

ANTARCTICA NEW ZEALAND

K001: CAPE ROBERTS PROJECT

1998/1999

LOGISTICS REPORT

K001:CAPE ROBERTS PROJECT (CRP2)
ANTARCTICA NEW ZEALAND 1998/1999

Event Personnel :

RIDGEN	Jeremy	NZ	Mechanic/Engineer
HOWAT	Brian	NZ	Engineer/Plant Operator
SINCLAIR	Peter	NZ	Carpenter
PYNE	Alex	NZ	Science Support Manager
REID	Brian	NZ	Electrician
KNOX	Murray	NZ	Plant Operator
CONAGLEN	Kevin	NZ	Carpenter/ Field Assistant
CLARKE	Colleen	NZ	Paramedic/ Camp Manager
COWIE	Jim	NZ	Project Manager
ALEXANDER	John	NZ	CRP Liaison Officer
SKINNER	Dennis	NZ	Chef
VARCOE	Kath	NZ	Camp Assistant
BRICE	David	NZ	Field Assistant
BROWN	Steve	NZ	Carpenter
COOPER	Pat	NZ	Drill Manager
HOLLOWAY	Leon	USA (NZ)	DV/Drill Engineer
TANSEY	Frank	NZ	Driller
MACDONALD	Malcolm	NZ	Driller
MARCUSSEN	John	NZ	Assistant Driller
AVEY	Michael	NZ	Assisstant Driller
WOODFORD	Sam	NZ	Assisstant Driller
SYMONS	Todd	NZ	Assisstant Driller
KINGAN	Tony	NZ	Assisstant Driller
COLLIE	Chris	NZ	Assisstant Driller
EATON	David	NZ	Assisstant Driller
ANDERSON	Joanna (Jo)	NZ	Science Technician*
BRYCE	Sonya	Australia	Science Technician*
JACKSON	Nick	NZ	Science Technician*
BUTLER	Edward	NZ	Science Technician*
PLANKELL	Eric	USA	Science Technician*
WILSON	Terry	USA	Scientist*
RAFAT	Nodi	USA (Germ)	Science Technician*
PAULSEN	Timothy	USA	Scientist*
NEISSEN	Frank	Germany	Scientist*
KOPSCH	Conrad	Germany	Science Technician*
POLOZEK	Kerstin	Germany	Science Technician*
BARRETT	Peter	NZ	Chief Scientist*
WEBB	Peter	USA	Science Leader, Cray Lab
POWELL	Ross	USA	Scientist*
WOOLFE	Ken	Australia	Scientist*

ATKINS	Cliff	NZ	Science Technician**
EHRMANN	Werner	Germany	Scientist**
NAISH	Tim	NZ	Scientist
JANACEK	Tom	USA	Core Curator
CURRAN	Matt	USA	Core Curator
SCHERER	Reed	USA	Scientist
BOHATY	Stephen	USA	Scientist
DEVINE	Rusty	USA	Scientist
TABECKI	Mike	UK	Science Technician
KRISSEK	Larry	USA	Scientist
FIELDING	Chris	Australia	Scientist
LAVELLE	Mark	UK	Scientist*
STRONG	Percy	NZ	Scientist
PASSCHIER	Sandra	USA	Scientist
HANNAH	Mike	NZ	Scientist
WILSON	Graeme	NZ	Scientist
ASKIN	Rosie	USA	Scientist
SIMES	John	NZ	Science Technician
MCLEOD	Barbara	USA	Science Technician
WATKINS	David	USA	Scientist
VILLA	Giuliana	Italy	Scientist
TAVIANI	Marco	Italy	Scientist
SMELLIE	John	UK	Scientist
TALARICO	Franco	Italy	Scientist
AGHIB	Fulvia	Italy	Scientist
WONIK	Thomas	Germany	Scientist**
BUECKER	Christian	Germany	Scientist**
BRINK	Jason	USA	Scientist*
SCHOLZ	Erich	USA	Science Technician**
WILSON	Gary	USA	Scientist
SAGNOTTI	Leo	Italy	Scientist
FLORINDO	Fabio	Italy	Scientist
CLAPS	Michele	Italy	Scientist**
SANDRONI	Sonia	Italy	Science Technician
ALBERTI	Mauro	Italy	Science Technician
KETTLER	Richard	USA	Scientist
ARMIENTI	Pietro	Italy	Scientist
MAGGS	Tom	Australia	DV/Enviro. Auditor AADiv
FOX	Jeff	USA (NZ)	CRP Distinguished Visitor (DV)
CARTER	Bob	Australia	CRP Distinguished Visitor
GROBE	Hannes	Ger.(USA)	DV/AWI Core Curator
RAINE	Ian	NZ	Scientist
VEROSUB	Ken	USA	Scientist
HENRYS	Stuart	NZ	Scientist
VAN DER MEER	Jaap	NZ (N/lands)	Scientist
CITA	Maria Bianca	Italy	ISC Member
DAVEY	Fred	NZ	Scientist/ISC Member
TESSENSOHN	Franz	Germany	ISC Member
HUCH	Monika	Germany	CRP DV/Science Journalist
ANDERSON	Ian	Australia	CRP DV/Science Journalist
FUETTERER	Dieter	Germany	CRP DV/OMG Member
THOMSON	Michael	UK	Scientist/ISC Member
ROBERTS	Andy	UK (NZ)	Scientist

