Deepwell dewatering systems are employed to lower groundwater levels to provide stable working conditions in excavations. Deepwell systems are also used for water supply, contaminated groundwater recovery and as recharge points to control drawdowns. WJ's comprehensive sub-contract service covers the design, provision of equipment, installation and operation of deepwell systems for any purpose.

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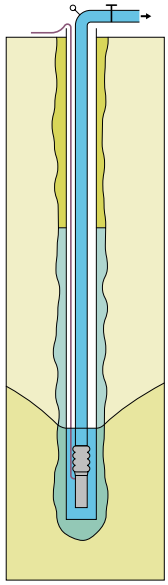
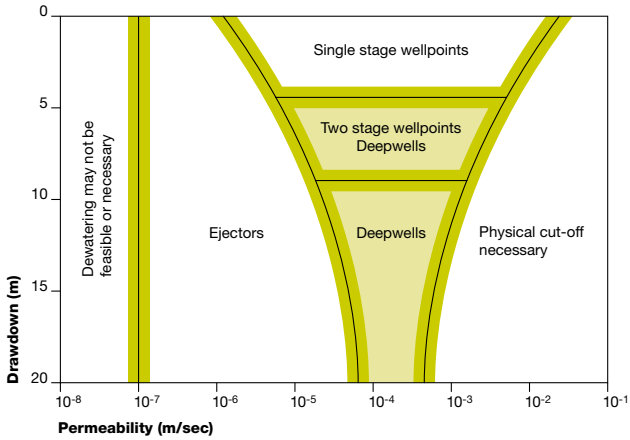
Application

Deepwell systems are effective in a range of soil conditions from gravel through to silty fine sands. Because the pump is installed at depth in the well there is no physical limit on drawdown other than the aquifer response and the performance characteristics of the pump in use. Individual well performance may be enhanced by application of a vacuum in fine soils. Well yields can also be improved by specialist development techniques such as airlift in granular soils and acid development in chalk. The technique is particularly suited to deeper excavations or where artesian groundwater pressures threaten base stability. The system is reliable in long term operation and the relatively widely spaced wells cause a minimum of access restrictions.





Principles of deepwell systems

A deepwell consists of a bored well with a multi-stage electric submersible borehole pump. In unstable granular soils wells are fitted with a liner and screen to provide borehole support and allow ingress of groundwater. Filter packs and grout seals may be required around the well liner. In order to achieve a particular drawdown requirement it is usually necessary to install an array of several interacting wells. The pumps are powered from a central control cabin and discharge water is normally collected in a ring main.

Equipment specification

- Pump discharge size: 25 mm to 150 mm
- Electrical control: starters, protection, alarms
- Automatic mains failure systems
- Well liner: 100 mm to 400 mm
- Wellscreen: slotted, geotextile wrap
- Liner material: PVC. uPVC, polypropylene, steel, galvanised steel, stainless steel
- Bore diameter: 150 mm to 500 mm
- Well depth: up to 150 m

Installation methods

- Jetting tube
- Hydraulic auger
- Hole puncher with hammer action
- Cable percussion drill
- Rotary drill

Design capability

WJ has a proven record of innovative design solutions based on many years of practical and technical experience of small and large scale projects. The service includes assessment of site investigation data, followed by provision of layout drawings, method statements and design calculations as required.