

04 September, 2012

Rob Regan  
Chief Inspector of Coal Mines  
Department of Primary Industries  
PO Box 344,  
Hunter Region Mail Centre NSW 2310

Our ref: 10.123.116

Your ref:

Dear Rob,

**NRE Wongawilli application to conduct extraction of LW3 which lies partially within the Cordeaux Notification Area: DSC designation NRE\_WONGAWILLI\_1**

The Dams Safety Committee (DSC) endorsed NRE Wongawilli's application to extract LW3 which lies partially within the Cordeaux Notification Area at their meeting on the 9<sup>th</sup> May 2012. The Committee designated the application NRE\_Wongawilli\_1.

This letter contains the Dam Safety Committee's recommendations in respect of the NRE\_Wongawilli\_1 application. The application is for extraction of LW3 which falls partially within the notification area of Cordeaux dam and its reservoir. The extraction is >500m from the FSL of the reservoir and no complications are anticipated.

**Recommendations**

These, then, are the Committee's recommendation to the Minister in respect to extraction of LW3 which lies partially within the Cordeaux notification area.

1. That approval to conduct partial extraction within the notification area as depicted on the attached plan, WA0-01-0448 dated 12/06/2012 and delineated in blue hatching, be approved subject to conditions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24 of the attached Annexure D, and conditions 1, 2, 3, and 4 Annexure D1.

Annexures B & E (attached) are referenced by various conditions in Annexure D.

If you have further enquiries regarding this matter please contact Heather Middleton on 9895 7353.

Yours faithfully,



Steve Knight  
Executive Engineer





## ANNEXURE "B"

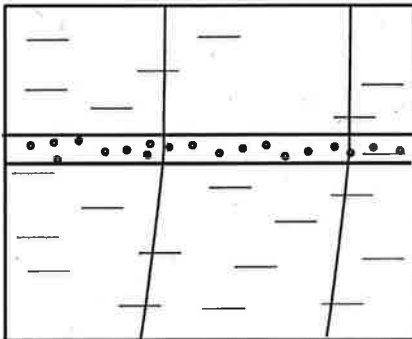
### FAULTS & DYKES: DEFINITIONS & DESCRIPTIONS NEEDED ON MINE RECORDS

#### A. FAULTS

From the geological point of view a fault is defined in terms of origin, i.e. as a plane or zone across which observable displacement has occurred in the rock mass.

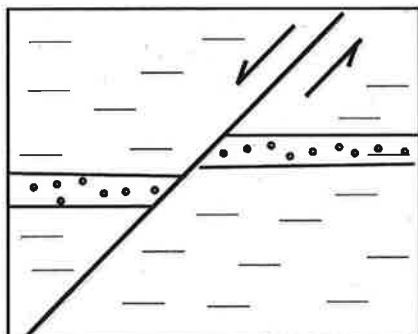
From the geotechnical engineering point of view we are concerned not only with origin, but also with the engineering properties (e.g. Width, shape, strength, permeability and moisture content) of the defect or defect zone produced by the fault movements. The types of defect which may be found are defined below. Most faults are either SHEARED ZONES or CRUSHED SEAMS, in the engineering sense, but some faults with quite large displacements are merely continuous JOINTS, as defined.

#### "FAULTS" IN THE ENGINEERING SENSE, OR DEFECTS WHICH CAN BE FORMED BY FAULTING



#### JOINT

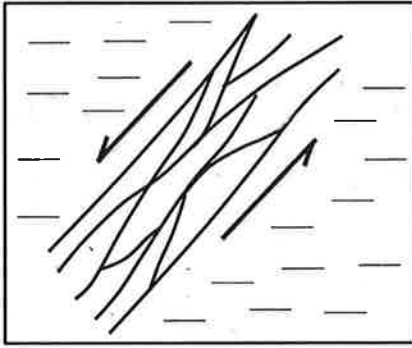
Almost planar surface or crack across which there is no discernable movement and little tensile strength. May be open, or filled with water, or a rock/clay substance which acts as cement. The joint would be continuous for at least tens of metres.



#### FAULT LINE

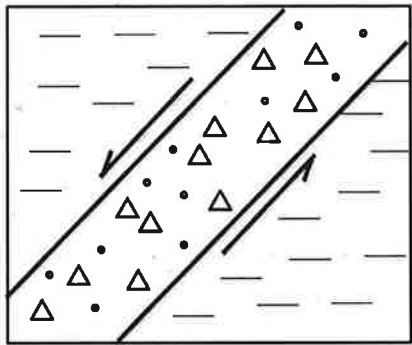
A fault line is a planar/subplanar fracture in a rock across which the rock on one side of the fracture has moved with respect to the rock on the other side of the fracture. The surface of the fracture is usually slickensided (striated) in the direction of movement.





