

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 4-1 Harbor Receiving Water Quality Data (Station No. 6)

Date	Parameters																							
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (µmho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
04-Jan-88	21									<0.1	<0.001	2.8		<0.01			7.8	0.009	61400	8.2	2.9	7.4		
07-Feb-88	22									<0.1	<0.001	2.1		<0.01			7.8	0.006	60900	4.6	2.0	7.6		
12-Mar-88	26	<0.001	<0.001		0.04	<0.01		<0.05	0.04	<0.1	<0.001	1.0		0.01			7.8	0.003	62700	6.4	2.3	6.4		
10-Apr-88	27									<0.1		2.8		0.03			7.8	0.003	62700	2.5	1.3	6.0		
10-May-88	31									0.2	<0.001			<0.01			7.8	0.003	61100	3.2	2.1	5.1		
05-Jun-88	34	<0.001	<0.001	<0.002	0.02	<0.01		<0.05	0.011	<0.1	<0.001	1.8		0.01			7.7	0.003	60000	5.1	1.3	5.3		
17-Oct-88	34									<0.1	<0.001	3.6		<0.01			8.2	0.014	60100	5.5	0.8	5.0		
12-Dec-88	26	<0.001	<0.001	<0.002	0.005	<0.01		<0.05	<0.01	<0.1	<0.001	1.6		<0.01			8.1	0.006	61000		0.7	6.3		
19-Mar-89	24	<0.001	<0.001	0.003	0.006	<0.01		<0.05	<0.01	<0.1	<0.001	2.6		<0.01			8.2	0.004	61000	7.3		6.1		
03-Apr-89	24									<0.1	<0.001	2.7		<0.01			8.2	0.005	61700	6.8		5.9		
25-Jun-89	35	<0.001	<0.001	<0.002	0.011	<0.01		<0.05	0.016	0.18	0.004	2.5		<0.01			8.2	<0.002	59200	4.7	0.3	5.3		
25-Jul-89	39	<0.001	<0.001	0.003	0.021	<0.01		<0.05	<0.01	0.57	0.004	4.5		<0.01			8.1	0.002	59100	3.3	0.5	4.8		
16-Sep-89	35									0.15	<0.001	3.4		<0.01			8.1	0.008	59700	6.3	0.6	5.1		
26-Nov-89		<0.001	<0.001	0.004	0.018	<0.01		<0.05	<0.01	<0.1		2.8	<0.01	0.03				0.004		5.1	0.7			
10-Dec-89										0.11		2.0	<0.01	<0.01				0.009		7.4	0.6			
04-Feb-90	24	<0.001	<0.001	0.003	<0.005	<0.01		<0.05	<0.01	<0.01	0.025	3.4		<0.01			8.0	0.011	60400	5.0	0.5	6.1		
08-Apr-90	27									<0.1	<0.001	3.5		<0.01			8.2	0.007	61200	2.0	0.2	5.3		
06-May-90	31	<0.001	<0.001	0.002	0.01	<0.01		<0.05	<0.01	0.14	0.014	3.8		<0.01			8.3	0.002	61200	4.0	0.2	7.9		
26-Jul-90	38									0.12	0.008	4.7		<0.01			8.0	0.003	59500	1.0	0.2	5.6		
22-Sep-90	35	<0.001	<0.001	0.005	0.008	<0.01		<0.05	<0.01	<0.1	<0.001	3.3		0.02			8.4	0.006	60100	3.0	1.0	5.8		
11-Nov-91	28	<0.001	<0.001	0.007	0.03	<0.01		<0.05	0.01	0.24	<0.001	2.4		0.03			8.1	0.011	61100	6.5	1.4	6.0		
09-Feb-92	18										0.002	1.2	0.01	<0.01			7.4	0.007	61600	2.2	0.3	9.4		
08-Mar-92	18	<0.001	<0.001	<0.005	<0.01	<0.01		<0.05	<0.01			2.7	0.02	0.03			7.5	0.014	61400	5.5	0.9	6.8		
27-Apr-92	27										<0.001	2.8	<0.01	<0.01			7.3	0.010	62900	4.6	1.4	5.4		
26-May-92	30										<0.001	1.3	<0.01	0.02			8.0	0.014	62600	18.8	0.6	6.5		
12-Jul-92	34									0.42	<0.001	1.6	0.03	<0.01			7.5	0.012	61100	10.4	0.2	7.0		
10-Aug-92	36	<0.001	<0.001	<0.005	<0.01	<0.01		<0.05	<0.01	0.18	<0.001	2.2	<0.01	<0.01			7.0	0.014	62000	17.2	0.2	7.8		
13-Sep-92	36									0.13	<0.001	2.8	0.12	<0.01			7.2	0.013	61500	3.9	0.2	7.0		
12-Oct-92	32	<0.001	<0.001	<0.005	<0.01	<0.01		<0.05	<0.01	0.03	<0.001	2.0	0.26	<0.01			7.9	0.013	61200	6.4	0.2	7.0		
31-Mar-93	27									0.58	<0.001	2.3	0.16				7.1	0.021	61100	17.0	0.2	6.8		
28-Apr-93										0.50	<0.001	3.1	0.11	<0.01				0.017		17.8				
25-May-93										0.38	<0.001	1.7	0.13	<0.01				0.015		12.2				
23-Jun-93		<0.001	<0.001	<0.005	0.012	<0.01		<0.05	<0.01	1.07	<0.001	2.0	0.14	<0.01				0.016		12.3				
19-Jul-93										0.45		3.5	0.10	<0.01				0.013		12.1	0.2			
09-Aug-93		<0.001	<0.001	<0.005	0.011	<0.01		<0.05	<0.01	0.65	<0.001	3.5	0.11	<0.01				0.014		19.7				

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Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 4-2 Harbor Receiving Water Quality Data (Station No. 6)

Date	Parameters																							
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D-Oxygen	T.C (MPN/100ml)	F.C (MPN/100ml)
18-Sep-93										0.43	<0.001	2.7	0.17				8.3	0.016	62300	7.3		7.5		
16-Oct-93										0.48		2.5	0.06				8.3	0.008	58700	17.3	0.1	8.2		
23-Nov-93										2.11		7.7	0.09				8.2	0.009	58000	10.5	0.5	7.7		
26-Dec-93										1.02		2.5	<0.01				8.0	0.011	59800	13.7	1.1	7.8		
26-Jan-94										0.70	<0.001	2.0	<0.01				8.2	0.010		58.0	1.4	8.0		
20-Mar-94		<0.001	<0.001	<0.005	<0.005	<0.01		<0.05	<0.01	2.00		1.5	0.08	0.01				0.010		10.9	0.4	7.2		
25-May-94	30									1.00		3.0	0.08	0.02			8.2	0.370	59400	25.7		7.0		
04-Sep-94	33			0.009	0.026	0.010		0.043	0.023	0.20	0.022	3.9	0.15				8.3	0.440	50600		1.3	5.1		
12-Oct-94	33		<0.01	0.086	0.026	0.030		0.014	<0.01	0.40		2.5	0.03				8.1	0.900	56200	18.2	4.8	4.6		
28-Nov-94	28	0.001	<0.001	0.056	0.003	<0.01		0.022	0.002	0.61		4.8	0.25				8.0	<0.01	55800	10.7		6.2		
15-Jan-95		<0.001	0.007	0.006	0.05	0.021		0.003	0.120	0.67		5.3	0.03				7.9	0.026	40100	18.0	2.5	4.9		
19-Feb-95	23									1.20	0.40	5.7	0.21				8.0	<0.01	35000	8.5	2.2	2.1		
25-Mar-95	25	<0.001	<0.001		0.042	<0.01		<0.05	0.020	0.96	0.12	4.8	0.23	<0.01			8.1	0.010	50200	13.5	3.9	4.4		
12-Apr-95	26									0.64		24.2	0.08				8.2		48000	9.6	2.0	2.7		
18-May-95	32									0.64		5.5	0.01				8.0	<0.01	60200	13.7	2.6	6.0		
21-Jun-95			<0.001	0.006	0.05	<0.01		<0.05	0.028	0.60		5.8	0.08				8.3	<0.01	45100	10.9	6.5	6.1		
17-Jul-95	35									1.20		4.5	0.03	<0.01			7.9	<0.01	40000	22.0	8.6	5.5		
14-Aug-95	35									1.40		6.0	0.06	<0.01			7.9	<0.01	42200	20.0	8.5	6.4		
07-Sep-95	31	<0.001	<0.001	0.01	0.048	0.025		<0.05	0.018	1.00		6.6	<0.01	<0.01			8.1	<0.01	48900	11.0	19.3	6.4		
16-Oct-95										0.42			0.08	<0.01			8.2	<0.01	46600	50.4	16.4	5.5		
07-Nov-95	25									0.51		7.1	0.16				8.3	<0.01	53600	12.0	20.2	6.7		
26-Dec-95	18	0.001	0.012	0.002	0.016	0.008		0.033	0.016	0.35		10.8	0.06				8.2	<0.01	54100		10.6	8.5		
14-Jan-96	18									0.40		12.3	0.09				8.3	0.020	48400	85.0		10.0		
16-Mar-96	28	0.003	<0.001	0.003	0.019	0.016		0.012	0.025	0.30		9.4	0.04	<0.01			8.2	<0.01	42500	8.0	8.0	9.0		
17-Apr-96	28									0.40		5.6	0.08	<0.01			8.3	0.010	51900	14.0	13.0	7.8		
21-May-96	36									0.70		11.4	0.06	<0.01			8.3	<0.01	56400	20.0	10.0	5.4		
10-Jun-96	37	0.002	<0.001	0.003	0.013	0.007		0.006	0.005	0.80		11.4	0.03	<0.01			8.2	<0.01	54800	9.0	3.0	6.4		
02-Jul-96	35									0.40		10.0	0.02	<0.01			8.2	0.020	63000	11.0	1.0	5.5		
03-Aug-96	37									8.30	0.01	15.0	0.21	<0.01			8.2	<0.01	54600	9.0	1.0	6.1	<3	<3
07-Sep-96	34	0.002	<0.001	0.003		0.006	0.0017	0.007	0.009	0.70	<0.01	9.0	0.15	<0.01		17.0	8.3	0.020	57600	8.0	2.0	6.5	<3	<3
30-Oct-96	30									0.70	<0.01	33.0	1.47	<0.01			8.5	0.010	56500	6.0	1.0	5.8	<3	<3
20-Nov-96	30									0.20	<0.01	31.0	<0.01	<0.01			8.3	0.010	50200	14.0	3.0	6.0	<3	<3
08-Dec-96	30	0.003	<0.001	0.002		0.007	0.0007	<0.001	0.028	0.20		28.0	0.06	0.09		0.7	8.3	<0.01	56100	23.0	1.0		<3	<3
18-Jan-97	26									0.10	<0.01	9.0	<0.01	<0.01			8.1	0.010	56800	16.0	3.0		<2	<2
19-Mar-97	26	0.001	<0.001	0.003		0.005	0.0009	0.004	0.036	0.20	<0.01	7.0	0.61	0.04		2.6	8.2	<0.01	56300	11.0	1.0	6.7	<2	<2
12-Apr-97	25									0.10	<0.01	5.0	<0.01	<0.01		2.0	8.3	<0.01	56000	6.0	3.0	7.0	<2	<2
15-Jun-97	36	0.003	0.001	0.004		0.010	<0.0001	0.004	0.024	0.10	<0.01	26.0	0.07	<0.01		1.52	8.3	<0.01	57600	5.0	2.0	5.3	<2	<2

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Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 4-3 Harbor Receiving Water Quality Data (Station No. 6)

Date	Parameters																								
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T.C (MPN/100ml)	F.C (MPN/100ml)	
16-Jul-97	34	0.002	<0.001	0.005		0.011	<b>0.0017</b>	0.003	0.021	0.10	<0.01	19.0	0.09	<0.01		1.24	8.2	<0.01	55800	5.0	1.0	5.2	<2	<2	
19-Aug-97	33	0.001	<0.001	0.003	0.031	0.011	<b>0.0015</b>	0.003	0.020	0.30		37.0	0.02	<0.01		1.49	8.3	<0.01	56400	4.0	2.0	5.5	<2	<2	
10-Sep-97	34	0.001	0.001	0.004	0.021	0.013	<b>0.0016</b>	0.008	0.022	<b>1.30</b>	<0.01	6.0	0.08	<0.01		1.01	8.2	<0.01	55800	1.0	<1	4.4	9	9	
27-Oct-97	26	0.001	0.001	0.003	0.046	0.008		0.007	0.010	0.20	<0.01	8.0	0.05	<0.01			8.2	<0.01	46600	143.0	1.0		<2	<2	
19-Nov-97	29	0.001	0.001	0.005	0.021	0.011	<b>0.0013</b>	0.008	0.031	0.10	<0.01	5.0	0.15	<0.01		0.76	8.2	<0.01	57000	5.0	1.0	6.0	<2	<2	
27-Dec-97	26	0.002	<0.001	0.003	0.015	0.011	<b>0.0009</b>	<0.001	0.022	0.10	<0.01	7.0	0.07	<0.01		0.80	8.2	<0.01	59700	9.0		7.2	<2	<2	
25-Jan-98	23	0.002	<0.001	0.003	0.048	0.011	<b>0.0007</b>	0.009	0.051	0.10	<0.01	7.0	0.11	<0.01		0.76	8.3	<0.01	60100	12.0	3.0	6.7	<2	<2	
14-Feb-98	21	0.002	0.001	0.002	0.022	0.006	<b>0.0015</b>	0.003	0.031	0.10		16.0	0.16	<0.01		0.75	8.3	<0.01	59900	10.0	1.0	6.9	7	7	
15-Mar-98	25	0.003	<0.001	0.003	0.109	0.008	<b>0.0009</b>	0.004	0.021	0.20	<0.01	8.0	0.14	<0.01		0.80	8.2	<0.01	58600	11.0	1.0	6.4	<2	<2	
13-Apr-98	28	0.002	<0.001	0.006	0.031	0.007	<b>0.0006</b>	0.006	0.028	0.10	0.01	4.0	0.06	<0.01	<0.01	0.81	8.4	<0.01	59000	10.0	2.0	6.8	<2	<2	
07-May-98	30	0.002	<0.001	0.004	0.028	0.003	<b>0.0003</b>	0.004	0.022	0.20	0.01	8.0	0.10	<0.01	<0.01	0.79	8.1	<0.01	59500	25.0	1.0	4.8	220	26	
09-Jun-98	33	0.003	<0.001	0.008	0.024	0.008	<b>0.0012</b>	0.007	0.033	0.20	<0.01	12.0	0.13	<0.01	<0.01	0.79	8.1	<0.01	56400	4.0	2.0	4.0	<2	<2	
07-Jul-98	35	0.001	<0.001	0.005	0.027	0.004	<b>0.0006</b>	0.003	0.022	0.50	<0.01	6.0	0.17	<0.01	<0.01	0.78	8.3	<0.01	56600	8.0	2.0	5.2	<2	<2	
03-Aug-09	35	0.003	<0.001	0.006	0.024	0.006	<b>0.0011</b>	0.007	0.028	0.10	<0.01	7.0	0.11	<0.01	<0.01	0.75	8.3	<0.01	57200	4.0	1.0	4.5	<2	<2	
16-Sep-98	36	0.003	<0.001	0.006	0.041	0.006	<b>0.0020</b>	0.003	0.015	<0.1	<b>0.02</b>	11.0	0.07	<0.01	<0.01	0.85	8.0	<0.01	56100	12.0	1.0	4.2	<2	<2	
10-Oct-98	35	0.005	<0.001	0.004	0.039	0.009	<b>0.0009</b>	0.007	0.016	0.10	<b>0.02</b>	5.0	0.10	<0.01	<0.01	0.78	8.3	<0.01	54400	5.0	2.0	5.0	<2	<2	
8-Nov-98	28	0.002	<0.001	0.004	0.028	0.011	<b>0.0008</b>	0.006	0.015	<0.1	0.01	5.0	0.16	<0.01	<0.01	0.74	8.2	<0.01	54400	4.0	1.0	5.6	<2	<2	
27-Dec-98	25									0.20	<0.01	5.0	0.12	<0.01			8.3	<0.01	59300	3.0	2.0	5.8	<2	<2	
6-Jan-99	22	0.001	<0.001	0.003	0.041	0.004	<b>0.0003</b>	0.004	0.017	0.10	<0.01	10.0	0.09	<0.01	<0.01	0.9	8.1	<0.01	59400	12.0	3.0	6.6	4	4	
9-Feb-99	25									0.10	<b>0.04</b>	6.0	0.18	<0.01			8.3	<0.01	59500	29.0	2.0	6.0	<2	<2	
2-Mar-99	25									0.10	<0.01	5.0	0.12	<0.01			8.3	<0.01	59500	17.0	1.0	6.9	<2	<2	
8-Apr-99	31	0.001	<0.001	0.007	0.028	0.009	0.0001	0.004	0.023	0.10	<b>0.02</b>	11.0	0.14	<0.01	<0.01	0.82	8.2	<0.01	55300	16.0	1.0	5.4	240	34	
16-May-99	30									0.20	<0.01	10.0	0.1	<0.01			8.3	<0.01	55400	18.0	1.0	5.4	<2	<2	
12-Jun-99	35									0.20	<0.01	3.0	0.19	<0.01			8.3	<0.01	54800	33.0	1.0	5.4	<2	<2	
<b>RCEG</b>						<b>0.05</b>	<b>0.0002</b>		<b>0.5</b>	<b>1</b>	<b>0.01</b>			<b>0.02</b>	<b>0.01</b>		<b>65.85</b>	<b>0.015</b>			<b>20</b>	<b>4(m)</b>	<b>1000</b>		

