



Australian Government

Australian Maritime Safety Authority

**MONTARA WELL RELEASE
TIMOR SEA**

**OPERATIONAL MONITORING
STUDY 02**

**MONITORING OF OIL
CHARACTER
FATE AND EFFECTS**

**WATER QUALITY
REPORT 02**

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TABLE OF CONTENTS

Title Page	1
Document Control	2
Revision Record	2
Table of Contents	3
1.0 INTRODUCTION	4
1.1 Scope of this Report	4
1.2 Study Rational	4
1.3 Methods	4
2.0 RESULTS	6
2.1 Timor Sea: "First Class" Survey	6
2.2 Mainland Coastal Waters	6
2.3 Timor Sea: Curtin University Survey	6
2.4 Shoreline Assessment Surveys	7
3.0 REFERENCES	8
ATTACHMENT A: SITE DESCRIPTIONS AND RESULTS FROM "FIRST CLASS" SURVEY: LEEDER CONSULTING	9
ATTACHMENT B: WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN DURING THE STUDY S2 "SHORELINE ECOLOGICAL ASSESSMENT AERIAL SURVEY" UNDERTAKEN BY THE UNIVERSITY OF QUEENSLAND	18
ATTACHMENT C: ATTACHMENT C: WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN DURING THE STUDY S4A "EFFECTS ON FISHERIES" UNDERTAKEN BY CURTIN UNIVERSITY WESTERN AUSTRALIA (09-19/11/2009)	21
ATTACHMENT D: WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN DURING THE STUDY S4A "EFFECTS ON FISHERIES" UNDERTAKEN BY CURTIN UNIVERSITY WESTERN AUSTRALIA (04-18/03/2010)	24
ATTACHMENT D: WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN DURING THE SHORELINE ASSESSMENT SURVEY" 2010.	30

1.0 INTRODUCTION

1.1 Scope of this Report

The information set out in this report is based on an analysis of water samples taken during a number of monitoring surveys undertaken during the response to the Montara well release (August to November) and in post response surveys.

It reports the findings of the water sampling programme undertaken as part of Operational Monitoring Study O2 "Monitoring of Oil Character Fate and Effects".

This Report incorporates the data reported in the earlier 2009 Report (AMSA, 2009b).

Water samples have been taken by a number of scientific teams:

- Operational Monitoring Survey (OM Study 2) undertaken by Leeder Consulting (30th September to 9th October 2009) on board the "First Class". Results are presented in Section 2.1 and in Attachment A.
- Scientific Monitoring Study S2 "Shoreline Ecological Assessment Aerial Survey" undertaken by the University of Queensland. Results are presented in Section 2.2 and in Attachment C
- Scientific Monitoring Study S4A "Assessment of the Effects on Timor Sea Fish" undertaken by Curtin University. (2009 and 2010 surveys). Results are presented in Section 2.3 and in Attachments C and D.
- Shoreline Assessment surveys undertaken under the direction of the Department of the Environment, Water, Heritage and the Arts (DEWHA). Results are presented in Section 2.4 and in Attachment E.

1.2 Study Rational

Concerns have been expressed with regards the potential for hydrocarbons to enter the water column and to affect marine life. Sampling and analysis has been undertaken in order to:

- Determine the distribution, concentrations and character of petroleum hydrocarbons, if any, in waters impacted by oil from the Montara Well.
- Determine the distribution, concentrations and character of petroleum hydrocarbons, if any, in un-impacted waters. This data is required for comparative purposes.

The distribution of dispersed oil has also been a focus of concern. Analytical data from water samples taken in association with dispersant operations are provided in AMSA Oil Report No 3 (AMSA, 2009a).

The analysis of water samples is presented in Attachments to this report.

1.3 Methods

Sampling

Water samples were taken from waters of varying depths using a Niskin bottle, Van Doorn bottle or other suitable sampling device.

Depths sampled were surface (0.5m), 1m, 2m, 3m, 5m, 10m and 20m depths.

Samples were placed in clean sample bottles, refrigerated and transferred to the laboratory via rapid courier in cooled containers.

In the case of the dedicated OM Study 02 survey, overlying oil samples were also taken for analysis. The results of this analysis are reported in AMSA Oil Report No. 4.

Analysis

All samples were screened for hydrocarbons (total petroleum hydrocarbons) and if positive then further analysed for monocyclic aromatic hydrocarbons (MAH; i.e. benzene, ethylbenzene, toluene and xylenes [BTEX]) and polycyclic aromatic hydrocarbons (PAH).

Laboratory detection limits are as follows:

- TPH: <0.5 mg/L (<50 ppb) but specifically as follows;
 - C6-C9: <0.01 mg/L (<10 ppb).
 - C10-C14: <0.01 mg/L (<10 ppb).
 - C15-C28: <0.5 mg/L (<50 ppb).
 - C29-C36 <0.5 mg/L (<50 ppb).
- BTEX: <0.001mg/L (<1 ppb).
- PAH: <0.001mg/L (<1 ppb).

Random samples which showed negative for TPH were also analysed and results are included in the relevant Attachment.

Reporting

Results of analysis are reported in the Leeder Consulting Reports or other reports as listed in Section 3.

2.0 RESULTS

2.1 Timor Sea: “First Class” Survey

Hydrocarbons were detected in 1 set of subsurface water samples taken within the impacted area. This was at location 12° 39.9' S, 124° 35.7 E (samples 2009020411, 2009020412, 2009020413, 2009020414 in Attachment A) on 04/08/2009.

C15-C28 hydrocarbons were detected at all depths at this location. Further analysis of these samples showed no presence of BTEX or PAHs. The samples were taken below a surface slick of orange coloured oil (see A.3 in Attachment A).

This location was within the area in which dispersant operations were undertaken and it is possible that the detected hydrocarbons were from operations completed in the previous few days. Conditions were calm and natural dispersion is unlikely.

