

IN THE LAND COURT OF QUEENSLAND
AT BRISBANE
GENERAL DIVISION

Nos. MRA082-13
EPA083-13

BETWEEN:

HANCOCK COAL PTY LTD

Applicant

and

KATHRYN KELLY, PAUL AND JANEICE ANDERSON, COAST AND
COUNTRY ASSOCIATION OF QUEENSLAND INC, MACKAY
CONSERVATION GROUP, FIORELLA PAOLA CASSONI, BRUCE AND
ANNETTE CURRIE

Objectors

and

THE CHIEF EXECUTIVE, DEPARTMENT OF ENVIRONMENT AND
HERITAGE PROTECTION

Statutory Party

**CLOSING SUBMISSIONS ON BEHALF OF
COAST AND COUNTRY ASSOCIATION OF QUEENSLAND INC.**

1. These written submissions are made on behalf of the Coast and Country Association of Queensland Inc (CCAQ) in relation to application by Hancock Coal Pty Ltd (**Hancock**) for an environmental authority under the *Environmental Protection Act 1994 (Qld)* (**EPA**) and a mining lease under the *Mineral Resources Act 1989 (Qld)* (**MRA**) for the Alpha Coal Project (**Alpha**).

SUMMARY

2. In outline, CCAQ's case is simply that:
 - (a) Before it can recommend the approval of Hancock's applications, the Court needs to be affirmatively satisfied that the approval of those applications will result in a net benefit to Queensland.
 - (b) Here, the state of the evidence before the Court in relation to groundwater, climate change and economics does not allow it to be so satisfied.
 - (c) It follows that the Court should recommend that both applications be refused.
3. In relation to groundwater impacts, the evidence provided by Hancock is entirely unsatisfactory. In particular, the conceptual hydrogeological model (CHM) relied upon by Hancock is:
 - (a) unable to explain why groundwater east of the Great Dividing Range (GDR) flows north-northeast, except by hypothesising a groundwater divide under the GDR;
 - (b) unable to explain why there is a groundwater divide under the GDR, given that Hancock's experts insist that the strata in the area uniformly dip to the west and that there is no possibility of geological complexity under the GDR;
 - (c) unable to convincingly or plausibly explain how recharge occurs to the aquifers, given that Hancock's experts insist that there is no possibility of recharge through the overlying units at the GDR;
 - (d) unable to transparently explain how the amount of recharge that is assumed to occur is distributed in the predictive modelling.

4. The fact that the CHM cannot explain observed phenomena undermines the integrity of the predictive numerical modelling undertaken by Hancock, because that modelling is fundamentally based on the CHM.
5. The reliability of the predictive modelling outputs is further undermined by:
 - (a) entirely unrealistic inputs for groundwater recharge to the modelled area; and
 - (b) questionable assumptions about the modelled boundary conditions and hydraulic parameters.
6. Given these inadequacies, the Court can have no confidence that the impacts of Alpha on groundwater in the region have been adequately predicted or assessed.
7. In relation to climate change impacts:
 - (a) There is general agreement about the science and impacts of climate change and the contribution made by the burning of fossil fuels to climate change. The real dispute is how Alpha's contribution to climate change is to be evaluated.
 - (b) CCAQ's position is that climate change is an environmental harm, that the burning of coal from Alpha will contribute to climate change and that this Court must, as a matter of law, take those matters into account in determining whether or not to approve Alpha.
 - (c) Once taken into account the emissions can only be seen as a significant contribution to climate change and a substantial factor weighing against the approval of Alpha.
8. In relation to economics,
 - (a) CCAQ's case is that the economic analysis presented by Hancock is flawed in that:

- (i) it asserts, but does not demonstrate, continued demand for coal throughout the 30 year life of the mine;
 - (ii) it fails to consider or acknowledge the considerable uncertainty regarding the future of the coal market that the economics experts recognise exists;
 - (iii) it relies on a model that is well-recognised as subject to serious limitations; and
 - (iv) in calculating the economic benefits produced by Alpha, it does not account for environmental and social costs associated with Alpha, producing an exaggerated estimate of the benefits.
- (b) The effect of these deficiencies is that the Court has little reliable information about the likely benefits of the proposal, having only an upper-range estimate of the possible benefits in the best case scenario.
9. For these reasons, CCAQ contends that Court cannot be satisfied that the grant of the approvals will result in a net benefit to Queensland and, as a result, it must recommend refusal of the applications.

INTRODUCTION

10. CCAQ's position that the Court must be affirmatively satisfied that the grant of the approvals will result in a net benefit to Queensland before it can recommend approval.
11. The need for the Court to be affirmatively satisfied arises from the nature and subject matter of the decisions it is required to make and the legislative framework it is required to apply:
 - (a) It has been decided that, in making a recommendation under either the EPA or the MRA, the Court is acting in an administrative capacity.¹ As an administrative decision-maker, the Court is required to make the 'correct or preferable' decision on the material before it.²
 - (b) In applications of this kind, the Court must resolve a tension between, on the one hand, the possible economic benefits of allowing a private company to exploit public resources, in the form of coal owned by the Crown in right of Queensland,³ and, on the other hand, the costs of allowing that exploitation, particularly in the form of environmental harm. Given the public nature of the resource to be exploited and the public nature of the costs to be incurred, the Court should err on the side of caution and only recommend approval if it feels positively persuaded that the grant of the approvals will result in a net benefit to Queensland.
 - (c) This view is supported by the legislative framework in which the Court is operating:

¹ *Dunn v Burtenshaw* [2010] QLAC 5, [47].

² See, e.g., *Drake v Minister for Immigration and Ethnic Affairs* (1979) 24 ALR 577, at 589. *Drake* was concerned with merits review proceedings, but the same test has been said to apply to first instance decision-makers: see *Bushell v Repatriation Commission* (1992) 175 CLR 408, at 425 per Brennan J.

³ Section 8(2), *Mineral Resources Act 1989* (Qld) provides that coal is property of the Crown.

- (i) A useful starting point is the decision of the High Court in *Sinclair v Maryborough Mining Warden*, where the Court made a number of comments about the process for the granting of mining leases under Queensland law:
- (A) First, the majority of the High Court held that an applicant for a mining lease was not entitled to that grant of that lease simply because the warden was not satisfied that the application should be refused.⁴ Instead, as Barwick CJ said, the correct position is that there must be material before the warden ‘which would warrant an affirmative conclusion on the substance of the applications that the recommendations should be made.’⁵
- (B) Second, Stephen J explained that what was involved in considering the ‘public interest’ under the relevant legislation was a ‘weighing of benefits and detriments’.⁶ Although his Honour acknowledged that a reference to the public interest might not always require this, he concluded that:
- where however the concept of the public interest occurs as a factor in the grant or refusal by the Crown of a mining lease it can, I think, have only this meaning.*⁷
- (C) Third, Gibbs J implicitly identified uncertainty as a ground on which an application could be refused, saying it was open to the mining warden to refuse to grant a mining lease

⁴ *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473, at 481 per Barwick CJ; 483 per Gibbs J; 485 – 486 per Stephen J; and Murphy J at 488 (concurring with Barwick CJ). Cf. Jacobs J at 487.

⁵ *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473, at 481.

⁶ *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473, at 485.

⁷ *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473, at 485.

*not because he has formed the opinion that the public interest will be prejudicially affected but because he considers that the public interest might be prejudicially affected and that in all the circumstances of the case the application should not be granted until it is possible to say whether the effect of granting it will be prejudicial or not.*⁸

- (ii) Although *Sinclair* dealt with an earlier regulatory framework, its continuing relevance was affirmed by the Court of Appeal in *Armstrong v Brown*.⁹ Accepting that the economic viability of a mine was a relevant consideration under s 269 of the MRA, McMurdo J, with whom MacPherson and Jerrard JJA agreed, said:

*Sinclair was a case dealing with an earlier statutory regime, but to some extent the statements relied upon are relevant to the operation of s. 269. What Sinclair shows is that the Tribunal should not recommend the grant of a mining lease unless the circumstances warrant that recommendation, having regard to the purposes for which the Crown should give a right to mine its minerals.*¹⁰

⁸ *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473, at 482.

⁹ [2004] 2 Qd R 345.

¹⁰ [2004] 2 Qd R 345, [15].

- (iii) The Court of Appeal returned to this theme in *Queensland Conservation Council Inc v Xstrata Coal Queensland Pty Ltd*.¹¹ There, McMurdo P, with whom Holmes JA and Mackenzie J agreed, emphasised that, irrespective of the content of any particular objection, the task of the Court, under both the EPA and the MRA, was to consider all relevant matters and to decide what recommendation it should make to the Minister. In doing so, it referred to both *Sinclair* and *Armstrong*.¹²
- (iv) In fact, the need for affirmative satisfaction is particularly great in making a recommendation under the EPA:
- (A) The object of the EPA is:
- to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development)*¹³
- (B) Pursuant to s 5 of the EPA, this Court is under a duty to exercise its powers under that Act 'in the way that best achieves the object of [the] Act'.
- (C) It would not be consistent with this duty to allow development where the Court could not positively conclude that the development would be ecologically sustainable.

¹¹ [2007] QCA 338, [53].

¹² [2007] QCA 338, [53] and footnote 74.

¹³ *Environmental Protection Act 1994* (Qld), s 3.

- (v) The need for affirmative satisfaction does not mean that Hancock, as the applicant, is under a legal onus to ‘prove’ their case in some way. The concept of the onus of proof does not apply in administrative proceedings.¹⁴ It simply means that, unless the Court is actively satisfied on the evidence before it that the grant of the applications will result in a net benefit to Queensland, it must recommend refusal.
12. In order to attain the required state of satisfaction, the Court must be provided with appropriate material to enable it to say with some confidence what the impacts, positive and negative, of granting the applications will be.
13. Again, the need for adequate information is particularly important under the EPA:
- (a) As noted, s 5 obliges the Court to exercise its powers under the EPA in the way that best achieves the protection of the environment and the promotion of ecologically sustainable development (**ESD**).
- (b) In *Gray v Minister for Planning*, Pain J of the NSW Land and Environment Court observed:

The key purpose of environmental assessment is to provide information about the impact of a particular activity on the environment to a decision maker to enable him or her to make an informed decision based on adequate information about the environmental consequences of a particular development. This is important in the context of enabling decisions about environmental impact to take into account the various principles of ESD...¹⁵

¹⁴ See, e.g., *Re Minister for Immigration and Multicultural Affairs; ex parte S20/2002* (2003) 77 ALJR 1165, at [134] per Kirby J.

¹⁵ (2006) 152 LGERA 258, [118]. See also *Bentley v BGP Properties Pty Ltd* (2006) 145 LGERA 234, [67] – [70] per Preston CJ.

- (c) In that case, her Honour found that the absence of information regarding the impacts of the project meant that it was not possible for the decision-maker to have taken into account the ESD principles.¹⁶
- (d) In this context, the provision of unreliable information is as bad as the provision of no information because the fundamental purpose of the assessment, that is, enabling the decision maker to make a properly informed decision, is defeated.
14. The need for adequate information in this case is further heightened by the particular circumstances of the applications. Alpha is the first mine of this scale to be developed in Queensland and the first mine to be developed in the Galilee Basin. How these applications are treated will set a precedent – at least in terms of the quality of information required – for subsequent applications. It is appropriate for this Court to ensure that development of the Galilee Basin, if it is to occur, ‘gets off on the right foot’ by ensuring that decisions about that development are based on high quality information.
15. It may be suggested to the Court that, to the extent there is uncertainty regarding the impacts from Alpha, this can be addressed through conditions. This suggestion should not be accepted. The power to impose conditions serves as an aid to good decision making, but the imposition of conditions by itself is not a substitute for a decision made on the basis of reliable information.
16. It may also be suggested that the fact that Alpha has already received some sort of approval at both the State and Federal level supports a finding that the evidence is adequate to grant the approvals sought in these proceedings. This should not be accepted. It is for this Court to decide whether it is satisfied that it is appropriate to grant the approvals sought and this Court must do so on the evidence and material before it in these proceedings. Whether or not that

¹⁶ (2006) 152 LGERA 258, [126] and [135].

material might have been adequate to enable another decision maker to make a different decision is neither here nor there.

GROUNDWATER

Introduction

17. Groundwater is an important issue, not only to the extent that it is raised in this case but also as an ongoing concern for future development in this area.
18. As regards issues of groundwater management or impacts, the precautionary principle is very important – in the context of such issues there will always be some uncertainty.
19. The relevant question for the Court in applying the precautionary principle in these proceedings is whether the level of uncertainty is acceptable.
20. It is true that groundwater is a complex issue, but not impossibly so.
21. The evidence, taken as a whole, leaves a very high degree of uncertainty about:
 - (a) the nature of Alpha’s impacts; and
 - (b) the extent of Alpha’s impacts, both physically and temporally.
22. In other words, the evidence, taken as a whole, does not give the Court the necessary degree of confidence about:
 - (a) what will happen; and
 - (b) how long it will last.

Hancock’s Evidence

23. The evidence of Hancock, which is the main body of evidence advanced in support of Alpha, can give the Court no confidence whatsoever as to the veracity of Hancock’s assessment of potential groundwater impacts.
24. Hancock adduced evidence from two witnesses:

- (a) Mr Mark Stewart of URS, who is project manager and author of the primary groundwater modelling report relied on by Hancock, *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, dated 28 March 2012 (**URS Report**);¹⁷ and
 - (b) Mr Iain Hair of Douglas Partners, who considers his role to be that of an independent third party audit reviewer.¹⁸
25. Mr Stewart is undoubtedly a talented modeller and mathematician. That said, in the course of this trial it has become evident that he is considerably less competent as a geologist, in that, for example:
- (a) he failed to identify and act upon the fundamental inconsistencies in his CHM, namely;
 - (i) The inconsistency between the conceptualised geology and the observed groundwater flows, discussed further below at paragraphs 30 to 32;
 - (ii) The impossibility of a raised potentiometric surface in the confined aquifers under the GDR, without some source of recharge at the groundwater divide, as discussed further below at paragraph 39.
 - (b) he proffered an opinion, which he quickly retracted in cross-examination,¹⁹ that the water in the Colinlea and Bandanna aquifers has been there since the formation of these geological units, at least 250 million years ago;²⁰ and

¹⁷ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000].

¹⁸ Transcript 4-71.32 to 4-71.36.

¹⁹ Transcript 11-22.12 to 11-22.19.

²⁰ Transcript 2-44.1 to 2-44.2, 2-44.11 to 2-44.21, 2-44.24 to 2-44.29.

(c) he was unclear about standard usage of the geological term “plunge” as it relates to the orientation of folding.²¹

26. Mr Hair was engaged to conduct an independent third party audit review. The following observations are made about that review:

(a) An independent third party audit review was clearly necessary in this case. Mr Stewart cannot be regarded as sufficiently independent to be treated by the Court as an independent expert witness, because:

(i) he has been involved in the groundwater assessment from the start of the EIS process; and

(ii) throughout the EIS and SEIS process, he has drafted documents under the name of Hancock, principally by editing the work of other consultants.²²

(b) The results of earlier independent third party audit reviews had continually identified weaknesses in the various iterations of the modelling and impact assessment, for example:

(i) the RPS report, *Alpha Coal Project – Review of Selected Aspects of the EIS, Supplementary EIS, SEIS Addendum and other Proponent Responses: proposed conditions*, dated 23 December 2011 (**RPS Review**);²³ and

(ii) the Parsons Brinckerhoff report, *Alpha Project groundwater modelling – Independent due diligence assessment*, dated 27 March 2012 (**PB Review**).²⁴

²¹ Transcript 2-48.1 to 2-48.18.

²² Transcript 1-51.1 to 1-51.15.

²³ RPS (2011) *Alpha Coal Project – Review of Selected Aspects of the EIS, Supplementary EIS, SEIS Addendum and other Proponent Responses: proposed conditions*, 23 December 2011, Exhibit 140.2 [OCCA0062.000.001].

²⁴ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], Appendix D Steady State Calibration Data, (soft copy p. 344).

- (c) Mr Stewart was clearly not sufficiently expert in all matters of science necessary for input into the model, such as;
- (i) geology, as discussed above at paragraph 25;
 - (ii) stratigraphy, which was outsourced to Salva and not subsequently reconsidered;
 - (iii) hydrogeochemistry, which Mr Stewart recognises is beyond his expertise.²⁵
- (d) On no view can Mr Hair's main report be regarded as anything other than a superficial review of the existing material. At best, Mr Hair cast an uncritical eye over a very large volume of material in order to conclude that the detailed work done by others seemed in order:
- (i) It is noteworthy that, while Mr Hair said he had read the PB review and agreed with what it said about the modelling set out in the URS Report,²⁶ he failed to bring any of the issues raised in the PB Review to the attention of the Court;
 - (ii) In cross-examination, Mr Hair appeared to have been uninvolved in some of the major issues in dispute between the experts:
 - (A) With respect to the dispute over the volume of recharge applied to the model, he did not recall there being any significant dispute as to the quantum of recharge:

Q: There is a dispute about the amount of recharge between – there's a difference of opinion between Dr Webb and Mr Stewart – you know that to be the case?

A: Not in the quantum of recharge as far as I can recall. It's fairly low. As a percentage of rainfall.

²⁵ Transcript 11-25.12.

²⁶ Transcript 4-77.41 to 4-77.42.

...

*I don't recall that there was that much of a difference between the figures. I thought they were more – they were more similar than that.*²⁷

- (B) With respect to the disputed mechanism for recharge to the Colinlea Sandstone, he was unaware that URS had disproved the possibility of direct recharge to the Colinlea sandstone outcrop to the east of the mine, as detailed out in the URS Report²⁸ that he purports to have reviewed in detail:

Q: Hasn't the outcrop to the east as a source of recharge to the Colinlea been disproved by drilling and testing?

*A: Not to my knowledge.*²⁹

- (iii) Interestingly, Mr Hair stated that, if he identified any problems or issues in the course of his independent third party audit review, he would have felt obliged to raise these with URS in the first instance, and indicated that he considered URS to be his client.³⁰
- (e) In fact, the earlier RPS Review and PB Review raised questions that were not identified at all by Mr Hair, have still not been answered by Hancock's evidence and were not even addressed until Dr Webb's report was filed:
- (i) The RPS Review raised concerns:

²⁷ Transcript 5-76.36 to 5-76.47.

²⁸ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], pp. 34-35.

²⁹ Transcript 11-54.44 to 11-54.45.

³⁰ Transcript 4-72.34 to 4-72.42.

- (A) about the 'simplifying assumption' of constant head boundaries;³¹ and
- (B) about the consequences of the inadequacies of the hydrogeological conceptualisation in the following terms:

A condition should be imposed that further investigations be undertaken to verify the source(s) and mechanism(s) of recharge prior to project approval, as this may have a bearing on the potential for the project to impact on the [Great Artesian Basin].³²

- (ii) The PB Review did not include a review of the hydrogeological conceptualisation and Parsons Brinckerhoff was not instructed with the RPS Review. Rather, it proceeded on the basis that the existing geological conceptualisation was correct.³³ This is notwithstanding that Hancock was provided a copy of the RPS Review on 3 January 2012,³⁴ more than two months before the PB review was issued to Hancock on 27 March 2012;
- (iii) The PB Review identified its own series of issues, including:
 - (A) An absence of transparency over why certain parameters were chosen and how field data was used to constrain insensitive parameters (i.e. parameters for which no unique preferred value emerges from calibration, but rather a plausible range);³⁵

³¹ RPS (2011) *Alpha Coal Project – Review of Selected Aspects of the EIS, Supplementary EIS, SEIS Addendum and other Proponent Responses: proposed conditions*, 23 December 2011, Exhibit 140.2, p. 8.

³² RPS (2011) *Alpha Coal Project – Review of Selected Aspects of the EIS, Supplementary EIS, SEIS Addendum and other Proponent Responses: proposed conditions*, 23 December 2011, Exhibit 140.2, p. 10.

³³ Transcript 2-57.4 to 2-57.6, 2-57.34 to 2-57.35.

³⁴ Email from Hancock to the Office of the Coordinator-General, 3 January 2012, confirming receipt of RPS Review, Exhibit 140 [OCCA0062.000.000].

³⁵ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], Appendix D Steady State Calibration Data, (soft copy p. 344), pp. 15, 22.

- (B) The need for further constraint of influential model parameters based on field data and professional judgement;³⁶ and
 - (C) The need for further justification of the choice of parameter values.³⁷
- (f) Oddly enough, Hancock advances its case on the basis that this issue has undergone close scrutiny over a long period. If this is true, there is little evidence that the results of this close scrutiny have been carefully heeded in subsequent iterations of the groundwater modelling. Indeed, Mr Stewart gave evidence that:
- (i) he had never seen the RPS report, which was received by Hancock on 3 January 2012 and provided feedback and recommendations intended to inform future modelling;³⁸ and
 - (ii) the issues raised, and comments made, in the PB Review, which was delivered on 27 March 2012, would apply to the URS Report finalised on 28 March 2012.³⁹
- (g) More to the point, Hancock has, without explanation, chosen not to call:
- (i) RPS, an earlier independent third party audit reviewer;
 - (ii) Parsons Brinckerhoff, another earlier independent third party audit reviewer;
 - (iii) JBT, the primary consultant responsible for the technical studies underlying the EIS and SEIS, and much of the material presented in the URS Report; or

³⁶ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], Appendix D Steady State Calibration Data, (soft copy p. 344), pp. 18-19.

³⁷ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], Appendix D Steady State Calibration Data, (soft copy p. 344), p. 11.

³⁸ Transcript 11-42.17 to 11-42.32.

³⁹ Transcript 11-12.31 to 11-12.34.

