

NORTH PIERSON UNIT NO. 1

Waterflood Progress Report 2020

Prepared for:

Manitoba Industry, Economic Development and Mines

Petroleum Branch

Prepared by:



TUNDRA OIL & GAS

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## Introduction

North Pierson Unit No. 1 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Waterflood Order No. 31, effective January 1st, 2014 with Tundra Oil and Gas as Operator. North Pierson Unit No. 1 area contains wells covering portions of sections 15, 16, 17, 19-3-28 WPM and the entire of sections 18, 20 and 21-3-28 WPM in the Pierson Field. The Unit contains 72 wells. 18 producers, 5 injectors, and 49 abandoned/suspended/other.

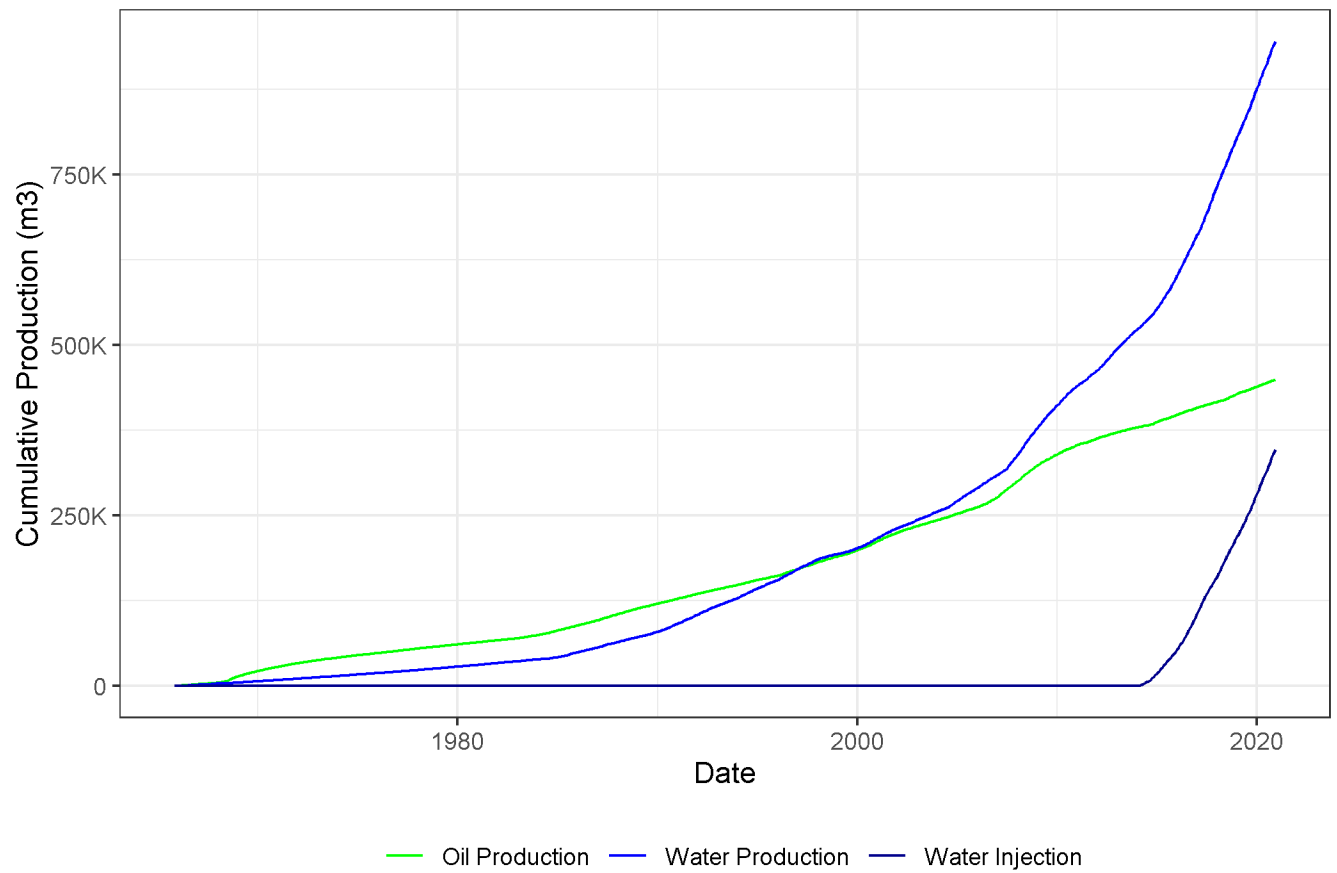
## Monthly oil and water production rates, injection rate, GOR and WOR

