

# END-OF-SEASON REPORT CRP 1995/96

## K001: CAPE ROBERTS PROJECT

### Event Personnel:

A.R. Pyne VUW CRP Science Support Manager  
J.W. Cowie NZAP CRP Project Manager  
J. Ridgen NZAP Mechanic  
M. Knox NZA Plant Operator  
M. Davis NZA Plant Operator  
B. Reid NZAP Electrician  
P. Davies Dawn Construction Ltd, Engineer Contractor  
M. Muirhead Dawn Construction Ltd, Engineer  
M. Barrett Works Consultancy Services, Engineer  
M. Mitchell Works Consultancy Services, Engineer  
P. Sinclair NZAP Carpenter  
P. Walton NZAP Carpenter  
E. Tripp Telecom, Technician  
B. Caulder, SB Winter-Over Electrician

### Introduction.

The 1995/96 Antarctic field season for the Cape Roberts Project (K001) was in two parts, October-November 1995 and January-February 1996 and consisted entirely of logistic preparations to enable drilling to begin the following summer. The October-November period began with sledging equipment from Scott Base to Cape Roberts and thereafter focussed on commissioning the core facilities of the Cape Roberts Base Camp. The second half of the season began with a successful ship off-load from the MV ITALICA after which a small team unpacked, reorganised and assembled equipment .

### Phase 1: 01 October - mid-December 1995.

**01 - 28 October.** During this period various CRP personnel assembled at Scott Base to begin preparations for deploying to Cape Roberts. Walton was tasked with building a connecting-way to join NZ1 and NZ3 at the Drill Site (DS) Camp and making up flooring panels for Italian tents. Pyne, Ridgen, Knox, Davis and Caulder, ably assisted by Scott Base staff, concentrated on organising vehicles and material for the sledge train to CR planned for the end of October. The Americans also loaded and transported three of the Project's German sledges from McMurdo to Marble Point with approximately 120 drums of JP8 and 30 drums of Mogas fuel. This period was one of intense activity. A helicopter reconnaissance of the route from Marble Point to CR was made and GPS waypoints established that were useful in the actual traverse.

**29 - 31 October.** A cargo train traversed SB to CR over this period taking just under 26 hours travelling time. Personnel accompanying it were Pyne, Ridgen, Caulder, Walton, Knox and Davis. The Train was made up of: Hagglands H28 and sledge, Kassbohrer PB 170 and Caterpillar bulldozers D6LGP and D5LGP which between them towed eight sledges. The sledge cargo was three Accommodation Containers, NZ9, NZ1, NZ3, NZ7, ASV, four Skidoos, the prefabricated 'wannigan vestibule', fuel tank and many other miscellaneous items like timber and tools. The sledges used were one German Aalener 10t, the purpose-built crack bridging sledge (a very useful load carrier as well), three Mitchell-designed rigid sledges, the SB Oskam sledge (returned to SB later) and three Cantago sledges. At Marble Point they left temporarily left NZ9 and picked up one of the German fuel sledges.

The party used the prepared American route to Marble Point and then navigated by the established waypoints. Even with the benefit of the helicopter reconnaissance deviations were necessary to bypass rough ice not often visible from the air. A 20 km long iceberg locked into the sea ice from Dunlop Island to the Debenham Glacier Ice Tongue forced the party to traverse to the seaward side of it. The party overnighted off the Bowers Piedmont Glacier. Overall the route was a very good and safe one.

**01 - 26 November.** On 04 November Pyne, Ridgen and Knox returned the 55 km to Marble Point with the D6 and H28 to recover the remaining two fuel sledges and NZ9. The unladen trip took 5hrs 20mins and the return 6hrs 30mins. In good weather GPS waypoints from the initial traverse were used to make this relatively quick trip.

At Cape Roberts throughout November the main task was to commission the core buildings of the CR Base Camp. The eight container buildings, with their sledges, that make up the nucleus of the Camp had been off-loaded at CR the previous January. After clearing the accumulated snow from around these buildings they were towed out onto the sea ice just off the 'South Beach' transition (6 hrs). Minor damage from the off-load and winter was repaired (2 days) and on 03 November the buildings were sledged to the north side of CR where they were positioned and then 'joined' by plumbing and electrical cables. This work took four people over 6 hours in good weather.

On 09 November Martin Barrett (Works Consultancy), Peter Davies and Warwick Muirhead (Dawn Construction) arrived to assist with the commissioning process. Potable water was produced for three days from the Reverse Osmosis desalination plant and all electrical and heating services were run in the buildings. Staff were able to have hot showers with good water pressure. Decommissioning took two days and the buildings were then sledged back to the South Bay on 18 November where further repairs/adjustments were made and winterisation begun. The buildings were finally pulled ashore on 22 November after the storage area was prepared with a covering of snow. Barrett, Davies and Muirhead departed CR once the decommissioning process began.