- (iv) Salva, whose geological conceptualisation underpins all subsequent groundwater modelling.⁴⁰

Dr Webb's Evidence

- 27. Dr Webb's evidence, while not unblemished by error, provides the only plausible explanation of the geology and groundwater conditions in this area, particularly in respect of:
 - (a) the apparent groundwater divide to the west of Alpha under the GDR;
 - (b) the observed potentiometric gradient (flow) across the mine site; and
 - (c) a defined recharge mechanism for the deeper Permian aquifers.
- 28. Dr Webb's evidence is to be compared with two things:
 - (a) the process by which URS and Mr Stewart arrived at their conceptualisation; and
 - (b) Mr Stewart's and Mr Hair's efforts to discredit or disprove Dr Webb's approach.

Process of reasoning behind Mr Stewart's Conceptualisation

- 29. The starting point for all geological and hydrogeological conceptualisation was Salva's 2009 Galilee Regional Model (**Salva Model**),⁴¹ which:
 - (a) was not intended to provide any comment on hydrogeological impacts;⁴²
 - (b) is only representative of broad regional trends:

⁴⁰ Transcript 2-14.33 to 2-14.34.

⁴¹ Transcript 2-14.33 to 2-14.34; Salva Resources (2009) *Summary of Galilee Regional Model (GAB), Internal Project Memorandum from Salva Resources to Hancock Coal Pty Ltd*, Exhibit 151 [AH050.000.000], p. 6.

⁴² Salva Resources (2009) *Summary of Galilee Regional Model (GAB), Internal Project Memorandum from Salva Resources to Hancock Coal Pty Ltd*, Exhibit 151 [AH050.000.000], p. 6.

Due to the very large geographical coverage and arrangement of data, the system has been allowed to model with a large degree of freedom. This has resulted in a broadly trending 'regional' scale model⁴³

- (c) led to the adoption in the EIS of a geological conceptualisation with uniformly westward dipping beds;⁴⁴ and
 - (d) suggests that groundwater in the Colinlea and Bandanna aquifers would flow to the west down the dip of the beds, as shown in the conceptualisation presented at Figure 4-2 of the EIS⁴⁵ and retained in Figure N-2 of the SEIS:⁴⁶
 - (i) Mr Stewart accepted that this is the logical implication of the geological conceptualisation presented in the Salva Model.⁴⁷
 - (ii) This is consistent with the general rule that horizontal conductivity is higher than the vertical conductivity in stratified sedimentary rocks.⁴⁸
30. The EIS section on groundwater⁴⁹ and the accompanying technical report⁵⁰ show, on the basis of bore water levels, a potentiometric gradient in the Colinlea Sandstone (the D-E sandstone, in particular) to the north-northeast (NNE), which:

⁴³ Salva Resources (2009) *Summary of Galilee Regional Model (GAB), Internal Project Memorandum from Salva Resources to Hancock Coal Pty Ltd*, Exhibit 151 [AH050.000.000], p. 6.

⁴⁴ Transcript 1-56.9 to 1-56.23.

⁴⁵ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 2, Section 4 Geology*, Exhibit 13.7.12 [AH013.007.012], pp. 4-5.

⁴⁶ Hancock Prospecting Pty Ltd (2011) *Alpha Coal Project Supplementary EIS Volume 2, Appendix N Groundwater & Final Void Report*, Exhibit 13.8.19 [AH013.008.019] p. N-8.

⁴⁷ Transcript 1-54.12 to 1-54.18, 1-54.42 to 1-54.46.

⁴⁸ Transcript 1-54.14 to 1-54.15; see also URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], Appendix D Steady State Calibration Data, (soft copy p. 344), p. 16.

⁴⁹ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 2, Section 12 Groundwater*, Exhibit 13.7.20 [AH013.007.020], Figure 12-7.

⁵⁰ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 5, Appendix G Groundwater*, Exhibit 13.7.52 [AH013.007.052], Figure 13.

- (a) indicates that groundwater is flowing NNE, contrary to the dip of the beds to the west; and
 - (b) requires an increase in the potentiometric surface – i.e. a groundwater divide - in the vicinity of the GDR, as it is known that groundwater on the western side of the GDR is flowing to the west.
31. Mr Stewart acknowledged in cross-examination that this inconsistency between stratigraphic dip conceptualised in the Salva Model and the observed groundwater flow warranted further investigation:

Q: *We have got two possible scenarios, neither of which can be absolutely correct?*

A: *That's right.*

Q: *And certainly at the very least, what was required at that time was a plausible explanation for the conundrum. We needed an answer?*

A: *Right.*

Q: *Didn't we?*

A: *So we needed to do more work, yes.*⁵¹

32. Despite this internal inconsistency, the Salva Model was not challenged or reconsidered by Mr Stewart or URS and remained unchallenged until the preparation of Dr Webb's expert report.⁵²
33. Two possible mechanisms for recharge to the Colinlea and Bandanna aquifers were considered in the Alpha EIS,⁵³ and later reproduced in the SEIS⁵⁴ and the URS Report.⁵⁵ These were:

⁵¹ Transcript 1-59.44 to 1-60.4.

⁵² Transcript 2-14.29 to 2-14.31.

⁵³ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 2, Section 12 Groundwater*, Exhibit 13.7.20 [AH013.007.020], pp. 12-19-12-21.

⁵⁴ Hancock Prospecting Pty Ltd (2011) *Alpha Coal Project Supplementary EIS Volume 2, Appendix N Groundwater & Final Void Report*, Exhibit 13.8.19 [AH013.008.019], pp. 30-32.

⁵⁵ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], pp. 32-34 (soft copy pp. 50-52).

- (a) direct recharge to the outcrops of Colinlea Sandstone to the east of the Mine Lease Area (MLA); or
 - (b) diffuse recharge in the topographically elevated areas in the GDR.
34. The supporting technical report on groundwater in the EIS, which was prepared by JBT:
- (a) Describes the diffuse recharge option in more general terms, as either ‘recharge in the Great Dividing Range, or as diffuse downward recharge over a wider area’:⁵⁶
 - (i) Mr Stewart acknowledged in cross-examination that this could be taken to suggest direct recharge in the GDR, but that an assumption was made in his summary in the EIS⁵⁷ and in the SEIS⁵⁸ that recharge would be treated as diffuse; and
 - (ii) Mr Stewart also acknowledged in cross-examination that this discussion of direct recharge to the GDR was, without explanation, absent from all subsequent consideration of recharge mechanisms.⁵⁹
 - (b) Identified the following factors that suggest recharge in the GDR:
 - (i) Recharge in the west is suggested by the flow patterns to the NNE;
 - (ii) Hydrochemistry suggests that the recharge is occurring a distance from the site; and
 - (iii) Groundwater springs to the north of the mine site suggest groundwater flow from topographically elevated areas.⁶⁰

⁵⁶ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 5, Appendix G Groundwater*, Exhibit 13.7.52 [AH013.007.052], p. 44.

⁵⁷ Transcript 1-70.28 to 1-70.38.

⁵⁸ Transcript 2-7.7 to 2-7.17.

⁵⁹ Transcript 2-29.44 to 2-30.1.

⁶⁰ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 5, Appendix G Groundwater*, Exhibit 13.7.52 [AH013.007.052], p. 26.

35. Evidence later emerged that proved direct recharge into the Colinlea Sandstone outcrop to the east of the mine was not occurring.⁶¹
36. As a result, because it was the only mechanism considered to be potentially consistent with the observed groundwater flows,⁶² the remaining diffuse recharge mechanism was adopted by default as the preferred option in the EIS to be applied in the model, notwithstanding that:
- (a) there was, and still is, no clear understanding of the diffuse recharge mechanism by which recharge to the Colinlea and Bandanna aquifers was presumed to occur at the GDR;⁶³
 - (b) there was a clear inconsistency between the westward dipping beds conceptualised by Salva and the known groundwater flow patterns to the NNE which remained unresolved; and
 - (c) no review of the Salva Model had been undertaken in light of this inconsistency.⁶⁴
37. Importantly, notwithstanding that URS adopted a mechanism of diffuse recharge from topographically high locations, when it came to apply the recharge in the predictive model, it applied the total amount of recharge across the whole model area, rather than to the topographical high areas where it says the diffuse recharge occurs. This approach to the modelling of recharge was:
- (a) not transparently disclosed in any of the reports, as discussed below at paragraph 80; and
 - (b) described by Dr Webb as ‘astonishing’.⁶⁵

⁶¹ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], pp. 34-35 (soft copy pp. 52-53).

⁶² Transcript 1-64.41 to 1-65.3.

⁶³ Transcript 1-64.24, 1-72.5 to 1-72.6.

⁶⁴ Transcript 2-14.29 to 2-14.31.

⁶⁵ Transcript 12-69.1 to 12-69.3.

38. Figure 1 of Appendix A⁶⁶ to the Joint Groundwater Experts' Report shows the most recent representation of the geological and hydrogeological conceptualisation put forward by Mr Stewart and on which the modelling is based (**Mr Stewart's CHM**).

Dr Webb's views

39. According to Dr Webb, Mr Stewart's CHM presents an untenable hypothesis because:

- (a) There is no explanation for the raised potentiometric surface under the GDR:
 - (i) The general principle that the potentiometric surface will be a subdued reflection of topography cannot sensibly be applied to a deeper confined aquifer, such as the Colinlea and Bandanna aquifers, because there is no recharge through the overlying confining layer(s);⁶⁷ and
 - (ii) Mr Stewart and Mr Hair expressly deny the possibility of recharge through the Rewan Formation, and characterise it as a regional aquitard.⁶⁸
- (b) The potentiometric gradient on either side of the groundwater divide dictates the flow of groundwater in the Colinlea and Bandanna aquifers:
 - (i) up the dip to the east on the eastern side of the GDR; and
 - (ii) down the dip to the west on the western side of the GDR.

⁶⁶ Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18.1 [AH018.001.000], Appendix A Mark Stewart, Figure 1.

⁶⁷ Transcript 11-53.34 to 11-54.15.

⁶⁸ Transcript 2-22.32 to 2-22.33, 11-52.30 to 11-52.31, 11-54.29 to 11-54.32.

- (c) Without recharge to the Colinlea and Bandanna aquifers along the groundwater divide, through the Rewan Formation, there is no water in the aquifer to maintain the groundwater flow inferred by the divide.
- (d) In Dr Webb's own words, on either side of the groundwater divide:

the water's flowing up the aquifer that way and down the aquifer that way. Therefore there has to be a recharge coming through the overlying units to feed the flow in either direction.... Otherwise what you require in this area [on the groundwater divide in the aquifer] is a little magic box making water. Without the recharge through the overlying aquifer, this model cannot work. That's why I was always astonished that they refused to allow any recharge through the Rewan. Their model requires it.⁶⁹

Approach taken by Hancock's witnesses

- 40. Mr Stewart and Mr Hair have set about making a deliberate and unjustified attack, on specious and illogical grounds, on a theory that they accept was, on its face, plausible.

Mapping

- 41. Mr Hair strongly criticises Dr Webb's geological mapping method, although Mr Hair:
 - (a) had never used that method; and
 - (b) does not understand that method.⁷⁰
- 42. Mr Hair criticises remote sensing on the basis that it can only tell you about surficial geology but, in fact:
 - (a) remote sensing can:
 - (i) provide information of geology to 30cm below the surface;⁷¹ and

⁶⁹ Transcript 13-14.44 to 13-15.4.

⁷⁰ Transcript 5-59.44 to 5-59.45.

⁷¹ Transcript 12-57.18 to 12-57.20.

- (ii) provide more information about chemistry than a simple field inspection;⁷² and
 - (b) Mr Stewart accepts that field inspection does not tell you what is going on under the ground.⁷³
43. Hancock implies that, in this case, field inspections are superior to remote sensing and aerial observation:
- (a) This is perhaps true, but only if the person conducting the inspection properly understands and can identify the relevant geological features:
 - (i) despite relying on the 1:250,000 Galilee map to imply that Dr Webb's maps are wrong, Mr Hair did not read the explanatory notes before conducting the field inspection;⁷⁴ and
 - (ii) in cross-examination, Mr Hair described the Dunda beds as 'mainly dominated by silt stones and shales',⁷⁵ which bears no resemblance to the description of 'sandy' in the explanatory notes.⁷⁶
 - (b) In fact, Dr Webb's mapping is of a very high standard. To the extent that his mapping conflicts with the Galilee map, Dr Webb's mapping is to be preferred:
 - (i) The Galilee map itself describes the reliability as "Reconnaissance: many traverses and air-photo interpretation";⁷⁷
 - (ii) The explanatory notes on the Galilee map note that the Galilee basin was mapped in 1964 as part of a regional study of the Great Artesian

⁷² Transcript 13-23.27 to 13-23.30.

⁷³ Transcript 2-37.20 to 2-37.23.

⁷⁴ Transcript 11-58.25 to 11-58.28.

⁷⁵ Transcript 11-60.41 to 11-60.42.

⁷⁶ R. Vine and F. Douth (1973) *Galilee Queensland 1:250 000 Geological Series Explanatory Notes*, Exhibit 134 [OCCA0058.000.000], p. 11.

⁷⁷ Bureau of Mineral Resources, Geology and Geophysics (1972) *Australia 1:250,000 Geological Series, Galilee, Queensland*, 1 January 1972, Exhibit 30 [AH067.000.000], see Reliability Diagram.

Basin (**GAB**), and that the aerial photographs that provide complete coverage of the area are at a scale of 1:48,000;⁷⁸

- (iii) The landsat and radiometric images used by Dr Webb:
 - (A) are a source of high resolution data that simply was not available to the geologists that prepared the 1:250,000 geological maps in the early 1970s;⁷⁹ and
 - (B) were used by Dr Webb in addition to the 1:250,000 mapping and other data relied on by Hancock.⁸⁰
- (iv) While the Jericho and Galilee maps appear to be quite reliable and widely used, it is important to note that they are unchanged since publication⁸¹ and that Dr Webb's use of more modern tools can only improve the geological understanding of the area.

Geological conceptualisation - Folding

- 44. Hancock says there is no evidence of folding.
- 45. The evidence relied on to make this claim falls into six categories:
 - (a) Bore log data within the MLA;
 - (b) Bore log data outside the MLA;
 - (c) Mr Hair's field observations of westward dipping strata;
 - (d) Mr Hair's suggestion that Dr Webb's mapping is inconsistent with the existence of anticlinal and synclinal formations;
 - (e) Reports and EISs prepared for the assessment of other mining projects in the region; and
 - (f) Other earlier geological work.

⁷⁸ R. Vine and F. Douth (1973) *Galilee Queensland 1:250 000 Geological Series Explanatory Notes*, Exhibit 134 [OCCA0058.000.000].

⁷⁹ Transcript 5-60.1 to 5-60.8.

⁸⁰ Transcript 12-58.40, 12-59.4 to 12-59.8.

⁸¹ Transcript 5-60.22 to 5-60.24.

46. Extensive bore log data has been collected in the mine area for the purpose of resource identification:⁸²
- (a) This provides a clear understanding of the geology but only in the limited area proposed to be mined.⁸³
 - (b) The data does not disprove the existence of folding as proposed by Dr Webb:
 - (i) Mr Stewart acknowledges that the major structural complexity proposed by Dr Webb occurs off lease to the west,⁸⁴ and that there is no drilling data to prove or disprove this;⁸⁵
 - (ii) The folding occurs only shallowly through the mine area;⁸⁶ and
 - (iii) The axis of the easternmost syncline would be difficult to identify in the Alpha and Kevin's Corner MLAs because of the very broad folding, the pre-existing dip of the beds and the erosion of one limb of the syncline.⁸⁷
47. In respect of bore log data outside the MLA:
- (a) It is very sparse and, over extensive areas, there is none. For example, no data at all has been collected under the GDR;⁸⁸ and
 - (b) The Wendouree bore log data consists of data from only 4 bores:
 - (i) Dr Webb has considered this data and it is consistent with his theory of folding;⁸⁹

⁸² Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 9, [31].

⁸³ Transcript 2-30.22 to 2-30.33.

⁸⁴ Transcript 2-25.10 to 2-25.12.

⁸⁵ Transcript 2-30.45 to 2-30.47.

⁸⁶ Transcript 12-63.39 to 12-64.23.

⁸⁷ Transcript 12-60.15 to 12-60.24, 12-60.46 to 12-61.5.

⁸⁸ Transcript 2-26.7 to 2-26.9, 2-26.34 to 2-26.38, 2-29.37 to 2-29.39.

- (ii) Mr Stewart now acknowledges that it does not disprove Dr Webb's conceptualisation of folding;⁹⁰ and
- (iii) we note Mr Stewart only located this data during preparation of his expert report in 2013.⁹¹

48. In respect of Mr Hair's field observations of westward dipping strata:

- (a) the folding proposed by Dr Webb would involve only very shallow dips of 1-2° in the area of Mr Hair's field inspection;⁹²
- (b) as Dr Webb has pointed out, this very shallow dipping would be very difficult or impossible to see at close range;⁹³
- (c) Mr Stewart now accepts that you would not necessarily see evidence of subtle folding on the ground⁹⁴ and, contrary to Mr Hair's observation of westward dipping beds, Mr Stewart goes no further than to state that he observed no evidence of easterly dipping beds while on the field trip with Mr Hair;⁹⁵
- (d) As a result, Dr Webb's more distant view from the aerial inspection is more reliable than views from closer range.⁹⁶ That view shows sloping consistent with the topography:
 - (i) as Dr Webb described, the large outcropping cliff visible to the left of Figure 6 in his expert report shows the strata running parallel with the top of the cliff;⁹⁷ and

⁸⁹ Transcript 13-5.38 to 13-6.7.

⁹⁰ Transcript 2-31.23 to 2-31.29.

⁹¹ Transcript 2-30.45 to 2-30.47.

⁹² Transcript 13-24.35 to 13-24.39; Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 21, [68].

⁹³ Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 21, [68].

⁹⁴ Transcript 2-36.39 to 2-36.40.

⁹⁵ Supplementary Expert Report by Mr Stewart, Exhibit 23 [AH024.000.000], p. 11.

⁹⁶ Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 21, [68].

- (ii) the measured topography of this outcrop confirms that the strata, in conformity with the general topography, are dipping east at this point.⁹⁸
- 49. In respect of Mr Hair's suggestion that the geology as mapped by Dr Webb is inconsistent with the existence of anticlinal and synclinal formations:
 - (a) As mentioned above at paragraph 43(a), Mr Hair was clearly confused about what he saw on his field inspection, in that:
 - (i) he did not know the composition of the Dunda Beds;⁹⁹ and
 - (ii) as a consequence, he appears to have assumed that all sandy outcrops were Clematis Sandstone.¹⁰⁰
 - (b) Dr Webb's mapping, which should be preferred to the Galilee map to the extent of any inconsistency, supports his view of folding under the GDR.
 - (c) It is also important to note that:
 - (i) Mr Hair agrees that Dr Webb's mapping is consistent with the 1:250,000 geological mapping to the extent that it covers areas on the Jericho map;¹⁰¹
 - (ii) While Mr Hair trenchantly criticises Dr Webb's mapping in the Galilee area, particularly at points A, B, C and D as shown in Figure 4 of his Supplementary Report,¹⁰² it is noteworthy that:
 - (A) Mr Hair's only criticism of points C and D is that they do not conform with the Galilee map;¹⁰³

⁹⁷ Transcript 13-12.37 to 13-13.15.

⁹⁸ Transcript 13-12.37 to 13-13.15.

⁹⁹ Transcript 11-60.41 to 11-60.42.

¹⁰⁰ Transcript 11-67.1 to 11-67.3, 11-67.19 to 11-67.24.

¹⁰¹ Transcript 5-71.30 to 5-71.35.

¹⁰² Supplementary Expert Report by Mr Hair, Exhibit 24 [AH025.000.000], p. 8.

¹⁰³ Transcript 11-64.32 to 11-64.34.

- (B) No effort was made to confirm whether the Galilee map accurately represented the geology at points C and D;¹⁰⁴ and
 - (C) Although the Mr Hair and Mr Stewart flew straight past points C and D during their helicopter flight:¹⁰⁵
 - (1) no photos were taken of the geological formation between points C and D;¹⁰⁶ and
 - (2) no close investigation, by helicopter or otherwise, was undertaken at C or D.
 - (d) It is open to the Court to infer that Mr Hair consciously focussed his attention on points A and B, while having little regard to C and D, because he thought it would be sufficient to prove Dr Webb wrong, rather than undertaking the more fulsome investigations to properly test Dr Webb's theory and mapping work.
50. In respect of the other reports and EISs prepared for the assessment of other mining projects in the region:
- (a) The authors of this work were not called to give evidence in this matter;
 - (b) The methods and assumptions employed in conducting this work were not able to be properly scrutinised;
 - (c) The material presented by Hancock does not, in fact, undermine Dr Webb's conceptualisation as Hancock claims. In particular:
 - (i) The EIS for Waratah Coal's Galilee Coal Project (a.k.a. China First), prepared by E3 Consulting (**E3 Report**):

¹⁰⁴ Transcript 11-64.36 to 11-64.37.

¹⁰⁵ Transcript 11-64.17 to 11-64.18.

¹⁰⁶ Transcript 11-64.20 to 11-64.23.

- (A) shows folding of the kind conceptualised by Dr Webb in a conceptual model shown at Figure 2-4;¹⁰⁷ and
 - (B) is not invalidated, as suggested by Mr Hair, by the presentation of a different conceptualisation in the subsequent SEIS material, which was prepared by a different consultant.
- (ii) The SEIS for Waratah Coal’s Galilee Coal Project, prepared by Heritage Computing (**Heritage Report**):
- (A) presents a simpler conceptualisation that does not show folding such as that represented in the E3 Report, shown at Figure 3.6;¹⁰⁸ and
 - (B) shows, at Figure 4.2, that the model itself is constructed to include a great deal more structural complexity than represented in the conceptualisation, and appears to maintain the kind of folding identified in the E3 Report.¹⁰⁹
- (iii) South Galilee Coal Project Groundwater Assessment and Modelling, prepared by RPS Aquaterra (**SGCP Report**):
- (A) presents a very simple hydrogeological conceptual model at Figure 4-9;¹¹⁰ and
 - (B) includes landholder bore census reports prepared by Matrixplus that present schematic geological cross sections that show folding in the Colinlea and Bandanna formations.¹¹¹

¹⁰⁷ E3 Consulting (2010) *Waratah Coal China First: Groundwater Assessment*, Exhibit 152 [AH053.000.000] p. 2-14.