Bold denotes sample not meeting RCEG

All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 5-1 Harbor Receiving Water Quality Data (Station No. 8)

Date	Parameters																						
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	TPH	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen
04-Jan-88	18									<0.1		1.5						7.9	0.009	60300	2.2	0.5	9.6
07-Feb-88	17									<0.1		1.0			<0.01			7.9	0.003	58900	2.1	1.1	8.3
12-Mar-88	19									3.70		5.0			<0.01			7.9	0.006	62000	3.9	1.1	6.8
10-Apr-88	21									1.20		2.1			<0.01			7.8	0.003	61700	1.6	0.7	6.8
10-May-88	25									<0.1					<0.01			7.8	0.005	55900	2.5	0.5	6.4
05-Jun-88	29									<0.1		1.9			<0.01			7.8	0.003	60100	5.0	1.9	6.1
17-Oct-88	30									0.30		3.3						8.2	0.010	59800	3.3	0.3	5.6
12-Dec-88	22									0.10		2.1						8.2	0.007	60600	4.1	0.3	6.6
19-Mar-89	19									<0.1		2.2						8.1	0.006	60800	10.4	0.7	7.0
03-Apr-89	20									<0.1		2.8						8.3	0.004	61200	5.2		6.3
25-Jun-89	29									0.36		2.7						8.2	0.007	58600	4.7	0.2	6.0
25-Jul-89	33									0.68		3.5						8.2	0.005	58700	3.3	0.2	5.6
16-Sep-89	32									0.21		3.2						8.2	0.007	59300	2.8	0.2	5.2
26-Nov-89										<0.1		2.6		<0.01					0.006		3.1	0.2	
10-Dec-89										0.16		2.1		<0.01					0.006		1.4	0.3	
04-Feb-90	17									0.15		2.9						8.0	0.010	60000	2.7	0.2	7.6
08-Apr-90	22											3.7						8.2	0.008	61100	2.9	0.2	5.8
06-May-90	27									0.10		4.3						8.3	0.003	61000	2.8	0.1	7.7
26-Jul-90	34									0.21		3.7						8.3	0.006	59100	4.9	0.6	5.1
22-Sep-90	31									<0.1		4.6						8.3	0.006	59400	2.9	0.7	5.5
11-Nov-91	24									0.39		1.9						7.6	0.008	60600	2.3	0.6	5.3
09-Feb-92	16											1.2		0.02				7.2	0.006	61800	3.7	0.3	8.6
08-Mar-92	17											2.0		0.25				7.3	0.011	62000	3.9	0.6	7.5
27-Apr-92	24											3.5		<0.01				8.1	0.013	62600	6.4	0.6	6.0
26-May-92	27											1.0		<0.01				8.0	0.011	61100	3.4	0.3	7.0
12-Jul-92	32									0.42		1.7		0.03				7.4	0.017	60800	5.4	0.2	6.6
10-Aug-92	33									0.91		1.0		0.01				7.4	0.014	62100	7.9	0.2	8.1
13-Sep-92	32									0.04		2.7		0.13				7.1	0.011	61400	4.5	0.2	6.1
12-Oct-92	28									0.13		1.8		0.05				8.0	0.012	61400	5.2	0.2	7.6
31-Mar-93	22									0.70		3.4		0.11				7.2	0.016	60900	13.3	0.2	7.6
28-Apr-93										0.49		2.6		0.03					0.019		5.9		
25-May-93										0.56		2.3		0.10					0.010		7.0		
23-Jun-93										0.77		2.0		0.11					0.010		11.4		

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 5-2 Harbor Receiving Water Quality Data (Station No. 8)

Date	Parameters																						
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	TPH	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D.Oxygen
19-Jul-93										0.22		2.8		0.10					0.008		10.1	0.2	
09-Aug-93										0.36		2.9		0.13					0.012		10.3		
18-Sep-93										0.47		2.9		0.08				8.3	0.011	59900	7.5		7.4
23-Oct-93										0.53		2.0		0.03				8.2	0.009	57500	3.2	0.1	8.1
23-Nov-93										0.43		2.3		0.03				8.3	0.011	58000	10.8	0.6	7.5
26-Jan-94										0.5		2.4		<0.01				8.3	0.010		69.8	0.6	8.1
20-Mar-94										0.4		2.8		0.09					0.010		9	0.4	6.6
25-May-94	27									0.6		2.8		0.08	0.01			8.2	0.310	61100	3.6		7.2
27-Jul-96	35	0.010	<0.001	0.003	0.019	0.007		0.008	0.018	0.6		10.0		0.01	<0.01		0.01	8.4	<0.01	60000	12	1.0	9.5
30-Sep-96	31	0.002	<0.001	0.003		0.006	0.0009	0.004	0.018	0.7	<0.01	20.0		0.15	<0.01		0.89	8.2	<0.01	52200	15	1.0	
10-Nov-96										0.2	<0.01	22.0		<0.01	<0.01			8.0	<0.01	49400	8	1.0	
08-Dec-96	23	0.002	<0.001	0.003		0.003	0.0022	0.008	0.018	0.1		17.0		0.10	<0.01			8.3	<0.01	56200	17	3.0	
18-May-97	27	0.003	0.001	0.002		0.008	0.0002	0.003	0.017	0.1	<0.01	8.0		0.04	<0.01		1.45	8.2	<0.01	56300	9	1.0	6.5
15-Jun-97	31	0.002	0.001	0.002		0.006	<0.0001	0.002	0.022	0.1	0.07	27.0		0.04	<0.01		1.49	8.3	<0.01	56600	7	2.0	6.3
27-Jul-97	32	0.003	0.001	0.002	0.026	0.015	<0.0001	0.002	0.017	0.5	<0.01	36.0		0.06	<0.01		1.68	8.1	<0.01	59500	5		5.9
12-Aug-97	32	0.003	<0.001	0.003	0.025	0.011	<0.0001	0.002	0.018	1.6	<0.01	46.0		0.02	<0.01		0.88	8.0	<0.01	59600	9	1.0	4.7
14-Dec-97	22	0.003	<0.001	0.002	0.017	0.006	0.0025	0.001	0.017	0.1	<0.01	7.0		0.14	<0.01		0.78	8.3	<0.01	59900	9		6.5
29-Apr-98	27	0.001	<0.001	0.003	0.040	0.006	0.0010	0.003	0.024	0.1	<0.01	5.0		0.17	<0.01	<0.01	0.80	8.2	<0.01	57900	29	1.0	7.8
27-May-98	31	0.001	<0.001	0.003	0.024	0.007	0.0007	0.004	0.022	0.1	<0.01	10.0		0.06	<0.01	<0.01	0.79	8.2		57100	11	1.0	5.8
24-Jun-98	34	0.004	<0.001	0.003	0.018	0.008	<0.0001	0.006	0.016	0.1	<0.01	12.0		0.10	<0.01	<0.01	0.76	8.3	<0.01	56200	5	1.0	5.9
01-Jul-98	32	0.001	<0.001	0.003	0.030	0.008	0.0007	0.009	0.018	0.1	<0.01	7.0		0.04	<0.01	<0.01	0.76	8.1	<0.01	56000	9	1.0	4.0
13-Aug-98	35	0.002	0.001	0.002	0.022	0.009	0.0009	0.006	0.014	0.1	<0.01	6.0	<0.1	0.06	<0.01	<0.01	0.70	8.3	<0.01	57200	6	1.0	4.4
26-Sep-98	33	0.004	<0.001	0.077	0.228	0.012	0.0019	0.007	0.019	0.1	0.01	8.0		0.10	<0.01	<0.01	0.84	8.3	0.010	54900	4	2.0	5.5
28-Oct-98	30	0.003	<0.001	0.004	0.016	0.017	0.0008	0.009	0.025	0.1	<0.01	5.0	0.1	0.16	<0.01	<0.01	0.80	8.2	<0.01	58300	4	1.0	6.2
25-Nov-98	26	0.001	<0.001	0.003	0.061	0.009	0.0006	0.004	0.024	0.1	<0.01	12.0	0.1	0.05	<0.01	<0.01	0.95	8.3	<0.01	53800	10	2.0	6.2
20-Dec-98	23									0.2	<0.01	5.0		0.05	<0.01			8.4	<0.01	58700	4	3.0	6.6
27-Jan-99	19									0.1	<0.01	6.0		0.18	<0.01			8.3	<0.01	58400	3	1.0	7.3
24-Feb-99	21	0.002	<0.001	0.002	0.022	0.008	0.0010	0.004	0.013	<0.1	0.04	4.0	<0.1	0.34	<0.01	<0.01	0.70	8.3	<0.01	58800	18	1.0	7.2
24-Mar-99	24									0.1	<0.01	9.0		0.09	<0.01			8.2	<0.01	55100	16	2.0	6.6
28-Apr-99	28									0.1	0.01	4.0		0.08	<0.01			8.4	<0.01	55800	23	1.0	6.1
26-May-99	29	0.002	<0.001	0.003	0.020	0.005	<0.0001	0.001	0.013	0.2	<0.01	7.0		0.21	<0.01	<0.01	0.77	8.3	<0.01	54900	23	1.0	5.6
23-Jun-99	32									0.3	0.01	5.0		0.07	<0.01			8.3	<0.01	54600	12	2.0	6.2
RCEG						0.05	0.002		0.5	1	0.01				0.01			6.3-8.5	0.015			20	4(m)

Bold denotes sample not meeting RCEG  
All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 6-1 Gulf Water Quality Data (Station No. 11)

Date	Parameters																		
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen
04-Jan-88	20								<0.1	2.6			7.8	0.012	60600	3.3	0.5	7.8	
07-Feb-88	18								<0.1	1.8		<0.01	7.9	0.003	61400	2.1	0.6	7.9	
12-Mar-88	19								2.4	4.5		<0.01	7.9	0.003	62000	1.6	0.5	7.1	
10-Apr-88	21								1.00	2.8		<0.01	7.8	0.003	61100	2.6	0.5	6.8	
10-May-88	25								<0.1			<0.01	7.8	0.008	58000	3.9	0.5	7.2	
05-Jun-88	28								0.10	3.2		<0.01	7.8	0.003	59800	5.0	0.9	6.3	
17-Oct-88	30								0.10	2.8			8.2	0.005	59800	1.1	0.3	5.4	
12-Dec-88	22								<0.1	2.1			8.2	0.004	60600	3.3	0.3	6.6	
19-Mar-89	18								<0.1	2.8			7.9	<0.002	60500	12.3	0.4	7.2	
03-Apr-89	19								<0.1	3.3			8.3	0.006	61000	5.5		6.5	
25-Jun-89	29								0.29	3.6			8.2	<0.002	58300	2.4	0.2	5.9	
25-Jul-89	33								1.11	3.5			8.4	0.002	58500	4.3	0.2	5.6	
16-Sep-89	32								0.13	3.4			8.2	0.002	59000	2.5	0.2	5.6	
26-Nov-89									<0.1	2.5	<0.01			0.004		1.9	0.3		
10-Dec-89									0.10	2.5	<0.01			0.026		3.5	0.2		
04-Feb-90	17								0.26	4.2			8.0	0.016	59500	3.4	0.2	6.9	
08-Apr-90	22								<0.1	4.0			8.2	0.007	60800	2.0	0.2	5.8	
06-May-90	25								<0.1	3.7			8.3	0.002	60300	3.2	0.2	7.8	
26-Jul-90	34								0.12	2.8			8.3	0.002	58400	2.0	0.5	5.7	
22-Sep-90	31								<0.1	2.6			8.4	0.005	59400	2.6	0.6	5.5	
11-Nov-91	26								0.44	2.4			7.6	0.008	60400	3.9	0.4	5.3	
09-Feb-92	17									1.2	0.02		7.5	0.006	61700	3.0	0.3	6.8	
08-Mar-92	18									2.2	0.02		7.4	0.011	62300	1.4	0.6	8.9	
27-Apr-92	24									3.8	<0.01		8.0	0.008	62400	18.7	0.6	7.6	
26-May-92	27									1.4	<0.01		7.6	0.010	62700	5.2	0.8	5.2	
12-Jul-92	31								0.27	1.7	<0.01		7.4	0.012	61100	17.8	0.2	5.4	

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 6-2 Gulf Water Quality Data (Station No. 11)

Date	Parameters																		
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen
10-Aug-92	33								0.07	2.6	<0.01			7.3	0.013	62100	4.9	0.2	9.0
13-Sep-92	32								0.03	2.3	0.06			7.3	0.013	61000	4.7	0.2	7.0
12-Oct-92	28								0.07	2.2	0.06			7.6	0.013	61600	7.3	0.2	6.5
31-Mar-93	21								0.82	2.5	0.08			7.2	0.018	60900	17.1	0.2	7.5
28-Apr-93									0.46	3.3	0.04				0.018		17.2		
25-May-93									0.51	1.6	0.09				0.011		11.5		
23-Jun-93									0.84	1.8	0.05				0.012		11.9		
19-Jul-93									0.35	3.4	0.06				0.008		6.6	0.2	
09-Aug-93									0.52	3.8	0.09				0.018		14.0		
18-Sep-93									0.42	2.2	0.1			8.2	0.011	60900	17.6		7.3
23-Oct-93									0.53	2.1	0.01			8.2	0.010	58100	3.1	0.1	8.0
23-Nov-93									0.46	2.1	0.04			8.2	0.014	57200	14.9	0.6	7.6
26-Jan-94									0.8	3.3	<0.01			8.3	0.010		59.6	0.5	8.0
20-Mar-94									0.4	3.3	0.12				1.000		8.3	0.5	6.7
25-May-94	26								0.5	2.9	0.08	0.03		8.0	0.620	58700	3.2		7.0
27-Jul-96	35	0.011	<0.001	0.003	0.020	0.005		0.007	0.019	0.4	9.0	<0.01	<0.01	8.3	<0.01	60000	23.0	1.0	7.0
30-Sep-96	31	0.007	<0.001	0.004		0.010	0.0006	0.008	0.022	1.0	22.0	0.17	<0.01	7.9	<0.01	52500	8.0	1.0	7.3
10-Nov-96										0.4	22.0	0.03	<0.01	8.0	0.010	47900	15.0	1.0	
08-Dec-96	23	0.003	<0.001	0.003		0.004	0.0006	<0.001	0.028		31.0	0.34	<0.01	8.4	<0.01	55900	2.0	1.0	
18-May-97	27	0.011	0.001	0.002		0.006	0.0003	0.003	0.020	0.2	15.0	0.01	<0.01	8.2	<0.01	55700	4.0	1.0	6.7
15-Jun-97	31	0.003	0.002	0.003		0.006	0.0010	0.005	0.022	0.1	8.0	0.10	<0.01	8.3	<0.01	56300	8.0	2.0	6.1
27-Jul-97	31	0.003	0.001	0.003	0.029	0.016	<0.0001	0.002	0.021	0.5	33.0	0.06	<0.01	8.1	<0.01	58900	9.0	1.0	6.3
12-Aug-97	32	0.003	<0.001	0.003	0.033	0.009	<0.0001	0.001	0.022	0.3	27.0	0.01	<0.01	8.1	<0.01	59200	3.0	1.0	5.3
14-Dec-97	22	0.004	<0.001	0.003	0.012	0.005	0.0008	0.003	0.040	0.2	7.0	0.17	<0.01	8.3	<0.01	60000	9.0		6.9
29-Mar-98	21	0.001	0.001	0.002	0.026	0.014	0.0009	0.004	0.014	0.1	2.0	0.05	<0.01	8.2	<0.01	57700	12.0	2.0	7.3
29-Apr-98	24	0.002	<0.001	0.002	0.079	0.007	0.0008	0.010	0.021	0.2	7.0	0.07	<0.01	8.3	<0.01	57400	28.0	4.0	7.6
27-May-98	30	0.001	<0.001	0.002	0.014	0.005	0.0006	<0.001	0.014	0.1	8.0	0.12	<0.01	8.3	<0.01	56000	38.0	<1	6.4
24-Jun-98	33	0.001	<0.001	0.002	0.017	0.013	<0.0001	0.007	0.051	0.1	10.0	0.09	<0.01	8.3	<0.01	55500	14.0	1.0	5.9

