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LAND COURT OF QUEENSLAND

CITATION:	*Hancock Coal Pty Ltd v Kelly & Ors and Department of Environment and Heritage Protection (No. 4)* [2014] QLC 12
PARTIES:	Hancock Coal Pty Ltd (applicant) v Kathryn Kelly, Paul Anderson and Janeice Marie Anderson, Coast and Country Association of Queensland Inc, Fiorella Paola Cassoni, Patricia Julien of Mackay Conservation Group, Bruce Bede Currie and Annette Helen Currie (objectors) Chief Executive, Department of Environment and Heritage Protection (Statutory Party)
FILE NOs:	MRA082-13 EPA083-13
DIVISION:	General Division
PROCEEDING:	Application for mining lease and objections; objections to application for environmental authority, the draft environmental authority and conditions included in the draft environmental authority
DELIVERED ON:	8 April 2014
DELIVERED AT:	Brisbane
HEARD ON:	16 September – 2 October 2013 25 October 2013
HEARD AT:	Brisbane
MEMBER:	PA Smith
ORDERS:	**1. I recommend to the Honourable the Minister responsible for the MRA in the alternative as follows:** **EITHER** **"That MLA 70426 be rejected"** **OR** **"That MLA 70426 be granted, subject to the**

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condition that approval be subject to Hancock first obtaining licences to take, use and interfere with water under s 206(1)(a) and (b) of the Water Act such that all concerns pursuant to the precautionary principle are resolved"

2. I recommend to the Honourable the Minister responsible for the EPA in the alternative as follows:
EITHER
"That draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN101017310 – Alpha Coal Mine be refused"
OR
"That draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN 101017310 – Alpha Coal Mine be granted, subject to the following conditions:

(a) that approval be subject to Hancock first obtaining licences to take, use and interfere with water under s 206(1)(a) and (b) of the Water Act such that all concerns pursuant to the precautionary principle are resolved;

(b) the draft Environmental Authority be amended by the insertion in table 15 of three additional monitoring points, one located on each of the Anderson's Currie's and Ms Cassoni's properties, with each given the parameter of water level, with at least one reading every twelve hours by electronic data reader;
and

(c) that there be a condition in the draft Environmental Authority to the effect that Hancock enter into make-good agreements with the Curries, the Andersons, and Ms Cassoni, within either twelve months of the grant of ML 70426, or before commencement of mining activities, whichever is the sooner".

CATCHWORDS:

Mining – application for mining lease – objections – functions and powers of Land Court – statutory criteria in considering grant – *Mineral Resources Act 1989* (MRA) ss 268, 269

Mining – application for environmental authority – objections – functions and powers of Court – *Environmental Protection Act 1994* (EPA) ss 217, 219, 222, 223

Mining – *Mineral Resources Act 1989* and *Environmental Protection Act 1994* – different and competing objects

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Mining – application for mining lease – determination of "significant project" by Coordinator-General – limits on challenge to Coordinator-General conditions – no inconsistent conditions permissible – *State Developmemt and Public Works Organisation Act 1971* ss 45(1), 46 and 49(1)

Mining – application for mining lease – requirement for water licence under *Water Act 2000* – whether objections to grant licence could be heard by Court concurrently with other objections in same project

Mining – application for mining lease – whether some water issues can fall under MRA ss 269(4)(a) and EPA

Mining – application for mining lease – application of precautionary principle – EPA s 223

Mining – application for mining lease – objections – considered under wider headings: groundwater, climate change, economics, ecology, surface water, miscellaneous

Groundwater – complexity and uncertainty with evidence – precautionary approach necessary – further water issues to be determined under Water Act licence application – whether present recommendation should be dependent on future water licence evidence and decision

Climate change – whether any "adverse environmental impact" – whether MRA permits consideration of downstream indirect environmental impacts – scope of "operations" limited to physical mining activities – impermissible to consider Global Scope 3 emissions save for "public interest" – *Xstrata* decision followed

Climate change – "demand for coal will be met by another source" argument considered – Global Scope 3 emissions will not fall if subject proposed mine does not proceed

Economics – social cost of carbon, economic impacts, projections as to future use of coal – meaning of "economic mineralisation"

Ecology – biodiversity off-sets – rail corridor ecology impacts not relevant here

Land Court – role of Court in making recommendation to Minister – administrative not judicial task – Court totally independent in undertaking function – hearing not a "mere formality"

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Orders – recommendations issued in alternative for both mining lease and environmental authority – power of Court to so order – possibility of appeal to Land Appeal Court

Environmental Protection Act 1994
Environmental Protection and Biodiversity Conservation Act 1999 (Cth)
Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012 No. 16
Mineral Resources Act 1989
State Development and Public Works Organisation Act 1971
Water Act 2000

Armstrong v Brown (2004) 2 QdR 345
Associated Minerals Consolidated Ltd v Wyong Shire Council (1974) 2 NSWLR 681
CMR of Police v Eaton (2013) 294 ALR 608
De Lacey & Anor v Kagara Pty Ltd (2009) 30 QLCR 57
Donovan v Struber & Ors (2011) 32 QLCR 226
Dunn v Burtenshaw (2010) 31 QLCR 156
Sinclair v Maryborough Mining Warden (1975) 132 CLR 473
South Australia v Tanner (1988-89) 166 CLR 161
Xstrata Coal Queensland Pty Ltd & Ors v Friends of the Earth – Brisbane Co-Op Ltd & Ors, and Department of Environment and Resource Management (2012) 33 QLCR 79

APPEARANCES:

DG Clothier QC with A Pomerenke, for the applicant
AJ Finanzio SC with Dr C McGrath and R Watters, for the objector Coast and Country Association of Queensland Inc
ND Loos for the statutory party
K Kelly, self represented objector
P & JM Anderson, self represented objectors
FP Cassoni, self represented objector
BB & AH Currie self represented objectors

SOLICITORS:

Allens for the applicant
Environmental Defenders Office (Qld) Inc for the objector Coast and Country Association of Queensland Inc

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Overview

[1] Mention the Bowen Basin to anyone with just a passing interest in coal mining in Queensland and they will almost certainly know what you are talking about; a rich coal deposit in Central Queensland that has been a significant contributor to the resources boom in Queensland and Australia.