Notes:

1. The breakdown of the 93 CRP personnel is:

Support Staff – 13

Drillers – 10

Scientists and Science Technicians - 58

Distinguished Visitors – 12

* Scientists and Science Technicians based at Cape Roberts.

** Scientists and Science Technicians who divided their time between Cape Roberts and Cray Laboratory, McMurdo Station.

CAPE ROBERTS PROJECT – CRP2 LOGISTICS REPORT 1998-1999

INTRODUCTION

1.1. 1998/1999 summer season was the second drill season for Cape Roberts Project and throughout this report will be referred to as CRP2 to distinguish it from the previous season: CRP1 1997/98.

1.2. CRP1 was terminated prematurely when a storm in late October broke up the sea ice near the Drill Site and threatened the safety of personnel and equipment. The drill site was located 15.25 kilometres east of Cape Roberts, over a water depth of 150 metres. A drill depth of 147.7 metres below sea floor (m bsf) was reached with a core recovery rate of 86%.

1.3. CRP1 exposed a number of inadequacies in the drilling system, the most serious involving the sea riser. Some parts of the sea riser (that part of the drill system suspended in the water) had design and manufacturing defects. Questions were also raised about the ability of the sea riser to withstand the strong currents in the drill site area. Another problem was the difficulty of embedding the sea riser in the sea floor. In the off-season significant and costly modifications were made to the sea riser.

AIMS OF CRP2

2.1. The aims of CRP2 were:

- To recover up to 700 meters of high quality rock core from a second drill hole east off Cape Roberts. The core from CRP2 would 'pick up' from where CRP1 core 'left off' (ie. optimally with an overlap of up to 30m) to maintain an unbroken time sequence in the core.
- To conduct drill and logistics operations in an efficient, timely and safe manner.
- To conduct all operations in accordance with the Comprehensive Environmental Evaluation report and thereby minimise impact on the environment.
- To successfully recover enough core to justify a third drill season.

PLANNING

3.1. CRP2 could not have proceeded had the sea riser not been upgraded. Planning for this had begun even before CRP1 had finished as time was short and additional funding had to be approved by the Project partners. The view of the Operations Management Group (OMG) was that CRP2 was the last chance to both prove the drill technology and achieve the operational goal of obtaining a reasonable amount of core. If neither of these goals were achieved then the Project would be terminated.