2.2 Mainland Coastal Waters

Thirty five inshore water samples were taken along the WA and NT coastline during the Scientific Monitoring Study S2 “Shoreline Ecological Assessment Aerial Survey” undertaken by the University of Queensland (09-18/11/2009). The location of sampling sites is provided in Figure 1.

No samples contained hydrocarbons. One sample was taken immediately below a surface film of wax and algae.

Analysis results are provided in Attachment B.

2.3 Timor Sea: Curtin University Survey

Water samples were taken during Scientific Monitoring Study S4A “Assessment of the Effects on Timor Sea Fish” undertaken by Curtin University.

2009 Survey

Analytical results are provided in Attachment C. Samples were taken to depths of up to 20m. Sampling locations are shown in Figure 2. No water samples showed the presence of TPH.

Figure 1 Scope of the Mainland Shoreline Survey
(Adapted from Duke *et al.* 2009)

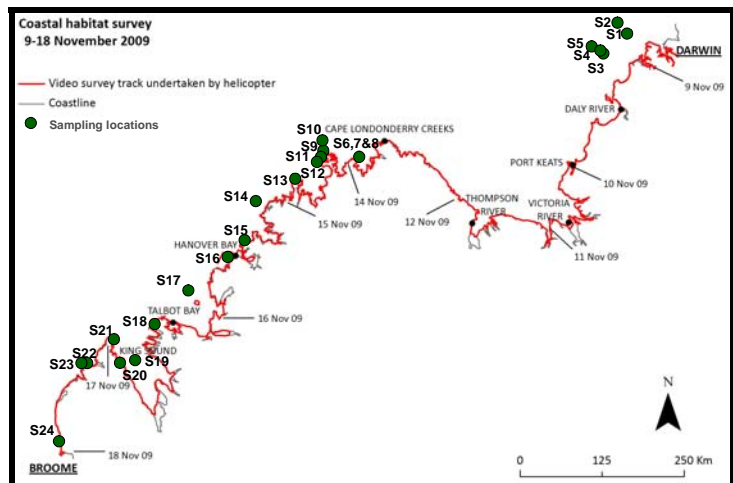
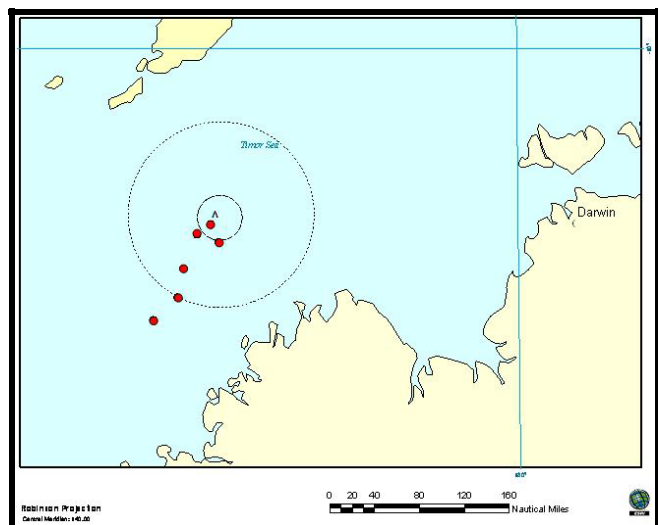


Figure 2 Study S4A 2009 Sample Locations



2010 Survey

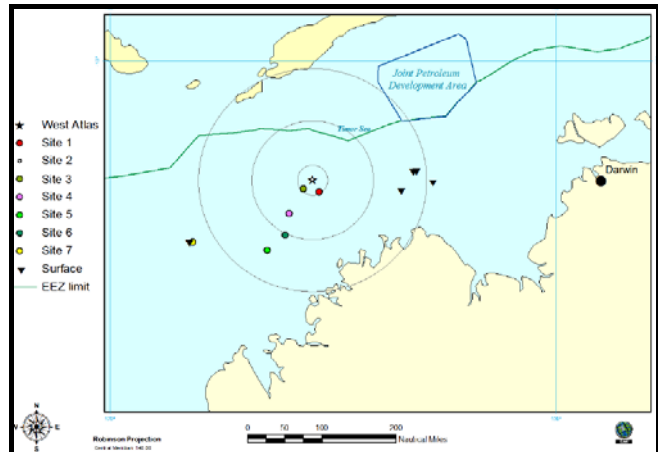
Analytical results are provided in Attachment D. Samples were again taken to depths of up to 20m.

2010 sampling locations are shown in Figure 3. No water samples showed the presence of hydrocarbons.

2.4 Shoreline Assessment Surveys

Water samples were taken during two shoreline assessment surveys undertaken by DEWH (AMSA, DEWHA, 2009 and 2010).

Figure 2 Study S4A March 2010 Sample Locations



October, 2009

This survey covered Ashmore-Cartier islands and Hibernia reef and associated waters (AMSA-DEWHA, 2009). During this survey only inshore water samples were taken and results of analysis for these is provided in AMSA, 2009c. No hydrocarbons were detected.

February, 2010

This post-response survey covered Ashmore- Cartier islands, Hibernia and Browse Island and associated waters (see AMSA-DEWHA, 2010). During this survey, water samples were taken at 8 locations.

No petrogenic hydrocarbons were detected in any sample. Analytical results are presented in Attachment E of this report.

