

NEW FILE

FIELD/POOL

PROGRESS

BIRDTAIL UNIT NO. 2

INJECTOR APPROVAL

# Manitoba



Industry, Trade  
and Mines

Petroleum

360-1395 Ellice Avenue  
Winnipeg MB R3G 3P2  
CANADA

Phone: (204) 945-6577

Fax: (204) 945-0586

April 23, 2001

Mr. Rick Bawol, P.Eng.  
Exploitation Manager  
Progress Energy Ltd.  
1110-520 5<sup>th</sup> Ave SW  
Calgary AB T2P 3R7

Dear Mr. Bawol:

**Re: Birdtail Unit No. 2 - Injection Well Approval**  
**Birdtail Unit No. 2 Prov. WIW A2-19-16-27 (WPM)**  
**Birdtail Unit No. 2 WIW 4-20-16-27 (WPM)**

Notice of your application to convert the 4-20-16-27 well to water injection was sent to the offsetting royalty and working interest owners and no objections or interventions were received by the Branch. In accordance with clause 1 of Waterflood Order No. 8 the well, Birdtail Unit No. 2 WIW 4-20-16-27 (WPM), is approved for conversion to water injection. Please note the Branch has corrected the location of the other recently approved injector, Birdtail Unit No. 2 Prov. WIW A2-19-16-27 (WPM).

The Branch will calculate the Third Tier EOR Factor (TTEF) for Birdtail Unit No. 2 and advise you in the near future. The TTEF is effective the first day of the month both wells are on-injection.

If you have any questions, please contact John N. Fox, Chief Petroleum Engineer at (204) 945-6574.

Yours truly,

A handwritten signature in dark ink, appearing to read 'L. R. Dubreuil'.

L. R. Dubreuil  
Director

# Manitoba



Industry, Trade  
and Mines

Petroleum

360-1395 Ellice Avenue  
Winnipeg MB R3G 3P2  
CANADA

Phone: (204) 945-6577  
Fax: (204) 945-0586

DATE: MARCH 29/01

TOTAL NO. OF PAGES (including this page) 3+ COVER

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: RICK BAWOL, P. ENG.  
BRANCH: PROGRESS ENERGY LTD.  
FAX NO: (403) 216-2514

FROM: **Industry, Trade And Mines  
Petroleum Branch**

360-1395 Ellice Avenue  
Winnipeg, Manitoba  
R3G 3P2

COMMENTS: APPROVAL TO CONVERT  
2-19-16-27 TO WATER INJECTION S  
NOTICE RE: 4-20-16-27

**Dan Surzyshyn**  
Senior Petroleum Technician



(204) 945-8102  
(204) 945-0586 Fax  
dsurzyshyn@em.gov.mb.ca  
www.gov.mb.ca

DAN

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\*\*\*\*\*  
\*\*\* TX REPORT \*\*\*  
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## TRANSMISSION OK

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USAGE T 01'32  
PGS. 4  
RESULT OK

**Manitoba**Industry, Trade  
and Mines

Petroleum

360-1395 Ellice Avenue  
Winnipeg MB R3G 3P2  
CANADAPhone: (204) 945-6577  
Fax: (204) 945-0586DATE: MARCH 29/01TOTAL NO. OF PAGES (including this page) 3+ COVERPLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: RICK BAWOL, P. ENG.  
BRANCH: PROGRESS ENERGY LTD.  
FAX NO: (403) 216-2514

FROM:

**Manitoba**Industry, Trade And Mines  
Petroleum Branch360-1395 Ellice Avenue  
Winnipeg, Manitoba  
R3G 3P2

COMMENTS:

APPROVAL TO CONVERT  
2-19-16-27 TO WATER INJECTION S  
NOTICE RE: 4-20-16-27

Dan Surzyshyn  
Senior Petroleum Technician(204) 945-8102  
(204) 945-0586 Fax  
dsurzyshyn@gem.gov.mb.ca  
www.gov.mb.ca

DAN

This message is intended only for the use of the individual or entity to which it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law.

If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any



## Memorandum

Date: March 28, 2001

To: Bob Dubreuil  
Director  
Petroleum Branch

From: John Fox  
Chief Petroleum Engineer  
Petroleum Branch

Subject: Birdtail Bakken C Pool  
Waterflood Order No. 8  
Revised Injector Locations

Telephone:

Progress Energy, the unit operator of Birdtail Unit No. 2, has applied to change the injection wells approved under Waterflood Order No. 8.

### Recommendations

It is recommended that notice of the application be sent directly to the royalty and working interest owners in the NW/4 of Section 17-16-27 (WPM) with respect to the proposed 4-20-16-27 injector conversion. A copy of the proposed notice is attached. If no objections or interventions are received with respect to the 4-20 injector conversion, it is recommended the conversion be approved under Clause 1 of Waterflood Order No. 8.

It is recommended that the proposed 2-19-16-27 injector conversion be approved at this time as the well is located adjacent to the original injection wells. A copy of the proposed letter of approval is attached.

### Discussion

Twenty-six months have passed since the Branch approved Progress's original waterflood application. Production from the pool under primary has continued to decline at approximately 9.3% per year. Current production (Dec-00) is 9.3 m<sup>3</sup> OPD with estimated primary recoverable reserves of 27.9 10<sup>3</sup>m<sup>3</sup> (7.6% OOIP) (see Fig. 1).

Under Waterflood Order No. 8, the Branch approved conversion of the 15-18-16-27 and 7-19-16-27 wells to water injection. Progress has applied to convert the 2-19-16-27 and 4-20-16-27 wells to injection instead (see Fig. 2). The reasons provided by Progress for changing the injector locations are:

- the 15-18 well is located at the edge of the pool, has poor productivity and has been shut-in since Sep-98

- the 7-19 well currently produces 1.6 m<sup>3</sup> OPD and accounts for 17.2% of the unit production, lost production from the conversion would have a significant negative impact on project economics
- the proposed injectors at 2-19 and 4-20 create two partial inverted 9-spot injection patterns (see Fig. 2), which should improve waterflood recovery when compared to the original line-drive injection

The Branch is satisfied with the proposed relocation of the injection wells. The Branch believes Progress's estimate of incremental recoverable reserves of 45.5 10<sup>3</sup>m<sup>3</sup> and ultimate recovery of 20% under waterflood, is somewhat optimistic.

The proposed 2-19 injector is situated between the originally approved injector locations at 15-18 and 7-19. Therefore it is not necessary to notify the offsetting royalty and working interest owners of the proposed conversion. Attached is a copy of the proposed Branch letter approving the 2-19 conversion. On the other hand, the proposed 4-20 conversion directly offsets the NW/4 of Section 17-16-27 WPM, which is not part of Birdtail Unit No. 2. It is recommended that the royalty and working interest owners in the NW/4 of Section 17 be sent notice of the application. Attached is a copy of the proposed notice.



