th day of ~~October~~ ^{MARCH}, A.D., ~~1966~~ and filed as Regulation ~~103/66~~ ^{57/72}, is amended as follows:
¹⁹⁷²

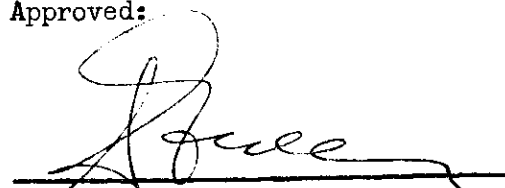
1. Subclause (1) of Clause 1 of the Pressure Maintenance Rules of the Order is amended by adding to the list of wells therein set out, the following wells:

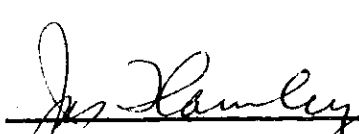
~~Chevron South Virden Prov. 12-11-10-26~~
~~Sarnedon Routledge Prov. 4-11-9-25~~
~~Sarnedon Routledge 8-14-9-25~~


²⁸

Oil and Natural Gas Order No. PM ~~27~~, made and passed this ~~19~~ day of ~~October~~ A.D., 1974, at the City of Winnipeg, in the Province of Manitoba, by The Oil and Natural Gas Conservation Board.

Approved:


Sidney Green,
Minister of Mines, Resources and
Environmental Management.


Jas. T. Cawley, P. Eng.,
Chairman,
The Oil and Natural Gas
Conservation Board.


