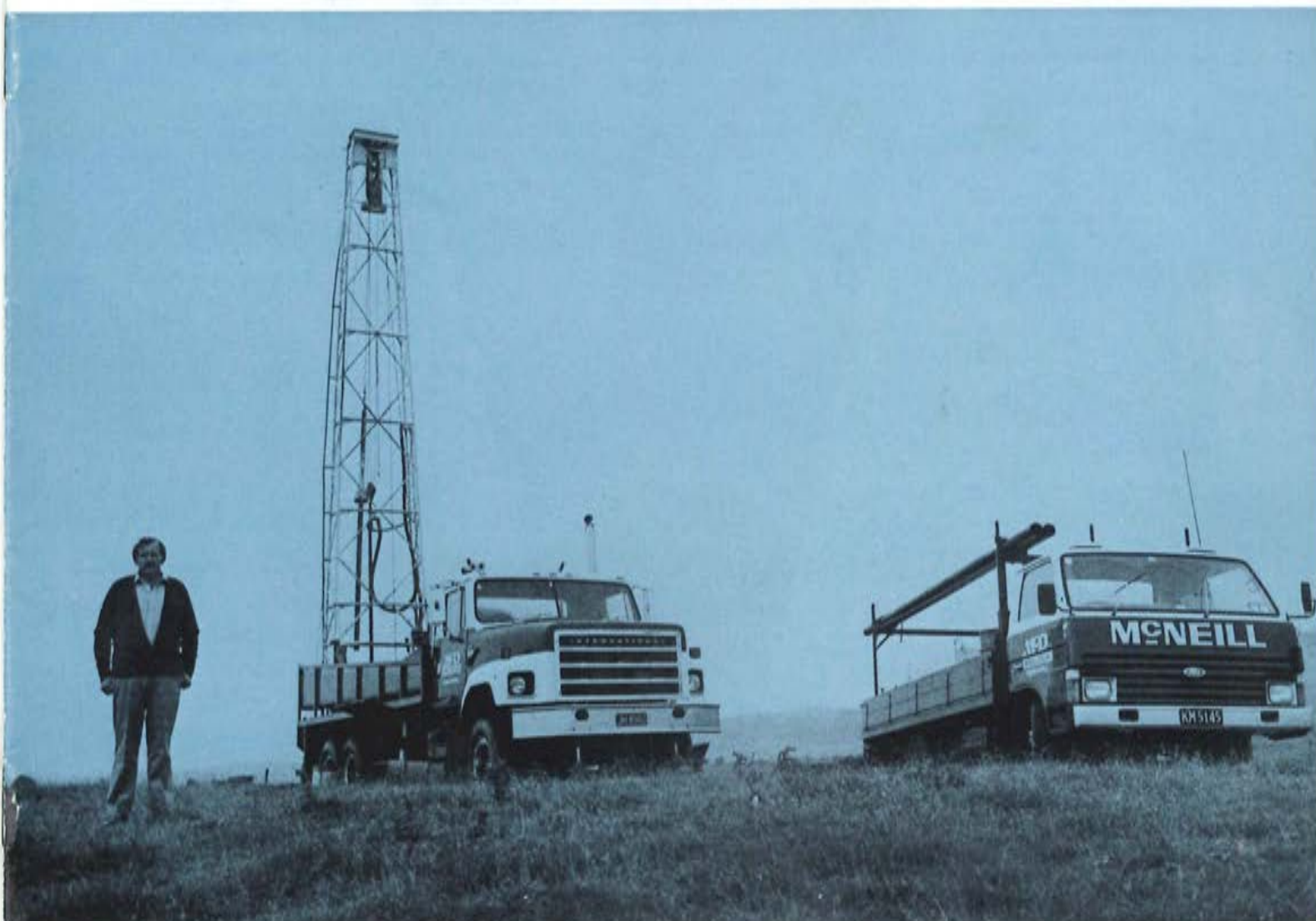




New Zealand  
**THE DRILLER**

OFFICIAL PUBLICATION OF THE NEW ZEALAND DRILLERS FEDERATION, AUTUMN 1982, No 3



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## New members admitted

SEVEN NEW members were admitted to the New Zealand Drillers Federation when their applications were approved by the council meeting in Wellington in February.

The new full members are G.L. Kelly Ltd, of New Plymouth, well drilling and site investigations; and Nova Supplies Ltd, of Masterton, site investigation, blasthole and anchor drilling.

Two new employee members are Mr L.J. Grey, of Dunedin, and Mr J.R. Hampton, of Turangi. Both are employed by the Ministry of Works and Development.

New associate members are Bay Water Pumps, of Tauranga, wells, site investigation and pump servicing; Mintech NZ Ltd, of Nelson, fluid products, bentonite, mica etc, mud engineering assistance; and Subsoil Engineering Ltd, of Auckland, soil investigations and laboratory work.