John Fox

# BIRDTAIL UNIT NO 2

## SELECTED WELLS PRODUCTION

Data As Of: 0-- (AB)  
WellCount: 10/13

From: 1997-01  
To: 2000-12

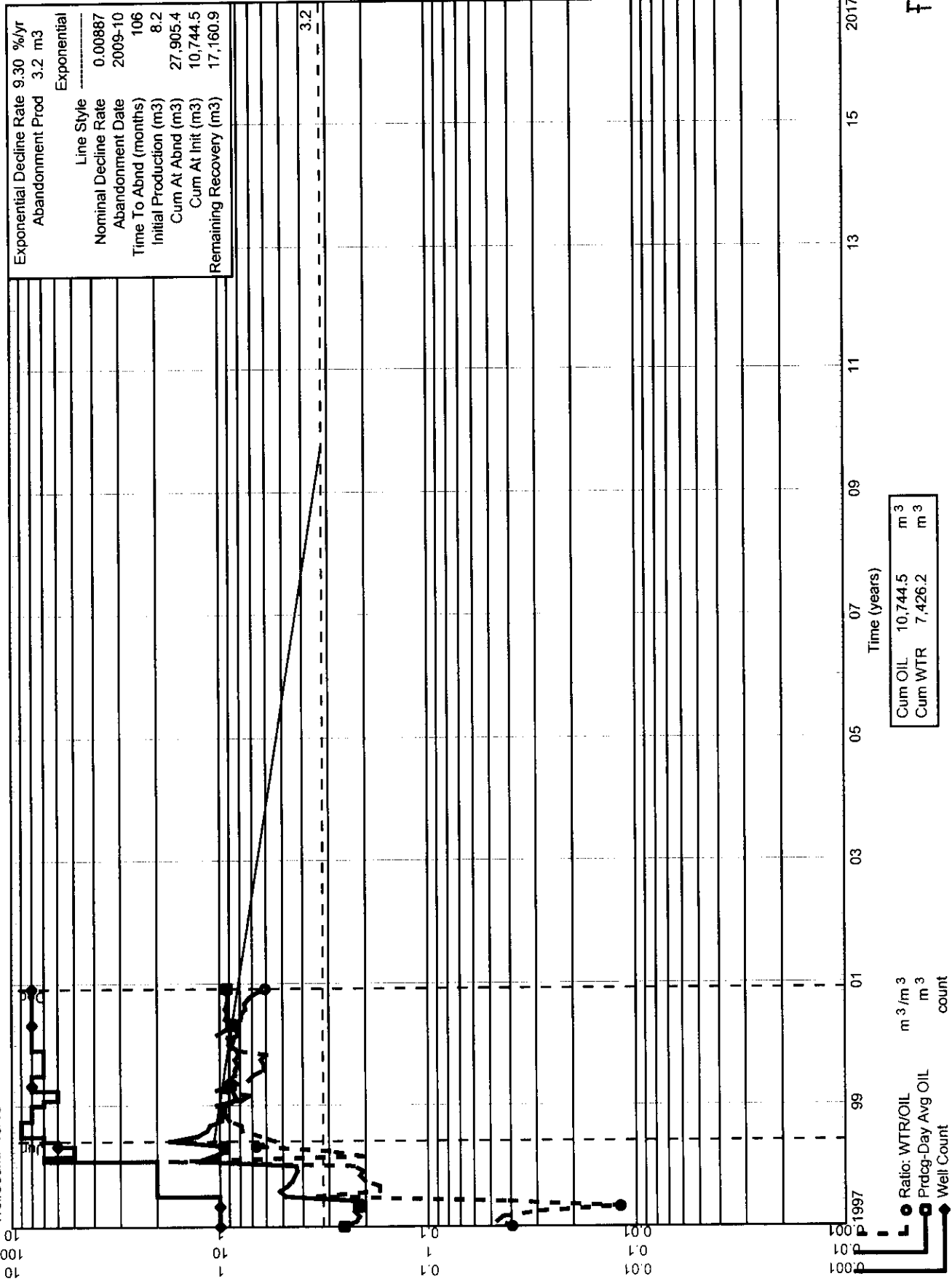


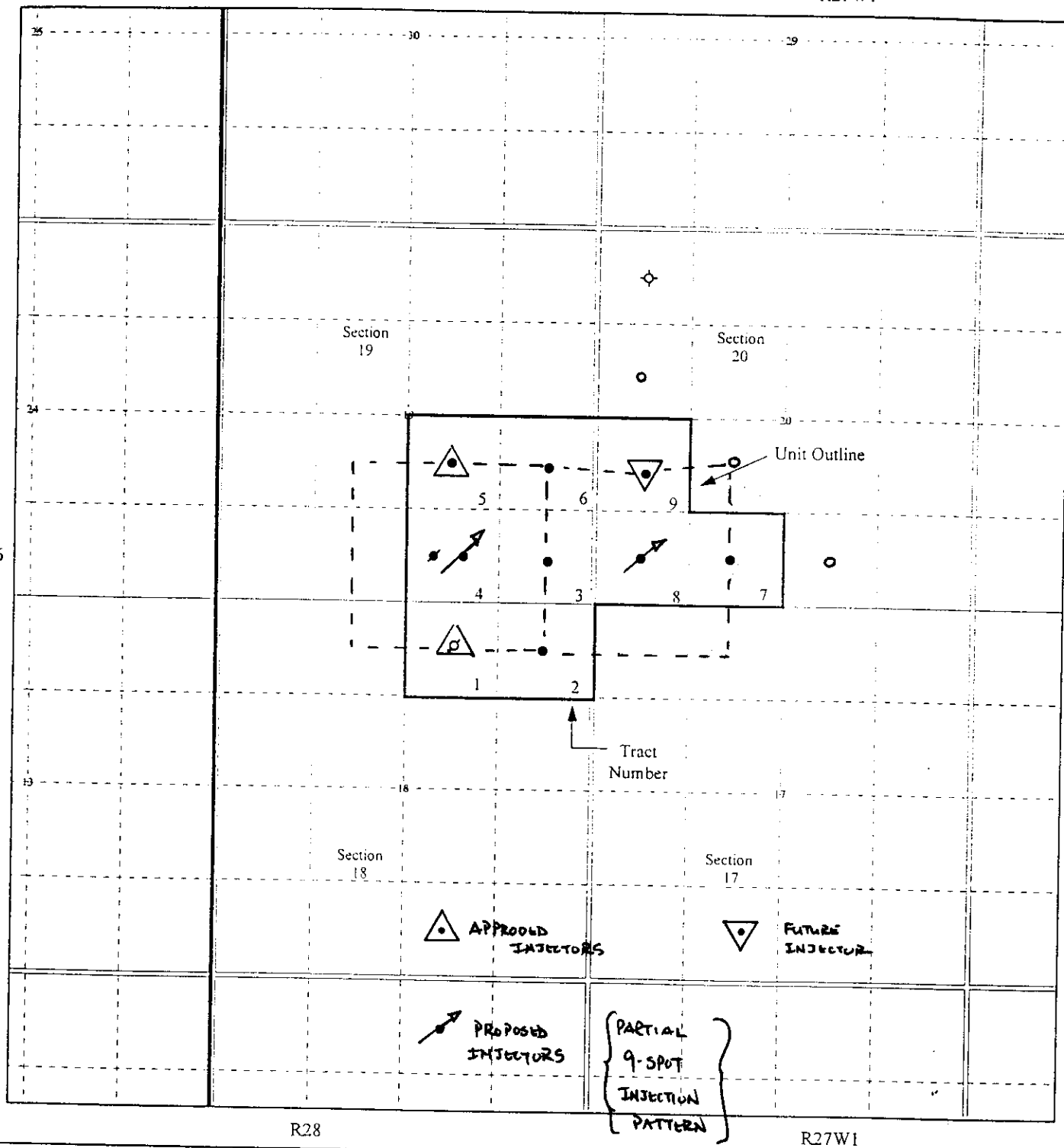
Fig. 1

R28

R27W1

T16

T16



R28

R27W1

Exhibit "B"

Birdtail Unit No. 2  
Unit Outline; Tract by LSD



Map Software by  
AccuMap EnerData,  
A Division of QC Data  
Version 4.01, Feb 16 1999  
(403) 243-5015

Author: Jeff Screen  
Date: March 15, 1999  
File: Birdtail.MAP  
Scale: 1 : 25000

Scale 1:25000

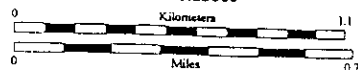


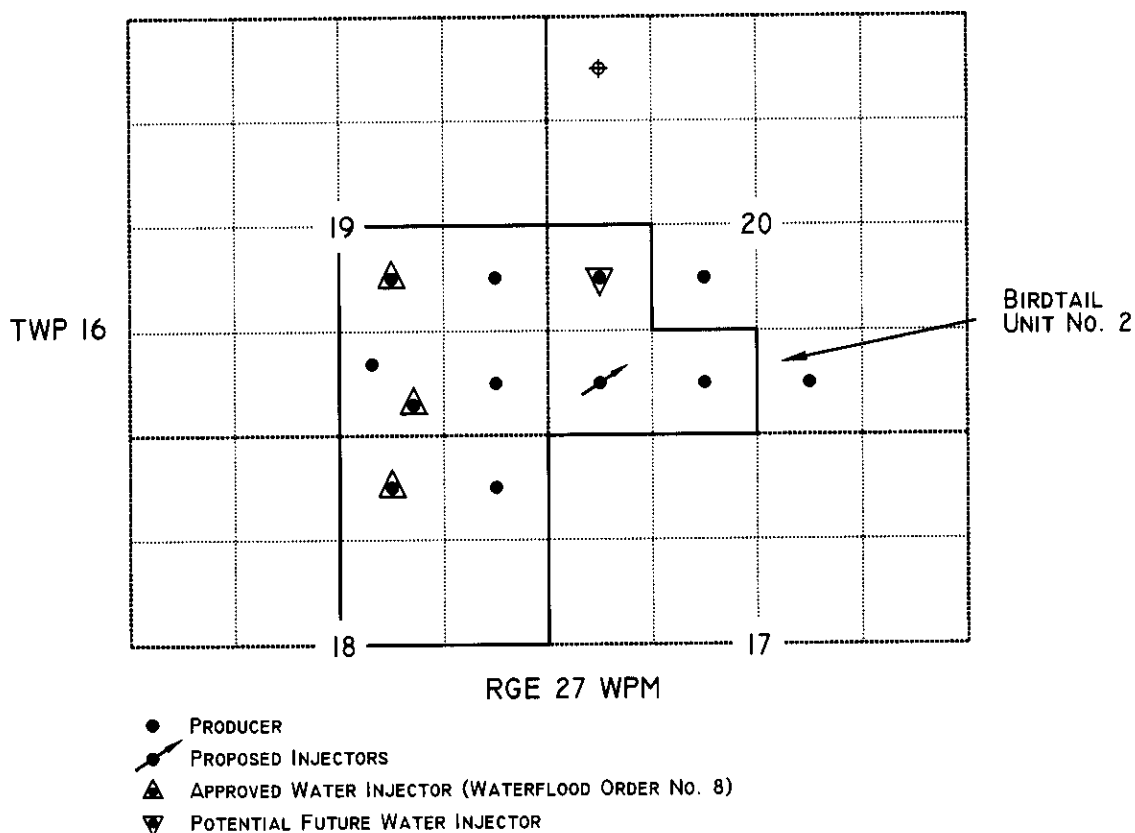
Fig. 2





**NOTICE**  
**UNDER THE OIL AND GAS ACT**  
**BIRDTAIL OIL FIELD**

Progress Energy Ltd. has made application under The Oil and Gas Act to revise the proposed injection wells approved under Waterflood Order No. 8 in the Birdtail Bakken C Pool shown below.