¹⁰⁸ Heritage Computing (2013) *Galilee Coal Project Groundwater Assessment*, Exhibit 26 [AH052.000.000], p. 76.

¹⁰⁹ Heritage Computing (2013) *Galilee Coal Project Groundwater Assessment*, Exhibit 26 [AH052.000.000], p. 90; Transcript 13-11.4 to 13-11.9.

¹¹⁰ RPS Aquaterra (2012) *South Galilee Coal Project (SGCP) Groundwater Assessment and Modelling*, Exhibit 27 [AH054.000.000], (soft copy p. 93).

(d) Contrary to Hancock's submission, this material tends to prove Dr Webb's folding theory. That said, it does have serious implications for Mr Stewart's CHM which do not appear to have been considered by Hancock:

- (i) Structural complexity and folding has been considered and adopted by a number of other consultants working in the area; and
- (ii) While the Heritage Report, which Hancock holds in very high regard, presents a very simple schematic cross section by way of a CHM, it has in fact adopted considerably more structural complexity in the model itself than was suggested in the E3 Report.

51. In respect of other earlier geological work relied upon by Hancock, namely:

(a) The Salva Model from 2009:

- (i) As identified above at paragraph 29, this was:
 - (A) not intended to provide any comment on hydrogeological impacts; and
 - (B) was representative of only broad regional trends.

(b) 1:250,000 geological mapping:

- (i) Dr Webb has incorporated this into his mapping and the development of his conceptual hydrogeological model;¹¹² and
- (ii) in Dr Webb's view, this is entirely consistent with the folding he conceptualises.

(c) Galilee Basin Operators Forum:

¹¹¹ RPS Aquaterra (2012) *South Galilee Coal Project (SGCP) Groundwater Assessment and Modelling*, Exhibit 27 [AH054.000.000], (soft copy pp. 202, 219.)

¹¹² Transcript 12-58.40; Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 6, [15].

- (i) Mr Stewart acknowledges that this does not show the absence of folding,¹¹³ and that it should be treated with caution in light of the scale at which the study has been performed and qualifications included in the report;¹¹⁴
 - (ii) Without extensively reading this report, Mr Stewart says he included it as a document that he believes helps support his conclusions.¹¹⁵
- (d) Mr Stewart acknowledges that none of the following information sources disprove Dr Webb's theory of folding:¹¹⁶
- (i) CSIRO Water Resource Assessment;¹¹⁷
 - (ii) Van Heeswijck 2006;¹¹⁸
 - (iii) Queensland Carbon Dioxide Geological Storage Atlas;¹¹⁹ and
 - (iv) Geology of Queensland.¹²⁰

Hydrogeological conceptualisation - Recharge

52. Dr Webb's recharge mechanism has effectively been rejected by Hancock's experts on the basis that they reject his geological conceptualisation and do not

¹¹³ Transcript 2-32.26 to 2-32.28.

¹¹⁴ RPS (2012) *Galilee Basin: Report on the Hydrogeological Investigations*, Exhibit 28 [AH055.000.000], Section 9.7, p. 373 (soft copy p. 408); Transcript 2-33.22 to 2-33.25.

¹¹⁵ Transcript 2-34.3 to 2-34.6, 2-33.30 to 2-33.31.

¹¹⁶ Transcript 2-34.38 to 2-34.44.

¹¹⁷ BD Smerdon and TR Ransley (Eds.) (2012) *Water resource assessment for the Central Eromanga region: A report to the Australian Government from the CSIRO Great Artesian Basin Water Resource Assessment*, Document not tendered [AH057.000.000].

¹¹⁸ A VanHeeswijck (2006) *The Structure, Sedimentology, Sequence Stratigraphy and Tectonics of the Northern Drummond and Galilee Basins, Central Queensland, Australia*, Exhibits 29.1 to 29.8 [AH058.001.000 to AH058.008.000].

¹¹⁹ Queensland Government Department of Employment, Economic Development and Innovation (2009) *Queensland Carbon Dioxide Geological Storage Atlas*, Document not tendered [AH059.000.000].

¹²⁰ PA Jell (Ed.) (2013) *Geology of Queensland*, Document not tendered [AH060.000.000].

accept the possibility of recharge through the Rewan Formation.¹²¹ This is so notwithstanding:

- (a) Mr Stewart's acceptance that his CHM does not explain recharge into the Permian aquifers at the groundwater divide;¹²² and
- (b) Mr Stewart's acceptance in cross-examination that the groundwater quality data presented in Table 1 of his Supplementary Expert Report¹²³ does not support the diffuse recharge mechanism.¹²⁴

53. Rather than seek to understand Dr Webb's recharge mechanism, in the context of the available groundwater quality data:

- (a) Mr Stewart attempted to explain the groundwater quality data by means of hydrogeochemical assessment that he recognised he did not have the expertise to make;¹²⁵ and
- (b) Mr Stewart resorted to the clearly untenable theory that the groundwater in the deeper aquifers has been there since they were formed, more than 250 million years ago, a theory which he subsequently accepted was not possible.¹²⁶

54. Mr Stewart has identified one groundwater monitoring bore – AVP-13 – as being particularly relevant to his assumption that diffuse recharge was the preferred mechanism:¹²⁷

- (a) AVP-13 is the westernmost groundwater monitoring bore considered in the URS Report, and is some distance further west than the next nearest bore, as shown in Figure 4-14 of the URS Report;¹²⁸

¹²¹ Transcript 2-22.32 to 2-22.33, 11-52.30 to 11-52.31, 11-54.29 to 11-54.32.

¹²² Transcript 2-42.1 to 2-42.11.

¹²³ Supplementary Expert Report by Mr Stewart, Exhibit 23 [AH024.000.0000], p. 34.

¹²⁴ Transcript 11-29.22 to 11-29.24.

¹²⁵ Transcript 11-30.5 to 11-30.16.

¹²⁶ Transcript 2-43.46 to 2-44.2, 11-21.40, 11-22.1 to 11-22.45, 11-29.1 to 11-29.33.

¹²⁷ Transcript 2-7.23 to 2-7.25.

- (b) The URS Report notes that AVP-13 is exceptional in that it is the only bore that shows an increase in groundwater levels in response to rainfall throughout 2010, 'which suggests a recharge potential at this site (i.e. potential for downward movement of groundwater)';¹²⁹
- (c) Mr Stewart gave evidence that AVP-13 was the only groundwater monitoring evidence that:
 - (i) suggested the diffuse recharge mechanism should be preferred over direct recharge to the Colinlea Sandstone outcrop;¹³⁰ and
 - (ii) justifies the conclusion that there is connectivity between the surface water flows and the Bandanna aquifer.¹³¹
- (d) However, Mr Stewart later gave evidence that the recharge response showed in AVP-13 supported the recharge mechanism advanced by Dr Webb:
 - (i) He acknowledged that a pressure response, that is, an increase in the potentiometric head level in a monitoring bore after a rainfall event, suggests recharge into the target aquifer;¹³²
 - (ii) This pressure response decreases over distance;¹³³
 - (iii) A pressure response in AVP-13, as the bore closest to the location of Dr Webb's proposed recharge mechanism, supports Dr Webb's

¹²⁸ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 22 (soft copy p. 40).

¹²⁹ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 32 (soft copy p. 50).

¹³⁰ Transcript 2-14.12 to 2-14.14.

¹³¹ Transcript 2-30.14 to 2-30.15.

¹³² Transcript 11-30.39 to 11-30.44.

¹³³ Transcript 11-31.3 to 11-31.12.

proposed recharge mechanism to the west of the mine site, even if other more distant bores further do not show a similar response.¹³⁴

Dr Webb's Conceptualisation

55. In fact, Dr Webb's theory provides an explanation for very important geological and hydrogeological features that Hancock either relies on or simply does not understand. It explains:

- (a) A mechanism for recharge into the C-D and D-E sandstone:
 - (i) That Mr Stewart recognises is not explained in his CHM;¹³⁵
 - (ii) That is consistent with the factors identified in the EIS technical report on Groundwater that suggest recharge in the GDR, as set out above at paragraph 34(b):
 - (A) Recharge in the west is suggested by the flow patterns to the NNE; and
 - (B) Hydrochemistry suggests that the recharge is occurring at a distance from the site; and
 - (C) Groundwater springs to the north of the mine site suggest groundwater flow from topographically elevated areas.¹³⁶
- (b) The groundwater divide beneath the GDR:
 - (i) Is represented in Mr Stewart's CHM as an "inferred groundwater divide" because he has no adequate explanation for its existence.¹³⁷
 - (ii) As included in Mr Stewart's CHM, is simply a description of what is observed on opposite sides of the range, rather than an explanation.

¹³⁴ Transcript 11-31.39 to 11-31.42.

¹³⁵ Transcript 2-42.1 to 2-42.11.

¹³⁶ Hancock Prospecting Pty Ltd (2010) *Alpha Coal Project EIS Volume 5, Appendix G Groundwater*, Exhibit 13.7.52 [AH013.007.052], p. 26.

¹³⁷ Transcript 2-39.19 to 2-39.33.

- (iii) Is, in effect, the basis on which the Project can be considered to present minimal risk to the GAB. In the absence of a groundwater divide, there is a far greater likelihood that the project could impact on the GAB.¹³⁸

56. Mr Stewart acknowledges that Dr Webb's CHM is a plausible explanation:

- (a) of the geology;¹³⁹ and
- (b) of the groundwater divide.¹⁴⁰

Recharge Mechanism

57. Consistent with the geological conceptualisation of folding beneath the GDR, Dr Webb's expert report describes how recharge occurs as follows:

... the main recharge areas for the Bandanna/Colinlea aquifer in the proposed mine area are along the crest of the Great Dividing Range, where the anticline axes are located (Figure 8). Although the Bandanna/Colinlea aquifer does not outcrop in this area, there are probably extensional fractures present that have opened along the axes of the anticlinal folds; these fractures most likely initiated the erosion that formed the areas of broken topography along the anticline axes. There are a substantial number of NE-SW lineaments within the Clematis Sandstone outcrop areas that probably represent fractures that have developed along the folds. These fractures penetrate through the Rewan Formation, which would otherwise act as an aquitard. Recharge may be greater where the Rewan Formation is exposed in the core of one anticline, because the Rewan Formation is thinner there (Figure 8).¹⁴¹

¹³⁸ Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 28, [96].

¹³⁹ Transcript 2-23.29.

¹⁴⁰ Transcript 2-40.14 to 2-40.16, 2-40.26 to 2-40.27.

¹⁴¹ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 19 [48].

58. Dr Webb notes that the spread of the hydraulic conductivity data presented in Mr Stewart's Expert Report¹⁴² is exactly what he would expect from a low permeability aquifer that contains fractures, which is how he envisages the Rewan Formation.¹⁴³
59. As shown in Figure 8 of Dr Webb's Expert report to the Land Court, the location of the recharge areas at the crest of the anticlines features in Dr Webb's CHM.¹⁴⁴
60. Further, as Dr Webb notes, not only is recharge in this area explained by his CHM, but it is also necessary in Mr Stewart's CHM as a consequence of the groundwater divide under the GDR.¹⁴⁵
61. The hypothesis of more direct recharge to the deeper aquifers through fractures in the Rewan Formation, as proposed by Dr Webb, is consistent with improving groundwater quality in deeper strata:
- (a) Dr Webb acknowledges that some degree of diffuse recharge to the Permian aquifers is possible:
- It is likely that the bulk of this surface recharge seeps down to the laterite layer, which probably develops a perched seasonal watertable. A portion of this recharge may seep down into the underlying Permian sediments, but it is probably not the main source of recharge for these strata.*¹⁴⁶
- (b) The groundwater quality data in Mr Stewart's expert report shows that by far the lowest water quality (highest salinity) is in the surficial deposits and tertiary layers.¹⁴⁷

¹⁴² Expert Report by Mr Stewart, Exhibit 23 [AH024.000.000], table 10, p. 71.

¹⁴³ Transcript 13-14.23 to 13-14.26.

¹⁴⁴ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 18.

¹⁴⁵ Transcript 13-14.44 to 13-15.4.

¹⁴⁶ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 19 [47].

¹⁴⁷ Supplementary Expert Report by Mr Stewart, Exhibit 23 [AH024.000.0000], table 1,p. 34.

- (c) As a result of this salinity, water passing through those deposits and tertiary layers will decrease in quality (increase in salinity).
- (d) If diffuse recharge were the main mechanism for recharge to the deeper Permian aquifers, you would expect to see equally saline water in the deeper units. Mr Stewart's groundwater quality data shows that this is not the case.
- (e) By contrast, limited diffuse recharge of the much more saline water from the tertiary layers into the underlying Permian units, when diluted in the higher quality (less saline) water entering the aquifer through the main recharge areas in the Rewan Formation, will result in increasing water quality down through the layers. Mr Stewart's groundwater data is consistent with this occurring.

Groundwater Divide

62. Dr Webb's CHM explains that the groundwater divide, which is inferred from groundwater flows in opposing directions on opposite sides of the GDR, is a consequence of geological controls. That is:

- (a) the beds of the Colinlea and Bandanna aquifers are raised at the crest of the anticlines, as shown in Figure 8 of Dr Webb's expert report;¹⁴⁸
- (b) the high point at the crest of the anticlines is the primary recharge point for the Colinlea and Bandanna aquifers, through fractures in the low permeability Rewan Formation;
- (c) groundwater flows from the elevated recharge areas along the plane of the aquifer beds, in accordance with the higher horizontal conductivity in the aquifers;

¹⁴⁸ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 18.

- (d) the coinciding recharge and elevation of the beds under the range maintains the higher potentiometric pressure along the axes of the anticlines; and
- (e) higher potentiometric pressure along the axes of the anticlines causes groundwater flow away from the topographic highs of the GDR – i.e. a groundwater divide.

Model inputs

- 63. Both the groundwater divide and the recharge mechanism are fundamentally important to the modelling exercise. Indeed, Mr Stewart agrees that:
 - (a) it is important to have a very good understanding of the regional and local geology to understand the impacts on groundwater of a project like Alpha;¹⁴⁹ and
 - (b) a proper understanding of the conceptualisation of the recharge mechanism is important to understanding the impacts.¹⁵⁰
- 64. There must be a relationship between the model and the geology, otherwise the model is merely a fiction.
- 65. As is represented in Mr Stewart's CHM, the model assumed a groundwater divide under the GDR in the deeper aquifers without explanation.¹⁵¹
- 66. The model also, according to Mr Stewart's CHM, assumes diffuse recharge into the C-D and D-E sandstone, without adequate explanation,¹⁵² rather than the more direct recharge through fractures in the Rewan Formation theorised by Dr Webb.
- 67. If Dr Webb's view is preferred, as it should be, then the model used to predict the impacts of Alpha does not accord with the reality of the situation.

¹⁴⁹ Transcript 1-52.29 to 1-52.38.

¹⁵⁰ Transcript 1-71.23 to 1-71.25.

¹⁵¹ Transcript 2-39.19 to 2-39.33.

¹⁵² Transcript 2-42.1 to 2-42.11.

Modelling recharge

Recharge volume

68. Importantly, and in addition to the question of direct or diffuse recharge, there is further uncertainty about the application of recharge in the model:
- (a) The model is calibrated for only 19 megalitres (**ML**) of annual recharge entering the system;¹⁵³
 - (b) How the recharge enters the system – i.e., the recharge mechanism – is important in calculating the volume of recharge;
 - (c) This is usually done by applying the percentage of Mean Annual Precipitation (% MAP) to the area where the recharge is said to be occurring:
 - (i) It is agreed that % MAP can be calculated using the chloride mass balance method.¹⁵⁴
 - (ii) Annual recharge in millimetres (mm) can be calculated using the % MAP figure and the measured average annual rainfall at the recharge area.
 - (iii) Multiplying the annual recharge by the recharge area provides a volume of recharge that can be applied in the model to the recharge area.
69. While it is true that there was some debate about what % MAP most accurately represents the recharge rate, it is now agreed that an appropriate recharge rate is ~0.2% MAP with respect to the DE and Sub-E aquifers.¹⁵⁵

¹⁵³ Transcript 11-19.1 to 11-19.4.

¹⁵⁴ Transcript 2-51.11; Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 11, [31]; Further Supplementary Expert Report by Mr Hair, Exhibit 133 [AH083.000.0000], p. 1.

¹⁵⁵ Transcript 11-84.31 to 11-84.33; Further Supplementary Expert Report by Mr Hair, Exhibit 133 [AH083.000.0000], p. 2.

70. Both of Hancock's witnesses and Dr Webb identify specific geographical areas where they each say that recharge is occurring:
- (a) Dr Webb specifies an approximately 400km² areas of broken topography in the GDR;¹⁵⁶
 - (b) Mr Stewart and Mr Hair say it is occurring across an unspecified area, but it is consistently claimed that recharge is occurring in the topographic highs of the GDR.
71. Notwithstanding his frequently repeated view that recharge is occurring in, and is applied in the model in,¹⁵⁷ the topographic highs of the GDR, Mr Stewart in fact applied recharge across the entire model area.¹⁵⁸
72. That approach can only distort the picture of the source and volume of groundwater flows in the steady state modelling and, consequently, misconceive how much will be intercepted by the mine.
73. If the usual calculation is used to work out the amount of groundwater recharge based on Mr Stewart's preferred % MAP of 0.1%, the entire model area of 5,404km² and the mean annual rainfall of 526mm, the volume of recharge is as follows:¹⁵⁹

$$\begin{aligned}
 \text{Annual Recharge (mm)} &= \% \text{ MAP} \times \text{mean annual rainfall (mm)} \\
 &= 0.001 \times 526\text{mm} \\
 &= 0.526\text{mm} \\
 \text{Annual recharge volume} &= \text{Annual recharge} \times \text{recharge area} \\
 &= 0.526\text{mm} \times 5,404 \text{ km}^2
 \end{aligned}$$

¹⁵⁶ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 19 [52].

¹⁵⁷ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 35 (soft copy p. 53).

¹⁵⁸ Transcript 11-19.44 to 11-20.2.

¹⁵⁹ Area of the entire model domain: URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 129; Mean annual rainfall: Hancock Prospecting Pty Ltd (2010) *Alpha EIS Volume 2, Section 11 Surface Water*, Exhibit 13.7.19 [AH013.007.019] Table 11-1, p. 11-9.

$$\begin{aligned}
&= 0.000526\text{m} \times 5,404,000,000\text{m}^2 \\
&= 2,842,504\text{m}^3 \\
&= 2,842,504,000\text{L} \\
&= 2843\text{ML}
\end{aligned}$$

74. Even on Mr Stewart's preferred lower % MAP, a recharge volume of about 2843ML per annum should be expected, rather than the 19ML per annum applied to the model.
75. Assuming the now agreed 0.2% MAP, a recharge volume of 5685ML per annum should be applied to the model, compared to 19ML per annum applied by Mr Stewart.

Recharge rate applied

76. Mr Stewart revealed in cross-examination how the approximately 19ML per annum of recharge was applied to the model:

Well, we added – it's a bit more tricky. Recharge of one times 10 to the minus eight metres per day across the whole model.¹⁶⁰

77. That is, rather than applying 0.1% MAP (0.526mm/year) to a designated recharge area, Mr Stewart in constructing the model applied $1 \times 10^{-8}\text{m}$ per day (0.00001mm/day or 0.00365mm/year) to the entire model domain.
78. The applied annual recharge of 0.00365mm/year equates to a recharge rate of less than 0.0007% MAP across the model domain, compared to the 0.1% MAP recharge rate claimed to have applied.
79. Mr Stewart also admitted in cross-examination that the means of applying recharge in the model bears no relationship to his preferred mechanism of diffuse recharge in the topographically elevated areas in the GDR:

¹⁶⁰ Transcript 11-19.18 to 11-19.19.

Q: *Isn't it right that the mathematical construct in your model for the distribution of recharge doesn't bear any relationship to the theory of diffuse recharge which you've proceeded on?*

A: *In the way it is simulated in the model, no.*¹⁶¹

Obfuscation of approach to recharge modelling

80. Importantly, the current model does not come close to representing the regional groundwater conditions, in terms of both the location and volume of recharge, but this was shrouded in obscurity until Mr Stewart's final day of cross-examination:

(a) The method of applying recharge to the entire area of the model domain is certainly not clear in the URS Report:

(i) When questioned on where the URS Report identifies that recharge was applied across the entire model domain, Mr Stewart referred to the discussion about the top flux boundary in section 8.5, page 82, of the URS Report,¹⁶² which simply restates:

*Recharge was considered insignificant and could be less than 0.1% of mean annual rainfall.*¹⁶³

(ii) A further statement is made in section 8.4 of the URS Report, entitled 'Recharge', that gives no indication that recharge is applied to the entire model domain:

Based on review of available groundwater monitoring data, recharge was only applied to the shallow perched aquifer as there was no correlation observed between rainfall events and groundwater level

¹⁶¹ Transcript 11-21.7 to 11-21.9.

¹⁶² Transcript 11-19.44 to 11-20.16.

¹⁶³ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 82 (soft copy p. 100) (emphasis added).

fluctuations in the deeper Permian layers that comprise the major aquifer systems in the MLA areas.¹⁶⁴

(iii) Earlier in the URS Report it states:

It is proposed that recharge to deeper Permian groundwater units occurs to the south-west of the site (along the Great Dividing Range) and that shallow groundwater units (above the low permeability Tertiary laterite) are recharged directly via diffuse rainfall recharge; this shallow groundwater then discharges relatively quickly to topographic lows (alluvium of Lagoon Creek and Sandy Creek) leaving isolated pockets of perched groundwater in the longer-term.