3.0 REFERENCES

- AMSA. 2009a. Montara Well Release Timor Sea, Operational Monitoring Study O2; Monitoring of Oil Character Fate and Effects Report 03 Dispersant Treated Oil Distribution. November 8th, 2009.
- AMSA. 2009b. Operational Monitoring Study O2 Monitoring of Oil Character, Fate and Effects Report 02 Water Quality.
- AMSA. 2009c. Operational Monitoring Study O2 Monitoring of Oil Character, Fate and Effects Report 05 Potential Shoreline Impact: Presence and Character of Oil.
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- Leeder Consulting. 2009a. West Atlas Oil Spill Water Sampling. Report M091522B Prepared for Australian Maritime Safety Authority 9th November, 2009.
- Leeder Consulting. 2009b. West Atlas Oil Spill Water Sampling. Report M091522E Prepared for Australian Maritime Safety Authority 4th November, 2009.
- Leeder Consulting. 2009c. West Atlas Oil Spill: Darwin Harbour. Report M09174 Prepared for Australian Maritime Safety Authority 4th November, 2009.
- Leeder Consulting. 2009d. West Atlas Oil Spill Certificate of Analysis. Report M091762. Prepared for Australian Maritime Safety Authority 26th November, 2009.
- Leeder Consulting. 2009d. West Atlas Oil Spill Certificate of Analysis. Report M091714. Prepared for Australian Maritime Safety Authority 26th November, 2009.
- Leeder Consulting. 2009e. West Atlas Oil Spill Certificate of Analysis. Report M091766. Prepared for Australian Maritime Safety Authority 4th December, 2009.
- Leeder Consulting. 2010. West Atlas Oil Spill Certificate of Analysis. Report M100132. Prepared for Department of the Environment, Water, Heritage and the Arts 9th March, 2010.

**ATTACHMENT A: SITE DESCRIPTIONS AND RESULTS FROM
"FIRST CLASS" SURVEY**

FROM LEEDER REPORTS M091522 (SERIES A, B, D, E)

All results are in mg/L. ND = Not Detected

Limits of Detection (Practical Quantitation Limits or PQL):

TPH:

C6-C9 = 0.01 mg/L

C10-C14 = 0.01 mg/L

C15-C28 = 0.05 mg/L


C29-C36 = 0.05 mg/L

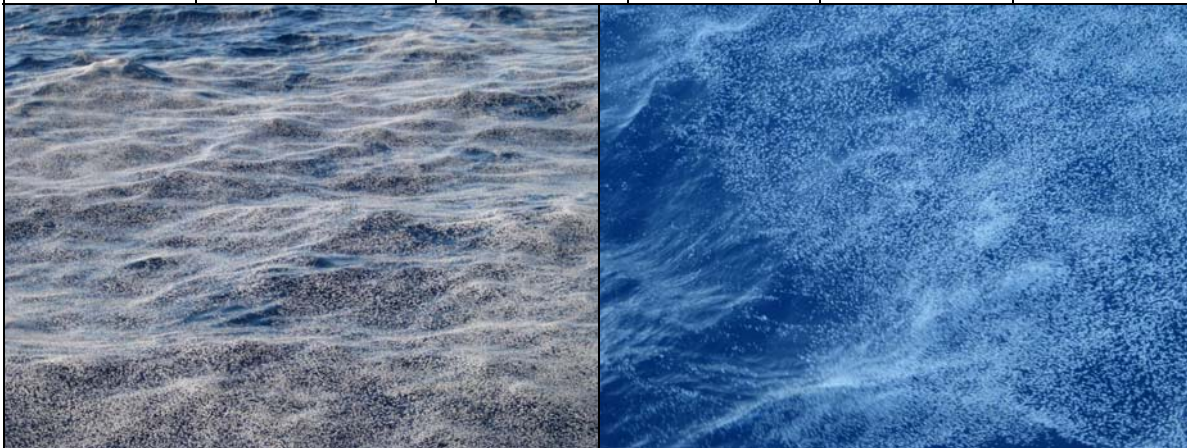
C5-C36 = 0.05 mg/L,


BTEX = 0.001 mg/L

PAH = 0.001 mg/L

Note

A.1	Location	12° 36.2' S, 126° 49.7 E				
	Site Description	Beneath a slick comprised of patches of khaki-coloured oil and purple patties. Approximately 140 nautical miles east of the West Atlas oil rig. Weather conditions were fine, hot, and still, with no wind. Samples were taken at approximately 17:30 on the 30 th of September				
	Results	Depth	1 m	2 m	3 m	5 m
		Leeder ID	2009020365	2009020364	2009020363	2009020362
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
TPH C29-C36		ND	ND	ND	ND	
Total TPH	ND	ND	ND	ND		
						

A.2	Location	12° 23.0' S, 124° 36.8 E				
	Site Description	Beneath a slick comprised of white waxy droplets. Approximately 20 nautical miles north of the West Atlas oil rig. Weather conditions: fine, hot, and no wind. Samples were taken at approximately 08:30 on the 1 st of October.				
	Results	Depth	1 m	2 m	3 m	5 m
		Leeder ID	2009020381	2009020382	2009020383	2009020384
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
TPH C29-C36		ND	ND	ND	ND	
Total TPH	ND	ND	ND	ND		
						

A.3	Location	12° 39.9' S, 124° 35.7 E				
	Site Description	Beneath an orange oil slick. Approximately 3 nautical miles east of the West Atlas oil rig. Weather conditions were fine, hot, and still, with no wind. Photographs of this slick appear in Attachment 2. These samples were taken at approximately 08:30 on the 4 th of October.				
	Results	Depth	1 m	2 m	3 m	5 m
		Leeder ID	2009020411	2009020412	2009020413	2009020414
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	0.09	0.12	0.09	0.08
TPH C29-C36		ND	ND	ND	ND	
Total TPH	0.09	0.12	0.09	0.08		
						