It is proposed to convert the well, Birdtail Unit No. 2 4-20-16-27 (WPM), to water injection.

If no valid objection or intervention is received in writing by the Department of Industry, Trade and Mines, Petroleum Branch, at Suite 360, 1395 Ellice Avenue, Winnipeg, Manitoba R3G 3P2 before April 16, 2001, the Minister may approve the application.

Copies of the application can be obtained from:

Rick Bawol, P.Eng.  
Exploitation Manager  
Progress Energy Ltd.  
1110 - 520 5<sup>th</sup> Ave. S.W.  
Calgary, AB T2P 3R7  
(204) 934-5850

This application may be viewed at the offices of the Petroleum Branch:

Suite 360, 1395 Ellice Avenue  
Winnipeg, MB R3G 3P2  
(204) 945-6577

227 King Street  
Virden, MB R0M 2C0  
(204) 748-4260

Dated at Winnipeg, this 28<sup>th</sup> day of March, 2001.

  
\_\_\_\_\_  
L.R. Dubreuil, Director  
Petroleum Branch

# Manitoba



Industry, Trade  
and Mines

Petroleum

360-1395 Ellice Avenue  
Winnipeg MB R3G 3P2  
CANADA

Phone: (204) 945-6577

Fax: (204) 945-0586

March 28, 2001

Mr. Rick Bawol, P.Eng.  
Exploitation Manager  
Progress Energy Ltd.  
1110-520 5<sup>th</sup> Ave SW  
Calgary AB T2P 3R7

Dear Mr. Bawol:

**Re: Birdtail Unit No. 2 2-19-16-27 (WPM)  
Injection Well Approval**

In accordance with clause 1 of Waterflood Order No. 8 the well, Birdtail Unit No. 2 2-19-16-27 (WPM), is approved for conversion to water injection.

Notice of your application to convert the 4-20-16-27 well to water injection has been sent to the offsetting royalty and working interest owners. A copy of the notice is attached for your reference.

If you have any questions, please contact the undersigned at (204) 945-6574.

Yours truly,

A handwritten signature in cursive script, reading "L. R. Dubreuil".

L. R. Dubreuil  
Director

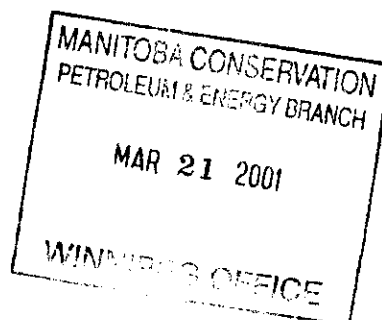
Attached.

JNF/hlt



March 19, 2001

Manitoba Energy and Mines  
Petroleum and Energy Branch  
Suite 360  
1395 Ellice Avenue  
Winnipeg, Manitoba  
R3G 3P2



**Attention: Mr. John Fox**

Dear Mr. Fox:

**Re: Birdtail Bakken C Pool Waterflood Amendment**

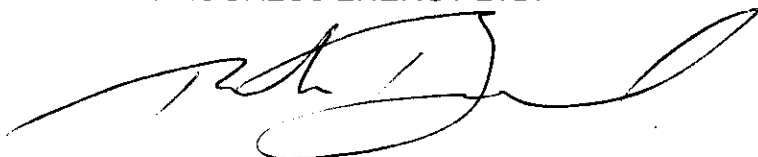
Last month Progress Energy Ltd. applied to amend Schedule A of Waterflood Order No. 8 by revising the proposed injection wells. In response to your email dated February 15, the following information is provided in support of our proposed amendment:

- *Revised primary and secondary recovery estimates:* Paddock Lindstrom & Associates Ltd. has just completed Progress Energy's corporate year-end reserves review and assigned a primary recovery factor to this pool of 7%. This is slightly higher than the 4.9% primary recovery factor estimated in our original application in 1998. The predicted recovery under waterflood was 20%, based for the most part on analogous Bakken pools. Although we believe that the proposed amendment will increase the secondary recovery, the change is not so substantial that we can confidently predict a percentage increase. Therefore we are not revising our predicted recovery factor under waterflood, but instead suggest that the proposed change will increase our probability of surpassing that value. The Paddock Lindstrom report still carries a recovery factor of 20% under waterflood in the proved plus probable case.
- *Potential future development drilling and waterflood expansion plans:* The production performance of the recently drilled non-unit wells 2-20 and 6-20 is still being evaluated. If these two wells look good, the next two locations would probably be 7-20 and 11-20. To continue developing the 9-spot pattern that's been started, the new 2-20 well could eventually be converted to an injector. After getting some production history on the new wells we will investigate expansion of the Unit to include them.
- *Notice to the landowners:* Please find attached copies of the letters that are being sent out to the surface owners.

- *Royalty and working interest owners in NW/4 of 17:* The lessee is Husky Oil Operations Ltd., 707 – 8<sup>th</sup> Avenue S.W., Calgary, Alberta, T2P 3G7. The royalty owner is David Henry Nettle, P.O. Box 398, Birtle, MB, R0M 0C0.

We trust that this meets your requirements. Please give me a call at 403-216-2510 ext. 109 if you have any questions or concerns about this amendment.

Sincerely,  
PROGRESS ENERGY LTD.

A handwritten signature in black ink, appearing to read 'Rick Bawol', with a large, stylized flourish extending to the right.

Rick Bawol, P. Eng.  
Exploitation Manager



March 19, 2001

Neil Bertram  
Box 613  
Birtle, Manitoba  
R0M 0C0

Fred & Shirley Barteaux  
Box 444  
Birtle, Manitoba  
R0M 0C0

Kelvin & Nona Gooda  
Box 125  
Birtle, Manitoba  
R0M 0C0

Dear Mr. Bertram:

RE: BIRDTAIL UNIT 2 – WATERFLOOD AMENDMENTS

Last month, Progress Energy applied to Manitoba Energy and Mines to amend the waterflood approval for the Birdtail Bakken C Pool. For various reasons which are detailed in the attached letter to M.E.M., we would like to change the injectors from the currently approved wells 15-18-16-27W1 and 7-19-16-27W1, to two different wells 2-19-16-27W1 and 4-20-16-27W1. This letter is to notify you, as surface owners of the affected locations, of this change.

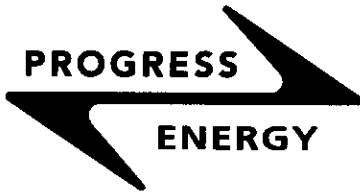
The effect of this change that you will observe at the wellsites will be minor, including:

- The pumpjacks will be shut down and eventually removed.
- A service rig will move onto each location and do a workover to convert the well to an injector.
- Produced water will be hauled into the site to test the injectivity of the well.
- An injection line will be run to the well.
- A small shelter may be placed around the wellhead to prevent freezing.

We trust that this modification to the waterflood plan will not inconvenience you. If you have any questions or concerns about this matter, please feel free to call me at 403-216-2510 ext. 109.

Sincerely,  
PROGRESS ENERGY LTD.

Rick Bawol  
Exploitation Manager



March 19, 2001

Neil Bertram  
Box 613  
Birtle, Manitoba  
R0M 0C0

Fred & Shirley Barteaux  
Box 444  
Birtle, Manitoba  
R0M 0C0

Kelvin & Nona Gooda  
Box 125  
Birtle, Manitoba  
R0M 0C0

Dear Mr. and Mrs. Barteaux:

RE: BIRDTAIL UNIT 2 – WATERFLOOD AMENDMENTS

Last month, Progress Energy applied to Manitoba Energy and Mines to amend the waterflood approval for the Birdtail Bakken C Pool. For various reasons which are detailed in the attached letter to M.E.M., we would like to change the injectors from the currently approved wells 15-18-16-27W1 and 7-19-16-27W1, to two different wells 2-19-16-27W1 and 4-20-16-27W1. This letter is to notify you, as surface owners of the affected locations, of this change.