3.2. **Operational Planning.** The time-line for CRP2 operational planning was:

a. **Ship Resupply January 1998.** The main items of resupply were two 'new' CRP containers (plus rigid sledges) fitted out as extensions to the Rig's mud hut system and the Drill Site Laboratory. All went according to plan.

b. **Post-Season Review.** An International Steering Committee (ISC) meeting was held in Washington in early February 1998 at which sea riser options were discussed. It was agreed the best option was to refurbish the existing riser because of the limited time and funding available. A major study was then undertaken by a US company to determine the existing sea riser's capabilities. From the results of that study modifications followed.

c. **Sea ice Monitoring.** The first DMSP (infrared) images were received from ASA by Science Support Manager (CRPSSM) and Cape Roberts Project Manager (CRPM) in early April 1998 and continued regularly from then. Dr Robert Onstott at ERIM also contributed regular interpretive reports on his website. CRPSSM predicted at the end of his April-May sea ice report that a 20 km strip of fast ice about 1m thick had formed off-shore of Cape Roberts. Although it was too early to make longer term predictions, ice formation had begun well. This proved to be the case, and the fast ice along the western coast remained stable for the remainder of the 1998 winter. Sea ice growth was also monitored at the American's ice runway and west of Arrival Heights, and these measurements confirmed what was found when the reconnaissance team travelled to Cape Roberts and then out to the Drill Site in early September.

d. **USAP Assistance.** At the annual Post Season-Pre Season planning meeting held in Denver by the US Program CRP requested US support for hauling the two 'new' containers from Scott Base to Marble Point. Three hundred helicopter hours were requested for the Project, to be equally shared between Antarctica New Zealand and USAP. The Project would also draw upwards of 30,000 litres of JP5 from Marble Point at a time or times to be arranged. All the above arrangements went according to plan.

e. **Staff Recruitment.** In early March 1998 CRPM initiated the CRP2 recruitment round with an 'expression-of-interest' letter and an employment questionnaire to all CRP1 employees. Most of the CRP1 support and drill staff wished to return for CRP2 and information obtained from the questionnaire responses proved useful in revising the contract. On the drill team, one driller from the previous season was not offered re-employment and one other was unavailable, necessitating two new drillers for CRP2. One member of the support team was not offered re-employment and one was unavailable. In addition to the two replacements, a new position was created – Camp Assistant – to take some of the workload off the Project Manager and Camp Manager. The Carpenter's length of employment was reduced to cover the period from September to mid-October. At the end of the drilling phase the Scott Base carpenter was seconded to Cape Roberts to help with the Drill Site and Camp decommissioning. This worked well. Movements Controller, Antarctica New Zealand (Ant NZ) was kept advised of all recruitment information such as addresses, individual contracts, salaries, travel arrangements, medical certificates, clothing forms and the like.

f. **Integration of CRP Scientists into Pre-Season Planning.** CRPM was advised of CRP2 scientists and their dates for flying to Antarctica in early June 1998. Minor changes were advised by the Chief Scientist as he was made aware of them. Movements Controller, Ant NZ was kept advised. The Movements section of Ant NZ was kept advised of all clothing and freight requirements of CRP2 scientists as advised to CRPM. The manifesting of scientists and their cargo went well from Ant NZ's point of

view. There were, however, some misunderstandings again with the Italian science contingent who were the responsibility of the US Program.

CRP2 CARGO

4.1. **Winfly 98 Cargo.** A total of nearly 31,700 lbs (14,400kg) of cargo was air freighted at Winfly 98 for the Project. Cargo consisted mainly of drilling equipment (sea riser rigid flotation modules -15,000 lbs - and additional steelwork), food – fresh, no-freeze and short shelf-life items, and science cargo.

4.2. **Mainbody 98 Cargo.** A total of 16,300 lbs (7,400kg) of cargo was air freighted during the season for CRP2. Of this, 6,000lbs (2,700kg) was for specialist drill 'muds'. Another 7,000 lbs (3,200kg) was science cargo, the majority for the two German science teams.

4.3. **Resupply Items.** Nearly 70 orders were raised during the drilling phase for resupply items that individually would have numbered well over a thousand. In terms of prompt delivery, most were important and about a quarter were 'urgent', ie. to replace a used, defective, near-defective or broken part. Fortunately most arrived on time. Timely delivery of over 2.5 tonnes of drill muds was appreciated. Resupply of 'freshies' needs to be looked at - weather delays couldn't be blamed for all the delays.