### **SHEARED ZONE**

Zone with roughly parallel almost planar boundaries, of rock substance cut by closely spaced (often < 50 mm) joints and or cleavage planes. The joints are usually smooth or slickensided and curved, intersecting to divide the mass into lenticular or wedge shaped blocks.



### **CRUSHED SEAM**

Seam with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock substance. The fragments may be of clay, silt, sand or gravel sizes or mixtures of these. The seam has soil properties.

Evidence of past displacement of the rock mass may or may not be present. Also the defect produced by faulting may vary in engineering character along its strike or dip. A common form of fault is a sheared zone containing one or more thin crushed seams.

### **DESCRIPTION REQUIRED FOR FAULTS**

1. Displacement, if evident (in metres) and direction and sense of displacement.
2. Width of fault zone in metres.
3. Type of defect, i.e. Slickensided, joints, sheared zone, crushed seam, or sheared zone containing crushed seams.
4. Moisture condition, i.e. whether dry, moist or wet (seeping or flowing water).
5. Strike (usually the direction of the trace in the roof) and dip angle (from horizontal).

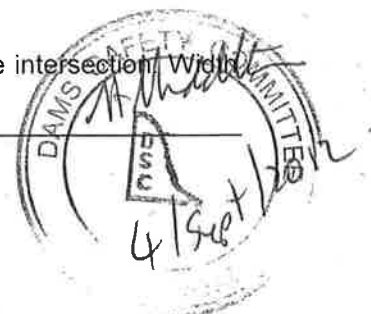
A fault line is a planar/subplanar fracture in a rock example Annexure B describes what should be recorded on geological plans.

### **DESCRIPTION REQUIRED FOR DYKES**

As well as any other geological description, the following description is required for dykes:

1. Thickness, in metres.
2. Strike and dip angle (from horizontal).
3. Engineering properties of dyke material:
4. Whether dry, moist, or wet (ie. with seepage or flows)
5. Whether or not there is evidence of any displacement of the coal, at the dyke intersection. Width of fault zone in metres.

END ANNEXURE B





## ANNEXURE "D"

### STANDARD MINING CONDITIONS

The following general conditions apply to the **NRE\_Wongawilli\_1** application, covering mining in the Cordeaux Notification Area around Cordeaux No.1 and No.2 Dams.

The conditions are laid out as follows:

Annexure Dx (D, D1, etc) specify what is required to be done by the applicant, and what the DSC may do following certain triggers;

Annexure E specifies the frequencies of monitoring and report, and the format of reports. That is, it provides details of the deliverables required by the approval;

Other Annexures may specify additional details, for example Annexure B describes what should be recorded on geological plans.

In Annexure Dx the section often includes a preamble. These may contain guidance and interpretation, or the background reasoning to a condition, but are not conditions in themselves. The conditions look like the following paragraph:

**Annexure D Condition 0.0: This is a condition, you must comply with it.**

#### Section I. GENERAL REQUIREMENTS

The Ministerial approval requires the company to do things or undertake monitoring programs, with reporting of results at various intervals. There is considerable scope for the DSC to modify the frequency of reporting and monitoring, and the format of reporting, during the life of an approval. This is important as it allows the level of monitoring to be increased or decreased according to the risk perceived by the DSC. This section sets out a hierarchy within the approvals:

1. Annexure E
2. A specified management plan
3. Annexure D

That is, any frequency specified in Annexure D is overridden by frequencies specified in a management plan or in Annexure E.



The DSC prefers applicant to prepare monitoring proposals in the first instance. Often these will become endorsed by being included as a reference in Annexure E. Annexure E will be re-issued by the DSC when there is a change to monitoring.

**Annexure D Condition 1.1:** The:

- frequency of monitoring;
- frequency of reporting; and
- format of reporting;

for any condition hereunder will be as stated in Annexure E or, where no statement is provided in Annexure E, as stated in the relevant "Management Plan" as specified in Annexure E, or, where no Plan is specified in Annexure E or where the Plan makes no statement, as specified in the condition hereunder.

**Annexure D Condition 1.2:** The Dams Safety Committee ("the DSC") may modify the content of Annexure E, any associated Management Plan, or the frequency of monitoring or reporting or the format of reporting for any condition hereunder from time to time.