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 6-3 Gulf Water Quality Data (Station No. 11)

Date	Parameters																		
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen
12-Aug-97	32	0.003	<0.001	0.003	0.033	0.009	<0.0001	0.001	0.022	0.3	27.0	0.01	<0.01	8.1	<0.01	59200	3.0	1.0	5.3
14-Dec-97	22	0.004	<0.001	0.003	0.012	0.005	<b>0.0008</b>	0.003	0.040	0.2	7.0	0.17	<0.01	8.3	<0.01	60000	9.0		6.9
29-Mar-98	21	0.001	0.001	0.002	0.026	<b>0.014</b>	<b>0.0009</b>	0.004	0.014	0.1	2.0	0.05	<0.01	8.2	<0.01	57700	12.0	2.0	7.3
29-Apr-98	24	0.002	<0.001	0.002	0.079	0.007	<b>0.0008</b>	0.010	0.021	0.2	7.0	0.07	<0.01	8.3	<0.01	57400	28.0	4.0	7.6
27-May-98	30	0.001	<0.001	0.002	0.014	0.005	<b>0.0006</b>	<0.001	0.014	0.1	8.0	0.12	<0.01	8.3	<0.01	56000	38.0	<1	6.4
24-Jun-98	33	0.001	<0.001	0.002	0.017	<b>0.013</b>	<0.0001	0.007	0.051	0.1	10.0	0.09	<0.01	8.3	<0.01	55500	14.0	1.0	5.9
30-Jul-98	35	0.002	<0.001	0.002	0.022	0.007	<b>0.0006</b>	0.007	0.015	0.1	8.0	0.05	<0.01	8.3	<0.01	56000	19.0	1.0	5.5
17-Aug-98	36	0.002	<0.001	0.002	0.029	0.007	<b>0.0011</b>	0.006	0.016	0.1	7.0	0.04	<0.01	8.4	<0.01	56100	11.0	1.0	5.7
26-Sep-98	34	0.004	<0.001	0.005	0.045	0.007	<b>0.0025</b>	0.005	0.016	0.1	9.0	0.04	<0.01	8.4	<0.01	52800	5.0	2.0	6.6
06-Oct-98	32	<b>0.007</b>	<0.001	0.003	0.027	0.008	<b>0.0012</b>	0.010	0.015	0.2	8.0	0.05	<0.01	8.4	<0.01	55800	9.0	3.0	6.1
25-Nov-98	25	0.001	<0.001	0.003	0.046	0.008	<b>0.0007</b>	0.003	0.017	0.1	4.0	0.05	<0.01	8.3	<0.01	53600	3.0	1.0	6.5
30-Dec-98	23									0.1	4.0	0.06	<0.01	8.4	<0.01	58400	4.0	2.0	6.7
27-Jan-99	19									0.2	6.0	0.12	<0.01	8.3	<0.01	58300	18.0	1.0	7.0
24-Feb-99	20	<b>0.002</b>	<0.001	0.002	0.046	0.009	<b>0.0014</b>	0.005	0.015	0.2	7.0	0.34	<0.01	8.3	<0.01	58400	19.0	<1	7.1
24-Mar-99	22									0.2	9.0	0.09	<0.01	8.3	<0.01	54200	14.0	1.0	6.9
28-Apr-99	26									0.2	5.0	0.06	<0.01	8.4	<0.01	54800	20.0	2.0	6.5
26-May-99	28	0.001	<0.001	0.003	0.018	0.007	<0.0001	0.002	0.008	0.2	12.0	0.25	<0.01	8.4	<0.01	54300	21.0	1.0	6.2
23-Jun-99	31									0.2	1.0	0.04	<0.01	8.3	<0.01	54100	26.0	<1	6.0
<b>RCEG</b>		<b>0.005</b>	<b>0.05</b>	<b>0.1</b>		<b>0.01</b>	<b>0.0001</b>	<b>0.1</b>	<b>0.1</b>				<b>0.01</b>	<b>6.5-8.4</b>	<b>0.008</b>			<b>10</b>	<b>4(min)</b>

Bold denotes sample not meeting RCEG

All units in mg/l unless otherwise stated



Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 7-1 Gulf Water Quality Data (Station No. 13)

Date	Parameters																				
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
03-Jan-88	13									<0.1	1.8			8.1	0.011	61900	1.8	1.6	7.3		
07-Feb-88	16									<0.1	1.0		<0.01	7.9	0.003	62000	5.5	1.1			
12-Mar-88	20									3.80	4.7		<0.01	7.9	0.005	63200	4.1	1.1	6.9		
10-Apr-88	22									2.20	2.8		<0.01	7.9	0.003	62200	2.3	1.9	6.7		
08-May-88	26									0.15			<0.01	7.9	0.008	62200	8.1	2.9	6.0		
05-Jun-88	29									<0.1	1.4		<0.01	7.8	0.003	62100	3.4	1.7	5.6		
17-Oct-88	29									0.50	3.3			8.3	0.014	61400	4.9	0.6	5.8		
12-Dec-88	20									0.51	3.1			8.3	0.007	61700	4.2	0.4	7.6		
07-Feb-89	12										3.8			8.2	0.004	62100	2.6	0.6	7.4		
19-Mar-89	19									<0.1	2.6			8.5	0.005	61900	6.9	0.5	7.1		
03-Apr-89	19									0.21	2.9		<0.01	8.3	0.003	62600	7.7		6.3		
25-Jun-89	30									0.84	3.6			8.2	0.005	60300	4.7	0.4	5.4		
25-Jul-89	34									0.56	2.8			8.2	0.004	59000	1.3	0.2	5.5		
16-Aug-89	32									<0.1	3.8			8.2	0.002	60700	4.8	0.5	5.6		
16-Sep-89	31									0.68	5.0			8.3	0.007	60800	2.8	0.2	5.4		
04-Feb-90	17									<0.1	3.6			8	0.015	60300	2.4	0.2	6.5		
08-Apr-90	23									<0.1	3.1			8.3	0.007	62100	2.5	0.2	5.8		
06-May-90	27									0.15	3.1			7.5	0.003	61900	2.0	0.2	7.2		
26-Jul-90	33									0.29	3.6			8.2	0.004	60500	2.8	0.3	5.6		
22-Sep-90	31									<0.1	3.1			8.3	0.006	61300	4.8	0.8	5.4		
13-Nov-89										0.37	2.8	<0.01			0.004		5.5	0.6			
10-Dec-89										<0.1	3.1	<0.01			0.003		2.8	0.2			
17-Oct-90	28									0.08	3.6			8.4	0.005	61500	4.4	0.5	5.5		
21-Nov-90	21									0.04	2.7			7.8	0.004	62200	2.2	0.3	5.3		
19-Dec-90	20									0.19	2.3			7.8	0.002	61200	1.9	0.2	5.4		
29-Sep-91	29									0.20	2.8			7.3	0.008	61100	4.5	0.5	6.7		
13-Oct-91	28									0.18	2.8			8.3	0.006	61500	5.3	0.5	6.3		
11-Nov-91	23									0.43	1.1			8.2	0.007	62200	3.6	0.9	5.9		
26-Jan-92	13										1.5	<0.01		7.7	0.008	62200	12.3	0.2	7.4		
09-Feb-92	16										2.3	0.03		7.6	0.007	61900	1.7	0.3	6.5		
08-Mar-92	17										2.1	0.01		7.0	0.006	61500	2.6	0.5	6.9		
27-Apr-92	24										3.1	<0.01		8.0	0.003	62900	5.3	0.9	5.0		
26-May-92	28										1.4	<0.01		8.1	0.018	62800	7.2	0.7	6.5		
12-Jul-92	32									0.73	1.6	<0.01		7.4	0.012	61200	4.7	0.2	6.3		
10-Aug-92	33									0.15	2.5	0.07		6.5	0.011	62300	8.1	0.2	6.4		

Continued...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 7-2 Gulf Water Quality Data (Station No. 13)

Date	Parameters																				
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T.C (MPN/100ml)	F.C (MPN/100ml)
13-Sep-92	33									0.03	3.3	0.02		7.1	0.012	48600	16.3	0.2	6.5		
12-Oct-92	28									0.10	2.5	0.23		8.0	0.012	62000	20.6	0.2	6.3		
31-Mar-93	23									0.65	3.1	0.13		7.1	0.015	61100	10.9	0.2	6.8		
28-Apr-93										0.48	3.8	0.11			0.021		8.2				
18-May-93										0.77	2.4	0.06			0.013		8.6				
23-Jun-93										0.72	1.9	0.15			0.010		16.0				
11-Jul-93										0.35	3.8	0.17			0.016		21.9	0.2			
09-Aug-93										0.32	3.8	0.15			0.012		24.5				
18-Sep-93										0.39	3.1	0.10		8.2	0.014	63900	10.6		7.9		
16-Oct-93										0.47	3.1	0.02		8.3	0.008	60100	15.6	0.1	8.0		
23-Nov-93										0.37	2.5	0.10		8.2	0.012	58800	8.7	0.5	7.6		
26-Dec-93										1.01	3.8	0.14		7.8	0.009	60200	7.4	0.2	7.6		
26-Jan-94										0.74	2.1	0.09		8.3	0.010		66.7	0.5	8.0		
20-Mar-94										0.07	2.4	0.08			0.010		16.3	1.0	7.4		
30-Apr-94										0.10	3.4		<0.01	8.2	0.300		66.2		7.5		
25-May-94										0.60	2.2	0.10	0.03	8.2	0.310	59300	3.1		7.0		
04-Sep-94	32			0.004	0.023	0.01		0.038	0.008	1.00	6.0	0.04		8.1	0.810	51000		1.6	6.6		
18-Oct-94	29									1.00	2.9	0.11		8.1	0.700	55400	2.8	2.5	6.5		
27-Nov-94	25	0.001	<0.001	0.05	0.007	<0.01		0.02	0.002	0.91	3.0	0.01	0.03	8.2	0.016	53000		2.6	8.2		
23-Jan-95	16	0.001	0.003	0.064	0.091	0.01		0.025	0.094	0.90	6.5	0.03		8.0	0.040	53200	27.8	2.5	4.9		
13-Feb-95	20									1.20	6.9	0.10		8.0	0.010	49600	27.1	4.4	3.5		
23-Mar-95	22									1.10	7.7	0.05		8.1	0.020	50900	40.6	1.9	2.8		
19-Apr-95	25	<0.001	<0.001	<0.005	0.02	<0.01		<0.05	<0.01	3.10	12.2	0.21		8.9	0.300	23900	9.8	5.3	5.0		
28-May-95	31									1.50	7.9	0.35		8.3	0.030	52100	8.1	5.1	7.5		
26-Jun-95		<0.001	<0.001	<0.005	0.13	<0.01		<0.05	0.02	1.40	7.4	0.08		8.4	0.010	56200	10.1	2.0	7.1		
17-Jul-95	34									1.20	2.1	0.11	<0.01	8.1	<0.01	39800	22.0	95.7	6.0		
14-Aug-95	33									0.90	7.2	0.08	<0.01	8.1	<0.01	42400	71.0	15.3	6.2		
23-Sep-95	28	<0.005	<0.001	0.006	0.02	<0.01		<0.05	<0.01	0.60	3.1	<0.01	<0.01	8.3	<0.01	43700	19.0	18.0	6.2		
19-Oct-95	28									0.55	22.1	0.30		8.3	<0.01	49400	16.0	16.0	5.2		
07-Nov-95	24									0.66	8.3	0.03		8.4	<0.01	53100	14.0	12.8	6.8		
13-Jan-96	18									0.50	9.7	0.09	<0.01	8.1	0.030	50100	93.0	132.0	7.5		
10-Feb-96	20									0.30	4.4	0.04		8.3	<0.01	49500	5.0	9.0	7.2		
09-Mar-96	20	0.004	<0.001	0.006	0.044	0.016		0.014	0.034	0.50	9.8	0.15		8.3	<0.01	53100	19.0	6.0	7.2		
12-Apr-96	25									0.40	4.3	0.06		8.2	<0.01	53300	14.0	13.0	7.5		
19-May-96	35									0.50	10.9	0.04	<0.01	8.2	<0.01	59500	12.0	26.0	6.8		
10-Jun-96	34	0.002	<0.001	0.003	0.013	0.003		0.005	0.004	0.90	20.5	0.11	<0.01	8.3	<0.01	57700	10.0	9.0	5.4		

