

LEGISLATIVE COUNCIL
Question On Notice

Tuesday, 10 March 2020

2842. Hon Robin Chapple to the Minister for Regional Development representing the Minister for Water

I refer to the Port Hedland Regional Water Supply Scheme (PHRWSS), and I ask:

- (a) in the Ministers own words, what is the PHRWSS;
- (b) what infrastructure forms part of the PHRWSS;
- (c) which private sector entities have ownership interests in the assets of the PHRWSS;
- (d) what has been the yield taken from the Yule Borefield (YB), for each of the past 20 full reporting years;
- (e) what has been the allocation limit for the YB for each of the past 20 full reporting years;
- (f) what has been the yield taken from the Namagoorie Borefield (NB) for each of the past 20 full reporting years;
- (g) what has been the allocation limit for the NB for each of the past 20 full reporting years;
- (h) what has been the yield taken from the Bulgarene Borefield (BB) for each of the past 20 full reporting years;
- (i) what has been the allocation limit for the BB for each of the past 20 full reporting years;
- (j) are there any aquifers other than the YB, NB, and BB supplying the PHRWSS:
 - (i) if yes to (j), would the Minister please table the yield taken from each aquifer, for this year, and the last 20 years, where applicable; and
 - (ii) if yes to (j), would the Minister please table the allocation limits for each aquifer, for this year, and the last 20 years, where applicable;
- (k) what total volume of water has been supplied by the PHRWSS for each of the past 20 reporting years:
 - (i) of the amounts in (k), what volume has been supplied, per annum, for this year and the previous 20 reporting years, by the PHRWSS, for residential use;
 - (ii) of the amounts in (k), what volume has been supplied, per annum, for this year and the previous 20 reporting years, by the PHRWSS, for industrial use; and
 - (iii) of the amounts in (k), what volume has been supplied, per annum, for this year and the previous 20 reporting years, by the PHRWSS, under bulk supply or other agreements outside of residential or industrial use;
- (l) within the boundaries of the Town of Port Hedland, are there any major users of water not serviced by the PHRWSS:
 - (i) if yes to (l), who are those major users, and from where do they source their water;
- (m) what total charges for all customers (residential, industrial, other - including bulk supply agreements), as split out by Water Use Charges and Service Charges, have been levied for each of the past ten full reporting years in respect of the supply of water by the PHRWSS;
- (n) what total charges for residential customers, as split out by Water Use Charges and Service Charges, have been levied for each of the past ten full reporting years in respect of the supply of water by the PHRWSS;

- (o) what total charges for industrial customers, as split out by Water Use Charges and Service Charges, have been levied for each of the past ten full reporting years in respect of the supply of water by the PHRWSS;
- (p) are new water sources for the PHRWSS being investigated:
- (i) if yes to (p), what source(s); and
- (ii) if yes to (p), have site investigations been conducted; and
- (q) when does the Minister expect a final decision to be made, regarding the sourcing of new water supplies, for the supply of water to the PHRWSS?

Answer

(a) The Port Hedland Regional Water Supply Scheme (PHRWSS) supplies drinking water to the towns of Port Hedland, South Hedland and the industrial area of Wedgefield nearby to South Hedland. The PHRWSS also supplies port operations for the mining industry, notably at Nelson Point (Port Hedland) and also at Finucane Island to the west of Port Hedland.

(b) The PHRWSS sources its water from two borefields; the Yule Borefield and De Grey Borefield. There are 13 bores in the Yule Borefield and 11 bores in the De Grey Borefield. Water is transferred from both borefields to a tank complex in South Hedland.

(c) None

(d) [See tabled paper no.]

(e)

1996-2004	6,500,000 kilolitres per annum
2004-2011	8,500,000 kilolitres per annum
2011-current	10,500,000 kilolitres per annum

(f) [See tabled paper no.]

(g)

1996-2011	7,000,000 kilolitres per annum
2011-current	10,000,000 kilolitres per annum

(h) Zero

(i) Refer to (g), the Bulgarene Borefield is located within the De Grey River alluvial aquifer, downstream of the Namagoorie Borefield, and has not been assigned a separate allocation limit. Any groundwater abstracted from this borefield would be taken from within the existing De Grey River alluvial aquifer allocation.

(j) No.

(i) Not applicable

(ii) Not applicable

(k) Water Supplied from Yule and De Grey Borefields for use in the PHRWSS

Reporting Year	
1999/2000	11,290,118
2000/2001	11,016,635
2001/2002	11,761,211
2002/2003	11,544,204
2003/2004	13,765,903
2004/2005	11,690,832
2005/2006	8,906,753
2006/2007	8,655,985
2007/2008	8,908,363
2008/2009	9,492,445
2009/2010	10,855,611
2010/2011	9,974,551
2011/2012	9,895,133
2012/2013	10,608,063
2013/2014	9,820,626
2014/2015	11,199,739
2015/2016	11,418,390
2016/2017	11,208,509
2017/2018	11,268,954
2018/2019	12,337,496

(i.)