CRP2 PERSONNEL

5.1. A total of 93 people were on CRP2 in the 1998/199 season made up of:

a. **Scientists and Science Technicians** – 53.

b. **Support Staff** – 13, which included the Project Manager and the Project Liaison Officer (CRPLO).

c. **Drillers** – 10, made up of a Drill Manager, two Drillers and seven Assistant Drillers

d. **Science Support Staff** – five, made up of the Science Support Manager and four Core Technicians.

e. **CRP3 Official Visitors and Media** – 12, made up of three from Australia, one from Britain, four from Germany, one from Italy and three from NZ/USA

f. **Maintenance/Clean-up Team January 2000** – four, made up of CRPM, Electrician, Engineer/mechanic and Engineer/Asst Plant Operator.

5.2. The 'permanent' population at Cape Roberts during drill operations (ie. October and November) was 35, made up of support staff (10), drillers (10), science support staff (5) and scientists (10). The Chief Scientist spent approximately a third of his time at Scott Base/McMurdo.

5.3. The Winfly team of nine was made up of CRPM, CRPSSM, Engineer, Mechanic, Plant Operator, Electrician, Paramedic/Camp Manager, Field Assistant/Carpenter, and Carpenter. CRPM remained at Scott Base until Mainbody, while the remaining eight people traversed to Cape Roberts in two Hagglunds all-terrain vehicles and began setting up the main camp and then the Drill Site camp.

5.4. **Personnel Deployment.** CRP2 personnel deployment to Antarctica was full of disruption. Winfly flights suffered extensive delays and turnarounds. Four flights were scheduled from 20 to 26 August. The first successful flight was on 22 August and the last on 05 September. Because members of the reconnaissance team were delayed CRPM and CRPSSM decided to combine the reconnaissance phase with the set-up phase to make up for lost time. The full support team of eight travelled to Cape Roberts on 02-03 September.

5.5. Mainbody flights from NZ were also heavily disrupted. After a four-day delay the first and second flights made it on 03 and 04 October respectively before another period of delays. Local bad weather then delayed helicopter deployment to Cape Roberts, the first of the drillers not getting there till 07 October, four days behind schedule. A further six day bad-weather delay followed before key Cape Roberts-based scientists and science technicians arrived at Scott Base/McMurdo from NZ. By this time delays in getting some key items of drilling equipment (under-reamer and an electric motor) from NZ were threatening progress on sea riser deployment. Bad-weather and unservicability of aircraft caused delays of up to seven days to the planned drill schedule. However, in reality this was not as serious as it appeared because difficulties in deploying and embedding the sea riser and in establishing a regular coring routine added about six days to the schedule anyway.

5.6. The Crary Laboratory-based scientists and technicians were accommodated at Scott Base and McMurdo Station. Scott Base hosted 17*, made up of one Australian, four British, three Germans, and nine New Zealanders. Every Crary Laboratory-based scientist was encouraged to visit Cape Roberts and overnight so as to gain a fuller appreciation of the field operation. Most availed themselves of the overnight option. (*It should be noted that four of these individuals spent in excess of 10 days each at Cape Roberts.)

5.7. **CRP Distinguished Visitors/Media.** Nominations received for CRP official visitors were:

a. **Australia:**

- Mr Ian Anderson, science journalist, New Scientist.
- Prof Bob Carter, James Cook University, Townsville.
- Mr Tom Maggs, Environment Manager, Australian Antarctic Division.

b. **Britain:**

- Dr Michael Thomson, BAS and ISC member.

c. **Germany:**

- Dr Dieter Fuetterer, AWI and OMG member.
- Ms Monica Huch, science journalist.
- Dr Hannes Grobe, AWI.
- Dr Franz Tessensohn, BGR Hannover and ISC member.

d. **Italy:**

- Prof Maria-Bianca Cita, University of Milan and ISC member.

e. **New Zealand/USA:**

- Dr Fred Davey, IGNS and ISC member.
- Dr Jeff Fox, Director Ocean Drilling Program (ODP).
- Mr Leon Holloway, Drilling Engineer ODP.

