



Knowledge grows

11 October 2017

Our Reference: 200-200-LET-DWER-0003

Your Reference:

Mr Ian Munro
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Dear Ian

Yara Pilbara Nitrates 6-Monthly Groundwater Monitoring Results as per Condition 8 of Ministerial Statement No. 870

This letter is to inform the Department of Water and Environmental Regulation (DWER) on the outcomes of the latest 6-monthly groundwater monitoring undertaken by Yara Pilbara Nitrates Pty Ltd (YPN) at the Technical Ammonium Nitrate (TAN) plant, as required by Conditions 8-4 and 8-5 of Ministerial Statement 870 in September 2017.

The 6-monthly groundwater monitoring results show that all YPN groundwater monitoring bores are exceeding the calculated nitrate (NO₃) trigger level of 9.57 mg/L, with MW1 and MW3 returning results of 21.69 mg/L and 18.15 mg/L respectively, MW4 and MW5 returning results of 1,594.30 mg/L and 1,637.86 mg/L respectively and MW2 returning a result of 15,935.90 mg/L.

Total nitrogen levels at MW2, MW4 and MW5 also exceed the total nitrogen trigger level of 5.61 mg/L and MW2 exceeds the ammoniacal nitrogen (NH₃-N) trigger level of 0.04 mg/L.

In addition, MW2 had an exceedance of the calcium trigger level of 1,210 mg/L; MW4 exceeded the manganese trigger level of 0.242 mg/L and zinc trigger level of 0.052 mg/L; and MW5 exceeded the alkalinity trigger level of 561 mg/L. The results of the 6-monthly groundwater monitoring since 2011 are attached.

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As advised in the previous 6-monthly groundwater monitoring report submitted to DWER (formerly the Office of the Environmental Protection Authority) on 3 April 2017, an uptrend in calculated nitrate, total nitrogen and ammoniacal nitrogen has been identified. This uptrend is believed to be attributable to the unplanned releases of solutions containing ammonium nitrate to ground in proximity to MW2, MW4 and MW5.

Each of the unplanned releases constituted reportable emissions under Section 72 of the *Environmental Protection Act 1986* (a discharge of waste likely to cause pollution). YPN notified DWER of the events on 31 March and 21 July 2017.

YPN have taken the following actions in response to the unplanned releases:

1. completed an investigation into the cause;
2. engaged external consultants to develop a conceptual site model and undertake a Tier 1 risk assessment (in accordance with DWER guidelines) to assess environmental impact, which has been submitted to DWER;
3. undertaken additional monitoring and provided results to DWER;
4. installed an additional six (6) groundwater monitoring wells to better understand the impact; and
5. are in the process of engaging an external consultant to undertake further investigations including a Tier 2 risk assessment.

Please contact us if you have any further questions.

Yours sincerely

A large, stylized handwritten signature in black ink, appearing to read "Brian Howarth".