Reporting Year	Residential scheme use
1999/2000	2,436,621
2000/2001	2,249,863
2001/2002	2,553,563
2002/2003	2,726,917
2003/2004	2,441,333
2004/2005	2,462,161
2005/2006	2,678,619
2006/2007	2,596,836
2007/2008	2,588,562
2008/2009	2,743,010
2009/2010	2,728,569

2010/2011	3,115,423
2011/2012	3,091,666
2012/2013	2,580,435
2013/2014	3,347,586
2014/2015	3,169,651
2015/2016	2,985,993
2016/2017	2,873,230
2017/2018	2,931,958
2018/2019	3,035,456

(ii)

Reporting Year	Industrial scheme use
1999/2000	3,794,385
2000/2001	3,657,851
2001/2002	4,771,450
2002/2003	4,033,965
2003/2004	5,363,394
2004/2005	1,653,504
2005/2006	59,436
2006/2007	66,665
2007/2008	54,967
2008/2009	55,294
2009/2010	35,031
2010/2011	57,910
2011/2012	51,962
2012/2013	98,328
2013/2014	69,607
2014/2015	71,393
2015/2016	59,590
2016/2017	58,678
2017/2018	49,821
2018/2019	50,214

(iii)

Reporting Year	Other scheme water use (outside of residential or industrial use specifically)
1999/2000	3,545,953

2000/2001	3,897,956
2001/2002	3,978,793
2002/2003	4,338,689
2003/2004	4,661,190
2004/2005	5,270,391
2005/2006	5,966,046
2006/2007	5,129,993
2007/2008	5,633,529
2008/2009	5,928,073
2009/2010	6,454,892
2010/2011	6,267,615
2011/2012	6,013,332
2012/2013	6,226,813
2013/2014	6,230,323
2014/2015	6,806,409
2015/2016	6,803,599
2016/2017	6,758,460
2017/2018	6,288,753
2018/2019	6,952,305

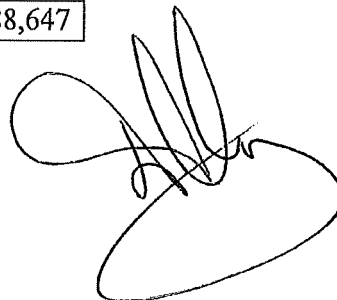
(l) The Department of Water and Environmental Regulation is not aware of any major users of water within the Town of Port Hedland boundaries that are not serviced by the PHRWSS.

(i) Not applicable

(m)

Reporting Year	Total water service charges for all customers	Total water usage charges for all customers
2009/2010	\$2,115,384	\$11,484,185
2010/2011	\$2,576,414	\$11,780,664
2011/2012	\$2,534,943	\$13,378,452
2012/2013	\$4,433,272	\$15,069,832
2013/2014	\$6,646,826	\$16,265,418
2014/2015	\$11,257,862	\$17,760,845
2015/2016	\$10,444,878	\$18,992,644
2016/2017	\$6,905,442	\$18,120,231
2017/2018	\$6,761,268	\$17,125,632
2018/2019	\$5,525,276	\$17,688,647

(n)



Reporting Year	Total water service charges for residential customers	Total water usage charges for residential customers
2009/2010	\$956,899	\$3,447,514
2010/2011	\$993,228	\$3,593,189
2011/2012	\$1,037,401	\$3,889,028
2012/2013	\$1,089,540	\$4,753,013
2013/2014	\$1,328,623	\$5,595,293
2014/2015	\$1,508,062	\$5,123,186
2015/2016	\$1,618,816	\$5,398,728
2016/2017	\$1,719,775	\$5,187,898
2017/2018	\$1,813,223	\$5,925,568
2018/2019	\$1,847,087	\$6,280,618

(o)

Reporting Year	Total water service charges for industrial customers*	Total water usage charges for industrial customers*
2009/2010	\$485,243	\$2,464,506
2010/2011	\$421,109	\$2,582,764
2011/2012	\$318,446	\$2,978,668
2012/2013	\$2,429,609	\$4,139,525
2013/2014	\$2,168,412	\$3,852,427
2014/2015	\$2,588,448	\$4,982,536
2015/2016	\$4,682,412	\$6,577,616
2016/2017	\$4,734,643	\$4,935,377
2017/2018	\$4,803,312	\$4,246,499
2018/2019	\$3,526,920	\$3,988,282

*It should be noted that due to limitations in splitting Industrial and Commercial customers, revenue for both Industrial and Commercial are included in the revenue figures.

(p) Yes.

(i) Expansion of the current borefields and/or seawater desalination.

(ii) Initial site investigations have been completed with regards to expansion of the current borefields. No site investigations have been completed with regards to seawater desalination.

(q) The planning study for a source expansion for PHRWSS is due for completion in early 2022. A decision on a new source will be made once triggers are met.

LEGISLATIVE COUNCIL
Question On Notice

Tuesday, 10 March 2020

2843. Hon Robin Chapple to the Minister for Regional Development representing the Minister for Water

Regarding the Yule Bore field in the Pilbara, and with reference to the document uploaded at <https://robinchapple.com/longitudinal-and-latitudinal-coordinates-bores-yule-borefield-pilbara>, I ask:

- (a) what were the Recharge Classes, the corresponding assigned m AHD Variable Performance Indicator Levels, and the actual recorded m AHD levels, for each of the bores in the referenced document, for each monitoring period, for each of the past 10 reporting years;
- (b) were there any monitoring bores, in addition to those listed in the referenced document, from which data was recorded in the Yule Bore field (YB):
 - (i) if yes to (b), could the Minister identify these bores;
 - (ii) if yes to (b), what were the Recharge Classes, the corresponding assigned m AHD Variable Performance Indicator Levels, and the actual recorded m AHD levels for each of those bores, for each monitoring period, for each of the past 10 reporting years; and
 - (iii) if yes to (b), what were the Performance Indicator Levels, as measured in TDS mg/L, and the actual recorded TDS mg/L levels, for each of those bores, for each monitoring period, for each of the past 10 reporting years;
- (c) what were the Performance Indicator Levels, as measured in TDS mg/L, and the actual recorded TDS mg/L levels, for each of the listed bores referenced in the document, for each monitoring period, for each of the past 10 reporting years;
- (d) what specific studies have been undertaken in relation to the health of groundwater-dependent vegetation within the YB within the past 10 years;
- (e) what is the general health of groundwater dependent vegetation within the YB at this time; and
- (f) what monitoring locations have been set up to assess ecological health within the YB?

