INSTITUTE OF GEOLOGICAL SCIENCES
MARINE GEOLOGY UNIT
Internal Report No. 81/4

CRUISE REPORT MV WHITETHORN

Legs 1 & 2 - 2nd April to 29th April 1981

by

J A Chesher

CONTENTS

1. Introduction

The MV Whitethorn departed from Liverpool on 2nd April as per schedule following the winter layup. Following successful equipment and ship trials in Liverpool Bay the ship continued en route to the survey area of the first part of the programme in Bosies Bank and the Orkneys.

Leg 1 from 2-15 April was spent on the Bosies Bank Sheet and Leg 2 from 16-29th April on the Orkney Sheet. Priority was given to vibrocoring in both areas, although several rockdrill sites were successfully occupied in the Orkney area on Papa Bank. Weather conditions during both legs were particularly good for the time of year resulting in minimal down time for this period.

2. Personnel

Leg 1 (Bosies Bank)	Leg 2 (Orkney)	
J Chesher	J Chesher	Senior Scientist
C Graham	E McElvanney	Day Surveyor
D Tappin (Leeds)	D Evans	Day Geologist
G Tulloch	L Tarbuck(QMC micro-biologist)	Day Lab
J Pheasant	J Pheasant	Deck Operations
P Wiggins	W Lonie	Maintn. Technician
B Tait	R Nicholson	Geochemist
A Skinner	M Stoker	Night Lab/Geol
G Bradley (Leeds)	C Graham	Night Deck

With the amalgamation of CSUN and CSUS into MGLU, personnel from the original two units were combined in the manning programme in order to promote exchange of ideas and uniformity of approach. In order to

maximise a multidisciplinary approach to the samples taken a geochemist was carried on both legs and a microbiologist working on an SRC project on sulphate reducing bacteria from Queen Mary College, London, was present on the second leg.

3. Results

The number and type of stations occupied during the period are tabulated below.

	Vibrocorer	Shipek Grab	Gravity Corer	Rockdrill
Bosies Bank Sheet	? →	→ asked John McEwan		
Orkney Sheet	? →			

Minimal time was lost on equipment, ship or weather down time throughout the period.

4. Equipment

4.1 Ship Both the ship and its equipment operated satisfactorily following an extensive winter overhaul. Only a few minor setting up problems were encountered with the ships main engines, that might be expected following such an extensive service.

The decision to lay up the ship during the winter meant that the vessel was able to start survey immediately without the initial setting up period and time loss concurrent with normal mobilisation.

4.2 IGS Equipment i) No problems were encountered with the IGS equipment apart from cables, reflecting the effort put into the maintenance of the gear during the winter period by the IGS Operational Group personnel.

ii) Launch and recovery of the vibrocorer with the retraction wire on the opposite side of the vibrocorer to the barrel extraction greatly facilitated removal of the barrel. However this did mean that the penetrometer signal plate was more prone to damage, a fault that was overcome by bouncing the signal directly off the pot.

iii) The midi drill initially worked satisfactorily following a total service during the winter. It drilled some 0.5 metre in 1 hour in hard gneiss and resulted in approximately 0.35 metre cores. However on later sites problems were encountered in core retention within the barrel, especially when lifting off seabed after drilling when any bounce on the seabed resulted in the core dropping out.

5. Core Processing

Following discussions in Edinburgh it was decided that the cores would be cut in half, photographed, logged and curated on board for a trial period this season. The cores were held in a frame and cut by a router sliding along the frame. Photographs of a complete core were taken with a Hasselblad camera which unfortunately developed a fault during the first leg, necessitating the use of an ordinary 35mm camera. Camera shake due to the vibration of the ship may prove a problem.

The cutting, curation and logging of cores collected on board proved highly successful and should be continued as standard operational procedure

for future legs. It not only provides additional geological information for the geologist on board, but dictates that cores that otherwise might not immediately be inspected ashore due to time availability are fully logged and described before leaving ship. Time spent ashore on curation and cutting will also be minimised by this procedure.

6. Geology

Full geological descriptions of the core collected are provided by the geological log sheets.