Brian HOWARTH

Health, Environment, Safety & Quality Manager

Yara Pilbara Nitrates

Attachments

1. YPN 6-Monthly Groundwater Results Sep2017.pdf

**Yara Pilbara Nitrates
6-Monthly Groundwater Monitoring Results
September 2017**

		Standing water level (m AHD)	pH	TDS mg/L	TSS mg/L	Alkalinity (total) as CaCO ₃ mg/L	Ammonia as N (NH ₃ -N) mg/L	Aluminium (Filtered) mg/L	Arsenic (Filtered) mg/L	Cadmium (Filtered) mg/L	Calcium (Filtered) mg/L	Chloride mg/L	Chromium (Filtered) mg/L	Copper (Filtered) mg/L	Iron (Filtered) mg/L	Lead (Filtered) mg/L	Manganese (Filtered) mg/L	Magnesium (Filtered) mg/L	Mercury mg/L	Nickel (Filtered) mg/L	Nitrate (as NO ₃) calculated mg/L	Nitrogen (Total) mg/L	Zinc (Filtered) mg/L	
SITE	Date Trigger Level	NA	6-8.4	143,000	2,090	561	0.04	0.021	NA	NA	1,210.0	95,700	NA	NA	0.260	NA	0.242	5,170.0	0.0001	NA	9.57	5.6	0.052	
MW4	30/04/2011	2.555	7.6	6,700		510	0.74	<0.005	<0.005	<0.0005	39.0	3,900	<0.005		<0.025	<0.005	0.014	100.0	<0.00005		3.63	2.1	0.010	
	20/09/2011	2.358	7.6		670	370	0.02	<0.005	<0.005	<0.0005	28.0	2,500	<0.005		<0.025		0.011	68.0		<0.005		0.5	0.029	
	27/02/2012	2.428	7.5		1,900	390	<0.005	<0.005	<0.005	<0.0005	49.0	3,200	<0.005		<0.025		0.033	96.0		<0.005		0.75	0.8	0.047
	11/10/2012	1.934	7.7		2,900	420	<0.005	<0.01	<0.01	<0.001	69.0	3,700	<0.01		<0.05		0.041	150.0		<0.01		1.95	1.2	0.012
	6/03/2013																							
	17/04/2013		7.2	43,810	210	390	<0.005	0.031	<0.005	<0.0005	94.0	4,700	<0.005	<0.005	<0.025	<0.005	0.120	190.0		<0.005		1.06	0.7	<0.025
	17/10/2013	2.480	4.3	136,000	74	109	0.88	<0.025	<0.0025	<0.001	972.0	69,800	<0.0025	0.005	<0.025	<0.001	0.277	3,900.0	<0.0001	0.0479	12.79	3.6	<0.025	
	9/04/2014	2.460	7.0	88,300	43	148	0.01	<0.025		<0.001	598.0	49,000	<0.0025	<0.005	0.034	<0.001	0.003	2,210.0	<0.0001	0.035	18.02	7.9	0.042	
	30/10/2014	2.035	7.2	41,000	14	317	<0.005	0.013	0.002	<0.0004	248.0	25,700	0.0018	<0.002	0.019	<0.0004	0.075	921.0	<0.0001	0.021	9.61	3.2	0.042	
	30/04/2015	2.080	6.8	134,000	201	118	<0.005	<0.025	<0.0025	<0.001	1,120.0	38,600	0.004	<0.005	<0.025	<0.001	3.290	4,590.0	<0.0001	0.037	1.95	0.4	<0.025	
	23/11/2015	1.911	6.8	128,000	133	203	<0.005	<0.005	0.002	0.001	1,020.0	72,200	0.0051	0.003	<0.005	0.0002	0.098	3,960.0	<0.0001	0.034	5.36	1.4	0.006	
	1/06/2016	no sample																						
	9/08/2016	no sample																						
	1/09/2016	no sample																						
	22/11/2016	2.070	7.1	140,000	200	123	<0.1	<0.025	<0.050	<0.0050	982.0	74,700	<0.005	<0.0050	<0.025	<0.0050	1.400	4,050.0	<0.0001	<0.050	3.01	1.0	<0.025	
	15/03/2017	2.740	7.4	66,000	11	259	0.22	<0.025			198.0	39,600			<0.025		0.280	775.0	<0.0001		243.47	58.0	<0.025	
	15/03/2017	-						0.25														243.57	58.0	
	12/09/2017	2.283	7.3	83,000	17	264	<0.01	<0.050	<0.001	<0.0050	290.0	47,600	<0.010	0.021	<0.050	<0.0050	0.250	1,250.0	<0.0001	<0.050	1,594.30	380.0	0.058	
MW5	30/04/2011	2.166	6.7	130,000		370	0.06	<0.05	<0.05	<0.005	1,000.0	87,000	<0.05		<0.25	<0.05	0.220	4,100.0	0.0001		4.87	5.1	<0.05	
	20/09/2011	1.999	6.6		1,100	210	0.05	<0.1	<0.1	<0.01	1,100.0	87,000	<0.1		<0.5		<0.1	4,300.0		<0.1	0.00	2.7	<0.1	
	27/02/2012	2.188	6.6		1,400	150	0.01	<0.1	<0.1	<0.01	1,100.0	80,000	<0.1		<0.5		<0.1	4,700.0		<0.1	5.31	3.4	<0.1	
	11/10/2012	5.636	6.9		2,600	160	0.62	<0.05	<0.05	<0.005	970.0	77,000	<0.05		<0.25		<0.05	3,700.0		<0.05	4.87	1.8	<0.05	
	6/03/2013	5.785	6.8		660	170	1.00	<0.25	<0.05	<0.005	770.0	64,000	<0.05		<0.25		<0.05	3,000.0		<0.05	5.75	3.4	<0.25	
	17/04/2013	4.670	6.2		1,600	170	0.01	0.300	<0.05	<0.005	740.0	58,000	<0.05	<0.05	<0.25	<0.05	<0.05	2,900.0		<0.05	7.08	2.6	<0.25	
	17/10/2013	2.160	6.8	75,400	63	207	0.01	<0.01	0.001	<0.0004	599.0	40,500	0.012	<0.002	<0.01	<0.0004	0.001	2,030.0	<0.0001	0.0073	14.56	3.5	<0.01	
	9/04/2014	2.275	7.1	47,100	78	275	0.02	0.086	<0.001	<0.0004	303.0	25,700	0.007	<0.002	0.015	<0.0004	0.003	1,040.0	<0.0001	0.0032	6.82	4.2	0.017	
	30/10/2014	2.185	7.2	33,200	<5	351	0.01	<0.005	0.002	<0.0002	194.0	20,500	0.0065	<0.001	0.010	<0.0002	0.002	665.0	<0.0001	0.0024	4.52	1.3	<0.005	
	30/04/2015	2.220	7.3	25,400	154	397	0.02	<0.005	0.001	<0.0002	139.0	16,300	0.003	0.002	0.007	<0.0002	0.005	464.0	<0.0001	0.0018	4.40	1.9	0.020	
	23/11/2015	1.934	7.4	19,400	119	638	0.02	<0.005	0.001	<0.0001	20.0	10,600	0.004	<0.001	<0.005	<0.0002	0.002	220.0	<0.0001	0.0014	6.37	4.5	<0.005	
	1/06/2016		7.9	17,000	49	485	<0.01	0.031	<0.010	<0.0010	54.0	9,300	<0.005	<0.002	0.024	<0.0010	0.013	172.0	<0.0001	<0.010		5.4	<0.005	
	9/08/2016	2.430						<0.005																
	1/09/2016	2.440	7.9	15,000	19	560	<0.01	<0.005	<0.005	0.001	49.8	8,720	0.004	<0.0005	<0.005	<0.0005	0.005	171.0	<0.0001	<0.005	24.35	5.7	0.009	
	22/11/2016	2.140	8.1	13,000	20	630	0.01	<0.005	<0.005	<0.0005	30.8	7,040	0.004	0.0008	<0.005	<0.0005	<0.001	102.0	<0.0001	<0.005	25.23	5.8	0.008	
	15/03/2017	2.760	7.8	15,000	2	628	<0.01	<0.005			40.7	8,340			<0.005		<0.001	155.0	<0.0001		39.40	9.4	0.012	
	15/03/2017	-						<0.01														39.40	9.0	
	12/09/2017	2.378	7.9	14,000	2	591	<0.01	0.007	<0.001	<0.0005	34.0	6,250	0.005	0.0022	0.013	<0.0050	0.002	116.0	<0.0001	<0.005	1,637.86	390.0	0.008	