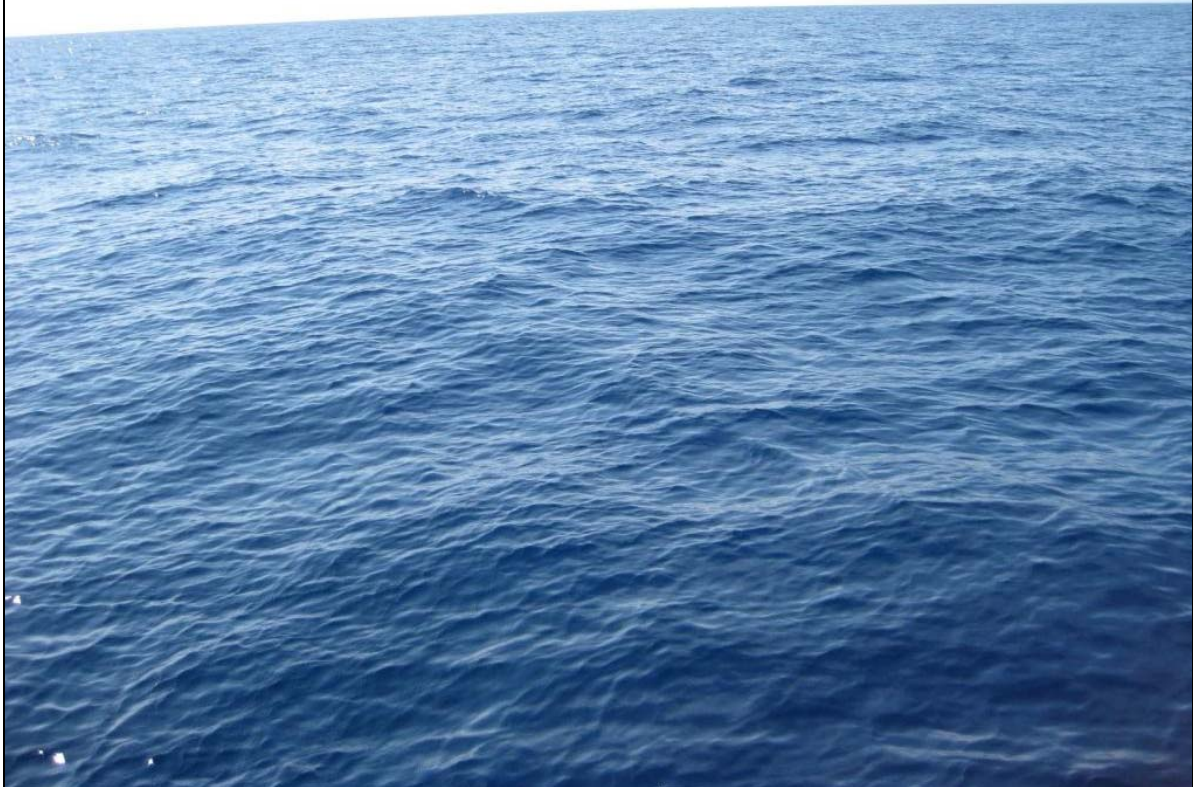
A.4	Location	12° 43.7' S, 124° 31.8 E				
	Site Description	Beneath a slick of highly emulsified oil found approximately 3 nautical miles south of the West Atlas oil rig. Weather conditions were fine, hot, and still, with no wind. Samples were taken at approximately 13:00 on the 7 th of October.				
	Results	Depth	1 m	2 m	3 m	5 m
		Leeder ID	2009020453	2009020454	2009020455	2009020456
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
TPH C29-C36		ND	ND	ND	ND	
Total TPH	ND	ND	ND	ND		


A.5	Location	12° 40.7' S, 124° 44.8 E				
	Site Description	Clean seas. Approximately 12.5 nautical miles east of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. Samples were taken at approximately 12:50 on the 8 th of October.				
	Results	Depth	1 m	3 m	5 m	10 m
		Leeder ID	2009020482	2009020483	2009020484	2009020485
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
		TPH C29-C36	ND	ND	ND	ND
Total TPH	ND	ND	ND	ND		

A.6	Location	12° 35.8' S, 124° 44.3 E				
	Site Description	Clean seas. Collected from approximately 12.5 nautical miles east-north-east of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. These samples were taken at approximately 14:15 on the 8 th of October.				
	Results	Depth	1 m	3 m	5 m	10 m
		Leeder ID	2009020487	2009020488	2009020489	2009020490
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
		TPH C29-C36	ND	ND	ND	ND
Total TPH	ND	ND	ND	ND		