Therefore, for the purpose of groundwater modelling, recharge is applied to topographically elevated areas of the Great Dividing Range.¹⁶⁵

(b) When this issue was broached in Mr Stewart's earlier cross-examination, he gave similarly obscure responses:

(i) Mr Stewart was first read the passage from the URS Report referred to above in 80(a)(iii). He agreed with this passage and made no effort to correct the fallacious assertion that, for the purpose of groundwater modelling, recharge is applied to topographically elevated areas of the Great Dividing Range.¹⁶⁶

(ii) Mr Stewart later suggested that recharge was applied to the outcrop areas:

Q: And because of that assumption, when you've approached the question of recharge in the modelling - in the modelling ... you

¹⁶⁴ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 82 (soft copy p. 100) (emphasis added).

¹⁶⁵ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], p. 35 (soft copy p. 53) (emphasis added).

¹⁶⁶ Transcript 2-10.34 to 2-10.44.

have not allowed for - you've only applied the recharge to the upper levels, to the shallow areas?

A: *To the outcrop areas.*

Q: *To the outcrop areas?*

A: *Yes, to the top layers... that are outcropped in the model, yes.*¹⁶⁷

- (c) This approach can be contrasted with the completely transparent approach adopted in the Heritage Report, which:
- (i) clearly specifies eight different recharge zones across the model domain for different geological units present;¹⁶⁸
 - (ii) determines an appropriate recharge rate for each of these zones;¹⁶⁹
 - (iii) clearly depicts the location and spatial extent of each of these recharge zones in Figure 4.5.¹⁷⁰
- (d) Based on the above, it is open to the Court to infer that Mr Stewart consciously avoided revealing the manner in which recharge was applied in the model, because it is a fiction – ‘tricky’ in Mr Stewart’s words¹⁷¹ – and is clearly inconsistent with both the recharge rate and recharge mechanism described in the URS Report.

Modelling assumptions and calibration

81. In truth, the model is a mathematical exercise that is in part informed by a high level of on-site data, but also relies heavily on unconvincing guesswork about regional geology and hydrogeology.

¹⁶⁷ Transcript 2-12.22 to 2-12.30.

¹⁶⁸ Heritage Computing (2013) *Galilee Coal Project Groundwater Assessment for Waratah Coal Pty Limited*, March 2013, Exhibit 26 [AH052.000.000], p. 39 (soft copy p. 4023).

¹⁶⁹ Heritage Computing (2013) *Galilee Coal Project Groundwater Assessment for Waratah Coal Pty Limited*, March 2013, Exhibit 26 [AH052.000.000], p. 39 (soft copy p. 4023).

¹⁷⁰ Heritage Computing (2013) *Galilee Coal Project Groundwater Assessment for Waratah Coal Pty Limited*, March 2013, Exhibit 26 [AH052.000.000], p. 93 (soft copy p. 4077).

¹⁷¹ Transcript 11-19.18.

82. The approach of the modellers here was brought into stark relief when Mr Stewart presented his model simulation of Dr Webb's recharge amount:
- (a) Mr Stewart failed to faithfully represent all facets of Dr Webb's conceptualisation, particularly with respect to:
 - (i) the geology in the region;
 - (ii) the preferable boundary conditions;
 - (iii) other likely discharge points from the system such as Albro Springs.
 - (b) While he claimed that he 'gave it every shot he could to get it to work'¹⁷², Mr Stewart:
 - (i) made no attempt to test the range of recharge values proposed by Dr Webb;¹⁷³ and
 - (ii) in modifying the vertical conductivity of the C-D, D-E and Sub-E units, ostensibly "to facilitate higher recharge" through the recharge area proposed by Dr Webb, he appears to have modified this value across the entire model domain.¹⁷⁴
 - (c) Under further cross-examination it became very clear how easily, in the absence of critical field data, the mathematical parameters could be altered by a function of:
 - (i) statistical calibration, for example:

¹⁷² Transcript 11-37.43 to 11-37.44.

¹⁷³ Transcript 11-38.1 to 11-38.8.

¹⁷⁴ Further Supplementary Expert Report by Mr Stewart, Exhibit 132 [AH082.000.0000], p. 15 of 20 (soft copy p. 20).

- (A) a change in one parameter based on new information, such as recharge, will require recalibration and adjustment of other parameter values;¹⁷⁵
 - (B) the process of calibration will be limited to a pre-determined range of values for a parameter, based on a variety of field data and relevant literature,¹⁷⁶ but can generate a number of values that might be applied in the model.¹⁷⁷
- (ii) judgement, for example:
- (A) the decision that it is appropriate to apply a uniform value for horizontal permeability of the units across the entire predictive model domain,¹⁷⁸ notwithstanding the observed heterogeneity;¹⁷⁹
 - (B) the decision as to which of the range of permeability values generated by the calibration would be applied in the predictive model. In this case the lowest value for permeability was applied;¹⁸⁰
 - (C) the assumption that the data and calibrations based on the 200m x 300m test pit can be extrapolated over the entire mine length, despite the fact that there will be variation along the 24km mine strike;¹⁸¹

¹⁷⁵ Transcript 11-7.1 to 11-7.4.

¹⁷⁶ Transcript 11-10.29 to 11-10.31, 11-37.12 to 11-37.17.

¹⁷⁷ Transcript 11-33.32 to 11-33.46.

¹⁷⁸ Transcript 11-18.11 to 11-18.12, 11-18.32 to 11-18.35.

¹⁷⁹ Transcript 11-32.26 to 11-32.45.

¹⁸⁰ Transcript 11-35.4 to 11-35.12.

¹⁸¹ Transcript 11-36.28 to 11-36.34.

- (D) the decision to simply mirror the D-E seam conductivity parameters in the Sub-E aquifer in the absence of any data for the Sub-E aquifer.¹⁸²

Assumption of constant head boundaries in the model

- 83. Hancock says that the assumption of constant head boundaries in the predictive modelling is perfectly valid, but this assumption requires careful consideration:
 - (a) There is agreement among the parties on the importance of selecting the right model boundary conditions:
 - (i) The importance and effect of model boundary selection is addressed by Dr Webb at paragraph 147 of the Joint Experts' Report:

*"According to Anderson & Woessner (Applied Groundwater Modelling, 2002, Academic Press), boundaries are "the most likely source of error in the modelling process", because they "are largely responsible for how flow occurs in the system". A constant head boundary is one for which there is no drawdown; the hydraulic head value is fixed "regardless of the system conditions in the surrounding grid cells, thus acting as an infinite source of water entering the system, or as an infinite sink for water leaving the system. Therefore, Constant Head boundary conditions can have a significant influence on the results of a simulation" (Visual MODFLOW Professional User's Manual, version 4.2, 2006, p. 226). Surface water bodies are often used as constant head boundaries, because they can supply an effectively infinite supply of water to the hydrogeological system."*¹⁸³

- (ii) Mr Hair agrees on the importance of appropriate boundary simulations in a model and that Dr Webb's comments in paragraph 147 of the Joint Experts Report are correct.¹⁸⁴

¹⁸² Transcript 11-16.15 to 11-16.23.

¹⁸³ Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 39.

¹⁸⁴ Supplementary Expert Report by Mr Hair, Exhibit 24 [AH025.000.0000], p. 15 of 20 (soft copy p. 20).

- (b) Axiomatically, a constant head boundary cannot predict any impact at or beyond the model boundary because the groundwater head level at the boundary cannot change.
- (c) The assumption of a constant head boundary can only be valid if the model boundary is located sufficiently far from the mine:
- (i) In cross-examination, Dr Webb stated this requirement in the following terms:

So the northern boundary of the model that Mr Stewart applied was chosen to be 40 kilometres north of the Kevin's Corner mine on the basis that he thought that would be as far as the impact to the mine would be likely to extend and on that basis, what he was implying was that between the northern boundary of the mine and the northern boundary of the model, there would be sufficient additional flow coming in from areas not impacted by the mine to maintain that steady state...

If you put [a constant head boundary] far enough away from the impact zone that the amount of water that's being withdrawn is only a small portion that's fed to that boundary, then there will be no impact. In this case, that's demonstrably [not] so.¹⁸⁵

- (ii) Thus, it is evident that the validity of the assumption of a constant head boundary is not dependent solely on distance, but also on the extent to which the flow of groundwater to the relevant boundary will be intercepted by the mine;
- (iii) Mr Stewart says that a constant head boundary has been applied in his model solely on the basis of its distance from the mine.¹⁸⁶
- (iv) Dr Webb's evidence is that:

¹⁸⁵ Transcript 12-75.16 to 12-75.24, 12-75.46 to 12-76.2. See also the correction of 12-76.2 as confirmed by Dr Webb at 13-33.30.

¹⁸⁶ Transcript 2-66.8 to 2-66.12, 12-77.4 to 12-77.6.

- (A) The drawdown contours for Alpha and the neighbouring Kevin's Corner mine indicate that the dewatering will intercept around three-quarters of the groundwater flow to the north;¹⁸⁷
- (B) Consistent with the URS modelled groundwater contours for Alpha 300 years post-mining,¹⁸⁸ the final void will intercept a substantial proportion of the northwards groundwater flow forever;¹⁸⁹
- (C) As a consequence, the assumption of a constant head boundary in URS modelling is invalid and will have led to an underestimate of the northward extent of the Alpha's impacts on groundwater, which Dr Webb considers could easily reach the springs on Degulla and could also potentially impact on surface drainages, particularly Degulla lagoon.¹⁹⁰
- (D) In Dr Webb's own words:

*In order for [the mine to have no impact at the boundary], the amount of water flowing through that constant head boundary must not be significantly affected by the mine. In this particular case, three-quarters of the area supplying water to that boundary is going to be impacted by the mine so that's automatically going to have a big impact on the water flowing through that boundary and the assumption, therefore, does not hold.*¹⁹¹

¹⁸⁷ Transcript 12-74.3 to 12-74.10, 12-76.28 to 12-76.37.

¹⁸⁸ URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project*, Exhibit 106 [AH027.000.000], Figure 12-6 Simulated Groundwater levels in D seam after 300 years, p. 143 (soft copy p. 161).

¹⁸⁹ Transcript 12-83.34 to 12-83.36, 13-20.7 to 13-20.17.

¹⁹⁰ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 23 [64].

¹⁹¹ Transcript 22-77.8 to 12-77.12.

- (d) In any case, the predictive modelling cannot be relied upon to establish the limited northern extent of Alpha's impact on groundwater, and the assumption of the constant head boundary, because of:
 - (i) The flawed conceptualisation, as discussed above at paragraph 39;
 - (ii) The unjustifiable application of recharge in the predictive modelling, as discussed above at paragraphs 68 to 79;
- (e) Indeed, the Heritage Report prepared for the SEIS for the Galilee Coal Project, on which Hancock has relied heavily, used general head boundaries rather than constant head boundaries:

General heads are applied to the northern, western and southern boundaries to allow lateral inflow/outflow to/from the model area.¹⁹²

- (f) Other boundary options available to URS to give a better indication of possible future impacts to the north include:
 - (i) General head boundaries;
 - (ii) Decreasing head boundaries.
- (g) Hancock says the choice of constant head model boundaries is validated by the modelling results, however:
 - (i) Reliance on these results is questionable because of the issues identified above at 83(d);
 - (ii) Any attempt to justify the starting assumptions of the model based on the predictive modelling outputs involves circular reasoning and is logically fallacious:

¹⁹² Heritage Computing (2013) *Galilee Coal Project Groundwater Assessment for Waratah Coal Pty Limited*, March 2013, Exhibit 26 [AH052.000.000], Section 4.5 Model Stresses and Boundary Conditions, p. 38 (soft copy p. 46).

- (A) Mr Stewart states that the 0.5m drawdown contour is sufficiently far from the constant head boundaries to not affect the drawdown predictions.¹⁹³
- (B) The drawdown contours are generated by the predictive numerical modelling that assumed constant head boundaries and are therefore influenced by the choice of constant head boundaries.
- (C) Had the predictive numerical modelling assumed a decreasing head over the duration of the simulation rather than constant head boundary, which Dr Webb asserts is appropriate in this circumstance, the drawdown contours would extend further than modelled in the URS Report.¹⁹⁴
- (D) Therefore, the drawdown contours generated by the predictive numerical modelling cannot logically be presented in support of the assumptions on which that predictive modelling was based.

84. In fact, if Hancock is wrong in its conceptualisation, and particularly in light of the unjustifiable application of recharge in the model, the Court cannot be satisfied that:

- (a) The choice of a constant head boundary, particularly for the northern model boundary, is valid.
- (b) The choice of the constant head boundary has not distorted the model's predictions.

¹⁹³ Transcript 2-66.14 to 2-66.15; Supplementary Expert Report by Mr Stewart, Exhibit 23 [AH024.000.000], p. 30.

¹⁹⁴ Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 23 [60]-[64].

- (c) The model's predicted impacts are sufficiently certain and an appropriate basis on which the Court can base a decision to recommend that Alpha proceed.

Conclusions on the evidence

- 85. On balance, Dr Webb should be treated as both an honest witness and a true expert independently reviewing all material, creating and diligently testing his hypothesis. This is in contrast to the position of Mr Stewart and Mr Hair, whose efforts were largely directed to contradicting Dr Webb's views, rather than determining their correctness.
- 86. The Court should accept Dr Webb's opinion that the outputs of the model can give the Court little comfort that they reasonably predict the nature and extent of the likely impacts of the project on groundwater.
- 87. It is likely that Hancock will seek to criticise Dr Webb for his admitted error in relation to the recharge rate. It is important to see this error in context, however:
 - (a) The facts are:
 - (i) He did get it wrong;
 - (ii) He was reluctant to use the data supplied in Mr Stewart's report, due to the unusually high proportion of chloride in TDS values;¹⁹⁵
 - (iii) Even when provided with the limited chloride data in Mr Stewart's supplementary report, the data in the URS Report did not include the data necessary to allow Dr Webb to make a proper assessment of the quality of the data;¹⁹⁶ and

¹⁹⁵ Transcript 12-38.5 to 12-38.10.

¹⁹⁶ Transcript 12-38.12 to 12-38.16.

- (iv) He, quite properly, conceded the point when the data was made available to him, which demonstrates he is open to testing and necessary modification of his hypothesis in light of new data.
- (b) The human factors are:
 - (i) Dr Webb's error was understandable in circumstances where the necessary data are not transparently provided; and
 - (ii) Ultimately, the making of an error in a mathematical calculation where limited information is available should not affect Dr Webb's credibility.
- (c) The Court should undertake a proportionate weighing of this matter against the balance of his evidence.

88. On balance, the open attack of Hancock's witnesses on all aspects of Dr Webb's evidence reflects poorly on them in circumstances where neither Mr Hair nor Mr Stewart had a convincing or scientifically plausible alternative.

The Law

89. Because of the deficiencies in Hancock's evidence, it is appropriate to take a precautionary approach to the groundwater impacts:
- (a) As this Court recognised in *DeLacey v Kagara Pty Ltd*, the precautionary principle is a relevant consideration under the EPA.¹⁹⁷ It is also, arguably, relevant under the MRA;¹⁹⁸
 - (b) As set out in the *National Strategy for Ecologically Sustainable Development*, the precautionary principle is that:

¹⁹⁷ [2009] QLC 77, [172]-[177].

¹⁹⁸ Section 269(4)(k) of the *Mineral Resources Act 1989* (Qld) requires consideration of the 'public interest'. In *Walker v Minister for Planning* [2008] NSWCA 224, [56], Hodgson JA, with whom Campbell JA agreed on this point, suggested (in 2008) that it was likely that ESD principles would come to be seen as 'so plainly an element of the public interest, in relation to most if not all decisions, that failure to consider them will become strong evidence of failure to consider the public interest'.

*where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*¹⁹⁹

- (c) In the most frequently cited legal formulation of the precautionary principle, the principle is engaged when two conditions are satisfied:
 - (i) There is a risk of serious or irreversible environmental harm; and
 - (ii) Uncertainty about the likelihood, nature or scope of that harm.²⁰⁰
- (d) Here, these two conditions are plainly satisfied:
 - (i) Dewatering, including interception of groundwater flow by the final void, is clearly a form of serious or irreversible environmental harm.
 - (ii) As a result of the failings of Hancock's modelling, there is uncertainty about the scope and nature of that harm.
- (e) That said, there is no definitive evidence of what the likely impacts will be once Hancock's evidence is rejected. This leaves the Court with three options, but, in truth, one choice:
 - (i) The first option is to accept Hancock's evidence, which is demonstrably wrong;
 - (ii) The second option is to speculate on the likely impacts from Alpha, potentially falling into error; or
 - (iii) The third option, and the only real choice, is to recommend refusal on the grounds of inadequate information.
- (f) It should be noted that option (iii) above would not prevent Hancock from making further applications in future with improved information.

¹⁹⁹ Commonwealth Government (1992) *National Strategy for Ecologically Sustainable Development*, Exhibit 125 [OK0013.000], p.8, Part 1 – Introduction.

²⁰⁰ *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256, [128].

- (g) Applying the precautionary principle, the proper course is to refuse the application:
- (i) Once the conditions precedent to the application of the precautionary principle are fulfilled, precautionary measures should be taken to address the risk of harm, unless it can be shown that the risk is negligible;²⁰¹
 - (ii) Hancock's evidence is unable to show that the risk is negligible. In fact, it is the inadequacy of Hancock's evidence which requires a precautionary approach;
 - (iii) Given the lack of credible information about the likely extent of the harm, recommending refusal is the correct response:
 - (A) In applying the precautionary principle, it is appropriate to adopt a proportionate response to the risk of harm;²⁰²
 - (B) It may be conceded that not every uncertainty in an assessment will require refusal. It depends on the nature of the uncertainty in question. As the Victorian Civil and Administrative Tribunal observed in *Cox v Southern Rural Water*, a case concerning the grant of a groundwater licence:

*uncertainty appears to be part and parcel of any assessment of groundwater resources. ... Within the decision making process the level of uncertainty about certain parameters deemed to be of importance and the consequences of 'getting it wrong' are likely to influence the ultimate decision.*²⁰³
 - (C) Here, the high level of uncertainty about what are undoubtedly important modelling parameters mean that it is not possible to

²⁰¹ *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256, [128].

²⁰² *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256, [167].

²⁰³ [2009] VCAT 1001, [39].

accurately determine the likely groundwater impacts of Alpha. This makes it impossible to properly gauge the consequences of 'getting it wrong' and weighs strongly in favour of refusal.

- (h) Attempting to manage the risk through conditions is not an appropriate approach in this case:
 - (i) One way of satisfying the precautionary principle is by an 'adaptive management' regime, in which impacts are monitored and the management regime altered to accommodate unexpected impacts through a series of conditions;²⁰⁴
 - (ii) However, as Preston CJ of the NSW Land and Environment Court has explained, adaptive management 'is not a "suck it and see", trial and error approach to management'.²⁰⁵ Instead, it relies upon having a sufficient level of knowledge to be able to monitor and respond to changes in the environment and to be confident that the desired outcome can be achieved;
 - (iii) The problems with Hancock's groundwater evidence are so significant that there is no way this Court could have the required confidence in being able to achieve any desired outcomes;
 - (iv) Accordingly, this is not an appropriate case in which to try to establish an adaptive management regime.
- (i) Nor can the risk be addressed by requiring make-good agreements to be entered into:

²⁰⁴ *Newcastle and Hunter Valley Speleological Society Inc. v Upper Hunter Shire Council and Stoneco Pty Ltd* [2010] NSWLEC 48, [185] and cases cited there.

²⁰⁵ *Newcastle and Hunter Valley Speleological Society Inc. v Upper Hunter Shire Council and Stoneco Pty Ltd* [2010] NSWLEC 48, [184].

- (i) Dr Webb's evidence, which was not disputed, was that the groundwater impacts of Alpha will last for centuries and that some of them will be permanent.²⁰⁶
- (ii) It is possible that a make-good agreement between a landholder and Hancock would be able to address some of these impacts for a period of time. That may be relevant in deciding the weight to be given to the impacts during the term of the agreement. This Court would still ultimately have to consider the overall impact of Alpha on groundwater though, as part of its decision under the EPA and the MRA.
- (iii) Further, the suggestion that make-good agreements can address the harm depends, to a large extent, on the assumption that the impacts predicted by Mr Stewart and Mr Hair are the likely impacts. If this assumption is not correct, it is not clear that make-good agreements can address the harm in the way suggested.

Conclusions on groundwater

- 90. Given the foregoing, the lack of adequate information regarding groundwater impacts justifies refusal under the EPA. The risk of getting it wrong is simply too great, with potentially disastrous consequences, particularly for nearby landholders. At the very least, the absence of any clear information about groundwater impacts must be a strong factor weighing against the recommendation of approval.
- 91. If the Court is concerned about recommending refusal on the basis of groundwater alone, it is respectfully submitted that it should still recommend refusal, but make a finding that the uncertainty may be able to be addressed by the Minister exercising his powers under s 271A of the MRA to refer the matter back to this Court for a further hearing on the groundwater issue.

²⁰⁶ Transcript 12-83.34 to 12-83.36, 13-20.7 to 13-20.17, 13-21.8 to 13-21.18, Expert Report by Dr Webb, Exhibit 42 [OCCA0011.000.000], p. 23, [61].

CLIMATE CHANGE

Introduction

92. There are two parts to the proper consideration of climate change in this case:
- (a) the evidence of the contribution to climate change made by the mining of the coal and its use; and
 - (b) the correct treatment of that contribution for the purposes of the assessment required under Queensland law.
93. It is not in dispute that the burning of coal from Alpha will produce greenhouse gas emissions and that those emissions will contribute to climate change. What is in dispute is whether, and if so how, this Court should consider those impacts.
94. In short, there is very little dispute between the parties concerning the facts, but there is considerable dispute about the law.
95. It is CCAQ's position that the legislative framework requires this Court to consider the environmental harm which will be, or is likely to be, caused by Alpha if authorised. The greenhouse gas accounting framework relied upon by Hancock, the hypothetical possibility of an alternative mine in a foreign location or the existence of a general government 'policy' in favour of coal mines do not detract from the fact that that Alpha, if approved, will make a significant partial contribution to climate change occurring.
96. It is appropriate to deal with this matter in three parts:
- (a) The facts;
 - (b) The law; and
 - (c) Hancock's approach.