With the exception of Leon Holloway all the CRP Visitors came to Cape Roberts in November. An ISC meeting was held at Cape Roberts 10-12 November 1998. Tom Maggs conducted an independent environmental assessment of the Project from 02 –05 November 1998.

FIELD DEPLOYMENT AND FIELD EQUIPMENT

6.1. WINFLY Deployment August-September. CRPM was in regular contact with Winter-over Manager in the two months prior to WINFLY detailing the programme and support and resources required from Scott Base. CRP personnel were grateful for the use of the Scott Base garage and cold porch throughout the Winfly period. Scott Base personnel willingly assisted in the loading of sledges and containers. At Cape Roberts the first reconnaissance of the proposed CRP2 drill site was made on 07 September. The ice was 1.8m thick. Steady progress was made on erecting the CR Camp and the first hot showers were taken on the evening of 11 September and the Camp became fully habitable on the 13th.

6.2. Pyne, Howat and Conaglen returned to Scott Base in H1 on 15 September for five days to complete important engineering and scientific tasks before returning to Cape Roberts. Two sledges and two fully loaded containers (additions to the Mud Hut and Drill Site Lab) were loaded and hauled to Marble Point by the Americans on 26 September. They were met there by Pyne, Knox and Howat with the D6, who on-hauled the train to Cape Roberts the following day.

6.3. The normal sea ice route from Scott Base to Marble Point was blocked by a large active west-east crack that extended across McMurdo Sound from the Strand Moraines and finally swung north to near Tent Island where it petered out. The USAP sledge train had to head north almost to Tent Island before it could make westward progress. The route from Marble Point to Cape Roberts was reasonably straightforward but three cracks had to be bridged for safe travel by the D6. The preferred sea ice route to the Drill Site was to the north of Cape Roberts (5kms) before 'turning' the CR Crack and heading ESE. The route was 25kms long and passed through a couple of patches of rough ice which slowed progress (after a helicopter reconn in early October changes were made to the route to avoid the worst of the rough sections).

6.4. The support team at Cape Roberts spent the second half of September establishing the Drill Site camp. The two ice holes were drilled on 08 September to enable deployment of the under-ice flotation bags and then the start of the sea riser deployment.

6.5. Mainbody Deployment/Redeployment October-December. The first of the Mainbody crew - drillers and the remaining support staff - arrived at Scott Base on 03 October, and at Cape Roberts on 07 October, having done an Antarctic Field Training refresher course. Helicopter support remained 'patchy' for the next week or so, mainly due to unsettled weather. Regular shift change helicopter operations began on 16 October. The regular and smooth movement of personnel and cargo through Scott Base

(and McMurdo) to Cape Roberts was the responsibility of the CRP Liaison Officer. His role was pivotal in the successful deployment and then ongoing movement of personnel and cargo between Christchurch, Scott Base/McMurdo and Cape Roberts.

6.6. Redeployment of personnel and science cargo to New Zealand went reasonably smoothly, in spite of an apparent lack of bed space at Scott Base and the threat of a lack of seats on aircraft returning to NZ, especially after the closure of the ice runway. Most of the drillers, the science technicians and some of the Cape Roberts-based scientists were able to return to Scott Base via a planned night-over at Vanda – a small reward for all their efforts.

6.7. **Field Equipment.** Relative to the size of the Project and the large number of personnel at Cape Roberts, only a small amount of field equipment was drawn from Scott Base stocks. In keeping with the Project's policy of 'self sufficiency' wherever possible, CRPM instituted CRP-owned light weight survival bags for people taking the shift change helicopters. Not only did these bags reduce weight and time for helicopter operations, they took considerable pressure off the limited supply of Scott Base survival bags. Scott Base-supplied field equipment was requisitioned in the normal manner and returned to store at the end of the season.

6.8. **Scott Base Equipment.** Throughout the drill season requests were made to Scott Base (and occasionally McMurdo) for the loan of specialist tools or the use of urgently required consumables such as plumbing and mechanical parts. These items were gratefully received and returned (and in some cases replaced) as soon as possible. The reality of the situation is that a Project the size of Cape Roberts, being conducted in a reasonably remote location, cannot hope to stock spares for every eventuality or have extensive repair facilities.