Answer

- a) Of the monitoring (observation) bores identified in the document referred to by the Member <https://robinchapple.com/longitudinal-and-latitudinal-coordinates-bores-yule-borefield-pilbara>, only 8/04, 10/04, 12/04, 13/04, 14/04, 15/04, 17/04, 21/04, 34/04 and 37/04 are recognised with a Recharge Class and associated Trigger, Criteria and Target levels. Setting of recharge classes commenced for the 2017-18 water year.

Site	Recharge class	Trigger (mAHD)	Criteria (AHD)	Target (mAHD)
Bore 8/04	1 Drought	8.27	7.28	-
	2 Dry	9.23	8.25	-
	3 Average	-	9.23	10.78
	4 Wet	-	-	10.78

Site	Recharge class	Trigger (mAHD)	Criteria (AHD)	Target (mAHD)
Bore 10/04	1 Drought	8.47	7.45	-
	2 Dry	9.86	8.88	-
	3 Average	-	9.86	12.18
	4 Wet	-	-	12.18
Bore 12/04	1 Drought	12.08	11.09	-
	2 Dry	14.30	13.32	-
	3 Average	-	14.30	15.39
	4 Wet	-	-	15.39
Bore 13/04	1 Drought	15.59	14.61	-
	2 Dry	17.53	16.55	-
	3 Average	-	17.53	18.34
	4 Wet	-	-	18.34
Bore 14/04	1 Drought	17.44	16.46	-
	2 Dry	18.77	17.79	-
	3 Average	-	18.77	19.82
	4 Wet	-	-	19.82
Bore 15/04	1 Drought	22.35	21.37	-
	2 Dry	23.12	22.14	-
	3 Average	-	23.12	24.22
	4 Wet	-	-	24.22
Bore 34/04	1 Drought	9.41	8.42	-
	2 Dry	10.06	9.07	-
	3 Average	-	10.06	10.68
	4 Wet	-	-	10.68
Bore 37/04	1 Drought	8.12	7.19	-
	2 Dry	8.87	7.88	-
	3 Average	-	8.87	10.32
	4 Wet	-	-	10.32
Bore 17/04	1 Drought	28.28	27.98	-
	2 Dry	28.96	28.66	-
	3 Average	-	28.96	29.48
	4 Wet	-	-	29.48
Bore 21/04	1 Drought	31.45	31.16	-
	2 Dry	32.03	31.73	-
	3 Average	-	32.03	32.48
	4 Wet	-	-	32.48

The measured mAHD (metres Australian Height Datum) levels of these sites for the last ten years are available.

[See tabled paper no.]

Bores 3, 8A, 18B, 20, 21, 14/70, 15/73, 19/73, 20/73, 21/73, 4/96, 6/96 and 8/96 do not have recharge Classes and associated Trigger, Criteria and Target levels associated with them but are included in the monitoring program.

The measured mAHD (metres Australian Height Datum) levels of these sites for the last ten years are available.

[See tabled paper no.]

No monitoring is required of bore 22/73, which was last used as a production bore in 1998.

b) Yes

(i) Bores 28/10, 1/11 and 3/11.

(ii) These bores do not have recharge Classes and associated Trigger, Criteria and Target levels associated with them but are included in the monitoring program. The measured mAHD levels of these sites are also available.

[See tabled paper no.]

(iii) There is no specific Performance Indicator related to TDS of raw water samples from these monitoring bores. No TDS sampling is required or undertaken.

- c) There is no specific Performance Indicator related to TDS of raw water samples from monitoring bores at Yule Borefield. No TDS sampling is required or undertaken.
- d) Vegetation Condition Monitoring was undertaken between March 2009 and November 2011 and then annually since 2017 in accordance with Department of Water and Environmental Regulation (DWER) requirements.
- e) The Vegetation Condition monitoring reports show conditions vary from good to poor, with poor areas exhibiting the impacts of grazing, weeds, and recent floods.
- f) Monitoring sites have been set up at MM1(37/04), MI(12/04), MA(14/04), MB(15/04), MC(17/04), MK(10/04).

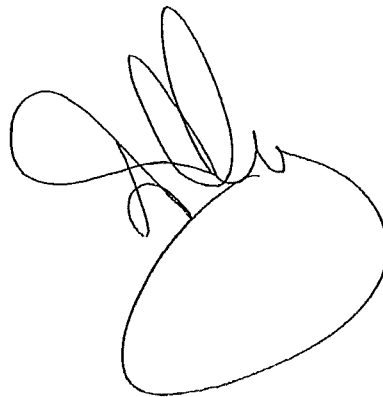
A handwritten signature in black ink, consisting of several loops and a large oval at the bottom, positioned in the lower right quadrant of the page.