The commissioning of the CR Base Camp was a success - only minor problems were revealed. These included:

- a. Excessive melting out of the sea water intake -brine return hole in the sea ice. Solution: a deeper brine return hose to disperse warm water.
- b. Poor insulating 'sleeves' for plumbing between buildings. Solution: redesign.
- c. Poor heat output in Ablutions building. Solution: reposition thermostat at doorway.
- d. Poor connection system for external overhead heat ducting. Solution: redesign.
- f. Big, unsafe step down from container doorways. Solution: ensure floor of cold porch (not fitted for commissioning) is high enough.
- g. Reverse circulation of hot water when boiler pump turned off. Solution: install one way valve/ small back up pump.
- h. Some incompatible electrical extenuation cords and plugs. Solution: revise all electrical cables to external buildings and points.

In November Peter Walton built a cold porch and deck onto the main NZAP hut at CR to give additional storage and shelter to the front door of the hut. This project was successfully completed and will prove invaluable during the colder months of September and October.

On 17 November Pyne did a sea ice reconnaissance aboard Kiwi 02 to ascertain likely sites and routes for the second ship off-load. An off-load site was identified some 19 km due east of CR. A surface reconnaissance followed the next day and a route was pushed through to the ice edge. This route initially trended south from CR before heading east through rough ice and then north east. This early reconnaissance proved invaluable when the party returned in January to be confronted by deteriorating ice conditions. The off-load site tentatively identified in November proved to be the only feasible one for many kilometres along the ice edge.

On 26 November Hagglands H28 returned to SB with two Hagglands sledges, the empty Oskam sledge and Pyne, Ridgen, Knox and Walton. The 150 km journey took 8 hrs 15 minutes in the good conditions.

**Mid December.** Ridgen and Tripp returned to CR mid December to repair the Kassbohrer and investigate radio repeater sites on the northern end of the Wilson Piedmont respectively.

### **S u m m a r y .**

The objectives of this phase of the CRP operation, namely to transport equipment and vehicles from SB to CR, to commission the CR Camp, to build a cold porch on the CR Hut, to organise the storage area at CR and to prepare for the second ship off-load, were all successfully achieved.

The environmental impact of this set-up phase of the Project was minimal. The 'fuel dump' of some 200 drums of JP8 and Jet A1 had survived the winter well with no signs of leakage or damage. All refuelling of vehicles and buildings during this phase was carried out on the sea ice from a dedicated Hagglands sledge set up with fire extinguishers and field fuel spill kits. There was only one minor fuel spill on the sea ice. This was cleaned up and the contaminated snow returned to SB. Vehicles were able to operate around the storage area at CR without causing any ground disturbance because of the good snow cover.

The use of a helicopter and GPS for route reconnaissance saved valuable time and wear and tear on vehicles.

The Project Manager and Science Support Manager always recognised there was a lot of work to do in this phase. This may not have been fully appreciated in the early pre-season planning and so a lot was asked of those at CR in terms of long continuous work days. It was, therefore, unfortunate that on return to SB there was criticism of this effort on the grounds that 'normal' (SB hours?) work hours and days were not adhered to. The important lesson to be learned from this 'difference of opinion' is that CRP is in fact different from NZAP's normal small-field operations and allowances must be made accordingly.

## **Phase 2: 12 January - 05 February 1996.**

**12 January.** Cowie and Pyne, who had arrived at Scott Base the previous evening from NZ, completed a helicopter reconnaissance of the sea ice from Cape Roberts to the sea ice edge, a distance of 20 kms. Assisted by Ridgen and Americans Bill Hals and Buck Tilley a close investigation was also made of the tide crack or transition area at the southern access to the Cape. It was apparent that conditions were not as good as they had been for the previous ship off-load and that greater care would have to be taken in route finding and testing the ice. Ice at the transition was still thick (up to three meters) but was clearly deteriorating.

**13 January.** A meeting at NSF Chalet (JC, AP, PB & RR) with Al Sutherland and Mickey Finn advised there was little chance of icebreaker support for CRP off-load because it was unserviceable. Zucchelli at TNB was advised of situation.

**14 - 16 January.** CRP personnel (Cowie, Pyne, Ridgin, Reid, Knox, Sinclair, Mitchell and Tripp plus Jacqui Unwin SB GD) flew to CR on 14 January. Zucchelli rendezvoused from TNB at CR and did a preliminary sea ice reconnaissance with Pyne and established the only really feasible off-load position 19.5 km directly east of CR. General work began on equipment but the main emphasis was on establishing the easiest and safest route to the ice edge. On 15 January with support from RNZAF's K02 the route was established and the following day Pyne, Knox and Reid spent a long day drilling and flagging it.

**17 - 18 January.** The NZAP party positioned itself with the D5 (kept 3 km back from off-load point), Kassbohrer PB 170 and two skidoos at the ice edge. Two more reconnaissance flights were made with Zucchelli and the ITALICA's captain in the early afternoon as the ship had to penetrate about 8 km of pack. The weather remained warm and calm for the whole period and the ITALICA finally manoeuvred into the off-load point at 2130 hours. The sea ice here was 1.3m thick and weakly structured. Throughout the operation a very close eye was kept on it and care was taken to keep the heavier loads under tension on the ship's crane until the sea ice had 'taken up the load'.