## Conference at Nelson

THIS YEAR'S New Zealand Drillers' Federation annual conference and drilling school will be held at the DB Rutherford Hotel, Nelson, from July 28-31.

The full list of speakers and topics has yet to be finalised but some overseas participants are confirmed. They will discuss the latest drilling techniques and equipment.

Hydrologists from Nelson and Marlborough will give papers on the underground water systems of the two provinces.

Conference organiser and federation council member Mr 'Woody' Woodford is making every effort to ensure that a new 250mm diameter cable tool-drilled water well nears completion at the right time. Delegates will be able to see that start of a 24-hour pump test, and it is hoped that observation wells will be available so the aquifer drawdown and recovery can be recorded.

Mr Woodford said it is also hoped to demonstrate a site investigation hole. Soil sampling, subsoil sampling and diamond coring difficult clay-bound gravels with mud assistance will be shown.

**THIS MONTH'S COVER:** On a hillside near Ohai, New Zealand Drillers' Federation President Mr Hamish Pearson supervises one of his company's rigs working on a mine dewatering contract. Mr Pearson is interviewed on p8 of this edition of *The New Zealand Driller*

"Every effort will be made to have this demonstration as Mintech New Zealand and Baroid Australia want to do a practical demonstration of their mud techniques."

The drilling school supervisor this year is federation vice-president Mr Bill Washington, of Timaru, who had experience with all earlier schools.

A certificate of attainment will be issued to those passing an examination, the syllabus for which will cover speaker sessions and practical demonstrations.

Conference registration forms will be despatched in the near future.

## Social plans firming up

The main conference social function will be held on Saturday, July 31, and Nelson's most popular entertainment group, the Crystallairs, is likely to perform.

The ladies' programme tentatively includes two bus trips.

The first, probably on Thursday, July 29, will take in visits to points of interest around Nelson itself, including the Tahunanui beach resort, antique shops and museums, and others, including Nelson's cathedral.

Proposed for Saturday, July 31, is a full-day trip travelling to Kaiteiteri Beach, 60km west of Nelson, visiting a major pottery at Waimea where demonstrations can be arranged vineyards, and Motueka on the way. The return journey will travel the coast route, calling at another pottery.

People interested in either, or both, tours are asked to contact either the secretary of the federation, or the organiser, as soon as possible. Information from

**Mr Woody Woodford**  
Richmond  
NELSON RD1  
Ph 8381

## Training gets close scrutiny

THE NEW Zealand Drillers Federation is to take a close look at establishing formal industry training and qualification procedures with the aim of enhancing drillers' status.

"Everybody wants some recognition of the industry. I've been 20 years in the industry and I've got no qualifications, and neither has my staff, to say we're drillers," said Mr

The Driller is the official publication of the New Zealand Drillers' Federation Inc.

## EDITORIAL

All editorial inquiries, including manuscripts, should be directed to

**The Editor**  
The NZ Driller  
P O Box 245  
WELLINGTON  
Ph (04) 729 924

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Editor: Greg Newton

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Bill Washington, the federation's vice-president.

He has taken on the responsibility of investigating the development of a recognised training structure.

"Drillers want the training and we, the employers, want them trained. They need to go to schools that are more formal than the school at our own conference, and are oriented more toward drilling rig operation," Mr Washington said.

At last year's Groundwater '81 conference in Kuala Lumpur he spent a lot of time at sessions on driller training and education, and was particularly impressed with a scheme developed in Alberta, Canada.

"If you haven't got a licenced driller on your staff over there you don't work, and the rest of Canada is now moving the same way.

"The awkward thing so far as New Zealand is concerned is that we aren't big enough. No way could we afford to have a guy on the federation's staff to arrange examinations as a fulltime job and none of us can spend even part of our time on it because we've all got businesses to run."

Mr Washington is intending to have discussions with the Ministry of Works and Development, which each year sends a number of drillers to their federation conference and training school.

It may be possible to, once or twice a year, import one of the Australian National Water Wells Association's instructors — they have four — to hold courses in a central location.

"We could then send our drillers up to Nelson or Wellington for a week.

"That sort of thing backed up with correspondence courses would encourage our guys.

"We've tended in the past to give a job to a cobbler's mate's son but in future we're going to have to be more selective and look for better guys.

"But training is going to take a lot of getting off the ground."

## Next issue

The Winter 1982 issue of the New Zealand Driller will be published on July 1, 1982.

Advertising material for this issue should be in the hands of

**The Advertising Manager  
The NZ Driller  
P O Box 245  
WELLINGTON  
Ph (04) 729 924**

by June 10, 1982.

The deadline for editorial submissions, including new products and services information, is June 1, 1982.

## Coal survey nationwide

THE MINES division of the Ministry of Energy is probably the largest single employer of contract drillers in the country — and the picture is unlikely to change much in the near future.