Table 4: Water sources in the Perth and Peel region (Greater Perth), gigalitres (GL)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Groundwater (non-potable)	280.1	284.5	286.1	279.5	283.3	290.5	286.2	295.0	300.8	298.6
Groundwater (potable)	120.8	164.8	158.8	140.2	125.8	124.0	137.4	147.5	126.9	123.4
Southern Seawater Desalination Plant	0	0	29.0	48.4	65.1	73.1	92.9	102.5	102.9	50.3
Perth Desalination Plant	47.7	52.0	49.0	47.7	48.0	46.4	46.2	47.3	46.0	39
Surface water (potable)	90.7	48.8	34.4	36.6	49.0	47.5	20.0	0.5	15.8	72.2
Surface water (non-potable)	9.8	9.5	8.7	9.1	10.0	8.0	7.0	5.5	6.3	9.2
Wastewater recycling (potable)	0	0	0	0	0	0	1.2	1.0	6.0	0.1
Wastewater recycling (non-potable)	5.5	5.7	7.6	7.5	7.9	7.7	8.0	7.6	7.2	7.4
Total	554.6	565.3	573.6	569	589.1	597.2	598.9	606.9	611.9	600.2

See tabled paper.

LEGISLATIVE COUNCIL
Question On Notice

Tuesday, 10 March 2020

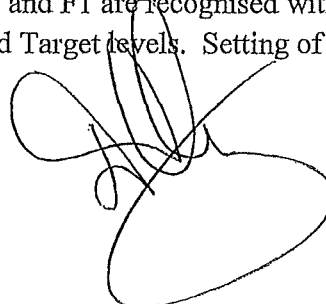
2844. Hon Robin Chapple to the Minister for Regional Development representing the Minister for Water

I refer to the monitoring bores of the Namagoorie Borefield (NB), in regards to the document uploaded at <https://robinchapple.com/longitudinal-and-latitudinal-coordinates-bores-namagoorie-borefield-pilbara>, and I ask:

- (a) what were the Recharge Classes, the corresponding assigned m AHD Variable Performance Indicator Levels, and the actual recorded m AHD levels for each of the listed bores for each monitoring period for each of the past 10 reporting years;
- (b) were there any monitoring bores, in addition to those outlined in (a), from which data was recorded in the NB:
 - (i) if yes to (b), would the Minister please identify these bores;
 - (ii) if yes to (b), what were the Recharge Classes, the corresponding assigned m AHD Variable Performance Indicator Levels, and the actual recorded m AHD levels for each of those bores for each monitoring period for each of the past 10 reporting years; and
 - (iii) if yes to (b), what were the Performance Indicator Levels, as measured in TDS mg/L, and the actual recorded TDS mg/L levels, for each of those bores for each monitoring period for each of the past 10 reporting years;
- (c) what were the Performance Indicator Levels, as measured in TDS mg/L, and the actual recorded TDS mg/L levels, for each of the listed bores, for each monitoring period for each of the past 10 reporting years;
- (d) what specific studies have been undertaken in relation to the health of groundwater-dependent vegetation within the NB within the past 10 years;
- (e) what is the general health of groundwater-dependent vegetation within the NB at this time; and
- (f) what monitoring locations have been set up to assess ecological health within the NB?

Answer

- (a) Of the monitoring (observation) bores identified in the document <https://robinchapple.com/longitudinal-and-latitudinal-coordinates-bores-namagoorie-borefield-pilbara>, only U1, 9/04, 6/04, 7/04, H2, I2 and F1 are recognised with a Recharge Class and associated Trigger, Criteria and Target levels. Setting of recharge classes commenced for the 2017-18 water year.



Site	Recharge class	Trigger (mAHD)	Criteria (AHD)	Target (mAHD)
Bore U1	1 Drought	9.26	9.15	-
	2 Dry	9.65	9.61	-
	3 Average	-	9.65	10.06
	4 Wet	-	-	10.06
Bore 7/04	1 Drought	14.42	13.96	-
	2 Dry	14.47	14.45	-
	3 Average	-	14.47	14.96
	4 Wet	-	-	14.96
Bore H2	1 Drought	18.15	18.05	-
	2 Dry	18.39	18.30	-
	3 Average	-	18.39	18.94
	4 Wet	-	-	18.94
Bore I2	1 Drought	20.33	20.17	-
	2 Dry	20.48	20.36	-
	3 Average	-	20.48	20.82
	4 Wet	-	-	20.82
Bore F1	1 Drought	21.65	21.30	-
	2 Dry	22.16	21.88	-
	3 Average	-	22.16	23.38
	4 Wet	-	-	23.38
Bore 09/04	1 Drought	7.05	6.90	-
	2 Dry	7.38	7.25	-
	3 Average	-	7.38	7.72
	4 Wet	-	-	7.72
Bore 06/04	1 Drought	7.87	7.81	-
	2 Dry	8.48	8.38	-
	3 Average	-	8.48	9.14
	4 Wet	-	-	9.14

The measured mAHD (metres Australian Height Datum) levels of these sites are available in the tabled paper.

[See tabled paper no.]

Bores 11/76, 4/76, E1, E3, E4B, H1, I1, 8/04, R1, U2, U3 and U4 do not have recharge Classes and associated Trigger, Criteria and Target levels associated with them but are included in the monitoring program. The measured mAHD levels of these sites are also available.

[See tabled paper no.]

No monitoring is required or undertaken in the last ten years at bore sites X1, 1/04, T1, T2, T3 and T4.