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- A service rig will move onto each location and do a workover to convert the well to an injector.
- Produced water will be hauled into the site to test the injectivity of the well.
- An injection line will be run to the well.
- A small shelter may be placed around the wellhead to prevent freezing.

We trust that this modification to the waterflood plan will not inconvenience you. If you have any questions or concerns about this matter, please feel free to call me at 403-216-2510 ext. 109.

Sincerely,  
PROGRESS ENERGY LTD.

Rick Bawol  
Exploitation Manager



March 19, 2001

Neil Bertram  
Box 613  
Birtle, Manitoba  
R0M 0C0

Fred & Shirley Barteaux  
Box 444  
Birtle, Manitoba  
R0M 0C0

Kelvin & Nona Gooda  
Box 125  
Birtle, Manitoba  
R0M 0C0

Dear Mr. and Mrs. Gooda:

RE: BIRDTAIL UNIT 2 – WATERFLOOD AMENDMENTS

Last month, Progress Energy applied to Manitoba Energy and Mines to amend the waterflood approval for the Birdtail Bakken C Pool. For various reasons which are detailed in the attached letter to M.E.M., we would like to change the injectors from the currently approved wells 15-18-16-27W1 and 7-19-16-27W1, to two different wells 2-19-16-27W1 and 4-20-16-27W1. This letter is to notify you, as surface owners of the affected locations, of this change.

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- The pumpjacks will be shut down and eventually removed.
- A service rig will move onto each location and do a workover to convert the well to an injector.
- Produced water will be hauled into the site to test the injectivity of the well.
- An injection line will be run to the well.
- A small shelter may be placed around the wellhead to prevent freezing.

We trust that this modification to the waterflood plan will not inconvenience you. If you have any questions or concerns about this matter, please feel free to call me at 403-216-2510 ext. 109.

Sincerely,  
PROGRESS ENERGY LTD.

Rick Bawol  
Exploitation Manager



February 9, 2001

Manitoba Energy and Mines  
Petroleum and Energy Branch  
Suite 360  
1395 Ellice Avenue  
Winnipeg, Manitoba  
R3G 3P2

**Attention: Mr. John Fox**

Dear Mr. Fox:

**Re: Birdtail Bakken C Pool Waterflood**

Progress Energy Ltd. hereby applies to amend Schedule A of Waterflood Order No. 8 by revising the proposed injection wells. Currently we have approval to inject into 15-18-16-27W1M and 7-19-16-27W1M. Based on the performance of the pool since our original application, we would now like to inject into 2-19-16-27W1 and 4-20-16-27W1 instead.

Our request is based on the following observations:

- The fluid inflow rate at 15-18 declined rapidly in its first few months of production to the point where it was shut-in in 1998 and has not produced since. We see this as evidence that this is a tight edge well that will be difficult to inject into. We do not feel that we can get sufficient volumes into this well without significantly exceeding the maximum approved wellhead injection pressure.
- Both of the currently approved injectors are at the west end of the pool. We believe that the wells in section 20 will be too far removed from these injectors to receive much benefit from the waterflood under the current scenario. Converting 4-20 to an injector will provide much better support to 3-20 and 5-20. This factor has become even more important now that we have drilled 2-20 and 6-20, thereby extending the pool even further to the east. (We expect to expand the Unit to include these wells in the future.)
- Although 15-18 is suspended, 7-19 is now producing 1.6 m<sup>3</sup>/day of oil, making it one of the best wells in the pool. If we convert 7-19 to an injector, the waterflood will have to increase production from the rest of the pool by about 20% (to make up the lost production from 7-19) before Progress, the Crown or the freehold royalty owners begin to see a benefit in production revenues. By comparison, 2-19 and 4-20 only make 0.7 m<sup>3</sup>/day of oil between them (although their fluid inflow rates are still high enough to make them reasonable injectors). Therefore almost all of the production resulting from the waterflood will be incremental.

We recognize that the proposed injectors are a little higher than the ones that are currently approved. However we do not feel that structure will have a significant impact on the performance of the flood because the zone is fairly thin and the vertical perm is relatively low. We feel that any benefits that we were going to get from downdip injection will be outweighed by improved sweep efficiency.

Please give me a call at 403-216-2510 ext. 109 if you have any questions or concerns about this amendment.

Sincerely,  
PROGRESS ENERGY LTD.

Rick Bawol, P. Eng.  
Exploitation Manager

## **Fox, John (EM)**

**To:** Rick Bawol  
**Subject:** RE: Birdtail C Pool - Proposed Waterflood Amendment

Rick:

I have reviewed your letter requesting approval to change the injection wells in Birdtail Unit No. 2 to 2-19-16-27 and 4-20-16-27.

The Branch requests the following information be submitted in support of the application.

- 1) Revised primary and secondary recovery estimates for the Unit.
- 2) Potential future development drilling and waterflood expansion plans.
- 3) A copy of a notice to the landowners in the SE/4 of Section 19 and the SW/4 of Section 20 of Progress's plans to convert the two wells to injection.
- 4) The name and address of the royalty and working interest owners in the NW/4 of Section 17. These owners will have to be notified of your application to convert the 4-20 well to injection prior to the Branch granting approval. No notification is required for the 2-19 well which is located between the originally proposed injectors.

Any questions please give me a call.

John N. Fox, P.Eng.  
Chief Petroleum Engineer  
Petroleum Branch  
Manitoba Industry, Trade and Mines  
360, 1395 Ellice Avenue, Winnipeg MB R3G 3P2  
PH: (204) 945-6574 FAX: (204) 945-0586

-----Original Message-----

**From:** Rick Bawol [SMTP:rbawol@progressenergy.com]  
**Sent:** 2001-Feb-09 6:00 PM  
**To:** Fox, John (EM)  
**Subject:** Birdtail C Pool - Proposed Waterflood Amendment

John, although this project has undergone a few delays for various reasons, we are now planning construction for shortly before breakup or shortly afterward. I would like to change the injection locations as detailed in the attached letter. Please give me a call if you'd like to discuss this. I will send out a hardcopy of the letter by regular mail on Monday.

Rick Bawol  
Exploitation Manager  
Progress Energy Ltd.  
403-216-2510 ext. 109  
fax 216-2514 << File: Birdtail Waterflood Amendment.doc >>

February 12, 2001

Manitoba Energy and Mines  
Petroleum and Energy Branch  
Suite 360  
1395 Ellice Avenue  
Winnipeg, Manitoba  
R3G 3P2

**Attention: Mr. John Fox**

Dear Mr. Fox:

**Re: Birdtail Bakken C Pool V**

Progress Energy Ltd. hereby  
revising the proposed injection  
27W1M and 7-19-16-27W1M  
application, we would now like

Our request is based on the f

- The fluid inflow rate at 15-18 point where it was shut-in that this is a tight edge well to get sufficient volumes approved wellhead injection to the evidence we can maximum
- Both of the currently approved the wells in section 20 benefit from the waterflood provide much better evidence that we much sector will even more pool even future.)
- Although 15-18 is suspended, 7-19 is now producing 1.6 m<sup>3</sup>/day of oil, making it one of the best wells in the pool. If we convert 7-19 to an injector, the waterflood will have to increase production from the rest of the pool by about 20% (to make up the lost production from 7-19) before Progress, the Crown or the freehold royalty owners begin to see a benefit in production revenues. By comparison, 2-19 and 4-20 only make 0.7 m<sup>3</sup>/day of oil between them (although their fluid inflow rates are still high enough to make them reasonable injectors). Therefore almost all of the production resulting from the waterflood will be incremental.

We recognize that the proposed injectors are a little higher than the ones that are currently approved. However we do not feel that structure will have a significant impact on the performance of the flood because the zone is fairly thin and the vertical perm is relatively low. We feel that any benefits that we were going to get from downdip injection will be outweighed by improved sweep efficiency.

Please give me a call at 403-216-2510 ext. 109 if you have any questions or concerns about this amendment.

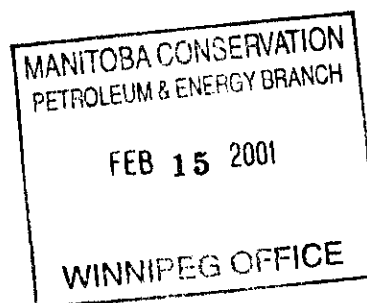
Sincerely,  
PROGRESS ENERGY LTD.