J. S. Roper,
Deputy Chairman,
The Oil and Natural Gas
Conservation Board.

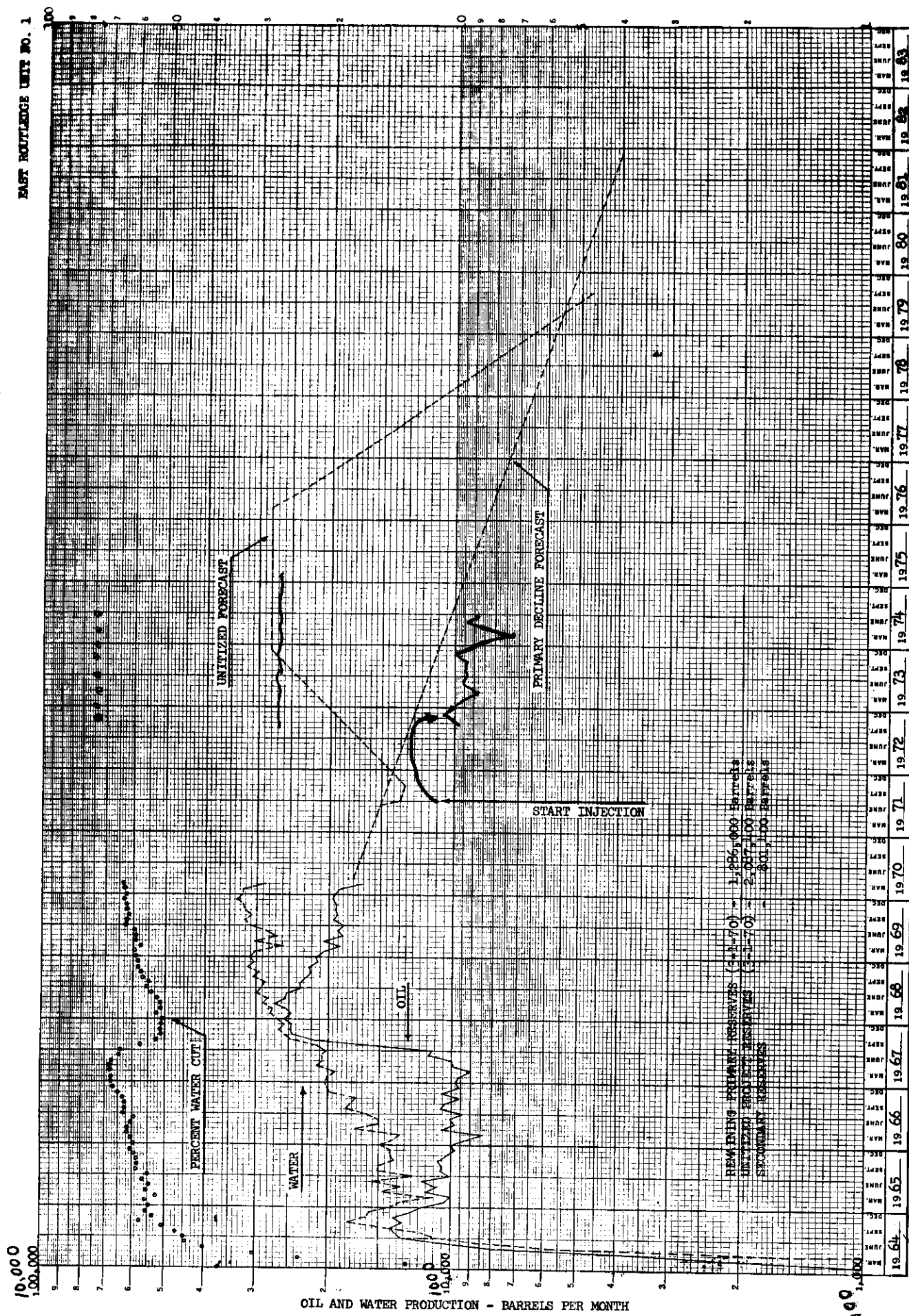


FIGURE NO. 7

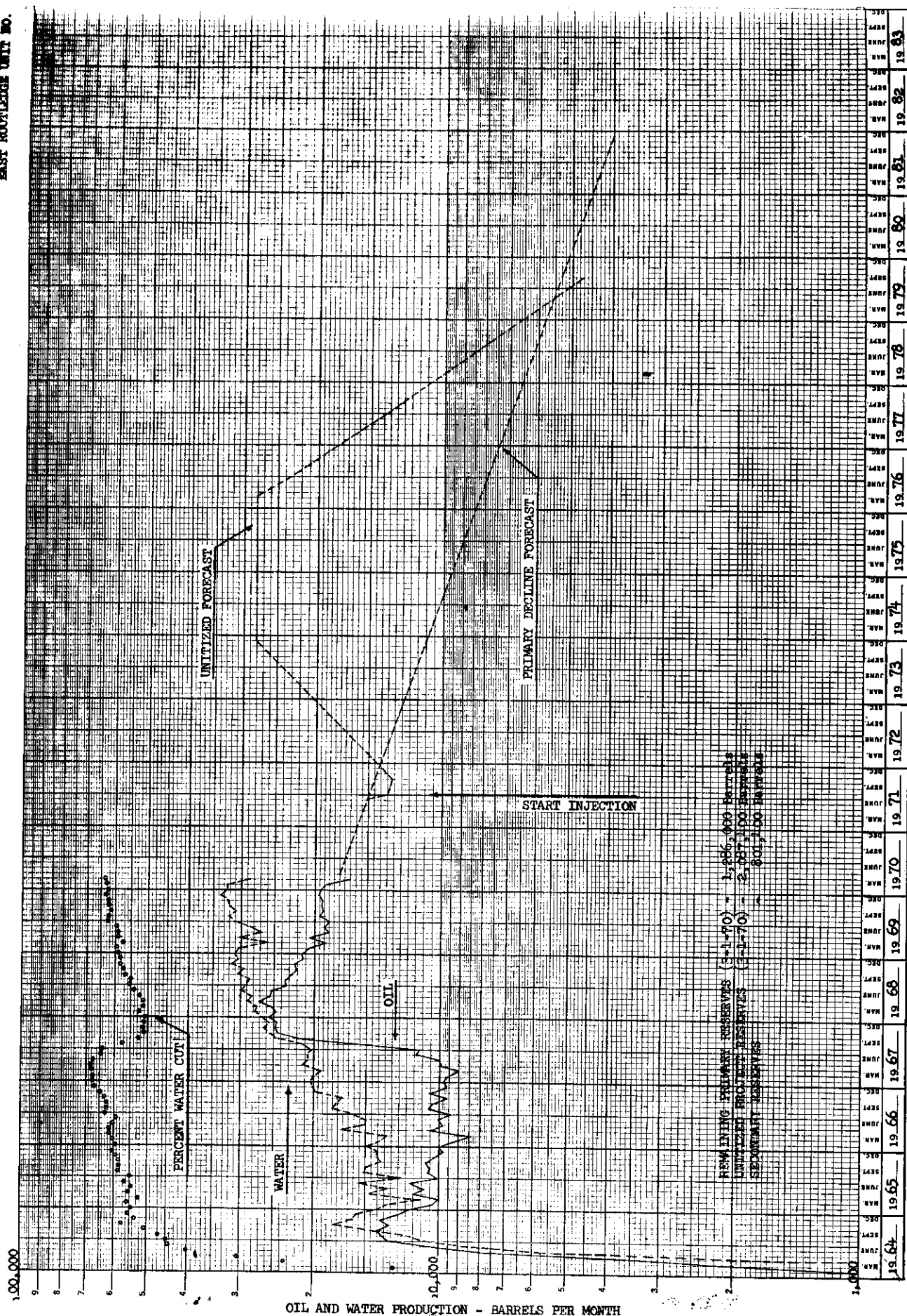


FIGURE NO. 7

WATER CUT - PERCENT

EAST BOWLINGDON UNIT NO. 1

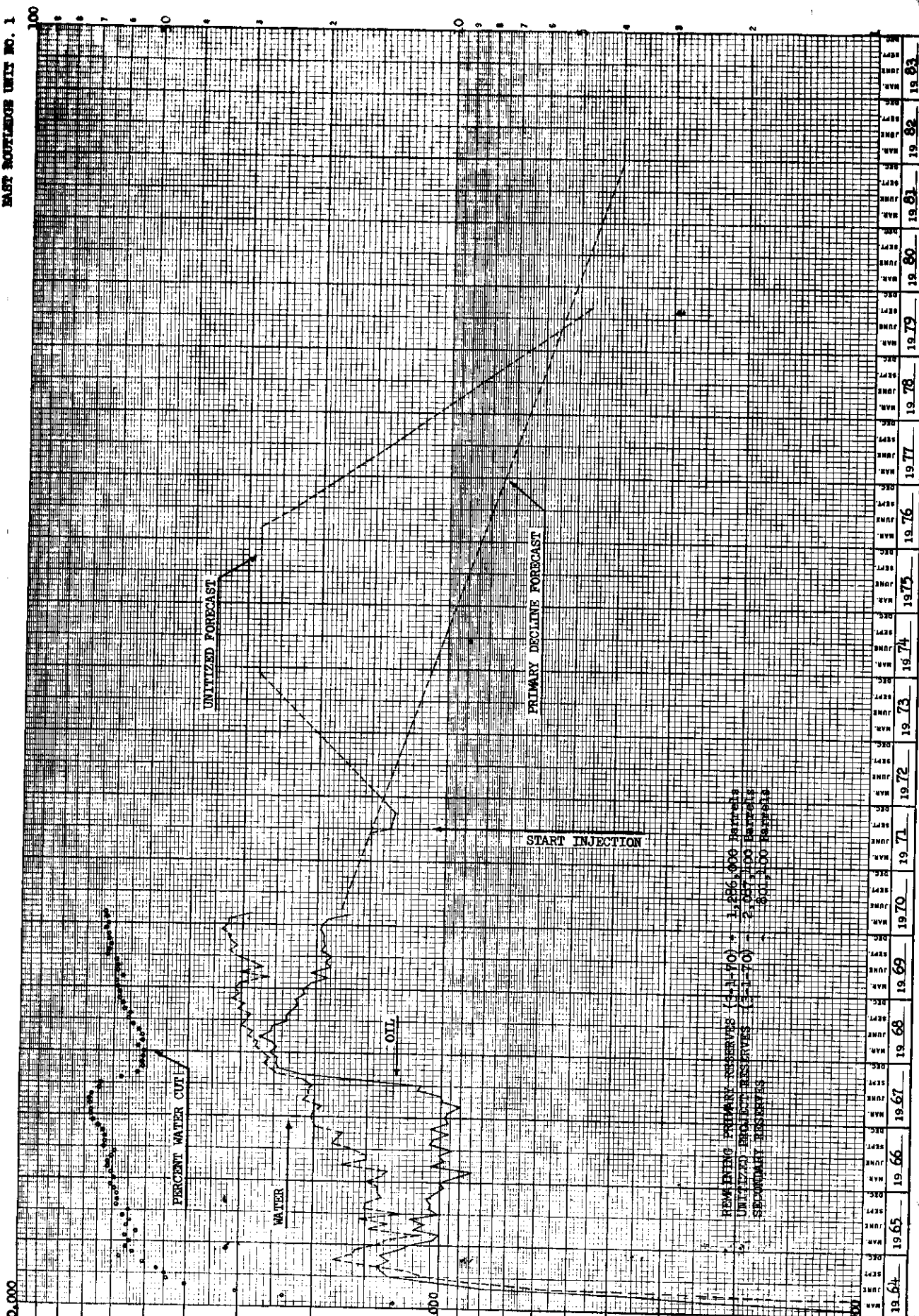


FIGURE NO. 7

WATER CUT - PERCENT

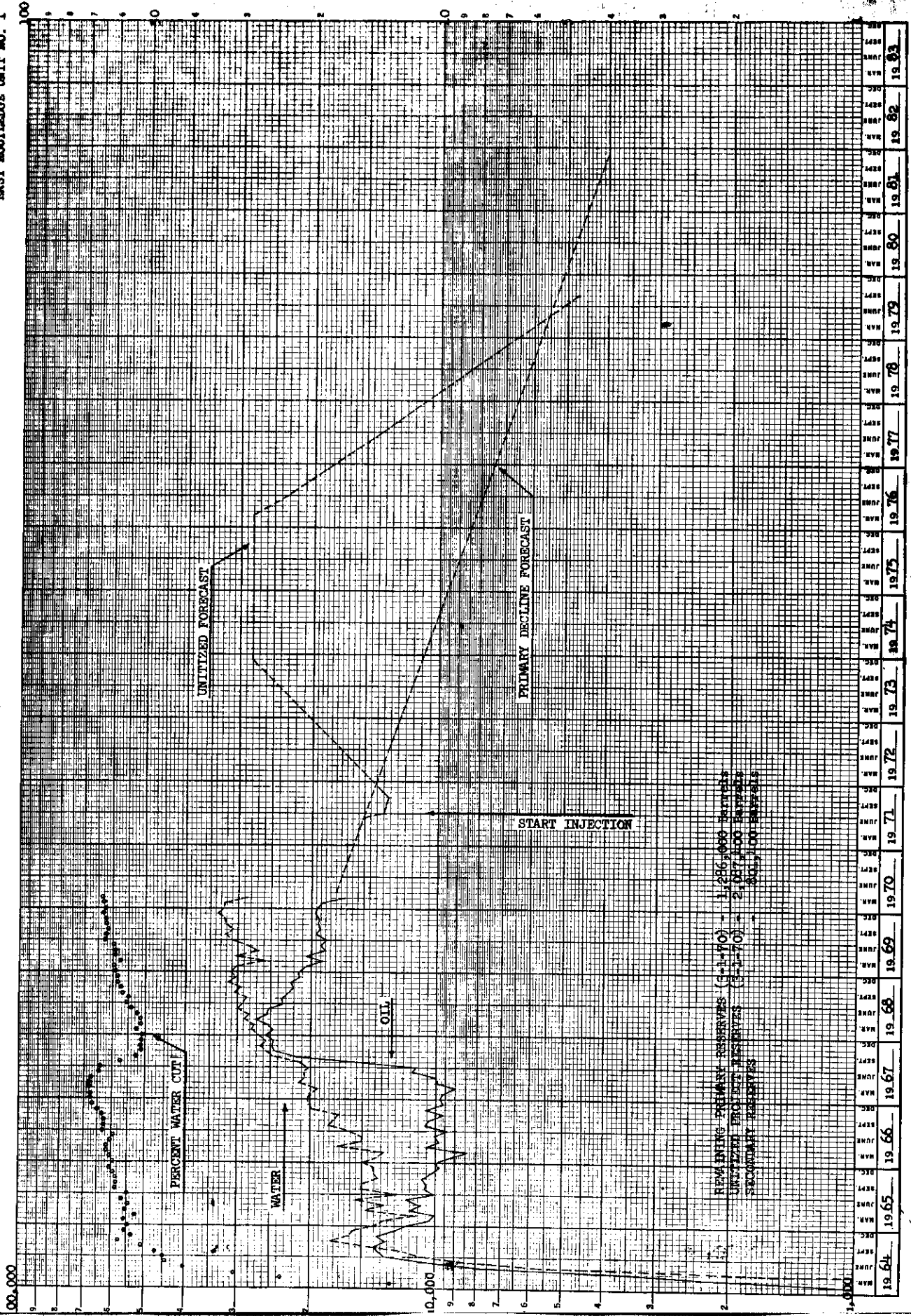
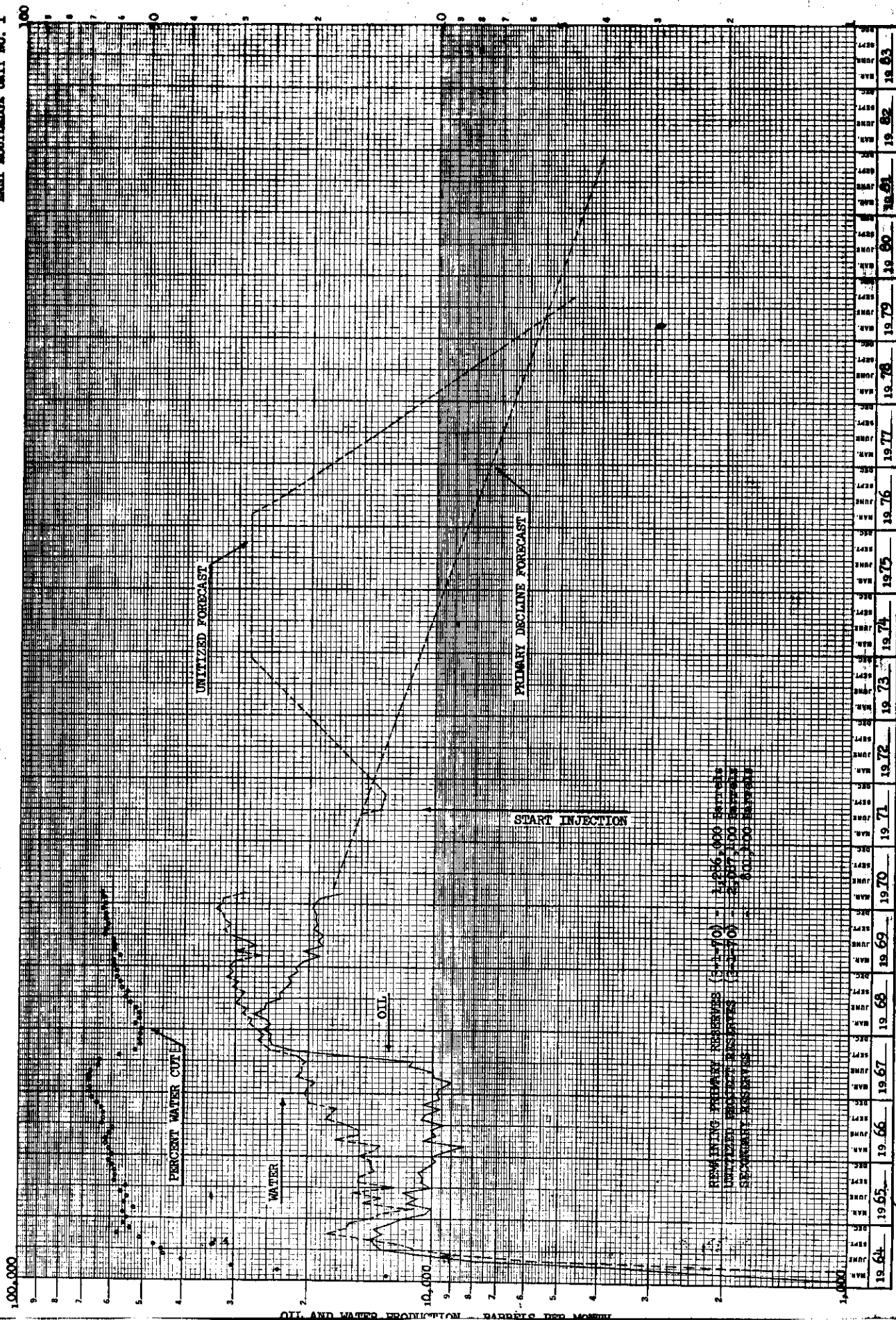
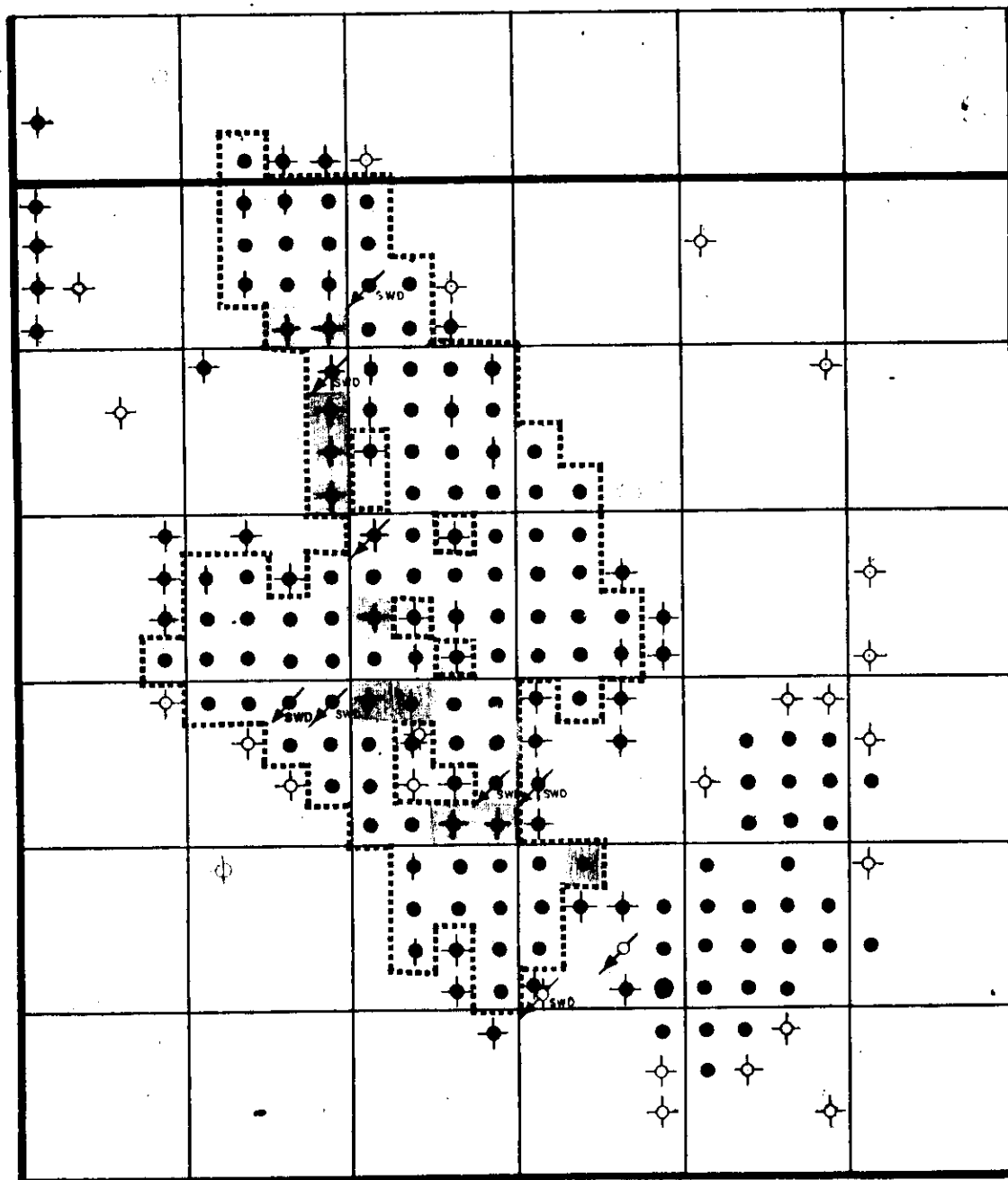


FIGURE NO. 7

WATER CUT - PERCENT





R. 25 W.P.M.

FIGURE 1

LEGEND

UNIT BOUNDARY

S.W.D. WELL

SUSPENDED WELL

ABANDONED WELL

ROUTLEDGE UNIT No. 1
AS OF DECEMBER 31, 1972



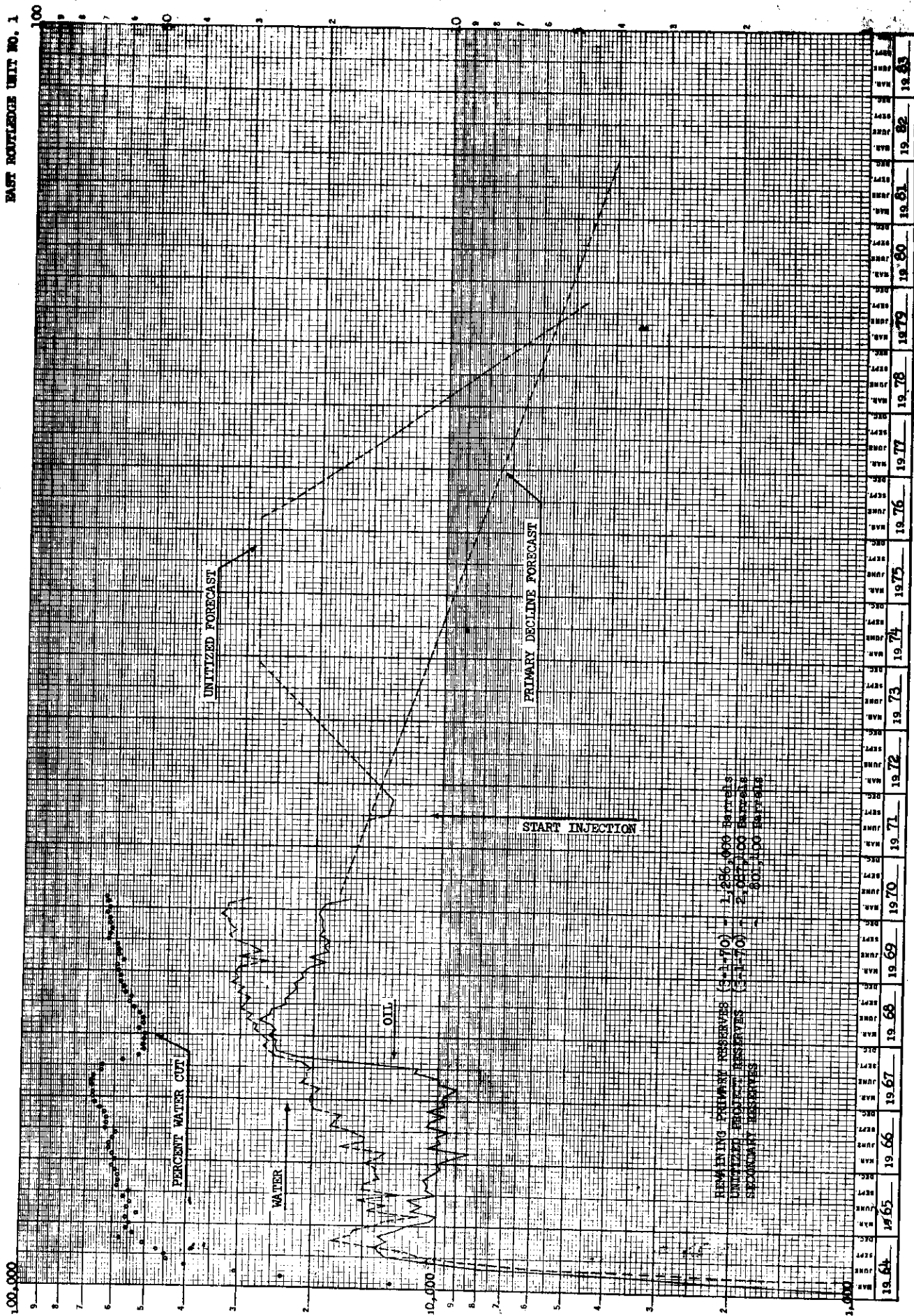


FIGURE NO. 7



DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT
THE OIL AND NATURAL GAS CONSERVATION BOARD
901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

Jas. T. Cawley, P. Eng.

~~XXXXXXXXXXXX~~ CHAIRMAN 946-7438

J. S. ROPER 946-7428

DEPUTY CHAIRMAN

M. J. GOBERT 946-7859

MEMBER

R. R. McDANIEL
CONSULTANT

NOTICE

EAST ROUTLEDGE UNIT NO. 1

SAMEDAN OIL OF CANADA, INC., as operator of the East Routledge Unit No. 1, has made application to increase the maximum injection pressure to 1,500 p.s.i.g., in the following injection wells:


Samedan Routledge Prov. W.I.W. 2-11-9-25

Samedan Routledge Prov. W.I.W. 10-11-9-25

Samedan Routledge Prov. W.I.W. 12-11-9-25

If no serious objection to the contrary, in writing, is received by the Board within 14 days of the publication of this notice, approval of the application may be granted, subject to Samedan Oil of Canada, Inc., accepting responsibility for any adverse results.

Copies of the proposal are available for perusal at the office of the Director of Mines, 901 Norquay Building, Winnipeg, Manitoba or at the offices of Samedan Oil of Canada, Inc., 730 Elveden House, Calgary, Alberta.


J. S. Roper
Deputy Chairman

Dated at Winnipeg, Manitoba,
this 12th day of September, 1973.

*PUBLISHED IN
MANITOBA GAZETTE*

VOL. 102. NO. 38

SEPT 22, 1973.

*(EXPIRES
OCT 6, 73)*

INTER-DEPARTMENTAL MEMORANDUM



PROVINCE
OF
MANITOBA

DATE September 11, 1973

FROM F. S. Ganev
Reservoir Engineer
Petroleum Division

TO J. S. Roper, Deputy Chairman
Oil and Natural Gas Conservation Board

SUBJECT Re: Samedan Oil of Canada

East Routledge Unit No. 1

Application to increase permissible water injection pressure to 1,500 p.s.i.g.