**Annexure D Condition 1.3:** Where the DSC has modified the conditions as per Condition 1.2 and has advised the liaison officer appointed under Condition 22 in writing, the modified conditions replace any conditions hereunder and shall have the same effect as if they were part of the approval.

**Annexure D Condition 1.4:** The company shall arrange for DSC staff to inspect the workings from time to time when required by the Committee, and in particular when any significant features are encountered in the workings.

Section II. CORRESPONDENCE WITH THE DSC

**Annexure D Condition 2.1:** All correspondence with the Committee in regard to this approval shall be clearly labelled **NRE\_Wongawilli\_1**.

**Annexure D Condition 2.2:** Reports required under the NRE\_Wongawilli\_1 approval shall be sent to:

The Executive Engineer  
N.S.W. Dams Safety Committee  
Floor 3, Macquarie Tower,  
10 Valentine Avenue,  
Parramatta N.S.W. 2150

P.O. Box 3720  
Parramatta N.S.W. 2124

Fax: (02) 9895 7354  
Phone: (02) 9895 7363

Email: [mining@damsafety.nsw.gov.au](mailto:mining@damsafety.nsw.gov.au)



**Annexure D Condition 2.3:** Copies of any reports or plans required to be provided to the Committee shall also be provided to the Senior Inspector of Coal Mines, Wollongong.

### Section III. NOTIFICATION OF COMMENCEMENT OF MINING

**Annexure D Condition 3.1:** So that the DSC is aware that mining in an approved area has commenced (and can therefore expect to receive reports of monitoring) the company shall notify the DSC that mining has commenced in the notification area within seven days of the commencement of mining.

### Section IV. INSPECTION OF WORKINGS

It is essential that the Committee is aware of any factors that could:

- Influence the magnitude of surface subsidence as predicted,
- Indicate that pillars are performing as expected, or
- Indicate an increase in permeability of the strata.

Information to be presented on these matters will vary depending on the type of mining system, but generally a copy of a plan, (of, say, the district being worked) showing the extraction/development for the period coloured, should be included, with comments (either on the plan or written on an attached sheet). These comments should include notes on such items as:

(a) Pillar performance-

Spalling or general deterioration should be noted.

(b) Roof conditions-

Guttering, roof falls, pillar punching, whether the roof is caving easily or if it is hanging up, etc. should be noted.

(c) Floor conditions-

Is there any floor heave or pillar punching?

(d) Water inflows-

Any areas where drippers occur, seepage, wet joints, etc. should be noted.

The report should try to quantify these features as much as possible.

**Annexure D Condition 4.1:**

(a) The company shall carry out visual inspections of the workings whenever mining in the notification area, or whenever mining has occurred in the notification area during the preceding 6 months, at intervals as specified in Annexure E.

(b) Reports of these inspections shall be forwarded to the DSC at intervals specified in Annexure E.



## Section V. SEAM LEVEL GEOLOGICAL FEATURES

In-seam records of geological features are used by the Committee to determine if through-going structural defects (such as faults or dykes) are present prior to pillar extraction or longwall mining. The information can also be useful in interpreting subsidence anomalies.

It is expected that this seam level mapping will provide more detailed information than the visual inspections in condition 4.

**Annexure D Condition 5.1:** Seam level geological plans shall be prepared during first workings in the notification area or within 300 m of the notification area. The features that should be reported include faults (as defined and described in Annexure "B", hereto), dykes, slickensided joints, and areas of cinder. This record shall be maintained on a plan of scale 1:4,000 or as specified by the Committee from time to time, and shall show traces of the features, their angles of dip measured from the horizontal, and other properties listed in Annexure B. The positions, dates of observations, turbidity, and estimated rates of inflow in litres/hour of all water inflows and seepages shall also be recorded on the plan.

**Annexure D Condition 5.2:** The company shall submit an electronic copy of the updated plans to the DSC together with brief reports describing any new geological feature encountered monthly, or at intervals determined by the Committee from time to time.

**Annexure D Condition 5.3:** At the completion of development work, at the completion of an area of bord and pillar work, or when requested by the Committee from time to time, the company shall submit an electronic copy of the plan(s) to the DSC.

## Section VI. SURFACE GEOLOGY/TOPOGRAPHY

The main purpose of the surface geological mapping is to allow assessment to be made of any possible correlation between geological features (e.g. faults or dykes) exposed in development or other workings at seam level, and geological or related topographic features at the ground surface. This correlation can be used in the interpretation of subsidence anomalies, and the estimation of the effect of the extraction on the overburden.