Rick Bawol, P. Eng.  
Exploitation Manager



Rick - Progress  
(403) 216-2510  
EXT. 109

5-20 TRACT  
NEIL BERTRAM (25%)



February 9, 2001

Manitoba Energy and Mines  
Petroleum and Energy Branch  
Suite 360  
1395 Ellice Avenue  
Winnipeg, Manitoba  
R3G 3P2

Attention: Mr. John Fox

Dear Mr. Fox:

**Re: Birdtail Bakken C Pool Waterflood**

Progress Energy Ltd. hereby applies to amend Schedule A of Waterflood Order No. 8 by revising the proposed injection wells. Currently we have approval to inject into 15-18-16-27W1M and 7-19-16-27W1M. Based on the performance of the pool since our original application, we would now like to inject into 2-19-16-27W1 and 4-20-16-27W1 instead.

Our request is based on the following observations:

- The fluid inflow rate at 15-18 declined rapidly in its first few months of production to the point where it was shut-in in 1998 and has not produced since. We see this as evidence that this is a tight edge well that will be difficult to inject into. We do not feel that we can get sufficient volumes into this well without significantly exceeding the maximum approved wellhead injection pressure.
- Both of the currently approved injectors are at the west end of the pool. We believe that the wells in section 20 will be too far removed from these injectors to receive much benefit from the waterflood under the current scenario. Converting 4-20 to an injector will provide much better support to 3-20 and 5-20. This factor has become even more important now that we have drilled 2-20 and 6-20, thereby extending the pool even further to the east. (We expect to expand the Unit to include these wells in the future.)
- Although 15-18 is suspended, 7-19 is now producing 1.6 m<sup>3</sup>/day of oil, making it one of the best wells in the pool. If we convert 7-19 to an injector, the waterflood will have to increase production from the rest of the pool by about 20% (to make up the lost production from 7-19) before Progress, the Crown or the freehold royalty owners begin to see a benefit in production revenues. By comparison, 2-19 and 4-20 only make 0.7 m<sup>3</sup>/day of oil between them (although their fluid inflow rates are still high enough to make them reasonable injectors). Therefore almost all of the production resulting from the waterflood will be incremental.

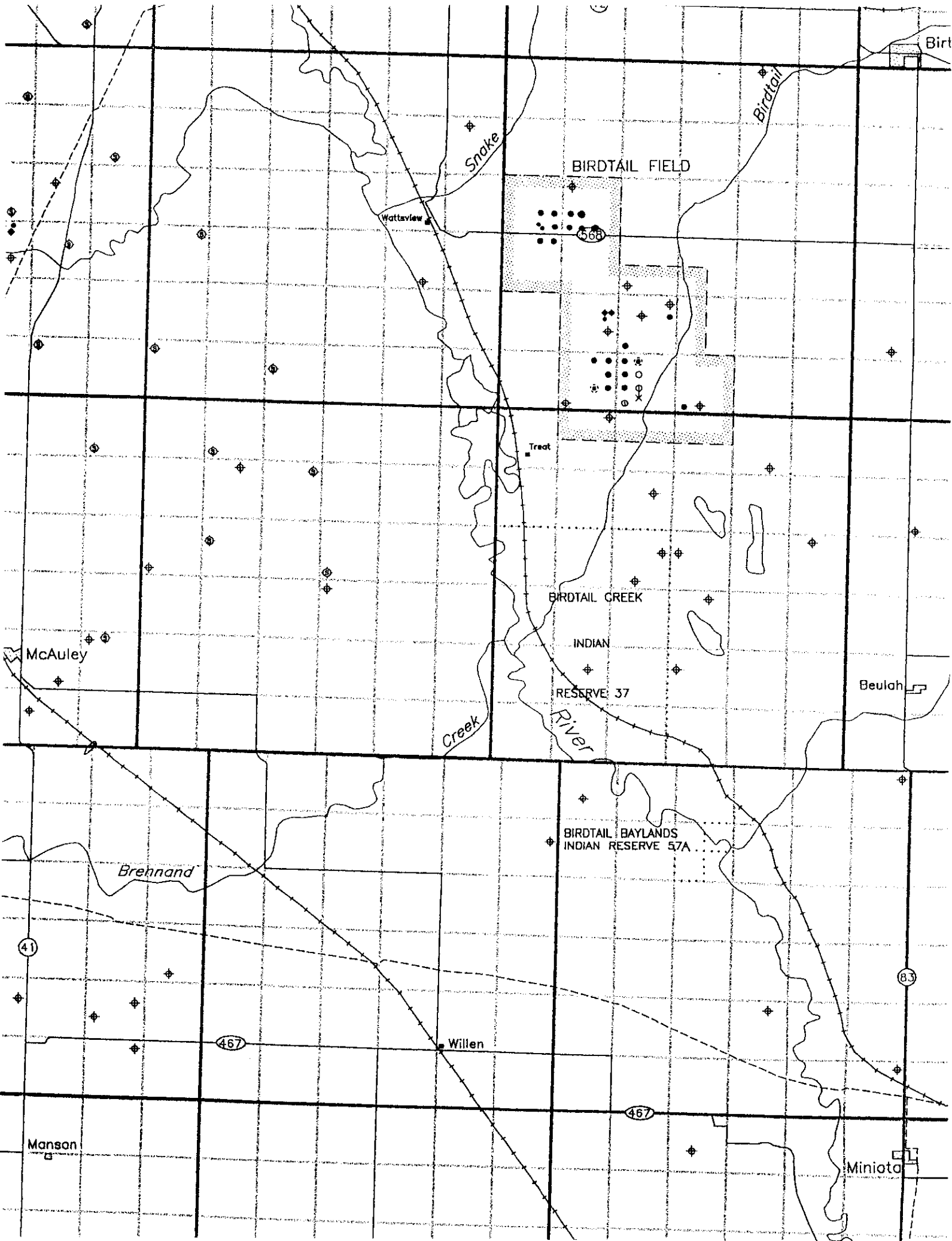
We recognize that the proposed injectors are a little higher than the ones that are currently approved. However we do not feel that structure will have a significant impact on the performance of the flood because the zone is fairly thin and the vertical perm is relatively low. We feel that any benefits that we were going to get from downdip injection will be outweighed by improved sweep efficiency.

Please give me a call at 403-216-2510 ext. 109 if you have any questions or concerns about this amendment.

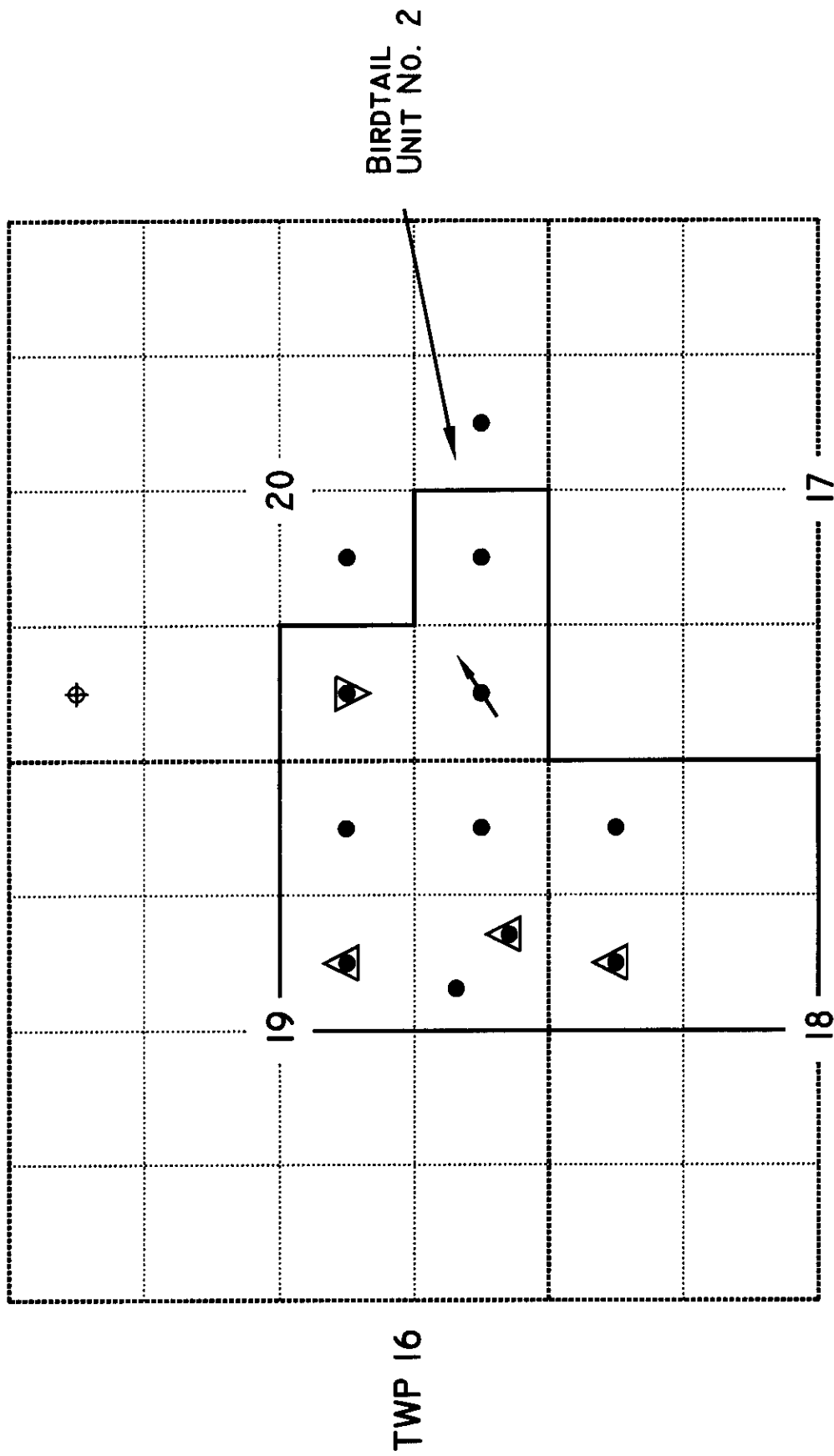
Sincerely,  
PROGRESS ENERGY LTD.