Samedan Oil of Canada has made application to increase injection pressure to a maximum of 1,500 p.s.i.g. ⁱⁿ three wells in the above Unit, namely:

Samedan Routledge Prov. W.I.W. 2-11-9-25

Samedan Routledge Prov. W.I.W. 10-11-9-25

Samedan Routledge Prov. W.I.W. 12-11-9-25

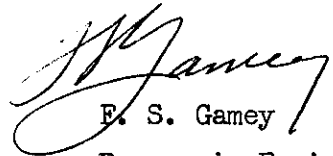
1. The formation fracture pressure in the above wells is estimated to be approximately 1,300 p.s.i.g. (theoretical)
2. Although the above wells have had chemical stimulation (750 gallons of 28% Hcl. acid each) and the injection pressure has been increased from 1,000 p.s.i.g. to 1,260 p.s.i.g., the overall injection volumes of 2,610 barrels of water per day has not been achieved. This is the volume of water rate they anticipated in their Engineering report submitted at the Unitization Hearing. They are presently injecting (as of July 1973) about 2030 barrels of water per day.
3. The company has made a study of maximum fracture propagation and feels there is no danger of any fracturing radiating downward to the cherty zone aquifer. This assumes the formation may be fractured. Also the flood fronts are calculated to be beyond any possible fracture radius, which precludes the possibility of by-passing any recoverable oil.
4. The 1,500 p.s.i. maximum pressure is the operational limit of the injection pump. The maximum surface pressure is within the pressure ratings of all installed surface and down-hole equipment.

Procedure

This was discussed with Mr. M.J. Gobert in March 1973, when Samedan first considered increasing the pressure. Samedan decided to wait until June 1973, to see if there was any better response to the flood at that time.

It was agreed (in March) that the Board would advertize the application in the Virden paper and the Gazette, before approving the increase in pressure.

A draft letter for advertisement by the Board is here attached for your consideration.


E. S. Gamey
Reservoir Engineer

FSG/evh
Attachment

INTER-DEPARTMENTAL MEMORANDUM

FROM F. S. Gamey
Reservoir Engineer
Petroleum Division



PROVINCE
OF
MANITOBA

DATE September 11, 1973

TO J. S. Roper, Deputy Chairman
Oil and Natural Gas Conservation Board

SUBJECT Re: Samedan Oil of Canada

East Routledge Unit No. 1

Application to increase permissible water injection pressure to 1,500 p.s.i.g.

Samedan Oil of Canada has made application to increase injection pressure to a maximum of 1,500 p.s.i.g. ⁱⁿ three wells in the above Unit, namely:

Samedan Routledge Prov. W.I.W. 2-11-9-25

Samedan Routledge Prov. W.I.W. 10-11-9-25

Samedan Routledge Prov. W.I.W. 12-11-9-25

1. The formation fracture pressure in the above wells is estimated to be approximately 1,300 p.s.i.g. (theoretical)
2. Although the above wells have had chemical stimulation (750 gallons of 28% Hcl. acid each) and the injection pressure has been increased from 1,000 p.s.i.g. to 1,260 p.s.i.g., the overall injection volumes of 2,610 barrels of water per day has not been achieved. This is the volume of water rate they anticipated in their Engineering report submitted at the Unitization Hearing. They are presently injecting (as of July 1973) about 2030 barrels of water per day.
3. The company has made a study of maximum fracture propagation and feels there is no danger of any fracturing radiating downward to the cherty zone aquifer. This assumes the formation may be fractured.

Also the flood fronts are calculated to be beyond any possible fracture radius, which precludes the possibility of by-passing any recoverable oil.


4. The 1,500 p.s.i. maximum pressure is the operational limit of the injection pump. The maximum surface pressure is within the pressure ratings of all installed surface and down-hole equipment.

Procedure

This was discussed with Mr. M.J. Gobert in March 1973, when Samedan first considered increasing the pressure. Samedan decided to wait until June 1973, to see if there was any better response to the flood at that time.

It was agreed (in March) that the Board would advertize the application in the Virden paper and the Gazette, before approving the increase in pressure.

A draft letter for advertisement by the Board is here attached for
your consideration.


F. S. Gamey
Reservoir Engineer

FSG/evh
Attachment



MANITOBA

DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT

THE OIL AND NATURAL GAS CONSERVATION BOARD

901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

NOTICE

Jas. T. Cawley, P. Eng.

~~MANITOBA~~ 946-7438

CHAIRMAN

J. S. ROPER 946-7428

DEPUTY CHAIRMAN

M. J. GOBERT 946-7859

MEMBER

R. R. McDANIEL
CONSULTANT

EAST ROUTLEDGE UNIT NO. 1

SAMEDAN OIL OF CANADA, INC., as operator of the East Routledge Unit No. 1, has made application to increase the maximum injection pressure to 1,500 p.s.i.g., in the following injection wells:

Samedan Routledge Prov. W.I.W. 2-11-9-25

Samedan Routledge Prov. W.I.W. 10-11-9-25

Samedan Routledge Prov. W.I.W. 12-11-9-25

If no serious objection to the contrary, in writing, is received by the Board within 14 days of the publication of this notice, approval of the application may be granted, subject to Samedan Oil of Canada, Inc., accepting responsibility for any adverse results.

Copies of the proposal are available for perusal at the office of the Director of Mines, 901 Norquay Building, Winnipeg, Manitoba or at the offices of Samedan Oil of Canada, Inc., 730 Elveden House, Calgary, Alberta.

J. S. Roper
Deputy Chairman

Dated at Winnipeg, Manitoba,
this 12th day of September, 1973.

DEPARTMENT OF MINES, RESOURCES AND ENVIRONMENTAL MANAGEMENT

ROUTE SLIP

TO <u>J. S. ROPER</u>	FROM <u>F. S. GAMMAY</u>
TO	FROM

- | | | |
|--|--|--|
| <input type="checkbox"/> For your approval or revision | <input type="checkbox"/> Reply direct with copy to me | <input type="checkbox"/> Please sign |
| <input type="checkbox"/> For your information | <input type="checkbox"/> Please supply data for my reply | <input type="checkbox"/> Please return |
| <input type="checkbox"/> Please take action | <input type="checkbox"/> Return with comments and/or recommendations | <input type="checkbox"/> Please see me |
| <input type="checkbox"/> Extracts of minutes for your information and action | <input type="checkbox"/> Investigate and report | <input type="checkbox"/> Please phone |
| <input type="checkbox"/> Please draft reply for signature of | | |

Date SEPT 12/73 Subject SAME OAN.

Message

If the draft letter is satisfactory
please sign and we will
reproduce for publication copies,
and "white out" the "DRAFT OF NOTICE"

MNR-A-94

Use reverse side if necessary



MANITOBA

DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT

THE OIL AND NATURAL GAS CONSERVATION BOARD

901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

NOTICE

Jas. T. Cawley, P. Eng.

~~XXXXXXXXXXXX~~ 946-7438

CHAIRMAN

J. S. ROPER 946-7428

DEPUTY CHAIRMAN

M. J. GOBERT 946-7859

MEMBER

R. R. McDANIEL
CONSULTANT

EAST ROUTLEDGE UNIT NO. 1

SAMEDAN OIL OF CANADA, INC., as operator of the East Routledge Unit No. 1, has made application to increase the maximum injection pressure to 1,500 p.s.i.g., in the following injection wells:

Samedan Routledge Prov. W.I.W. 2-11-9-25

Samedan Routledge Prov. W.I.W. 10-11-9-25

Samedan Routledge Prov. W.I.W. 12-11-9-25

If no serious objection to the contrary, in writing, is received by the Board within 14 days of the publication of this notice, approval of the application may be granted, subject to Samedan Oil of Canada, Inc., accepting responsibility for any adverse results.

Copies of the proposal are available for perusal at the office of the Director of Mines, 901 Norquay Building, Winnipeg, Manitoba or at the offices of Samedan Oil of Canada, Inc., 730 Elveden House, Calgary, Alberta.

J. S. Roper
Deputy Chairman

Dated at Winnipeg, Manitoba,
this 12th day of September, 1973.

INTE DEPARTMENTAL MEMORANDUM

FROM F. S. Gamey

Reservoir Engineer



PROVINCE
OF
MANITOBA

DATE October 9, 1973

TO J. S. Roper

Deputy Chairman


The Oil and Natural Gas Conservation
Board

SUBJECT Re: Samedan Oil of Canada

East Routledge Unit No. 1

Application to increase water injection pressure to 1,500 p.s.i.g.

1. Under date of letter September 5, 1973, Samedan Oil of Canada made formal application to the Board to increase injection pressure to a maximum of 1,500 p.s.i.g. in three injection wells operating in the Routledge Unit No. 1.
2. Notice of the above application was published in the Virden Empire-Advance Newspaper of September 19, 1973 and in the Manitoba Gazette of September 22, 1973.
3. No objections to the application have been received verbally or in writing as of October 9, 1973.
4. It is recommended that the Board approve the application to increase the injection pressures.
5. A draft letter of approval for Board Chairman's signature is attached.


F. S. Gamey

FSG/evh

Attachment



MANITOBA

DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT

THE OIL AND NATURAL GAS CONSERVATION BOARD

901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

Jas. T. Cawley, P. Eng.

XXXXXXXXXXXX	946-7438
CHAIRMAN	
J. S. ROPER	946-7428
DEPUTY CHAIRMAN	
M. J. GOBERT	946-7859
MEMBER	
R. R. McDANIEL	
CONSULTANT	

October 9, 1973

Mr. Garry D. Kilbourn
Vice President and Manager
Samedan Oil of Canada, Inc.
730 Elveden House
CALGARY, Alberta
T2P 0Z3

Dear Mr. Kilbourn:

Re: Permission to increase injection pressure
East Routledge Unit No. 1

In accordance with Section 4 of Order No. PM 20, pertaining to pressure maintenance by water flooding of the above Unit, the Board hereby grants permission to the operator to

1. Increase the injection pressure to a maximum of 1,500 p.s.i.g., in the following injection wells --

Samedan Routledge Prov. W.I.W. 2-11-9-25
Samedan Routledge Prov. W.I.W. 10-11-9-25
Samedan Routledge Prov. W.I.W. 12-11-9-25

Yours sincerely,

Jas. T. Cawley, P. Eng.,
Chairman,
The Oil and Natural Gas
Conservation Board.

FSG/evh

INTER-DEPARTMENTAL MEMORANDUM

PROVINCE
OF
MANITOBA

DATE September 11, 1973

FROM F. S. Gamey
Reservoir Engineer
Petroleum Division

TO J. S. Roper, Deputy Chairman

Oil and Natural Gas Conservation Board

SUBJECT Re: Samedan Oil of Canada

East Routledge Unit No. 1

Application to increase permissible water injection pressure to 1,500 p.s.i.g.

Samedan Oil of Canada has made application to increase injection pressure to a maximum of 1,500 p.s.i.g. ⁱⁿ three wells in the above Unit, namely:

Samedan Routledge Prov. W.I.W. 2-11-9-25

Samedan Routledge Prov. W.I.W. 10-11-9-25

Samedan Routledge Prov. W.I.W. 12-11-9-25

1. The formation fracture pressure in the above wells is estimated to be approximately 1,300 p.s.i.g. (theoretical)
2. Although the above wells have had chemical stimulation (750 gallons of 28% Hcl. acid each) and the injection pressure has been increased from 1,000 p.s.i.g. to 1,260 p.s.i.g., the overall injection volumes of 2,610 barrels of water per day has not been achieved. This is the volume of water rate they anticipated in their Engineering report submitted at the Unitization Hearing. They are presently injecting (as of July 1973) about 2030 barrels of water per day.
3. The company has made a study of maximum fracture propagation and feels there is no danger of any fracturing radiating downward to the cherty zone aquifer. This assumes the formation may be fractured. Also the flood fronts are calculated to be beyond any possible fracture radius, which precludes the possibility of by-passing any recoverable oil.
4. The 1,500 p.s.i. maximum pressure is the operational limit of the injection pump. The maximum surface pressure is within the pressure ratings of all installed surface and down-hole equipment.

Procedure

This was discussed with Mr. M.J. Gobert in March 1973, when Samedan first considered increasing the pressure. Samedan decided to wait until June 1973, to see if there was any better response to the flood at that time.

It was agreed (in March) that the Board would advertize the application in the Virden paper and the Gazette, before approving the increase in pressure.

A draft letter for advertisement by the Board is here attached for your consideration.

F. S. Gamey
Reservoir Engineer

FSG/evh
Attachment



MANITOBA

DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT
THE OIL AND NATURAL GAS CONSERVATION BOARD
901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

Jas. T. Cawley, P. Eng.
~~200-XXXX-XXXX~~ 946-7436
CHAIRMAN
J. S. ROPER 946-7428
DEPUTY CHAIRMAN
M. J. GOBERT 946-7859
MEMBER
R. R. McDANIEL
CONSULTANT

DRAFT OF NOTICE

NOTICE

EAST ROUTLEDGE UNIT NO. 1

SAMEDAN OIL OF CANADA, INC., as operator of the East Routledge Unit No. 1, has made application to increase the maximum injection pressure to 1,500 p.s.i.g., in the following injection wells:

Samedan Routledge Prov. W.I.W. 2-11-9-25
Samedan Routledge Prov. W.I.W. 10-11-9-25
Samedan Routledge Prov. W.I.W. 12-11-9-25

If no serious objection to the contrary, in writing, is received by the Board within 14 days of the publication of this notice, approval of the application may be granted, subject to Samedan Oil of Canada, Inc., accepting responsibility for any adverse results.

Copies of the proposal are available for perusal at the office of the Director of Mines, 901 Norquay Building, Winnipeg, Manitoba or at the offices of Samedan Oil of Canada, Inc., 730 Elveden House, Calgary, Alberta.

J. S. Roper
Deputy Chairman

Dated at Winnipeg, Manitoba,
this day of , 1973.

EAST ROUTLEDGE UNIT No. 1

SAMEDAN OIL OF CANADA, Inc., as operator of the East Routledge Unit No. 1, has made application to increase the maximum injection pressure to 1,500 p.s.i.g., in the following injection wells:

Samedan Routledge Prov.
W.I.W. 2-11-9-25

Samedan Routledge Prov.
W.I.W. 10-11-9-25

Samedan Routledge Prov.
W.I.W. 12-11-9-25

If no serious objection to the contrary, in writing, is received by the Board within 14 days of the publication of this notice, approval of the application may be granted, subject to Samedan Oil of Canada, Inc., accepting responsibility for any adverse results.

Copies of the proposal are available for perusal at the office of the Director of Mines, 901 Norquay Building, Winnipeg, Manitoba or at the offices of Samedan Oil of Canada, Inc., 730 Elveden House, Calgary, Alberta.

