



Kevin Gant
Conventional Operations Superintendent
867-587-3105 Tel.
kevin.j.gant@exxonmobil.com

November 30, 2016

Bonnie Bergsma
Sahtu Land and Water Board
P.O. Box 1
Fort Good Hope, NT
X0E 0H0

**Re: Monthly Water Use Report for September 2016
Water Licence S13L1-007, Annex A, Part D, Condition 1
Imperial Oil Resources N.W.T. Limited (Imperial)**

Dear Ms. Bergsma,

Imperial is submitting this report as per Water Licence S13L1-007, Annex A, Part D, Condition 1.

During the sampling period, October 27 – 31, the inlet and outlet water quality results for pH were reported less than water licence criteria; however, additional samples (quarterly samples) taken on October 31 for pH met water licence criteria. There is no concern with the water quality. The anomalous results from the original samples were determined to be human error; acid preservative was added to the wrong sampling containers which lowered the pH in the water quality. All results are included in the enclosed data sheet.

On June 19, 2016 the chlorine injection system was taken out of service due to a piping issue. The chlorine system will remain out of service until a repair can be completed. During this time, no chlorine sampling will be executed.

Any questions or concerns please contact me at (867) 587-3215.

Sincerely,

A handwritten signature in black ink, appearing to read "Lindsay Hollands".

Lindsay Hollands
Regulatory and Environmental Advisor

cc: T. Morton, INAC, Yellowknife

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF DAILY VOLUMES
October 2016

Date	VOLUMES (m ³)					TEMP (C)		CHLORINE (mg/L)
	S13L1-007-1 CPF Intake Water	S13L1-007-2 CPF Effluent Water	Fresh Water Injection	Produced Water Injection	Total Water Injection	S13L1-007-1 CPF Intake Water	S13L1-007-2 CPF Effluent Water	S13L1-007-2 CPF Effluent Water
1	5,547	3,599	1,948	6,817	8,765	9	18	*
2	5,907	3,843	2,063	6,662	8,726	9	18	*
3	6,001	3,948	2,053	6,628	8,681	8	18	*
4	6,001	3,995	2,006	6,977	8,982	9	18	*
5	5,884	3,956	1,928	6,961	8,889	8	17	*
6	5,870	4,011	1,859	7,039	8,898	7	17	*
7	6,300	4,430	1,870	7,057	8,927	7	17	*
8	6,013	4,139	1,874	7,091	8,964	6	17	*
9	5,893	4,029	1,864	7,270	9,133	6	17	*
10	6,269	4,423	1,846	7,321	9,167	6	17	*
11	5,774	3,956	1,818	7,165	8,983	6	17	*
12	5,601	3,744	1,856	7,292	9,148	5	16	*
13	5,601	3,737	1,863	7,238	9,101	5	16	*
14	5,601	3,786	1,815	7,296	9,110	5	16	*
15	5,694	3,870	1,824	7,434	9,258	4	16	*
16	6,149	4,351	1,798	7,432	9,230	5	17	*
17	6,401	4,588	1,813	7,398	9,211	4	15	*
18	6,157	4,285	1,872	7,453	9,325	4	15	*
19	6,172	4,534	1,638	6,605	8,243	3	14	*
20	6,300	4,346	1,954	7,385	9,339	3	15	*
21	6,307	4,322	1,985	7,282	9,267	4	15	*
22	5,947	3,994	1,953	7,293	9,246	3	14	*
23	5,792	3,865	1,927	7,265	9,192	2	13	*
24	5,671	3,846	1,826	7,172	8,997	2	13	*
25	5,501	3,509	1,992	7,273	9,265	5	13	*
26	5,500	3,448	2,052	6,998	9,050	2	13	*
27	5,623	3,698	1,926	7,129	9,054	5	14	*
28	5,998	4,054	1,944	7,156	9,099	7	15	*
29	5,953	3,931	2,022	7,119	9,141	4	15	*
30	5,987	3,947	2,040	7,097	9,137	4	16	*
31	6,313	4,271	2,042	7,106	9,148	3	12	*
TOTAL	183,726	124,456	59,270	221,408	280,678			
AVG	5,927	4,015	1,912	7,142	9,054	5	16	-
HIGH	6,401	4,588	2,063	7,453	9,339			

*Chlorine injection system inoperable since June 19. No chlorine sampling occurred during this time.