A handwritten signature in black ink, appearing to read 'Rick Bawol', with a large, stylized loop at the end.

Rick Bawol, P. Eng.  
Exploitation Manager







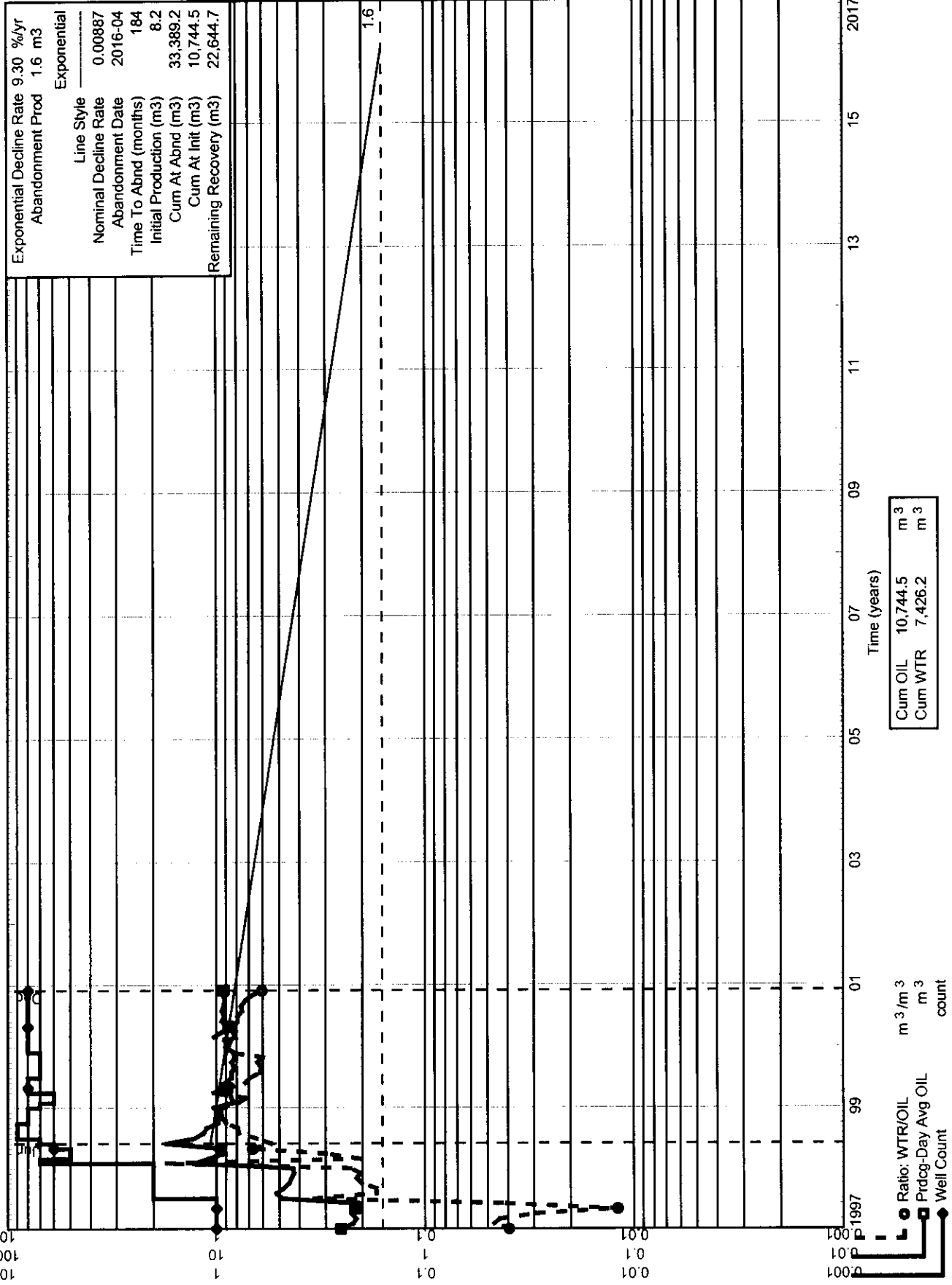
RGE 27 WPM

- PRODUCER
- ▲ PROPOSED INJECTORS
- ▲ APPROVED WATER INJECTOR (WATERFLOOD ORDER No. 8)
- ▲ POTENTIAL FUTURE WATER INJECTOR

# SELECTED WELLS PRODUCTION

Data As Of: 0- (AB)  
WellCount: 10/13

From: 1997-01  
To: 2000-12



Data As Of:0-- (AB) SELECTED WELLS PRODUCTION From:1997-01  
WellCount:10/13 To:2000-12