J. S. Roper
Deputy Chairman

Dated at Winnipeg, Manitoba, this
12th day of September, 1973. 13

PETROLEUM

SAMEDAN OIL OF CANADA, INC.
730 ELVEDEN HOUSE
CALGARY, ALBERTA
T2P 0Z3

Dept. Mines, Resources and
Environmental Management

SEP 7 1973

PETROLEUM ENGINEERING
DIVISION

September 5, 1973

TO: ALL WORKING INTEREST OWNERS
EAST ROUTLEDGE UNIT NO. 1

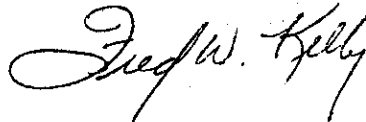
Gentlemen:

RE: REPORT ON OPERATIONS
— August 1 - 31, 1973

Attached for your information is the monthly Report On Operations for the East Routledge Unit No. 1 for the month of August, 1973.

Yours truly

SAMEDAN OIL OF CANADA, INC.



Fred W. Kelly
Division Engineer.

EAST ROUTLEDGE UNIT NO. 1
SUMMARY OF UNIT OPERATIONS AND PRODUCTION

FIRST HALF: _____
SECOND HALF: 1973
DATE: _____
AUGUST

CUMULATIVE OIL PRODUCTION PRIOR TO UNITIZATION ON 5-15-72 - 1,466,076 BARRELS
CUMULATIVE WATER PRODUCTION PRIOR TO UNITIZATION ON 5-15-72 - 2,388,966 BARRELS

OIL PRODUCTION - BBLs.

Monthly Production
Daily Average
Cumulative Unit Production

WATER PRODUCTION - BBLs.

Monthly Production
Daily Average Production
Per-Cent Water Cut
Cumulative Unit Production

SUPPLY WATER - BBLs.

Monthly Water Supply
Daily Average Supply
Cumulative Water Supply

WATER INJECTION - BBLs.

Monthly Injection
Daily Average Injection
Cumulative Injection
Plant Injection Pressure

NET INJECTION - RSVR. BBLs.

Monthly Balance
Daily Average Balance

WELL STATUS

Producers
Closed in Producers
Injection Wells
Closed in Injection Wells
TOTAL

	JULY	AUGUST						
Monthly Production	9,049	9,459						
Daily Average	292	305						
Cumulative Unit Production	144,618	154,077						
Monthly Production	28,735	29,023						
Daily Average Production	927	936						
Per-Cent Water Cut	76.05	75.42						
Cumulative Unit Production	441,838	470,861						
Monthly Water Supply	34,361	33,957						
Daily Average Supply	1,108	1,095						
Cumulative Water Supply	228,169	262,126						
Monthly Injection	63,096	62,980						
Daily Average Injection	2,035	2,032						
Cumulative Injection	484,689	547,669						
Plant Injection Pressure	1,260#	1,320#						
Monthly Balance	+ 24,860	+ 24,025						
Daily Average Balance	+ 802	+ 775						
Producers	22	22						
Closed in Producers	--	--						
Injection Wells	5	5						
Closed in Injection Wells	--	--						
TOTAL	27	27						

FWK/caf
8/9/73

SAMEDAN OIL OF CANADA, INC.

730 ELVEDEN HOUSE

CALGARY, ALBERTA

T2P 0Z3

MONTH OF

AUGUST, 1973

SALT WATER INJECTION REPORT

EAST ROUTLEDGE UNIT NO. 1

Receipts From:

	<u>Current Month</u>	<u>Cumulative</u>
East Routledge Unit No. 1	29,023	285,543
Samedan Battery 13-2-9-25	1,105	6,703
Chevron Battery 16-17-9-25	32,852	255,423
TOTAL	62,980	547,669

Injected in S. W. I. Wells:

Injected in S. W. I. Wells:		<u>Cumulative</u>		<u>Current</u> <u>Month</u>	<u>Pressures</u>	
	<u>Required</u>				<u>Maximum</u>	<u>Minimum</u>
2-11-9-25	WLM. 330	169	5,252	43,782	1320	1260
10-11-9-25	WLM. 250	137	4,253	37,561	1320	1260
12-11-9-25	WLM. 1011	700	21,700	183,684	1320	1260
14-11-9-25	WLM. 244	250	7,750	66,243	1150	1150
6-14-9-25	WLM. 776	775	24,025	216,399	1050	1000

2031

EAST ROUTLEDGE UNIT NO. 1

WORKING INTEREST OWNERS

ADDRESS LIST

Bueno Oils, Ltd.
Post Office Box 150
Calgary 1, Alberta

Bueno Oils, Ltd.
Post Office Box 1321
Midland, Texas 79701
Attention: Mr. Lloyd Ugland

Canadian Reserve Oil and Gas Ltd.
1600 - 639 Fifth Avenue S. W.
Calgary, Alberta
Attention: Mr. G. Czeman

Chevron Standard Limited
400 - 5th. Avenue S. W.
Calgary, Alberta
Attention: Mr. Allan Hamberg,
Information Centre

Mr. Joseph H. Hirshhorn
Suite 1601
8 King Street East
Toronto 1, Ontario

Prairie Oil Royalties Company, Ltd.
640 - 8th. Avenue S. W.
Calgary, Alberta
Attention: Mr. V. F. Maxwell

Ranchmen's Minerals Ltd.
6th. Floor,
630 - 6th. Avenue S. W.
Calgary, Alberta
Attention: Mr. A. G. Savage

Samedan Oil Corporation
P. O. Box 909
Ardmore, Oklahoma 73401
Attention: Mr. H. Leon Veeder

Samedan Oil of Canada, Inc.
730 Elveden House
717 - 7th. Avenue S. W.
Calgary, Alberta
Attention: Mr. Fred W. Kelly

United Reef Petroleum Ltd.
Suite 1601
8 King Street East
Toronto 1, Ontario
Attention: Mr. John S. Adams

As of AUGUST 1973

Samedan Oil of Canada Inc.
730 Elveden House
717 - 7th Avenue S.W.
CALGARY, Alberta

7
ATTENTION: Garry D. Kilbourn, Vice-President
and Manager

Samedan Oil Corporation,
Box 909
ARDMORE, Oklahoma
U. S. A.

ATTENTION: George J. McLeod, Executive Vice-President
and Director

DEPARTMENT OF MINES, RESOURCES AND ENVIRONMENTAL MANAGEMENT

ROUTE SLIP

TO <i>J. - Roper</i>	FROM <i>F. S. Gamay</i>
TO	FROM

- | | | |
|--|--|--|
| <input type="checkbox"/> For your approval or revision | <input type="checkbox"/> Reply direct with copy to me | <input type="checkbox"/> Please sign |
| <input type="checkbox"/> For your information | <input type="checkbox"/> Please supply data for my reply | <input type="checkbox"/> Please return |
| <input type="checkbox"/> Please take action | <input type="checkbox"/> Return with comments and/or recommendations | <input type="checkbox"/> Please see me |
| <input type="checkbox"/> Extracts of minutes for your information and action | <input type="checkbox"/> Investigate and report | <input type="checkbox"/> Please phone |
| <input type="checkbox"/> Please draft reply for signature of | | |

Date *AUG 31 / 73.*

Subject *SAMEDAN*

Message

EAST ROUTLEDGE UNIT

Received a phone call from Fred. Kelly of Samedan Oil. Stating they would send in a formal application to the BOARD (next week Sept 4th) to increase the water injection pressure on the injection wells to 1500 p.s.i. They would send a man down to discuss

MNR-A-94

Use reverse side if necessary

The program with the Board
if necessary

F.S.G

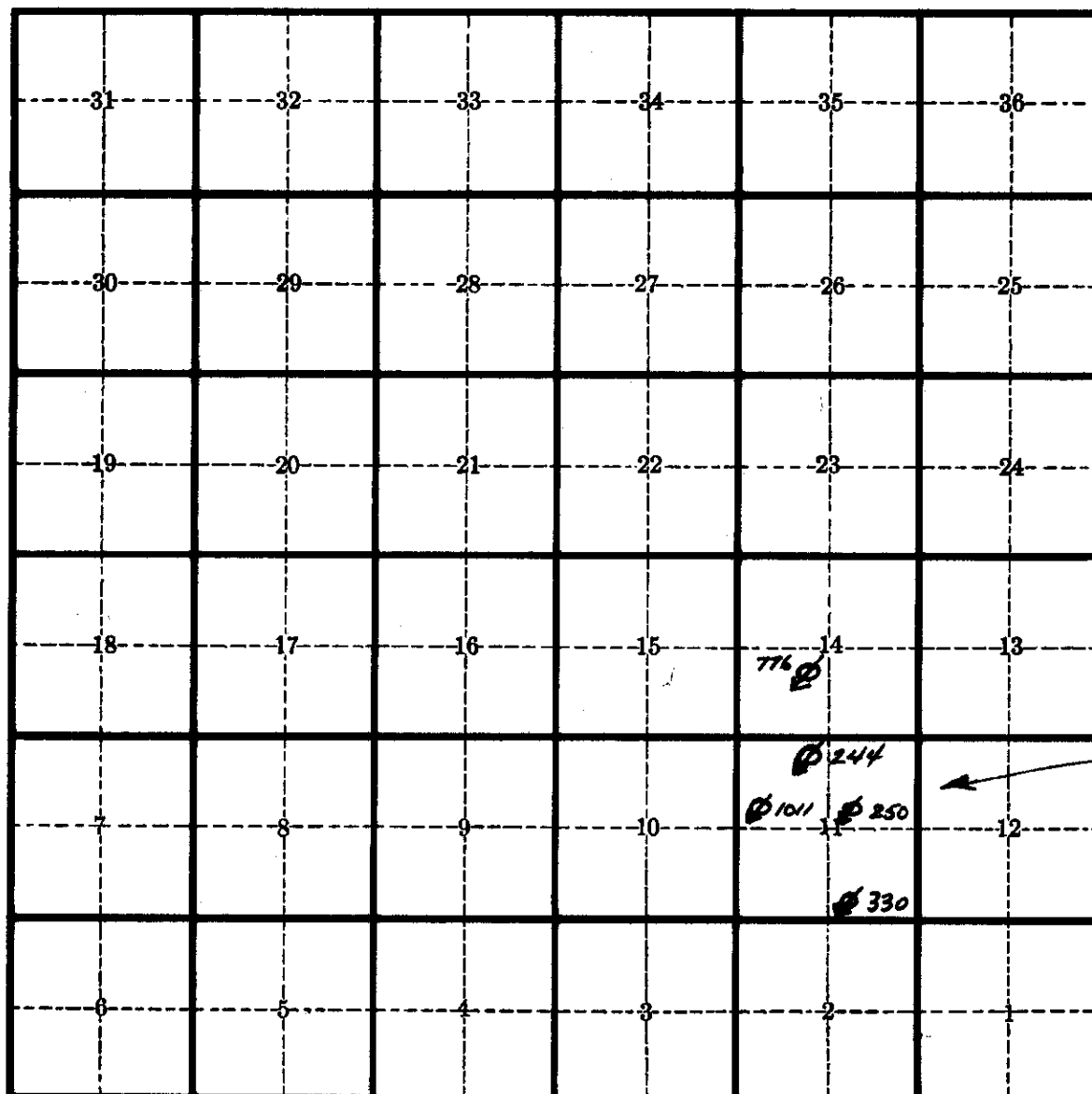


SKETCH PLAN OF

SANDBAR
INJECTION
WELLS.



TOWNSHIP 9 (NINE) RANGE 25 OF MERIDIAN



ENERG
REPAIR
INJ. VOLUME
REQUIRED
← BBLs/DAY

1413
KING INJECT.
2-11 = 191 ✓
10-11 = 122 ✓
12-11 = 686 ✓

press 1260.

press 1078 - OK

press 978 OK

14-11 = 250

6-14 = 778

PART XXII

THE LANDS IN THE PROVINCE OF MANITOBA WHICH COMPRISE
THE EAST ROUTLEDGE UNIT NO. 1 ARE AS FOLLOWS:

<u>TRACT NUMBER</u>	<u>LEGAL DESCRIPTION</u>	<u>TRACT NUMBER</u>	<u>LEGAL DESCRIPTION</u>
	<u>TOWNSHIP 9 RANGE 25 WPM</u>		<u>TOWNSHIP 9 RANGE 25 WPM</u>
1-10	LSD. 1, Section 10	14-11	LSD. 14, Section 11
8-10	LSD. 8, Section 10	15-11	LSD. 15, Section 11
9-10	LSD. 9, Section 10	5-12	LSD. 5, Section 12
2-11	LSD. 2, Section 11	5-13	LSD. 5, Section 13
3-11	LSD. 3, Section 11	1-14	LSD. 1, Section 14
4-11	LSD. 4, Section 11	2-14	LSD. 2, Section 14
5-11	LSD. 5, Section 11	3-14	LSD. 3, Section 14
6-11	LSD. 6, Section 11	6-14	LSD. 6, Section 14
7-11	LSD. 7, Section 11	7-14	LSD. 7, Section 14
8-11	LSD. 8, Section 11	8-14	LSD. 8, Section 14
10-11	LSD. 10, Section 11	9-14	LSD. 9, Section 14
11-11	LSD. 11, Section 11	10-14	LSD. 10, Section 14
12-11	LSD. 12, Section 11	11-14	LSD. 11, Section 14
13-11	LSD. 13, Section 11		

PART XXIV

<u>TRACT</u> <u>NUMBER</u>	<u>TRACT PARTICIPATION</u>		<u>TRACT</u> <u>NUMBER</u>	<u>TRACT PARTICIPATION</u>	
	<u>INTERIM</u>	<u>FINAL</u>		<u>INTERIM</u>	<u>FINAL</u>
1-10	4.74458	4.22753	14-11	1.02484	0.60393
8-10	2.87217	3.57419	15-11	7.30149	9.42445
9-10	3.49776	2.19813	5-12	2.19585	1.83004
2-11	0.74068	0.50345	5-13	3.13178	2.37288
3-11	2.91362	2.07245	1-14	2.67472	2.13603
4-11	3.95482	3.40836	2-14	4.81221	4.26967
5-11	4.44951	3.69730	3-14	3.41431	4.13644
6-11	5.17710	4.51867	6-14	3.82719	3.85203
7-11	4.65950	4.53441	7-14	4.37642	5.02515
8-11	3.92591	4.25913	8-14	8.48123	10.31383
10-11	0.53833	0.60194	9-14	6.05140	6.18710
11-11	1.74588	1.65497	10-14	6.89570	7.90708
12-11	1.60080	1.59075	11-14	<u>4.80294</u>	<u>4.93059</u>
13-11	0.18926	0.16950		<u>100.00000</u>	<u>100.00000</u>



MISCELLANEOUS ORDER

FROM THE

OFFICE OF THE QUEEN'S PRINTER
TWO HUNDRED VAUGHAN STREET
WINNIPEG CANADA R3C 0P8

M 6444

DATE OF ORDER September 14, 1973

REQUISITION NO. MB246

TO: . **Virden-Empire Advance**
 . **VIRIDEN, Manitoba**
 .
 .