- (b) No
 - (i) Not applicable
 - (ii) Not applicable
 - (iii) Not applicable
- (c) There is no specific Performance Indicator related to TDS of raw water samples from monitoring bores at Namagoorie borefield. No TDS sampling is required or undertaken.
- (d) Annual Vegetation Condition Monitoring has been undertaken since 2017 in accordance with Department of Water and Environmental Regulation requirements.
- (e) Vegetation Condition Monitoring Reports show conditions vary from good to poor, with poor areas exhibiting the impacts of grazing, weeds, and recent floods.
- (f) Monitoring sites have been set up at MT, MV, MY3, MZ and DG (located near H2).

PQC2842

Reporting Year	Yule Borefield Answer to question d	Namagoorie Borefield Answer to question f
	Abstraction (kL)	Abstraction (kL)
1999/2000	4,732,631	6,557,487
2000/2001	4,383,958	6,632,677
2001/2002	4,735,569	7,025,642
2002/2003	5,042,195	6,502,009
2003/2004	6,676,247	7,089,656
2004/2005	5,370,400	6,320,432
2005/2006	4,416,764	4,489,989
2006/2007	3,644,041	5,011,944
2007/2008	3,950,146	4,958,217
2008/2009	4,083,265	5,409,180
2009/2010	4,665,311	6,190,300
2010/2011	4,613,519	5,361,032
2011/2012	3,915,630	5,979,503
2012/2013	3,622,875	6,985,189
2013/2014	2,800,427	7,020,199
2014/2015	6,191,559	5,008,180
2015/2016	6,365,307	5,053,083
2016/2017	6,658,026	4,550,483
2017/2018	5,777,825	5,491,129
2018/2019	7,197,299	5,140,196

MONITORING BORES FOR RESPONSE (a)

MONITORING BORES FOR RESPONSE (b)