**Annexure D Condition 6.1:** A plan shall be prepared to a format as specified by the Committee prior to the commencement of mining showing the following features:

- (a) Contours of the ground surface at 10 m intervals;
- (b) The positions of any lineaments located on air photo/satellite imagery;
- (c) The results of surface geological mapping in the vicinity of each significant lineament, aimed at determining the surface conditions giving rise to the lineament. The actual surface features delineated will vary from case to case but may include areas of rock outcrop with their rock types, fracture patterns, and other geological features noted, areas of soil cover, vegetation changes, slope changes, wet areas, seepages, springs and creeks (with estimated flow rates, dated);
- (d) The outline of past extraction areas (in fine lines) showing the positions and descriptions of all faults (including major slickensided joints, shear



or crushed zones which may not show displacement of the coal), all dykes, and areas of cinder in the coal seams; and

- (e) The areas of proposed extraction.

**Annexure D Condition 6.2:** The plan(s) shall be on a scale 1:4,000, or as specified by the Committee from time to time and shall cover the surface over the proposed workings, and shall extend outward a further distance of 300 metres from any point on these workings. It may be that further geological mapping will be required following the results of subsidence monitoring/in seam mapping/etc., and the Committee will inform the company when this is necessary.

**Annexure D Condition 6.3:** An electronic copy of such plan(s) shall be forwarded to the DSC prior to the commencement of mining.

## Section VII. WATER MONITORING

In areas that are known to be wet, monitoring of water pumped or flowing out of the area being worked may indicate that joints/faults have opened up, or that water flows have increased for some reason.

**Annexure D Condition 7.1:**

- (a) The company shall carry out daily measurements of all water entering and leaving the section of the mine that includes the approval area.
- (b) Reports of these measurements shall be forwarded to the DSC monthly, or at intervals determined by the Committee from time to time.

## Section VIII. EMERGENCY WATER CONDITIONS

“Significant” in relation to groundwater flows into the workings is defined in this document as meeting any of the following criteria:

- The volume or rate of flow, or the change in the volume or rate of flow, or the location causes surprise among persons familiar with the workings;
- The volume or rate of flow doubles over a few days; or
- The volume or rate of flow is more than 3 standard deviations above the mean value (i.e. larger than about 99% of recent readings).

**Annexure D Condition 8.1:** The DSC shall be notified immediately if:

- (a) Water monitoring indicates that total outflow is significantly greater than total inflow;
- (b) A significant groundwater flow into any of the subject workings or within 300 metres of them is observed;
- (c) Significantly increasing water flows are encountered at any time during the development of workings; or
- (d) Any visible flow is discoloured by the presence of clay, sand or silt.





**Annexure D Condition 8.2:** If, in the opinion of the Committee, a significant change in the groundwater inflows or discolouration of water flows is noted, the Committee may require chemical, biological, nuclear or other testing to be carried out, or additional monitoring, and for these to be reported to the Committee at frequencies specified by the Committee from time-to-time.

**Annexure D Condition 8.3:** Water monitoring under condition 8 will operate in addition to all water monitoring requirements and inflow trigger levels specified in the Contingency Plan required under section 16.

## Section IX. SUBSIDENCE AND STRAIN MONITORING

The Committee bases many of its decisions on the results of subsidence and strain predictions. In order to verify these predictions, to provide a data base of previous survey results on which to base further decisions, to indicate developing anomalies as extraction occurs, and to provide an indication of the movements occurring in the overlying strata, the Committee generally requires that extensive survey lines be established and monitored until negligible subsidence and strain are recorded by successive surveys. "Negligible" subsidence is determined by the Committee and, typically, it may take several years after the completion of mining for this state to occur.

### **Annexure D Condition 9.1:**

- (a) A subsidence and strain survey lines shall be established and monitored along the NM3 surveyline shown on plan No.1098 Nebo extraction Plan (attached).
- (b) the lines shall extend a distance of "D" metres clear of the proposed mining where "D" is the depth of cover to the Wongawilli seam.

**Annexure D Condition 9.2:** The lines shall be established as soon as possible and vertical subsidence and horizontal strains shall be measured at the following mining stages: -

- (a) prior to the extraction of coal in each LW2 and LW3.
- (b) when coal extraction in each panel has been completed, and thereafter each six (6) months until successive measurements indicate negligible differences in strains and subsidence at points along the survey lines, as determined by the Committee.

**Annexure D Condition 9.3:** The results of these surveys shall be submitted to the DSC within one (1) month of the completion of the survey. Brief comments on the results of the survey, and a plan showing the extent of workings at the time of the survey, shall be included with each of the surveys submitted to the DSC. The results shall be provided in a format and on media as approved by the Committee from time-to-time.