Continued...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 7-3 Gulf Water Quality Data (Station No. 13)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
02-Jul-96	31									0.70	11.0	0.05	<0.01	8.2	<0.01	64200	4.0	1.0	7.0		
04-Aug-96	31									0.90	14.0	0.04	<0.01	8.2	<0.01	65400	11.0	1.0	6.2	<2	<2
08-Sep-96	35	0.002	<0.001	0.005		0.011	0.0013	0.007	0.012	0.60	9.0	0.05	<0.01	8.3	<0.01	58400	8.0	1.0	6.0	<2	<2
31-Oct-96	25									0.70	34.0	0.08	<0.01	8.4	0.020	55700	25.0	9.0	6.1	9	3
20-Nov-96	24									0.10	25.0	0.04	<0.01	8.3	<0.01	51400	2.0	3.0	6.5	<2	<2
08-Dec-96	21	0.002	<0.001	0.003		0.003	0.0024	0.001	0.023		31.0	0.20	<0.01	8.4	0.010	56500	3.0	4.0		<2	<2
18-Jan-97	18									0.10	6.0	0.04	<0.01	8.2	<0.01	55200	19.0	6.0	7.6	<2	<2
10-Mar-97	16	0.002	<0.001	0.005		0.005		0.011	0.206	0.30	12.0	0.15	<0.01	8.1	0.050	53200	53.0	25.0	7.9	22	14
13-Apr-97										0.20	8.0	0.09	<0.01	8.3	<0.01	58200	6.0	4.0	7.1		
12-May-97	28	0.002	0.001	0.003		0.013	<0.0001	0.011	0.021	0.40	14.0	0.04	<0.01	8.3	<0.01	62100	30.0	2.0	6.5	<2	<2
12-Jun-97	32	0.003	0.001	0.003		0.012	<0.0001	0.006	0.022	0.10	26.0	0.09	<0.01	8.3	<0.01	58400	26.0	1.0	6.4	<2	<2
17-Jul-97	31	0.002	<0.001	0.003		0.012	<0.0001	0.004	0.019	0.30	38.0	0.11	<0.01	8.3	<0.01	56100	22.0	6.0	6.9	<2	<2
19-Aug-97	32	0.001	<0.001	0.002	0.095	0.010	0.0013	0.003	0.017	0.20	33.0	0.06	<0.01	8.4	<0.01	56200	14.0	12.0	6.6	<2	<2
09-Sep-97	28	0.005	0.001	0.002	0.023	0.011	0.0011	0.007	0.013	0.10	8.0	0.09	<0.01	8.3	<0.01	55700	13.0	2.0	7.4	<2	<2
27-Oct-97	26	0.003	0.001	0.002	0.029	0.010		0.007	0.016	0.10	36.0	0.27	<0.01	8.2	<0.01	50100	12.0	2.0		<2	<2
18-Nov-97	22	0.001	<0.001	0.003	0.106	0.011	0.0011	0.006	0.029	0.40	6.0	0.07	<0.01	8.4	<0.01	50700	10.0	3.0	7.8	<2	<2
23-Dec-97	16	0.001	<0.001	0.002	0.062	0.010	0.0007	0.002	0.015	0.10	9.0	0.04	<0.01	8.3	<0.01	60400	10.0	1.0	7.9	<2	<2
25-Jan-98	20	0.002	<0.01	0.004	0.103	0.009	0.0009	0.007	0.018	0.20	7.0	0.05	<0.01	8.3	<0.01	59200	16.0	6.0	7.3	70	70
11-Feb-98	24	0.001	0.002	0.002	0.074	0.006	0.0014	0.003	0.025	0.10	13.0	0.04	<0.01	8.4	<0.01	58300	13.0	9.0	7.0	11	7
15-Mar-98	24	0.003	<0.001	0.006	0.026	0.009	0.0007	0.004	0.018	0.20	8.0	0.15	<0.01	8.4	0.010	56300	15.0	2.0	7.3	>1600	4
13-Apr-98	28	0.001	<0.001	0.005		0.008	0.0006	0.005	0.029	0.10	7.0	0.07	<0.01	8.3	<0.01	58800	13.0	25.0	6.1	<2	<2
06-May-98	28	0.001	<0.001	0.002	0.019	0.002	0.0006	0.003	0.018	0.20	6.0	0.12	<0.01	8.3	<0.01	60100	27.0	4.0	7.1	<2	<2
07-Jun-98	32	0.001	<0.001	0.004	0.021	0.006	0.0009	0.001	0.019	0.10	11.0	0.05	<0.01	8.3	<0.01	57300	4.0	2.0	6.3	<2	<2
12-Jul-98		0.002	0.001	0.002	0.134	0.006	0.0009	0.009	0.009	0.10	12.0	0.04	<0.01	8.3	<0.01	58300	20.0	33.0	6.3	>1600	>1600
08-Aug-98	34	0.002	<0.01	0.002	0.025	0.009	0.0009	0.005	0.011	0.10	6.0	0.05	<0.01	8.3	<0.01	58400	8.0	2.0	6.8	<2	<2
16-Sep-98	33	0.004	<0.001	0.002	0.206	0.008	0.0022	0.002	0.010	<0.1	10.0	0.07	<0.01	8.3	<0.01	56800	10.0	2.0	6.4	<2	<2
10-Oct-98	31	0.004	<0.001	0.003	0.025	0.008	0.0003	0.006	0.012	0.60	4.0	0.10	<0.01	8.3	<0.01	54800	6.0	2.0	6.5	<2	<2
08-Nov-98	21	0.002	<0.001	0.002	0.020	0.010	0.0011	0.004	0.011	<0.1	4.0	0.10	<0.01	8.3	<0.01	54800	6.0	1.0	<2	<2	<2
20-Dec-98	20									0.40	5.0	0.06	<0.01	8.3	<0.01	58200	8.0	3.0	7.4	<2	<2
26-Jan-99	13									0.40	7.0	0.08	<0.01	8.2	<0.01	59000	3.0	1.0	7.7	<2	<2
10-Feb-99	21									0.10	7.0	0.20	<0.01	8.3	<0.01	59400	25.0	8.0	7.5	<2	<2
08-Mar-99	21	0.003	<0.001	0.004	0.034	0.010	0.0005	0.005	0.024	<0.1	11.0	0.24	<0.01	8.3	<0.01	60000	25.0	3.0	7.4	<2	<2
15-Apr-99	23									0.10	6.0	0.08	<0.01	8.4	<0.01	55800	18.0	1.0	7.1	<2	<2
16-May-99	28									0.30	9.0	0.06	<0.01	8.4	<0.01	56700	23.0	2.0	7.0	<2	<2
13-Jun-99	31	0.003	<0.001	0.002	0.041	0.007		0.006	0.012	0.20	2.0	0.12	<0.01	8.4	0.010	55100	22.0	<1	6.8	280	17
RCEG		0.005	0.05	0.1		0.01	0.0001	0.1	0.1				0.01	6.5-8.5	0.008			10	4(min)	230	

Bold denotes sample not meeting RCEG  
All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 8-1 Gulf Water Quality Data (Station No. 16)

Date	Parameters																				
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	TC (MPN/100ml)	FC (MPN/100ml)
03-Jan-88	14									<0.1	2.3			7.9	0.012	61800	4.6	1.8	7.9		
07-Feb-88	13									<0.1	2.3		<0.01	7.9	0.003	62300	3.7	2.2	5.9		
12-Mar-88	19									<0.1	1.0		<0.01	7.9	0.003	62700	6.4	2.3	6.9		
10-Apr-88	22									1.20	3.0		<0.01	7.9	0.003	62900	3.0	1.7	6.6		
08-May-88	25									2.76			<0.01	7.8	0.008	60600	8.1	2.9	5.8		
05-Jun-88	28									<0.1	3.9		<0.01	7.9	0.003	60700	6.9	2.5	5.4		
17-Oct-88	29									0.10	2.7			8.2	0.012	61500	4.1	0.7	5.3		
13-Nov-88	25									0.40	4.2			8.1	0.007	61000	5.2	1.5	6.2		
12-Dec-88	19									0.18	3.8			8.1	0.007	61500	2.1	0.5	7.2		
07-Feb-89	13										4.0			8.1	0.012	61300	3.8	0.8	7.3		
05-Mar-89	19									<0.1	2.2			8.3	<0.003	61900	1.0	0.2	6.8		
03-Apr-89	19									<0.1	5.4			8.2	0.004	61800	4.9		6.7		
25-Jun-89	30									0.48	3.3			8.1	<0.002	59800	7.0	0.6	5.5		
25-Jul-89	34									0.58	4.2			8.2	0.004	60100	5.3	0.4	5.5		
16-Aug-89	32									<0.1	3.6			8	0.002	59900	3.2	0.5	5.5		
16-Sep-89	30									0.15	3.3			8.1	0.004	61000	3.3	0.5	5.4		
13-Nov-89										<0.1	3.2				<0.01		5.7	0.2			
10-Dec-89										0.20	2.8	<0.01			0.005		2.8	0.2			
04-Feb-90	16									0.21	2.8			7.9	0.006	60600	4.0	0.4	6.8		
08-Apr-90	23									<0.1	5.2			8.2	0.007	61900	3.7	0.2	5.7		
06-May-90	27									<0.1	5.2			8.1	0.002	61600	3.7	0.2	5.4		
26-Jul-90	33									0.20	3.8			8.2	0.003	60700	4.8	0.2	5.9		
22-Sep-90	30									0.20	3.0			8.4	0.005	60700	1.2	0.8	5.9		
17-Oct-90	28									0.07	3.3			8.3	0.005	60900	2.8	0.4	5.9		
21-Nov-90	21									0.43	3.6			8.0	0.003	62000	1.8	0.3	5.1		
19-Dec-90	20									0.47	3.4			7.8	0.003	61200	7.5	0.2	5.4		
29-Sep-91	29									0.23	2.6			7.4	0.023	60800	4.4	0.4	6.8		
13-Oct-91	28									0.12	2.3			7.5	0.006	61200	7.4	0.5	6.4		
11-Nov-91	23									0.49	2.4			7.8	0.007	61900	3.6	1.0	5.7		
26-Jan-92	13										1.5	<0.01		7.6	0.007	61800	7.4	0.3	8.0		
09-Feb-92	16										2.3	0.01		8.0	0.003	61600	2.9	0.4	7.5		
08-Mar-92	17										2.3	0.01		8.0	0.007	61900	2.3	0.5	7.0		
27-Apr-92	25										3.2	<0.01		8.1	0.012	62500	10.9	1.0	8.0		
26-May-92	27										1.2	0.03		7.5	0.012	62900	12.7	0.5	6.3		
12-Jul-92	31									0.19	2.2	<0.01		7.4	0.012	61200	5.9	0.2	6.9		

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 8-2 Gulf Water Quality Data (Station No. 16)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	TC (MPN/100ml)	FC (MPN/100ml)
10-Aug-92	33									<0.1	2.3	<0.01		8.0	0.012	62300	21.2	0.2	6.4		
13-Sep-92	32									0.19	2.6	0.02		8.0	0.010	61900	3.2	0.2	6.1		
12-Oct-92	28									<0.1	1.7	0.18		8.1	0.012	61400	24.2	0.2	7.3		
31-Mar-93	21									0.91	2.8	0.21		6.9	0.016	61100	15.0	0.2	7.2		
28-Apr-93										0.39	3.8	0.14			0.014		10.8				
18-May-93										0.39	2.9	0.06			0.011		7.9				
23-Jun-93										0.57	2.1	0.13			0.012		13.3				
11-Jul-93										0.31	4.1	0.18			0.017		28.7	0.2			
09-Aug-93										0.30	3.5	0.17			0.011		16.8				
18-Sep-93										0.32	2.8	0.11		8.3	0.013	64300	7.8		7.7		
16-Oct-93										0.37	2.7	0.02		8.3	0.009	60400	10.8	0.1	8.3		
23-Nov-93										0.33	2.3	0.01		8.2	0.013	57300	6.2	0.7	7.8		
26-Dec-93										1.02	2.8	0.13		8.0	0.010	59500	1.3	0.4	7.7		
25-Jan-94										0.50	2.1	<0.01		8.3	0.010		59.5	1.4	7.9		
20-Mar-94										0.10	6.5	0.08			0.010		23.7	1.8	8.0		
30-Apr-94										0.06	3.3	0.03	<0.01	6.5	0.250		77.8		7.7		
25-May-94										0.20	2.9	0.11	0.03	8.2	0.500	60500	30.0		7.1		
04-Sep-94	32			0.006	0.059	0.01		0.054	0.021	0.50	2.7	0.08		8.2	1.120	49700	0.1	3.4	6.9		
18-Oct-94	28									0.50	10.3	0.05		8.0	0.600	55000		15.5	6.2		
27-Nov-94	25	0.001	<0.001	0.063	0.005	<0.01		0.019	0.002	0.67	3.0	0.18	0.03	8.2	0.008	56600		1.2	8.9		
23-Jan-95	16	0.001	0.003	0.07	0.071	0.01		0.025	0.063	0.60	6.9			8.1	0.040	49100	84.2	1.4	4.0		
13-Feb-95	19									0.80	6.4	0.04		7.8	<0.01	50700	38.3	4.8	4.5		
23-Mar-95	23									1.00	6.6	0.01		8.2	0.030	51700	9.0	5.6	7.0		
13-Apr-95	24									1.72	5.6	0.15		8.1	<0.01	52400	63.9	3.1	6.3		
28-May-95	30									1.03	5.7	0.15	<0.01	8.4	<0.01	57300	13.6	4.8	8.0		
26-Jun-95		<0.01	<0.001	<0.005	0.01	<0.01		<0.05	0.019	0.51	6.0	0.05		8.2	0.010	54400	26.2	5.2	2.4		
17-Jul-95	32									1.40	2.2	0.11	<0.01	8.1	<0.01	44808	30.0		5.9		
14-Aug-95	32									1.40	6.8	0.13	<0.01	8.1	<0.01	43400	11.0	15.0	6.6		
23-Sep-95	30	0.003	<0.001	<0.005	0.028	<0.01		<0.05	<0.01	0.70	5.4	0.11	<0.01	8.3	<0.01	43000	13.0	70.5	6.4		
19-Oct-95	27									0.58	31.5	0.30		8.3	0.010	47100	13.0	22.3			
07-Nov-95	25									0.44	5.8	0.05		8.4	<0.01	53900	3.0	17.9			
13-Jan-96	21									0.40	9.9	0.10	<0.01	8.1	0.020	50400	98.0	88.0	5.5		
26-Feb-96	19									0.70	11.1	0.01	<0.01	8.3	<0.01	45300	14.0	90.0	8.0		
17-Apr-96	28									0.60	4.0	0.03		8.5	0.010	61300	15.0	19.0	6.5		
19-May-96	38									0.60	12.2	0.08	<0.01	8.4	<0.01	62300	20.0	67.0	6.8		
10-Jun-96	31	0.002	0.002	0.008	0.018	0.014		0.008	0.011	0.60	11.2	0.02	<0.01	8.2	<0.01	57200	9.0	17.0	6.4		

Continued...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 8-3 Gulf Water Quality Data (Station No. 16)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (omis)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
02-Jul-96	32									0.90	13.0	<0.01	<0.01	8.2	<0.01	58200	15.0	4.0	7.0		
04-Aug-96	29									1.20	14.0	0.02	<0.01	8.2	<0.01	65300	14.0	1.0	6.6	<3	<3
08-Sep-96	36	0.002	<0.001	0.003		0.004	0.0009	0.005	0.016	0.90	10.0	0.08	<0.01	8.3	<0.01	56600	7.0	4.0	7.0	7	7
30-Oct-96	29									0.80	48.0	0.75	<0.01	8.7	0.010	52800	5.0	1.0	6.2	<3	<3
20-Nov-96	24									0.20	35.0	<0.01	<0.01	8.3	<0.01	51200	22.0	1.0	7.3	<3	<3
01-Dec-96		0.002	<0.001	0.004		0.006	0.0002	0.004	0.023	0.60	20.0	0.22	<0.01	8.3	<0.01	52000	15.0	2.0		<3	<3
05-Jan-97										0.10	5.0	<0.01	0.19	8.3	<0.01	55600	5.0	2.0		<2	<2
10-Mar-97	16	0.002	<0.001	0.002		0.003		0.004	0.037		5.0	0.17	<0.01	8.5	0.020	55600	9.0	13.0	8.0	26	22
13-Apr-97	20									0.20	9.0	0.27	<0.01	8.4	<0.01	57900	6.0	15.0	8.1		
12-May-97	28	0.002	0.001	0.003		0.012	0.0002	0.010	0.023	0.10	11.0	0.06	<0.01	8.3	<0.01	61500	6.0	3.0	6.5	<2	<2
07-Jun-97	32	0.002	0.001	0.003		0.007	<0.0001	0.006	0.021	0.20	23.0	0.04	<0.01	8.5	<0.01	59000	20.0	2.0	8.2	<2	<2
17-Jul-97	30	0.002	0.001	0.004		0.012	<0.0001	0.003	0.027	0.10	35.0	0.12	<0.01	8.3	<0.01	57500	19.0	6.0	6.2	<2	<2
19-Aug-97	30	0.001	0.001	0.002	0.094	0.008	0.0012	0.010	0.013	0.40	38.0	0.07	<0.01	8.3	<0.01	56700	16.0	9.0	5.8	<2	<2
09-Sep-97	28	0.006	0.001	0.003	0.044	0.012	0.0014	0.008	0.015	0.10	5.0	0.04	<0.01	8.3	<0.01	55800	9.0	3.0	6.7	<2	<2
27-Oct-97	26	0.003	0.001	0.002	0.035	0.008		0.006	0.017	<0.1	67.0	0.06	<0.01	8.3	0.010	49700	17.0	4.0		<2	<2
18-Nov-97	22	0.002	0.001	0.003	0.038	0.017	0.0008	0.009	0.022	0.50	5.0	0.26	<0.01	8.3	<0.01	56200	10.0	3.0	7.5	<2	<2
23-Dec-97	17	0.001	<0.001	0.002	0.040	0.009	0.0009	0.001	0.016	0.30	6.0	0.05	<0.01	8.3	<0.01	60000	12.0	2.0	7.7	<2	<2
07-Jan-98	18	0.001	0.001	0.005	0.028	0.011	0.0008	0.002	0.020	0.20	7.0	0.10	<0.01	8.3	<0.01	58100	10.0	1.0	7.6	<2	<2
16-Feb-98	18	0.002	<0.001	0.002	0.027	0.011	<0.0001	0.003	0.038	0.20	2.0	0.11	<0.01	8.3	<0.01	59700	12.0	1.0	7.6	<2	<2
15-Mar-98	22	0.003	<0.001	0.002	0.021	0.010	0.0006	0.004	0.016	0.20	5.0	0.12	<0.01	8.4	<0.01	58300	10.0	2.0	7.3	<2	<2
14-Apr-98	26	0.002	<0.001	0.002		0.009	0.0009	0.004	0.016	1.80	3.0	0.05	<0.01	8.3	<0.01	59500	10.0	1.0	6.6	<2	<2
06-May-98	27	0.001	<0.001	0.004	0.019	0.003	0.0004	0.004	0.017	0.20	6.0	0.06	<0.01	8.2	0.010	60200	26.0	3.0	6.3	<2	<2
08-Jun-98	31	0.001	<0.001	0.002	0.027	0.003	0.0006	<0.001	0.012	0.10	9.0	0.09	<0.01	8.2	<0.01	57500	23.0	5.0	5.5	<2	<2
08-Jul-98	32	0.001	<0.001	0.002	0.040	0.005	0.0011	0.003	0.021	0.20	6.0	0.06	<0.01	8.3	<0.01	57600	5.0	4.0	5.9	<2	<2
02-Aug-98	35	0.003	<0.001	0.002	0.033	0.005	0.0010	0.005	0.019	0.10	7.0	0.05	<0.01	8.3	<0.01	57700	3.0	2.0	5.5	<2	<2
02-Sep-98	35	0.001	<0.001	0.004	0.061	0.008	0.0017	0.002	0.019	<0.1	9.0	0.07	<0.01	8.2	<0.01	58000	11.0	2.0	5.4	<2	<2
07-Oct-98	31	0.004	<0.001	0.003	0.036	0.009	0.0001	0.006	0.011	<0.1	10.0	0.04	<0.01	8.3	<0.01	54800	15.0	1.0	6.0	<2	<2
04-Nov-98	26	0.003	<0.001	0.003	0.051	0.011	0.0007	0.008	0.013	0.10	5.0	0.09	<0.01	8.3	<0.01	54800	11.0	3.0	6.1	<2	<2
20-Dec-98	20									0.10	5.0	0.10	<0.01	8.3	<0.01	58000	6.0	3.0	7.4	<2	<2
05-Jan-99	17									0.30	4.0	0.03	<0.01	8.3	<0.01	59500	6.0	4.0	7.5	<2	<2
03-Feb-99	18									0.10	3.0	0.12	<0.01	8.3	<0.01	59600	14.0	2.0	7.6	<2	<2
02-Mar-99	20	0.003	<0.001	0.003	0.046	0.011	0.0003	0.004	0.021	0.10	7.0	0.26	<0.01	8.3	<0.01	59600	18.0	4.0	6.1	30	8
14-Apr-99	25									0.10	7.0	0.06	<0.01	8.3	<0.01	55900	18.0	3.0	6.8	<2	<2
15-May-99	27									0.20	11.0	0.09	<0.01	8.3	<0.01	55400	22.0	2.0	6.0	<2	<2
06-Jun-99	32	0.003	<0.001	0.002	0.060	0.006	0.0001	0.006	0.018	0.20	5.0	0.27	<0.01	8.4	<0.01	55400	23.0	1.0	5.6	<2	<2
<b>RCEG</b>		<b>0.005</b>	<b>0.05</b>	<b>0.1</b>		<b>0.01</b>	<b>0.0001</b>	<b>0.1</b>	<b>0.1</b>					<b>8.6</b>	<b>0.008</b>			<b>10</b>	<b>4(min)</b>	<b>230</b>	