TRANSPORTATION

7.1. **Christchurch-McMurdo Air Operations.** The early part of the 1998/1999 season was disrupted by bad weather and CRP suffered delays in personnel and freight arrivals. Although frustrating and inconvenient at the time these early delays did not adversely affect the outcome of the drilling and science operation. At the end of the drill season there was concern expressed by Project management that unnecessary pressure was applied from Scott Base to finish early and have personnel 'off the Ice' before the ice runway closed. The threat of 'not getting home till after Christmas' was exaggerated and added to the already stressful task of making CRP2 a success. All Project personnel returned to NZ on or about the dates originally planned.

7.2. **Cargo.** Refer to CRP2 Cargo, Para 4 above, for cargo details. Overall the movement and delivery of cargo went well, especially so given the high amount air freighted (some 46,000 lbs ex Christchurch) and the often short notice to purchase and deliver. There is room for improvement in the way urgent cargo is tracked from NZ to Cape Roberts and better ways of doing this will be instituted for CRP3. CRPSSM was critical of the delay and damage done to science cargo that was returned to NZ after the drilling phase ended. It seems the problem here is that when CRPLO departs Scott Base there is something of a vacuum created and 'loss of ownership' and CRP equipment can be overlooked. Hopefully CRP3 will plan for this.

7.3. Both German science groups (Niessen and Wonik) on the Project brought radioactive sources as part of their science cargo. Both scientists reported that this administratively sensitive cargo was moved smoothly through 'the system'. Niessen elected to leave his low grade source in storage at Cape Roberts until CRP3, thereby saving a good deal of paperwork.

7.4. **Helicopter Operations.** In CRP2 a total of 228.7 hours were flown of the 300 hours allocated. Of that, 217 hrs were flown in the drill operations phase, and the remainder in the January-February maintenance and winterisation phase. **Refer to Appendix 1 for a breakdown of helicopter hours by week.** The Project was well served by both the RNZAF and PHI. After some exuberant flying by RNZAF pilots on CRP1, the more measured approach by this season's RNZAF crews was appreciated by those who rode helicopters daily to work. CRPM was particularly appreciative of the effort by the RNZAF crews to back-load trash to Scott Base.

7.5. **CRP Vehicle Fleet.** The CRP2 vehicle fleet consisted of two Caterpillar bulldozers, - D5 and D6 models, a Kassbohrer PB 170 equipped with a Hiab crane, four Bombardier skidoos, a 4 x 4 Honda motorbike and two Haaglunds all-terrain vehicles. With the exception of the Haaglunds and the Honda motorbike all the other vehicles were wintered-over at Cape Roberts. The Honda motorbike arrived at Cape Roberts in late September on the sledge train to replace the unreliable ASV (all seasons vehicle) Track-Truck which was returned to Scott Base at the same time. Vehicle serviceability was generally good throughout the drill season. During the maintenance phase all vehicles were serviced. The skidoos are 'showing their age' and will require increased servicing to see out CRP3 and the clean-up year. A major job was undertaken at Cape Roberts in January when the right-side pivot shaft on the D6 was replaced. This involved the removal of the tracks, the blade and the track roller frame to access the worn shaft. It would not have been possible without the heavy lift capability of the Hiab crane on the Kassbohrer.

EVENT DIARY

8.1. **Refer to Appendix 2 for an outline event diary and Appendix 3 for the CRPSSM's report covering drilling and science events and issues pertaining mainly to the Drill Site operation.** The CRPM wrote daily situation reports (Sitreps) throughout the drill operation phase of CRP2. These recorded movement of personnel to and from Cape Roberts, daily weather, sea ice conditions, personnel welfare and drilling progress. The Sitreps are not reproduced in this report but can be accessed through Ant NZ records if required.