On any given day, up to 15 rigs throughout the country are employed on the national coal resource survey. Already in progress for four years the investigation still has at least five years to run.

It cost \$3.2million in the year to March 31, 1982, and 60 per cent of that was paid out in drilling costs.

The work covers practically the whole country.

In late February

- Two rigs were working at Kaitangata, in South Otago
- One was working near Greymouth
- Two were working the Mokau field, in North Taranaki
- Four were working around Kawhia, in the South Waikato
- And another two were looking about the northern extremities of the Waikato field, between Huntly and Pukekawa.

As well, contract drillers are employed on the big Waikato mine development programme associated with the New Zealand Steel expansion project and plans for a new coal-fired power station.

Geologist Mr Phil Taylor told The New Zealand Driller that spending on the resource investigation is budgetted to continue at current levels for the next few years.

While the investigation at Kaitangata is expected to finish during 1982, planning is underway for work in the Buller region and tenders will shortly be called for another contract, worth about \$200 000, in the Greymouth region.

"Mines division operations use contract services wherever possible. We don't only employ contractors for drilling, we use them for well logging, geological work and analysis.

"We have a small staff of our own who manage operations overall and provide some specialised technical services."

Mr Taylor said most exploration holes are less than 400 metres deep, but some go down as far as 800 metres.

Tenders are called on either an hourly hire or metres drilled basis, and require either full coring or open-hole drilling depending on which best suits the division's requirements.

Drillers on open hole work are often required to take short core runs when instructed, but the system allows sub-

stantially faster penetration rates than can be achieved when full coring is required.

All holes are geophysically logged using density measuring equipment, which picks up the coal seams because coal is less dense than most other rocks, and gamma ray logging equipment, which finds the seams because coal emits less radiation than other materials.

Mr Taylor said the mines division uses a number of drilling firms from all over New Zealand, but is always interested to hear from other drillers who may be able to perform the operations required.

Drillers interested in this sort of work should contact

**Mr Phil Taylor, Geologist  
Mines division, MOE  
P.O. Box 6342  
Wellington  
Ph (04) 735 755**

## Big drills on for black gold

PETROCORP'S OIL strike at the McKee field in Taranaki has set off the closest thing to an oil prospecting boom New Zealand is likely to see.

The state-owned oil company has since last year been proving the McKee field with an Ideco 2100 rig, capable of drilling more than 6 500 metres.

It is looking round world markets for a small land-based drill, capable of going down to 3 000 metres.

And it also has an eye out for a semi-submersible drilling rig to drill off the North Island's west coast between Kawhia and the top of the South Island, working up to 80km offshore.

A Petrocorp spokesman said most of the onshore drilling will be carried out in Taranaki. Various structures in the northern part of the province show fairly good potential.

The Ideco rig, contracted from an Australian firm, is expected to be in use for at least two years. The rig is electrically-operated with SCR controls which convert AC power to DC, giving better control over drilling performance, without the need for using expensive DC generating equipment.

Drilling for oil is considerably different from the water well or foundation drilling that the New Zealand drilling industry knows so well. Everything is bigger and brighter; the depths, the technology and of course, the money.

