

## EDG01

# BOREHOLE SEALING REQUIREMENTS ON LAND: COAL EXPLORATION

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## 1. PURPOSE

This guideline specifically addresses the environment and safety requirements for drillholes pursuant to NSW mining legislation and conditions of mining and exploration titles.

The guidelines identify the basis for assessment for relinquishment of security deposits, as relates to condition of drillholes.

## 2. SCOPE

The Coal Mines Regulation Act 1984 Part 5 Operation of Mines Section 137 states:

*'Where any borehole to which section 135 applies is:*

*(a) drilled from the surface or from underground-it shall, upon completion, be completely backfilled with material of an approved type unless otherwise directed by the Chief Inspector, or*

*(b) drilled from under water-it shall, upon completion, be sealed completely in the presence of an officer authorised by the Chief Inspector."*

Section 135 states:

*"(1) Subject to subsection (4), any person who, at a mine, proposes to drill a borehole, or extend an existing borehole, for the purpose of proving coal shall, before commencing work, notify the Chief Inspector of his intention to do so and furnish to him particulars of the location of the borehole.*

*(2) A person referred to in subsection (1) shall furnish such additional particulars in relation to a borehole as the Chief Inspector may require.*

*(3) A requirement under subsection (2) may be made either before or after the commencement of the work to which the requirement relates.*

*(4) This section does not apply to boreholes put down to determine:*

*(a) the extent of overburden; or*

*(b) the thickness and quality of coal,*

*for the purpose of open cut workings where the occurrence of coal has previously been proved."*

The following guidelines are intended to assist the licence holder in the sealing of boreholes located on land. Note there is a separate guideline for sealing of boreholes located on the beds of waterbodies.

The guidelines do not specify quantitative information for seal works as it is not intended to restrict innovative design. Where specific design or procedures are required, advice should be sought from the Chief Inspector of Coal Mines.

### **3. REFERENCE**

Standard Conditions Of Authority

*Coal Mines Regulation Act 1982*

*Mining Act 1992*

Department of Mineral Resources "Drillers Guide"

### **4. DEFINITIONS**

shall - means that the requirement is mandatory

should - means recommended. If not adopted the decision shall be justified by a documented risk review.

## 5. SEALING REQUIREMENTS

### 5.1. Filling Requirements

All boreholes shall be filled in from the total depth to the surface with approved cement mixtures, in such manner that no excess is deposited on the surface which may interfere with any land use activities.

If a hole is left open temporarily for any reason a suitable casing cap or bridge must be placed over the top of the hole for the period involved.

### 5.2. Cement Mixtures

Approved cement mixtures shall be designed to support the maximum allowable length of grout and provide an effective seal within the hole.

Approved cement mixtures shall not be deposited in more than two hundred (200) metres of vertical depth in any borehole at any one time. Setting and weight testing shall be satisfactory completed and recorded before any further cement mixtures can be deposited in the borehole. When directed by an officer of the Department representative samples of the concrete mixture shall be kept for strength determinations.

### 5.3. Sealing Procedures

No borehole should be left in an open state unless the landowner requests that a borehole remain open for water supply purposes. The hole must be licensed under the *Water Management Act 2000*. The NSW Office of Water will require details of the water quality and a copy of the bore log (confidential information may be deleted). The company carrying the drilling should obtain written confirmation from the landowner that the bore has been licenced.

If a borehole is left open at the landowners request, subject to the above requirements, then this may only occur if a basal plug has been placed to seal off the coal measure section of the borehole and this seal also includes a 100 metre interval of grout above the highest potentially mineable coal seam encountered in the hole.

No borehole may be left open if:

- a) There are artesian groundwater flows which are likely to have a detrimental surface environmental impact.
- b) There is a likelihood of groundwater contamination by poor quality aquifers in multiple aquifer environments.
- c) There is a probability that the borehole will act as a conduit for groundwater or gas into current or future mine workings.
- d) There is a likelihood of gas escaping to the surface.

Records shall be kept to demonstrate the method used to seal the hole, volumes and types of materials used and information on the drillhole such as depth, diameter and casing string(s) left in the hole. Any loss of cement mixture due to high flow aquifers or permeable strata shall also be recorded and the method used to overcome these problems. All records relating to the sealing of boreholes shall be provided to the Department together with a declaration by the titleholder confirming that the work was carried out according to these guidelines and documenting any variations with supporting explanation.

All boreholes must be sealed by pumping the cement mixture from either the base of the hole or the bottom of the previously cemented section of the hole.

The cement maybe preceded and/or followed by plugs. The position of the plugs in the borehole shall be determined before further grouting. In the event that a number of plugs are used within a borehole, the plugs must be placed so as not to leave a significant unfilled section between the plug and the underlying previously cemented section.

When grouting surface casing the cement mixture should be allowed to extrude from the annulus between the casing and the borehole wall or another larger diameter casing string.

All boreholes should be depth tested between all grouting and plug operations to determine if the level of the grout in the borehole is higher than shown in the calculations. All depth testing for this purpose shall be recorded.

No excess of cement mixture excess shall be deposited on the surface.