The Facts

97. The following eight propositions are unarguably correct:

Proposition One – The mine is for thermal coal

- (a) The coal resource to be mined at Alpha is thermal coal:
 - (i) The application is based on the proposed mine producing 30 million tonnes (Mt) of thermal coal per annum.²⁰⁷
 - (ii) Over the proposed 30 year life-of-mine, the mine will produce approximately 839.6 Mt of thermal coal.²⁰⁸
 - (iii) If this mine were to proceed, it would be one of, if not the largest coal mine in Australia.²⁰⁹
 - (iv) The proposed mine contains total resources of 1.821 billion tonnes, of which 821 Mt are Measured, 700 Mt are Indicated, and the 300 Mt are Inferred.²¹⁰
 - (v) This is a sizable fraction of the proven reserves (coal that may be economically recoverable) of thermal coal globally, which are estimated to be 456 billion tonnes.²¹¹

Proposition Two – Thermal coal is solely for electricity production

- (b) The sole purpose for extracting the coal is for use in the production of electricity²¹² – internationally, but also potentially domestically.

²⁰⁷ Hancock Coal opening at Transcript 1-3.33 to T 1-4.4; Affidavit of Mr Willis, sworn 30 May 2013, Exhibit 13 [AH013.005.000].

²⁰⁸ Expert Report by Dr Taylor, Exhibit 5 [AH005.000.000], p 12..

²⁰⁹ Mr Willis, Transcript 1-43.17.

²¹⁰ EIS Vol 2, Section 4, Part 4.8.2.3, Exhibit 13.7.12 [OCCA0045.007.012]. Note that slightly different figures were stated in Hancock Coal's opening at Transcript 1-4.6 to 1-4.10, but this may be a transcription error. Slightly different figures are also provided in the EIS Vol 2, Section 2, Part 2.4.1.1, Exhibit 13.7.10 [OCCA0045.007.010].

²¹¹ Hancock Coal opening at Transcript 1-24.36 to 1-24.40; Appendix B (Salva Report on Thermal Coal Supply and Demand Study) to Expert Report by Mr Offen's, Exhibit 6.6 [AH006.002.000], p 2.

- (i) Initially all product coal is planned for export;²¹³ however,
- (ii) Domestic use will be explored.²¹⁴

Proposition Three - The use of coal will result in carbon emissions

- (c) The coal extracted is intended to be burnt to generate power, and thereby result in carbon dioxide (CO₂) emissions to the atmosphere:
 - (i) Axiomatically, by producing and selling thermal coal, the coal extracted is intended to be burnt in coal-fired power stations.²¹⁵
 - (ii) The application does not proceed upon the basis that the sale of the coal will be limited to power stations equipped with Carbon Capture and Storage (CCS) technology, thereby eliminating carbon emissions.
 - (iii) Indeed, Hancock's experts agree that CCS is not currently technologically or economically viable and it is unknown whether it will ever be viable.²¹⁶

Proposition Four - Use of the coal will contribute to climate change

- (d) The burning of the coal will make a contribution to harmful, greenhouse gas emissions:
 - (i) All of the parties, including Hancock Coal,²¹⁷ agree on the basic science of climate change including that the burning of fossil fuels, and the resulting emissions, will contribute to climate change.

²¹² Hancock Coal opening at Transcript 1-3.33 and 1-24.22 to 1-24.30.

²¹³ Hancock Prospecting Pty Ltd, *Hancock Alpha Project - Initial Advice Statement September 2008*, p 2 (Exhibit RDW-5 to the affidavit of Mr Willis, Exhibit 13.5, [AH013.005.000]).

²¹⁴ Hancock Prospecting Pty Ltd, *Hancock Alpha Project - Initial Advice Statement September 2008*, p 2 (Exhibit RDW-5 to the affidavit of Mr Willis, Exhibit 13.5, [AH013.005.000]).

²¹⁵ Hancock Coal opening at Transcript 1-24.22 to 1-24.30.

²¹⁶ Dr Taylor, Transcript 8-17.25; and Mr Stanford, Transcript 8-59.25.

- (ii) In their joint report the climate scientists agree that:
 - (A) the 'current understanding of climate change is not disputed';²¹⁸ and
 - (B) 'The most appropriate and more recent discussion of global climate change and regional implications for Australia can be found in the Climate Commission's reports, *The Critical Decade* (2011) and *The Critical Decade 2013* (2013).'²¹⁹

Proposition Five - The contribution is agreed

- (e) The contribution of those emissions to harmful climate change can and has been calculated and agreed:
 - (i) In their joint report the climate experts agree with Dr Taylor's calculations of the total emissions as follows:²²⁰
 - (A) Scope 1 - 11,036,093 tonnes of carbon dioxide equivalent (t CO₂-e);
 - (B) Scope 2 - 17,582,321 t CO₂-e; and
 - (C) Scope 3 - 1,828,744,093 t CO₂-e.
 - (ii) These calculations assume that the mine operates for 30 years and the volume of product coal is 839.6 million tonnes. If those assumptions are not correct, then the figures will change. In

²¹⁷ See Hancock Coal's opening at Transcript 1-23.30 to 1-23.36. See also the discussions of greenhouse gases in the EIS and SEIS: Exhibit 13.7.22 (EIS, Vol 2), section 14 (Greenhouse Gas Emissions and Climate Change); Exhibit 13.7.95 (EIS, Vol 6), Appendix C (Climate change and GHGs); Exhibit 13.7.79 (EIS, Vol 3), section 14.1.2 (Background on Greenhouse Gas Assessment).

²¹⁸ Joint Expert Report by Professor Jones, Professor Karoly and Dr Taylor, Exhibit 16 [AH016.000.000], p.2.

²¹⁹ Joint Expert Report by Professor Jones, Professor Karoly and Dr Taylor, Exhibit 16 [AH016.000.000], p.2.

²²⁰ Expert Report by Dr Taylor's, Exhibit 5 [AH005.000.000]. An addendum report, Exhibit 5.4 [AH005.004.000], did not materially affect these calculations.

particular, if more coal is produced than is assumed, emissions will be higher.²²¹

- (iii) Over 98% of the total (Scope 1, 2 and 3) emissions come from the burning of the coal.
- (iv) While the figures for emissions provided by Dr Taylor include all greenhouse gases, over 99% of the Scope 1, 2 and 3 emissions are carbon dioxide.²²²

Proposition Six – The contributions elsewhere affect the whole climate

- (f) The Earth’s atmosphere and climate system is a single entity.²²³ The Earth is a closed system where the damage to the atmosphere in one location can result in effects in other locations.²²⁴

Proposition Seven – Queensland depends on the climate

- (g) It is almost trite to say that Queensland, along with the rest of the world, depends upon the health of the Earth’s atmosphere and its climate system.

Proposition Eight – Use of the coal affects Queensland’s environment

- (h) The burning of the coal from the mine will affect Queensland, whether burnt in China, New South Wales or Queensland:
 - (i) Whichever way one seeks to bring to account the burning of coal on the scale supplied by the Alpha mine, the end result will be a significant contribution to global climate change, and therefore to the impacts of climate change on Queensland.

²²¹ Joint Expert Report by Professor Jones, Professor Karoly and Dr Taylor, Exhibit 16 [AH016.000.000], p.1.

²²² Dr Taylor, Transcript 8-35.13 to 8-35.15.

²²³ Dr Taylor, Transcript 8-41.4 to 8-41.18.

²²⁴ Dr Taylor, Transcript 8-41.4 to 8-41.18.

- (ii) The damage to the atmosphere and the Earth's climate system caused by the burning of the coal from the mine, whether it is burnt in Queensland or anywhere in the world, will or is likely to cause environmental harm and impacts in Queensland.²²⁵
- (iii) *The Critical Decade 2013* report:
 - (A) was published by the Australian Climate Commission;
 - (B) was accepted by all climate experts in this case as representative of the nature and extent of possible future impacts of climate change in Australia and in Queensland in particular;
 - (C) records the currently held and widely accepted view that a rise in mean temperatures of greater than 2 degrees Celsius will be dangerously high;
 - (D) observes the likely risks associated with temperature rises to Queensland in particular, including:²²⁶
 - (1) ocean acidification, which has negative impacts on sea life, including corals;²²⁷
 - (2) changes to the overall temperature distribution, resulting in more hot weather, including record breaking hot weather;²²⁸
 - (3) the bleaching, and possible death, of the Great Barrier Reef;²²⁹

²²⁵ Dr Taylor, Transcript 8-41.4 to 8-41.18.

²²⁶ *The Critical Decade 2013* report, Exhibit 115, [OCCA0018.000.000].

²²⁷ *Ibid*, Figure 31 on page 50.

²²⁸ *Ibid*, Figure 35 on page 54.

²²⁹ *Ibid*, Figure 47 on page 70.

- (4) more intense tropical cyclones;²³⁰
 - (5) more deaths from heat;²³¹ and
 - (6) inundation of coastal areas as a result of sea level rise.²³²
- (iv) In addition to the impacts listed in *The Critical Decade 2013*, Professor Karoly identified further climate change impacts in the form of biodiversity loss and damage to infrastructure.²³³

The Law

98. The key dispute in this area is whether, and if so, how this Court should take into account Alpha's contribution to climate change.
99. The question of what matters a decision-maker must take into account in making a decision – or in this case a recommendation – is ultimately a question of statutory construction.²³⁴ CCAQ's position is that, properly construed, both the EPA and the MRA require this Court to consider Alpha's contribution to climate change, including Scope 3 emissions.
100. In saying this, CCAQ recognises that the EPA and MRA create different legislative regimes and seek to achieve different purposes.²³⁵ There are a number of ways that the Court can approach these two Acts. Perhaps the safest is to simply treat them as two separate and independent statutes. This approach does not detract from the fact that there may be some overlap between the relevant considerations under the two Acts, a fact that the Court has recognised in the past.²³⁶

²³⁰ Ibid, Section 3.3 on page 74.

²³¹ Ibid, Section 3.3 on page 74.

²³² Ibid, Section 3.3 on page 74.

²³³ Expert Report by Professor Karoly's, Exhibit 40 [OCCA0009.000.000], p.9, [34].

²³⁴ See, e.g., *Minister for Aboriginal Affairs v Peko-Wallsend Ltd* (1986) 162 CLR 24, at 40.

²³⁵ *Donovan v Struber* [2011] QLC 45, [14].

²³⁶ *Delacey v Kagara* [2009] QLC 77, [171].

The Environmental Protection Act

101. As noted, the question of whether a particular matter is a relevant consideration is a matter of statutory construction to be determined according to the subject matter, scope and purpose of the Act.²³⁷ This requires consideration of the Act as a whole.²³⁸
102. In this case, the subject matter, scope and purpose of the Act all support consideration of Scope 3 emissions:
- (a) Consideration of Scope 3 emissions is consistent with the purpose of the Act which seeks to protect Queensland’s environment from environmental harm:
 - (i) Section 3 of the EPA relevantly states that the purpose of the Act is ‘to protect Queensland’s environment’.
 - (ii) Section 14 of the EPA goes onto define ‘environmental harm’ as:

*any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.*²³⁹
 - (iii) An ‘environmental value’ is defined as ‘a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety’.²⁴⁰
 - (iv) The existing climate system is clearly an ‘environmental value’ in that it forms a key part of the environment in which humans and numerous other species have been able to grow and flourish.
 - (v) Equally clearly, climate change is environmental harm as it will have

²³⁷ *Minister for Aboriginal Affairs v Peko-Wallsend Ltd* (1986) 162 CLR 24, at 40.

²³⁸ *Peko-Wallsend Ltd v Minister for Aboriginal Affairs* (1985) 5 FCR 532, at 539; *Papillon Mining & Exploration P/L v Minister for Mines and Energy* [2009] QSC 97, [24].

²³⁹ Section 14(1)(a), *Environmental Protection Act 1994* (Qld).

²⁴⁰ Section 9, *Environmental Protection Act 1994* (Qld).

a significant permanent adverse effect on the existing climate system, effectively replacing it with a new system in which temperatures are consistently higher. CCAQ notes that Hancock does not appear to dispute this, as it accepts that its Scope 1 and 2 emissions are an environmental issue.

- (vi) In this context, it is not relevant that Scope 3 emissions may, as Dr Taylor suggested,²⁴¹ only be an indirect consequence of the mining of coal. This is because, in defining environmental harm, the EPA expressly provides that environmental harm may be caused by an activity 'whether the harm is a direct or indirect result of the activity'.²⁴² Moreover, given that the only purpose of thermal coal is to be burnt, it is at least arguable that it is a direct consequence. On any view, it is plainly within the contemplation of Hancock, that the coal it sells will be burnt.²⁴³
 - (vii) It would be inconsistent with the object of the EPA to simply ignore the fact that Scope 3 emissions do make a significant contribution to climate change which constitutes a form of environmental harm.
- (b) Consideration of Scope 3 emissions is also consistent with obligation to consider the principles of ESD:
- (i) Section 223 of the EPA, as it applies to this decision,²⁴⁴ requires the

²⁴¹ Dr Taylor, Transcript 8-36.40 to 8-36.41.

²⁴² Section 14(2)(a), *Environmental Protection Act 1994* (Qld).

²⁴³ The fact that thermal coal has no other purpose than to be burnt was considered a relevant factor by Pain J in *Gray v Minister for Planning* in finding that Scope 3 emissions should be taken into account: (2006) 152 LGERA 258, [100].

²⁴⁴ Since this proceedings was commenced, the *Environmental Protection Act 1994* (Qld) was significantly amended by *Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012* (Qld). In the absence of anything to the contrary, this Court would ordinarily be required to make its recommendation on the basis of the law in force at the time of its recommendation: see, e.g., *Kentlee Pty Ltd v Prince Consort Pty Ltd* [1998] 1 Qd R 162, 173. Section 683 of the EPA as currently in force, however, provides that, where an application was lodged prior to the amendments commencing on 31

Court to consider the 'standard criteria', including the principles of ecologically sustainable development (ESD) set out in the *National Strategy for Ecologically Sustainable Development*.

- (ii) Relevantly, the ESD principles include:
 - (A) The principle of intergenerational equity;
 - (B) The precautionary principles; and
 - (C) The need to recognise and consider 'the global dimension of environmental impacts and policies'.
- (iii) It was held in *Gray v Minister for Planning*, that the principle of intergenerational equity requires consideration of Scope 3 emissions. *Gray* concerned a coal mine at Anvil Hill in NSW. There, Pain J concluded that, as a matter of law, intergenerational equity could not have been considered as part of an EIA process 'if the major component of GHG which results from the use of the coal, namely scope 3 emissions, is not required to be assessed'.²⁴⁵ For the same reasons, her Honour held that there had also been a failure to consider the precautionary principle.²⁴⁶
- (iv) The need to recognise the global dimension of environmental impacts also supports considerations of Scope 3 emissions, wherever they are produced. This is because it is not possible to distinguish between Queensland's climate system and the broader global

March 2013, 'processing of the application and all matters incidental to the processing must proceed as if the [*Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012*] had not been enacted'. Accordingly, s 223 continues to apply to this application (which was lodged in 2009) in the form it was in prior to that Act being enacted.

²⁴⁵ (2006) 152 LGERA 258, [126].

²⁴⁶ (2006) 152 LGERA 258, [134]-[135].

system.²⁴⁷

(c) The text and structure of the Act as a whole also support treating Scope 3 emissions as a relevant consideration:

(i) Consistent with the terms of s 3, the structure of the Act is built around prohibiting environmental harm, but allowing approval where it is judged to be in the interests of the community:

(A) as explained above, climate change is clearly a form of environmental harm and Scope 3 emissions are part of that harm;

(B) section 493A of the EPA provides that it is unlawful for a person to cause environmental harm;²⁴⁸

(C) section 493A(2) provides a specific exception to this principle where the environmental harm is authorised by a relevant instrument, environmental authorities;

(D) The EPA provides a number of processes by which those authorising instruments, including environmental authorities, can be obtained; and

(E) In each of those authorising processes, reason dictates that the environmental harm to be authorised must be a relevant consideration. Any other conclusion would be absurd and absurdity in the construction of statutes should be avoided.

(d) It is also relevant to note that the EPA does not confine the grounds on

²⁴⁷ Dr Taylor, Transcript 8-41.4 to 8-41.18.

²⁴⁸ See also Chapter 8, Part 3 of the Act, which creates the offences of 'causing serious environmental harm', 'causing material environmental harm' and 'environmental nuisance' (environmental nuisance is specifically defined by s 14(1) as being a form of environmental harm).

which a person may object to the grant of a mining lease. Had Parliament intended to confine the matters to be considered by this Court, it could easily have done so.²⁴⁹

- (e) Treating Scope 3 emissions as relevant is also consistent with similar decisions under other similar legislation:
 - (i) As noted, in *Gray v Minister for Planning*, the NSW Land and Environment Court held that Scope 3 emissions were a relevant consideration in considering an application for a coal mine under the *Environmental Planning and Assessment Act 1979* (NSW). In reaching this conclusion, Pain J relied upon the need to take into account principles of ESD (in particular intergenerational equity and the precautionary principle) which, her Honour held, could not be done if Scope 3 emissions were ignored.
 - (ii) Further, in *Queensland Conservation Council Inc. v Minister for Heritage*, Kiefel J, as her Honour then was, construed the phrase ‘all adverse impacts’ in the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) as including indirect impacts caused by the actions of third parties.²⁵⁰ Her Honour observed that a wide reading of the phrase was supported by ‘the high public policy apparent in the objects of the Act’. That observation is equally applicable here.²⁵¹

103. All of these factors support a conclusion that Scope 3 emissions are a relevant consideration under the EPA.

²⁴⁹ Compare *Re Warden French; ex parte Serpentine-Jarrahdale Ratepayers and Residents Association* (1994) 11 WAR 315, at 328, citing the judgment of Mason J, as his Honour then was, in *Stow v Mineral Holdings (Australia) Pty Ltd* (1977) 180 CLR 295, at 302.

²⁵⁰ [2003] FCA 1463; an appeal against her Honour’s judgment by the Minister was dismissed by the Full Federal Court in *Minister for Environment and Heritage v Queensland Conservation Council Inc.* (2004) 139 FCR 24.

²⁵¹ [2003] FCA 1463, [40], citing *Marks v GIO Australia Holdings Ltd* (1998) 196 CLR 494 at 515, 528, 537.

104. It is acknowledged that, in *Xstrata Coal Pty Ltd v Friends of the Earth, Brisbane Co-op Ltd*, the Land Court found that Scope 3 were not relevant to its consideration under the EPA.²⁵² This decision is not binding on this Court and it is respectfully submitted that it should not be followed:

- (a) It is CCAQ's position that, for the reasons set out above, Scope 3 emissions are a relevant consideration under the EPA;
- (b) The *Xstrata* Court appears to have concluded that its consideration was confined to the direct physical impacts of the mining activities expressly authorised by the EA;²⁵³
- (c) With respect, this conclusion would appear to be at odds with the express words of the EPA which provide that the concept of environmental harm under the EPA includes indirect and cumulative harms;²⁵⁴
- (d) Further, s 14A of the *Acts Interpretation Act 1954* (Qld) expressly provides that, in interpreting an Act, the court should prefer 'the interpretation which would best achieve the purpose of the Act'. In this case, the purpose of the EPA is to protect the environment whilst allowing ecologically sustainable development. This objective is best achieved by a clear-eyed balancing of benefits and costs, not by artificially ignoring a recognised form of environmental harm on the ground of an accident of geography, particularly given that the sole purpose of thermal coal is to be burnt for fuel, creating emissions;²⁵⁵

²⁵² [2012] QLC 13.

²⁵³ [2012] QLC 13, [610].

²⁵⁴ *Environmental Protection Act 1994* (Qld), s 14(2).

²⁵⁵ In *Minister for the Environment and Heritage v Queensland Conservation Council Inc* (2004) 139 FCR 24, one of the reasons given by the Full Federal Court for considering the "downstream" impacts of building the Nathan Dam, such as increased irrigation, was that the use of the water for irrigation was within the contemplation of the proponents: [57]-[60]. That is, it was not an unexpected or unforeseen consequence.

- (e) Accordingly, it is respectfully submitted that this Court should decline to follow the decision in *Xstrata* in relation to its construction of the EPA.

The Mineral Resources Act

105. The relevance of Scope 3 emissions under the MRA is less clear cut than under the EPA.

106. That said, the ‘public interest’ criterion contained in s 269(4) of the MRA requires, or at least authorises, consideration of Scope 3 emissions:

- (a) The concept of the ‘public interest’ is broad enough to incorporate consideration of Scope 3 emissions. As McPherson JA, with whom Jerrard JA and White J agreed, explained in *Harburg Investments Pty Ltd v Mackenroth*,

[t]he expression ‘in the public interest’, when used in a statute, was said [by the High Court] in O’Sullivan v Farrer to import:

‘a discretionary value judgment to be made by reference to undefined factual matters, confined only ‘in so far as the subject matter and the scope and purpose of the statutory enactments may enable ... given reasons to be [pronounced] definitely extraneous to any objects the legislature could have had in view’.”²⁵⁶

- (b) Here, it cannot be said that consideration of Scope 3 emissions are ‘definitely extraneous’ to any of the MRA’s objects. This is particularly so given that the objectives of the MRA include encouraging environmental responsibility in mining.²⁵⁷

²⁵⁶ [2005] 2 Qd R 433, [3]. In *Papillon Mining & Exploration Pty Ltd v Minister for Mines and Energy* [2010] 1 Qd R 452, Fryburg J applied what was said in *Mackenroth* to the public interest criterion under s 286A of the MRA. Whilst s 269(4)(k) is cast in slightly different terms, those differences are not material.