The off-load began at 2300 hours and was successfully completed six hours later at 0500 hours. The Italians provided three Kassbohrer PBs (one 270 and two 330s) which were invaluable and made for a very quick operation. Apart from a large semi-circular crack in the sea ice along about half of the ship's side, probably caused by the earlier stress of the drill rig (17.5 tonnes), the whole off-load and traverse operation was uneventful. The Italians had returned to the ship by 0830 hours after leaving all the loads spread out on the sea ice just to the south of CR. Each sledge was then positioned by the D5 at the transition and then winched across using the D6, a safe and successful operation that was completed by noon.

**19 January - 03 February.** Work at CR began in earnest with the arrival of all the equipment from the second off-load. In brief this was:

- a. Drill Rig (included skis, enclosed platform, complete Longyear 44 HD power pack and mast) - total weight 17.5 tonnes.
- b. Insulated Containers - 10 containers and respective sledges made up of: Accommodation Units x 3, Laboratories x 4, Mud Huts x 2 and Drill Site Generator Shed x 1 - total weight approximately 60 tonnes.
- c. Steel Container x 1 (ex ENEA) - for storage at CR - total weight 6 tonnes.
- d. Sea Riser parts including guide base, 12(?) x 6m lengths of outer casing incorporating inflatable floats, 6(?) x 1m lengths of outer casing.
- e. Ancillary Drilling Equipment including ice auger, Drill Rig rod ramp, stairway and stabilising 'outriggers', and drilling spares.
- f. Tents. Polar Haven Mess Tent - 16' x 24' plus wooden insulated flooring panels for the Mess and Recreation Tents.

The main tasks were to:

- a. Unpack all the containers, reposition the contents and reposition the containers for winterisation.
- b. Assemble various buildings and equipment, eg fitout the three accommodation containers that had been delivered the previous year, assemble the 'Mess warm vestibule' and core saw linkway for DS Lab.
- c. Carry out maintenance on the vehicles prior to winter.
- d. Generally 'clean up' the whole storage area at CR, make an inventory and secure everything for winter.

The CRP team worked long continuous days and although the Project Manager was pleased with what was achieved there was still another few days work required to complete the task. Cowie, Reid and Sinclair were the last to leave CR on 03 February, the last day of helicopter flying for the season. The team had earlier (16 Jan) been strengthened by the arrival of "Mud" Davis, the second SB Plant Operator, who returned to SB on 23 January. Murray Mitchell departed CR for NZ on 20 January followed on 26th by Alex Pyne and Murray Knox. Pyne had a meeting the following day at the Crary Laboratory with Dr Scott Borg and Glen Smith, the manager, to discuss aspects of the Project as they affect the Crary Laboratory end of the operation. On 31 January Jeremy Ridgen left to return home and Eric Tripp and David Hornstein (SB Technician) arrived to continue the 'battle'.

## Summary

Phase 2 of K001's 1995/96 Season was highly successful. The second ship off-load was efficiently and safely carried out in spite of sea ice conditions that, in places on the ship-to-shore route, were rapidly becoming marginal. Much of the credit for this must go to Alex Pyne for his knowledge of the sea ice and thorough planning and inspection of the route. Everybody involved in the operation worked extremely hard, long days and although tiredness began to take its toll towards the end morale remained high and everybody was positive about 'getting the job done'.

During this Phase no time was lost due to bad weather. In fact the weather overall was excellent - a majority of days were clear, sunny and 'warm' with little wind. Only one day could be described as poor weather with low overcast, a cool wind and light snow.

No ill health or accidents were reported. Having said that, it was a concern of Cowie and Pyne that the hours that had to be worked to achieve the task and the resulting tiredness could just have easily contributed to an accident or personal injury. Had the weather not been so good the risk of accident or injury would have been greater. There is also little doubt that the use of NZAP's Kassbohrer PB 170 and its Hiab crane contributed significantly to minimising injury or accident during lifting operations. Where there was any doubt about the capability of people to lift or move something safely, the Hiab crane was used. It was invaluable.

Support received from Scott Base was good - efficient and timely. There appeared to be a difference of opinion over ration entitlement with CRP personnel eating a mix of food from ration boxes supplemented mainly by fresh food (meat and fruit/vegetables). Given the consistently high work rate the combination of food was both necessary and justifiable.

The environmental impact of this pre-drilling phase of CRP on Cape Roberts and the surrounding area was minimal, with one exception. Wherever possible and practicable all staff adhered to the requirements of the CEE. Regrettably there was greater ground disturbance inside the designated storage area on Cape Roberts than had been anticipated. An area of approximately 1,000 square metres immediately to the west and north west of the permanent NZAP hut was cut up by tracked vehicles and sledge runners as the 23 containers now on site were manoeuvred into position. Unlike the previous season, there was little snow on the ground this January to provide protection. Every effort was made at the time to restore the damaged areas by racking but it is clear a bigger effort will be required once the Project is completed and all equipment removed from the Cape.

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Project Manager Cape Roberts Project

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