HEALTH AND SAFETY

9.1. No member of the CRP2 team suffered any serious illness or injury while in Antarctica. At Cape Roberts there were only minor injuries reported; eg. two strained backs, various muscle strains, a wrist injury and a welding burn. There were a couple of cases of cold/throat infections and a passing 24 hour-type flu, but fortunately that is where it ended.

9.2. **Paramedic/Camp Manager Position.** Colleen Clarke assumed the role of Paramedic/Camp Manager and immediately made her mark in both positions. First-aiders were identified and trained for emergencies at the Drill Site. First aid equipment

was reorganised and new kits made up for each skidoo. Personnel feeling unwell or with a minor injury could approach Colleen with confidence. Colleen took an active role in the weekly staff safety meetings. She was also responsible for health and safety in the Camp, frequently making suggestions for improvements. And finally she tested the Camp's water supply daily for its pH level and weekly for bacteria count. The water was 'dosed' with sodium bicarbonate to maintain an optimal pH of between 7.8 and 8.2, as recommended by Ant NZ's water expert, Tim Donaldson of Ace Water Treatment Ltd. All bacteria counts were negative during the season. In mid-October a water sample was sent to Tim Donaldson in Christchurch for more specialised analysis of impurities such as copper and lead. Levels of these substances were either non-existent or well within acceptable levels.

9.3. A member of the Cape Roberts team who suffers from a potentially communicable disease was self administering injectable medication. Both CRPM and Paramedic were aware of this and suitable disposal arrangements for the used syringes were made. However, through an oversight the Scott Base medical office was not aware and became alarmed when used syringes were found in a rubbish bin at Scott Base. The individual concerned acknowledged a lack of forethought on his part but in his defence said there was no obvious 'sharps container' and he didn't know who to see about such a facility. This incident highlighted the need for better communication and access to medical files by all who should be 'in the loop' in such a case.

9.4. **Safety Meetings.** Weekly safety meetings were held throughout the drill operation phase. The pattern that worked best was the Drill Manager conducted a Drill Site meeting of all day shift personnel on a Friday. Notes from this meeting were given to the CRPM who then conducted a second meeting at CR Camp on the Saturday involving all night shift and support staff (not otherwise at the Drill Site meeting). Notes from both meetings were then posted on the noticeboard in the Warm Vestibule for everybody to read. Feedback from these meetings was positive, and the information useful. The key to the acceptance of the meeting format was the 'no blame' theme – people were there to learn, discuss and propose alternatives, and not to lay blame.

9.5. **Incident Reports.** CRPM filed three incident reports to Manager Scott Base during the drill season. All were classified 'near misses'.

a. The first occurred when a pillion passenger on a skidoo fell off when the skidoo went over an obstacle. Speed nor carelessness were not at issue, except that the passenger wasn't holding on well enough. The real danger was a sled was being towed behind the skidoo and the passenger was lucky not to be struck or run over by it. Thereafter no passengers were to travel on skidoos towing a sled.

b. The chef was very lucky to escape serious fat burns when there was an 'explosion' of boiling fat from the CR Camp's deep fat fryer. This was caused by a build up of water in the fat from repeated cooking of water-logged parboiled potatoes. The chef should have recognised the danger.

c. A party was caught out on the Wilson Piedmont in a white-out when returning to CR Camp from a climb of Mt England. They were travelling with two skidoos and trailers and had all necessary survival gear. The leader of the group of five was an experienced climber and had three seasons Antarctic experience. He elected to push on, got off the route and didn't stop until the party had become thoroughly disorientated. Camp was made but not before they discovered they had ventured into a crevassed area. The weather lifted about three hours later and they safely returned to Camp. This incident raised a number of important issues regarding field safety and leadership.

COMMUNICATIONS

10.1. Three communications facilities were available to CRP2. They were telephone links utilising 'Country' sets, HF radio and VHF radio. HF and VHF radio provided only voice communication, while the telephone system provided voice, data and facsimile transmission. There were three distinct communication phases during CRP2 – Winfly (September), drill operations (October-November), and close down/maintenance (December and January). The operational phase was the only one which had all communication facilities functioning. The total communications suit was only just adequate during the main operational-science phase of CRP2. At times, because of unserviceability, interference and overload the communication system was variously criticized as limited, cheap, ill-conceived, user-unfriendly and stress inducing.