²⁵⁷ *Mineral Resources Act 1989* (Qld), s 2.

- (c) Further, the concept of the ‘public interest’ has been held to incorporate principles of ESD:
- (i) In *Minister for Planning v Walker*, Hodgson JA of the NSW Court of Appeal, with whom Bell and Campbell JJA agreed, held that the concept of the ‘public interest’ incorporated the principles of ESD.²⁵⁸ Nonetheless, his Honour concluded the Minister had not erred by failing to take into account ESD principles on that occasion. His Honour then continued:
- However, I do suggest that the principles of ESD are likely to come to be seen as so plainly an element of the public interest, in relation to most if not all decisions, that failure to consider them will become strong evidence of failure to consider the public interest and/or to act bona fide in the exercise of powers granted to the Minister, and thus become capable of avoiding decisions.*²⁵⁹
- (ii) A year later, in *Aldous v Greater Taree City Council*,²⁶⁰ Biscoe J of the Land and Environment Court held, following *Walker*, that the time had come to treat ESD as a mandatory element of the public interest, although on the facts his Honour found no failure to take it into account.
- (iii) If it is correct that ESD is an element of the public interest, even where it is not expressly spelt out, then it follows, for the reasons given by Pain J in *Gray* in relation to the principle of intergenerational equity and the precautionary principle, that Scope 3 emissions must be considered.

²⁵⁸ [2008] NSWCA 224, [42] – [43].

²⁵⁹ [2008] NSWCA 224, [56]. Cf. [66] per Bell JA, preferring not to express a view.

²⁶⁰ [2009] NSWLEC 17.

- (d) Treating the ‘public interest’ as including consideration of Scope 3 emissions is also consistent with the function of the ‘public interest’ under the MRA:
- (i) As Stephen J explained in *Sinclair v Maryborough Mining Warden*, the function of the concept of the ‘public interest’ under the MRA ‘involve[s] the weighing of benefits and detriments’ associated with the grant of the mining lease.²⁶¹
 - (ii) Consistent with this, if there is a recognised detriment that will result from the granting of the lease, then the Court ought not to shut its eyes to that detriment but should take it into account.
- (e) Taking into account Scope 3 emissions is also consistent with the role of this Court in making recommendations to the Minister under the MRA:
- (i) The role of this Court is to make recommendations to the Minister regarding the exercise of his discretion to grant a mining lease;
 - (ii) In making his decision, the Minister must take into account both the Court’s recommendation and the matters set out in s 269(4) of the MRA, including the ‘public interest’;
 - (iii) Given the Court’s role of advising the Minister (as opposed to making the decision itself), it is inappropriate to pre-emptively exclude matters from its consideration unless they are ‘definitely extraneous’. As Ipp J, with whom Kennedy J agreed, explained in *Re Warden French; ex parte Serpentine-Jarrahdale Ratepayers and Residents Association*,
- there are very good reasons why the Warden should first investigate matters of public interest, in open court, with full opportunity for matters to be contested and argued, so that the Minister is fully*

²⁶¹ (1975) 132 CLR 473, at 485.

*apprised of all relevant material, that has been fairly and publicly ventilated, before making a decision.*²⁶²

- (iv) If the Court were to pre-emptively exclude Scope 3 emissions from its consideration, then it would make the task of the Minister more difficult if he considered those matters were in fact relevant to his discretion in making a recommendation.²⁶³

107. In addition to being relevant to the “public interest” under s 269(4)(k), Scope 3 emissions may also be regarded as an indirect adverse “impact” on the environment of Alpha²⁶⁴ under s 269(4)(j) and a “good reason” to refuse the mine under s 269(4)(l) of the MRA. Section 269(4)(l) of the MRA is an extremely wide consideration that is limited only by the subject matter, scope and purposes of the Act.²⁶⁵ Clearly, there must be a good reason, as opposed to a reason that is extraneous to the purposes of the Act.²⁶⁶ The question of whether good reason has been shown must depend on all the circumstances of the particular case.²⁶⁷
108. All of these factors support a conclusion that Scope 3 emissions are a relevant consideration under the MRA. Alternatively, they support a conclusion that, at the very least, Scope 3 emissions are not an irrelevant consideration such that this Court is required to exclude them from consideration.

²⁶² (1995) 11 WAR 315, 328 – 329. Although that case concerned the function of a Mining Warden under the *Mining Act 1978* (WA), his Honour’s observations were approved by the Land Appeals Court in *Dunn v Burtenshaw* [2010] QLAC 5, [33], which noted that ‘the obligations and recommendation of a mining warden pursuant to the Western Australian legislation closely mirror the previous functions of the mining warden in Queensland and the present functions of the Land Court under the current provisions of the MRA’: [34].

²⁶³ A point made by Pain J in *Gray v Minister for Planning* [2006] NSWLEC 720.

²⁶⁴ Although the learned President took a contrary approach in *Xstrata Coal Queensland Pty Ltd & Ors v Friends of the Earth – Brisbane Co-Op and Department of Environment and Resource Management* [2012] QLC 013 at [535]-[549].

²⁶⁵ *Minister for Aboriginal Affairs v Peko-Wallsend Ltd* (1986) 162 CLR 24 at 39-40.

²⁶⁶ *Water Conservation and Irrigation Commission (NSW) v Browning* (1947) 74 CLR 492 at 505.

²⁶⁷ See *Campbell v United Pacific Transport* [1966] Qd R 465, at 472.

109. Again, it is acknowledged that, in *Xstrata Coal Pty Ltd v Friends of the Earth, Brisbane Co-op Ltd*, the Land Court found that Scope 3 were not relevant to its consideration under the MRA.²⁶⁸ Again, CCAQ contends that this decision is not binding on this Court and, with respect, ought not to be followed:

- (a) In *Xstrata*, the Court appears to have confined its consideration of Scope 3 emissions to considering the operation of s 269(4)(j), which requires consideration of ‘any adverse environmental impacts of those operations’;
- (b) The *Xstrata* Court interpreted ‘those operations’ in s 269(4)(j) as referring to ‘the mining operations’ authorised under the mining lease and construed s 269(4)(j) narrowly as confined only to the direct physical impacts of the mining operations;
- (c) Without conceding the correctness of this conclusion, CCAQ notes that the *Xstrata* Court does not appear to have considered whether s 269(4)(k) independently authorised consideration of Scope 3 emissions;
- (d) For the reasons set out above, CCAQ contends that s 269(4)(k) permits and requires consideration of Scope 3 emissions. This is so notwithstanding the presence of s 269(4)(j):
 - (i) If, as the *Xstrata* Court held, s 269(4)(j) is intended to apply only to direct environmental impacts, then there is no justification for treating it as necessarily excluding consideration of indirect environmental impacts in case where those impacts are relevant, significant and may affect the ‘public interest’;
 - (ii) For the mining of many materials, there may be no relevant indirect impacts. In the case of thermal coal, however, which is mined exclusively for the purpose of being sold to be burnt and generate

²⁶⁸ [2012] QLC 13.

power, there are clearly significant indirect impacts with significant consequences for Queensland as a whole.

- (e) Accordingly, CCAQ respectfully submits that *Xstrata* ought not to be followed by this Court.

Conclusions on the law

110. For the reasons set out above, CCAQ contends:

- (a) It cannot reasonably be argued that Scope 3 emissions are not a relevant consideration under the EPA. Such a result would be entirely at odds with the whole thrust of the Act; and
- (b) In relation to the MRA, whilst the position is less clear, Scope 3 emissions are required to be taken into account under s 269(4)(k), which requires consideration of the 'public interest' or, alternatively, are not excluded from consideration.

Hancock's approach to the law

111. Hancock acknowledges that, if mined and sold, that the burning of coal from Alpha will produce harmful greenhouse gas emissions. Nor does Hancock pretend that those emissions will not have an adverse impact on the environment.

112. Rather, Hancock's argues that, as a matter of law, this Court ought not, or is not permitted to, consider scope 3 emissions. This argument is put on three bases:

- (a) Deflected responsibility, that is, an argument that 'if we don't do it then someone else will';
- (b) Hancock's interpretation of greenhouse gas accounting rules; and
- (c) The existence of a general government policy in favour of coal.

113. The common feature of all these arguments is that they find no basis in the text of either the EPA or the MRA.

114. In relation to the ‘deflected responsibility’ argument:

- (a) It is clear that, at least under the EPA, the Court must consider the environmental harm, including indirect and cumulative harm,²⁶⁹ resulting from the activities for which approval is sought. This includes a project’s contribution to climate change;
- (b) As noted, Hancock’s argument is not that Alpha will not make a contribution to climate change. Instead, the argument is that this contribution should be ignored simply because another project undertaken by someone else somewhere else might, if it happens, have the same impact;
- (c) Nothing in either the EPA or the MRA suggests that a relevant impact ceases to be an impact simply because it is possible that equivalent environmental harm will be caused by some other project;
- (d) As such, Hancock’s argument is essentially that this Court should read into both Acts a limitation which has no basis in either. The Court should reject this invitation. As Lord Mersey stated in *Thompson v Goold & Co*:

*It is a strong thing to read into an Act of Parliament words which are not there, and in the absence of clear necessity it is a wrong thing to do.*²⁷⁰

- (e) It should be noted that the ‘deflected responsibility’ argument is equally applicable to Alpha’s Scope 1 and 2 emissions, or indeed any emissions from any source in Australia or elsewhere, but, perhaps wisely, this

²⁶⁹ *Environmental Protection Act 1994* (Qld), s 14(2).

²⁷⁰ [1910] AC 409, at 420. *Thompson* remains frequently cited: see, e.g., *Metroplex Management Pty Ltd v Brisbane City Council* [2010] QCA 333, [45]; *Nicholas v Wesfarmers Curragh Pty Ltd & Ors* [2010] QSC 447, [31].

argument is not pressed by Hancock as it would reveal the fact that this argument, if accepted, would essentially preclude any consideration of carbon emissions by this Court as there is always another hypothetical project waiting just over the hill.

115. Turning to the accounting argument, this should be rejected:

- (a) Hancock contends that, because it is only required to account for its Scope 1 and 2 emissions under the *National Greenhouse and Energy Reporting Act 2007* (Cth) (**NGER Act**) and because Australia is only required to account for its Scope 1 emissions under the *United Nations Framework Convention on Climate Change* (**UNFCCC**), then this Court is not required to consider Scope 3 emissions in assessing the environmental harm that will be caused by Alpha. Put another way, the argument is ‘we do not have to count it, therefore the Court does not have to consider it’;
- (b) As with the ‘deflected responsibility’ argument, the correctness of this submission ultimately depends on the proper construction of the EPA and the MRA.
- (c) Properly construed, neither the NGER Act nor the UNFCCC has the effect Hancock alleges:
 - (i) In relation to the UNFCCC,
 - (A) It is accepted that, in construing the statute, it is appropriate to construe it so as to conform to Australia’s international obligations;²⁷¹
 - (B) The ultimate objective of the UNFCCC, as stated in Article 2, is
to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations

²⁷¹ *Minister for Immigration and Ethnic Affairs v Teoh* (1995) 183 CLR 273, at 287.

in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

- (C) Consistent with this objective, there is nothing in the UNFCCC which, subject to other international obligations, would prevent any nation from taking action to address climate change, especially where that action consists merely of taking into climate change impacts into account in domestic decision-making;
 - (D) Indeed, given the ultimate objective of the UNFCCC is not merely to establish a reporting regime, but to actually reduce emissions, it would be extremely surprising if it prevented parties from taking steps to address emissions.
- (ii) In relation the NGER Act,
- (A) The NGER Act is an Act of the Commonwealth Parliament;
 - (B) The issue of inconsistency between Commonwealth and State legislation is governed by s 109 of the Commonwealth Constitution and depends on Parliament's intention in passing the NGER Act;²⁷²
 - (C) Section 5 of the NGER Act expressly addresses the issue of inconsistency and excludes, in substance, any State or Territory legislation purporting to create a carbon reporting framework;
 - (D) Neither the EPA nor the MRA create a reporting framework. Instead, they require assessment of the impacts, including the environmental impacts, of the relevant proposal;

²⁷² See, e.g., *Momcilovic v the Queen* (2011) 245 CLR 1, [102] - [103].

(E) Put simply, there is nothing in the NGER Act that would suggest any intention to exclude Scope 3 emissions, if otherwise relevant, from consideration as part of the operation of normal environment protection and project approval legislation such as the EPA.

(d) The reality is that the NGER Act and the UNFCCC simply have no bearing on the operation of the EPA and the MRA. They are directed to different purposes.

116. Finally, the Court ought not to accept the policy argument advanced by Hancock:

(a) Hancock's contention here is that, because governments, State and Federal, favour the coal industry, the Court should not do anything to discourage investment in that industry, such as making private companies bring to account emissions caused by burning of the coal they sell, whether in Australia or overseas. This is perhaps most apparent in Mr Stanford's observation that:

*Governments will be wary ... of allowing regulators to impose conditions that could prevent proposed new mines from going ahead or discourage investment in the industry.*²⁷³

(b) This should be categorically rejected. As this Court has previously observed in this very matter, the Court is not a 'rubber stamp' and should not be viewed as such by anyone.

(c) It is unsurprising that governments, in the business of being popularly elected, may favour projects with the potential to deliver short-term economic benefits to their constituents, but the function of this Court, under both the EPA and the MRA, is to act independently, to provide a

²⁷³ Expert Report by Mr Jon Stanford, Exhibit 4 [AH004.000.000], p. 25.

forum for the ventilation of argument and the rigorous testing of evidence and, after that, to make a full and frank report to the Minister regarding the likely impacts, positive and negative, of the proposals before it.

- (d) The importance of this function, and proper approach to it, was recognised by Barwick CJ, with whom Murphy J agreed, in *Sinclair v Maryborough Mining Warden*. His Honour said:

*It is to my mind very important that hearing of an application and of objections thereto by a mining warden take place according to law. The purpose of notifying the making of the applications, indicating the time for objections and of the date of hearing, is to afford the applicant on the one hand an opportunity to justify in a public hearing the grant of a mining lease, both in point of area and point of term, and also to give the public an opportunity of opposition supported by evidence to the grant of a mining lease. I cannot accept the proposition that the hearing of the application and of the objections is a mere formality...*²⁷⁴

- (e) In particular, the Court serves a unique function in the assessment of EA and mining lease applications by providing for the public testing of evidence. While Alpha may have received a number of government approvals prior to the hearing, the reality is that these approvals were provided with little opportunity for interested parties to challenge the assertions made by Hancock. The importance of this testing is underlined by the fact that Hancock has made a number of significant concessions regarding its evidence that might well have been material to those earlier decisions, but were only exposed through this process.
- (f) Ultimately, this Court has to discharge the vital functions conferred on it by statute. As Mr Stanford conceded, none of the policies he identified had the effect of changing the legislative regime to be applied by this

²⁷⁴ (1975) 132 CLR 473, at 481.

Court²⁷⁵ and this Court should not shy away from fully and vigorously examining the evidence simply because of a perception of what ‘Governments’ want.

Weight

117. The question of relevance is, of course, only the starting point for considering Alpha’s climate change impacts. The real question is how much weight should be given to those impacts.²⁷⁶

118. The answer is that it largely depends upon the scale of the emissions in question. Despite Dr Taylor’s flippant comparison between Alpha and a taxi ride,²⁷⁷ the emissions from Alpha cannot be regarded as anything other than significant:

- (a) It is conceded that measuring the contribution of a particular project to climate change is a complex enterprise. One way of measuring contribution is as a percentage of overall emissions. Looked at this way, the contribution of any single project to climate change really depends on how bad the situation really gets.
- (b) Broadly speaking, when it comes to climate change, there are two main scenarios:
 - (i) The ‘best case’ scenario, from a climate change perspective, is one in which firm and timely action is taken on climate change. In this scenario, emissions of carbon dioxide are limited to 600 billion tonnes or less between now and 2050 and, as a result, climate change is limited to 2°C or less. Such a scenario still has significant negative environmental impacts, including temperature rises, coral bleaching and sea level rises.

²⁷⁵ Transcript 8-69.25 – 8-70.20.

²⁷⁶ *Gray v Minister for Planning* (2006) 152 LGERA 258 at [136]-[138].

²⁷⁷ Transcript 8-25.35.

(ii) The 'business as usual' scenario is one in which little or no action is taken on climate change and emissions continue to track at the top of projections. In this scenario, climate change exceeds 4°C and its impacts are, in a word, catastrophic. In addition to the impacts experienced at lower temperatures, the Intergovernmental Panel of on Climate Change predicted that climate change of 4°C or more would lead to:

(A) 'Hundreds of millions more people exposed to increased water stress';

(B) 40% or more of species becoming extinct;

(C) Millions of additional people potentially at risk from coastal flooding; and

(D) Various impacts on human health:

(1) 'Increasing burden from malnutrition, diarrhoeal, cardio-respiratory and infectious diseases';

(2) 'Increasing morbidity and mortality from heat waves, droughts and floods'; and

(3) A '[s]ubstantial burden on health services'.²⁷⁸

(c) In between these two scenarios lie a range of possibilities in which the impacts of climate change are worse than in the best case scenario, but not as bad as in the business as usual scenario.

119. Depending on the desired outcome, it is possible to identify a global 'budget' of carbon the globe can emit before losing the opportunity to achieve that outcome:

²⁷⁸ IPCC 2007 Exhibit 113, Figure 3.6.

- (a) In order to have a good chance (75%²⁷⁹) of limiting temperature increases to no more than 2°C (i.e. the figure beyond which it is widely recognised that the most serious effects of climate change begin to manifest themselves):
- (i) A global budget of carbon dioxide emissions 600 billion between now and 2050;²⁸⁰
 - (ii) On current trends, the budget will be spent by 2028;²⁸¹
 - (iii) The climate scientists in this case agreed that the burning of coal from this mine would represent 0.3% of the 600 billion tonne budget for greenhouse gas emissions for the total period.²⁸²
- (b) Of course, the percentage of contribution from Alpha changes with the scenario: the larger the total emissions, the lower the percentage contribution from Alpha. Conversely, the smaller the total emissions, the larger the contribution from the mine. In other words,
- (i) If the world does nothing about man made climate change and runs at full speed into a future of over 4°C increases in mean temperatures then the coal burned from the Alpha mine will, as a percentage of total emissions, be a relatively small contribution to a catastrophe.
 - (ii) On the other hand, if serious action is to be taken on climate change, then the contribution from Alpha is a significant part of a large problem which must be overcome.

²⁷⁹ *The Critical Decade 2013* report, Exhibit 115 [OCCA0018.000.000], pp 82-83.

²⁸⁰ *The Critical Decade 2013* report, Exhibit 115 [OCCA0018.000.000], pp 82-84.

²⁸¹ *The Critical Decade 2013* report, Exhibit 115 [OCCA0018.000.000], pp 82-84.

²⁸² Expert Report by Professor Karoly, Exhibit 40 [OCCA0009.000.000], pp 8-9, para 28; Dr Taylor, Transcript 8-40.40, to Transcript 8-41.2; and Expert Report by Professor Jones, Exhibit 110 [OK0004.000], p 3, para 1.

- (c) In this case, an appropriate approach for the Court to adopt here is the 'best case' scenario, with its' 600 billion tonne carbon budget, as the relevant figure for comparison. This is because the EPA specifically requires this Court to consider the 'resilience ... of the receiving environment' as one of the 'standard criteria' in making its decision.²⁸³ Given that the 2°C figure is 'accepted by most nations of the world as an estimate of the level beyond which dangerous climate change lies',²⁸⁴ this provides a convenient measure of the resilience of the atmosphere, although realistically significant adverse impacts are likely to occur even before warming reaches 2°C.²⁸⁵
- (d) Importantly, regardless of what scenario is considered, the amount of emissions expressed in absolute terms does not change, nor does the fact that the emissions will still be a significant contributor to a global problem.

Conclusions on Climate Change

120. The reality is that Alpha will make a significant contribution to climate change, primarily through its Scope 3 emissions. As a matter of law, that contribution cannot, and should not, be ignored.
121. Taken along with the very serious groundwater issues in this case, the likely climate change contribution made by Alpha means that this Court should recommend that Alpha not proceed.
122. Hancock places significant emphasis upon the positive impacts of the proposal if approved. True it is that, if proved, these positive impacts may have an impact upon the end result. In truth however, these positive impacts are at best exaggerated and at worst a work of unsubstantiated fiction.

²⁸³ *Environmental Protection Act 1994* (Qld), s 223(c) and Schedule 4.

²⁸⁴ *The Critical Decade 2013* report, Exhibit 115 [OCCA0018.000.000], p 80.

²⁸⁵ *The Critical Decade 2013* report, Exhibit 115 [OCCA0018.000.000], p 80.

ECONOMICS

Introduction

123. The statutory framework this Court has to apply demands a balancing of the positives and negatives that might flow from the grant of the approvals sought.
124. Hancock's case depends upon establishing that, notwithstanding the negatives which might flow from this proposal in environmental and social terms, there are considerable economic benefits which flow to the State and to the community.
125. It is critical to the outcome of any balancing exercise of the kind required here that the information upon which the assessment is provided fairly and accurately represents those positives and negatives. Information which is biased one way or the other will always skew the outcome of the analysis.
126. In this case, there is good reason to be sceptical that the projected benefits will ever be realised at all or that, if realised, they will reach the levels projected:
- (a) at a fundamental level, the Economic Impact Analysis is premised on a level of demand for coal that is not supported by any evidence at all;²⁸⁶
 - (b) further, the Economic Impact Analysis exaggerates the benefits of Alpha by:
 - (i) using a method that is known to overstate benefits;²⁸⁷ and
 - (ii) failing to take into account any social or economic costs that might be associated with the project.²⁸⁸
127. These flaws are further exacerbated by the failure of the Economic Impact Analysis to consider, or even acknowledge, the uncertainties regarding the future of the coal market.²⁸⁹

²⁸⁶ See paragraphs [128] to [138] below.