DELIVER TO:

MINES, RESOURCES & ENV. MANAGEMENT
Mines Branch - Petroleum Division
224 Marquay Building
WINNIPEG, Manitoba


These goods are for the sole use of the government of Manitoba,
are purchased with Crown Funds, and are not for re-sale

INVOICE MUST BE MAILED TO THE QUEEN'S PRINTER

QUANTITY	DESCRIPTION	INVOICE NO.
	<u>CLASSIFIED ADVERTISEMENT</u>	
	East Routledge Unit No. 1 as per attached.	
1	insertion - first edition upon receipt of order. <i>published SEP 19/73.</i>	
		DATE
		AMOUNT

PAYMENT OF INVOICE SUBJECT TO
CONDITIONS ON BACK OF THIS ORDER

CCA-q-40


ICE OF THE QUEEN'S PRINTER

SAMPLE OF PRESSURE
MAINTENANCE
ORDER

Manitoba Regulation 57/72

Being

THE OIL AND NATURAL GAS CONSERVATION BOARD

ORDER NO. PM 20

An Order pertaining to Pressure Maintenance by Water Flooding

EAST ROUTLEDGE UNIT NO. 1

Made and passed pursuant to "The Mines Act", Cap. M160, R.S.M., 1970, and amendments thereto, by The Oil and Natural Gas Conservation Board, of Manitoba.

(Filed April 18, 1972)

WHEREAS, subsection (9)(d) of Section 62 of "The Mines Act", being Chapter M160 of the Revised Statutes of Manitoba, 1970, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(d) requiring the repressuring, recycling, or pressure maintenance, of any pool or portion thereof where it is economical so to do, and for that purpose where necessary requiring the introduction or injection into any pool or portion thereof of gas, air, water, or other substance;"

AND WHEREAS, the Board, pursuant to Section 62 of "The Mines Act", held a public Hearing on October 5, 1971, and on February 16, 1972, for the purpose of considering a Proposal for Pressure Maintenance by Water Flooding within the Unit Area of the East Routledge Unit No. 1, by Samedan Oil of Canada, Inc., on its own behalf and other working interest owners, in the Routledge Field in Manitoba.

AND WHEREAS, upon due consideration of the submissions and testimony at the Hearings the Board has found:

- (a) That the pressure maintenance by water flooding of a certain part of the Routledge Field in Manitoba, comprising the Unit Area of the East Routledge Unit No. 1, is reasonably necessary to prevent waste, and to increase substantially the recovery of oil;

- (b) That the value of the estimated additional recovery of oil and gas resulting from such operation will exceed the estimated additional cost incidental to the conduct of such operation; and
- (c) That such operation will result in general advantage to the owners of oil and gas rights within the Unit Area.

2—Order No. PM 20

AND WHEREAS, Unitization Order No. 13 provides for the appointment of a Unit Operator.

NOW, THEREFORE, the Board orders:

- 1. (a) The Unit Operator shall conduct pressure maintenance operations by the injection of water to the Members of the Lodgepole Formation of the Mississippian Age underlying the Unit Area;
- (b) The pressure maintenance operations shall be in accordance with, and subject to, the following rules:

PRESSURE MAINTENANCE RULES

- 7
- 1. (1) Water shall be injected to the Lodgepole Formation of the Mississippian Age in the wells

Samedan Routledge Prov. 2-11-9-25
Samedan Routledge Prov. 4-11-9-25
Samedan Routledge Prov. 10-11-9-25
Samedan Routledge Prov. 12-11-9-25
Samedan Routledge Prov. 14-11-9-25
Samedan Routledge Prov. 6-14-9-25
Samedan Routledge 8-14-9-25

and, from time to time, in such other wells as the Board may direct, or, upon application of the Unit Operator, may approve;

- (2) After the commencement, the Unit Operator shall, subject to any remedial work required to be performed on the well or wells referred to in this clause, endeavour to maintain continuous injection;
 - (3) Notwithstanding the provisions of subclause (2), the Board may, upon application by the Unit Operator, approve the suspension of water injection, provided the Board is satisfied that the pressure maintenance operation in the Unit Area will not be adversely affected.
- 2. (1) Before the injection of water is commenced, and from time to time after the commencement of injection, and upon the request of the Board, the Unit Operator shall satisfy the Board as to the source, suitability, and method of treatment of the water to be injected;
 - (2) Before any change is made in the source of water being injected, the Unit Operator shall satisfy the Board as to the suitability of the water to be injected.
- 3. The Unit Operator shall immediately report to the Board any indication of channeling or break-through of injected water to producing wells, or any indication of other detrimental effects that may be attributable to the pressure maintenance operations.

3—Order No. PM 20

- 4. In the interest of equity and good engineering practice the Board may prescribe from time to time a maximum pressure, or a minimum or a maximum rate, at which water shall be injected in any well in the Unit.

5. At least annually, unless otherwise directed by the Board, the Unit Operator shall determine the reservoir pressure in the producing wells in the Unit to the satisfaction of the Board.
6. The Unit Operator shall inject water to each well referred to in clause 1 hereof in a manner such that, within five years of the effective date of the Order, a suitable balance is achieved and maintained between water injected to, and fluids withdrawn from, the Unitized Strata.
7. The Unit Operator shall, not later than the twenty-fifth day of each month, file with the Mines Branch a report of the quantity and source of water injected during the preceding month to each well referred to in clause 1 hereof.
8. (1) Unless otherwise authorized in writing by the Board, the Unit Operator shall, within six weeks of the expiration of each yearly period commencing on the first day of January, 1973, file with the Board a report of the progress, performance, and efficacy of the pressure maintenance program during the period;
- (2) Subject to any direction in writing of the Board to the contrary, a report required by this clause may, at the discretion of the Unit Operator, be in two parts, the first of which parts shall set out graphically and from the commencement of the operation of the pressure maintenance program
 - (a) the daily average rate during each month of oil production of each producing well;
 - (b) the average water-oil ratio during each month of each producing well;
 - (c) the monthly cumulative oil and water production from each producing well;
 - (d) the daily average rate during each month of water injection to each injection well;
 - (e) the daily average water injection pressure during each month at each injection well;
 - (f) the monthly cumulative volume of water injected to each injection well;
 - (g) the average injectivity index during each month, for each water injection well, which index, at the discretion of the Unit Operator, may be determined as
 - (i) the daily injection rate divided by the average injection well-head pressure, or
 - (ii) any similar index that the Board, on the application of the Unit Operator, may approve; and

4—Order No. PM 20

- (h) the date and type of any well treatment or work-over which shall be indicated on the graph, and the second of which parts shall contain
 - (a) calculations of the balance during each month between water injected to, and fluids withdrawn from the Unitized Strata,
 - (b) such other interpretative information as the Unit Operator considers necessary to evaluate adequately the progress, performance, and efficacy of the pressure maintenance program, and
 - (c) an outline of the method actually in use for the quality, control, and treatment of the water, or, where there has been no change in the control or treatment from that outlined in a previous report, a statement to that effect.

- (3) If a report required by this clause is in the form provided for in subclause (2), the Board, at any time, may make the first part of the report available to the public, and, after one year from the end of the period for which the report is made, may make the second part of the report available to the public, and, if the report is not in the form provided for in subclause (2), the Board may make the whole of the report available to the public at any time.
2. This Order shall be effective at the hour of seven o'clock in the forenoon, official time, on the fifteenth day of May, A.D., 1972.

Oil and Natural Gas Order No. PM 20,
made and passed this 30th day
of March, A.D. 1972,
at the City of Winnipeg, in the
Province of Manitoba, by The Oil
and Natural Gas Conservation Board.

Approved:

"Leonard S. Evans"

Leonard S. Evans,
Acting Minister of Mines, Resources and
Environmental Management.

"W. Winston Mair"

W. Winston Mair,
Chairman,
The Oil and Natural Gas Conservation Board.

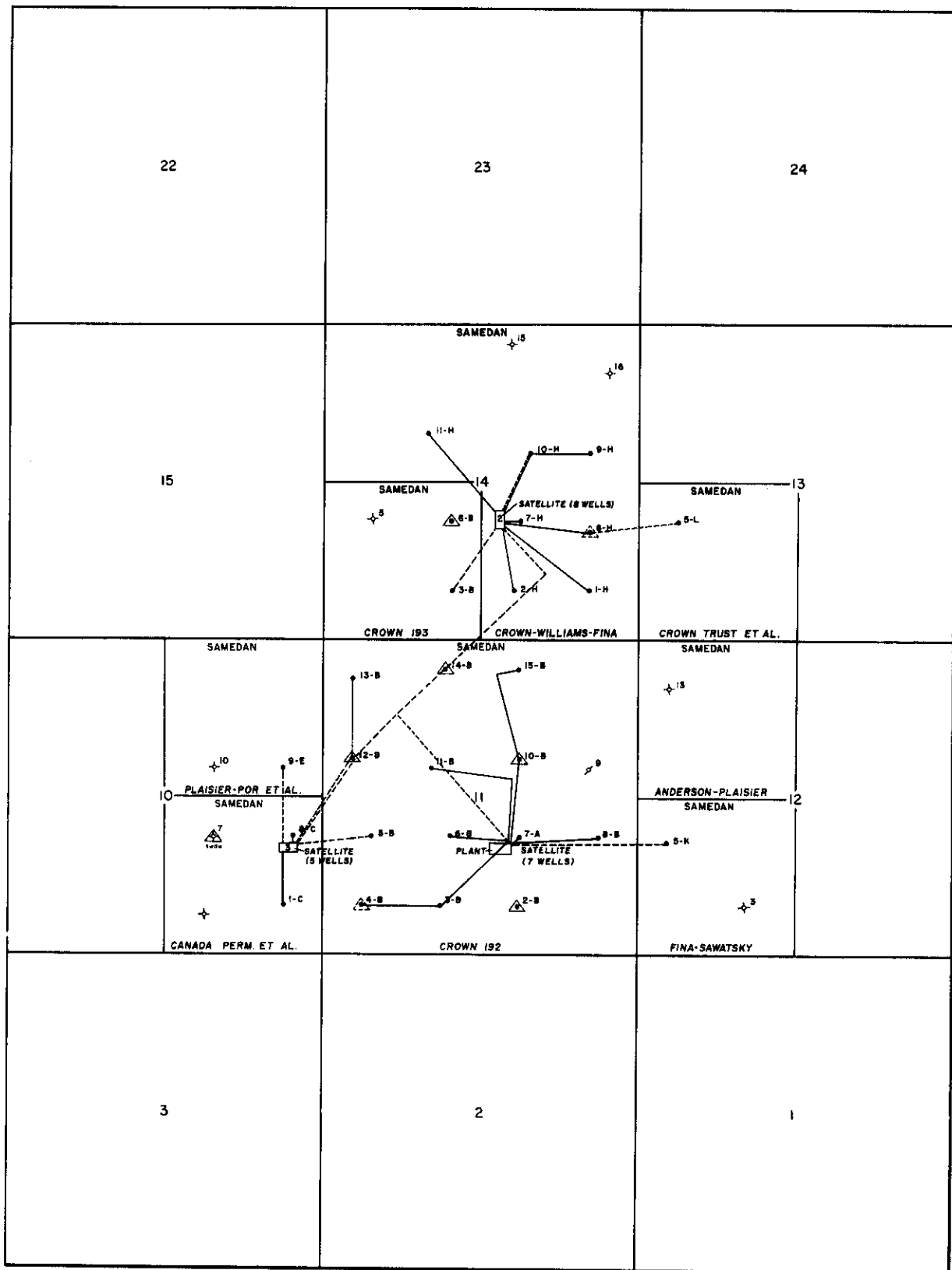
"J.S. Roper"

J.S. Roper,
Deputy Chairman,
The Oil and Natural Gas Conservation Board.

"M.J. Gobert"

M.J. Gobert,
Member,
The Oil and Natural Gas Conservation Board.

R. 25 W.



- EXISTING 3" LINE-BARE STEEL
- - - PURCHASE 3" FIBERGLASS 300 PSI
- PRODUCING WELL
- ✦ DRY HOLE
- △ INJECTION WELL
- △△ PROPOSED INJECTION WELL

EAST ROUTLEDGE UNIT NO. 1
MANITOBA PROVINCE, CANADA

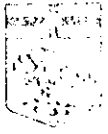
0 1000 2000 3000
scale

FIGURE NO. 6

OIL GATHERING SYSTEM

LAYOUT: H.L.V.

6/1/71



Province of Manitoba
Department of Mines, Resources and Environmental Management
Mineral Resources Division

Petroleum Branch
Telephone: (204) 633-9543
980 Century Street
Winnipeg, Manitoba
R3H 0W4

October 11, 1977

Samedan Oil of Canada, Inc.
730 Elveden House
717 - 7th Avenue S. W.
Calgary, Alberta
T2P 0Z3

Attention: Mr. John K. Topping
Production Accountant

Dear Sir:

Re: East Routledge Unit No. 1 --
Increase of Basic Overhead Monthly Charge

We acknowledge receipt of your letter dated September 9, 1977 together with enclosures.

As the terms of the Plan for Unit Operation Governing the Unitized Management Operation and Further Development of East Routledge Unit No. 1 as authorized by The Oil and Natural Gas Conservation Board Unitization Order No. 13 provide for making such amendments no formal approval from the Board is required in this case.

It is requested that Samedan as Unit Operator of East Routledge Unit No. 1 submit the following information to this office to permit us to update our files on this Unit:

1. List of all tracts in the Unit with names of the current royalty interest holders and working interest owners in each tract and the respective interests held by each party.
2. A summarized listing showing each Working Interest Owner and the corresponding total percentage working interest it holds in the Unit.

Receipt of this information prior to November 4, 1977 will be appreciated.

Yours sincerely,

H. C. Moster, P. Eng.,
Director, Petroleum Branch.

HCM/et



Province of Manitoba

Department of Mines, Resources and Environmental Management

Mineral Resources Division

Petroleum Branch

Telephone: (204) 633-9543

989 Century Street

Winnipeg, Manitoba

R3H 0W4

October 11, 1977

Samedan Oil of Canada, Inc.
730 Elveden House
717 - 7th Avenue S. W.
Calgary, Alberta
T2P 0Z3

Attention: Mr. John K. Topping
Production Accountant

Dear Sir:

Re: East Routledge Unit No. 1 —
Increase of Basic Overhead Monthly Charge

We acknowledge receipt of your letter dated September 9, 1977 together with enclosures.

As the terms of the Plan for Unit Operation Governing the Unitized Management Operation and Further Development of East Routledge Unit No. 1 as authorized by The Oil and Natural Gas Conservation Board Unitization Order No. 13 provide for making such amendments no formal approval from the Board is required in this case.

It is requested that Samedan as Unit Operator of East Routledge Unit No. 1 submit the following information to this office to permit us to update our files on this Unit:

1. List of all tracts in the Unit with names of the current royalty interest holders and working interest owners in each tract and the respective interests held by each party.
2. A summarized listing showing each Working Interest Owner and the corresponding total percentage working interest it holds in the Unit.

Receipt of this information prior to November 4, 1977 will be appreciated.

Yours sincerely,

H. C. Moster, P. Eng.,
Director, Petroleum Branch.

HCM/et

Province of Manitoba

inter-departmental memo

77 10 06

Mr. H. C. Moster
Director
Petroleum Branch, M.R.E.M.
989 Century Street
Winnipeg

Date J. F. Redgwell
From Departmental Solicitor

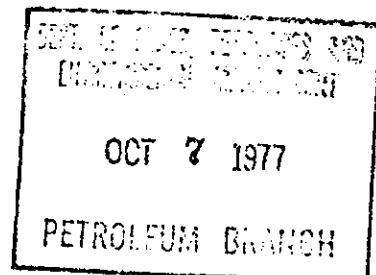
Subject: CHANGES TO OVERHEAD CHARGES - EAST RUTLEDGE UNIT NO. 1

As the change proposed is accomplished within the terms of the Plan as approved by Unitization Order 13, a letter of acknowledgment will suffice. It is only where the changes involve amendment to the Plan not otherwise provided for that a re-hearing is required.