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY VOLUMES SUMMARY
October 2016

Water Injection Volumes (m³)

Total fresh water injected	59,270	
Total produced water injected	221,408	
Total Monthly	280,678	Total Injected

CPF Water Volumes (m³)

Total CPF intake water S13L1-007-01	183,726	
Total CPF effluent water S13L1-007-02	124,456	
Highest daily water intake S13L1-007-01	6,401	Max. Allow. 16,000 m3/day.
YTD water intake S13L1-007	2,036,516	Max. Allow. 3,500,000 m3/yr.

Alternate Water Usage Volumes (m³)

Alternate surface water usage	0
YTD Alternate surface water usage	0

Surface Runoff Water Release Volumes (m³)

Refinery Impound Basin	0
LT 11 Impound Basin	0
Refinery Water flood Basin	0
CPF Impound Basin	0
Misc. Mainland Impound Areas	0
Misc. Bear Island Impound Areas	0
Misc. Goose Island Impound Areas	0
Total - YTD Surface Runoff	50,961

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY WATER DATA
October 2016

SNP S13L1-007-1 (Intake Water)			
	Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)
Max. Grab Limit			
Sept 29 - Oct 3	110.0	8.05	280
Oct 3 - 6	54.0	8.19	280
Oct 6 - 10	71.0	7.77	270
Oct 10 - 13	85.0	7.95	270
Oct 13 - 17	71.0	8.08	260
Oct 17 - 20	190.0	7.82	260
Oct 20 - 24	100.0	8.11	260
Oct 24 - 27	8.0	8.05	270
Oct 27 - 31	2.7	1.80*	7300

*pH result less than licence criteria due to human error; preservative added to the wrong container. Refer to cover letter and quarterly results below for October 2016.

SNP S13L1-007-2 (Effluent Water)			
	Suspended Solids (mg/L)	pH	Specific Conductivity (uS/cm)
Max. Grab Limit		6.0 - 9.0	
Sept 29 - Oct 3	14.0	8.06	280
Oct 3 - 6	13.0	8.21	280
Oct 6 - 10	13.0	7.90	270
Oct 10 - 13	87.0	8.00	260
Oct 13 - 17	4.7	8.07	270
Oct 17 - 20	19.0	7.88	260
Oct 20 - 24	8.7	8.09	260
Oct 24 - 27	47.0	8.03	270
Oct 27 - 31	1.3	1.75*	7700

*pH result less than licence criteria due to human error; preservative added to the wrong container. Refer to cover letter and quarterly results below for October 2016.

SNP S13L1-007-1 (Intake Water)		
	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)
Max. Grab Limit		
Sept 26 - Oct 3	<2.0	0.0034
Oct 3 - 10	<2.0	<0.0020
Oct 10 - 17	<2.0	<0.0020
Oct 17 - 24	<2.0	<0.0020
Oct 24 - 31	<2.0	<0.0020

SNP S13L1-007-2 (Effluent Water)				
	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Daily Chlorine (mg/L)	Temp (C)
Max. Grab Limit	5	0.14		
Sept 26 - Oct 3	<2.0	0.0033	*	18
Oct 3 - 10	<2.0	<0.0020	*	17
Oct 10 - 17	<2.0	<0.0020	*	16
Oct 17 - 24	<2.0	<0.0020	*	14
Oct 24 - 31	<2.0	<0.0020	*	14

*Chlorine injection system inoperable since June 19

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
CPF MONTHLY WATER DATA
October 2016

SNP S13L1-007-2 (Effluent Water) - FOUR WEEK AVERAGE CONCENTRATION							
Parameter	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Suspend Solids (mg/L)	pH	Specific Conduct. (uS/cm)	Daily Chlorine (mg/L)	Temp (C)
Max. Average Limit	5.00	0.14		6.0 - 9.0			
Sept 5 - Oct 3	<2.0	0.0023	71.2	8.0	281.1	*	20
Sept 12 - Oct 10	<2.0	0.0025	38.0	8.0	282.5	*	19
Sept 19 - Oct 17	<2.0	0.0020	24.0	8.1	275.0	*	18
Sept 26 - Oct 24	<2.0	0.0023	20.9	8.0	270.0	*	16
Oct 3 - 31	<2.0	0.0020	24.2	7.2	1196.3	*	16

*Chlorine injection system inoperable since June 19

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007-1
QUARTERLY CPF WATER INLET DATA
October 2016

