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Skills and knowledge requirements of waterwell applicants

Class 1 licence

An applicant for a class 1 drillers' licence must be capable and have knowledge and skills, as they apply to the drilling method endorsement, in:

1. The provision of the legislation and regulations relating to groundwater and groundwater drilling; an understanding and appreciation of bore construction licence application procedures and licence conditions
2. Siting a bore – recognising potential contamination sources to water supply bores and appropriately siting a bore to prevent contamination
3. Straightness and plumbness of hole – setting up a rig, the causes of bent bores and the methods of hole straightening
4. Drilling – correctly choosing and using equipment, having regard to such factors as rotational speed and proper annular velocities
5. Fishing – their tools and procedures
6. Formation sampling and description – obtaining representative lithological samples, and labelling and describing them
7. Bore design – designing and constructing bores for domestic and stock, groundwater monitoring and irrigation purposes in single aquifer systems
8. Construction – seating and sealing of casing, casing types and their uses, methods of grouting casing, headworks design and completion of the bore site
9. Cementing – grouting casing and abandoning bores
10. Setting screens and stabilising fill – selecting the appropriate slot size, screen length and diameter, and procedures for screens installation. Selection and installing stabilising fill material
11. Bore development and disinfection procedures
12. Aquifer testing and water sampling – carrying out a single stage pumping test, and determining static water level, drawdown and yield; taking and labelling a water sample
13. Abandonment – designing and selecting appropriate materials for the abandonment of bores in single non–flowing aquifers systems
14. Bore completion reports – correctly filling in a bore completion report

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Class 2 licence

An applicant for a class 2 licence must have the knowledge and skills required of a class 1 driller together with knowledge and skills as they apply to the drilling method endorsement, in:

1. Bore design – designing and constructing bores in a multiple aquifers with emphasis on designs and methods used to exclude unsuitable waters
2. Screens and gravel pack selection – skill in the design of high yielding bores is required. This entails overcoming entrance velocity problems and carrying out sand sieve analysis in order to select appropriate gravel pack material and screens (i.e. screen length, diameter and aperture)
3. Cementing – grouting casing, plug selected zones, effect of cement additives; ability to calculate hole volume and slurry volumes. Hole preparation, casing installation and circulation requirements
4. Aquifer testing – the procedures involved in a step multi-stage pumping test
5. Abandonment – designing and selecting appropriate materials for the abandonment of bores in multiple aquifers

Class 3 licence

An applicant for a class 3 licence must have the knowledge and skills required of a class 1 and class 2 driller together with knowledge and skills, as they apply to the drilling method endorsement, in:

1. Drilling fluids – methods, procedures and calculations required for formation fluid pressure control
2. Cementing – methods and procedures and calculations required in carrying out pressure cement jobs
3. Bore design – in aquifer systems that have high pressure conditions; design of efficient bores (i.e. be able to carry out screen surface area and diameter calculations)
4. Aquifer yesting – the procedures for a flow recession, static and step pumping tests on flowing bores
5. Abandonment – designing and selecting appropriate materials and procedures for the abandonment of bores having high pressure conditions