The Order and Plan are enclosed.

J. F. Redgwell
Departmental Solicitor

/gs
Encs.



77 09 27

J. F. Pedgull
Departmental Solicitor
6th Floor, Woodworth Building

H. C. Master
Director
Petroleum Branch

Changes to Operating Charges -- East Montford Unit No. 1

The attached letter dated September 9, 1977 was received from Sarnedon Oil of Canada, Inc., operator of East Montford Unit No. 1.

Also attached is a copy of Board Unitisation Order No. 13 and the Plan for Unit Operation Governing the Unitised Management Operation and Further Development of East Montford Unit No. 1 dated July 22, 1977.

Questions:

1. Does the proposed change in the basic overhead charge require a re-hearing under Section 78 of the Mines Act?
2. Does such amendment to the Plan (Order) require the approval of the Board?
3. Do the following sections of the "Plan" adequately provide the Operating Committee with the necessary authority to amend the plan as proposed without requiring Board approval:

5.08
6.01
6.03 (j)
26.06 (1)(iii)(a)

4. Would a letter of acknowledgement from this Branch be adequate to cover this matter?

NOTE: Please return Board Order and Plan with your reply.

H. C. Master

HJ/et
Attachs.



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

R. A. Park
Manager - Production

May 14, 1976

Representative Change
Operating Committee
East Routledge Unit No. 1

The Oil and Natural Gas Conservation Board
Province of Manitoba
310 Legislative Building
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. Jas. T. Cawley, Chairman

Gentlemen:

Please be advised that Chevron Standard Limited has changed their representatives on the Operating Committee for the East Routledge Unit No. 1, effective May 1, 1976, as follows:

Representative: D. M. Mahura

Alternates: G. S. MacMillan
D. R. Henderson

Yours very truly,

R. A. PARK

DRHenderson/mb

cc: Samedan Oil of Canada, Inc.
Attention: Mr. Fred W. Kelly

cc: J. S. Roper
I. Haugh
C. Moster
/ie 76 05 18

April 24, 1973

F. S. Ganey

J. S. Roper

Reservoir Engineer

Director of Mines

Re: East Routledge Unit No. 1

April 24th, 1973, I phoned Mr. Fred Kelly of Samedan Oil regarding the East Routledge Unit injection volumes.

He informed me that they will wait until June (1973) to see if there is response to the flood at that time.

If they see no response by June they will then assess the possibilities of high pressure injection, and will make application to the Board if they consider a high pressure flood necessary.



F. S. Ganey

FSG/evh

R3C OP3

April 25, 1973

Mr. Fred Kelly
Sarnedan Oil of Canada Inc.
730 Elveden House
CALGARY, Alberta
T2P 0Z3

Dear Fred:

Re: Rundle High Pressure Pilot Flood

Enclosed is the final report submitted on the Rundle pilot flood and the testimony of Ralph Atkinson at the Unit hearing regarding its performance.

The injection well was originally used as a Devonian salt water disposal well. The Mississippian crinoidal zone was perforated and acidized with 2,500 gallons of 28% acid, a bridge plug was set below the new perforations at 2,590 feet K.B. and cement lined 2 3/8 inch tubing was landed in a retrievable packer at 2,433 feet K.B. The annulus above this upper packer was filled with fresh water and corban. The Mississippian injection test showed 0 p.s.i. up to 3 barrels per minute and 350 - 600 p.s.i. at 4 barrels per minute.

I would estimate the theoretical fracture pressure to be about 1,780 p.s.i. at a depth of 2,590 feet. It is likely you would require over 2,000 p.s.i. (surface pressure) to offset friction, in fracturing. I think their maximum injection pressure was 1,320 p.s.i. at surface.

Yours sincerely,

F. S. Ganev
Reservoir Engineer

FSG/evh
Enclosures

February 26, 1973

F. S. Gamey
Reservoir Engineer

J. S. Roper, Deputy Chairman
O. and N.G.C.B.
M. J. Gobert, Asst. Deputy Minister

Re: Samedan Oil of Canada
East Routledge Unit No. 1
Permission to increase injection pressure to 1,300 p.s.i.g.

Samedan Oil of Canada has requested permission to increase injection pressure in the above Unit to 1,300 p.s.i.g., which is near fracture pressure of the formation. Pressure has been restricted to 1,000 - 1,075 p.s.i.g. in accordance with their statement at the Unitization hearing, not to exceed formation fracture pressure.

Remedial attempts (two acid treatment jobs on the injection wells in December 1972) has not been successful in increasing the injectivity.

Chevron Standard Limited carried out a pilot high pressure waterflood scheme in the Daly Waterflood area during 1971, where injection pressures reached 1,400 p.s.i.g. As there were no changes in the production or fluid levels at any of the adjacent producing wells the scheme was abandoned.

Unless the Board has misgivings about the effect of a high pressure waterflood, it is suggested that a maximum pressure of 1,300 p.s.i.g. be set in accordance with section 4 of P.M. Order No. 20.

A suggested letter for Board consideration is attached.



F. S. Gamey

FSG/evh
Enclosure



DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT
THE OIL AND NATURAL GAS CONSERVATION BOARD
901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

Jas. T. Cawley
~~XXXXXXXXXXXXXXXXXXXX~~
CHAIRMAN
J. S. ROPER 946-7428
DEPUTY CHAIRMAN
M. J. GOBERT 946-7859
MEMBER
R. R. McDANIEL
CONSULTANT

DRAFT LETTER

February 26, 1973

Mr. George J. McLeod, Pres.
Samedan Oil of Canada, Inc.
730 Elveden House
CALGARY, Alberta
T2P 0Z3

Dear Mr. McLeod:

Re: Permission to increase injection pressure
East Routledge Unit No. 1.

In accordance with Section 4 of Order No. PM 20, pertaining to pressure maintenance by Waterflooding of the above Unit, the Board hereby grants permission to the operator to:

- (1) Increase the injection pressure to a maximum of ~~1500~~¹³⁰⁰ p.s.i.g., in the injection wells referred to under the "Pressure Maintenance Rules" of the above Order No. PM 20.

Yours sincerely,

Jas. T. Cawley, P. Eng.
Chairman

FSG/evh

EAST ROUTLEDGE UNIT NO. I

PRESSURE MAINTENANCE PROGRAM

SAMEDAN OIL OF CANADA, INC.

730 ELVEDEN HOUSE
CALGARY, ALBERTA
T2P 0Z3

Department of Mines, Resources
and Environmental Management

FEB 21 1973

882 D
DIRECTOR OF MINES

February 19th, 1973

J. S. Roper
Deputy Chairman,
The Oil and Natural Gas Conservation
Board of Manitoba
Manitoba, Canada

Gentlemen:

Re: East Routledge Unit No. 1
Pressure Maintenance Program

Enclosed is a report dealing with the injectivity practices currently being applied to the East Routledge Unit No. 1.

This report is being presented to obtain permission to increase the efficiency of the pressure maintenance program.

Yours truly,

SAMEDAN OIL OF CANADA, INC.

George J. McLeod

George J. McLeod
Vice President

jo.
encl.

INDEX

	<u>PAGE</u>
I. OBJECT	1
II. CONCLUSIONS	1
III. RECOMMENDATIONS	1
DISCUSSION	2

I.

OBJECT

The purpose of this report was to evaluate the performance of the pressure maintenance program currently in effect in the East Routledge Unit No. 1.

II.

CONCLUSIONS

1. Water injection rates from start of injection on Nov. 10, 1973 to Jan. 31, 1973 are lower than expected.
2. The maximum allowable injection pressure of 1175 psig is hindering higher injection rates.

III.

RECOMMENDATIONS

1. To maximize pressure maintenance efficiency, injection rates should be increased by changing the maximum allowable injection pressure from 1175 psig to 1300 psig.

DISCUSSION

Water injection began Nov. 10, 1972 in the East
Routledge Unit No. 1 in

Samedan Routledge Prov. 2-11-9-25
Samedan Routledge Prov. 10-11-9-25
Samedan Routledge Prov. 12-11-9-25
Samedan Routledge Prov. 14-11-9-25
Samedan Routledge Prov. 6-14-9-25

Currently the area has approval to maintain a maximum pressure of 1175 psig on each of the injection wells. The highest daily injection rate on a monthly basis that has been achieved to Jan. 31, 1973 was 1781 barrels per day at pressures ranging from 1000 psig to 1075 psig.

The Engineering Report of June 1971 indicates an expected injection rate of 2611 barrels per day from these wells at 1000 psig. This indicates that current injectivity is 32 percent below expectation.

Since higher injection rates are required, Samedan Oil of Canada, Inc. is making application to attain permission to increase the allowable injectivity pressure to a maximum of 1300 psig.

Manitoba Regulation 4/71

**Being THE OIL AND NATURAL GAS CONSERVATION BOARD
ORDER NO. PM 15
An Order pertaining to Pressure Maintenance by Water Flooding
DALY FIELD**

*Made and passed pursuant to "The Mines Act", R.S.M., 1970, and
amendments thereto, by The Oil and Natural Gas Conservation
Board, of Manitoba.*

(Filed January 18, 1971)

WHEREAS, subsection (9) (d) of Section 62 of "The Mines Act", being Chapter M160 of the Revised Statutes of Manitoba, provides as follows:

"62 (9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(d) requiring the repressuring, recycling, or pressure maintenance, of any pool or portion thereof where it is economical so to do, and for that purpose where necessary requiring the introduction or injection into any pool or portion thereof of gas, air, water, or other substance;"

AND WHEREAS, the Board, pursuant to Section 62 of "The Mines Act", held a public hearing on March 19 and December 15, 1970, for the purpose of considering a Pilot High Pressure Water Flood in the Daly Field in Manitoba by Chevron Standard Limited.

AND WHEREAS, upon due consideration of the submissions and testimony at the hearing, the Board has found that it is reasonably necessary to conduct a Pilot High Pressure Water Flood in the Daly Field in Manitoba.

NOW, THEREFORE, the Board orders:

1. (a) Chevron Standard Limited shall conduct a Pilot High Pressure Water Flood by the injection of water to the Lodgepole formation of the Mississippian Age underlying part of the Daly Field;
- (b) The pressure maintenance operations shall be in accordance with, and subject to, the following rules:

PRESSURE MAINTENANCE RULES

1. (1) Water, produced from oil wells in the Daly Field, shall be injected to the Lodgepole formation of the Mississippian Age in the well
Chevron Daly WIW 14 - 1 - 10 - 28
 - (2) The volume of water injected shall not exceed 600 barrels per day, at any time.
 - (3) The injection pressure during the first month of operation of the Pilot High Pressure Water Flood shall not exceed 1,300 p.s.i.g.
 - (4) Chevron Standard Limited shall, following the first month's operation, file with The Oil and Natural Gas Conservation Board, a report of the performance and efficacy of the Pilot High Pressure Water Flood. The report required under this Clause may be subject to any direction, in writing, by the Board.
2. The Board may grant permission to the operator to increase the injection pressure by increments of 100 p.s.i.g., during succeeding test periods of one (1) month's duration; and the requirements of sub-clause 4 of Rule 1 shall apply for each test period.
3. Chevron Standard Limited shall immediately report to the Board any indication of channelling or breakthrough of injected water to producing wells, or any indication of other detrimental effects that may be attributable to the Pilot High Pressure Water Flood.
4. After commencement, the operator shall, subject to any remedial work required to be performed on the water injection well or offsetting oil producing wells, endeavour to maintain continuous injection for not more than three hundred and sixty-five (365) consecutive days from the effective date of this Order.
5. Notwithstanding the provisions of Rule 4, the Board may, upon application by the operator, approve the suspension of water injection.
6. This Order shall be effective at the hour of seven o'clock in the forenoon on February 1, 1971.

Oil and Natural Gas Order No. PM 15,
made and passed this 4th day
of January A.D., 1971, at
the City of Winnipeg, in the
Province of Manitoba, by The Oil
and Natural Gas Conservation Board.

Approved:

"Sidney Green"

Sidney Green,
Minister of Mines and Natural Resources.

"J. S. Richards"

J. S. Richards,
Deputy Chairman,
The Oil and Natural Gas Conservation Board.

"M. J. Gobert"

M. J. Gobert,
Member,
The Oil and Natural Gas Conservation Board.

Manitoba Regulation 57/72

Being

THE OIL AND NATURAL GAS CONSERVATION BOARD

ORDER NO. PM 20

An Order pertaining to Pressure Maintenance by Water Flooding

EAST ROUTLEDGE UNIT NO. 1

Made and passed pursuant to "The Mines Act", Cap. M160, R.S.M., 1970, and amendments thereto, by The Oil and Natural Gas Conservation Board, of Manitoba.

(Filed April 18, 1972)

WHEREAS, subsection (9)(d) of Section 62 of "The Mines Act", being Chapter M160 of the Revised Statutes of Manitoba, 1970, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(d) requiring the repressuring, recycling, or pressure maintenance, of any pool or portion thereof where it is economical so to do, and for that purpose where necessary requiring the introduction or injection into any pool or portion thereof of gas, air, water, or other substance;"

AND WHEREAS, the Board, pursuant to Section 62 of "The Mines Act", held a public Hearing on October 5, 1971, and on February 16, 1972, for the purpose of considering a Proposal for Pressure Maintenance by Water Flooding within the Unit Area of the East Routledge Unit No. 1, by Samedan Oil of Canada, Inc., on its own behalf and other working interest owners, in the Routledge Field in Manitoba.

AND WHEREAS, upon due consideration of the submissions and testimony at the Hearings the Board has found:

- (a) That the pressure maintenance by water flooding of a certain part of the Routledge Field in Manitoba, comprising the Unit Area of the East Routledge Unit No. 1, is reasonably necessary to prevent waste, and to increase substantially the recovery of oil;

- (b) That the value of the estimated additional recovery of oil and gas resulting from such operation will exceed the estimated additional cost incidental to the conduct of such operation; and
- (c) That such operation will result in general advantage to the owners of oil and gas rights within the Unit Area.

2—Order No. PM 20

AND WHEREAS, Unitization Order No. 13 provides for the appointment of a Unit Operator.

NOW, THEREFORE, the Board orders:

1. (a) The Unit Operator shall conduct pressure maintenance operations by the injection of water to the Members of the Lodgepole Formation of the Mississippian Age underlying the Unit Area;
- (b) The pressure maintenance operations shall be in accordance with, and subject to, the following rules:

PRESSURE MAINTENANCE RULES

1. (1) Water shall be injected to the Lodgepole Formation of the Mississippian Age in the wells

Samedan Routledge Prov. 2-11-9-25
Samedan Routledge Prov. 4-11-9-25
Samedan Routledge Prov. 10-11-9-25
Samedan Routledge Prov. 12-11-9-25
Samedan Routledge Prov. 14-11-9-25
Samedan Routledge Prov. 6-14-9-25
Samedan Routledge 8-14-9-25

and, from time to time, in such other wells as the Board may direct, or, upon application of the Unit Operator, may approve;

- (2) After the commencement, the Unit Operator shall, subject to any remedial work required to be performed on the well or wells referred to in this clause, endeavour to maintain continuous injection;
 - (3) Notwithstanding the provisions of subclause (2), the Board may, upon application by the Unit Operator, approve the suspension of water injection, provided the Board is satisfied that the pressure maintenance operation in the Unit Area will not be adversely affected.
2. (1) Before the injection of water is commenced, and from time to time after the commencement of injection, and upon the request of the Board, the Unit Operator shall satisfy the Board as to the source, suitability, and method of treatment of the water to be injected;
 - (2) Before any change is made in the source of water being injected, the Unit Operator shall satisfy the Board as to the suitability of the water to be injected.
3. The Unit Operator shall immediately report to the Board any indication of channeling or break-through of injected water to producing wells, or any indication of other detrimental effects that may be attributable to the pressure maintenance operations.

