



# WEARDALE GEOTHERMAL BOREHOLE

## CLIENT NAME:

NEWCASTLE UNIVERSITY

## DESCRIPTION OF THE WORKS:

NEWCASTLE UNIVERSITY HAD RECENTLY DRILLED A 1000MTR DEEP GEOTHERMAL BOREHOLE WHICH PRODUCED HEATED WATER FROM DEEP IN THE WEARDALE GRANITE FORMATION.

THE NEW PROJECT WAS TO DRILL A RECHARGE BOREHOLE INTO THE GRANITE SEVERAL HUNDRED METRES AWAY. THE PROPOSED BOREHOLE WAS TO BE 400MTR DEEP PENETRATING APPROXIMATELY 100MTR INTO THE GRANITE FORMATION. A SMALL SPOT CORE WAS ALSO TO BE TAKEN OF THE GRANITE AS THIS HAD NEVER BEEN SEEN IN SOLID FORM. THE STRATA TO BE PENETRATED ABOVE THE GRANITE CONSISTED OF A SERIES OF LIMESTONE, MUDSTONE AND WHIN SILL LAYERS, MANY OF WHICH WERE FRACTURED, CAVERNOUS AND PARTICULARLY HARD.



**DRILCORP**



## HOW THE WORK WAS CARRIED OUT:

THE BOREHOLE WAS DRILLED WITH **DRILCORP'S** CONRAD COMAX 800 DRILLING RIG WITH VARIOUS DRILLING TECHNIQUES. SUPERFICIAL DEPOSITS WERE DRILLED AT 18.5" Ø WITH MUD FLUSH AND A 16" Ø MILD STEEL CASING WAS INSTALLED TO MAINTAIN THE STABILITY OF THE BOREHOLE. MUD FLUSH DRILLING AT 14.5 Ø WAS CONTINUED ON DOWN TO 70MTR. HOWEVER, SERIOUS FLUSH LOSSES IN A CAVERNOUS LIMESTONE OCCURRED AND EVEN REPEATED GROUTING FAILED TO PLUG THE LARGE VOIDS. THIS SECTION OF THE BOREHOLE THUS HAD TO BE CASED OFF WITH A 12" MILD STEEL CASING. THE BOREHOLE CONTINUED TO BE ADVANCED AT A 10.5" DIAMETER AND OWING TO THE HARDNESS OF THE STRATA, A DOWN THE HOLE HAMMER WAS USED. THE GRANITE FORMATION WAS FOUND TO BE AT 288MTR. DRILLING CONTINUED 10MTR INTO THE GRANITE AND THEN A HEAVY DUTY 245MM (95/8") CASING WAS INSTALLED AND THE ANNULUS FULLY GROUTED.

DRILLING CONTINUED TO 410MTR AT 8.5"Ø USING AIR LIFT REVERSE CIRCULATION, TAKING A SPOT CORE AT 296MTR. THE BOREHOLE WAS SUBSEQUENTLY CAPPED OFF AND IT WILL BE USED FOR FURTHER SCIENTIFIC EXPERIMENTS IN THE FUTURE.