MONTH	Cal Day Oil m3/d	Cal Day Water m3/d	Cal Day Injection m3/d	WOR	GOR
JAN 2020	29.42	201.90	201.10	6.86	0
FEB 2020	29.15	205.67	198.28	7.06	0
MAR 2020	30.84	220.59	200.10	7.15	0
APR 2020	25.18	208.69	206.70	8.29	0
MAY 2020	27.50	213.13	200.90	7.75	0
JUN 2020	27.61	186.47	166.63	6.75	0
JUL 2020	24.71	183.89	156.03	7.44	0
AUG 2020	31.04	227.14	203.81	7.32	0
SEP 2020	33.46	214.93	203.33	6.42	0
OCT 2020	32.86	213.25	203.19	6.49	0
NOV 2020	30.17	198.10	200.40	6.57	0
DEC 2020	32.20	198.93	203.16	6.18	0
Average	29.51	206.06	195.30		

## Year summary of produced oil, gas, water and fluid injected

Categories	m3
Oil Production	10,805
Water Production	75,435
Gas Production	0
Water Injection	71,479
Cumulative Oil	449,073
Cumulative Water	944,628
Cumulative Injection	346,372

Cumulative Production and Injection



## Monthly Wellhead Pressure

All readings are in kPa

UWI	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Average
100.11-17-003-28W1.00	2,546	2,586	2,553	3,303	4,158	4,289	3,738	2,537	2,629	2,629	2,629	2,548	3,012
102.07-19-003-28W1.00	1,814	1,797	1,793	1,775	1,754	1,713	1,630	1,606	1,646	1,646	1,646	1,667	1,707
102.08-18-003-28W1.00	3,690	3,783	3,885	4,204	4,301	4,276	3,391	3,132	4,027	4,027	4,027	4,246	3,916
102.10-21-003-28W1.00	3,514	3,767	3,843	3,962	3,972	3,959	3,801	3,679	3,852	3,852	3,852	3,968	3,835
103.01-21-003-28W1.00	2,342	2,410	2,428	2,447	2,696	2,947	2,958	2,987	2,980	2,980	2,980	2,633	2,732

## Monthly Injected Volumes

All Volumes are in m3

UWI	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
100.11-17-003-28W1.00	1,692	1,583	1,697	1,647	1,691	1,653	1,492	1,704	1,643	1,699	1,617	1,695	19,813
102.07-19-003-28W1.00	1,521	1,424	1,528	1,477	1,517	1,484	1,339	1,527	1,474	1,525	1,452	1,524	17,792
102.08-18-003-28W1.00	1,016	948	1,109	1,155	1,084	34	393	1,206	1,122	1,128	1,075	1,140	11,410
102.10-21-003-28W1.00	1,079	992	1,051	1,025	1,020	981	858	1,056	1,032	1,035	987	1,013	12,129
103.01-21-003-28W1.00	926	803	818	897	916	847	755	825	829	912	881	926	10,335
Grand Total	6,234	5,750	6,203	6,201	6,228	4,999	4,837	6,318	6,100	6,299	6,012	6,298	71,479

## Voidage

All Volumes are in m3      Oil Formation Volume Factor (Rm3/Sm3) = 1.24								
MONTH	Oil	Water	Injection	Cumulative Oil	Cumulative Water	Cumulative Injection	VRR	Cumulative VRR
JAN 2020	912	6,259	6,234	439,175	875,443	281,127	0.844	0.198
FEB 2020	846	5,964	5,750	440,021	881,407	286,877	0.820	0.201
MAR 2020	956	6,839	6,203	440,977	888,246	293,080	0.773	0.204
APR 2020	755	6,261	6,201	441,732	894,507	299,281	0.862	0.208
MAY 2020	853	6,607	6,228	442,585	901,114	305,509	0.813	0.211
JUN 2020	828	5,594	4,999	443,413	906,708	310,508	0.755	0.213
JUL 2020	766	5,701	4,837	444,179	912,409	315,345	0.727	0.216
AUG 2020	963	7,041	6,318	445,142	919,450	321,663	0.767	0.219
SEP 2020	1,004	6,448	6,100	446,146	925,898	327,763	0.793	0.222
OCT 2020	1,019	6,610	6,299	447,165	932,508	334,062	0.800	0.225
NOV 2020	905	5,943	6,012	448,070	938,451	340,074	0.851	0.228
DEC 2020	998	6,167	6,298	449,068	944,618	346,372	0.851	0.231