3—Order No. PM 20

4. In the interest of equity and good engineering practice the Board may prescribe from time to time a maximum pressure, or a minimum or a maximum rate, at which water shall be injected in any well in the Unit.

5. At least annually, unless otherwise directed by the Board, the Unit Operator shall determine the reservoir pressure in the producing wells in the Unit to the satisfaction of the Board.
6. The Unit Operator shall inject water to each well referred to in clause 1 hereof in a manner such that, within five years of the effective date of the Order, a suitable balance is achieved and maintained between water injected to, and fluids withdrawn from, the Unitized Strata.
7. The Unit Operator shall, not later than the twenty-fifth day of each month, file with the Mines Branch a report of the quantity and source of water injected during the preceding month to each well referred to in clause 1 hereof.
8. (1) Unless otherwise authorized in writing by the Board, the Unit Operator shall, within six weeks of the expiration of each yearly period commencing on the first day of January, 1973, file with the Board a report of the progress, performance, and efficacy of the pressure maintenance program during the period;
- (2) Subject to any direction in writing of the Board to the contrary, a report required by this clause may, at the discretion of the Unit Operator, be in two parts, the first of which parts shall set out graphically and from the commencement of the operation of the pressure maintenance program
 - (a) the daily average rate during each month of oil production of each producing well;
 - (b) the average water-oil ratio during each month of each producing well;
 - (c) the monthly cumulative oil and water production from each producing well;
 - (d) the daily average rate during each month of water injection to each injection well;
 - (e) the daily average water injection pressure during each month at each injection well;
 - (f) the monthly cumulative volume of water injected to each injection well;
 - (g) the average injectivity index during each month, for each water injection well, which index, at the discretion of the Unit Operator, may be determined as
 - (i) the daily injection rate divided by the average injection well-head pressure, or
 - (ii) any similar index that the Board, on the application of the Unit Operator, may approve; and

4—Order No. PM 20

- (h) the date and type of any well treatment or work-over which shall be indicated on the graph, and the second of which parts shall contain
 - (a) calculations of the balance during each month between water injected to, and fluids withdrawn from the Unitized Strata,
 - (b) such other interpretative information as the Unit Operator considers necessary to evaluate adequately the progress, performance, and efficacy of the pressure maintenance program, and
 - (c) an outline of the method actually in use for the quality, control, and treatment of the water, or, where there has been no change in the control or treatment from that outlined in a previous report, a statement to that effect.

- (3) If a report required by this clause is in the form provided for in subclause (2), the Board, at any time, may make the first part of the report available to the public, and, after one year from the end of the period for which the report is made, may make the second part of the report available to the public, and, if the report is not in the form provided for in subclause (2), the Board may make the whole of the report available to the public at any time.

2. This Order shall be effective at the hour of seven o'clock in the forenoon, official time, on the fifteenth day of May, A.D., 1972.

Oil and Natural Gas Order No. PM 20,
made and passed this 30th day
of March, A.D. 1972,
at the City of Winnipeg, in the
Province of Manitoba, by The Oil
and Natural Gas Conservation Board.

Approved:

"Leonard S. Evans"

Leonard S. Evans,
Acting Minister of Mines, Resources and
Environmental Management.

"W. Winston Mair"

W. Winston Mair,
Chairman,
The Oil and Natural Gas Conservation Board.

"J.S. Roper"

J.S. Roper,
Deputy Chairman,
The Oil and Natural Gas Conservation Board.

"M.J. Gobert"

M.J. Gobert,
Member,
The Oil and Natural Gas Conservation Board.

Manitoba Regulation 57/72

Being

THE OIL AND NATURAL GAS CONSERVATION BOARD

ORDER NO. PM 20

An Order pertaining to Pressure Maintenance by Water Flooding

EAST ROUTLEDGE UNIT NO. 1

Made and passed pursuant to "The Mines Act", Cap. M160, R.S.M., 1970, and amendments thereto, by The Oil and Natural Gas Conservation Board, of Manitoba.

(Filed April 18, 1972)

WHEREAS, subsection (9)(d) of Section 62 of "The Mines Act", being Chapter M160 of the Revised Statutes of Manitoba, 1970, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(d) requiring the repressuring, recycling, or pressure maintenance, of any pool or portion thereof where it is economical so to do, and for that purpose where necessary requiring the introduction or injection into any pool or portion thereof of gas, air, water, or other substance;"

AND WHEREAS, the Board, pursuant to Section 62 of "The Mines Act", held a public Hearing on October 5, 1971, and on February 16, 1972, for the purpose of considering a Proposal for Pressure Maintenance by Water Flooding within the Unit Area of the East Routledge Unit No. 1, by Samedan Oil of Canada, Inc., on its own behalf and other working interest owners, in the Routledge Field in Manitoba.

AND WHEREAS, upon due consideration of the submissions and testimony at the Hearings the Board has found:

- (a) That the pressure maintenance by water flooding of a certain part of the Routledge Field in Manitoba, comprising the Unit Area of the East Routledge Unit No. 1, is reasonably necessary to prevent waste, and to increase substantially the recovery of oil;

- (b) That the value of the estimated additional recovery of oil and gas resulting from such operation will exceed the estimated additional cost incidental to the conduct of such operation; and
- (c) That such operation will result in general advantage to the owners of oil and gas rights within the Unit Area.

2—Order No. PM 20

AND WHEREAS, Unitization Order No. 13 provides for the appointment of a Unit Operator.

NOW, THEREFORE, the Board orders:

- 1. (a) The Unit Operator shall conduct pressure maintenance operations by the injection of water to the Members of the Lodgepole Formation of the Mississippian Age underlying the Unit Area;
- (b) The pressure maintenance operations shall be in accordance with, and subject to, the following rules:

PRESSURE MAINTENANCE RULES

- 1. (1) Water shall be injected to the Lodgepole Formation of the Mississippian Age in the wells

Samedan Routledge Prov. 2-11-9-25
Samedan Routledge Prov. 4-11-9-25
Samedan Routledge Prov. 10-11-9-25
Samedan Routledge Prov. 12-11-9-25
Samedan Routledge Prov. 14-11-9-25
Samedan Routledge Prov. 6-14-9-25
Samedan Routledge 8-14-9-25

and, from time to time, in such other wells as the Board may direct, or, upon application of the Unit Operator, may approve;

- (2) After the commencement, the Unit Operator shall, subject to any remedial work required to be performed on the well or wells referred to in this clause, endeavour to maintain continuous injection;
 - (3) Notwithstanding the provisions of subclause (2), the Board may, upon application by the Unit Operator, approve the suspension of water injection, provided the Board is satisfied that the pressure maintenance operation in the Unit Area will not be adversely affected.
- 2. (1) Before the injection of water is commenced, and from time to time after the commencement of injection, and upon the request of the Board, the Unit Operator shall satisfy the Board as to the source, suitability, and method of treatment of the water to be injected;
 - (2) Before any change is made in the source of water being injected, the Unit Operator shall satisfy the Board as to the suitability of the water to be injected.
- 3. The Unit Operator shall immediately report to the Board any indication of channeling or break-through of injected water to producing wells, or any indication of other detrimental effects that may be attributable to the pressure maintenance operations.

3—Order No. PM 20

- 4. In the interest of equity and good engineering practice the Board may prescribe from time to time a maximum pressure, or a minimum or a maximum rate, at which water shall be injected in any well in the Unit.

5. At least annually, unless otherwise directed by the Board, the Unit Operator shall determine the reservoir pressure in the producing wells in the Unit to the satisfaction of the Board.
6. The Unit Operator shall inject water to each well referred to in clause 1 hereof in a manner such that, within five years of the effective date of the Order, a suitable balance is achieved and maintained between water injected to, and fluids withdrawn from, the Unitized Strata.
7. The Unit Operator shall, not later than the twenty-fifth day of each month, file with the Mines Branch a report of the quantity and source of water injected during the preceding month to each well referred to in clause 1 hereof.
8. (1) Unless otherwise authorized in writing by the Board, the Unit Operator shall, within six weeks of the expiration of each yearly period commencing on the first day of January, 1973, file with the Board a report of the progress, performance, and efficacy of the pressure maintenance program during the period;
- (2) Subject to any direction in writing of the Board to the contrary, a report required by this clause may, at the discretion of the Unit Operator, be in two parts, the first of which parts shall set out graphically and from the commencement of the operation of the pressure maintenance program
 - (a) the daily average rate during each month of oil production of each producing well;
 - (b) the average water-oil ratio during each month of each producing well;
 - (c) the monthly cumulative oil and water production from each producing well;
 - (d) the daily average rate during each month of water injection to each injection well;
 - (e) the daily average water injection pressure during each month at each injection well;
 - (f) the monthly cumulative volume of water injected to each injection well;
 - (g) the average injectivity index during each month, for each water injection well, which index, at the discretion of the Unit Operator, may be determined as
 - (i) the daily injection rate divided by the average injection well-head pressure, or
 - (ii) any similar index that the Board, on the application of the Unit Operator, may approve; and

4—Order No. PM 20

- (h) the date and type of any well treatment or work-over which shall be indicated on the graph, and the second of which parts shall contain
 - (a) calculations of the balance during each month between water injected to, and fluids withdrawn from the Unitized Strata,
 - (b) such other interpretative information as the Unit Operator considers necessary to evaluate adequately the progress, performance, and efficacy of the pressure maintenance program, and
 - (c) an outline of the method actually in use for the quality, control, and treatment of the water, or, where there has been no change in the control or treatment from that outlined in a previous report, a statement to that effect.

- (3) If a report required by this clause is in the form provided for in subclause (2), the Board, at any time, may make the first part of the report available to the public, and, after one year from the end of the period for which the report is made, may make the second part of the report available to the public, and, if the report is not in the form provided for in subclause (2), the Board may make the whole of the report available to the public at any time.
2. This Order shall be effective at the hour of seven o'clock in the forenoon, official time, on the fifteenth day of May, A.D., 1972.

Oil and Natural Gas Order No. PM 20,
made and passed this 30th day
of March, A.D. 1972,
at the City of Winnipeg, in the
Province of Manitoba, by The Oil
and Natural Gas Conservation Board.

Approved:

"Leonard S. Evans"

Leonard S. Evans,
Acting Minister of Mines, Resources and
Environmental Management.

"W. Winston Mair"

W. Winston Mair,
Chairman,
The Oil and Natural Gas Conservation Board.

"J.S. Roper"

J.S. Roper,
Deputy Chairman,
The Oil and Natural Gas Conservation Board.

"M.J. Gobert"

M.J. Gobert,
Member,
The Oil and Natural Gas Conservation Board.

Manitoba Regulation 57/72

Being

THE OIL AND NATURAL GAS CONSERVATION BOARD

ORDER NO. PM 20

An Order pertaining to Pressure Maintenance by Water Flooding

EAST ROUTLEDGE UNIT NO. 1

Made and passed pursuant to "The Mines Act", Cap. M160, R.S.M., 1970, and amendments thereto, by The Oil and Natural Gas Conservation Board, of Manitoba.

(Filed April 18, 1972)

WHEREAS, subsection (9)(d) of Section 62 of "The Mines Act", being Chapter M160 of the Revised Statutes of Manitoba, 1970, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(d) requiring the repressuring, recycling, or pressure maintenance, of any pool or portion thereof where it is economical so to do, and for that purpose where necessary requiring the introduction or injection into any pool or portion thereof of gas, air, water, or other substance;"

AND WHEREAS, the Board, pursuant to Section 62 of "The Mines Act", held a public Hearing on October 5, 1971, and on February 16, 1972, for the purpose of considering a Proposal for Pressure Maintenance by Water Flooding within the Unit Area of the East Routledge Unit No. 1, by Samedan Oil of Canada, Inc., on its own behalf and other working interest owners, in the Routledge Field in Manitoba.

AND WHEREAS, upon due consideration of the submissions and testimony at the Hearings the Board has found:

- (a) That the pressure maintenance by water flooding of a certain part of the Routledge Field in Manitoba, comprising the Unit Area of the East Routledge Unit No. 1, is reasonably necessary to prevent waste, and to increase substantially the recovery of oil;

- (b) That the value of the estimated additional recovery of oil and gas resulting from such operation will exceed the estimated additional cost incidental to the conduct of such operation; and
- (c) That such operation will result in general advantage to the owners of oil and gas rights within the Unit Area.

2—Order No. PM 20

AND WHEREAS, Unitization Order No. 13 provides for the appointment of a Unit Operator.

NOW, THEREFORE, the Board orders:

1. (a) The Unit Operator shall conduct pressure maintenance operations by the injection of water to the Members of the Lodgepole Formation of the Mississippian Age underlying the Unit Area;
- (b) The pressure maintenance operations shall be in accordance with, and subject to, the following rules:

PRESSURE MAINTENANCE RULES

1. (1) Water shall be injected to the Lodgepole Formation of the Mississippian Age in the wells

Samedan Routledge Prov. 2-11-9-25
Samedan Routledge Prov. 4-11-9-25
Samedan Routledge Prov. 10-11-9-25
Samedan Routledge Prov. 12-11-9-25
Samedan Routledge Prov. 14-11-9-25
Samedan Routledge Prov. 6-14-9-25
Samedan Routledge 8-14-9-25

and, from time to time, in such other wells as the Board may direct, or, upon application of the Unit Operator, may approve;

- (2) After the commencement, the Unit Operator shall, subject to any remedial work required to be performed on the well or wells referred to in this clause, endeavour to maintain continuous injection;
 - (3) Notwithstanding the provisions of subclause (2), the Board may, upon application by the Unit Operator, approve the suspension of water injection, provided the Board is satisfied that the pressure maintenance operation in the Unit Area will not be adversely affected.
2. (1) Before the injection of water is commenced, and from time to time after the commencement of injection, and upon the request of the Board, the Unit Operator shall satisfy the Board as to the source, suitability, and method of treatment of the water to be injected;
 - (2) Before any change is made in the source of water being injected, the Unit Operator shall satisfy the Board as to the suitability of the water to be injected.
3. The Unit Operator shall immediately report to the Board any indication of channeling or break-through of injected water to producing wells, or any indication of other detrimental effects that may be attributable to the pressure maintenance operations.

3—Order No. PM 20

4. In the interest of equity and good engineering practice the Board may prescribe from time to time a maximum pressure, or a minimum or a maximum rate, at which water shall be injected in any well in the Unit.