**Annexure D Condition 9.4:** A plan of scale 1:2000, or as specified by the Committee from time-to-time, shall be prepared showing the locations of the survey lines and the positions of each of the survey marks. An electronic copy of such plan(s) shall be forwarded to the DSC at the same time as the first survey results.

**Annexure D Condition 9.5:** During the survey any surface cracking observed in the vicinity of the survey lines shall be recorded on the plan referred to in condition 9.4, and a copy of this plan submitted with each survey. If no cracking is observed, or there has been no change since the previous survey, then a short written note to this effect is to be included with the survey.



## Section X. PLANS SUPPLIED TO THE DSC

**Annexure D Condition 10.1:** Several conditions require the company to submit plans to the DSC. Apart from the district plans that may be required under condition 4 and the position of the face required under condition 23, these plans shall share the same scale and base map to facilitate the comparison and correlation between different factors.

## Section XI. VARIATIONS

**Annexure D Condition 11.1:** From time to time the company may desire to alter the approved mining within the notification area in a minor way (termed a "minor variation"). It may wish to add an extra cutthrough, increase or decrease the width of a panel/longwall, etc. Applications for minor variations to approvals shall be made to the Chief Inspector of Coal Mines, who will refer the application to the DSC.

**Annexure D Condition 11.2:** The Committee requires all proposed variations, even small variations, be referred to it (via the Chief Inspector) for its consideration. To expedite the approval process where the proposed variation is urgent and very minor, DSC staff will give a decision by phone, fax, or email to the company, and inform the Chief Inspector of their decision. The company will then approach the Chief Inspector for formal approval or otherwise, with both parties aware of the Committee's decision. This procedure should only be followed in urgent situations.

**Annexure D Condition 11.3:** The usual procedure is to submit a written application, with appropriate supporting documentation, to the Chief Inspector of Coal Mines, who will then forward this to the DSC for its consideration. The company should also send a copy of the application to the DSC so that it may begin processing it. This will allow for a quick reply.

Where the variation is sufficiently extensive (as determined by the DSC) the company will be required to submit a full application to mine within the notification area.

**Annexure D Condition 11.4:** The Chief Inspector of Coal Mines shall not approve any minor variation unless an endorsement by the DSC has been received.

## Section XII. COMPLETION OF MONITORING

**Annexure D Condition 12.1:** Regardless of the status of mining or location of the active face, all monitoring and reporting shall continue as specified until the Committee considers that it is no longer required, or that the frequency of the monitoring can be altered. The company may apply to the Committee for modification to the frequency of monitoring, or for the discontinuance of monitoring.

## Section XIII. COMMITTEE'S EMERGENCY POWERS

**Annexure D Condition 13.1:** The Minister, on notice from the Committee, may at any time or times suspend for a period of time, cancel, alter, omit from or add to this consent or the conditions of this consent.

**Annexure D Condition 13.2:** Regardless of the content of any management plan, the Committee may require by notice in writing the company to:



- Cease any or all mining at the NRE Wongawilli Mine in the Nebo Area until such time as the Committee agrees that mining may recommence;
- Undertake investigations as specified by the Committee; and/or
- Undertake remedial works as specified by the Committee.

#### Section XIV. VIBRATION MONITORING

*This condition does not apply to the NRE\_Wongawilli\_1 approval.*

#### SECTION XV REPAIR OF DAMAGE TO PRESCRIBED DAMS

The aim of this condition is to ensure that mining induced damage which results in an unacceptable reduction in the safety of the dam is repaired within an acceptable period. Generally, the DSC will require written confirmation from the dam owner that an agreement has been made.

**Annexure D Condition 15.1:** Prior to mining commencing the company is to satisfy the Committee that the safety (as determined by the Committee) of the dam will be restored by the owner if, in the opinion of the Committee, it has been compromised by the effects of mining. Such restoration by the owner is to be within a time acceptable to the Committee.

#### SECTION XVI CONTINGENCY PLANS

The Committee's decisions are based on the best information available to it, and it takes considerable care in making these decisions. However the nature of mining is such that unexpected conditions are not uncommon. Given the possibility of serious consequences occurring in the event of encountering these conditions the Committee considers that a contingency plan should be developed.

#### SECTION XVII MONITORING MANAGEMENT PLANS

Where several monitoring programs are required under an approval the Committee requires that a Management Plan be developed for these programs. The plan will specify at least:

- What is required to be done and when,
- What is required to be delivered and when, and
- Who is responsible for each task.