The hire of high capacity rigs and

**Continued on P15**



# Get it straight



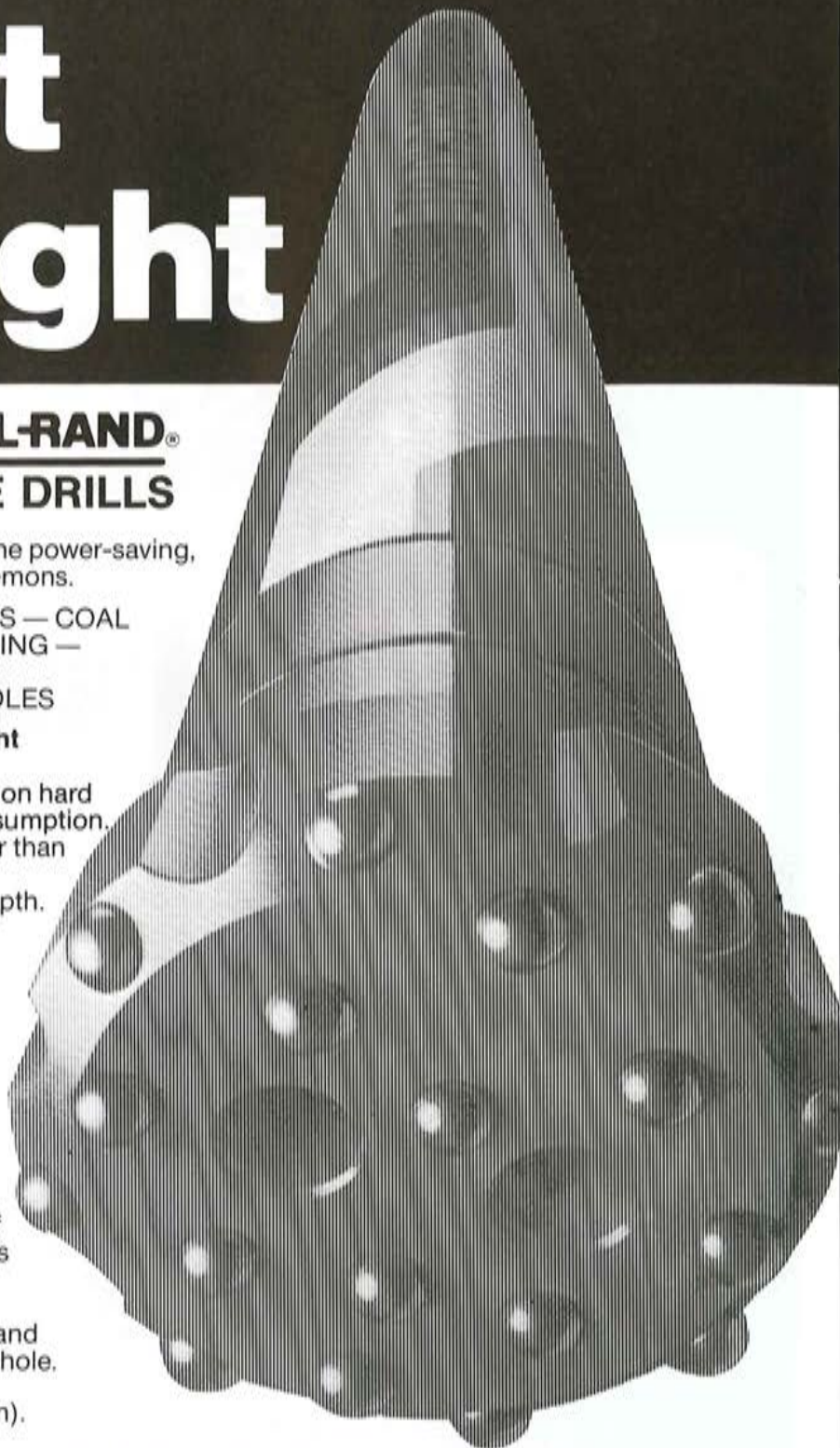
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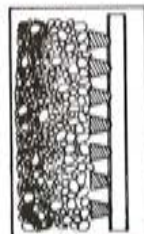
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## Stiff-foam drilling overcomes rotary strictures

FOAM DRILLING is a technique being increasingly used in applications where hole erosion, caused by the large quantities of air or water required to return cuttings to the surface, is a problem.

Mr George Strickland, Baroid Australia's technical representative, told the Drillers Federation conference last year that the technique is not new.

It was used in Western Australia for large diameter surface drilling on Barrow Island and for 2 000 metres of 45cm offshore holes, as well as for numerous desert water wells throughout the world.

The basic principle involves reducing the hydrostatic head of the well's fluid column to a point where some fluids return to the surface. Small amounts of air are used as a circulating medium, and a mixture of polymers, bentonite and foaming agents is injected.

The air foaming mixture and formation water produces a foam similar to aerosol shaving cream. The air-foam mixture and rate of penetration ratios must be controlled relative to the amount of water produced by the formation.

Air and injection fluid mixing rates can be controlled on the surface by bleeding off air as required to cause cuttings to return to the surface continuously.

Stiff foam drilling requires much lower annular velocities than air drilling — from 60-150 metres/minute — thus reducing hole erosion. Low gas volumes needed to achieve the velocity — about 3-15 cubic metres/minute — mean less compressor or inert gas generator volume.

Mr Strickland said that injection fluid rates should be adjusted to penetration rate. Rule of thumb requires a volume of injection fluid for every

volume of formation removed from the hole, thus

- 0.4 cubic metres of injection fluid for every metre of 65cm hole drilled, and
- 0.5 cubic metres of injection fluid for every metre of 45cm hole drilled.

Another rule of thumb, he said, involved using approximately 15 litres of injection fluid a minute for each metre of bit diameter.

Excessive air use should be avoided as this will result in dirty hole conditions, with the cuttings being 'outrun' by air.

A suggested injection fluid mix comprises 6-9kg/m<sup>3</sup> soda ash, 15-18kg/m<sup>3</sup> quik get or aquagel, 1.5-3kg/m<sup>3</sup> XC-polymer or Lo-loss, 1.5-1.2kg/m<sup>3</sup> quik trol or super trol, 2-3kg/m<sup>3</sup> Coat 777 oxygen scavenger, 13-15 litres quik foam or super foam and 9-18kg/m<sup>3</sup> Torq Trim II. Both the Torq Trim and Coat 777 are optional.