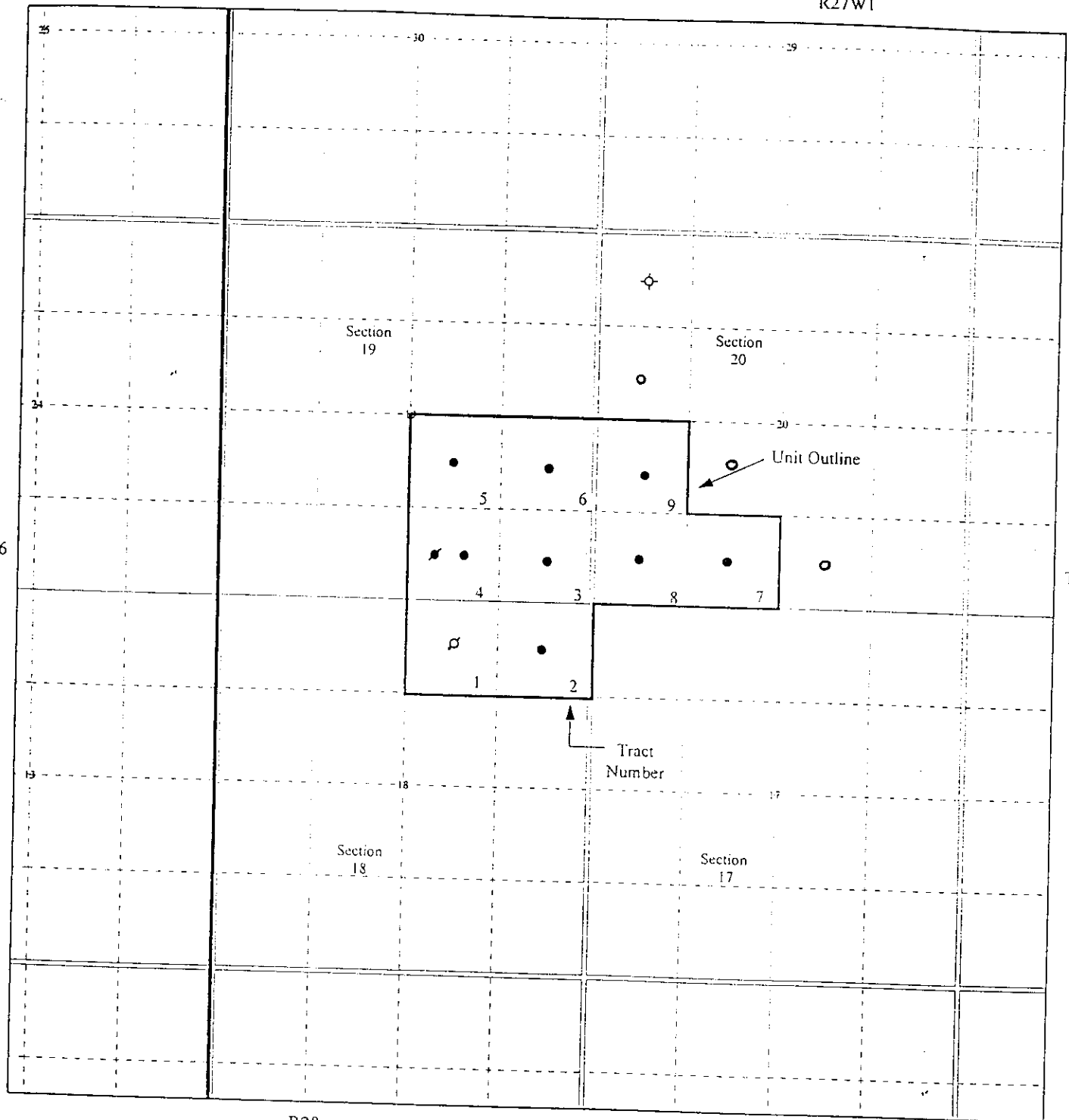
Prod Period (Mon/Yr)	Monthly OIL m3	Prdcg-Day Avg OIL m3	Ratio WTR/OIL m3/m3	Monthly Well count	Cumulative OIL m3	Calndr-Day Avg OIL m3
Jan 1997	38.1	2.54	0.04	1	38.1	1.23
Feb 1997	62.2	2.22	0.05	1	100.3	2.22
Mar 1997	66.4	2.14	0.04	1	166.7	2.14
Apr 1997	65.6	2.26	0.03	1	232.3	2.19
May 1997	67.2	2.17	0.01	1	299.5	2.17
Jun 1997	62.6	2.09	0.04	1	362.1	2.09
Jul 1997	145.0	4.85	0.34	2	507.1	4.68
Aug 1997	160.5	5.18	0.17	2	667.6	5.18
Sep 1997	142.9	4.76	0.17	2	810.5	4.76
Oct 1997	139.5	4.50	0.20	2	950.0	4.50
Nov 1997	131.6	4.39	0.21	2	1081.6	4.39
Dec 1997	132.2	4.26	0.20	2	1213.8	4.26
1997	1213.8	3.45	0.16			3.33
Jan 1998	131.9	4.31	0.23	2	1345.7	4.25
Feb 1998	179.5	12.87	1.73	7	1525.2	6.41
Mar 1998	332.0	10.97	0.21	5	1857.2	10.71
Apr 1998	275.7	9.24	0.30	5	2132.9	9.19
May 1998	286.0	9.51	0.67	6	2418.9	9.23
Jun 1998	263.6	17.35	0.55	7	2682.5	8.79
Jul 1998	365.3	12.78	0.65	9	3047.8	11.78
Aug 1998	355.0	11.55	0.78	9	3402.8	11.45
Sep 1998	327.4	11.15	0.79	9	3730.2	10.91
Oct 1998	305.0	9.84	0.90	8	4035.2	9.84
Nov 1998	291.9	9.73	0.94	8	4327.1	9.73
Dec 1998	287.7	9.75	0.95	8	4614.8	9.28
1998	3401.0	10.75	0.71			9.32
Jan 1999	238.4	10.35	0.95	7	4853.2	7.69
Feb 1999	216.5	8.29	0.79	6	5069.7	7.73
Mar 1999	263.6	8.50	0.72	6	5333.3	8.50
Apr 1999	252.2	8.69	1.04	8	5585.5	8.41
May 1999	275.1	8.87	0.89	8	5860.6	8.87
Jun 1999	267.0	9.01	0.73	8	6127.6	8.90
Jul 1999	257.8	8.50	0.69	7	6385.4	8.32
Aug 1999	261.5	8.46	0.62	7	6646.9	8.44
Sep 1999	247.4	8.25	0.61	7	6894.3	8.25
Oct 1999	262.7	8.47	0.64	7	7157.0	8.47
Nov 1999	239.2	8.14	0.60	7	7396.2	7.97
Dec 1999	252.5	8.36	0.90	8	7648.7	8.15
1999	3033.9	8.66	0.76			8.31
Jan 2000	208.6	9.07	0.88	8	7857.3	6.73
Feb 2000	192.9	9.05	0.86	8	8050.2	6.65
Mar 2000	247.1	8.14	1.03	8	8297.3	7.97
Apr 2000	251.9	8.40	0.93	8	8549.2	8.40
May 2000	272.4	8.79	0.85	8	8821.6	8.79
Jun 2000	283.2	9.44	0.79	8	9104.8	9.44
Jul 2000	285.2	9.20	0.79	8	9390.0	9.20
Aug 2000	292.5	9.44	0.76	8	9682.5	9.44
Sep 2000	278.0	9.27	0.76	8	9960.5	9.27
Oct 2000	284.2	9.17	0.73	8	10244.7	9.17
Nov 2000	273.9	9.22	0.68	8	10518.6	9.13
Dec 2000	225.9	9.26	0.60	8	10744.5	7.29
2000	3095.8	9.04	0.80			8.48

R28

R27W1

T16

T16



R28

R27W1

## Exhibit "B"

Birdtail Unit No. 2  
Unit Outline; Tract by LSD



Map Software by  
AccuMap EnerData,  
A Division of QC Data  
Version 4.11, Feb 19 1999  
(403) 293-3051

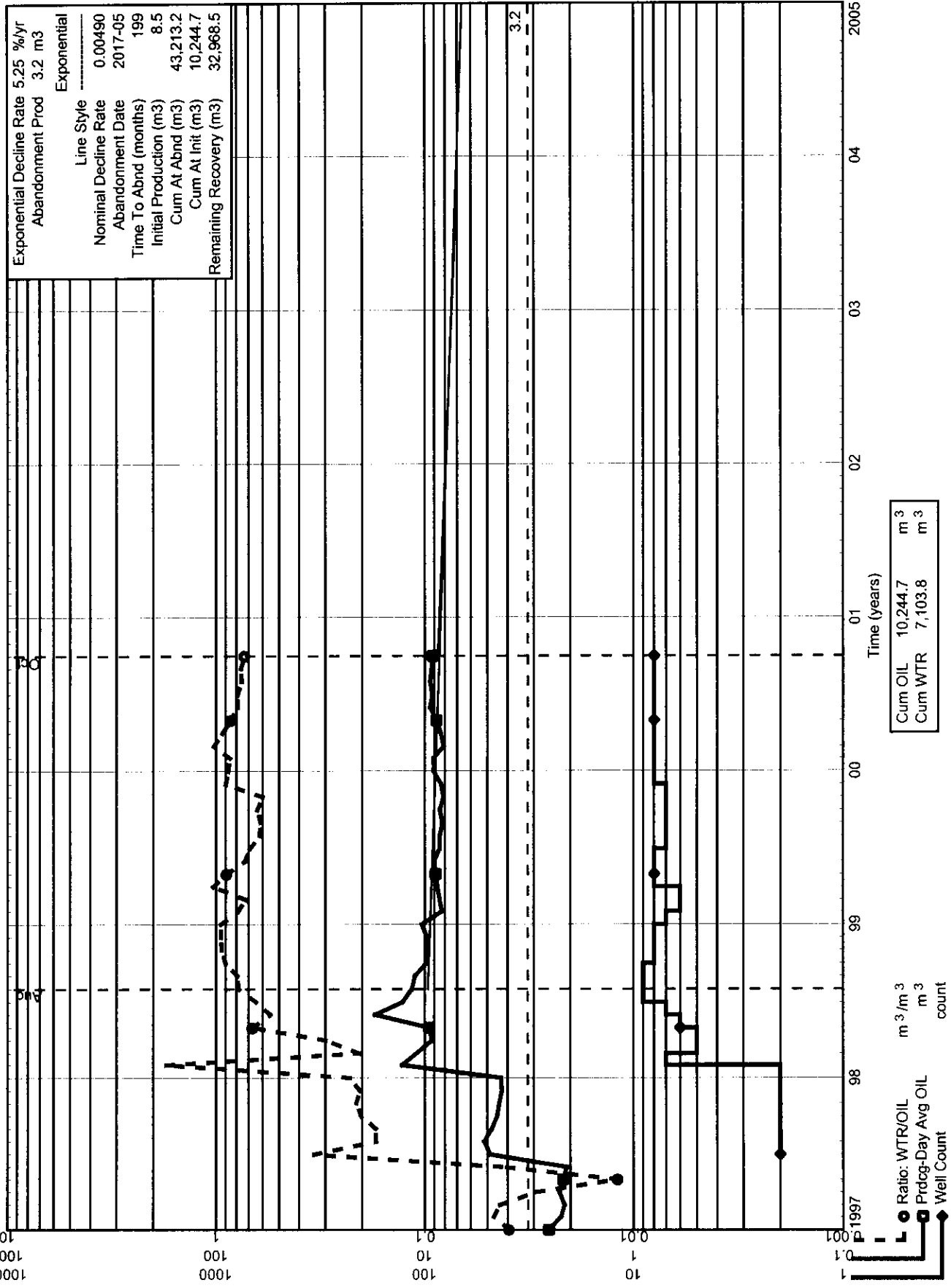
Author: Jeff Screen  
Date: March 25, 1999  
File: Birdtail.MAP  
Scale: 1 : 25000

