

R1/12

AMM

In Confidence - not to be quoted without reference to the Laboratory 11SR82

FRV "Scotia"

Cruise 11/82

REPORT

27 October - 5 November 1982.

Objectives

- 1 To investigate the distribution of hydrocarbons in water and sediment around the Beatrice, Murchinson, Brent, Beryl, Forties and Montrose oilfields and along the Forth Forties line.
- 2 To investigate the effects of high hydrocarbon loads in the sediments around Beryl on benthic animal distribution.

Narrative

"Scotia" left Aberdeen at 1500 hours on 27 October and arrived on station at the Beatrice oilfield at 2340 hours on 27 October. Twenty-four stations around Beatrice were sampled and a one hour demersal trawl taken. At 1600 hours the vessel commenced passage to the Murchison field, stopping en route to sample from JONSIS line stations which were used as "clean" stations for the hydrocarbon samples. Sampling around the Murchison and Brent fields commenced at 0800 hours on 30 October after a short loss of time due to severe weather, and a further 48 stations were occupied. A two hour demersal trawl was also taken close to the Brent field.

At 1930 hours on 31 October the vessel made passage to the Beryl field where a further 30 stations were occupied and a demersal trawl taken commencing at 1400 hours and finishing at 1530 hours on 1 November.

A further 50 stations were occupied around the Forties and Montrose oilfields followed by a two hour demersal trawl around the Montrose field. The vessel left the oilfields at 0130 on 4 November on passage to Aberdeen. A trawl and a hydrocarbon sample were taken at a clean station en route. The vessel docked in Aberdeen at 1700 hours on 4 November.

Results

Almost all of the objectives of the cruise were carried out. The only part of the programme that was not completed was the line of stations between the Forties field and the Firth of Forth, which was lost due to a short spell of bad weather at the start of the cruise. Preliminary results and the list of stations occupied are shown in Table 1.

J M Davies

3 February 1983

Seen in draft: J W Gillon

TABLE 1 Details of stations occupied by FRV "Scotia" 27 October - 5 November 1982
and preliminary hydrocarbon data (by fluorescence)