Mr Strickland said that a 75-litre slug of 30 per cent Baroid foam corrosion inhibitor and diesel oil should be injected every 30 minutes to reduce corrosion.

The mixing procedure involves filling a mixing tank or pit with soda ash and bentonite, then stirring to disperse the latter. After the polymer is added the mixture should be stirred for 30 minutes, before the foaming agent is added cautiously. Cover the surface of the pit with 10-15mm diesel oil or Torq Trim, add required Coat 777, then pour the solution through oil and mix with a paddle. The solution is then ready for use.

Air compressors of the roto-vane or roto-screw type are suitable for holes up to 125 metres deep, depending on the water table. For injection a small independent drive piston pump with 100mm liners is preferred.

The compressor's air valve must be fitted near the driller to allow the air flow to be controlled. The conductor must be fitted with a deflector cap or a rotary head to prevent foam returns coming through the rotary table.

A cross fitting should be installed on the stand pipe, with air introduced into one port and the foaming agent into the other. A low pressure 1 500kPa gauge should be fitted where the driller can see it easily.

Mr Strickland said that penetration rate with foam drilling can proceed fairly rapidly if the formation is not

producing too much water. The rate usually will be equal to mud or air drilling. Once the drilling rate is established, so are injection fluid and air ratios.

Restarting after connections or shut-downs is easy because the normal foam formulation will remain stable for about an hour.

Foam's carrying and suspending properties normally exceed those of water, and formation lithology changes can be noted easily by colour changes in the foam returns.

The driller using the system should use only enough air to keep steady returns and a clean hole, take all possible precautions against corrosion, and look out for excess torque, which can be fixed with 8-15 litres of Torq Trim on each connection of drill pipe.

"Gel foam techniques are versatile and offer a means of drilling some areas with rotary equipment where cable tools or blind drilling previously were the only option.

"For normal surface hole or water depths, small centrifugal compressors are usually locally obtainable. Normal readily available mud products are used in making up and their use has been proven in many areas around the world," Mr Strickland said.

## Double-disc pump potential

DOUBLE-DISC pumps offer many advantages over conventional systems, according to MacEwans Machinery Ltd's pump division.

Designed initially for sludge applications, they are now used in just about any situation where liquids, or liquids containing solids, have to be shifted.

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Potential applications put the double-disc pump into competition with double diaphragm air pumps, some centrifugal pumps, 'mono' pumps, contractors' pumps and air and electric diaphragm pumps. Information from

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## Experience key to drilling company's success

EXPERIENCE COUNTS for a lot in the drilling business, where few jobs are similar and even fewer turn out to be as easy as they might look.

McNeill Drilling Co Ltd, of Invercargill, is one of the most experienced drilling companies in the country. Its history can be traced back to 1914.

And the managing director, Mr Hamish Pearson, is one of the most experienced drillers in the country, due to celebrate 30 years in the business in 1983.

Mr Pearson, president of the New Zealand Drillers' Federation since last August, started with the company as a 17-year-old after working as a labourer in an engineering shop where a rig was built for McNeill.

Like so many drillers, he started work on a rig without a trade and "just worked my way up."

McNeill now operates 11 rigs — four Callwells, three rotaries, two cable tools, an auger and a piling machine — but before a bit of devolution during 1981 the fleet stood at 17.

One was sold to Mr Clark McKenzie, who worked for the company for 12 years and now operates from a base in Balclutha. Five went into a new company, Southland Piling Co Ltd, headed by long-time McNeill foreman Mr Maurice Pascoe.

Spinning off these businesses, Mr Pearson said, came from "the need for us to do something positive for these guys to keep them in the industry."

"The men were going to do other things but the industry just can't afford to lose experienced people like that."

The need to retain experienced hands, and train new ones, are topics close to Mr Pearson's heart.

"Getting the right staff is a big problem."



"It'll, set you back \$500 000 for a rig today if you get a decent one, and you want the right bloke who knows what he's doing to look after it."

"Guys off farms are best suited to the work. They're used to working outside. It's a dirty filthy job and they're used to working in mud and machinery and they don't mind long hours."

"Drillers are a breed of their own — they're born, not made. They're not happy unless they're covered in mud from head to foot."

But like many small, specialised industries, drilling companies find many staff once developed to the stage where they're some use about the place, disappear over the horizon in search of other opportunities.

Mr Pearson is concerned about the lack

of formal training opportunities and supports the development of an apprenticeship scheme, seeing it as one of the federation's top priorities.

He has been on the executive since the Drillers' Federation took its current form about eight years ago, and doesn't plan any dramatic innovations or developments during his leadership term.

"We're just coming up nicely, with the membership growing every year."

"I think we're going pretty well. We're financial and I don't think we could wish for anything better at this stage of our development."