Reading Date	Yule Bore 37/04	Yule Bore 10/04	Yule Bore 13/04	Yule Bore 21/04	Yule Bore 17/04	Yule Bore 8/04	Yule Bore 12/04	Yule Bore 14/04	Yule Bore 15/04	Yule Bore 34/04	Yule Bore 21/73	Yule Bore 20/73	Yule Bore 3	Yule Bore 8A	Yule Bore 14/70	Yule Bore 21	Yule Bore 20	Yule Bore 18B	Yule Bore 15/73	Yule Bore 4/96	Yule Bore 6/96	Yule Bore 8/96	Yule Bore 19/73	Yule SWIM Bore 28/10	Yule SWIM Bore 1/11	Yule SWIM Bore 3/11		
22/01/2010	9.32	9.98	17.31	31.92	28.85	9.46	14.83	18.71	23.39	10.01	9.62	10.04	12.01	14.88	26.4	9.86	13.66	19.76	11.08	17.17	16.93	13.48						
24/02/2010	9.15	9.75	17.08	31.83	28.77	9.26	14.29	18.53	23.23	9.93	9.42	9.63	11.97	14.85	26.32	9.72	13.53	20.16	10.96	17.12	16.77	13.26	9.43					
18/03/2010	9.05	9.65	16.92	31.78	28.72	9.15	13.98	18.43	23.08	9.86	9.23	9.67	11.93	14.82	26.26	9.63	13.42	20.1	10.84	17.03	16.55	13.08	9.4					
22/04/2010	8.94	9.48	16.67	31.7	28.64	9.09	13.57	18.23	22.98	9.78	9.11	9.54	11.88	14.8	26.18	9.51	13.28	20.02	10.75	17.03	16.32	12.89	9.25					
20/05/2010	8.79	9.08	16.43	31.63	28.57	8.9	13.25	18.07	22.84	9.7	9.04	9.47	11.82	14.76	26.1	9.38	13.12	19.93	10.57	16.96	16.1	12.69	9.05					
18/06/2010	8.64	8.87	16.21	31.57	28.5	8.68	12.89	17.93	22.72	9.64	8.97	9.41	11.77	14.73	26.02	9.27	12.97	19.86	10.56	16.91	15.9	12.55	8.9					
22/07/2010	8.52	8.88	15.98	31.53	28.45	8.61	12.88	17.78	22.6	9.58	8.79	9.31	11.76	14.7	25.95	9.16	12.84	19.76	10.52	16.86	15.69	12.43	8.8					
12/08/2010	8.44	8.79	15.85	31.49	28.4	8.54	12.54	17.68	22.53	9.53	8.7	9.25	11.73	14.67	25.9	9.11	12.71	19.71	10.47	16.82	15.58	12.36	8.73					
16/09/2010	8.31	8.68	15.57	31.42	28.33	8.41	12.27	17.53	22.41	9.45	8.57	9.15	11.68	14.67	25.8	8.99	12.55	19.6	10.35	16.77	15.4	12.19	8.59					
28/10/2010	8.1	8.22	15.44	31.31	28.21	8.09	11.84	17.33	22.24	9.43	8.46	9.02	11.6	14.63	25.69	8.83	12.28	19.44	10.13	16.57	15.19	11.86	8.32					
25/11/2010	7.95	7.99	15.32	31.23	28.15	7.84	11.71	17.22	22.13	9.26	8.35	8.93	11.54	14.59	25.61	8.71	12.14	19.36	10.02	16.61	15.07	11.74	8.14					
23/12/2010	7.9	8.21	15.21	31.17	28.08	7.84	11.6	17.11	22.03	9.2	8.28	8.88	11.49	14.55	25.63	8.64	12.03	19.26	10.03	16.56	14.95	11.57	8.2					
23/01/2011	7.85	8.19	15.19	31.19	28.23	7.95	11.47	17.3	22.06	9.13	8.17	8.91	11.44	14.52	25.45	8.57	11.92	19.2	9.87	16.52	14.89	11.37	8.13					
30/03/2011	12.22	13.38	19	32.87	30.04	12.12	16.48	21.31	25.91	10.32	8.76	8.78	11.5	14.87	26.12	10.05	13.33	19.94	10.17	16.71	17.89	12.79	10.71					
29/04/2011	11.48	13.26	18.71	32.87	29.81	11.82	16.17	21.08	25.41	10.08	8.97	8.9	11.54	14.73	26.32	10.43	13.51	20.03	10.25	16.88	17.89	13.07	11.02					
30/05/2011	11.07	12.99	18.55	32.72	29.56	11.46	15.83	20.73	24.93	10.1	9.08	9	11.61	14.78	26.4	10.69	13.57	20.17	10.32	17.03	17.82	13.19	10.98					
22/06/2011	10.79	12.75	18.43	32.68	29.43	11.31	15.67	20.54	24.93	10.11	9.19	9.19	11.63	14.77	26.42	10.66	13.85	20.21	10.47	17.08	17.78	13.27	10.93					
25/07/2011	10.57	12.34	18.19	32.5	29.18	11.02	15.31	20.14	24.31	9.98	9.26	9.15	11.67	14.8	26.38	10.6	13.93	20.48	10.2	17.13	17.81	13.12	10.77					
23/08/2011	10.3	12.02	18.01	32.54	29.09	10.53	14.95	19.98	24.01	9.73	9.44	9.11	11.73	14.82	26.36	10.54	13.8	20.58	9.99	17.18	17.5	12.86	10.62					
22/09/2011	10.12	11.09	17.74	32.19	29.01	10.48	14.82	19.52	23.79	9.96	9.23	9.23	11.61	14.81	26.24	10.3	13.98	20.31	10.36	17.13	17.24	12.97	10.41					
20/10/2011	9.93	10.63	17.53	32.13	28.91	10.23	13.96	19.26	23.55	9.91	9.12	9.11	11.58	14.81	26.18	10.16	13.45	20.2	10.04	17.1	17.04	12.66	10.22					
25/11/2011	9.68	10.29	17.19	31.86	28.61			18.93	23.25				11.52	14.79	26.08				10.06	17.07	16.72	12.4						