Title of station (stn no in brackets)		Lat	Long	Date	Time	Depth m	Hydrocarbons Water µg l ⁻¹	Sediments µg g ⁻¹
<u>Clean Stations</u>								
CS1	(25)	59°15.08'N	00°59.99'W	29.10.82	0125	127	10.02	10.79
CS2	(26)	59°15.12'N	00°00.10'W	"	0710	138	1.48	27.61
CS3	(149)	57°18.19'N	01°10.85'W	4.11.82	1058	77	2.39	8.03
CS4	(150)	57°15.12'N	01°30.01'W	"	1230	75	2.20	7.48
<u>Beatrice South leg</u>								
10SBt	(1)	57°56.54'N	03°05.18'W	27.10.82	2340	80	4.91	29.09
5SBt	(2)	58°01.75'N	03°05.05'W	28.10.82	0049	45	4.23	6.68
3SBt	(3)	58°03.89'N	03°05.30'W	"	0130	44	5.70	4.90
2SBt	(4)	58°04.93'N	03°05.15'W	"	0155	42	3.14	4.63
1SBt	(5)	58°05.88'N	03°04.85'W	"	0218	43	4.69	4.79
0.5SBt	(19)	58°06.28'N	03°05.28'W	"	1013	43	5.24	14.54
<u>Beatrice North leg</u>								
0.5NBt	(17)	58°07.56'N	03°05.31'W	"	0915	48	1.11	27.87
1NBt	(6)	58°08.05'N	03°05.00'W	"	0245	48	5.24	43.08
2NBt	(7)	58°08.95'N	03°04.75'W	"	0310	50	5.26	8.23
3NBt	(8)	58°09.81'N	03°05.30'W	"	0328	59	4.69	25.31
5NBt	(9)	58°12.19'N	03°05.21'W	"	0350	68	4.61	23.23
10NBt	(10)	58°17.03'N	03°05.19'W	"	0445	62	1.93	20.28
<u>Beatrice West leg</u>								
10WBt	(11)	58°07.10'N	03°24.07'W	"	0632	49	4.06	6.03
5WBt	(12)	58°07.16'N	03°14.69'W	"	0715	60	1.66	16.00
3WBt	(13)	58°06.99'N	03°10.82'W	"	0743	54	1.49	16.81
2WBt	(14)	58°07.00'N	03°09.01'W	"	0806	54	1.60	21.66
1WBt	(15)	58°06.99'N	03°06.63'W	"	0831	50	1.93	14.07
0.5WBt	(16)	58°06.88'N	03°06.32'W	"	0846	49	1.47	10.14
<u>Beatrice East leg</u>								
0.5EBt	(8)	58°06.97'N	03°03.99'W	"	0947	42	1.39	5.26
1EBt	(20)	58°07.10'N	03°03.14'W	"	1329	41	0.83	10.12
2EBt	(21)	58°06.97'N	03°00.90'W	"	1355	43	1.01	4.90
3EBt	(22)	58°06.99'N	02°59.38'W	"	1414	44	0.93	2.73
5EBt	(23)	58°07.00'N	02°55.41'W	"	1436	37	1.01	1.96
10EBt	(24)	58°07.01'N	02°45.90'W	"	1513	47	1.01	1.30
<u>Murchison North leg</u>								
10NM	(27)	61°33.80'N	01°44.50'E	30.10.82	0805	120	1.66	-
5NM	(28)	61°28.91'N	01°44.50'E	"	0945	154	1.29	2.18
3NM	(29)	61°27.91'N	01°44.50'E	"	1025	154	1.47	4.32
2NM	(30)	61°26.05'N	01°44.30'E	"	1127	153	1.01	6.79
1NM	(31)	61°26.00'N	01°44.00'E	"	1115	154	1.01	12.70
0.5NM	(32)	61°24.42'N	01°43.92'E	"	1152	152	0.92	16.30

Title of station stn no in brackets)		Lat	Long	Date	Time	Depth m	Hydrocarbons Water /ug l ⁻¹	Sediments /ug g ⁻¹
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urchison South leg

5SM	(34)	61°23.25'N	01°44.46'E	30.10.82	1315	152	0.74	15.60
SM	(44)	61°22.79'N	01°44.56'E	"	2241	152	1.19	16.51
SM	(45)	61°21.76'N	01°44.49'E	"	2103	152	0.92	18.91
SM	(46)	61°20.77'N	01°44.53'E	"	2121	154	1.56	11.71
SM	(47)	61°18.81'N	01°44.50'E	"	2147	152	1.29	9.95

urchison West leg

WM	(36)	61°24.01'N	01°35.55'E	"	1432	160	0.83	24.93
WM	(37)	61°23.88'N	01°38.21'E	"	1530	159	0.74	13.33
WM	(38)	61°23.78'N	01°41.23'E	"	1610	155	1.29	8.64
WM	(39)	61°24.01'N	01°42.65'E	"	1631	153	1.20	13.18
5WM	(35)	61°23.91'N	01°43.41'E	"	1348	153	0.74	2.04

urchison East leg

5EM	(33)	61°23.93'N	01°45.62'E	"	1226	150	0.65	108.36
EM	(43)	61°23.87'N	01°46.68'E	"	2017	150	1.01	5.42
EM	(42)	61°24.00'N	01°48.50'E	"	1930	150	1.20	5.61
EM	(41)	61°23.95'N	01°50.66'E	"	1844	150	1.11	5.41
EM	(40)	61°23.87'N	01°55.14'E	"	1802	200	1.01	2.04