McNeill Drilling works throughout the southern part of the South Island. Resources are at any given time usually divided between Southland and Cen-



Anticlockwise from left; NZDF president Mr Hamish Pearson talks over a drilling contract at Ohai with employees Mike Simmons (left) and Phillip Gage . . . a McNeill rig working on electricity pylon foundations high above the Southland landscape . . . a rig drilling bridge foundations from an unusual platform . . . working overseas, a piling rig is unloaded at the Chatham Islands where it installed piles for a new wharf . . . and the problems of the Southland climate; a convoy halted by heavy snow, and a flooded river flowing over a bridge foundation site — note the slightly damp compressor at left



It was on the job for 12 months, doing site investigation, exploring for construction aggregate sources and water, drilling foundations, then the water bores supplying the vast industrial complex.

Access to the site in those early days was very restricted. Working hours were limited by the necessity for workers to get in and out by four-wheel drive vehicle around the mudflats of Awarua Bay at low tide.

The peninsula was covered with heavy tussock over pea gravel and most heavy plant had to be pulled onto the site by tractors.

One night a call came through — a Landrover stuck fast on the track and the tide coming in fast. Another vehicle was rushed to the scene but when it arrived the water was over the Landrover. Two very wet and bedraggled operators were wading through the surf with the small amount of gear they could salvage.

Once everything was established on site access was by jetboat across Bluff Harbour, "but that had its bloody moments too," Mr Pearson said.

In stormy conditions the Bluff pilot launch had to be called in to get men out.

The smelter is still providing work because the large diameter water bores producing over three million litres of water each day, require regular servicing.

The latest big project in the region, the hydroelectric development on the Clutha River is also providing work. A number of contracts are already complete and work is now in progress on aggregate investigations at the Luggate dam site.

McNeill Drilling Co Ltd has the capacity to carry out just about any type of drilling work that its wide range of clients may require.

And as well it has that vital ingredient, experience, to ensure that work is successfully completed.



tral Otago, although an occasional rig does venture further afield.

Operations in the first week of March were fairly typical; three rigs on drilling pylon foundations for a new New Zealand Electricity transmission line between Invercargill and Dunedin, another on bridge foundations for the Wallace County out near Tuatapere, another working for the mines division at Ohai, one drilling a farm water bore just out of Invercargill, and two drilling irrigation bores in Central Otago.

The business employs 28 people at the moment, down from 35 since the spinning off of the other businesses.

About 25 per cent of its business comes from the pump supply and servicing branch which holds the New Zealand

franchise for T.R.W. Reda pumps and stocks many other well known brands.

It was during the sixties that McNeill Drilling entered the big time, benefitting from work associated with the development of the aluminium smelter at Tiwai Point, near Bluff.

Nearly three years were spent drilling pylon foundations for the electricity transmission lines from Manapouri to Invercargill.

"We did one line then they decided they needed two — well that was always on, we knew that when we started — so we had to turn round and go back the way we'd come."

Mr Pearson said the work at Tiwai Pt was one of the most interesting jobs the company has carried out.



## More money down the hole

OIL FEVER of what seems to be a particularly ill-founded variety struck Canterbury in the early part of the 20th century when a well was drilled at Chertsey, south of Christchurch.

The moving force behind this ill-fated venture was one Mr Alexander Joyce who, in 1908, attempted to float the Ashburton Prospecting Company with a prospectus stating

"The Ashburton plains are situated opposite the highest point of the Southern Alps... and it is only reasonable to believe that the disturbance and fissuring of the ground was greater there than at less elevated portions of the ranges; also that the quantities of oil formed... would be larger in this locality than in other parts of the Southern Alps."

The geological reasoning obviously didn't impress many people and the company was not formed. Mr Joyce was, however, far from finished.

In 1913 he advertised in Christchurch newspapers setting up the Canterbury Petroleum Prospecting Co. He said "... After considerable study of the question I have come to the conclusion that there is an immense undeveloped oilfield in Canterbury... extending from Orari to the Ashley."

Six months later, when shares worth £5 000 were subscribed, the company held its first site meeting at Chertsey. Thomas Smith, who had worked with pioneer Canterbury driller Job Osborne, was in February 1914 commissioned to visit Gisborne, from where he bought a steam-powered percussion drilling plant for £450. By April the derrick, a 75-foot-high tower covered in corrugated iron was under construction.

In October the machinery was started. By January 1916 the well was over 200 metres down and in mid-1917 was a little short of 400 metres deep. Some began to get discouraged at about this stage and suggested liquidation. Mr Smith on August 20 reported signs of oil and flammable gas, when the rig reached 420 metres. In January 1918 the Minister of Mines visited the site and about then a 17.5mm valve was installed at the top of the casing as a precaution

against striking gas or oil under high pressure.

After another 12 months, the well was over 600 metres deep and a drill and spudding tool fell down the hole. The spudding tool was fished out and the casing was driven past the drill.