10.2. HF radio, using 5400kHz, was only used on the Winfly traverses to and from Cape Roberts when the vehicles lost comms on VHF. Thereafter it was there as a radio of 'last resort' in an emergency.

10.3. VHF radio was the workhorse of the communications system, particularly between CR Camp and the Drill Site and between vehicles and the two camps and Scott Base. The majority of the VHF sets (some 15 including vehicle radios) were supplied from Scott Base stock. The base stations at both camp sites are CRP-owned. Performance during the Winfly period was excellent once the Piedmont VHF repeater (behind Cape Roberts) had been installed. However, it did deteriorate as the season progressed and at various times Channels 3 and 5 were being constantly interchanged in search of better performance.

10.4. The telephone system consisted of two lines – line 1 was set up once the Piedmont repeater was activated at Winfly and provided a reliable if static voice line to Scott Base and the world. The second line was transmitted through an intermediary repeater on Hoopers Shoulder, Mt Erebus. This could only be activated in early October once helicopter flying began. The quality of this line for most of the time was suitable for voice, data and facsimile transmission. It was, therefore, in high demand. Not only was the demand on it too much, data and facsimile transmission could easily and inadvertently be cut because of the way the system was configured at CR Camp.

10.5. As drilling progressed one of the most serious limitations of the communications system became increasingly apparent – there was no 'private' link, namely a telephone or scrambled radio link, between the Camp and the Drill Site. CRPSSM and the Drill Manager grew increasingly reluctant to discuss drilling issues and decisions on 'public' VHF radio and this adversely affected the working relationships in the on-site management team.

10.6. The CRP communications system had limitations and some criticism was justified, but in mitigation it should be remembered that:

- the system was conceived in 1994 with a negligible budget,
- in 1994 it was not appreciated how much all personnel on the Project would utilise phone, data and facsimile facilities if they were made available, and
- based on the mid-1980s CIROS experience nobody expected the drilling to be as difficult and demanding as it was on CRP1 and CRP2, necessitating good quality and private communications when frequent 'hard' and sometimes debatable decisions had to be made at short notice by the management team.

ENVIRONMENT REPORT

11.1. The CRP2 Environment Report is attached as Appendix 4. Note that this report is submitted to Ant NZ's Environmental Manager who in turn incorporates it in the annual environmental return to EARP. The Environment Report contains Appendices on person-days and visitors at Cape Roberts and a hazardous substances report.

Jim Cowie
Cape Roberts Project Manager

May 1999

Appendices;

1. CRP2 Helicopter Hours 1998/1999 Season.
2. CRP2 Event Diary.
3. CRP2 CRPSSM's Report dated Feb 99.
4. CRP2 EOS Environment Report dated Feb 99.

CRP2 HELICOPTER HOURS 1998/1999 SEASON

To Week End	10-Oct	17-Oct	24-Oct	31-Oct	7-Nov	14-Nov	21-Nov	28-Nov	5-Dec	12-Dec	16-Jan	23-Jan	30-Jan	TOTAL
Projected	35.0	35.0	25.0	25.0	25.0	25.0	30.0	30.0	30.0	30.0	5.0	2.5	2.5	300.0
Actual	7.8	24.1	26.7	25.4	31.8	22.9	28.5	29.5	24.0	4.1	1.2	1	1.7	228.7
Difference	-27.2	-10.9	1.7	0.4	6.8	-2.1	-1.5	-0.5	-6.0	-25.9	-3.8	-1.5	-0.8	-71.3
Accum. Diff.	-27.2	-38.1	-36.4	-36.0	-29.2	-31.3	-32.8	-33.3	-39.3	-65.2	-69.0	-70.5	-71.3	
TOTAL	7.8	31.9	58.6	84.0	115.8	138.7	167.2	196.7	220.7	224.8	226.0	227.0	228.7	

NOTE: CRP2 helo hours are shared equally between Ant NZ (K001) and USAP (S-049).