23/12/2011	9.58	10.17	17.04	31.74	28.58			18.8	23.13				8.71	8.89				9.99	13.3	20.14				9.96				
20/01/2012	12.54	15.03	19.63	33.08	30.38	12.45	16.94	21.61	26.12	14.77	8.62	8.63	11.49	14.73	26.01	9.84	13.4	20.06	10.02	17.03	16.58	12.28	9.86					
18/02/2012	12.29	14.34	19.3	32.94	30.14	12.31	16.72	21.5	25.92	12.56	8.98	8.94	11.58	14.74	26.42	11.4	14.36	20.24	10.25	17.05	18.23	13.02	11.1					
28/03/2012	12.16	13.75	19.16	32.9	30.14	12.1	16.53	21.54	25.84	11.82	9.16	9.08	11.58	14.74	26.8	11.86	14.76	20.42	10.36	17.15	18.34	13.3	11.2					
25/04/2012	12.09	15.04	18.94	32.82	30.88	12.65	17.16	21.75	25.83	9.85	8.73	8.68	11.67	14.79	26.47	9.93	13.32	19.99	10.12	17.51	18.24	12.76	10.4					
15/05/2012	12.8	15.28	19.23	32.83	30.64	12.72	17.25	21.8	25.93	9.93	9.23	9.11	11.72	14.82	26.52	10.05	13.24	20.08	10.11	17.54	18.1	12.84	10.43					
21/06/2012	10.98	12.99	18.5	32.61	30.66	11.44	15.76	20.61	24.76	9.87	9.08	8.9	11.53	14.76	26.72	9.82	13.26	19.71	10.32	17.91	17.93	13.43	11.15					
19/07/2012	10.94	12.73	18.27	32.67	29.24	11.42	15.55	20.31	24.51	9.92	8.92	8.95	11.51	14.76	26.61	9.94	13.27	19.96	10.4	17.18	17.21	13.4						
28/07/2012	10.55	12.33	18.1	32.37	29.26	11	15.26	19.87	23.91	9.71	9.01	8.9	11.47	14.77	26.55	9.81	13.14	19.77	10.2	17.45	17.58	13.21	10.84					
23/08/2012	10.33	12.81	17.86	32.34	29.87	10.89	14.85	19.66	24.01	9.62	8.93	8.84	11.47	14.82	26.47	9.51	13.07	19.79	10.15	17.38	17.07	13.07	10.58					
22/09/2012	10.18	12.62	17.72	32.04	28.88	10.75	14.71	19.54	23.84	9.32	9.07	8.76	11.29	14.65	26.36	9.42	12.77	19.68	9.92	18.15	17.24	12.95	10.39					
29/10/2012	9.95	12.39	17.39	31.9	28.94	10.25	13.53	19.16	23.62	9.23	8.96	8.86	11.39	14.63	26.3	9.18	12.65	19.5	9.79	17.86	16.92	12.8	10.3					
23/12/2012	9.84	11.89	17.24	31.84	28.89	10.17	13.12	18.98	23.51	9.14	8.58	8.58	11.38	14.8	26.25	9.14	12.58	19.41	9.67	17.84	16.78	12.3	10.19					
5/02/2013	10.24	13.84	18.12	32.75	30.04	12.17	16.51	20.44	25.52	9.87	8.92	8.92	11.39	14.75	26.39	9.89	13.34	19.9	9.89	18.34	17.15	12.93	10.67					
22/02/2013	13.88	19.04	32.81	30.07	30.07	12.2	16.5	21.26	25.94	9.69	8.95	8.95	11.39	14.84	26.53	10.12	13.65	20.02	9.66	18.73	18.02	12.6	10.71					
26/03/2013	10.4	13.75	18.13	32.85	30.11	12.3	16.89	21.38	26.04	8.82	9.1	8.99	11.45	14.88	26.82	9.28	12.69	19.58	9.83	18.17	18.11	12.74	13.91					
17/04/2013	11.29	13.43	18.63	32.79	29.71	12.09	15.96	20.99	25.24	8.75	9.27	8.91	11.32	14.73	26.69	9.21	12.65	19.52	10.02	18.94	17.97	13.02	10.87					
22/05/2013	12.58	18.37	32.77	29.39	12.07	15.58	20.9	25.02	24.73	9.26	8.91	8.91	11.3	14.73	26.67	9.14	12.7	19.68	10.1	18.89	17.94	12.9	11.21					
28/06/2013	13.01	18.38	32.81	29.45	12.16	15.92	20.44	24.74	25.28	9.28	8.83	8.83	11.36	14.69	26.69	9.25	10.2	18.62	10.1	18.71	17.74	13.19	11.15					
26/07/2013	11.26	12.97	18.36	32.8	29.43	12.12	15.5	20.42	24.72	9.26	8.79	8.79	11.34	14.84	26.67	9.15	14.83	20.21	10.18	18.66	17.72	13.16	11.19					
30/08/2013	11.37	13.05	18.35	32.78	29.42	12.28	15.56	20.38	24.71	8.91	9.31	8.96	11.32	14.69	26.65	9.15	14.83	20.21	10.18	18.66	17.72	13.16	11.19					
27/09/2013	11.17	12.94	18.44	32.79	29.64	12.02	15.66	21.49	24.94	8.82	9.26	9.16	11.49	14.89	26.87	9.15	13.37	20.31	10.34	18.85	18.15	13.8	11.24					
28/10/2013	10.75	12.61	17.87	32.22	29.22	11.56	15.08	21.15	24.64	8.45	8.66	8.66	11.39	14.54	26.49	8.59	12.77	19.6	9.92	18.42	17.8	13.25	10.7					
28/11/2013	10.71	12.53	17.82	32.5	29.4	11.54	15.31	20.47	24.48	10.89	8.6	8.74	11.49	14.49	26.49	8.54	12.75	19.64	10.2	18.5	17.82	13.54	10.57					
19/01/2014	10.55	12.44	17.69	32.																								