Oil signs persisted for another 12 months but quicksand made drilling difficult.

Then some clown dropped the sand pump down the hole. And although the best part of a year was spent trying to rescue it, only four metres progress was made.

At the end of August 1921 the quicksand rushed into the hole and rose several hundred metres. And that was that. The shareholders held a meeting on September 20, 1921 and the company was wound up.

The New Zealand Driller acknowledges Mr Bill Washington for providing the information for this story. Readers with similar items of drilling-related general interest should send them to The Editor, The New Zealand Driller, P O Box 245, Wellington.



INTRODUCING... The Drillers, a cartoon creation especially for the drilling industry.

With words and pictures by Mike Morrow an employee of Rotorua Welldrilling Co Ltd.

Mr Morrow 23, has been a driller for two years. His earlier career included a three year stint with the RNZAF as a spray painter, a year working as a car cleaner, and another year working in a tyre retreading plant.

The series has two main characters — The Driller himself, a stern swandri-enveloped personality, and his off-sider, a buck-toothed individual with a radio in his ear muffs and a general air of "What the hell am I doing here?"

Mr Morrow enjoys the driller's life. It's as dirty as spray painting but nowhere as boring... "It's a different sort of job where you get a chance to do different things. Spray painting is boring with the hours you spend

sanding down and all that sort of thing."

He has an ambition to develop his artistic talents, and recently started a correspondence course with that aim in mind.

Cartooning isn't his only outlet; he keeps his hand in at his former trade by keeping the paintwork on Rotorua Welldrilling's fleet up to standard.

"The cartoons are all based more or less on things that have happened to me. There's a bit of exaggeration."





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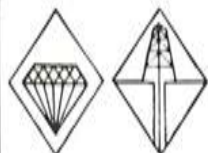
Dril Vis has been used and proved effective in many wells here in New Zealand  
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66 Vivian Street, P.O. Box 15, New Plymouth, New Zealand

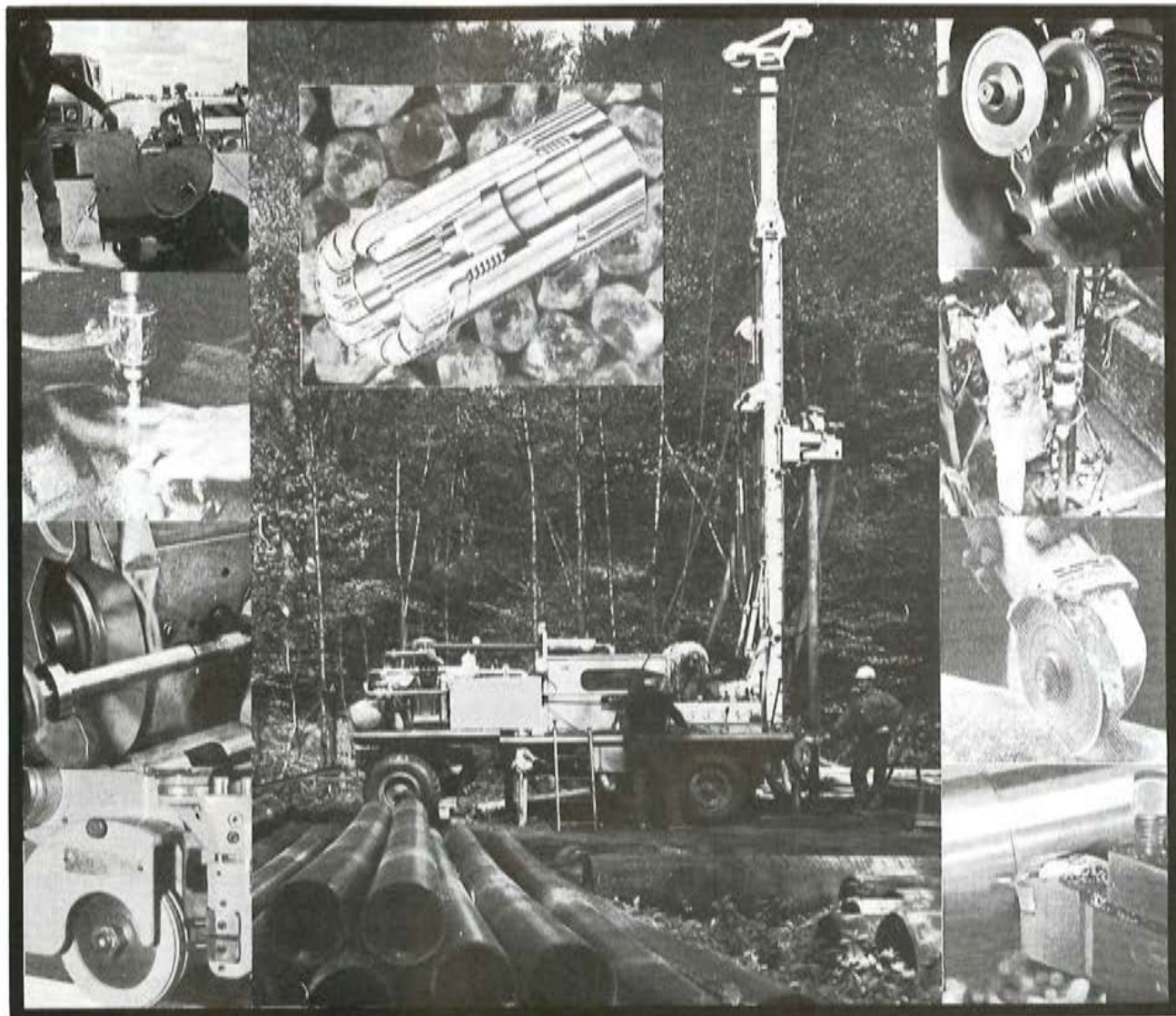
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## Submersibles released