²⁸⁷ See paragraphs [143] to [146] below.

²⁸⁸ See paragraph [145] below.

Demand for coal

128. Demand for coal is a critical issue in this matter.
129. The delivery of the promised benefits is not only dependent upon the ongoing existence of demand for the coal produced at Alpha, but a demand at a price that ensures that Alpha is economically viable:
- (a) If coal prices are too low then, then Hancock, as a prudent business operator, will defer investment in Alpha.²⁹⁰ This would mean that the projected benefits associated with that investment, including employment benefits, would not be realised.²⁹¹
 - (b) Hancock has elected not to provide this Court, or even its own experts,²⁹² with any information about the rate of return required to make Alpha viable, leaving significant uncertainty over the circumstances in which Alpha will proceed.
130. Evidence of the factors which contribute to the economic viability of Alpha, and therefore the likelihood of projected benefits being realised, is clearly relevant evidence in this case. Without that evidence, most of the economic analysis is affected by considerable uncertainty. Hancock has provided no explanation for its decision to not to adduce such evidence. It is open for this Court to draw the inference that such evidence would not have assisted Hancock.²⁹³
131. The fact is that there is considerable uncertainty regarding the future of the coal market:

²⁸⁹ See paragraphs [129] to [136] below.

²⁹⁰ Mr Brown, Transcript 7-81.27 to 7-81.32.

²⁹¹ Mr Brown, Transcript 7-80.42 to 7-80.46; Mr Stanford, Transcript 8-60.27 to 8-60.44.

²⁹² Under cross examination Mr Brown revealed that 'we had made enquiries when we actually prepared the EIS as to, sort of, roughly speaking, what was the hurdle rate for the project and we were told that that's commercial in-confidence information': Transcript 7-81.10 to 7-81.14.

²⁹³ *Jones v. Dunkel* (1959) 101 CLR 298, at 308 per Kitto J.

- (a) All of the experts agreed that there was significant uncertainty or risk regarding future demand for coal over the life of the mine;²⁹⁴
- (b) The consensus among the experts in this case is confirmed by the IEA *World Energy Outlook 2012* (“WEO 2012”);²⁹⁵
- (c) Both Mr Offen and Mr Stanford agreed that there are a variety of factors that may impact on demand for coal including:
 - (i) Changes in overall energy demand, as a result of:
 - (A) Changes in the composition of the economy;²⁹⁶ or
 - (B) Change in GDP growth rate;²⁹⁷
 - (C) Decline in energy intensity;²⁹⁸ or
 - (D) Increased energy efficiency;²⁹⁹
 - (ii) A broadening of the energy mix, including competition from gas, renewables and nuclear power;³⁰⁰
 - (iii) the level of coal imports required by China;³⁰¹
 - (iv) the coal price;³⁰²
 - (v) climate policy actions;³⁰³

²⁹⁴ Mr Stanford conceded in cross examination ‘if you’re asking me if this coal mine faces a major risk in the future, in terms of the coal market, then I would say yes.’: Transcript 8-60.21 8-60.24; Expert Report by Mr Nsair, Exhibit 147 [OCCA0012] sections 6.3 and 6.4; Expert Report by Dr Duncan, Exhibit 41 [OCCA0010], paragraphs 3.2 and 5.27; Mr Offen, Transcript 8-50.44 to 8-50.45.

²⁹⁵ In the Executive Summary, the IEA states that there is ‘much uncertainty’ in international thermal coal markets and prices, due to the possibility of policy changes, development of alternative fuels and the need for infrastructure: WEO 2012, p. 27.

²⁹⁶ Mr Offen, Transcript 8-47.38 to 8-47.39.

²⁹⁷ Mr Offen, Transcript 8-47.40.

²⁹⁸ Mr Offen, Transcript 8-47.34.

²⁹⁹ Mr Offen, Transcript 8-47.36.

³⁰⁰ Mr Offen, Transcript 8-47.44; Mr Stanford, Transcript 8-59.41 to 8-59.44.

³⁰¹ Mr Offen, Transcript 8-47.13 to 8-47.17.

³⁰² Mr Offen, Transcript 8-47.19 to 8-47.20.

- (vi) availability of financing for new electricity generators;³⁰⁴and
 - (vii) regulatory risks.³⁰⁵
- (d) One particular risk faced by Alpha is the risk of serious action on climate change:
- (i) Hancock’s approach seems to be that, because international multilateral governmental action on climate change has not yet occurred and appears difficult to achieve at present, then a proper assumption for the purpose of the economic impact analysis is to assume nothing will happen. This assumption, while favourable to Hancock, ignores the potentially significant effects of:
 - (A) unilateral governmental action on the operation of the market place; and
 - (B) investment decisions made extra governmentally in the energy market itself which affect the demand for coal;
 - (ii) In the first place, Hancock’s own witness does not agree that multilateral action on climate change should be completely discounted. Mr Stanford described climate change as “a deep and urgent [threat] and that the world needs to do something about it”.³⁰⁶ He thought multilateral action on climate change is a ‘plausible scenario’³⁰⁷ with ‘some level of probability’³⁰⁸ whose impact needs to be assessed’;³⁰⁹

³⁰³ Mr Offen, Transcript 8-48.4 to 8-48.7; Mr Stanford, Transcript 8-59.5 to 8-59.13; Joint Report by Dr Duncan, Mr Stanford and Professor Jones, Exhibit 45 [OCCA0015], paragraph 9.

³⁰⁴ Mr Offen, Transcript 8-48.35 to 8-48.36.

³⁰⁵ Mr Offen, Transcript 8-48.24 to 8-48.25.

³⁰⁶ Mr Stanford, Transcript 8-63.28 to 8-63.29.

³⁰⁷ Mr Stanford’s view in the Joint Report by Mr Stanford and Dr Duncan, Exhibit 45 [OCCA0015], p. 6; see also Mr Stanford, Transcript 8-59.15 to 8-59.19.

- (iii) Both Mr Offen and Mr Stanford agreed that, leaving aside multilateral action, there was scope for significant unilateral action on climate change, particularly by China³¹⁰ which represents almost half of the current global thermal coal market.³¹¹ As the IEA notes:

*Because of the sheer size of China's coal demand and production, relatively small changes in either its consumption or production have major impacts on the global market. For example, a drop in demand or a rise in production of just 3% could halve China's coal import needs based on current levels. Therefore, the success of China's efforts to curb coal-demand growth, for example by improving the thermal efficiency of its coal-fired power plants or more rapid diversification in the power sector, would have sharp and immediate effects on global international coal trade and prices.*³¹²

- (iv) The unchallenged evidence of Mr Nsair,³¹³ with whom Mr Offen and Mr Stanford agreed in cross-examination,³¹⁴ is that China is already taking significant steps to address climate change;
- (v) Other countries, such as the United States, and international institutions, such as the World Bank, are taking steps to address

³⁰⁸ Joint Report by Dr Duncan, Mr Stanford and Professor Jones, Exhibit 45 [OCCA0015], paragraph 12.

³⁰⁹ Mr Stanford's view in the Joint Report by Mr Stanford and Dr Duncan, Exhibit 45 [OCCA0015], p. 6.

³¹⁰ Mr Stanford, Transcript 8-59.28 to 8-59.29; Mr Offen, Transcript 8-51.5 to 8-51.45.

³¹¹ International Energy Agency, *Tracking Clean Energy Progress 2013*, Exhibit 146, page 8; agreed by Mr Stanford, Transcript 8-59.33.

³¹² WEO 2012, Exhibit 145, p.169.

³¹³ Expert Report by Mr Nsair, Exhibit 147 [OCCA0012], page 22, section 6.2; see also Mr Nsair's view in the Joint Report by Mr Stanford, Mr Offen and Mr Nsair, Exhibit 109 [OCCA0044], p.8.

³¹⁴ Mr Stanford, Transcript 8-59.28 to 8-59.47; Mr Offen, Transcript 8-51.5 to 8-51.45.

climate change, e.g., through restricting financing for fossil fuel power plants;³¹⁵

- (vi) As Mr Stanford observed, the potential for serious action on climate change – including serious unilateral action – poses a ‘major risk’ to Alpha’s future.³¹⁶ Mr Offen also agreed that this was a ‘critical issue’ for Alpha.³¹⁷

132. Despite all of this, nothing in the Economic Impact Assessment recognises, let alone evaluates:

- (a) The potential for serious action on climate change, whether multilateral or unilateral, during the life of Alpha; or
- (b) The consequences of such action, if it does occur, on the operation of Alpha.

133. The cumulative effect of these matters is that it cannot simply be assumed that coal demand will continue to grow in the way it has in the past. In light of the evidence before the Court, the maintenance of such an assumption by Hancock is breathtakingly selective.

134. There is no consideration of the obvious uncertainty which attaches to the assumptions concerning coal demand in the Economic Impact Assessment whatsoever. As Dr Duncan noted in his evidence, the Economic Impact Assessment makes a prediction about the future and that prediction is that nothing at all will change in the coal market over the next thirty years.³¹⁸

³¹⁵ Expert Report by Mr Nsair, p.22, [OCCA0012] Exhibit 147. Joint Report of Mr Stanford, Mr Offen and Mr Nsair, p.8, [OCCA0044], Exhibit 109. ; See also Mr Stanford, Transcript 8-68.34 and 8-76.33, and Mr Offen, Transcript 8-48.40.

³¹⁶ Mr Stanford, Transcript 8-60.20 to 8-60.24.

³¹⁷ Mr Offen, Transcript 8-50.45.

³¹⁸ Expert Report by Dr Duncan, Exhibit 41 [OCCA0010], p.11, paragraph 5.27, where he says ‘the analysis presented presents one possible future, which is exactly the same as today just 30 years in the future. The one thing we can be quite certain about the future is that it will not be like today.’ See also Dr Duncan, Transcript 13-49.29 to 13-49.34, where he says

135. Given the significant uncertainty regarding the future of the coal market, the Court ought not to accept any economic analysis premised upon an assumption that likely future coal demand will continue on present trends unabated.
136. At the very least, the Court might have been assisted by some kind of sensitivity analysis:
- (a) The experts agreed that one means of addressing uncertainty is through the use of scenario analysis.³¹⁹ No such analysis was undertaken in this case.³²⁰
 - (b) In circumstances like those in this case, a proper recognition that a high degree of uncertainty exists in relation to key assumptions is not only warranted, it is critical if the decision maker is to be able to properly evaluate the potential reward against the risks. In such circumstances, any analysis which ignores uncertainty in favour of a single absolute and highly favourable assumption can carry very little, if any, weight at all.
 - (c) Here, Hancock's approach has resulted in an analysis that considers only the best of all possible worlds for Alpha and gives no indication of what will happen to Alpha (and the benefits it promises) if that 'best case' scenario does not eventuate. It is not to the point that probabilities are not usually attached to scenarios in scenario analysis.³²¹

'the economic impact analysis has its own prediction and its own prediction is that there will be no climate change, that there will be no climate change policy and that the future will be just like today. So, in that sense, I'm suggesting that we should perhaps consider these other alternatives, in addition to the scenario analysis essentially that the mine has put forward, which is nothing changes'.

³¹⁹ Expert Report by Dr Duncan, Exhibit 41 [OCCA0010], p.11, paragraph 5.27; Mr Offen, Transcript 7-79.18 to 7-79.30; Mr Stanford, Transcript 8-58.29 to 8-58.45.

³²⁰ Mr Brown, Transcript 7-77.24 to 7-77.42; Mr Stanford, Transcript 8-49.24 to 8-49.26.

³²¹ Nor is it to the point to observe that undertaking scenario analysis may involve additional expense: Mr Stanford, Transcript 8-65.1 to 8-65.4. Alpha is supposedly a multi-billion project. In this context, cost alone is an inadequate justification for failing to take steps to assist this Court in making a properly informed decision.

137. If it is the case that the assumptions of experts giving evidence before a Court are to be proved, then it is clear that there is very little if any evidence at all which proves the demand assumption relied upon by Hancock's witnesses:

- (a) None of the experts called by Hancock have personally undertaken any detailed assessment of current and projected coal demand over the life of the mine:
 - (i) Mr Brown expressly relied upon the work of Mr Offen;³²²
 - (ii) Mr Offen himself substantially relied upon a report prepared by Salva Report Pty Ltd, entitled 'Thermal Coal Supply and Demand Study' (**Salva Report**);³²³
 - (iii) Mr Stanford did not undertake a detailed quantitative assessment himself,³²⁴ but relied upon past growth in coal production and:
 - (A) a slide from an International Energy Agency presentation to the press, summarising the contents of the *World Energy Outlook 2012 (IEA Slide)*;³²⁵ and
 - (B) a paragraph from an IEA report entitled *Tracking Clean Energy Progress 2013 (IEA Paragraph)*.³²⁶
 - (iv) Given this, any suggestion that Mr Nsair should be criticised, or his evidence given less weight, for having only undertaken a 'literature review' is, at best, hypocritical. Certainly, none of Hancock's experts have actually undertaken any original research. Indeed, Mr Offen, Hancock's principal witness on coal demand, does not even appear

³²² Mr Brown, Transcript 7-79.38.

³²³ Mr Offen, Transcript 8-45.37.

³²⁴ Mr Stanford, Transcript, 8-65.24 to 8-64.26.

³²⁵ Joint Report by Mr Stanford and Professor Jones, Exhibit 15 [AH015], p.7; and Mr Stanford, Transcript 8-67.1 to 8-67.4.

³²⁶ Joint Report of Mr Stanford, Mr Offen and Mr Nsair, Exhibit 109 [OCCA0044], p.7; and Joint Report of Mr Stanford and Dr Duncan, Exhibit 14 [AH014], p.5.

to have undertaken a literature review, preferring to rely almost exclusively on the Salva Report.

(b) The documents relied upon by Hancock do not provide a proper basis on which to make a finding of fact regarding levels of coal demand over the life of the mine:

(i) The Salva Report is 'inscrutable', in that:

(A) its author, a Mr Mark Gresswell, was not called to give evidence; and

(B) the Salva Report itself:

(1) does not identify the scope of work Mr Gresswell was asked to undertake;³²⁷

(2) Does not identify the data on which Mr Gresswell based his opinions;³²⁸

(3) Does not identify, in any understandable way, how Mr Gresswell derived his conclusions from the data;³²⁹ and

(4) Does not identify what assumptions were made in reaching those conclusions.³³⁰

(C) In evidence, Mr Offen acknowledged that, if he had been preparing a document like the Report for an investor client, he would have included the above data.³³¹

³²⁷ Confirmed by Mr Offen, Transcript 8-48.27 to 8-48.33.³²⁸ Confirmed by Mr Offen, Transcript 8-46.20 to 8-46.46.

³²⁸ Confirmed by Mr Offen, Transcript 8-46.20 to 8-46.46.

³²⁹ Confirmed by Mr Offen, Transcript 8-48.44 to 8-49.22.

³³⁰ Confirmed by Mr Offen, Transcript 8-49.30 to 8-49.39.

³³¹ Mr Offen, Transcript 8-50.4 to 8-50.6.

- (D) The effect of these deficiencies is that, as Mr Offen conceded, the conclusions of the Report simply cannot be meaningfully tested.³³²
 - (E) As this Court has noted in the past, expert opinions that cannot be tested are ‘inherently productive of unfairness’ and should be given little weight.³³³
 - (F) Accordingly, the Salva Report does not offer a satisfactory basis on which to make any findings about demand.
- (c) In relation to the IEA Slide:
- (i) The slide is part of a presentation given at the launch of the WEO 2012 report. The contents of WEO 2012 itself should be preferred to any single summary slide:
 - (A) WEO 2012 runs to approximately 690 pages and evaluates four different possible scenarios for future energy growth. Obviously, a single slide cannot represent all of this information.
 - (B) To the extent that WEO 2012 comments on coal demand, it makes a number of observations that emphasise the uncertainty facing coal producers:
 - (1) it expressly acknowledges that the coal market faces ‘much uncertainty’³³⁴ and that ‘[p]olicy decisions will determine whether demand carries on rising strongly or changes course radically’;³³⁵

³³² Mr Offen, Transcript 8-49.48 to 8-50.49.

³³³ *Gregcarbil v Backus & Ors (No. 2)* [2013] QLC 46, [284] and cases cited there.

³³⁴ WEO 2012, p. 26, Exhibit 145.

³³⁵ WEO 2012, p.155, Exhibit 145.

- (2) observes that the future of coal demand toward 2035 represents a 'marked change' from the rapid growth over the past decade;³³⁶
 - (3) notes that, under the 'New Policies' scenario (depicted in the IEA Slide), where currently planned energy and climate change policies are cautiously implemented,³³⁷ four-fifths (80%) of coal demand growth between 2010 and 2035 occurs between 2010 and 2020,³³⁸ i.e. within three years of Alpha commencing operations and before full production has been achieved;³³⁹
 - (4) comments that coal demand in China is likely to peak by 2020,³⁴⁰ again within three years' of Alpha commencing operations and before full production has been achieved.³⁴¹
- (d) In relation to the IEA Paragraph, that paragraph represents a comment about the current trajectory of coal growth, based on current policies. It is not intended to indicate future levels of coal demand and necessarily does not take into account the possibility of any changes in the policy environment, which is one of the key sources of uncertainty in the analysis.

138. The failure of Hancock to provide any convincing analysis of future coal demand, including under what their own experts described as 'plausible

³³⁶ WEO 2012, p.156, Exhibit 145.

³³⁷ WEO 2012, p.52, Exhibit 145.

³³⁸ WEO 2012, p.53, Exhibit 145.

³³⁹ Affidavit of Ross David Willis, sworn 30 May 2013, p.11, paragraph 53(a)(iii), Exhibit 13 [OCCA0045].

³⁴⁰ WEO 2012, p.155, Exhibit 145.

³⁴¹ Affidavit of Ross David Willis, sworn 30 May 2013, p.11, paragraph 53(a)(iii), Exhibit 13 [OCCA0045].

scenario[s]', means that this Court ought not to simply assume that the projected benefits associated with Alpha will arise.

Carbon Leakage; or “If Alpha doesn’t supply the coal someone else will”

139. Hancock contends that, in evaluating the environmental impact of Alpha, the Court should assume that, if Alpha does not proceed, the coal it would have produced will otherwise be sourced from elsewhere.

140. Leaving aside the legal question of whether such an approach is permitted under the EPA or the MRA, discussed at [113] above, the veracity of this assertion as a matter of fact depends upon two matters:

- (a) First, evidence that other sources of supply exist which are willing and able to supply 30 Mt of coal every year for the next 30 years at a suitable price. This Court is simply asked to assume that these sources exist.
- (b) Second, and more importantly, an assumption that the future demand for coal is sufficient to justify the development of new coal mines, either in Australia or elsewhere. For the reasons set out above, the weakness of the evidence for continuing growth in coal demand renders this assumption unsafe.

Public and Private Risk

141. Hancock argues that the economic viability of Alpha, that is, the risk of failure, is a purely private matter for it and its investors.

142. In fact, the viability of Alpha is an important consideration for this Court:

- (a) What Hancock is seeking in applying for a mining lease and an environmental authority is the right to exploit valuable public resources, in the form of both coal, which is owned by the Crown,³⁴² and the environment more broadly.

³⁴² *Mineral Resources Act 1989* (Qld), s 8(2).

- (b) These resources are finite and need to be carefully managed. If they are not carefully managed, the costs of allowing their exploitation may exceed the benefits that are derived from that that exploitation, as both Mr Brown and Mr Stanford acknowledged.³⁴³
- (c) The need to ensure the proper management of valuable public resources is a key reason why the MRA and the EPA exist in the first place and why they require this Court, as a public authority, to hear applications for mining lease and environmental authorities.
- (d) In this context, the issue of economic viability of the proposed mine is relevant to this Court's determination because it goes to the likelihood of benefits predicted by the proponent being delivered. It is therefore not simply a matter for Hancock.
- (e) This view is consistent with the decisions of the Court of Appeal in *Armstrong v Brown* and of the Supreme Court in *Papillon Mining and Exploration Pty Ltd v Minister*:
 - (i) In *Armstrong v Brown*, the Court of Appeal held that the economic viability of a mine was a relevant consideration under the MRA. Having observed that a mining lease should only be granted if it was warranted 'having regard to the purposes for which the Crown should give a right to mine its minerals', McMurdo J continued:

There would be no proper purpose in recommending the grant of a mining lease which was not going to be used for or in relation to any mining. It is relevant for the Tribunal to enquire whether the mining for which the lease is sought is likely to be profitable,

³⁴³ Mr Brown, 7-80.41 to 7-80.46 and 7-81.41 to 7-81.45. Mr Stanford, Transcript 8-60.40 to 8-60.45.

*because mining is unlikely to occur if it is unlikely to be profitable.*³⁴⁴

- (ii) Similarly, in *Papillon*, Fryburg J rejected an argument that, if mining was not occurring, it could not be said that the renewal of a mining lease was against the public interest. His Honour said:

*It would in my judgment be open to the Minister to proceed on the basis that the renewal of a mining lease over land which could not be economically mined would adversely affect the public interest. Mining leases confer rights good against the world. They constrain land use. To continue a lease which cannot economically achieve its purpose is capable of being regarded as adversely affecting the public interest.*³⁴⁵

Unreliable projections

143. In any event, the projected benefits from Alpha are exaggerated because, as stated:

- (a) the Economic Impact Analysis relies on an analytic model known to overstate impacts; and
- (b) fails to account for environmental and social costs, providing an inflated appearance of benefits.

144. The method used for the Economic Impact Analysis is well-known to exaggerate benefits:

- (a) it is uncontroversial that the economic impact analysis was prepared using an 'input-output' (IO) model.³⁴⁶

³⁴⁴ [2004] 2 Qd R 345, [15].