Bold denotes sample not meeting RCEG  
All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 9-1 Community Harbor Water Quality Data (Station No. 17)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
19-Jan-88	15									<0.1	1.0			7.7	0.006	70500	20.8	5.0	6.2		
15-Feb-88	16									<0.1	1.0		<0.01	8.1	0.003	70400	10.2	3.4	5.2		
01-Mar-88	18									<0.1	2.8		<0.01	7.8	0.003	69900	5.3	3.8	6.5		
06-Apr-88	20									<0.1	4.0		<0.01	7.9	0.003	71500	3.7	2.1	6.5		
23-May-88	28									0.35			<0.01	7.7	0.005	74300	3.8	2.5	5.5		
12-Jun-88	30									26.89	1.0		<0.01	7.6	0.013	74500	4.5	2.2	5.2		
09-Oct-88	29									0.20	3.0			8.0	0.003	74200	5.6	1.0	5.4		
06-Nov-88	26									0.31	6.5			7.9	0.020	74100	4.1	0.5	5.6		
05-Dec-88	18									0.39	3.5			8.3	0.003	73500	5.5	1.1	6.8		
02-Jan-89	13									<0.1	3.3			7.9	0.007	70700	9.3	1.1	7.5		
05-Feb-89	12										5.4			7.8	0.006	70500	4.3	0.6	7.8		
13-Mar-89	19									<0.1	4.3			8.0	<0.003	69700	6.8	0.2	6.9		
02-Apr-89	19									<0.1	2.9			8.0	0.004	69300	14.2		6.8		
18-Jun-89	27									0.37	3.5			8.1	0.006	72200	7.3	0.2	5.6		
09-Jul-89	31									1.05	2.7			8.1	0.005	72200	3.0	0.6	5.4		
14-Aug-89	32									<0.1	3.7			7.8	0.001	72800	5.2	0.7	5.5		
04-Sep-89	33									0.46	3.7			7.9	0.002	72700	5.7	0.7	4.8		
04-Oct-89										0.24	3.6	<0.01			0.007		6.4	0.1			
06-Nov-89										0.24	4.1	<0.01			0.007		4.8	0.5			
03-Dec-89										0.28	2.8	<0.01			<0.002		6.7	0.4			
03-Jan-90	16									0.36	2.4			7.7	0.009	69800	3.5	0.7	6.8		
14-Feb-90	18									0.23	2.9			7.7	0.005	67400	3.7	0.5	6.2		
04-Mar-90										<0.1	3.7				0.006		2.9	0.7			
04-Apr-90	24									<0.1	4.6			7.8	0.006	62000	8.9	0.2	5.7		
13-May-90	27									0.52	4.3			8.1	0.004	72000	4.7	0.2	5.6		
04-Jun-90	29									0.14	5.5			8.2	0.002	72700	4.1	0.7	5.7		
09-Jul-90	30									0.15	3.6			8.3	0.003	74300	3.2	0.1	5.7		
05-Aug-90	32									<0.1	5.5			8.2	0.008	74300	1.0	0.3	5.9		
03-Sep-90	31									0.1	4.1			8.4	0.004	74200	4.0	0.7	5.9		
03-Oct-90	27									0.17	3.8			8.3	0.004	74900	3.9	0.5	5.9		
07-Nov-90	20									0.19	4.1			8.0	0.005	61000	4.6	0.6	5.4		
01-Dec-90	20									0.14	3.1			8.0	0.002	75000	2.8	0.5	5.0		
30-Sep-91	29									1.04	2.6			8.2	0.034	73300	25.0	1.0	5.7		
20-Oct-91	28									<0.1	4.3			8.0	0.006	73100	4.7	0.6	6.1		

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 9-2 Community Harbor Water Quality Data (Station No. 17)

Date	Parameters																				
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (µmhos/cm)	TSS	Turbidity	D Oxygen	T.C (MPN/100ml)	F.C (MPN/100ml)
04-Nov-91	25									0.67	3			8.4	0.003	72100	3.8	1.0	5.1		
02-Dec-91	25										2.3			8.5	0.004	72100	11.8	0.8	5.1		
13-Jan-92	12										2.6	0.001		7.3	0.003	69800	7.1	<0.1	6.5		
05-Feb-92	15										2.3	0.009		7.4	0.014	68900	16.0	1.0	6.9		
04-Mar-92	15										1.9	<0.001		7.5	0.003	68400	3.6	0.4	6.6		
13-Apr-92	22										3.1	0.02		8.1	0.005	69600	9.8	0.8	6.4		
04-May-92	26										2.7	<0.01		8.0	0.007	65900	6.7	0.1	6.7		
03-Jun-92	27										1.8	0.02		8.0	0.010	65800	21.6	0.2	5.4		
09-Jul-92	31									0.16	2.6	<0.01		7.0	0.011	65800	3.6	0.1	6.9		
02-Aug-92	30									0.01	3.3	0.16		7.2	0.012	73900	9.5	0.2	7.0		
07-Sep-92	31									0.16	3.0	0.06		7.2	0.007	75100	9.8	0.2	7.3		
04-Oct-92	27									0.01	2.4	0.12		7.9	0.007	75300	26.5	0.2	7.0		
04-Nov-92										0.19	2.4	0.13			0.007		8.3	0.2			
10-Jan-93	16									0.37	5.7			7.7	0.005	65900	14.2	0.2	7.6		
16-Feb-93	16									1.96	4.5			7.8	0.016	63700	14.0	0.2	8.4		
09-Mar-93	21									0.61	3.1			7.7	0.007	64000	29.4	0.2	7.8		
04-Apr-93										0.79	2.7	0.14			0.007		4.8	0.2			
03-May-93										0.29	3.5	0.13			0.010		23.0				
06-Jun-93										0.58	3.8	0.10			0.009		19.0				
08-Aug-93										0.44	4.1	0.11			0.005		14.8				
12-Sep-93										0.61	3.9	0.16			0.011		18.8				
05-Oct-93										0.51	4.0	0.09		8.0	0.009	61200		0.1	5.7		
07-Nov-93										0.90	3.8	0.08		8.2	0.022	72100	15.7	2.0	6.1		
05-Dec-93										0.82	4.0	0.03		8.0	0.011	72100	1.5	1.5	6.1		
10-Jan-94										0.97	2.4	0.13			0.005		3.7	0.5			
07-Mar-94										2.73	2.6	0.10			0.007	68000	8.8	7.3	6.8		
04-Apr-94										0.76	6.2	0.10		8.1	1.000	69400	<1	5.4	7.5		
24-Jul-94	29									0.97	8.6	0.10		8.1	1.063						
18-Aug-94										1.92	2.2	0.02		8.1	0.338	59700	5.2	0.9			
27-Sep-94										0.76	4.8	0.01		8.0	0.450	68500	<1	1.5	6.6		
09-Oct-94			<0.001	0.005	0.012	0.022		0.007	<0.01	0.25	6.8	0.04		8.0	0.325	68000	6.8	0.8	6.5		
07-Nov-94	28		<0.001	0.001	<0.005	<0.01		<0.05	<0.01	0.36		0.01		8.1	0.500	49700	<1	1.5	7.0		
15-Dec-94	16	<0.001	0.008	0.070	0.018	0.018		0.014	0.109	0.12	2.7	0.05	0.03	7.9	<0.01	44400	<1		5.7		
05-Jan-95										0.56	8.6	0.13		7.9	0.027	63500	4.6	1.8	2.4		
09-Feb-95	17									0.69	4.0	0.10		7.9	<0.01	39800	21.8	1.2	4.9		
16-Mar-95	21									1.47	3.9	0.40		7.9	<0.01	45900	61.2	2.3	2.8		

Continued . . .



Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 9-3 Community Harbor Water Quality Data (Station No. 17)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
06-Apr-95	22		<0.001	0.008	0.013	0.01		<0.05	0.043	0.58	7.3	0.23		8.1	0.030	49400	19.0	3.4	0.9		
18-May-95	29									0.76	14.5	0.23		8.1	<0.01	64400	13.2	1.6	5.2		
15-Jun-95	30									0.74		0.28		8.0	<0.01	58200		7.9	4.7		
03-Jul-95										0.96	3.6	0.10		8.0	<0.01	70600	30.2	3.0	6.2		
17-Aug-95	33									0.81	9.2	0.06	<0.01	8.2	<0.01	5300	21.3	25.4	6.0		
23-Sep-95	31	<0.001	<0.001	<0.005	0.009	<0.01		<0.05	<0.01	0.59	4.2	<0.01	<0.01	8.2	<0.01	53400	21.6	26.4	6.1		
10-Oct-95	25									0.96	7.3	0.30	<0.01	8.2	<0.01	46800	104.1	26.6			
11-Nov-95	24									0.93	4.2	0.01		8.3	<0.01	70400	36.0	4.3			
13-Dec-95	18	0.003	<0.001	0.003	0.048	0.012		0.002	0.167	0.42	10.7	<0.01		8.1	<0.01	63800	151.8	28.2			
28-Jan-96	18									0.40	19.9	0.06		8.1	<0.01	53500	12.0	27.0	9.0		
10-Feb-96	28									0.50	10.8	0.04		8.1	<0.01	57100	24.0	16.0	7.0		
06-Mar-96										0.60	8.7	0.04		8.2	<0.01	55500	19.0	16.0			
13-Apr-96	26									0.60	12.5	0.04	<0.01	8.1	0.010	60600	26.0	123.0	6.0		
11-May-96	29									1.50	10.2	0.17	<0.01	8.2	<0.01	51700	27.0	18.0	6.2		
10-Jun-96	32	0.003	0.001	0.004	0.063	0.011		0.009	0.010	0.60	9.8	0.06	<0.01	8.2	<0.01	67200	7.0	17.0	6.8		
02-Jul-96	33									0.60	11.0	0.07	<0.01	8.1	<0.01	71800	11.0	2.0	5.8		
03-Aug-96	34									1.50	18.0	0.20	<0.01	8.2	<0.01	68700	11.0	7.0	7.0	<3	<3
07-Sep-96	34	0.002	<0.001	0.003		0.001	0.0016	0.007	0.014	0.80	10.0	0.08	<0.01	8.3	<0.01	72100	17.0	1.0	6.0	<3	<3
30-Oct-96	27									0.60	42.0	4.50	<0.01	8.3	<0.01	67900	4.0	<1	5.4	<3	<3
19-Nov-96	23									0.20	51.0	0.06	<0.01	8.3	<0.01	61800	10.0	3.0	6.5	<3	<3
11-Dec-96	21	0.001	<0.001	0.003		0.004	0.0008	0.004	0.011	0.20	49.0	0.10	<0.01	8.1	<0.01	67100	27.0	8.0	6.5	<2	<2
18-Jan-97	16									0.10	11.0	<0.01	<0.01	8.1	<0.01	60900	5.0	8.0		<2	<2
05-Feb-97	17	0.002	0.001	0.003		0.008	0.0067	0.013	0.030	0.20	5.0	0.13	<0.01	7.9	0.010	62600	14.0	6.0		<2	<2
19-Mar-97	20	0.002	<0.001	0.003		0.003	0.0023	0.003	0.022	0.20	5.0	0.15	<0.01	8.3	<0.01	64100	14.0	7.0	7.7	<2	<2
13-Apr-97	20									0.20	10.0	0.02	<0.01	8.3	<0.01	66600	16.0	1.0	7.2		
12-May-97	27	0.002	0.001	0.004		0.014	0.0002	0.012	0.025	0.30	15.0	0.06	<0.01	8.3	0.010	67900	14.0	3.0	6.6	<2	<2
07-Jun-97	31	0.002	0.003	0.003		0.009	<0.0001	0.006	0.019	0.30	13.0	0.18	<0.01	8.3	<0.01	69300	17.0	2.0	6.9	<2	<2
16-Jul-97	29	0.003	0.001	0.006		0.012	0.0008	0.003	0.024	0.30	36.0	0.09	<0.01	8.2	<0.01	69600	11.0	2.0	6.0	<2	<2
16-Aug-97	30	0.003	<0.001	0.002	0.039	0.013	0.0005	0.003	0.015	0.30	36.0	0.14	<0.01	8.2	<0.01	72800	37.0	1.0	5.3	<2	<2
09-Sep-97	29	0.006	0.001	0.003	0.038	0.012	0.0016	0.009	0.012	0.20	5.0	0.15	<0.01	8.2	<0.01	70200	8.0	3.0	4.5	34	34
15-Oct-97	28	0.002	0.001	0.003	0.034	0.014		0.013	0.018	0.10	19.0	0.06	<0.01	8.2	0.020	66200	6.0	3.0	5.3	>1600	900
05-Nov-97	26	0.001	0.001	0.002	0.025	0.005	0.0001	0.002	0.015	0.10	9.0	0.11	<0.01	8.1	<0.01	66900	13.0		4.7	50	23
07-Dec-97	19	0.002	<0.001	0.003	0.024	0.011	<0.0001	0.003	0.016	0.20	9.0	0.06	<0.01	7.4	<0.01	69500	13.0	2.0	6.7	80	<2
07-Jan-98	15	0.002	0.001	0.004	0.083	0.011	0.0001	0.002	0.020	0.20	8.0	0.06	<0.01	8.2	<0.01	66100	14.0	8.0	7.7	900	4
10-Feb-98	20	0.003	0.002	0.003	0.070	0.009	0.0013	0.007	0.028	0.20	15	0.11	<0.01	8.1	0.010	66100	17.0	3.0	7.0	90	4
05-Mar-98	23	0.003	0.001	0.005	0.031	0.005	0.0005	0.005	0.028	0.20	4	0.16	<0.01	7.8	<0.01	66400	14.0	2.0	7.4	500	500
12-Apr-98	26	0.002	<0.001	0.002	0.041	0.008	0.0008	0.007	0.019	0.10	8	0.11	<0.01	8.3	0.030	50400	9.0	6.0	7.3	>1600	900
03-May-98	27	0.001	<0.001	0.002	0.032	0.004	0.0002	0.004	0.019	0.20	8	0.19	<0.01	8.1	0.060	55300	26.0	3.0	7.1	>1600	>1600