SNP S13L1-007-1 (Intake Water)					
Date	January 2016 (mg/L)	April 2016 (mg/L)	July 2016 (mg/L)	October 2016 (mg/L)	YTD Avg. (mg/L)
pH	7.92	8.05	8.00	7.86 *	7.99
Phenols	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Dissolved Sodium	9.0	9.0	8.3	11.0	9.3
Total Sodium	9.8	9.4	7.4	11.0	9.4
Dissolved Potassium	0.84	0.86	0.95	0.91	0.89
Total Potassium	0.94	0.92	1.90	1.10	1.22
Dissolved Sulphate	36.0	37.0	55.0	37.0	41.3
Dissolved Chloride	11.0	11.0	8.2	11.0	10.3
Dissolved Calcium	26.0	28.0	36.0	37.0	31.8
Total Calcium	28.0	29.0	38.0	37.0	33.0
Dissolved Magnesium	10.0	10.0	11.0	10.0	10.3
Total Magnesium	11.0	11.0	12.0	9.70	10.9
Total Alkalinity	80.0	83.0	90.0	100.0	88.3
Specific Conductivity	270.0	260.0	290.0	290.0	277.5
Total Suspended Solids	<1.0	<1.0	140.0	47.0	47.25
Total Dissolved Solids	120.0	140.0	170.0	180.0	152.5
Total Petroleum Hydrocarbons	<2.0	<2.0	<2.0	<2.0	<2.0
Total Phosphorus	0.13	<0.10	0.13	<0.10	0.12
Total Hardness	110.0	110.0	140.0	130.0	122.5

* Sample was collected on October 31 the same day as the anomolous result from Oct 27 - 31. See cover letter for detail.

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007-2
QUARTERLY CPF WATER EFFLUENT DATA
October 2016

SNP S13L1-007-2 (Effluent Water)					
Date	January 2016 (mg/L)	April 2016 (mg/L)	July 2016 (mg/L)	October 2016 (mg/L)	YTD Avg. (mg/L)
pH	7.99	8.03	7.97	7.95 *	8.00
Phenols	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Dissolved Sodium	9.4	9.0	8.5	10.00	9.2
Total Sodium	9.6	9.4	7.7	11.0	9.4
Dissolved Potassium	0.91	0.87	0.91	0.86	0.89
Total Potassium	0.93	0.92	1.40	1.0	1.06
Dissolved Sulphate	36.0	38.0	54.0	37.0	41.3
Dissolved Chloride	11.0	12.0	9.3	11.0	10.8
Dissolved Calcium	28.0	28.0	36.0	34.0	31.5
Total Calcium	28.0	30.0	35.0	37.0	32.5
Dissolved Magnesium	11.0	11.0	11.0	9.8	10.7
Total Magnesium	11.0	11.0	10.0	9.6	10.4
Total Alkalinity	83.0	83.0	90.0	100.0	89.0
Specific Conductivity	270.0	260.0	290.0	290.0	277.5
Total Suspended Solids	<1.0	<1.0	36.0	9.3	11.8
Total Dissolved Solids	150.0	140.0	170.0	160.0	155.0
Total Petroleum Hydrocarbons	<2.0	<2.0	<2.0	<2.0	<2.0
Total Phosphorus	0.11	<0.10	<0.10	<0.10	<0.10
Total Hardness	110.0	110.0	140.0	120	120.0

* Sample was collected on October 31, same day as the anomolous result from Oct 27 - 31. See cover letter for detail.

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007-2
QUARTERLY ACUTE LETHALITY
October 2016

SNP S13L1-007-2 (Effluent Water)		
Date	Rainbow Trout (% Survival)	Daphnia Magna (% Survival)
Licence Criteria	> 50% Survival	> 50% Survival
Q1 - January	100%	100%
Q2 - April	100%	100%
Q3 - July	100%	100%
Q4 - October	100%	100%

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SURFACE WATER RUNOFF RELEASE REPORT
October 2016

Discharge Where Contamination Suspected										
	Date	Start/ Middle/ End	Total Discharge Volume (m ³)	Total Petroleum Hydrocarbons (mg/L)	Phenols (mg/L)	Chlorides (mg/L)	pH	Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Specific Conduct. (uS/cm)
Max Grab Sample Limit				5	0.14	<500	6.0-9.0			
Mainland Areas			0							
Misc. Mainland Impound Areas			0							

IMPERIAL - NORMAN WELLS OPERATIONS
WATER LICENCE S13L1-007
SURFACE WATER RUNOFF RELEASE REPORT
October 2016

Discharge Where No Contamination Suspected					
	Date	Total Discharge Volume (m ³)	Chlorides (mg/L)	pH	Sheen Y/N
Sample Limits			< 500	6.0-9.0	N
Mainland		0			
Bear Island		0			
Goose Island		0			