³⁴⁵ [2010] 1 Qd R 452, [18].

³⁴⁶ See, for example, Expert Report by Mr Brown, p.1, section 2(a), Exhibit 7 [AH007].

- (b) it is also uncontroversial that the IO model suffers from a range of well-recognised limitations:
- (i) These limitations are set out in documents produced by both the Australian Bureau of Statistics (**ABS**)³⁴⁷ and the Queensland Office of Economic and Statistical Research (**OESR**).³⁴⁸ They are also set out, albeit in less detail, in the Economic Impact Assessment itself;³⁴⁹
 - (ii) These limitations are not insignificant. ABS concluded that the ‘inherent shortcomings’ of the IO model make it ‘inappropriate for economic impact analysis’,³⁵⁰ whilst the OESR observes that IO modelling:
 - (A) is based on ‘unrealistic assumptions’;
 - (B) ‘often results in a significant overstatement of the impacts on employment and Gross State Product’; and
 - (C) is ‘likely to overstate the benefits of the project to the State economy’.³⁵¹
- (c) The Economic Impact Analysis conducted on behalf of Hancock did not identify any negative economic impacts.³⁵² Such a finding is, standing alone, most surprising and raises a justifiable scepticism in the outcomes of the Economic Impact Analysis as a whole;

³⁴⁷ Australian Bureau of Statistics, 5209.0.55.001 - Australian National Accounts: Input-Output Tables, 2008-09, Exhibit 104 [OCCA0056].

³⁴⁸ Queensland Treasury (2012) Overview of some of the alternative methodologies for economic impact analysis, Exhibit 46 [OCCA0028].

³⁴⁹ Economic Associates, Economic Impact Study, p.29, Section 5.1.1, Exhibit 13.7.59 [OCCA0045.007.089].

³⁵⁰ ABS, p.2, Exhibit 104 [OCCA0056].

³⁵¹ OESR, p.2, Exhibit 46 [OCCA0028]. Hancock sought to temper this criticism by suggesting that the OESR might no longer hold these views. Given that the limitations on the IO model have not changed, there is no reason to believe this is correct.

³⁵² Mr Brown, Transcript 7-71.45 – 7-71.47.³⁵³ Mr Brown, Transcript 7-57.9 to 7-57.10.

- (d) Given the absence of any identified negatives in the Economic Impact Analysis, it is open to conclude that the effect of the limitations in the model employed by Hancock is that the benefits associated with the proposal are almost certainly exaggerated;
- (e) As Mr Brown acknowledged, Hancock was not obliged to use an IO model to assess the economic impacts from Alpha.³⁵³ It could have used other approaches, including computable general equilibrium (CGE)³⁵⁴ or cost-benefit analysis (CBA):³⁵⁵
- (i) The advantage of using a CGE model is that, as Mr Stanford noted, it is generally 'far more accurate' than IO model.³⁵⁶ This is because, among other things, CGE models are capable of modelling supply side constraints, whereas the IO model simply assumes them away.
- (ii) The advantage of using a CBA model was explained by the Commonwealth Department of Finance and Administration in its publication, *Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies*:

A CBA adds rigour to a programme evaluation because, among other things, it makes explicit the links between inputs and outcomes, clarifies the underlying assumptions, and points to gaps in information. By endeavouring to express outcomes (benefits) and inputs (costs) in dollar terms, it facilitates comparisons across different

³⁵³ Mr Brown, Transcript 7-57.9 to 7-57.10.

³⁵⁴ Mr Brown, Transcript 7-57.12 to 7-57.13.

³⁵⁵ In the sense that the monetisation of environmental impacts required for cost benefit analysis was not prohibited under the Terms of Reference for the EIS, Transcript 7-84.19 to 7-84.23 and 7-86.27 to 7-86.28.

³⁵⁶ Mr Stanford, Transcript 8-56.43 to 8-56.47 and 8-57.15.

*types of programmes as well as options within a particular programme.*³⁵⁷

- (iii) A particular advantage of CBA is that it is capable of estimating whether a particular project will result in a net benefit to a particular community. This is something that an 'impact assessment' model, like the IO model, is unable to do.³⁵⁸
- (iv) In cross-examination, Hancock sought to challenge the appropriateness of using a CBA approach for which Hancock contended was a private project. As explained above at [142], however, this is not truly a private project. It is, effectively, a partnership between the State and Hancock for the exploitation of the State's resources to the benefit of both parties. As such, as Dr Duncan contended,³⁵⁹ it is appropriate to adopt an approach, such as CBA, which demonstrate net benefit.
- (f) Mr Brown sought to defend his choice of model on two bases:
 - (i) First, he suggested that the Terms of Reference prepared by the Coordinator-General under the *State Development and Public Works Organisation Act 1971* (Qld) required the use of an 'impact assessment' approach, as opposed to a CBA approach. Leaving aside the issue of whether Mr Brown's interpretation of the Terms of Reference is correct, this does not explain his preference for an IO model over the 'far more accurate'³⁶⁰ CGE model. As Mr Brown

³⁵⁷ Commonwealth Department of Finance and Administration (2006) *Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies*, p4, section 1.1, Exhibit 144 [AH044].

³⁵⁸ Joint Expert Report of Dr Duncan and Mr Brown, p1, section 2.1, Exhibit [17] [AH017]

³⁵⁹ Joint Expert Report of Dr Duncan and Mr Brown, p1, section 2.1, Exhibit [17] [AH017]; Dr Duncan, Transcript 13-41.1 to 13-41.32.

³⁶⁰ Mr Stanford, Transcript 8-56.43 to 8-56.47 and 8-57.15.

accepted in cross-examination, both CGE and IO are 'impact assessment' models.³⁶¹

- (ii) Second, Mr Brown tried to distinguish between the use of the IO model to justify a request for government assistance, which he conceded was inappropriate, and its use in other contexts, such as seeking a project approval.³⁶² This is a distinction without a difference. Whether an application is for government assistance or a statutory approval, the problem lies in the fact that the model makes unrealistic assumptions leading it to project exaggerated benefits which are unlikely to occur in reality. This necessarily skews the balancing act that the decision-maker has to undertake in favour of the proponent.

145. In addition, the Economic Impact Analysis fails to take into account environmental and social costs:

- (a) In terms of the environmental impacts associated with Alpha, Mr Brown expressly acknowledged that he had not attempted to monetise those impacts.³⁶³
- (b) This failure has two implications:
 - (i) First, it obscures comparisons between economic benefits and non-economic costs. This makes it harder to compare costs and benefits and to determine whether Alpha will, in fact, produce a net benefit to Queensland.
 - (ii) Second, it creates an exaggerated picture of the benefits of Alpha by failing to include the economic costs of its non-economic impacts:

³⁶¹ Mr Brown, Transcript 7-56.38 to 7.57.13.

³⁶² Mr Brown, Transcript 7-77.19 to 7-77.22.

³⁶³ Mr Brown, Transcript 7-84.19 to 7-84.19.

- (A) This is particularly so in relation to carbon emissions. Dr Duncan, Professor Jones and Mr Stanford all agreed that, 'A net social cost of carbon should be included in a calculation of the impact of the mine on the welfare of Queensland residents';³⁶⁴
- (B) As Dr Duncan noted, the effect of not putting a price on carbon is the same as assuming that the price of carbon is \$0.³⁶⁵ This is the only figure we know cannot be correct. As Dr Duncan continued, the one thing that all estimates of the social cost of carbon share 'is they're not zero'.³⁶⁶
- (C) Whilst Hancock has sought to make much of the difficulty of identifying the social cost of carbon, Mr Stanford agreed that the difficulty of estimating an environmental cost was not a reason for not trying.³⁶⁷ As he said in cross-examination:

Q: There would be difficulties, but you could put a price on environmental harms?

A: Yes. You could.

Q: And it would be more transparent, in terms of decision-making, if you did. It would at least give the decision-maker something to go on?

*A: Yes. I mean – I mean, for a – for a major project with a, sort of, major impact in those sort of areas. Yes. Then you ought to try to do that.*³⁶⁸

³⁶⁴ Joint Report of Dr Duncan, Mr Stanford and Professor Jones, paragraph 7, Exhibit 45 [OCCA0015].

³⁶⁵ Dr Duncan, Transcript 13-58.19 to 13-58.24.

³⁶⁶ Dr Duncan, Transcript 13-58.19 to 13-58.24.

³⁶⁷ Mr Stanford, Transcript 8-58.4.

³⁶⁸ Mr Stanford, Transcript 8-58.21 to 8-58.27.

- (D) It cannot seriously be contended that Alpha is not a ‘major project’ or that, from a scientific perspective, it will not make a significant contribution to climate change. Accordingly, the evidence of Hancock’s own experts is that some attempt should have been made to put a price on environmental impacts and, in particular, the social cost of carbon. Yet this was not done.
- (c) As Mr Brown acknowledged, the practical difficulties of monetising environmental impacts are ‘not insurmountable’.³⁶⁹ Instead, Mr Brown’s justification for not attempting to monetise environmental impacts seemed to be rooted in two things:
- (i) he was not explicitly required to do so by the Terms of Reference for the EIS; and
 - (ii) his disdain for the idea that the views of ‘Sharon and Darren at the Rooty RSL’ regarding the value of the environment might be taken into account alongside the ‘scientific and technical’ views of experts such as himself.³⁷⁰
- (d) Neither of these reasons is satisfactory:
- (i) The Terms of Reference for the EIS were prepared by the Coordinator-General under the *State Development and Public Works Organisation Act 1971* (Qld). They have no statutory status under either the EPA or the MRA and do not confine this Court’s enquiry. Mr Brown’s reliance on the Terms of Reference may explain his failure to try to monetise the environmental costs of Alpha, but they cannot justify it. As Mr Stanford acknowledged, it would have been useful for Hancock to have at least tried.³⁷¹

³⁶⁹ Mr Brown, Transcript 7-84.10.

³⁷⁰ Mr Brown, Transcript 7-85.38 to 7-86.7.

³⁷¹ Mr Stanford, Transcript 8-58.24 to 8-58.27.

- (ii) As to the second reason, it is appropriate that, in valuing community assets, such as the environment, members of the community should have some input. That these members of the community may not have advanced academic qualifications is no reason to treat their views as irrelevant in considering the cost of environmental impacts.
- (e) On the issue of social costs:
- (i) Mr Brown revealed in his evidence that he had agreed, in preparing the Economic Impact Assessment, to treat the issue of labour supply, and by extension the impact of employment at Alpha on employment elsewhere, as a social issue and, as a result, he had not quantified it;³⁷²
 - (ii) This was despite the fact that the Economic Impact Assessment did treat the positive employment effects of Alpha as an economic issue and quantify them;
 - (iii) It is relevant to note that the China First Economic Impact Assessment has predicted that that mine would have a significant negative impact on employment in a number of fields,³⁷³ particularly, as Dr Duncan predicted,³⁷⁴ in the field of manufacturing;
 - (iv) The effect of this is necessarily to give a skewed picture of the overall employment impact of Alpha, by failing to include any negative employment consequences.
 - (v) Mr Brown sought to argue this away, by saying that the China First Economic Impact Analysis simply assumed adverse impacts on

³⁷² Mr Brown, Transcript 7-63.20 to 7-63.30 and 7-66.33 to 7-66.35.

³⁷³ Waratah Coal, *Economic Impact Assessment*, p.xvi, Table ES.7, Exhibit 103 [OCCA0055].

³⁷⁴ Expert Report by Dr Duncan, p.4, paragraphs 5.6 to 5.7, Exhibit 41 [OCCA0010]; Joint Report of Mr Brown and Dr Duncan, p.8, contention (d), Exhibit 17 [AH017].

employment in other industries.³⁷⁵ Equally, however, the inability of the IO model to model resource constraints means that it simply assumes no impact on employments in other industries, whether or not such an impact does exist.

- (vi) Moreover, even if the use of a CGE model in the China First Economic Impact Assessment gives conservative employment impact figure, such a conservative approach is more appropriate for seeking an approval than the use of a model which is widely acknowledged to produce unrealistic estimates.

146. Overall, the failure of Hancock to take into account any negative environmental or social consequences undermines the ability of this Court to undertake the balancing act required by the EPA and the MRA.

Conclusions on Economics

147. Unlike the areas of groundwater and climate change, there are no complex legal issues relating to economics. The economic benefits of Alpha are simply a matter to be taken into account and given weight by the Court.

148. Having said that, the various shortcomings identified in the Economic Impact Analysis and the evidence underpinning it mean that it is appropriate for the Court to heavily discount the projected benefits of Alpha and give them very little weight, as it is highly uncertain that they will ever be achieved.

MAKING THE DECISION

149. Ultimately, this Court is required to make a decision whether to recommend Hancock's applications be refused or approved. It is CCAQ's position that the Court should, and must, recommend refusal of both applications.

³⁷⁵ Mr Brown, Transcript 7-65.30 to 7-65.35.

150. As explained in the introduction, properly construed, both the EPA and the MRA require this Court to be affirmatively satisfied that grant approval for Alpha will result in a net benefit to Queensland before it can recommend approval.
151. Given the various deficiencies identified above in relation to the evidence about groundwater, climate change and economics, CCAQ respectfully submits that this Court simply cannot be affirmatively satisfied that the net impact of Alpha on Queensland will be positive. Accordingly, it should, and must, recommend refusal of both applications.
152. In addition, it would be appropriate for this Court to make a finding that, if the Minister is minded to recommend approval, he should exercise his power under s 271A of the MRA to refer the matter back to this Court for further hearing on the groundwater and economic impacts. This would at least enable the objectors to have some comfort that these matters would be properly dealt with before approval was granted.

CONDITIONS

153. There are two issues in relation to conditions:
- (a) The first is the scope of the Court's power to impose conditions, particularly in relation to groundwater.
 - (b) The second is the appropriateness of imposing conditions in situations where there is inadequate information available.

The Court's power to impose conditions in relation to groundwater

154. The Court has asked whether it can impose conditions on the mining lease or an environmental authority which might otherwise be contained in a water licence issued under the *Water Act 2000* (Qld) separately to the applications currently before the Court.

155. It is CCAQ's position that the Court does have the power to impose such conditions, although it acknowledges the decision of the Court to the contrary in *Xstrata Coal Pty Ltd v Friends of the Earth, Brisbane Co-op Ltd*:

- (a) In *Xstrata*, the Land Court held that it could not impose conditions relating to the diversion or appropriation of water on a mining lease or an environmental authority.³⁷⁶ The Court reached this conclusion on the basis of s 235(3) of the MRA, which provides:

Where any Act provides that water may be diverted or appropriated only under authority granted under that Act, the holder of a mining lease shall not divert or appropriate water unless the holder holds that authority

- (b) In *Xstrata*, the Court held that, because a further approval was required under the *Water Act*, the diversion or appropriation of water were not matters authorised under either the mining lease or the environmental authority and, hence, no conditions in relation to those matters could be imposed.³⁷⁷
- (c) It is CCAQ's position that the Court may impose conditions relating to groundwater on a mining lease or an environmental authority. This is based on two premises:
- (i) First, that the Court has a broad power, under both the MRA and the EPA, to impose conditions that 'fairly and reasonably' relate to development being approved; and
- (ii) Second, the fact that a further approval is required before an action is taken does not prevent the powers conferred on the Court under the MRA and EPA from exercised.
- (d) The Court has a broad power to impose conditions on a mining lease:

³⁷⁶ [2012] QLC 33, [205] - [215].

³⁷⁷ [2012] QLC 33, [205] - [215].

- (i) Section 269(3) of the MRA confers on the Court the power to recommend approval of a mining lease subject to conditions which it ‘considers appropriate’:
 - (A) Although the phrase ‘considers appropriate’ has not been the subject of significant judicial consideration,³⁷⁸ in substance, it is equivalent to impose such conditions as a decision maker ‘thinks fit’. That phrase has been considered on many occasions.³⁷⁹ Such a power is not absolute, as it must be exercised for the purposes for which it is conferred, but, within that, it is very broad.³⁸⁰
 - (B) As Gillard J observed in *Protean (Holdings) Ltd v Environmental Protection Authority*, such a test provides limited practical assistance in determining whether a particular condition is within power.³⁸¹ In that case, his Honour consider the more useful test was that advocated by Lord Denning in *Pyx Granite Co. Ltd. v Ministry of Housing and Local Government*, which asks whether the condition imposed ‘fairly and reasonably relates’ to the proposed development.³⁸² If it did, then the condition was within power.
- (ii) The Court has a similarly broad power under the EPA:
 - (A) The power to impose conditions under the EPA depends on whether a draft environmental authority has been issued for a project;

³⁷⁸ *The Appellants v Council of the Law Society of the ACT and the Legal Practitioner* [2011] ACTSC 133, [77].

³⁷⁹ See, e.g., *Shrimpton v The Commonwealth* (1945) 69 CLR 613, at 619-620.

³⁸⁰ *Shrimpton v The Commonwealth* (1945) 69 CLR 613, at 619-620.

³⁸¹ [1977] VR 51, at 59.

³⁸² [1958] 1 QB 554, at 572.

- (B) Where, as here, a draft environmental authority has been issued, the Court may recommend approval either subject to any draft conditions contained in the environmental authority or subject to 'stated conditions';³⁸³
 - (C) The only express constraints on this Court's power to impose conditions is that the conditions stated must not contradict those imposed by the Coordinator-General;³⁸⁴
 - (D) In the absence of any further limitations on the kind of conditions that might be imposed, CCAQ submits that a broad approach should be taken to the power to confer conditions. Such an approach is consistent with the text of the EPA and more likely to promote the purposes of the Act than a narrow conception.
- (iii) In light of the above, CCAQ's position is that the Court has a broad power to impose conditions on a mining lease or environmental authority provided those conditions 'fairly and reasonably relate' to what is being authorised by the relevant instrument.
- (e) The requirement to obtain an approval under the *Water Act* does not exclude the imposition of the conditions relating to groundwater take as part of other approvals processes:
- (i) The Court's reasoning in *Xstrata* appears to be premised on the view that, because the taking of groundwater specifically requires authorisation under the *Water Act* in order to be lawful, then the taking of groundwater is not authorised under either a mining lease or an environmental authority.

³⁸³ *Environmental Protection Act 1994* (Qld), s 222(1)(b).

³⁸⁴ *Environmental Protection Act 1994* (Qld), s 222(2)(b).

- (ii) CCAQ respectfully disagrees with this view. It submits that the better view is that the EPA, the MRA and the *Water Act* form a series of ‘multiple controls’, all of which must be complied with in order for the taking of groundwater to lawfully occur. Such controls operate in parallel, rather than to the exclusion of one another.
- (iii) The concept of ‘multiple controls’ has been endorsed by the Privy Council, in *Associated Minerals Consolidated Ltd v Wyong Shire Council*,³⁸⁵ and the High Court in *South Australia v Tanner*:³⁸⁶
 - (A) In *Wyong*, the Privy Council considered whether planning permission was required for mining where a mining lease had been granted under the *Mining Act 1906* (NSW). Their Lordships concluded that planning permission was required:

*Both Acts apply, or are capable of being applied, with complete generality to land in the State of New South Wales. Can they, in relation to a given piece of land, coexist? In their Lordships' opinion they clearly can, and do. The Acts have different purposes, each of which is capable of being fulfilled.*³⁸⁷

- (B) Similarly, in *Tanner*, the High Court rejected an argument that a prohibition on zoos contained in regulations under the *Waterworks Act* was inconsistent with the provisions of the *Planning Act*, which, it was said, provided a complete code for development. In rejecting this argument, the High Court accepted a submission by the Attorney-General for South Australia that, ‘Both pieces of legislation can stand together

³⁸⁵ [1974] 2 NSWLR 681. *Wyong* was recently referred to with approval by Crennan, Kiefel and Bell JJ in the decision of *Commissioner of Police v Eaton* (2013) 294 ALR 608, [45].

³⁸⁶ (1989) 166 CLR 161.

³⁸⁷ [1974] 2 NSWLR 686, at 686.

and operate cumulatively. They can do this because each Act has a distinct purpose, different from the other.’³⁸⁸

- (f) Here, as in *Wyong* and *Tanner*, each of the EPA, the MRA and the *Water Act* has a separate and distinct purpose and those Acts can and should be treated as operating cumulatively. No single Act has precedence over the other two. Rather, it is necessary to obtain permission under each of those Acts in order to lawfully conduct mining operations which involve the diversion or appropriation of water.
- (g) Understood in this light, s 235(3) of the MRA does no more than confirm what would otherwise be true: namely, that the mere conferral of a mining lease does not, without more, authorising the taking of groundwater for which permission is required under the *Water Act*.
- (h) It follows that s 235(3) does not operate to exclude the taking of groundwater from consideration under the EPA and MRA. By extension, if taking of groundwater is a relevant consideration under those Acts, then the power to impose conditions on instruments under those Acts extends to a power to impose conditions in relation to the taking of groundwater.

The appropriateness of imposing conditions

- 156. Leaving aside the issue of power, however, it is CCAQ’s position that the purpose of conditions on a permit is to avoid or manage impacts once they have been identified.
- 157. This requires the Court to have some confidence that it knows what the impacts of granting approval will be and, further, to have confidence that the conditions that it imposes will be able to manage those impacts. In all the circumstances of this case, the Court cannot have that confidence. To try to manage impacts without knowing what they are would violate the ‘principle of

³⁸⁸ (1989) 166 CLR 161, at 170.

finality' endorsed by the Court of Appeal in *McBain v Clifton Shire Council*,³⁸⁹ as it would potentially result in the approval of something quite different from what was originally considered.

158. Accordingly, rather than seek to regulate unknown impacts through stringent conditions, it is appropriate to simply refuse the applications.

18 October 2013

Adrian J Finanzio

Dr Chris McGrath

Rupert Watters

³⁸⁹ [1995] 2 Qd R 493. See also cases cited there at pp 496 - 497.

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