In certain circumstances it may be appropriate for the plan to incorporate other aspects, for example appropriate levels training, the format of reports, or regular feedback from the Committee.

**Annexure D Condition 17.1:** The company shall prepare a Management Plan encompassing all of the monitoring programs required by the Committee.

**Annexure D Condition 17.2:** The plan required above is to be submitted to the DSC for its approval prior to the commencement of mining in the notification area.



**Annexure D Condition 17.3:** The plan required above shall be reviewed by the company at intervals not exceeding 12 months. The review process shall include forwarding a copy of the plan to the DSC with a request for comments.

## SECTION XVIII CLOSURE REQUIREMENTS

**Annexure D Condition 18.1:** The company shall submit to the Committee a proposal aimed at minimising the risk of unacceptable leakage, as determined by the Committee, occurring as a direct or indirect result of mining during the projected life of Cordeaux Dam. Regardless of any proposal the company shall do any such things as the Committee considers necessary to ensure the long-term safety of the dam and stored waters.

## SECTION XIX STATISTICAL REPORTS

**Annexure D Condition 19.1:** The company shall report in writing to the DSC the total tonnage of coal extracted, and any other statistics related to the approval at intervals as specified in Annexure E.

## SECTION XX COMPLIANCE REPORTS

Where several monitoring programs are required under an approval it is difficult, and time consuming, to check compliance with the conditions. As it is the company's responsibility to maintain compliance with the conditions the Committee believes that the company is the appropriate organisation to undertake the bulk of this role.

**Annexure D Condition 20:** The company shall submit a statement of its compliance with the required conditions every 6 months, or at intervals determined by the Committee from time to time.

## SECTION XXI MONITORING, REPORTING AND EXTRACTION SCHEDULE

A regularly updated schedule will facilitate the granting of future approvals, assist in ensuring compliance, and generally improve the management of monitoring programs.

The schedule should track:

- Future mine workings, probably on a panel by panel basis;
- Deliverables (i.e. reports required to be submitted to the Committee); and
- Requirements for implementing certain monitoring or other conditions (e.g. required dates for installing equipment, for example).

**Annexure D Condition 21.1:** The company shall submit an updated Monitoring, Reporting and Extraction Schedule monthly, or at intervals specified by the Committee from time to time.



**Annexure D Condition 21.2:** The schedule shall include target dates for starting and finishing each panel, or other mining area as determined by the Committee.

**Annexure D Condition 21.3:** The schedule shall include the dates for supplying reports, or completing other tasks required by the Committee.

**Annexure D Condition 21.4:** The schedule shall be in a format as determined by the Committee from time to time.

## SECTION XXII LIAISON OFFICER

Effective coordination and management of the monitoring programs is essential. To this end the Committee believes that a person should be nominated as a "liaison officer". Their responsibilities will include:

- Providing a point of contact for the Committee,
- Ensuring compliance with the monitoring conditions,
- Coordinating the supply of monitoring data to the Committee, and
- Ensuring that the Committee is kept up to date of the progress of mining.

**Annexure D Condition 22.1:** The company shall appoint a suitably qualified and experienced person, acceptable to the Committee, as a liaison officer for the period when there is active mining in the notification area and for an additional period afterwards as determined by the Committee.

## SECTION XXIII REPORTS ON THE LOCATION OF THE FACE

**Annexure D Condition 23.1:** The company shall provide a plan to the DSC showing the location of any active faces, to the satisfaction of the Committee, weekly or at intervals as specified by the Committee from time to time. These reports are to continue until such time as the Committee agrees that it should cease, regardless of whether there is active mining in the notification area.

## SECTION XXIV CESSATION OF THIS APPROVAL

**Annexure D Condition 24.1:** No mining shall be undertaken in the approved area after 30 June 2018 unless such date is extended by the Committee.

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END OF ANNEXURE D





## Annexure "D"

# ANNEXURE "D1"

## SPECIAL MINING CONDITIONS

The conditions are laid out as follows:

- Annexure Dx (D, D1, etc) specify what is required to be done by the applicant, and what the DSC may do following certain triggers;
- Annexure E specifies the frequencies of monitoring and reporting, and the format of reports. That is, it provides details of the deliverables required by the approval;
- Other Annexures may specify additional details, for example Annexure B describes what should be recorded on geological plans.