THREE NEW submersible pumps, made in Japan by Sakuragawa, were released in New Zealand recently. The 40mm discharge U25L and the



50mm discharge U40L weigh only 17kg. The U233K, with its 80mm discharge, weighs 75kg.

The compact, portable and rugged design makes pumps highly functional, economic and easy to handle in confined spaces.

Impellers are abrasion resistant with a large channel to ensure freedom from clogging, even when pumping semi-solids. Safety features include an auto-cut recycling thermal protector that protects the motor against current overload or voltage drop, temperature rise due to dry running for long periods, or stalling due to clogging.

A six month warranty is available. Information from

**H.M. Forgarty Ltd**  
P O Box 37 445  
Parnell AUCKLAND  
Ph (09) 799 301

## Hard going AC rig

ATLAS COPCO has produced a new drilling rig, designated B80, for water well drilling in medium and very hard ground.

The fully-hydraulic rig can be mounted on a truck, tractor or trailer. It offers precise control of feeds and hold-back forces, a wide range of feed-force and spindle speed combinations, and guarantees a high penetration rate in difficult conditions.

The standard B80 is equipped with a mechanical rod-operating system with no special tools needed for coupling and uncoupling drill rods and bits. An hydraulic winch and hoist with one tonne capacity inserts and removes drill rods. Information from

**Atlas Copco (NZ) Ltd**  
Private Bag  
LOWER HUTT

## Fittings offer simple joints

A COMPRESSION fitting claimed to be the simplest possible means of joining pipes is now available in New Zealand.

The fittings, made by Dresser of the US, are suitable for air, gas, petroleum and low pressure water and steam pipes.

**Continued on P15**

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#### continued from P4

skilled crews is not cheap — over \$30 000 a day for the Ideco 2100.

The technology is also highly sophisticated, using special mud programmes designed to keep fluid reservoirs encountered under control without losing mud to the formation. Formulations used include modified starches, xanthan gum-polymer mixes, and potassium chloride.

"These things aren't harmful to the general long term environment and they give us extraordinarily good control of hole stability.

"One of the things we regularly have to cope with are some siltstones and mudstones which have a tendency to swell in proportion to the amount of water lost from the mud, so we have to very carefully control that water loss."

Contract drillers are also used for Petrocorp's geophysical exploration programmes.

Rigs, specially designed to be shifted by helicopter, can be leapfrogged over each other with each rig knocking out three or four 20-metre-deep holes every day when a programme is in full swing.

Helicopters are used to shift the rigs because the method saves access roading costs and time that would otherwise be spent driving from job to job.

#### continued from P13

The fitting slips over plain pipe ends then two nuts are tightened to make a permanent, flexible and tight seal. Exact pipe fittings, threading, grooving, soldering, flaring or caulking are not required. Information from

#### Spiral Welded Pipes Ltd

P O Box 3550

AUCKLAND

Ph (09) 591 219

## Large volume pumps out

A NEWLY introduced pump range — the ABS submersible propeller pump — is ideal for moving large volumes of water at low delivery heads.

Specific applications include irrigation and drainage, stormwater and land drainage.

The range has a maximum capacity of 4 500 cubic metres/hour with a maximum head of 10 metres. It is suitable for outlet pipe connections of 250-600mm diameter. Installation requires less civil construction work than conventional pumping systems. Information from

#### Mono Pumps (NZ) Ltd

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Ph (09) 889 053

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#### Mechanical engineer

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Applicants must be 26-40 years and have experience on Nat T12 Continental Emsco GC-350 or similar rig, to 2 500 metres depth. An engineering qualification is desirable.

The company offers very competitive salaries, generous expenses, paid leave, free single accommodation and food. First duty tour 18 months, then negotiable. Confidential applications and inquiries to

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