rent North leg

ONB	(48)	61°12.50'N	01°45.43'E	"	2302	146	1.10	19.31
NB	(59)	61°07.73'N	01°43.50'E	31.10.82	0650	144	0.92	58.62
NB	(58)	61°06.63'N	01°42.70'E	"	0615	136	1.57	40.31
NB	(57)	61°04.75'N	01°42.31'E	"	0530	136	13.38	48.37
NB	(56)	61°04.41'N	01°42.73'E	"	0500	137	34.78	52.05
5NB	(55)	61°03.98'N	01°42.42'E	"	0413	136	1.20	39.45

rent South leg

5SEB	(67)	61°01.93'N	01°42.97'E	"	1628	137	0.92	179.83
0 m water		"	"	"	"	-	3.23	-
0 m water		"	"	"	"	-	1.66	-
SB	(66)	61°01.56'N	01°43.66'E	"	1540	136	1.01	47.91
SB	(68)	61°00.00'N	01°42.25'E	"	1720	137	0.92	53.22
0 m water		"	"	"	"	-	1.85	-
0 m water		"	"	"	"	-	1.85	-
SB	(69)	60°58.99'N	01°42.38'E	"	1830	136	3.78	38.78
0 m water		"	"	"	"	-	2.12	-
0 m water		"	"	"	"	-	1.48	-
SSB	(70)	60°56.80'N	01°43.47'E	"	1900	134	4.15	40.67
0 m water		"	"	"	"	-	13.10	-
0 m water		"	"	"	"	-	1.94	-
OSB	(71)	60°53.46'N	01°42.54'E	"	1930	134	1.01	26.57

rent West leg

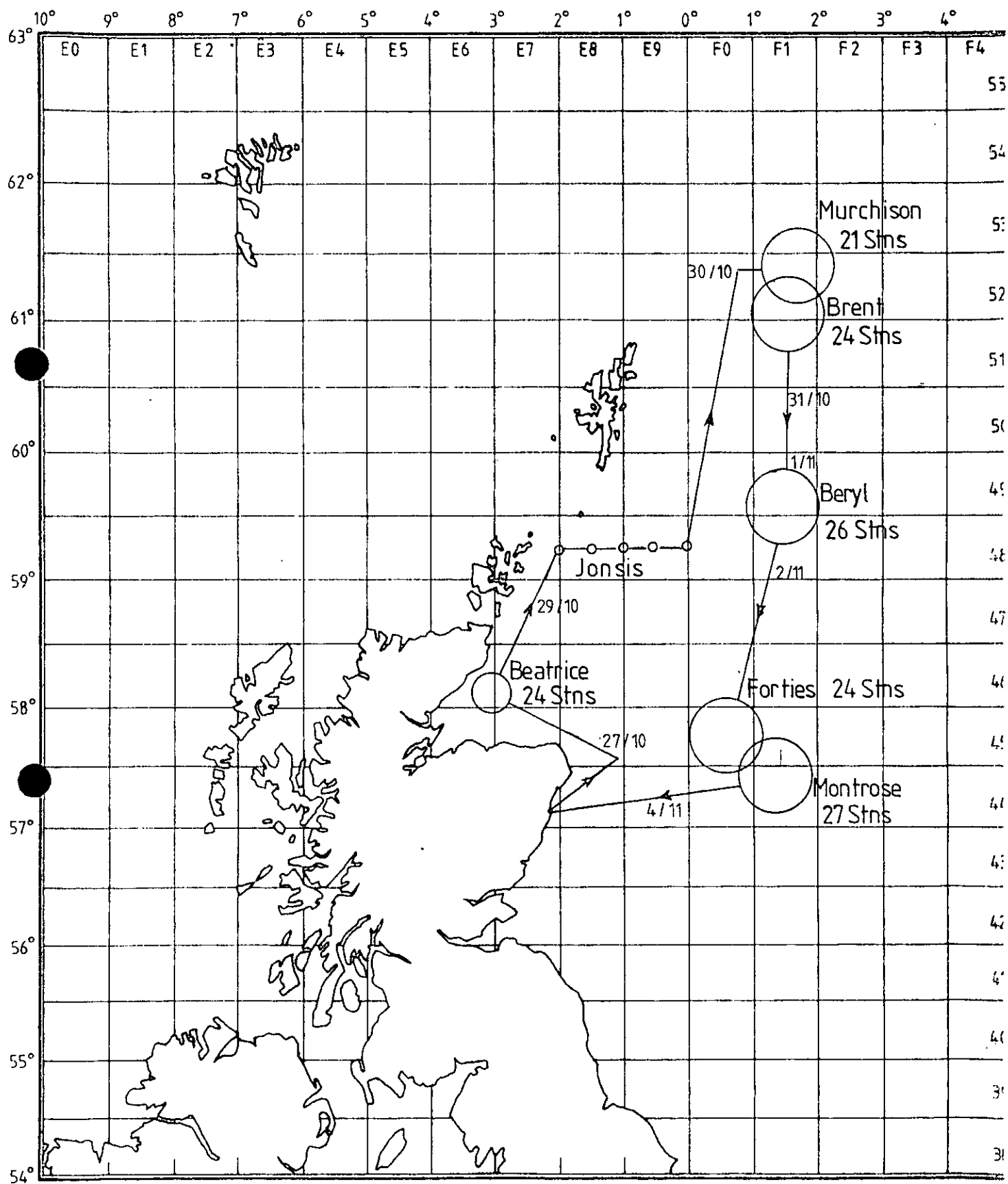
OWB	(60)	61°03.27'N	61°24.71'E	"	0830	145	1.57	58.98
WB	(61)	61°03.26'N	01°32.51'E	"	0904	144	1.48	39.88
WB	(62)	61°03.27'N	01°35.00'E	"	0931	145	1.66	38.77
WB	(63)	61°03.26'N	01°38.59'E	"	0959	140	1.01	40.97
NNWB	(64)	61°03.94'N	01°41.07'E	"	1036	140	3.04	45.81
5NWB	(65)	61°03.45'N	01°42.10'E	"	1125	140	9.50	75.29