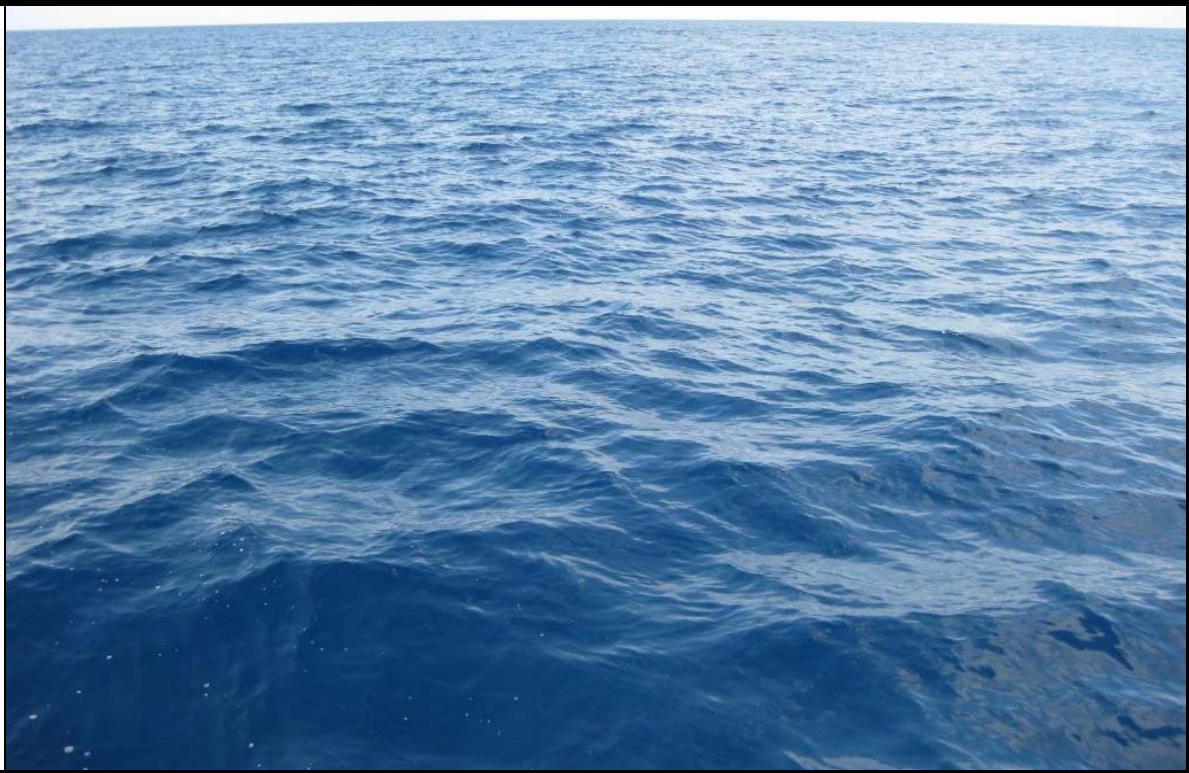
A.7	Location	12° 31.6' S, 124° 41.4 E				
	Site Description	Clean seas. Approximately 12.5 nautical miles north-east of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. These samples were taken at approximately 15:00 on the 8 th of October.				
	Results	Depth	1 m	3 m	5 m	10 m
		Leeder ID	2009020492	2009020493	2009020494	2009020495
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
		TPH C29-C36	ND	ND	ND	ND
Total TPH	ND	ND	ND	ND		

A.8	Location	12° 28.9' S, 124° 37.4 E				
	Site Description	Clean seas. Collected from approximately 12.5 nautical miles north-north-east of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. These samples were taken at approximately 15:55 on the 8 th of October				
	Results	Depth	1 m	3 m	5 m	10 m
		Leeder ID	2009020497	2009020498	2009020499	2009020500
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
TPH C29-C36		ND	ND	ND	ND	
Total TPH	ND	ND	ND	ND		
						

A.9	Location	12° 27.9' S, 124° 32.5 E				
	Site Description	Clean seas. Collected approximately 12.5 nautical miles north of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. Samples were taken at approximately 16:50 on the 8 th of October.				
	Results	Depth	1 m	3 m	5 m	10 m
		Leeder ID	2009020502	2009020503	2009020504	2009020505
		TPH C6-C9	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND
		TPH C29-C36	ND	ND	ND	ND
Total TPH	ND	ND	ND	ND		
						

A.10	Location	12° 25.9' S, 127° 34.1 E					
	Site Description	Clean seas. Approximately 170 nautical miles east of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. Samples were taken at approximately 09:10 on the 9 th of October.					
	Results	Depth	1 m	3 m	5 m	10 m	20 m
		Leeder ID	2009020507	2009020508	2009020509	2009020510	2009020511
		TPH C6-C9	ND	ND	ND	ND	ND
		TPH C10-C14	ND	ND	ND	ND	ND
		TPH C15-C28	ND	ND	ND	ND	ND
		TPH C29-C36	ND	ND	ND	ND	ND
Total TPH	ND	ND	ND	ND	ND		
Continued overage							

A.10
Cont



A.11

Location	12° 24.9' S, 128° 50.7 E					
Site Description	Clean seas. Approximately 250 nautical miles east of the West Atlas oil rig. Weather conditions were fine and hot, with a slight wind. Samples were taken at approximately 17:20 on the 9 th of October.					
Results	Depth	1 m	3 m	5 m	10 m	20m
	Leeder ID	20090205 13	20090205 14	20090205 15	20090205 16	20090205 17
	TPH C6-C9	ND	ND	ND	ND	ND
	TPH C10-C14	ND	ND	ND	ND	ND
	TPH C15-C28	ND	ND	ND	ND	ND
	TPH C29-C36	ND	ND	ND	ND	ND
	Total TPH	ND	ND	ND	ND	ND



Table A12 BTEX Analysis

Location	12° 36.2' S, 126° 49.7 E				12° 23.0' S, 124° 36.8 E				12° 39.9' S, 124° 35.7 E			
Depth	1 m	2 m	3 m	5 m	1 m	2 m	3 m	5 m	1 m	2 m	3 m	5 m
Sample ID	2009020 365	2009020 364	2009020 363	2009020 362	2009020 381	2009020 382	2009020 383	2009020 384	2009020 411	2009020 412	2009020 413	2009020 414
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	12° 43.7' S, 124° 31.8 E				12° 40.7' S, 124° 44.8 E				12° 35.8' S, 124° 44.3 E			
Depth	1 m	3 m	5 m	10 m	1 m	3 m	5 m	10 m	1 m	3 m	5 m	10 m
Sample ID	2009020 453	2009020 454	2009020 455	2009020 456	2009020 482	2009020 483	2009020 484	2009020 485	2009020 487	2009020 488	2009020 489	2009020 490
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	12° 31.6' S, 124° 41.4 E				12° 28.9' S, 124° 37.4 E				12° 27.9' S, 124° 32.5 E			
Depth	1 m	3 m	5 m	10 m	1 m	3 m	5 m	10 m	1 m	3 m	5 m	10 m
Sample ID	2009020 492	2009020 493	2009020 494	2009020 495	2009020 497	2009020 498	2009020 499	2009020 500	2009020 502	2009020 503	2009020 504	2009020 505
BENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
XYLENES	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	12° 25.9' S, 127° 34.1 E					12° 24.9' S, 128° 50.7 E			
Depth	1 m	3 m	5 m	10 m	20 m	1 m	3 m	5 m	10 m
Sample ID	2009020 507	2009020 508	2009020 509	2009020 510	2009020 511	2009020 513	2009020 514	2009020 515	2009020 516
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A13 Polycyclic Aromatic Hydrocarbons