MONITORING BORES FOR RESPONSE (a)

Reading Date	Degrey Bore F1	Degrey Bore H2	Degrey Bore I2	Degrey Bore 9/04	Degrey Bore 7/04	Degrey Bore 6/04	Degrey Bore U1	Degrey Bore 11/76	Degrey Bore 4/76	Degrey Bore E1	Degrey Bore E3	Degrey Bore E4B	Degrey Bore H1	Degrey Bore I1	Degrey Bore 8/04	Degrey Bore R1	Degrey Bore U2	Degrey Bore U3	Degrey Bore U4
27/05/2010				7.41	15.01	8.14	9.72								9.24				
25/06/2010				7.33	14.81	8.07	9.62								8.81				
30/06/2010	23.62	19.81	19.93					10.39	10.74	13.65	12.68	12.87		19.38		16.84	10.06	8.35	9.46
30/07/2010				7.27	14.72	8.03	9.52								9.01		10.01	8.3	9.37
26/08/2010				7.18	14.59	7.91	9.43								8.91		9.9	8.27	9.34
23/09/2010	23.52	18.7	19.81	7.09	14.43	7.81	9.32	10.34	11.53	13.53	12.56	12.83		19.31	8.82	16.73	9.85	8.24	9.28
20/10/2010				6.99	14.27	7.71	9.27								8.74		9.77	8.19	9.23
18/11/2010				6.83	14.23	7.54	9.25								8.68		9.71	8.14	9.26
16/12/2010	23.06	18.45	19.6	6.78	14.07	7.45	9.1	10.24	11.73	13.13	12.38	12.75		19.19	8.61	16.56	9.63	8.1	9.11
2/05/2011	25.22	19.38	20.54	6.08	15.75	8.97	10.08	10.43	11.66	13.99	12.67	13.21		19.74	9.88	17.46	10.46	8.55	9.02
2/06/2011				7.9	15.84	8.61	10.01								9.57		10.43	8.6	8.98
30/06/2011	24.86	19.41	20.39	7.57	15.02	8.2	9.88	10.52	11.49	13.99	12.81	13.13		19.77	9.31	16.96	10.26	8.57	8.89
18/08/2011				7.5	14.84	8.08	9.86								9.24		10.22	8.68	8.78
29/09/2011	24.5	19.19	19.96	7.3	14.76	7.75	9.54	10.42	11.76	13.89	12.79	13.07		19.6	9.21	17.06	10.05	8.45	8.81
31/10/2011				7.16	14.48	7.57	9.43								9.18		9.96	8.4	8.78
23/11/2011				7.08	14.9	7.44	9.47								9.1		9.91	8.34	8.76
28/12/2011	24.19	19.02	19.96	6.98	14.84	7.28	9.32	10.24	11.83	13.7	12.66	12.98		19.48	9.21	16.97	9.87	8.33	8.76
23/02/2012				8.49	15.59	8.63	10.09								9.7		10.51	8.33	8.76
28/03/2012	24.19	19.02	20.6	9.32	16.25	9.07	10.41	10.63	11.81	13.94	12.82	12.98		19.44	10.12	17.08	10.68	8.33	8.75
26/04/2012				9.39	16.33	9.14	10.51								10.21		10.81	8.42	8.85
31/05/2012						9.13	10.52								9.28		10.52	8.74	11.87
29/06/2012				7.87	15.13	8.48	10.15	10.62	11.49	13.95	12.62	13		19.71		16.89			
28/08/2012			20.34														10.57	8.79	11.88
31/07/2012				7.86	15.18	8.53	10.18										10.47	8.67	11.66
28/08/2012							10.22	9.39	11.55		11.87	12.13				17.11			
29/09/2012				7.54		7.78	9.92								9.13		10.21	8.6	11.83
25/10/2012				7.4	15.03	7.59	9.79								8.98		10.07	8.4	11.63
27/11/2012				7.33	14.89	7.57	9.45								8.93		10.02	8.38	11.62
19/12/2012			19.86				9.49	10.52	11.39	13.58	12.43	12.96	17.37	19.35		16.42		8.4	10.89
24/12/2012				7.23	14.95	7.54	9.49								8.91		9.95	8.4	10.89
5/02/2013				7.19	14.92	7.43	9.72								8.89		8.34	10.89	
18/02/2013							9.74												
29/03/2013				7.39	15.07	8.14	10.03								9.08		10.46	8.52	11.79
28/03/2013	25.04	19.82	20.71					10.66	11.58	13.68	12.76	13.08	18.36	19.7		16.85			
12/04/2013							9.91											8.57	11.13
22/04/2013				7.33	15.05	8.11	10								9.06		10.45	8.43	11.73
28/05/2013					15.47	8.79	9.91										10.66	8.64	
30/06/2013				7.28	15.43	8.74	9.94								9.03		10.65		
11/07/2013	25.28	19.8	20.77				9.94	10.72		14.06	12.62	13.16	18.58	19.76		16.88			
26/07/2013				7.23	15.41	8.7	9.95								9		10.72		
30/08/2013				7.4	15.53	8.81	9.94								9.09		10.71	8.7	11.74
30/09/2013					15.5	8.88	9.91												
29/10/2013	24.92	19.57	20.64					10.56	11.53	13.89	12.56	13.01	16.88	19.66		16.84	8.96	10.84	
30/10/2013				7.95	15.42	8.66									9.71		10.55	8.89	11.67
25/11/2013				7.91	15.37	8.78	10.08								9.68		10.51	8.85	11.58
19/03/2014	25.46	19.74	20.76				10.72	10.73	11.74	14.37	12.67	13.2	17.21	20.34		17.26		9.06	11.7
31/03/2014				8.57	15.65	9.12	10.72								10.15		10.99	9.06	11.7
24/04/2014				8.5	15.57	9.09	10.68								10.08		10.92	9	11.64
7/07/2014								11.04	11.3	14.23	12.91								
16/07/2014	25.28	19.62	20.65				10.64	10.56	11.69	13.98	12.61	13.15	17.07	20.23		17.13		8.52	
31/10/2014	24.7	19.22	20.57	8.04			10.51	10.54	11.58	13.82	12.55	13.03	17.03	20.17	10	17.06	10.35	8.74	11.53
25/11/2014						8.49													
31/12/2014	24.28	19.12	20.11	7.98			10.4	10.43	11.46	13.71	12.96	12.93	16.96	19.85	9.88	16.94	10.28	8.47	11.36
27/01/2015						8.32													
17/02/2015						8.36													
28/03/2015						8.42													
30/04/2015	24.33	19.15		8.04			10.5	10.51	11.5	13.77	13.05	12.98			9.96		10.33		
27/05/2015						8.54													
1/07/2015	24.01	18.97	20.19	7.77			10.39	10.69	12.05	13.94	12.85	12.67	17.51	19.84	9.46	16.89	10.2	8.49	10.63
20/07/2015						8													
17/08/2015						7.94													
21/09/2015						7.91													
30/09/2015	23.61	18.59	19.71	7.42			9.99	10.3	11.65	13.63	12.38	12.23	17.24	19.2	9.04	16.48	9.83	8.13	9.77
1/10/2015				7.42											9.04		9.83		
19/10/2015						7.87													
10/11/2015	23.52	18.48	19.64	7.37	15.51	7.71	9.9												
30/11/2015	23.9	18.61	20.48	7.26			9.2	10.76	11.92	13.54	12.79	12.89	16.79	17.22	8.99	16.46	9.78	8.3	10.41
3/12/2015	23.9	18.61	19.55	7.26	15.4	7.65	9.2												
12/01/2016	23.69	18.45	19.36	7.05	15.21	7.52	9.05												
8/02/2016			19.83					11.31	11.82	13.41	12.61		17.44	19.55		16.89	9.73	8.17	10.35