## Workovers

UWI	Date	Description
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## Well List

UWI	Type	Status
102.11-15-003-28W1.02	Horizontal	Producing
100.12-15-003-28W1.00	Horizontal	Producing
100.13-15-003-28W1.00	Vertical	Producing
100.14-15-003-28W1.00	Horizontal	Producing
100.12-16-003-28W1.00	Horizontal	Producing
102.12-16-003-28W1.00	Horizontal	Producing
100.14-16-003-28W1.00	Vertical	Abandoned
100.16-16-003-28W1.00	Vertical	Abandoned
100.10-17-003-28W1.00	Vertical	Producing
100.11-17-003-28W1.00	Horizontal	Injection
100.12-17-003-28W1.00	Horizontal	Producing
100.13-17-003-28W1.00	Vertical	Abandoned
100.14-17-003-28W1.00	Vertical	Abandoned
100.15-17-003-28W1.00	Horizontal	Producing
100.05-18-003-28W1.00	Horizontal	Producing
100.06-18-003-28W1.00	Vertical	Abandoned
100.07-18-003-28W1.00	Vertical	Abandoned
100.08-18-003-28W1.00	Vertical	Abandoned
102.08-18-003-28W1.00	Horizontal	Injection
100.09-18-003-28W1.00	Vertical	Abandoned
102.09-18-003-28W1.00	Vertical	Abandoned
100.10-18-003-28W1.00	Vertical	Abandoned
100.11-18-003-28W1.00	Vertical	Producing
100.12-18-003-28W1.00	Vertical	Abandoned
100.14-18-003-28W1.00	Horizontal	Producing
100.16-18-003-28W1.00	Vertical	Abandoned
100.01-19-003-28W1.00	Dir/Dev	Abandoned Zone
102.01-19-003-28W1.00	Horizontal	Producing
100.02-19-003-28W1.00	Vertical	Suspended
100.03-19-003-28W1.00	Vertical	Suspended
100.04-19-003-28W1.00	Vertical	Suspended
102.05-19-003-28W1.00	Horizontal	Producing
100.07-19-003-28W1.00	Vertical	Abandoned
102.07-19-003-28W1.00	Horizontal	Injection
100.08-19-003-28W1.00	Vertical	Abandoned
102.08-19-003-28W1.00	Horizontal	Producing
100.01-20-003-28W1.02	Vertical	Abandoned
100.05-20-003-28W1.00	Vertical	Producing
100.11-20-003-28W1.00	Horizontal	Producing
100.13-20-003-28W1.00	Horizontal	Producing
100.01-21-003-28W1.00	Vertical	Producing
102.01-21-003-28W1.00	Horizontal	Producing
103.01-21-003-28W1.00	Horizontal	Injection

UWI	Type	Status
100.02-21-003-28W1.00	Vertical	Abandoned
100.03-21-003-28W1.00	Vertical	Abandoned Zone
102.04-21-003-28W1.00	Vertical	Abandoned
102.10-21-003-28W1.00	Horizontal	Injection
100.12-21-003-28W1.00	Horizontal	Producing
100.14-21-003-28W1.02	Horizontal	Injection
100.11-15-003-28W1.00	Vertical	Abandoned
100.10-16-003-28W1.00	Vertical	Abandoned
100.09-17-003-28W1.02	Horizontal	Drain
100.16-17-003-28W1.02	Horizontal	Producing
102.12-18-003-28W1.02	Horizontal	Producing
100.13-18-003-28W1.00	Vertical	Abandoned
102.13-18-003-28W1.03	Horizontal	Producing
100.15-18-003-28W1.00	Vertical	Abandoned
100.06-19-003-28W1.00	Vertical	Abandoned
100.06-19-003-28W1.02	Horizontal	Producing
102.07-19-003-28W1.02	Horizontal	Producing
103.08-19-003-28W1.02	Horizontal	Potential
100.01-20-003-28W1.00	Vertical	Abandoned
100.03-20-003-28W1.00	Vertical	Abandoned
100.04-20-003-28W1.00	Vertical	Abandoned
100.07-20-003-28W1.02	Horizontal	Producing
102.11-20-003-28W1.02	Horizontal	Producing
100.14-20-003-28W1.00	Vertical	Abandoned
100.16-20-003-28W1.00	Vertical	Abandoned
100.16-20-003-28W1.02	Horizontal	Producing
100.04-21-003-28W1.00	Vertical	Abandoned
100.09-21-003-28W1.02	Horizontal	Producing
100.10-21-003-28W1.00	Vertical	Abandoned