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 9-4 Community Harbor Water Quality Data (Station No. 17)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
08-Jun-98	32	0.001	<0.001	0.002	0.019	0.006	<b>0.0010</b>	<0.001	0.015	0.10	11	0.12	<0.01	8.1	<0.01	68800	9.0	3.0	5.4	<2	<2
08-Jul-98	31	0.002	<0.001	0.002	0.035	0.005	<b>0.0005</b>	0.005	0.009	0.30	11	0.10	<0.01	8.2	<0.01	70500	1.0	4.0	5.1	2	2
06-Aug-98	34	0.002	<0.001	0.002	0.017	<b>0.011</b>	<b>0.0010</b>	0.008	0.011	0.10	8	0.11	<0.01	8.1	<0.01	70300	2.0	2.0	4.1	<b>240</b>	<b>240</b>
07-Sep-98	33	0.001	<0.001	0.003	0.028	<b>0.011</b>	<b>0.0021</b>	0.004	0.014	0.10	10	0.07	<0.01	8.0	<b>0.020</b>	65700	21.0	3.0	4.5	>1600	<b>1600</b>
08-Oct-98	31	0.004	<0.001	0.003	0.034	0.010	<b>0.0007</b>	0.007	0.012	<0.1	10	0.09	<0.01	8.1	<b>0.010</b>	64800	18.0	4.0	5.6	<2	<2
02-Nov-98	25	0.003	<0.001	0.003	0.033	<b>0.011</b>	<b>0.0013</b>	0.010	0.017	0.10	7	0.12	0.01	8.0	<b>0.020</b>	66800	10.0	2.0	5.5	<2	<2
17-Dec-98	18									0.10	10	0.12	<0.01	8.1	<b>0.040</b>	60400	11.0	3.0	7.2	>1600	<b>1600</b>
05-Jan-99	17	0.001	<0.001	0.002		0.006	<b>0.0007</b>	0.005	0.020	0.10	5	0.04	<0.01	8.2	<0.01	68100	17.0	3.0	7.5	<2	2
03-Feb-99	17									<0.1	9	0.10	<0.01	8.2	<0.01	66400	21.0	2.0	7.6	<2	<2
04-Mar-99	20									<0.1	10	0.36	<0.01	8.2	<b>0.010</b>	63200	22.0	2.0	7.1	<b>1600</b>	<b>900</b>
06-Apr-99	24	0.001	<0.001	0.002	0.030	0.008	<b>0.0001</b>	0.004	0.011	0.20	8	0.08	<0.01	8.2	<0.01	62100	21.0	2.0	6.7	>1600	>1600
02-May-99	27									0.20	10	0.05	<0.01	8.3	<0.01	64600	25.0	3.0	6.0	<2	<2
06-Jun-99	31									0.20	6	0.25	<0.01	8.3	<0.01	65600	23.0	2.0	5.7	<2	<2
<b>RCEG</b>		<b>0.005</b>	<b>0.05</b>	<b>0.1</b>		<b>0.01</b>	<b>0.0001</b>	<b>0.1</b>	<b>0.1</b>				<b>0.01</b>	<b>6.5-8.5</b>	<b>0.008</b>			<b>10</b>	<b>4(mg)</b>	<b>230</b>	

Bold denotes sample not meeting RCEG

All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 10-1 Community Harbor Water Quality Data (Station No. 18)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T.C. (MPN/100ml)	F.C. (MPN/100ml)
19-Jan-88	15									<0.1	1.0			7.6	0.003	68800	11.0	4.0	8.9		
15-Feb-88	17									<0.1	1.0		<0.01	7.7	0.010	69200	6.5	3.0	5.6		
01-Mar-88	18									<0.1	1.2		<0.01	7.8	0.003	69600	6.8	4.0			
06-Apr-88	21									<0.1	2.7		<0.01	7.8	0.008	72000	6.5	2.5	6.5		
23-May-88	29									0.70			<0.01	7.6	0.003	75000	2.8	2.7	5.3		
12-Jun-88	32									0.48	1.0		0.01	7.6	0.003	74200	5.7	1.4	5.5		
09-Oct-88	29									0.20	3.5			8.0	0.012	74400	8.1	0.8	5.4		
06-Nov-88	27									0.39	3.0			7.9	0.008	73300	5.7	0.6	5.6		
05-Dec-88	18									0.29	3.5			8.0	0.002	73100	4.5	0.9	6.9		
02-Jan-89	13									0.17	2.1			8.0	0.006	71500	6.1	0.9	7.6		
05-Feb-89	12										4.2			7.9	0.003	70600	10.5	0.8	7.3		
13-Mar-89	19									<0.1	2.7			8.1	<0.003	69300	14.3	0.2	6.9		
02-Apr-89	19									<0.1	2.9			8.1	0.003	70300	13.9		6.7		
18-Jun-89	28									0.99	3.7			8.1	0.004	72700	5.8	0.2	5.8		
09-Jul-89	31									0.40	5.2			8.1	0.003	71900	3.5	0.8	5.6		
14-Aug-89	32									0.22	5.8			8.0	0.002	73100	4.3	0.6	5.6		
04-Sep-89	33									0.25	4.6			8.0	0.002	72600	5.0	0.5	5.1		
04-Oct-89										<0.1	3.7	<0.01			0.014		5.1	1.6			
06-Nov-89										0.34	3.3	<0.01			0.006		4.0	0.8			
03-Dec-89										<0.1	2.3	<0.01			0.009		5.5	0.8			
03-Jan-90	16									0.21	2.2			7.8	0.005	69700	3.9	0.6	6.7		
14-Feb-90	17									0.25	3.2			7.8	0.006	67600	2.9	0.5	6.1		
04-Mar-90										<0.1	3.5				0.014		4.0	1.2			
04-Apr-90	24									<0.1	4.2			7.9	0.008	63200	5.6	0.3	5.8		
13-May-90	27									0.32	3.8			8.1	0.003	71800	5.1	0.2	5.6		
04-Jun-90	30									0.53	5.5			8.4	0.003	73400	4.3	0.6	5.5		
09-Jul-90	29									0.29	3.8			8.4	0.002	74500	3.1	0.2	5.3		
05-Aug-90	32									<0.1	4.2			8.2	0.008	74000	1.8	0.4	5.8		
03-Sep-90	31									0.19	3.8			8.4	0.002	74200	6.4	0.6	5.9		
03-Oct-90	27									0.35	3.6			8.2	0.004	75900	5.3	0.6	5.8		
07-Nov-90	20									0.29	3.6			8.0	0.002	61000	11.0	0.7	6.9		
02-Dec-90	20									0.29	2.9			7.8	0.002	75000	2.9	0.5	6.9		
30-Sep-91	28									1.04	3.5			8.4	0.008	73100	11.4	1.0	5.1		
20-Oct-91	28									0.39	4.8			8.0	0.003	73100	19.0	0.6	6.1		
04-Dec-91	29									0.53	3.6			8.2	0.004	71900	14.7	1.0	5.6		
02-Dec-91	25										2.2			8.4	0.004	71900	4.8	1.0	6.8		

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commision in Jubail

Table 10-2 Community Harbor Water Quality Data (Station No. 18)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
13-Jan-92	11										2.6	0.01		7.4	0.003	69400	4.5	0.3	8.6		
05-Feb-92	14										2.3	0.02		7.3	0.012	68600	19.1	1.0	7.5		
04-Mar-92	15										2	0.02		8.2	0.005	68300	6.6	1.6	7.8		
13-Apr-92	23										2.8	0.03		8.0	0.005	69800	6.6	0.8	5.2		
04-May-92	26										2.7	0.02		7.8	0.010	65900	12.1	0.1	5.2		
03-Jun-92	27										2.5	0.04		8.0	0.013	65800	6.1	0.2	6.4		
09-Jul-92	31									0.22	2.4	0.03		7.5	0.012	65800	23.0	0.2	7.0		
02-Aug-92	30									0.90	7.9	<0.01		7.4	0.002	74000	13.9	0.2	6.3		
07-Sep-92	31									0.42	3.1	0.15		6.9	0.009	75100	11.2	0.2	7.3		
04-Oct-92	27									0.10	2.7	0.20		7.9	0.012	74900	17.8	0.2	6.3		
04-Nov-92										0.17	2.4	0.19			0.013		7.7	0.2			
18-Jan-93	15									1.54	4.7			7.7	0.010	63800	13.9	0.2	7.0		
16-Feb-93	15									1.12	4.2			7.9	0.026	63800	24.0	0.1	8.3		
09-Mar-93	21									0.54	3.5			7.8	0.009	64000	7.9	0.2	7.1		
04-Apr-93										1.02	3.6	0.13			0.015		24.6	0.2			
03-May-93										0.25	4.1	0.18			0.016		21.4				
06-Jun-93										0.82	4.0	0.12			0.009		12.4				
18-Jul-93										0.55	4.4	0.11			0.024		21.2	0.1			
08-Aug-93										0.34	4.1	0.15			0.005		14.0				
12-Sep-93										0.58	3.7	0.16			0.009		16.6				
05-Oct-93										0.71	2.9			8.2	0.007	61900		0.1	5.8		
07-Nov-93										0.94	3.7			8.2	0.023	72100	21.0	3.6	6.3		
05-Dec-93										0.82	4.2			8.0	0.012	72100	9.9	1.8	6.1		
10-Jan-94										1.62	2.3	0.25			0.005		2.4	0.4			
07-Mar-94										2.10	2.2	0.01			0.200	66700	10.4	4.7	6.0		
04-Apr-94										1.48	3.6	0.13		8.0	0.100	69300	<1	5.4	7.2		
30-May-94										0.61	3.6	0.10	<0.01	8.2	0.560		10.0				
24-Jul-94	30									0.81	3.7	0.05		8.2	0.313						
18-Aug-94	32									0.62	4.3	0.01		8.1	0.313		1.3	1.7			
27-Sep-94										0.37	5.5	0.03		8.0	0.750	61300	<1	1.7	6.9		
09-Oct-94			<0.001	0.004	0.009	0.021		0.008	<0.01	1.00	3.4	0.02		7.9	0.400	69100	13.0	1.7	6.7		
07-Nov-94	28		<0.001	<0.001	<0.005	<0.01		<0.05	<0.01	0.58		0.03		8.0	0.275	48600	1.1	2.4	6.3		
15-Dec-94	16		<0.001	0.069	0.043	0.017		0.016	0.14	0.17	4.0	0.25		7.6	<0.01	45900	58.1				
05-Jan-95											5.3	0.20		8.0	0.046		12.5				
09-Feb-95	17									0.93	7.5	0.18		7.8	<0.01	46100	24.5	3.3	7.3		
16-Mar-95	22									1.34	8.2	0.43		7.9	<0.01	56800	25.1	4.2	2.8		
06-Apr-95	23		<0.001	<0.005	0.043	<0.01		<0.05	0.018	0.21	6.8	0.13		8.1	<0.01	48300	16.3	4.1	3.6		

Continued ...

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 10-3 Community Harbor Water Quality Data (Station No. 18)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T C (MPN/100ml)	F C (MPN/100ml)
18-May-95	29									0.83	11.0	0.13		8.1	0.010	70800	22.2	6.0	5.4		
15-Jun-95	31									1.08	3.8	0.24		8.1	0.010	57000	11.7	5.3	4.7		
03-Jul-95	30									1.26	4.3	0.13		8.0	<0.01	73200	20.3	9.7	5.8		
17-Aug-95	31									0.65	7.5	0.11	<0.01	8.2	<0.01	54600	22.0	15.4	5.7		
23-Sep-95	30	0.005	<0.001	<0.005	0.028	<0.01		<0.05	<0.01	0.60	7.4		<0.01	8.1	<0.01	56400	21.7	23.9	5.9		
10-Oct-95	26									0.86	6.6	0.33	<0.01	8.2	0.030	46600	15.1	33.1			
11-Nov-95	24									0.88	3.3	0.06		8.3	<0.01	69100	55.0	2.4			
13-Dec-95	19	0.003	<0.001	0.006	0.045	0.016		0.001	0.01	0.73	10.2	<0.01		8.1	<0.01	63400	106.0	27.7			
28-Jan-96	20									0.5	8.9	0.04		8.1	<0.01	52300	32.0	15.0	7.5		
26-Feb-96	20									0.8	11.6	0.02	<0.01	8.2	0.020	50300	34.0		7.8		
23-Mar-96	28	0.003	<0.001	0.004	0.026	0.014		0.017	0.014	0.1	11.2	0.06		8.2	<0.01	57300	8.0	10.0	6.6		
13-Apr-96	24									0.4	9.2	0.07	<0.01	8.2	0.010	61100	18.0	33.0	6.0		
11-May-96	28									0.6	9.9	0.04	<0.01	8.2	<0.01	52000	12.0	7.0	6.3		
10-Jun-96	33	0.002	0.001	<0.001	0.022	0.077		0.006	0.021	0.7	22.5	0.15	<0.01	8.2	<0.01	66500	9.0	14.0	6.4		
02-Feb-96	35									0.6	11.0	0.03	<0.01	8.1	<0.01	70900	13.0	2.0	5.5		
03-Aug-96	32									0.6	16.0	0.08	<0.01	8.2	<0.01	66500	23.0	3.0	6.0	<2	<2
07-Sep-96	34	0.002	<0.001	0.003		0.005	0.0019	0.008	0.012	0.6	10.0	0.10	<0.01	8.3	<0.01	71800	16.0	2.0	6.4	<2	<2
30-Oct-96	26									0.5	42.0	0.04	<0.01	8.3	<0.01	69500	10.0	<1	4.7	<2	<2
19-Nov-96	23									0.2	27.0	0.55	<0.01	8.2	<0.01	61200	29.0	19.0	5.7	<2	<2
11-Dec-96	21	0.001	0.001	0.003		0.003	0.0010	0.005	0.011	0.2	33.0	0.10	0.03	8.0	0.010	67400	18.0	11.0	6.6	<2	<2
18-Jan-97	16									0.2	6.0	<0.01	<0.01	8.1	0.010	62500	12.0	7.0		<2	<2
05-Feb-97	17	0.002	0.002	0.002		0.007	0.0072	0.012	0.033	0.1	5.0	0.01	<0.01	8.0	<0.01	6260	25.0	7.0		<2	<2
19-Mar-97	20	0.001	<0.001	0.002		0.006	0.0013	0.006	0.033	0.1	4.0	0.26	<0.01	7.8	<0.01	63100	8.0	4.0	8.5	<2	<2
13-Apr-97	22									0.3	24.0	<0.01	<0.01	8.3	<0.01	66900	39.0	3.0	7.1	<2	<2
12-May-97	27	0.003	0.002	0.004		0.013	0.0002	0.014	0.024	0.1	20.0	0.08	<0.01	8.3	<0.01	70200	10.0	3.0	7.1	<2	<2
07-Jun-97	29	0.002	<0.001	0.002		0.009	<0.0001	0.006	0.022	0.2	16.0	<0.01	<0.01	8.3	<0.01	69400	22.0	1.0	6.1	<2	<2
16-Jul-97	29	0.002	0.001	0.002		0.011	0.0009	0.002	0.015	0.2	35.0	0.09	<0.01	8.2	<0.01	69700	5.0	1.0	6.3	<2	<2
16-Aug-97	30	0.003	<0.001	0.002	0.037	0.010	0.0003	0.002	0.017	0.2	39.0	0.11	<0.01	8.2	<0.01	72900	6.0	1.0	5.1	<2	<2
09-Sep-97	29	0.001	0.001	0.002	0.023	0.012	0.0015	0.007	0.016	0.3	9.0	0.12	<0.01	8.2	<0.01	71000	6.0	2.0	5.1	9	9
15-Oct-97	29	0.002	0.001	0.003	0.047	0.013		0.013	0.019	0.1	22.0	<0.01	<0.01	8.3	<0.01	71500	14.0	4.0	5.7	<2	<2
05-Nov-97	25	0.001	0.001	0.002	0.019	0.003	0.0017	0.002	0.013	0.1	9.0	0.07	<0.01	8.1	<0.01	70000	12.0		9.5	<2	<2
07-Dec-97	19	0.003	<0.001	0.004	0.036	0.015	0.0002	0.005	0.029	0.2	9.0	0.07	<0.01	8.2	<0.01	70000	13.0	4.0	7.2	<2	<2
07-Jan-98	15	0.002	0.001	0.003	0.060	0.012	0.0005	0.003	0.024	0.3	13.0	0.15	<0.01	8.2	<0.01	65500	14.0	10.0	7.2	<2	<2
10-Feb-98	20	0.002	0.002	0.002	0.037	0.008	0.0012	0.003	0.019	0.3	10.0	0.10	<0.01	8.1	<0.01	66200	17.0	12.0	6.8	<2	<2
05-Mar-98	23	0.003	0.001	0.004	0.028	0.002	0.0007	0.01	0.028	0.3	7.0	0.13	<0.01	8.0	<0.01	66700	13.0	2.0	7.2	<2	<2
12-Apr-98	26	0.001	<0.001	0.002	0.016	0.005	0.0005	0.006	0.019	0.2	6.0	0.10	<0.01	8.2	<0.01	65100	11.0	2.0	7.0	7	7
03-May-98	29	0.001	<0.001	0.003	0.019	0.005	0.0007	0.006	0.015	0.2	7.0	0.08	<0.01	8.2	<0.01	69100	29.0	4.0	6.1	<2	<2