Scale 1:25000



$q_i = 9.1$   
 $q_t = 3.2$   
 $Q_{Rem} = 365 (9.1 - 3.2) \cdot 0.525 = 11,770 \text{ m}^3$   
 41019 = 11,770 m<sup>3</sup>

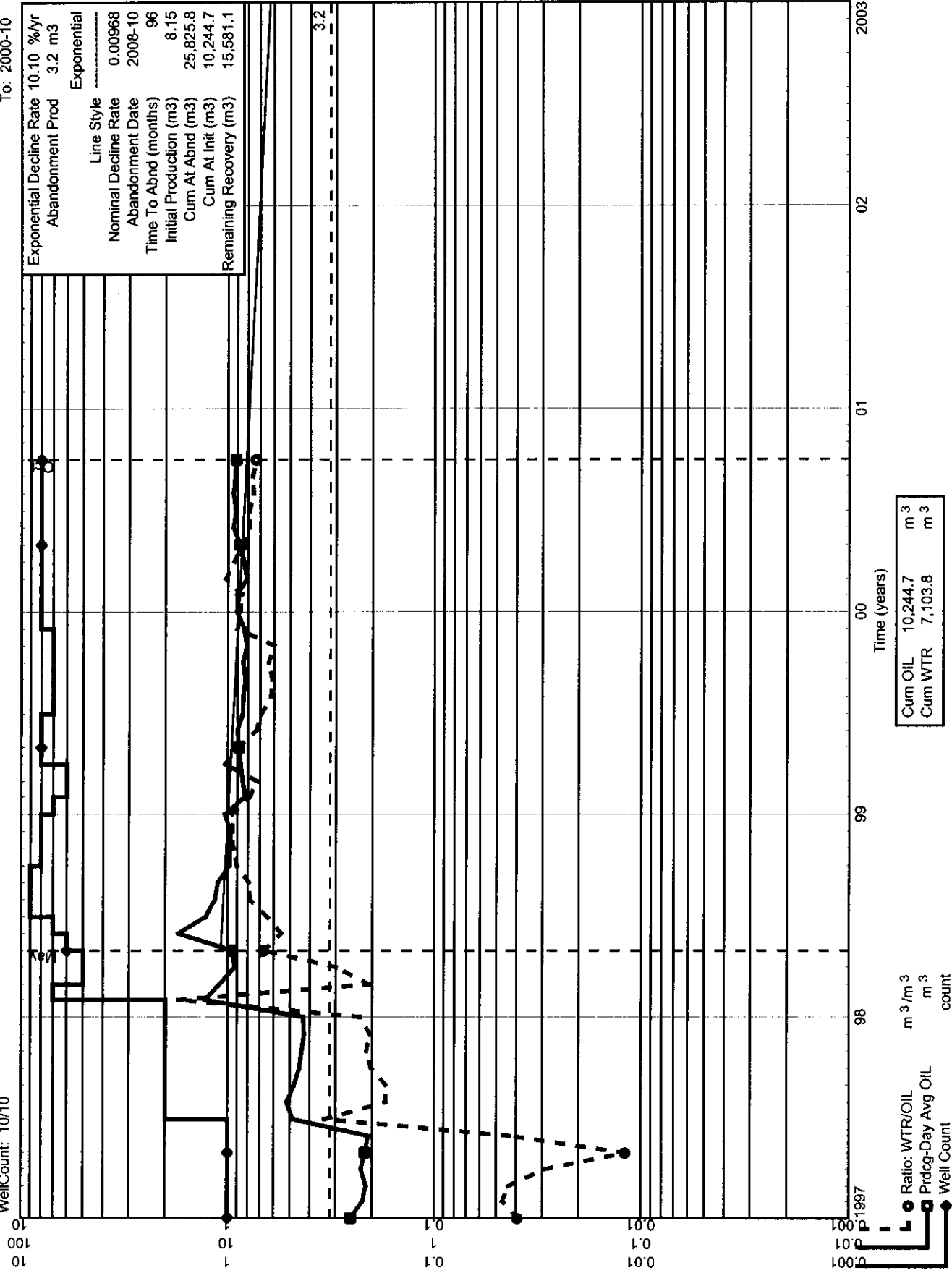
Data As Of: 0- (AB)  
 WellCount: 10/10  
 From: 1997-01  
 To: 2000-10  
 SELECTED WELLS PRODUCTION



Data As Of: 0- (AB)  
WellCount: 10/10

# SELECTED WELLS PRODUCTION

From: 1997-01  
To: 2000-10



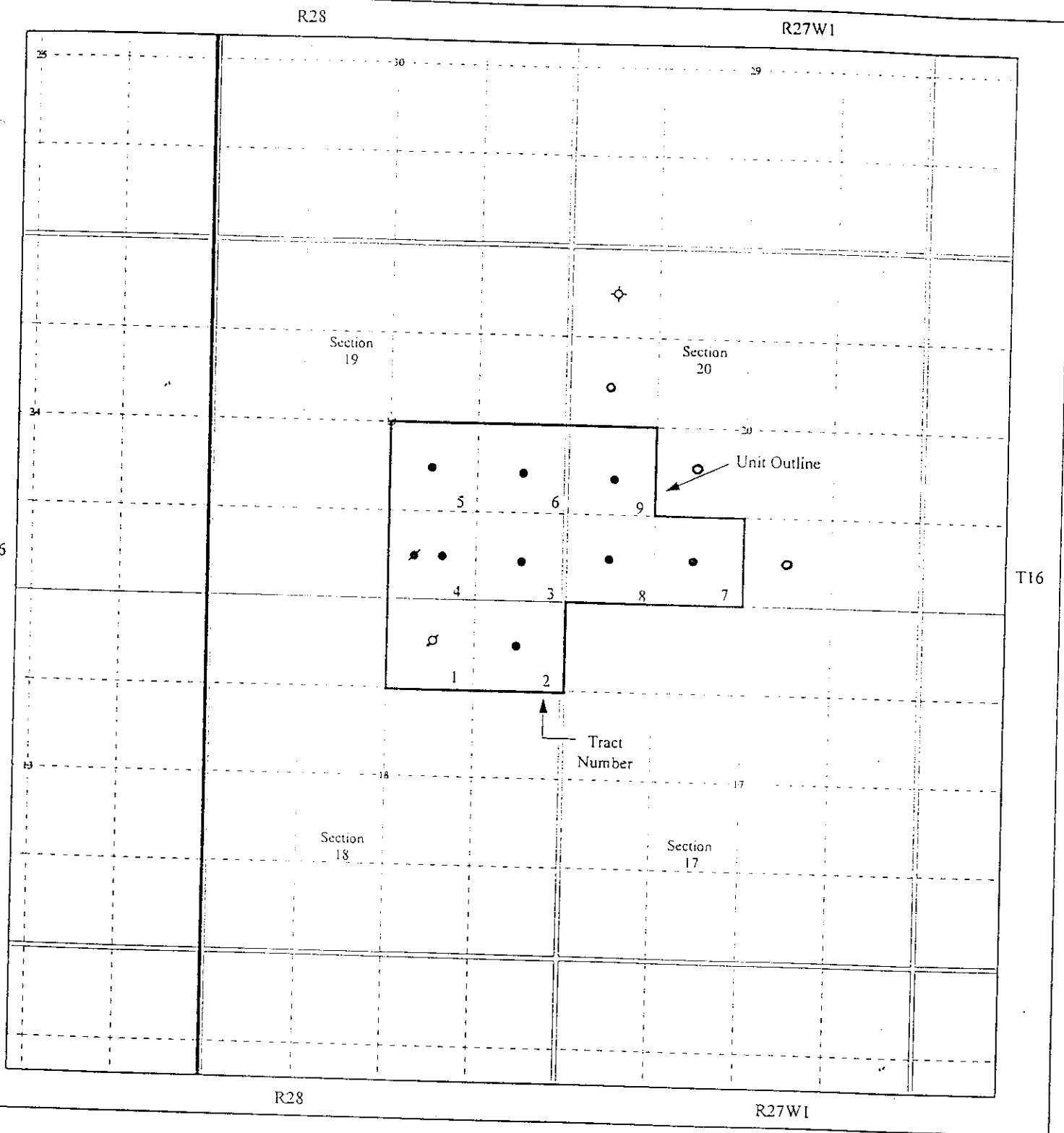



Exhibit "B"	
Birdtail Unit No. 2	
Unit Outline; Tract by LSD	
	Map Software by AutoMap EnerData, A Division of QC Data Version 4.31, Feb. 18, 1999 (407) 243-5011
Author: Jeff Screen Date: March 15, 1999 File: Birdtail.MAP Scale: 1 : 25000	