In order to produce an effective seal all casing strings that are not cemented into place according to these guidelines must be removed prior to or during the sealing of the hole. Where non-grouted casing cannot be removed, the casing must be perforated and grout must be pumped under pressure to fill the annulus behind the unsealed casing. In this situation it may be necessary to place a suitable bridge or plug near the base of the affected casing in order to facilitate the injection of grout behind the casing.

#### **5.4. Rehabilitation Requirements**

Clean up work area, do not leave plastic, wire, nails, etc on site.

Remove all pegs, stakes, measuring strings, wires, etc.

Reseed any areas of activity where vegetation has been damaged due to exploration activities. Vegetation type must match the surrounding environment.

Remove all equipment and materials unless approval has been given by the landowner.

Ensure that the company carrying out the drilling operations have complied with the Conditions Of Authority and any other conditions as set by the Department or any other Government agency.

Surface casing must be removed below a level such that it will not have an impact on future uses of the land eg. ploughing depth.

Where land use precludes surface markers, metal plates can be placed below the soil surface eg. level of cultivation, to facilitate relocating the drillhole using a metal detector. A temporary marker can be placed nearby where it is unlikely to be disturbed eg. a fence post or tree.

The Department shall receive notification when the borehole(s) are abandoned.

An application for assessment of relinquishment of the security deposit in accordance with the guidelines shall be accompanied by a completed Statutory Declaration - Confirmation of Sealing and Rehabilitation of Exploration Sites.

## 5.5 Survey Requirements

All boreholes shall be surveyed in compliance with the Conditions. of Authority.

All boreholes shall be properly surveyed to determine their horizontal and vertical positions and survey details are to be furnished with written reports.

A permanent steel identification plate or reference mark shall be placed at the location of each borehole for relocation purposes.

All boreholes shall be surveyed with a vertical position accuracy of  $\pm 0.3$  metres and a horizontal position accuracy of  $\pm 1.0$  metres. The vertical position shall relate to the Australian Height Datum (AHD) level values and the horizontal position shall relate to the Integrated Survey Grid (ISG) co-ordinate values.

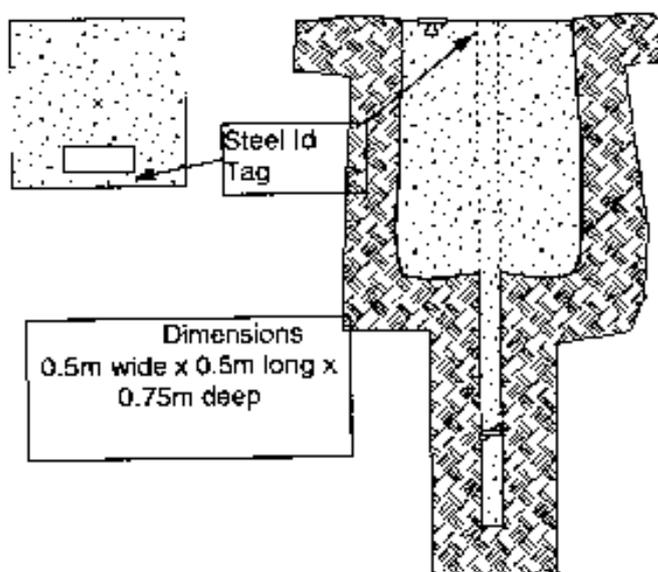


Figure 1 Example of Collar, Id Plate and Capping



certify the following matters concerning the making of this statutory declaration by the person who made it: [*\* please cross out any text that does not apply*]

1. \*I saw the face of the person OR \*I did not see the face of the person because the person was wearing a face covering, but I am satisfied that the person had a special justification for not removing the covering, and
2. \*I have known the person for at least 12 months OR \*I have not known the person for at least 12 months, but I have confirmed the person's identity using an identification document and the document I relied on was

.....  
*[describe identification document relied on]*

.....  
*[signature of authorised witness]*

.....  
*[date]*

**“A”**

**SEALING, BACKFILLING AND REHABILITATION OF EXPLORATION SITES**

Exploration Licence ..... [number]

**LOCATION DESCRIPTION(S)**

**DESCRIPTION OF EXCAVATIONS AND SURFACE DISTURBANCES**

**CATALOGUE NUMBER OF PLAN OF EXCAVATIONS & SURFACE DISTURBANCES**

**NAME & ADDRESS OF DRILLING CONTRACTOR**

**NUMBER OF DRILLHOLES**

**NOMINAL DRILLHOLE DIAMETER**

| IDENTIFIER OF WORKS NOT REHABILITATED | REASON FOR NOT REHABILITATING | LIST SUPPORTING DOCUMENTATION |
|---------------------------------------|-------------------------------|-------------------------------|
|                                       |                               |                               |

**TRUE COPIES OF SUPPORTING DOCUMENTATION ARE ATTACHED [ ]**

**A LOCATION PLAN IS ATTACHED [ ]**

**LIST OF ATTACHMENTS:**

**This and the following ..... pages form the Annexure marked “A” referred to in the Declaration of ..... made the**

**..... [date] before me:**

.....  
[name of authorised witness]

.....  
[signature of authorised witness]

For further information and contact details see [www.minerals.nsw.gov.au](http://www.minerals.nsw.gov.au),  
or telephone (02) 4931 6605.