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 10-4 Community Harbor Water Quality Data (Station No. 18)

Date	Parameters																				
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	TOC	T Ammonia	T Res Chlorine	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen	T.C. (MPN/100ml)	F.C. (MPN/100ml)
08-Jun-98	33	0.001	<0.001	0.003	0.021	0.005	<b>0.0010</b>	0.003	0.015	0.2	11.0	0.09	<0.01	8.2	<0.01	69400	13.0	3.0	5.9	<2	<2
08-Jul-98	32	0.002	<0.001	0.003	0.042	0.007	<b>0.0007</b>	0.006	0.018	0.3	12.0	0.12	<0.01	8.2	<0.01	70400	7.0	5.0	5.5	<2	<2
06-Aug-98	35	0.002	<0.001	0.002	0.014	0.009	<b>0.0006</b>	0.007	0.021	0.3	8.0	0.04	<0.01	8.2	<0.01	71200	8.0	2.0	5.6	<2	<2
07-Sep-98	33	0.001	<0.001	0.003	0.031	0.005	<b>0.0009</b>	0.009	0.016	<0.1	8.0	0.03	<0.01	8.2	<0.01	69600	12.0	5.0	5.4	<2	<2
08-Oct-98	31	0.003	<0.001	0.003	0.028	0.007	0.0001	0.007	0.015	<0.1	10.0	0.05	<0.01	8.2	<0.01	67300	8.0	3.0	5.7	<2	<2
02-Nov-98	25	0.003	<0.001	0.003	0.041	0.009	<b>0.0013</b>	0.005	0.018	0.1	7.0	0.09	<0.01	8.1	<0.01	71300	6.0	4.0	6.3	<2	<2
17-Dec-98	19									0.1	5.0	0.05	<0.01	8.2	<0.01	68200	15.0	3.0		<2	<2
05-Jan-99	17	0.001	<0.001	0.002		0.005	0.0003	0.003	0.018	0.1	6.0	0.03	<0.01	8.2	<0.01	68600	10.0	2.0	7.4	<2	<2
03-Feb-99	17									<0.1	2.0	0.10	<0.01	8.2	<0.01	66900	26.0	4.0	7.3	<2	<2
04-Mar-99	20									0.1	10.0	0.14	<0.01	8.1	<0.01	66800	27.0	1.0	6.9	<2	<2
06-Apr-99	25	0.002	<0.001	0.002	0.028	0.009	0.0001	0.003	0.013	0.1	6.0	0.09	<0.01	8.2	<0.01	62700	22.0	5.0	6.5	<2	<2
02-May-99	27									0.1	9.0	0.09	<0.01	8.3	<0.01	64700	35.0	2.0	6.1	<2	<2
06-Jun-99	32									0.2	11.0	0.25	<0.01	8.3	<0.01	65500	36.0	2.0	5.5	<2	<2
<b>RCEG</b>		<b>0.005</b>	<b>0.05</b>	<b>0.1</b>		<b>0.01</b>	<b>0.0001</b>	<b>0.1</b>	<b>0.1</b>				<b>0.01</b>	<b>6.5-8.5</b>	<b>0.008</b>			<b>10</b>	<b>4(min)</b>	<b>230</b>	

Bold denotes sample not meeting RCEG

All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 11 Harbor Receiving Water Quality Data (Station No. 19)

Date	Parameters																						
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	TPH	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (unh/tem)	TSS	Turbidity	D Oxygen
06-May-97	25	0.002	0.001	0.005		0.012	0.0001	0.009	0.034	0.2		9.0		0.02	<0.01			8.3	<0.01	59700	23	<1	6.7
21-Jun-97	31	0.003	0.001	0.008		0.008	<0.0001	0.004	0.024	0.1	<0.01	30.0		0.09	<0.01		1.36	8.3	<b>0.030</b>	59200	13	1	5.7
17-Jul-97	31	0.002	<0.001	0.003		0.011	<0.0001	0.001	0.021	0.2	<0.01	35.0		0.59	<0.01		1.59	8.3	0.010	54100	8	1	6.3
19-Aug-97		0.001	<0.001	0.030	0.038	0.007	0.0049	0.001	0.015	0.3	0.02	29.0		0.02	<0.01		1.52	8.4	<0.01	55000	9	1	5.5
10-Sep-97	32	0.002	0.001	0.003	0.026	0.011	0.0016	0.008	0.016	0.1	<0.01	5.0		0.07	<0.01			8.3	<0.01	55200	38	1	6.1
29-Oct-97	27	0.001	0.001	0.003	0.036	0.009		0.009	0.031	<b>7.9</b>	0.07	51.0		0.10	<0.01		0.77	8.3	<0.01	48500	15	2	
30-Dec-97	20	0.002	<0.001	0.003	0.040	0.011	0.0009	0.001	0.022	0.1	<0.01	7.0		0.07	<0.01		0.80	8.3	<0.01	59300	9	1	7.1
26-Jan-98	19	0.002	<0.001	0.007		0.010	0.0008	0.005	0.030	0.2	<0.01	7.0		0.10	<0.01		0.70	8.3	<0.01	59900	12	<1	7.7
10-Feb-98	20	0.002	0.001	0.005	0.041	0.011	0.0013	0.005	0.041	0.1	<0.01	12.0		0.11	<0.01		0.76	8.2	<0.01	59300	13	<1	6.9
29-Mar-98	22	0.001	0.001	0.002	0.025	0.014	0.0006	0.003	0.019	0.1	<0.01	2.0		0.03	<0.01	<0.01	0.77	8.2	<0.01	57700	12	1	7.4
29-Apr-98	25	0.002	<0.001	0.002	0.062	0.005	0.0011	0.009	0.021	0.1	0.03	7.0		0.56	<0.01	<0.01	0.80	8.3	<0.01	57600	28	2	7.1
27-May-98	31	0.001	<0.001	0.002	0.018	0.007	0.0004	<0.001	0.016	0.1	0.03	9.0		0.06	<0.01	<0.01	0.79	8.2	<0.01	56300	21	<1	6.4
24-Jun-98	34	0.001	<0.001	0.002	0.026	0.011	<0.0001	0.009	0.025	0.1	<0.01	14.0		0.07	<0.01	<0.01	0.76	8.2	<0.01	55300	4	1	5.9
30-Jul-98	35	0.003	<0.001	0.003	0.021	0.007	0.0007	0.006	0.019	0.1	<0.01	8.0		0.04	<0.01	<0.01	0.66	8.3	0.010	56600	2	1	5.4
17-Aug-98	36	0.002	<0.001	0.005	0.063	0.007	0.0015	0.006	0.026	0.1	<0.01	6.0	<0.1	0.06	<0.01	<0.01	0.72	8.3	<0.01	56300	2	2	5.8
26-Sep-98	34	0.004	<0.001	0.004	0.037	0.007	0.0024	0.006	0.016	0.1	0.03	7.0		<0.01	<0.01	<0.01	0.86	8.4	<0.01	53100	11	2	6.1
28-Oct-98	30	0.003	<0.001	0.003	0.051	0.015	0.0007	0.007	0.025	0.1	0.03	4.0	0.1	0.10	<0.01	<0.01	0.81	8.2	<0.01	58100	9	1	6.1
25-Nov-98	26	0.001	<0.001	0.003	0.079	0.007	0.0005	<0.001	0.027	0.1	<0.01	5.0	0.1	0.07	<0.01	<0.01	0.96	8.3	<0.01	53800	32	1	6.7
30-Dec-98	24									0.1	0.01	4.0		0.05	<0.01			8.4		58500	7	2	6.7
27-Jan-99	19									0.2	<0.01	3.0		0.20	<0.01			8.3	<0.01	58300	22	1	7.1
24-Feb-99	20	0.002	<0.001	0.002	0.022	0.009	0.0009	0.003	0.016	<0.1	0.01	7.0	<0.1	0.36	<0.01	<0.01	0.71	8.3	<0.01	58400	7	2	7.1
24-Mar-99	22									0.1	0.01	10.0		0.09	<0.01			8.3	<0.01	55000	17	2	6.9
28-Apr-99	26									0.2	0.03	6.0		0.05	<0.01			8.4	<0.01	55100	21	1	6.5
26-May-99	29	0.002	<0.001	0.003	0.025	0.010	<0.0001	0.001	0.009	0.4	0.02	9.0	0.3	0.20	<0.01	<0.01	0.77	8.3	<0.01	54600	18	<1	5.9
23-Jun-99	31									0.2	0.04	6.0		0.07	<0.01			8.3	<0.01	54300	17	1	6.0
<b>RCEG</b>						<b>0.05</b>	<b>0.0002</b>		<b>0.5</b>	<b>1</b>	<b>0.01</b>			<b>0.02</b>	<b>0.01</b>			<b>6.5-8.5</b>	<b>0.015</b>			<b>20</b>	<b>4(m)</b>

**Bold** denotes sample not meeting RCEG  
All units in mg/l unless otherwise stated

Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 12 Harbor Receiving Water Quality Data (Station No. 20)

Date	Parameters																						
	Temperature (C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	TPH	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (units/cm)	TSS	Turbidity	D Oxygen
06-May-97	25	0.002	<0.001	0.005		0.015	0.0005	0.011	0.042	0.2		7.0		0.02	<0.01			8.3	<0.01	59600	7	<1	6.8
21-Jun-97	31	0.004	0.001			0.009	<0.0001	0.005	0.024	0.2	<0.01	33.0		0.06	<0.01		1.35	8.4	<0.01	59900	42	2	6.1
17-Jul-97	31	0.002	0.001	0.002		0.011	<0.0001	0.002	0.014	0.2	<0.01	29.0		0.01	<0.01		1.69	8.3	<0.01	54500	10	1	6.5
19-Aug-97		0.002	<0.001	0.002	0.022	0.007	0.0062	0.001	0.021	0.3	0.02	28.0		<0.01	<0.01		1.60	8.5	<0.01	55300	5	1	5.9
10-Sep-97	32	0.001	0.001	0.002	0.026	0.009	0.0015	0.008	0.039	0.1	<0.01	2.0		0.06	<0.01		1.00	8.3	<0.01	55000	7	1	5.9
29-Oct-97	27	0.001	0.001	0.002	0.032	0.008		0.008	0.014	3.2	0.02	8.0		0.09	<0.01		0.77	8.3	<0.01	47400	10	3	
29-Nov-97	26	0.001	0.001	0.003	0.020	0.004	0.0015	0.006	0.017	0.5	<0.01	5.0		0.02	<0.01		0.99	8.2	<0.01	41900	9	1	6.5
30-Dec-97	20	0.002	<0.001	0.003	0.016	0.013	0.0011	<0.001	0.021	0.1	<0.01	6.0		0.05	<0.01		0.80	8.3	<0.01	59500	9	<1	7.1
26-Jan-98	19	0.002	<0.001	0.002		0.009	0.0011	0.002	0.024	0.1	<0.01	6.0		0.05	<0.01		0.70	8.3	<0.01	59300	12	<1	7.7
10-Feb-98	23	0.002	0.001	0.003	0.033	0.010	0.0012	0.005	0.032	0.1	<0.01	12.0		0.12	<0.01			8.2	<0.01	59400	13	2	6.9
29-Mar-98	24	0.002	0.001	0.003	0.043	0.016	0.0009	0.005	0.055	0.1	<0.01	2.0		0.04	<0.01	<0.01	0.78	8.2	<0.01	57900	15	3	7.1
24-Apr-98	27	0.002	<0.001	0.003	0.025	0.007	0.0011	0.008	0.064	0.1	0.03	5.0		0.11	<0.01	<0.01	0.80	8.2	<0.01	57700	25	2	6.8
27-May-98	30	0.001	<0.001	0.002	0.036	0.007	0.0006	0.002	0.231	0.1	0.03	9.0		0.12	<0.01	<0.01	0.78	8.3	<0.01	56300	31	1	6.5
24-Jun-98	34	0.001	<0.001	0.002	0.021	0.011	<0.0001	0.011	0.015	0.1	<0.01	8.0		0.08	<0.01	<0.01	0.76	8.3	<0.01	55500	20	1	5.9
30-Jul-98	36	0.003	<0.001	0.002	0.044	0.009	0.0013	0.006	0.137	0.1	<0.01	9.0		0.10	<0.01	<0.01	0.66	8.3	<0.01	56900	9	1	6.2
17-Aug-98	37	0.003	<0.001	0.003	0.026	0.008	0.0011	0.006	0.039	0.1	<0.01	7.0	<0.1	0.07	<0.01	<0.01	0.71	8.3	<0.01	56800	5	1	6.2
26-Sep-98	34	0.004	0.001	0.004	0.021	0.007	0.0029	0.004	0.017	0.1	0.03	6.0		0.10	<0.01	<0.01	0.88	8.4	<0.01	53000	14	1	6.3
28-Oct-98	29	0.002	<0.001	0.002	0.042	0.017	0.0007	0.006	0.067	0.1	0.01	5.0	0.1	0.09	<0.09	<0.01	0.82	8.3	<0.01	58500	3	1	6.2
25-Nov-98	26	0.002	<0.001	0.004	0.061	0.006	0.0004	0.008	0.097	0.1	<0.01	4.0	<0.1	0.09	<0.01	<0.01	0.93	8.3	<0.01	53800	9	1	6.4
30-Dec-98	22									0.1	0.01	5.0		0.05	<0.01			8.4		58400	7	1	6.9
27-Jan-99	18									0.2	<0.01	2.0		0.14	<0.01			8.3	<0.01	58400	19	1	7.3
24-Feb-99	20									<0.1	<0.01	7.0		0.20	<0.01			8.2	<0.01	59000	32	2	6
24-Mar-99	22	0.004	<0.001	0.003	0.034	0.011	0.0001	0.005	0.031	0.1	<0.01	7.0	0.1	0.10	<0.01	<0.01	0.70	8.3	<0.01	54400	17	2	6.8
28-Apr-99	26									0.3	<0.01	5.0		0.05	<0.01			8.4	<0.01	55200	25	2	6.5
26-May-99	29									0.2	0.01	9.0		0.21	<0.01			8.4	0.01	53600	18	<1	6.6
23-Jun-99	31	0.003	<0.001	0.002	0.021	0.008	<0.0001	0.003	0.034	0.2	0.02	5.0	0.2	0.14	<0.01	<0.01	0.78	8.3	<0.01	54300	17	1	5.8
RCEG						0.05	0.0002		0.5	1	0.01			0.02	0.01			6.5-8.5	0.015			20	4(m)