Sample ID	12° 39.9' S, 124° 35.7 E			
	2009020411	2009020412	2009020413	2009020414
Acenaphthene	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND
Benzo(ghi)perylene	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
Dibenz(ah)anthracene	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND

Table A14 TPH Analysis for Samples from Darwin Harbour
12° 29.346`S 130° 49.447` E

Depth	Surface	1 m	1 m (duplicate)	5 m	10m
Leeder ID	2009022961	2009022957	2009022958	2009022959	2009022960
TPH C6-C9	ND	ND	ND	ND	ND
TPH C10-C14	ND	ND	ND	ND	ND
TPH C15-C28	ND	ND	ND	ND	ND
TPH C29-C36	ND	ND	ND	ND	ND
Total TPH	ND	ND	ND	ND	ND

Table A15 BTEX Analysis for Samples from Darwin Harbour
12° 29.346`S 130° 49.447` E

Depth	Surface	1 m	1 m (duplicate)	5 m	10m
Leeder ID	2009022961	2009022957	2009022958	2009022959	2009022960
Benzene	ND	ND	ND	ND	ND
Toluene	0.002	0.001	0.002	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND

Table A16 VOC Analysis for Samples from Darwin Harbour
12° 29.346`S 130° 49.447` E

Depth	Surface	1 m	1 m (duplicate)	5 m	10m
Leeder ID	2009022961	2009022957	2009022958	2009022959	2009022960
Dibromofluoromethane	97	95	93	100	100
12-Dichloroethane-d4	103	100	105	108	107
Toluene-d8	70	75	81	98	98
p-Bromofluorobenzene	77	76	81	93	93

**ATTACHMENT B:
WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN DURING THE STUDY
S2 "SHORELINE ECOLOGICAL ASSESSMENT AERIAL SURVEY" UNDERTAKEN
BY THE UNIVERSITY OF QUEENSLAND (09-18/11/2009)**

FROM LEEDER REPORT M091763

All TPH results are in mg/L. ND = Not Detected (<0.01 mg/L)

Limits of Detection (Practical Quantitation Limits or PQL):

TPH:

C6-C9 = 0.01 mg/L

C10-C14 = 0.01 mg/L

C15-C28 = 0.05 mg/L

C29-C36 = 0.05 mg/L

C5-C36 = 0.05 mg/L,

BTEX = 0.001 mg/L

PAH = 0.001 mg/L

Table B1 TPH Analysis

Location	S1 Pearce Pt, NT		S2 NT			S3 Pelican Is. WA			S4 Pelican Is. WA
	S14°25`42.9; E129°20`19.0		S14°38`47.5; E129°11`16.6			S14°45`17.1; E120°46`58.5			S14°46`18.5; E128°46`31.2
Depth	0m	6m	0m	6m	10m	0m	6m	10m	0m
Sample ID	2009023583	2009023584	2009023585	2009023586	2009023587	2009023588	2009023589	2009023590	2009023591
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	S5	S6 Arvo Penn	S7 Sir Ghram Is.	S8 Sir Ghram Is.		S9 N. Eclipse Is.		S10 (Under Wax with Algae)	S10.5
	S13.73889; 126.95769	S13.94326; E126.56251	S13.88242; E126.58974	S13°52.61; E126°29.07		S13°42`37.6; E126°19`38.8		S13°49`21.8; E126°06`13.4	S14°03`49.8; E125°53`34.5
Depth	0m	0m	0m	0m	10m	0m	10m	0m	0m
Sample ID	2009023592	2009023593	2009023594	2009023595	2009023596	2009023597	2009023598	2009023599	2009023600
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	S11 Hat Pt	S12 Gibson Pt	S13 Cape Voltaire	S14 Biggs Is.		S15 Cape Brewster	S16	S17 Montgomery Is.	
	S13.92700; E126.01078	S13.9913; E125.98434	S14.25930; E125.58485	S14°32`49.2; E125°05`11.2		S15.11526; E124.90507	S15.29353; E124.67610	S15°48`02.3; E124°03`13.0	
Depth	0m	0m	0m	0m	10m	0m	0m	0m	10m
Sample ID	2009023601	2009023602	2009023603	2009023604	2009023605	2009023606	2009023607	2009023608	2009023609
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	S18	S19 Usbourne Pt Sound Entrance East	S20	S21 One Arm Pt Beach	S22 Lacepede Is.		S23	S24 Broome Cable
	S16.29788; E123.56147	S16.85677; E123.50729	S16.85969; E123.16285	S16.35893; E123.03236°	S16°53`02.6; E122°14`26.2		S16.76449; E122.58679	S17.938046; E122.209392
Depth	0m	0m	0m	0m	0m	10m	0m	0m
Sample ID	2009023610	2009023611	2009023612	2009023613	2009023614	2009023615	2009023616	2009023617
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND

**ATTACHMENT C: WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN
DURING THE STUDY S4A "EFFECTS ON FISHERIES" UNDERTAKEN BY CURTIN
UNIVERSITY WESTERN AUSTRALIA (09-19/11/2009)**

FROM LEEDER REPORT M091766

All results are in mg/L. ND = Not Detected

Limits of Detection (Practical Quantitation Limits or PQL):

TPH:

C6-C9 = 0.01 mg/L
C10-C14 = 0.01 mg/L
C15-C28 = 0.05 mg/L
C29-C36 = 0.05 mg/L
C5-C36 = 0.05 mg/L,