5. At least annually, unless otherwise directed by the Board, the Unit Operator shall determine the reservoir pressure in the producing wells in the Unit to the satisfaction of the Board.
6. The Unit Operator shall inject water to each well referred to in clause 1 hereof in a manner such that, within five years of the effective date of the Order, a suitable balance is achieved and maintained between water injected to, and fluids withdrawn from, the Unitized Strata.
7. The Unit Operator shall, not later than the twenty-fifth day of each month, file with the Mines Branch a report of the quantity and source of water injected during the preceding month to each well referred to in clause 1 hereof.
8. (1) Unless otherwise authorized in writing by the Board, the Unit Operator shall, within six weeks of the expiration of each yearly period commencing on the first day of January, 1973, file with the Board a report of the progress, performance, and efficacy of the pressure maintenance program during the period;
- (2) Subject to any direction in writing of the Board to the contrary, a report required by this clause may, at the discretion of the Unit Operator, be in two parts, the first of which parts shall set out graphically and from the commencement of the operation of the pressure maintenance program
 - (a) the daily average rate during each month of oil production of each producing well;
 - (b) the average water-oil ratio during each month of each producing well;
 - (c) the monthly cumulative oil and water production from each producing well;
 - (d) the daily average rate during each month of water injection to each injection well;
 - (e) the daily average water injection pressure during each month at each injection well;
 - (f) the monthly cumulative volume of water injected to each injection well;
 - (g) the average injectivity index during each month, for each water injection well, which index, at the discretion of the Unit Operator, may be determined as
 - (i) the daily injection rate divided by the average injection well-head pressure, or
 - (ii) any similar index that the Board, on the application of the Unit Operator, may approve; and

4—Order No. PM 20

- (h) the date and type of any well treatment or work-over which shall be indicated on the graph, and the second of which parts shall contain
 - (a) calculations of the balance during each month between water injected to, and fluids withdrawn from the Unitized Strata,
 - (b) such other interpretative information as the Unit Operator considers necessary to evaluate adequately the progress, performance, and efficacy of the pressure maintenance program, and
 - (c) an outline of the method actually in use for the quality, control, and treatment of the water, or, where there has been no change in the control or treatment from that outlined in a previous report, a statement to that effect.

- (3) If a report required by this clause is in the form provided for in subclause (2), the Board, at any time, may make the first part of the report available to the public, and, after one year from the end of the period for which the report is made, may make the second part of the report available to the public, and, if the report is not in the form provided for in subclause (2), the Board may make the whole of the report available to the public at any time.
2. This Order shall be effective at the hour of seven o'clock in the forenoon, official time, on the fifteenth day of May, A.D., 1972.

Oil and Natural Gas Order No. PM 20,
made and passed this 30th day
of March, A.D. 1972,
at the City of Winnipeg, in the
Province of Manitoba, by The Oil
and Natural Gas Conservation Board.

Approved:

"Leonard S. Evans"

Leonard S. Evans,
Acting Minister of Mines, Resources and
Environmental Management.

"W. Winston Mair"

W. Winston Mair,
Chairman,
The Oil and Natural Gas Conservation Board.

"J.S. Roper"

J.S. Roper,
Deputy Chairman,
The Oil and Natural Gas Conservation Board.

"M.J. Gobert"

M.J. Gobert,
Member,
The Oil and Natural Gas Conservation Board.

April 4, 1973

F. S. Ganey

M. J. Gobert

Reservoir Engineer

Assistant Deputy Minister

Re: Fracture pressure - East Routledge Unit No. 1

Formula:

$$\text{Overburden pressure (p.s.i.)} = h \times 2.4 \times \frac{1}{2.31}$$

where h = depth

2.4 = average rock density

1/2.31 = press. p.s.i. (water)

$$\text{Hydrostatic pressure (p.s.i.)} = h \times \frac{1}{2.31}$$

where h = depth

1/2.31 = press. p.s.i. (water)

*Pirson.
Oil Reservoir Engng.*

Average well depth of injection wells East Routledge Unit No. 1 = 2,140'

$$\text{Overburden pressure} = 2,140 \times 2.4 \times \frac{1}{2.31} = \underline{2,223} \text{ p.s.i.}$$

$$\text{Hydrostatic pressure} = 2,140 \times \frac{1}{2.31} = \underline{926} \text{ p.s.i.}$$

Difference between overburden and hydrostatic pressure =

$$2,223 - 926 = \underline{1,297} \text{ p.s.i.}$$

Injection pressure would have to be greater than 1,297 p.s.i. at a depth of 2,240 feet to fracture the formation.

F. S. Ganey

FSG/evh

*approx reservoir pressure = 0.435 x depth in feet to ground water level
= 2000 x 0.435
= 870 p.s.i.*

INTER-DEPARTMENTAL MEMORANDUM

DATE March 12, 1973.

FROM M. J. Gobert,

TO Mr. J. S. Roper,

Senior Assistant Deputy Minister.

Director of Mines.

SUBJECT SAMEDAN OIL OF CANADA - EAST ROUTLEDGE UNIT NO. 1



PERMISSION TO INCREASE INJECTION PRESSURE TO 1,300 p.s.i.g.

*F.S.G.
please prepare reply*

We are to advertise as we did earlier to the effect that we have received an application from Samedan Oil of Canada for permission to increase injection pressure to 1,300 p.s.i.g. Copies of the proposal are available for perusal at company's address and the Department. We propose to approve unless there is serious objection to the contrary.

In any such permission Samedan must accept responsibility.

Have we received monthly reports of volumes and pressures? If so, do these indicate a need for higher pressure injection? What is fracture pressure in area?

[Signature]
M. J. Gobert

MJG/as
Att.



MANITOBA

DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT
THE OIL AND NATURAL GAS CONSERVATION BOARD
901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1

Jas. T. Cawley
~~XXXXXXXXXXXXXXXXXXXX~~
CHAIRMAN
J. S. ROPER 946-7428
DEPUTY CHAIRMAN
M. J. GOBERT 946-7859
MEMBER
R. R. McDANIEL
CONSULTANT

DRAFT LETTER

February 26, 1973

Mr. George J. McLeod, Pres.
Samedan Oil of Canada, Inc.
730 Elveden House
CALGARY, Alberta
T2P 0Z3

Dear Mr. McLeod:

Re: Permission to increase injection pressure
East Routledge Unit No. 1.

In accordance with Section 4 of Order No. PM 20, pertaining to pressure maintenance by Waterflooding of the above Unit, the Board hereby grants permission to the operator to:

- (1) Increase the injection pressure to a maximum of 1,500 p.s.i.g., in the injection wells referred to under the "Pressure Maintenance Rules" of the above Order No. PM 20.

Yours sincerely,

Jas. T. Cawley, P. Eng.
Chairman

FSG/evh

INTER-DEPARTMENTAL MEMORANDUM

FROM F. S. Gamey

Reservoir Engineer



PROVINCE
OF
MANITOBA

DATE February 26, 1973

TO J. S. Roper, Deputy Chairman
O. and N.G.C.B.
M. J. Gobert, Asst. Deputy Minister

SUBJECT Re: Samedan Oil of Canada

East Routledge Unit No. 1

Permission to increase injection pressure to 1,300 p.s.i.g.

MAR 14 1973

HHE

Samedan Oil of Canada has requested permission to increase injection pressure in the above Unit to 1,300 p.s.i.g., which is near fracture pressure of the formation. Pressure has been restricted to 1,000 - 1,075 p.s.i.g. in accordance with their statement at the Unitization hearing, not to exceed formation fracture pressure.

Remedial attempts (two acid treatment jobs on the injection wells in December 1972) has not been successful in increasing the injectivity.

Chevron Standard Limited carried out a pilot high pressure waterflood scheme in the Daly Waterflood area during 1971, where injection pressures reached 1,400 p.s.i.g. As there were no changes in the production or fluid levels at any of the adjacent producing wells the scheme was abandoned.

Unless the Board has misgivings about the effect of a high pressure waterflood, it is suggested that a maximum pressure of 1,300 p.s.i.g. be set in accordance with section 4 of P.M. Order No. 20.

A suggested letter for Board consideration is attached.

FSG/evh
Enclosure

F. S. Gamey

March 16, 1973

F. S. Gamay

J. S. Roper - Director

Reservoir Engineer

M. J. Goyert - Asst. Deputy

Re: East Routledge Unit No. 1 Monthly reports.

Attached are copies of:

1. Salt water injection report for February 1973. These reports have been received since injection commenced in November 1972.
2. Report on operations for February. This is the first monthly report on operations received and I have been informed by Mr. Kelly of Samedan that they will be issued on a regular monthly basis.

Re: Fracture pressures in the area.

For an average well depth of 2,140 feet in the area of the injection wells, the formation fracture pressure would be approximately 1,297 p.s.i.g.

Injection pressures during February 1973, are reported as 1,160 p.s.i.g.

Increasing the pressure to 1,300 p.s.i.g. at the wellhead should not fracture the formation, as the tubing friction will reduce the injection pressure at the formation.

I do not think the increase in pressure will increase the volume of water to the rate they anticipated in their Engineering report.

They estimated an injection rate of 2,611 barrels of water per day for the present injection wells. Daily injection rate for February was 1,844 W.P.D.

F. S. Gamay

FSG/evh

Atts.

SAMEDAN OIL OF CANADA, INC.

730 ELVEDEN HOUSE

CALGARY, ALBERTA

T2P 0Z3

March 7, 1973

TO : ALL WORKING INTEREST OWNERS
EAST ROUTLEDGE UNIT NO. 1

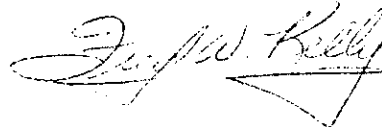
Gentlemen :

RE : Report on Operations
February 1 - 28, 1973.

Attached for your information is the monthly Report On
Operations for the East Routledge Unit No. 1 for the
month of February, 1973.

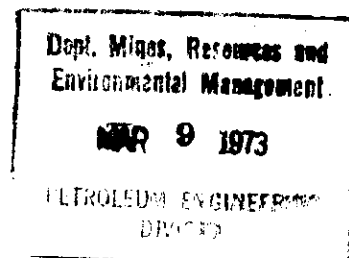
Yours truly

SAMEDAN OIL OF CANADA, INC.



Fred W. Kelly
Division Engineer.

md.



SAMEDAN OIL OF CANADA, INC.
730 ELVEDEN HOUSE
CALGARY, ALBERTA
T2P 0Z3

EAST ROUTLEDGE UNIT NO. 1

REPORT ON OPERATIONS

February 1 - 28, 1973

Cumulative oil production prior to unitization May 15, 1972	1,466,076 bbls.
Cumulative water production prior to unitization May 15, 1972	2,388,966 bbls.

1. Summary of Operations

February 1 - 28

Number of wells on production	22
Number of wells not produced	0
Oil production - total barrels	8,785
Oil production - daily average	314
Water production - total barrels	27,104
Water production - daily average	968
Fluid production - total barrels	35,889
Fluid production - daily average	1,282
Percentage water cut	75.52
Salt water to injection wells	27,104
Injection well pressure	1,160#

Cumulative unit oil production February 28, 1973	97,577 bbls.
--	--------------

Cumulative unit water production to February 28, 1973	293,229 bbls.
---	---------------

2. Operations Report

Discharge pressure at the injection pump was increased from 1075 to 1160 psi with the following results:

Average Injection Rate B/D

<u>Well</u>	<u>Feb. 1-7</u>	<u>Feb. 22-28</u>	<u>Change</u>
2-11	117	122	+5
10-11	120	130	+10
12-11	600	600	-
14-11	200	225	+25
6-14	853*	776	-77
TOTAL	1890	1853	-37

*Decreased by wellhead throttling valve.

SAMEDAN OIL OF CANADA, INC.

730 ELVEDEN HOUSE

CALGARY, ALBERTA

T2P 0Z3

MONTH OF February, 1973

SALT WATER INJECTION REPORT

OPENING INVENTORY 0

Receipts from :

East Routledge Unit No. 1 27104

Chevron 16-17-9-25 24591

Injected in Salt Water Injection Wells :

2-11-9-25	3374	
10-11-9-25	3521	
12-11-9-25	16800	
14-11-9-25	6055	
6-14-9-25	21945	51695

CLOSING INVENTORY 0

Pressure - 1160

Ave. daily injection rates, Feb./73

2-11-9-25	=	120 BWP.D.
10-11	=	125
12-11	=	600
14-11	=	216
6-14	=	783

1844

*ENGINEERING
PLAN.
(ANTICIPATION)*

330

250

1011

244

776

2611

Jly.

WORKING INTEREST OWNERS

ADDRESS LIST

Canadian Reserve Oil and Gas Ltd.
1600 - 639 Fifth Avenue S. W.
Calgary, Alberta
Attention: Mr. G. Czeman

Chevron Standard Limited
400 - 5th Avenue S. W.
Calgary, Alberta
Attention: Mr. Allan Hamberg,
Information Centre

Gringo Oils Ltd.
P. O. Box 150
Calgary Alberta

Mr. Joseph H. Hirshhorn
Suite 1601
8 King Street East
Toronto 1, Ontario

Prairie Oil Royalties Company, Ltd.
640 - 8th Avenue S. W.
Calgary, Alberta
Attention: Mr. V. F. Maxwell

Ranchmen's Minerals Ltd.
6th Floor, 630 - 6th Avenue S. W.
Calgary, Alberta
Attention: Mr. A. G. Savage

Samedan Oil Corporation
P. O. Box 909
Ardmore, Oklahoma 73401
Attention: Mr. H. Leon Veeder

United Reef Petroleums Ltd.
Suite 1601
8 King Street East
Toronto 1, Ontario
Attention: Mr. John S. Adams

Samedan Oil of Canada, Inc.
730 Elveden House
717 - 7th Avenue S. W.
Calgary, Alberta
Attention: Mr. Fred W. Kelly

SAMEDAN OIL OF CANADA, INC.

730 ELVEDEN HOUSE

CALGARY, ALBERTA

T2P 0Z3

MONTH OF November, 1972

SALT WATER INJECTION REPORT

OPENING INVENTORY

0

Receipts from :

East Routledge Unit No. 1

19461

Chevron 16-17-9-25

2150

Injected in Salt Water Injection Wells:

2-11-9-25	2084
10-11-9-25	1751
12-11-9-25	8846
14-11-9-25	1510
6-14-9-25	<u>7295</u>

21486

CLOSING INVENTORY - November 30, 1972

125

Pressure - 1000

SAMEDAN OIL OF CANADA, INC.

730 ELVEDIN HOUSE

CALGARY, ALBERTA

T2P 0Z3

MONTH OF December, 1972

SALT WATER INJECTION REPORT

OPENING INVENTORY

125

Receipts from :

East Routledge Unit No. 1

31940

Chevron 16-17-9-25

16712

Injected in Salt Water Injection Wells:

2-11-9-25	3448
10-11-9-25	3811
12-11-9-25	15585
14-11-9-25	5955
6-14-9-25	<u>19853</u>

48652

CLOSING INVENTORY - December 31, 1972

125

Pressure - 1000

Dept. of Resources and
Environmental Management

JAN 10 1973

PETROLEUM ENGINEERING
DIVISION

(SAMEDAN SWIS well - 7-10-9-25
taking 10,000 gals/month from unit)