Bold denotes sample not meeting RCEG

All units in mg/l unless otherwise stated



Attachment III Water Quality Monitoring Data by Royal Commission in Jubail

Table 13 Harbor Receiving Water Quality Data (Station No. 21)

Date	Parameters																						
	Temperature (°C)	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc	Oil & Grease	Phenols	TOC	TPH	T Ammonia	T Res Chlorine	Cyanide	Fluoride	pH (units)	T Phosphorus	Cond (umho/cm)	TSS	Turbidity	D Oxygen
06-May-97	25	0.002	0.001	0.007		0.013	0.0004	0.011	0.038	0.3		9.0		0.26	<0.01		7.9	<0.01	59700	7	1	7.0	
21-Jun-97	31	0.003	0.002	0.003		0.011	0.0011	0.006	0.024	0.2	<0.01	22.0		0.06	<0.01		1.37	8.4	0.010	59700	5	1	7.4
17-Jul-97	31	0.002	0.001	0.005		0.012	<0.0001	0.005	0.052	0.2	<0.01	36.0		0.02	<0.01		1.69	8.3	<0.01	54800	8	1	5.9
19-Aug-97		0.001	<0.001	0.002	0.016	0.006	0.0047	0.002	0.019	0.2	<0.01	32.0		<0.01	<0.01		1.60	8.5	<0.01	55400	5	2	6.4
10-Sep-97	32	0.001	0.001	0.002	0.022	0.012	0.0016	0.008	0.016	0.1	<0.01	3.0		0.04	<0.01		1.00	8.3	<0.01	55100	11	1	5.8
29-Oct-97		0.001	0.001	0.004	0.030	0.009		0.008	0.015	5.9		28.0		0.07	<0.01		0.78	8.3	<0.01	48200	9	2	
29-Nov-97	26	0.002	0.001	0.004	0.034	0.008	0.0008	0.007	0.029	9.1		7.0		0.06	<0.01		0.77	8.3	<0.01	45800	8	1	6.5
30-Dec-97	20	0.002	<0.001	0.002	0.018	0.014	0.0114	<0.001	0.029	0.1	<0.01	7.0		0.06	<0.01		0.81	8.3	<0.01	59000	10	<1	7.2
26-Jan-98	18	0.002	<0.001	0.002		0.009	0.0008	0.001	0.026	0.6	0.01	2.0		0.07	<0.01		0.71	8.3	<0.01	59600	11	<1	7.4
10-Feb-98	24	0.002	0.002	0.028	0.053	0.009	0.0013	0.006	0.019	0.1	<0.01	13.0		0.09	<0.01			8.2	0.010	59700	12	1	6.5
29-Mar-98	25	0.002	0.001	0.003	0.033	0.015	0.0009	0.004	0.018	0.1	<0.01	2.0		<0.01	<0.01	<0.01	0.77	8.2	<0.01	58300	10	2	6.9
29-Apr-98	27	0.003	<0.001	0.003	0.052	0.006	0.0012	0.010	0.037	0.2	0.02	7.0		0.10	<0.01	<0.01	0.80	8.2	0.010	57500	28	2	7.2
27-May-98	31	0.001	<0.001	0.055	0.021	0.010	0.0006	0.002	0.031	0.1	0.01	9.0		0.06	<0.01	<0.01	0.79	8.2	<0.01	55900	22	2	6.3
24-Jun-98	34	0.001	<0.001	0.002	0.028	0.009	0.0001	0.012	0.016	0.1	<0.01	9.0		0.01	<0.01	0.01	0.76	8.3	<0.01	55400	10	2	6.1
30-Jul-98	36	0.003	<0.001	0.003	0.071	0.008	0.0008	0.008	0.023	0.1	<0.01	9.0		0.05	<0.01	<0.01	0.67	8.3	0.010	57000	11	2	5.7
17-Aug-98	38	0.003	0.001	0.003	0.065	0.010	0.0008	0.004	0.026	0.1	<0.01	5.0	<0.1	0.05	<0.01	<0.01	0.66	8.3	<0.01	57400	5	2	5.3
26-Sep-98	34	0.004	0.001	0.005	0.082	0.008	0.0025	0.008	0.021	0.8	0.03	8.0		<0.01	<0.01	<0.01	0.89	8.4	0.010	53600	5	1	6.1
28-Oct-98	30	0.002	<0.001	0.003	0.069	0.011	0.0009	0.008	0.029	0.1	<0.01	5.0	0.1	0.07	<0.01	<0.01	0.83	8.3	<0.01	58300	5	2	6.4
25-Nov-98	26	0.001	<0.001	0.003	0.045	0.007	0.0004	0.002	0.022	0.4	0.03	4.0	0.2	0.08	<0.01	<0.01	0.95	8.3	0.010	53800	5	2	6.5
30-Dec-98	23									0.2	0.01	5.0		0.05	<0.01			8.4		58500	24	1	6.8
27-Jan-99	18									0.1	<0.01	6.0		0.18	<0.01			8.3	<0.01	58000	12	1	7.6
24-Feb-99	21									0.1	0.01	4.0		0.40	<0.01			8.3	<0.01	58500	20	2	6.9
24-Mar-99	23	0.004	<0.001	0.008	0.032	0.012	<0.0001	0.004	0.027	0.2	0.01	10.0	0.1	0.12	<0.01	<0.01	0.71	8.3	<0.01	54400	10	3	6.9
28-Apr-99	27									0.2	0.03	2.0		0.04	<0.01			8.4	<0.01	55100	17	1	6.6
26-May-99	29									0.3	0.02	9.0		0.25	<0.01			8.4	<0.01	54500	20	<1	5.9
23-Jun-99	31	0.001	<0.001	0.002	0.016	0.007	<0.0001	0.002	0.012	0.2	0.01	4.0	0.1	0.05	<0.01	<0.01	0.82	8.4	<0.01	54200	19	2	6.3
<b>RCEG</b>						<b>0.05</b>	<b>0.0002</b>		<b>0.5</b>	<b>1</b>	<b>0.01</b>			<b>0.02</b>	<b>0.01</b>			<b>8.5</b>	<b>0.015</b>			<b>20</b>	<b>4(m)</b>
Exceedance						0	0		0	2	0			0	0			0	0			0	0

**Bold** denotes sample not meeting RCEG

All units in mg/l unless otherwise stated

**Attachment IV**

**The Study on an Environmental Assessment and Monitoring  
of Arabian Gulf in the KSA**

**LABORATORY ANALYSIS REPORT**

**November, 1999**

**JICA & MEPA Study Team**

The Study on an Environmental Assessment and Monitoring  
of Arabian Gulf in the KSA

**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99001

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : DD20  
Sampled by : Khaled Busbait

Sampled : 30/10/99  
Received : 01/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	ND	0.5	
TSS	JEA 59-8	mg/L	-	1	
TOC	JIS K 0102 22.1	mg/L	-	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	ND	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	-	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

DLR: Detection Limit for Reporting

ND: Not Detected at the DLR

JEA: Japan Environmental Agency

JIS: Japan Industrial Standards

MHW: Ministry of Health & Welfare

Meteorology Environmental Protection Administration  
Eastern Province  
Tel: 03-857-6260  
Fax:03-857-6752

The Study on an Environmental Assessment and Monitoring  
of Arabian Gulf in the KSA

**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99002

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J1  
Sampled by : Khaled Busbait

Sampled : 30/10/99  
Received : 01/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	2	1	
TOC	JIS K 0102 22.1	mg/L	2	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	ND	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	ND	0.01	
Cyanogen	JIS K 0102 38	mg/L	ND	0.01	
Magnesium	JIS K 0102 51.2	g/L	1.5	0.1	
Cadmium	JIS K 0102 55.2	mg/L	ND	0.01	
Cobalt	JIS K 0102 60.2	mg/L	ND	0.05	
Copper	JIS K 0102 52.2	mg/L	ND	0.05	
Lead	JIS K 0102 54.2	mg/L	ND	0.1	
Nickel	JIS K 0102 59.2	mg/L	ND	0.05	
Zinc	JIS K 0102 53.2	mg/L	ND	0.01	
Chromium	JIS K 0102 65.1	mg/L	ND	0.1	
Mercury	JEA 59-1	mg/L	ND	0.005	
Arsenic	JIS K 0102 61.2	mg/L	ND	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	1.3	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

DLR: Detection Limit for Reporting

ND: Not Detected at the DLR

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The Study on an Environmental Assessment and Monitoring  
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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99003

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J2  
Sampled by : Khaled Busbait

Sampled : 30/10/99  
Received : 01/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	-	1	
TOC	JIS K 0102 22.1	mg/L	-	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	-	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	ND	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	-	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

DLR: Detection Limit for Reporting

ND: Not Detected at the DLR

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The Study on an Environmental Assessment and Monitoring  
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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99004

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J4  
Sampled by : Khaled Busbait

Sampled : 30/10/99  
Received : 01/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	1	1	
TOC	JIS K 0102 22.1	mg/L	ND	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	0.01	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	ND	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

DLR: Detection Limit for Reporting

ND: Not Detected at the DLR

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The Study on an Environmental Assessment and Monitoring  
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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99005

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J5  
Sampled by : Khaled Busbait

Sampled : 31/10/99  
Received : 02/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	ND	0.5	
TSS	JEA 59-8	mg/L	3	1	
TOC	JIS K 0102 22.1	mg/L	2	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	ND	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	0.01	0.01	
Cyanogen	JIS K 0102 38	mg/L	ND	0.01	
Magnesium	JIS K 0102 51.2	g/L	1.5	0.1	
Cadmium	JIS K 0102 55.2	mg/L	ND	0.01	
Cobalt	JIS K 0102 60.2	mg/L	ND	0.05	
Copper	JIS K 0102 52.2	mg/L	ND	0.05	
Lead	JIS K 0102 54.2	mg/L	ND	0.1	
Nickel	JIS K 0102 59.2	mg/L	ND	0.05	
Zinc	JIS K 0102 53.2	mg/L	ND	0.01	
Chromium	JIS K 0102 65.1	mg/L	ND	0.1	
Mercury	JEA 59-1	mg/L	ND	0.005	
Arsenic	JIS K 0102 61.2	mg/L	ND	0.01	
Phenols	JIS K 0102 28	mg/L	ND	0.005	
Oil & Grease	JEA 64-4	mg/L	ND	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	-	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

DLR: Detection Limit for Reporting

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The Study on an Environmental Assessment and Monitoring  
of Arabian Gulf in the KSA

**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99006

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J6  
Sampled by : Khaled Busbait

Sampled : 31/10/99  
Received : 02/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	2	1	
TOC	JIS K 0102 22.1	mg/L	1	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	0.01	0.01	
Cyanogen	JIS K 0102 38	mg/L	ND	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	ND	0.01	
Cobalt	JIS K 0102 60.2	mg/L	ND	0.05	
Copper	JIS K 0102 52.2	mg/L	ND	0.05	
Lead	JIS K 0102 54.2	mg/L	ND	0.1	
Nickel	JIS K 0102 59.2	mg/L	ND	0.05	
Zinc	JIS K 0102 53.2	mg/L	ND	0.01	
Chromium	JIS K 0102 65.1	mg/L	ND	0.1	
Mercury	JEA 59-1	mg/L	ND	0.005	
Arsenic	JIS K 0102 61.2	mg/L	ND	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	0.3	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

DLR: Detection Limit for Reporting

ND: Not Detected at the DLR

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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99007

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J7  
Sampled by : Khaled Busbait

Sampled : 31/10/99  
Received : 02/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	-	1	
TOC	JIS K 0102 22.1	mg/L	1	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	0.01	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	0.2	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99008

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J80  
Sampled by : Khaled Busbait

Sampled : 31/10/99  
Received : 02/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	ND	1	
TOC	JIS K 0102 22.1	mg/L	-	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	-	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	ND	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	ND	0.2	
TPH	JIS K 0102 26	mg/L	ND	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	-	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99009

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : J90  
Sampled by : Khaled Busbait

Sampled : 31/10/99  
Received : 02/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	ND	0.5	
TSS	JEA 59-8	mg/L	2	1	
TOC	JIS K 0102 22.1	mg/L	-	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	-	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	-	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99010

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : RI  
Sampled by : Khaled Al-Rasheed

Sampled : 08/11/99  
Received : 08/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	-	1	
TOC	JIS K 0102 22.1	mg/L	-	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	-	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	ND	0.2	
TPH	JIS K 0102 26	mg/L	ND	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	0.3	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99011

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : R40  
Sampled by : Khaled Al-Rasheed

Sampled : 08/11/99  
Received : 08/11/99  
Completed : 24/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	ND	0.5	
TSS	JEA 59-8	mg/L	1	1	
TOC	JIS K 0102 22.1	mg/L	-	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	-	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	-	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	ND	0.01	
Cobalt	JIS K 0102 60.2	mg/L	ND	0.05	
Copper	JIS K 0102 52.2	mg/L	ND	0.05	
Lead	JIS K 0102 54.2	mg/L	ND	0.1	
Nickel	JIS K 0102 59.2	mg/L	ND	0.05	
Zinc	JIS K 0102 53.2	mg/L	ND	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	ND	0.2	
Benzene	JIS K 0125	mg/L	ND	0.01	
Toluene	JIS K 0125	mg/L	ND	0.01	
Ethylbenzene	JIS K 0125	mg/L	ND	0.01	
Xylene	JIS K 0125	mg/L	ND	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	-	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	-	10	

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**LABORATORY ANALYSIS REPORT**

Date: November 27, 1999

Report No. JMP-W99012

Sample Site : The Gulf Coast, JICA Project  
Type of Sample : Sea Water  
Sample ID# : T2  
Sampled by : Khaled Al-Rasheed

Sampled : 18/10/99  
Received : 19/10/99  
Completed : 01/11/99

**Analytical Results**

Parameter	Method	Unit	Result	DLR	Note
Residual Chlorine	JIS K 0102 33.3	mg/L	-	0.5	
TSS	JEA 59-8	mg/L	ND	1	
TOC	JIS K 0102 22.1	mg/L	3	1	
NH <sub>3</sub>	JIS K 0102 42	mg/L	ND	0.2	
Total Phosphorus	JIS K 0102 46	mg/L	0.02	0.01	
Cyanogen	JIS K 0102 38	mg/L	-	0.01	
Magnesium	JIS K 0102 51.2	g/L	-	0.1	
Cadmium	JIS K 0102 55.2	mg/L	-	0.01	
Cobalt	JIS K 0102 60.2	mg/L	-	0.05	
Copper	JIS K 0102 52.2	mg/L	-	0.05	
Lead	JIS K 0102 54.2	mg/L	-	0.1	
Nickel	JIS K 0102 59.2	mg/L	-	0.05	
Zinc	JIS K 0102 53.2	mg/L	-	0.01	
Chromium	JIS K 0102 65.1	mg/L	-	0.1	
Mercury	JEA 59-1	mg/L	-	0.005	
Arsenic	JIS K 0102 61.2	mg/L	-	0.01	
Phenols	JIS K 0102 28	mg/L	-	0.005	
Oil & Grease	JEA 64-4	mg/L	-	0.2	
TPH	JIS K 0102 26	mg/L	-	0.2	
Benzene	JIS K 0125	mg/L	-	0.01	
Toluene	JIS K 0125	mg/L	-	0.01	
Ethylbenzene	JIS K 0125	mg/L	-	0.01	
Xylene	JIS K 0125	mg/L	-	0.01	
Chlorophyll a	MHW VI-20.2	ug/L	2.6	0.1	
Total Coliform	MNW VIII-5.4	pcs/100ml	5200	10	

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