Title of station (stn no in brackets)		Lat	Long	Date	Time	Depth m	Hydrocarbons Water $\mu\text{g l}^{-1}$	Sediments $\mu\text{g g}^{-1}$
<u>Brent East leg</u>								
0.5EB	(54)	61°03.20'N	01°44.06'E	31.10.82	0338	135	1.11	56.81
1EB	(53)	61°03.42'N	01°44.76'E	"	0317	136	8.58	56.84
2EB	(52)	61°03.30'N	01°46.78'E	"	0248	135	1.57	40.41
3EB	(51)	61°03.23'N	01°48.99'E	"	0220	137	1.38	32.46
5EB	(50)	61°03.20'N	01°52.77'E	"	0143	139	1.38	26.98
10EB	(49)	61°02.86'N	02°04.09'E	"	0037	133	1.29	5.89
<u>Beryl North leg</u>								
20NBy	(72)	59°51.44'N	01°32.15'E	1.11.82	0330	134	1.48	9.55
10NBy	(73)	59°42.82'N	01°32.06'E	"	0434	111	1.75	10.83
5NBy	(74)	59°37.80'N	01°32.50'E	"	0520	117	1.01	203.08
3NBy	(75)	59°35.72'N	01°32.48'E	"	0557	117	0.83	60.79
2NBy	(76)	59°34.79'N	01°32.55'E	"	0622	117	2.12	32.12
1NBy	(77)	59°33.75'N	01°32.50'E	"	0647	114	1.10	69.45
<u>Beryl South leg</u>								
0.5SBy	(79)	59°32.18'N	01°32.53'E	"	0814	115	1.38	1411.93
0.5SEBy	(80)	59°32.36'N	01°32.97'E	"	1025	115	1.10	260.48
1SEBy	(81)	59°32.27'N	01°33.91'E	"	1301	117	1.75	66.42
2SEBy	(82)	59°31.68'N	01°35.74'E	"	1340	115	1.66	46.16
2SBy	(92)	59°30.12'N	01°32.56'E	2.11.82	0211	115	1.56	42.39
3SBy	(91)	59°29.68'N	01°32.47'E	"	0040	112	1.38	24.12
5SBy	(90)	59°27.76'N	01°32.59'E	1.11.82	2251	106	1.47	12.66
10SBy	(89)	59°22.75'N	01°32.56'E	"	2137	111	1.29	19.39
<u>Beryl West leg</u>								
0.5WBy	(78)	59°32.80'N	01°31.61'E	"	0720	115	1.19	79.34
1WBy	(93)	59°32.86'N	01°30.20'E	2.11.82	0241	115	1.56	14.67
2WBy	(94)	59°32.66'N	01°27.59'E	"	0315	112	1.19	16.06
3WBy	(95)	59°32.81'N	01°26.26'E	"	0348	109	1.29	17.72
5WBy	(96)	59°32.75'N	01°22.50'E	"	0420	104	1.01	5.94
10WBy	(97)	59°32.80'N	01°02.50'E	"	0505	109	1.01	7.98
<u>Beryl East leg</u>								
0.5EBy	(83)	59°32.75'N	01°33.47'E	1.11.82	1615	116	1.29	120.71
1EBy	(84)	59°32.84'N	01°34.50'E	"	1720	114	1.38	53.00
2EBy	(85)	59°32.90'N	01°36.00'E	"	1740	114	1.75	29.81
3EBy	(86)	59°32.90'N	01°38.21'E	"	1800	113	1.75	51.59
5EBy	(87)	59°32.85'N	01°42.21'E	"	1900	120	1.85	34.61
10EBy	(88)	59°32.89'N	01°52.21'E	"	1949	129	2.31	49.79
<u>Forties North leg</u>								
10NF	(98)	57°54.99'N	00°55.03'E	2.11.82	1555	132	1.38	58.19
5NF	(99)	57°50.00'N	00°55.00'E	"	1700	131	1.75	22.88
3NF	(100)*	57°48.00'N	00°55.00'E	"	1735	131	1.10	46.40
2NF	(101)*	57°47.00'N	00°55.00'E	"	1815	131	1.29	29.27
1NF	(102)*	57°46.00'N	00°55.00'E	"	1905	131	1.10	60.64
0.5NF	(103)*	57°45.50'N	00°55.00'E	"	1925	131	1.65	46.26