In Annexure Dx the section often includes a preamble. These may contain guidance as to how to satisfy a condition, or the background to a condition, but are not conditions in themselves. The conditions look like the following paragraph:

**Annexure D Condition 0.0: This is a condition, you must comply with it.**

The following general conditions apply to the **NRE\_Wongawilli\_1** application, covering mining in the Cordeaux Notification Area around Cordeaux No.1 and Cordeaux No.2 Dams.

### Section I. GENERAL REQUIREMENTS

The Ministerial approval requires the company to do things or undertake monitoring programs, with reporting of results at various intervals. There is considerable scope for the DSC to modify the frequency of reporting and monitoring, and the format of reporting, during the life of an approval. This is important as it allows the level of monitoring to be increased or decreased according to the risk perceived by the DSC. This section sets out a hierarchy within the approvals:

1. Annexure E
2. A specified management plan
3. Annexure D

That is, any frequency specified in Annexure D is overridden by frequencies specified in a management plan or in Annexure E.



The DSC prefers applicant to prepare monitoring proposals in the first instance. Often these will become endorsed by being included as a reference in Annexure E. Annexure E will be re-issued by the DSC when there is a change to monitoring.

**Annexure D1 Condition 1.1:** The:

- frequency of monitoring;
- frequency of reporting; and
- format of reporting;

for any condition hereunder will be as stated in Annexure E or, where no statement is provided in Annexure E, as stated in the relevant "Management Plan" as specified in Annexure E, or, where no Plan is specified in Annexure E or where the Plan makes no statement, as specified in the condition hereunder.

**Annexure D1 Condition 1.2:** The Dams Safety Committee ("the DSC") may modify the content of Annexure E, any associated Management Plan, or the frequency of monitoring or reporting or the format of reporting for any condition hereunder from time to time.

**Annexure D1 Condition 1.3:** Where the DSC has modified the conditions as per Condition 1.2 and has advised the liaison officer appointed under Condition 22 in writing, the modified conditions replace any conditions hereunder and shall have the same effect as if they were part of the approval.

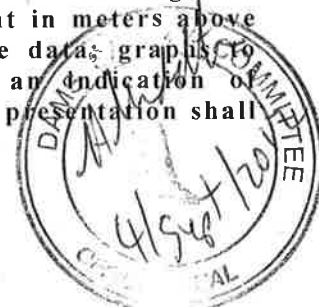
**Annexure D1 Condition 1.4:** The company shall arrange for DSC staff to inspect the workings from time to time when required by the Committee, and in particular when any significant features are encountered in the workings.

## Section II. GROUNDWATER MONITORING

**Annexure D1 Condition 2.1:** Before mining within 300 m of the Notification Area, or before some other time as determined by the Committee from time to time, the company shall submit a proposal for a groundwater monitoring program as part of the Monitoring Management Plan required under Annexure D Condition 17, for approval by the Committee. The company shall comply fully with the approved Monitoring Management Plan.

**Annexure D1 Condition 2.2:** Provisions of the groundwater monitoring program shall be established as soon as possible and shall be measured hourly, or at frequencies determined by the Committee from time to time. Monitoring shall continue after extraction in each panel has been completed, until the Committee agrees that groundwater monitoring may cease.

**Annexure D1 Condition 2.3:** The company shall prepare and submit to the Committee an analysis and interpretation of the results of the monitoring monthly, or as specified in Annexure E. The report shall include: piezometric monitoring data from each hole in terms of pressure and the equivalent height in meters above AHD; comments on the results and trends displayed by the data; graphs to demonstrate piezometric trends over time, overlain with an indication of longwall mining or other mining activities. The details of the presentation shall be determined by the Committee from time to time.



### Section III. WATER FINGERPRINTING

**Annexure D1 Condition 3.1:** Before mining within 300 m of the Notification Area, or before some other time as determined by the Committee from time to time, the company shall install boreholes, or other facility acceptable to the Committee, which enables groundwater samples to be taken directly from stratigraphic units within/near the application area acceptable to the Committee.

**Annexure D1 Condition 3.2:** shall submit a proposal for a groundwater sampling and assessment program as part of the Monitoring Management Plan required under Annexure D Condition 17, for approval by the Committee. The company shall comply fully with the approved Monitoring Management Plan. The company shall sample and assess the properties of water entering the workings, the longwall mining area, water in adjacent workings, water near any mine portal, groundwater in the overlying strata (including groundwater in the facility required under Section 2 2.1 and surface water from local streams and the Cordeaux No.2 Reservoir

**Annexure D1 Condition 3.3:** The frequency, sampling program, and assessment procedures shall be as determined by the Committee from time to time.