Sampling in the western part of the Bosies Bank showed thin surface sediments, generally fine sands and muddy sands less than 10cm thick, overlying the Quaternary. The Quaternary is relatively thin in this area and varies from soft pinkish clays, often interlaminated with fine silts, to tough boulder clays and red sands. The presence of red sand in several cores probably indicates the proximity to Old Red Sandstone or New Red Sandstone bedrock. A few cores recovered compact soft grey shelly mudstones that may well have been Lower Cretaceous or Tertiary in age.

Sampling in the western part of the Orkney area showed a variable Quaternary sequence varying from soft clays to tough boulder clays and red sands, that was not easy to correlate due to the limited number of samples at present collected. Drill sites on the Papa Bank recovered hard amphibolite biotite gneiss that may well be of Lewisian age. Further drilling on this extensive rock platform may well resolve the northern seaward continuation of the Moine thrust that is thought to transect the Papa Bank.

7. Ships Log

Leg 1. Thurs. 2nd April - Wed. 15th April

Thurs 2 April

0000-1430	In port Liverpool for mobilisation
1430-1940	Departed Liverpool en route for Orkney area. Ship on charter at 1430 hrs.
1940-2000	Laying anchors in Liverpool Bay for vibrocorer trial.
2000-2115	Testing vibrocorer, satisfactory except for penetrometer malfunction.
2115-2130	Lifing anchors
2130-2400	Continued steaming en route to Orkneys.

Fri 3 April

0000-0845	En route to Orkneys
0845-1900	Anchored in Belfast Lough for ships main engine repair to leaking cylinder head.
1900-2400	Continued en route to Orkneys.

Sat 4 April

0000-1445	En route to Orkneys
1445-1515	Laying anchors at Loch Snizort.
1515-2200	Vibrocorer trials at Loch Snizort. Problems calibrating penetrometer.
2200-2400	Continued en route to Orkneys

Sun 5 April

0000-0730	En route to Orkney area.
0730-0820	Laying anchors at Run Rock for mididrill site.
0820-1230	Preparing and testing rockdrill prior to launch.
1230-1400	Relaying anchors due to strong tides.
1400-1730	Mididrilling.

Sun 5 April (Contd)

1730-1800	Lifting anchors.
1800-1930	Steaming to Sule Skerry.
1930-2000	Laying anchors at Sule Skerry.
2000-2130	Mididrilling.
2130-2200	Lifting anchors.
2200-2400	Steaming en route to Bosies Bank Sheet

Mon 6 April

0000-0830	En route to Bosies Bank.
0830-0900	Laying anchors Bosies Bank.
0900-1530	Vibrocoring Bosies Bank Sheet NW.
1530-1545	Bent vibrocorer barrel when ship moved off station in tide.
1545-1800	Continued vibrocoring.
1800-1815	Bent another barrel due to ship drifting in strong tide.
1815-2400	Continued vibrocoring.

Tues 7 April

0000-0700	Routine sampling Bosies Bank.
0700-2330	Vibrocoring on Bosies Bank Sheet NW.
2330-2400	Routine sampling.

Wed 8 April

0000-0700	Routine sampling.
0700-2300	Vibrocoring.
2300-2400	Routine sampling.

Thurs 9 April

0000-0700	Routine sampling
0700-2330	Vibrocoring Bosies Bank Sheet.
2330-2400	Routine sampling.

Fri 10 April

0000-0700	Routine sampling Bosies Bank Sheet NE.
0700-2230	Routine sampling Bosies Bank Sheet NE.
2230-2400	Routine sampling.

Sat 11 April

0000-0700	Routine sampling.
0700-2230	Vibrocoring; problems in afternoon on anchor holding over deeps due to weather and sea bottom conditions. Anchors fouling.
2230-2400	Routine sampling.

Sun 12 April

0000-0800	Routine sampling
0800-2200	Vibrocoring Bosies Bank Sheet NE.
2200-2400	Routine sampling.

Mon 13 April

0000-0100	Hove to main engine valve sticking.
0100-0700	Continued routine sampling.
0700-2300	Vibrocoring.
2300-2400	Routine sampling Bosies Bank SW.

Tues 14 April

0000-0700	Routine sampling
0700-1200	Vibrocoring Bosies Bank.
1200-1970	Steaming for Aberdeen 12 hours ahead of schedule due to IPCS strike action in afternoon by personnel aboard.
1970-2400	In port Aberdeen

Wed 15 April

0000-2400	In port Aberdeen.