BTEX = 0.001 mg/L

PAH = 0.001 mg/L

Table C1 TPH Analysis

Location	Site 1						Site 2		
	13d 00.849 S 124d 31.374 E						12d 43.199 S 124d 31.656 E		
Depth	0m	1m	3m	5m	10m	15m	0m	1m	3m
Date	16/11/2009						9/11/2009		
Sample ID	2009023660	2009023662	2009023664	2009023666	2009023668	2009023671	2009023672	2009023674	2009023676
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	Site 2				Site 2-R				
	12d 43.199 S 124d 31.656 E				12d 43.199 S 124d 31.656 E				
Depth	5m	10m	15m	20m	0m	1m	3m	5m	10m
Date	9/11/2009				19/11/2009				
Sample ID	2009023678	2009023680	2009023682	2009023683	2009023984	2009023686	2009023688	2009023690	2009023692
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	Site 2-R	Site 3						Site 4	
	12d 43.199 S 124d 31.656 E	12d 52.856 S 124d 19.856 E						13d 24.550 S 124d 04.850 E	
Depth	15m	0m	1m	3m	5m	10m	15m	0m	1m
Date	19/11/2009	11/11/2009						12/11/2009	
Sample ID	2009023694	2009023696	2009023698	2009023700	2009023702	2009023704	2009023706	2009023708	2009023710
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	Site 4				Site 4.1				
	13d 24.550 S 124d 04.850 E				13d 24.550 S 124d 04.850 E				
Depth	3m	5m	10m	15m	0m	1m	3m	5m	10m
Date	12/11/2009				12/11/2009				
Sample ID	2009023712	2009023714	2009023716	2009023718	2009023720	2009023722	2009023724	2009023726	2009023728
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	Site 4.1	Site 5						Site 6	
	13d 24.550 S 124d 04.850 E	14d 12.270 S 123d 32.130 E						13d 51.220 S 123d 57.590 E	
Depth	15m	0m	1m	3m	5m	10m	15m	0m	1m
Date	12/11/2009	14/11/2009						15/11/2009	
Sample ID	2009023730	2009023732	2009023734	2009023736	2009023738	2009023740	2009023742	2009023744	2009023746
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND	ND

Location	Site 6								
	13d 51.220 S 123d 57.590 E								
Depth	3m	5m	10m	15m					
Date	15/11/2009								
Sample ID	2009023748	2009023750	2009023752	2009023754					
C6-C9	ND	ND	ND	ND					
C10-C14	ND	ND	ND	ND					
C15-C28	ND	ND	ND	ND					
C29-C36	ND	ND	ND	ND					
Total C6-C36	ND	ND	ND	ND					

**ATTACHMENT D: WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN
DURING THE STUDY S4A "EFFECTS ON FISHERIES" UNDERTAKEN BY CURTIN
UNIVERSITY WESTERN AUSTRALIA (04-18/03/2010)**

FROM LEEDER REPORT M0100344R1

All results are in mg/L. ND = Not Detected

Limits of Detection (Practical Quantitation Limits or PQL):

TPH:

C6-C9 = 0.01 mg/L
C10-C14 = 0.01 mg/L
C15-C28 = 0.05 mg/L
C29-C36 = 0.05 mg/L
C5-C36 = 0.05 mg/L,

BTEX = 0.001 mg/L

PAH = 0.001 mg/L

Table D1 Water Sample Analysis for BTEX and TPH

Location	Site 1						Site 2
Position	12' 40.18S 124' 32.07E						12' 56.70S 124' 41.40E
Depth	Surface	1m	3m	5m	10m	15m	Surface
Leeder ID	2010004044	2010004045	2010004046	2010004047	2010004048	2010004049	2010004050
Date	14/03/2010	14/03/2010	14/03/2010	14/03/2010	14/03/2010	14/03/2010	13/02/2010
BTEX							
Benzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND
TPH							
C6-C9	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND
PAH							
Acenaphthene	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND
Dibenz(ah)anthracene	ND	ND	ND	ND	ND	ND	ND
7,12Dimethylbenz(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND

AMSA Monitoring Study O2 Report 02-2B

Location	Site 2			Site 4			
Position	12' 56.70S 124' 41.40E			13' 25.83S 124' 01.04E			
Depth	3m	5m	10m	Surface	1m	3m	5m
Leeder ID	2010004051	2010004052	2010004053	2010004054	2010004055	2010004056	2010004057
Date	13/03/2010	13/03/2010	13/03/2010	07/03/2010	07/03/2010	07/03/2010	07/02/2010
BTEX							
Benzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND
TPH							
C6-C9	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	0.39*	0.13*	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	0.39*	0.13*	ND	ND
PAH							
Acenaphthene	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND
Dibenz(ah)anthracene	ND	ND	ND	ND	ND	ND	ND
7,12Dimethylbenz(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND

* Biogenic hydrocarbons, not petroleum based.

AMSA Monitoring Study O2 Report 02-2B

Location	Site 4		Site 5				
Position	13' 25.83S 124' 01.04E		14' 15.38S 123' 31.53E				
Depth	10m	15m	Surface	1m	3m	5m	10m
Leeder ID	2010004058	2010004059	2010004060	2010004061	2010004062	2010004063	2010004064
Date	07/03/2010	07/03/2010	10/03/2010	10/03/2010	10/03/2010	10/03/2010	10/03/2010
BTEX							
Benzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND
TPH							
C6-C9	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND
PAH							
Acenaphthene	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND
Dibenz(ah)anthracene	ND	ND	ND	ND	ND	ND	ND
7,12Dimethylbenz(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND

AMSA Monitoring Study O2 Report 02-2B

Location	Site 5	Site 6					
Position	14' 15.38S 123' 31.53E	13' 54.91S 123' 55.67E					
Depth	15m	Surface	1m	3m	5m	10m	15m
Leeder ID	2010004065	2010004066	2010004067	2010004068	2010004069	2010004070	2010004071
Date	10/03/2010	11/03/2010	11/03/2010	11/03/2010	11/03/2010	11/03/2010	11/02/2010
BTEX							
Benzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND
TPH							
C6-C9	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND
PAH							
Acenaphthene	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Benzo(ghi)perylene	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND
Dibenz(ah)anthracene	ND	ND	ND	ND	ND	ND	ND
7,12Dimethylbenz(a)anthracene	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND

AMSA Monitoring Study O2 Report 02-2B

Location	Site 7						
Position	14' 03.75S 123' 31.53E						
Depth	Surface	1m	3m	5m	10m	15m	
Leeder ID	2010004072	2010004073	2010004074	2010004076	2010004076	2010004077	
Date	08/03/2010	08/03/2010	08/03/2010	08/03/2010	08/03/2010	08/03/2010	
BTEX							
Benzene	ND	ND	ND	ND	ND	ND	
Ethylbenzene	ND	ND	ND	ND	ND	ND	
Toluene	ND	ND	ND	ND	ND	ND	
m&p-Xylenes	ND	ND	ND	ND	ND	ND	
o-Xylene	ND	ND	ND	ND	ND	ND	
TPH							
C6-C9	ND	ND	ND	ND	ND	ND	
C10-C14	ND	ND	ND	ND	ND	ND	
C15-C28	ND	ND	ND	ND	ND	ND	
C29-C36	ND	ND	ND	ND	ND	ND	
Total C6-C36	ND	ND	ND	ND	ND	ND	
PAH							
Acenaphthene	ND	ND	ND	ND	ND	ND	
Acenaphthylene	ND	ND	ND	ND	ND	ND	
Anthracene	ND	ND	ND	ND	ND	ND	
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	
Benzo(ghi)perylene	ND	ND	ND	ND	ND	ND	
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	
Chrysene	ND	ND	ND	ND	ND	ND	
Dibenz(ah)anthracene	ND	ND	ND	ND	ND	ND	
7,12Dimethylbenz(a)anthracene	ND	ND	ND	ND	ND	ND	
Fluoranthene	ND	ND	ND	ND	ND	ND	
Fluorene	ND	ND	ND	ND	ND	ND	
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	
3-Methylcholanthrene	ND	ND	ND	ND	ND	ND	
Naphthalene	ND	ND	ND	ND	ND	ND	
Phenanthrene	ND	ND	ND	ND	ND	ND	
Pyrene	ND	ND	ND	ND	ND	ND	

**ATTACHMENT E:
WATER QUALITY ANALYSIS OF WATER SAMPLES TAKEN
DURING THE SHORELINE ASSESSMENT SURVEY 2010
FROM LEEDER REPORT M100132**

All results are in mg/L. ND = Not Detected

Limits of Detection (Practical Quantitation Limits or PQL):

TPH:

C6-C9 = 0.01 mg/L
C10-C14 = 0.01 mg/L
C15-C28 = 0.05 mg/L
C29-C36 = 0.05 mg/L
C5-C36 = 0.05 mg/L,

BTEX = 0.001 mg/L

PAH = 0.001 mg/L

Table E1 Water Sample Analysis. Shoreline Assessment Survey of Ashmore-Cartier Islands: Analysis for BTEX and TPH

Location	W 1						W 2	
Position	12.23769S 122.98602E						12.17327S 123.22107E	
Depth	Bottom (12m)	10m	5m	3m	2m	1m	20m	10m
Leeder ID	2010002297	2010002292	2010002293	2010002294	2010002295	2010002296	2010002298	2010002299
Date	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010
BTEX								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
TPH								
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND

Location	W 2			W 3				
Position	12.17327S 123.22107E			12.18102S 123.39489E				
Depth	5m	2m	1m	20m	10m	5m	2m	1m
Leeder ID	2010002300	2010002301	2010002302	2010002303	2010002304	2010002305	2010002306	2010002307
Date	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010
BTEX								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
TPH								
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND

Location	W 4			W 5				
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AMSA Monitoring Study O2 Report 02-2

Position	12.18732S 123.56071E					12.19372S 123.73176E		
Depth	20m	10m	5m	3m	1m	20m	10m	5m
Leeder ID	2010002308	2010002307	2010002310	2010002311	2010002312	2010002313	2010002314	2010002315
Date	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010
BTEX								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
TPH								
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND

Location	W 5		W 6				W 7	
Position	12.19372S 123.73176E		12.19994S 123.90395E				12.20767S 124.09059E	
Depth	2m	1m	20m	10m	5m	2m	1m	2m
Leeder ID	2010002316	2010002317	2010002323	2010002324	2010002325	2010002326	2010002327	2010002328
Date	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010	14/02/2010
BTEX								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
m&p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
TPH								
C6-C9	ND	ND	ND	ND	ND	ND	ND	ND
C10-C14	ND	ND	ND	ND	ND	ND	ND	ND
C15-C28	ND	ND	ND	ND	ND	ND	ND	ND
C29-C36	ND	ND	ND	ND	ND	ND	ND	ND
Total C6-C36	ND	ND	ND	ND	ND	ND	ND	ND

Location	W 7	W 8					
Position	12.20767S 124.09059E	12.21336S 124.26671E					
Depth	1m	2m	1m				
Leeder ID	2010002329	2010002330	2010002331				
Date	14/02/2010	14/02/2010	14/02/2010				
BTEX							
Benzene	ND	ND	ND				
Ethylbenzene	ND	ND	ND				
Toluene	ND	ND	ND				
m&p-Xylenes	ND	ND	ND				
o-Xylene	ND	ND	ND				
TPH							
C6-C9	ND	ND	ND				
C10-C14	ND	ND	ND				
C15-C28	ND	ND	ND				
C29-C36	ND	ND	ND				
Total C6-C36	ND	ND	ND				