Title of station (stn no in brackets)		Lat	Long	Date	Time	Depth m	Hydrocarbons Water /ug l ⁻¹	Sediments /ug g ⁻¹
<u>Forties South leg</u>								
0.5SF	(115)	57°42.44'N	00°55.33'E	3.11.82	0212	116	1.38	38.70
1SF	(114)	57°42.02'N	00°55.16'E	"	0142	115	4.23	23.27
2SF	(113)	57°40.75'N	00°54.99'E	"	0121	116	1.38	25.87
3SF	(112)	57°39.98'N	00°54.48'E	"	0051	117	1.47	21.53
5SF	(111)	57°38.21'N	00°54.47'E	"	0021	113	1.38	23.77
10SF	(110)	57°33.38'N	00°57.75'E	2.11.82	2336	98	2.76	15.87
<u>Forties West leg</u>								
0.5WF	(104)*	57°43.10'N	00°50.00'E	"	2015	122	1.38	32.12
1WF	(105)*	57°42.90'N	00°49.00'E	"	2036	121	2.20	37.41
2WF	(106)	57°42.71'N	00°48.00'E	"	2049	121	2.20	41.91
3WF	(107)	57°42.48'N	00°45.92'E	"	2109	118	1.65	34.72
5WF	(108)	57°42.15'N	00°42.60'E	"	2133	109	1.65	26.76
10WF	(109)	57°41.55'N	00°33.25'E	"	2215	96	1.56	10.49
<u>Forties East leg</u>								
0.5EF	(116)	57°43.42'N	01°00.40'E	3.11.82	0240	100	2.21	29.58
1EF	(117)	57°43.51'N	01°01.24'E	"	0312	99	1.84	32.92
2EF	(118)	57°43.38'N	01°03.68'E	"	0350	92	2.48	7.34
3EF	(119)	57°43.67'N	01°04.43'E	"	0414	87	1.75	7.99
5EF	(120)	57°43.63'N	01°08.61'E	"	0445	83	1.84	12.12
10EF	(121)	57°43.21'N	01°18.06'E	"	0525	85	1.47	5.51
<u>Montrose North leg</u>								
10Nmt	(122)	57°36.20'N	01°23.47'E	"	0625	87	1.10	7.89
5Nmt	(123)	57°31.89'N	01°23.85'E	"	0705	88	1.65	14.58
3Nmt	(124)	57°30.04'N	01°23.88'E	"	0725	88	1.38	21.70
2Nmt	(125)	57°29.05'N	01°23.49'E	"	0750	88	1.56	23.04
1Nmt	(126)	57°28.00'N	01°23.32'E	"	0816	88	2.20	46.66
0.5Nmt	(127)	57°27.53'N	01°23.64'E	"	0828	87	2.11	133.90
close up N	(128)	57°27.33'N	01°23.63'E	"	0845	87	1.56	321.82
<u>Montrose South leg</u>								
close up S	(129)	57°26.77'N	01°23.26'E	"	1141	88	1.38	717.28
0.5Smt	(130)	57°26.44'N	01°23.47'E	"	1224	87	2.11	14.56
1Smt	(131)	57°25.87'N	01°23.05'E	"	1241	88	1.38	60.61
2Smt	(132)	57°24.89'N	01°23.38'E	"	1300	89	1.65	19.14
3Smt	(133)	57°23.93'N	01°23.43'E	"	1316	90	1.20	15.58
5Smt	(134)	57°21.95'N	01°23.55'E	"	1340	90	1.19	18.30
10Smt	(135)	57°16.94'N	01°23.29'E	"	1422	94	1.29	35.79
<u>Montrose East leg</u>								
10EMt	(136)	57°27.12'N	01°41.72'E	"	1600	87	1.56	10.80
5EMt	(137)	57°26.96'N	01°32.49'E	"	1719	89	1.84	14.34
3EMt	(138)	57°27.03'N	01°26.72'E	"	1742	88	1.84	15.79
2EMt	(139)	57°27.00'N	01°27.00'E	"	1820	88	2.26	16.49
1EMt	(140)	57°27.09'N	01°25.48'E	"	1952	89	2.20	19.03
0.5EMt	(141)	57°26.89'N	01°23.81'E	"	2106	88	2.30	19.93
close up EMt	(142)	57°26.87'N	01°23.12'E	"	2126	87	2.20	41.97

Title of station (stn no in brackets)		Lat	Long	Date	Time	Depth m	Hydrocarbons	
							Water /ug l ⁻¹	Sediments /ug g ⁻¹
<u>Montrose West leg</u>								
0.5WMT	(143)	57°26.84'N	01°21.57'E	3.11.82	2152	87	2.02	17.31
1WMT	(144)	57°27.05'N	01°21.68'E	"	2210	87	1.84	24.93
2WMT	(145)	57°27.19'N	01°19.77'E	"	2232	85	1.56	21.57
3WMT	(146)	57°27.24'N	01°18.31'E	"	2250	86	1.93	13.71
5WMT	(147)	57°27.04'N	01°14.44'E	"	2316	87	2.39	12.00
10WMT	(148)	57°26.97'N	01°04.49'E	"	2356	91	6.16	26.65

* Estimated (computer down)



FRV Scotia 27/10 — 5/11/82

11SR82