**Annexure D1 Condition 3.4:** The company shall prepare and submit to the Committee an analysis and interpretation of the results of the monitoring, within seven days of the end of each month, or at some other frequency as determined by the Committee from time to time. The report shall include: details of water samples taken; analytical results; and a brief interpretation and discussion of the significance of the results.

### Section IV. UPPER CORDEAUX # 2 DAM

The Committee is aware of occurrences of far-field horizontal movement, valley closure and valley bulging and the possibility these types of movement may impact on the Cordeaux No.2 dam.

**Annexure D1 Condition 4.1:** The Company shall conduct subsidence monitoring along the D2000 line in front of Upper Cordeaux No. 2 dam wall. A pre mining survey should be undertaken prior to March 2013, then annually thereafter until such time as the Committee is satisfied that subsidence related movement has ceased.

**Annexure D1 Condition 4.2:** The Company shall prepare and submit to the Committee a report on the results of monitoring within six weeks of completion of each of the surveys. The report is to include: a log of survey activity undertaken; survey data; and an interpretation and discussion of the significance of the results.

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END OF ANNEXURE D1





**Annexure E**

**Frequency of Monitoring and Reporting  
Format Statement  
Table of deliverables**

**NRE\_Wongawilli\_1 approval**

*Sorted by frequency of reporting*

<b>Frequency of monitoring</b>	<b>Frequency or timing of reporting</b>	<b>Condition</b>	<b>Deliverable description</b>	<b>Due date</b>	<b>Management plan</b>
As required	Immediately	ANN D/8	Notification if “significant” water inflow occurs	Immediately	
One off	Before development commences in LW2	ANN D/9	Plan for program of subsidence monitoring	Before development commences in LW2	Monitoring Management Plan to be provided
One off	Before extraction commences within NA	ANN D/16	Contingency action plan, including TARPS for movement on Dam Wall to the satisfaction of Committee	Before extraction commences within NA	Contingency Plan to be provided
One off	Before mining	ANN D/17	Monitoring Management Plan to the satisfaction of the Committee	Before mining	Monitoring Management Plan to be provided
One off	Before mining	ANN D1/2	Plan for program of groundwater monitoring	Before mining	Monitoring Management Plan to be provided
One off	Before mining	ANN D1/3	Plan for program of water fingerprinting	Before mining	Monitoring Management Plan to be provided
One off	Before mining within NA	ANN D/15	Satisfy Committee that safety will be restored by owner	Before mining within NA	



Frequency of monitoring	Frequency or timing of reporting	Condition	Deliverable description	Due date	Management plan
One off	Prior to mining	ANN D/6	Map of surface geology indicating structures and lineaments	Before mining	
One off	Before mining	ANN D/22	Liaison officer appointed	Before mining	
One off	Before mining	ANN D1/4	Plan of dam inspections	Before mining	Monitoring Management Plan to be provided
One off	Within seven days of commencement	ANN D/ 3.1	Notice of commencement to mine within NA	Within seven days of commencement	
Weekly	Weekly	ANN D/23	Location of the face	Weekly	
Daily	Monthly	ANN D/7	Mine water monitoring	Monthly	
Weekly	Monthly	ANN D/4	Inspection of workings	Monthly	
Monthly	Monthly	ANN D/5	Seam level geotechnical reporting	Monthly	
Monthly	Monthly	ANN D/20	Compliance statement	Monthly	
Monthly	Monthly	ANN D/21.1	Monitoring, reporting and extraction schedule	Monthly	
Data logged hourly	Monthly	ANN D1/2	Groundwater monitoring	Monthly	
Monthly, or as required	Monthly	ANN D1/3	Water fingerprinting	Monthly	



Frequency of monitoring	Frequency or timing of reporting	Condition	Deliverable description	Due date	Management plan
A pre-mine survey to be conducted on D2000 prior to March 2013, then annually until determined by Committee.	A pre-mine survey to be conducted on D2000 prior to March 2013, then annually until determined by Committee.	ANN D1/4	Dam wall movement survey <ul style="list-style-type: none"> <li>• Subsidence and strain</li> <li>• Valley closure</li> <li>• Visual crack monitoring</li> </ul>	Within 6 weeks of survey	
1) prior to partial extraction in the NA 3) and there after each six (6) months until determined by Committee	Within six weeks of receipt of survey results	ANN D/9	Subsidence results for line over LWN2 and LWN3	Within six weeks of completion of survey	
Annually	Annually	ANN D/17	Review of Monitoring Management Plan	Annually	
Annually	For year ended 30 June, by 31 July	ANN D/19	Statistics report	31 July	

END OF ANNEXURE E