Leg 2. Thurs 16th April - Wed 29th April

Thurs 16 April

0000-0900	Aberdeen port call.
0900-1200	Bunkering.
1200-2400	Departed Aberdeen ahead of original scheduled departure time to regain time lost by coming into port early. Steaming en route for Orkneys.

Fri 17 April

0000-0600	Steaming to North Orkney area.
0600-1345	Vibrocoring N Orkney area.
1345-1800	Lost port stern anchor due to bridge control not going into reverse on main engine when required, resulting in all wire paying off winch. Grappled and retrieved - anchor from 130m of water on 1st attempt. Respooled wire onto anchor winch.
1800-2300	Vibrocoring continued NW Orkney Sheet.
2300-2400	Routine sampling.

Sat 18 April

0000-0700	Routine sampling.
0700-1900	Vibrocoring NW Orkney Sheet.
1900-2400	Steaming towards Orkneys for shelter due to weather.

Sun 19 April

0000-0700	Steaming into sea off Hoy due to bad weather.
0700-2400	Vibrocoring Orkney Sheet SW.

Mon 20 April

0000-0700	Routine sampling
0700-1700	Vibrocoring Orkney Sheet NW.
1700-2300	Mididrilling Papa Bank. 1st attempt barrel sheared due to ship drifting. Successful 2nd attempt.
2300-2400	Routine sampling NW Orkney Sheet.

Tues 21 April

0000-0800	Routine sampling Orkney Sheet SW.
0800-1400	Mididrilling Orkney SW.
1400-1700	Commenced routine sampling on Papa Bank due to bad weather NW 6-8.
1700-2100	Steaming to Scapa Flow for shelter NW gales.
2100-2400	At anchor Scapa Flow.

Wed 22 April

0000-0630	At anchor Scapa Flow.
0630-1300	Steaming out of Scapa Flow to investigate weather conditions and attempt work W of Orkney.
1300-2100	Weather too bad to work in West. Steaming via Pentland Firth to E Orkneys to investigate working conditions.
2100-2400	Routine sampling E of Orkneys. Main engine problem on remaining turbo blower brushes.

Thurs 23 April

0000-0700	Routine sampling.
0700-0945	Vibrocoring E of Orkney.
0945-1045	Standby on site awaiting decision from Coes on main engine situation with turbo blowers.
1045-2330	Continued vibrocoring.
2330-2400	Routine sampling NE of Orkney

Fri 24 April

0000-0700	Routine sampling NE Orkney.
0700-1200	Vibrocoring NE Orkney.
1200-1500	Midi drill site NE Orkney.
1500-2045	En route to Kirkwall to pick up D Ardus.
2045-2400	D Ardus embarked and ship continued en route to W Orkney through Westray Sound.

Sat 25 April

0000-0300	Routine sampling W Orkney.
0300-0700	Steaming into weather to replace shipek (lost due to moving control level wrong way and pulling shipek into block) and also gravity corer (lost when rope broke under snatch load

as gravity corer slid down trough and into water as ship rolled during launch.

0700-2300 Midi-drilling. Cable continuity fault caused delay of 2 hours. Problems on core falling out of barrel on recovery.

2300-2400 Routine sampling NW Orkney sheet.

Sun 26 April

0000-0700 Routine sampling W Orkney.

0700-2400 Vibrocoring W Orkney.

Mon 27 April

0000-0700 Routine sampling W of Orkney.

0700-1300 Vibrocoring N of Orkney.

1300-2300 Midi-drilling N of Orkney. Problems on drill panel tripping out.

2300-2400 Routine sampling N of Orkney.

Tues 28 April

0000-0400 Routine sampling N of Orkney.

0400-0800 Steaming towards Orkneys for shelter from S gales.

0800-1000 Vibrocoring N of Ronaldsay.

1000-1500 Midi-drilling E of Ronaldsay.

1500-2400 Steaming to Aberdeen

Wed 29 April

0000-0700 Steaming to Aberdeen.

0700-2400 In port Aberdeen, routine port call.

8. Acknowledgements

Thanks is due to the excellent co-operation of the crew of the MV Whitethorn, in particular the captain and first and second officers and engineers, whose help and enthusiasm made the first two legs so successful. In addition mention must be made of the IGS personnel whose team spirit and hard work did much to make this period a success.