[2] The application and objections before me do not relate to the Bowen Basin but to the Galilee Basin. The Galilee Basin is also a rich coal deposit, situated to the west of the Bowen Basin. The significant difference is that there is currently no exploitation of the Galilee Basin.

[3] If the Alpha Mine at the heart of this matter is approved and goes into production, what will flow with it is significant infrastructure which will enable the development of additional coal mines in the Galilee Basin. On the other hand, if the Alpha Mine is not approved, the development of the Galilee Basin may be somewhat more problematic.

[4] In effect, the approval of the Alpha Mine is a watershed issue for the Galilee Basin. This explains why the various parties, representing some highly conflicting interests, have put such time, effort and finance into this matter, culminating in a three week hearing.

[5] As a further indication of the importance which the State Government places on the Alpha Mine, the Coordinator-General declared it to be a 'significant project' under s 26(1)(a) of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) on 24 October 2008.

[6] In this regard, the Coordinator-General's May 2012 Evaluation Report on the environmental impact statement had this to say:[1]

> "Coal resources in the Galilee Basin are currently undeveloped. The global demand for good quality thermal coal presents an opportunity to develop this area.
>
> The project meets Queensland Government objectives in realising the timely development of the Galilee Basin while ensuring the community benefits and environmental objectives are supported, therefore contributing to a four pillar economy. Overarching project-wide benefits include:
>
> - employment for construction, operation, and other indirect employment benefits, including (as presented in Appendix A of the Addendum to the Supplementary EIS):
>   - approximately 3600 jobs predicted during construction (1500 mine, 2100 rail) including contractors
>   - approximately 990 jobs predicted during operational (800 mine, 190 rail) including contractors
>   - indirect employment benefits
> - significant export income
> - local and state economic benefits
> - improved infrastructure into the region, including upgrades to roads and airport, and introduction of additional power and water supplies to the region
> - significant State and government taxes and royalties."

[1] See Exhibit 13 RDW 10 @ 2.3 p 11.

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[7] I must stress that, whilst it is no doubt true that this Court must be aware of and take into account the Coordinator-General's view as to the stated economic importance of the proposed Alpha Mine to both this State and the Nation,[2] that is just one of a myriad of factors to be considered. Simply because the Alpha Mine has been declared a significant project, and its development will, in all probability, lead to the opening up of the coal resources in the Galilee Basin, does not mean that this Court should simply "rubber stamp" the proposal. Far from it.

[8] This Court is a creature of statute, and all of its powers are sourced in various statutes. Quite simply, this Court must undertake the tasks, without fear or favour, which the legislature has given it; that is, specifically, to hear and determine the objections to the Mining Lease (ML) lodged under the *Mineral Resources Act 1989* (the MRA), together with the environmental objections under the *Environmental Protection Act 1994* (the EPA), and to then make relevant recommendations.

[9] This is no easy task. For instance, as will be examined in more detail later in this decision, the objects of the EPA and the MRA are quite different. Further, the varying views of the respective parties have not been put forward in isolation, or without reference to objective evidence. One has only to view the eminence of the various expert witnesses, who in some cases draw vastly different conclusions, to realise the bona fides of the various parties.

[10] If just one thing is clear, it is that the respective parties have diverse views as to what should be the outcome of these two cases. I conclude this overview by allowing the parties to speak for themselves, drawing from the executive summary submissions of each party.

[11] This is how the applicant, Hancock Coal Pty Ltd (Hancock) sees the case: [3]

> "…the Court is presently concerned with:
>
> (a) Hancock's application for the grant of the proposed mining lease under s268 of the MRA;
>
> (b) the objections to the grant of the proposed mining lease under s268 of the MRA;
>
> (c) the objections to the grant of the draft environmental authority under ss219 and 220 of the EPA.
>
> 35. There is a degree of overlap between various objections. For the purposes of analysis, they may be divided into the following categories:
>
> (a) groundwater;
>
> (b) climate change, including climate change policy and economics;

---

2 See, for instance, the SDPWOA, and the objectives of the *Mineral Resources Act 1989* (s 2) and various criteria in s 269(4), esp s 269 4(c).

3 Hancock's submissions, 18 October 2013, paras 34, 35, 38-50.

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(c) non-climate change economics;

(d) ecology;

(e) surface water;

(f) miscellaneous other objections.

…

II SHORT SYNOPIS

38. The following short synopsis addresses the five major categories of objection identified above.

Groundwater

39. ***The groundwater studies undertaken on behalf of Hancock provide an appropriate basis upon which to make an assessment of likely impacts and how they can be managed***. They have been extensive and conservative. They have been refined over a number of years. In their final form they are based on an extensive body of data, including valuable data obtained from an extensive drilling programme within the mining lease area, as well as a test pit constructed on site. This means that the *core features* of Hancock's analysis (*e.g.*, the aquifer parameters) are reliable. Of course, uncertainties remain particularly in relation to features outside the mining lease area where more data is not available and not readily obtainable. But those areas of uncertainty do not detract materially from the reliability of the *core features* of the analysis. Having said this, the studies do not claim to predict future impacts with complete accuracy or certainty. That would not be possible. Nor is it required to warrant approval. Were it otherwise, no project would ever be approved.

40. ***The impacts predicted by the groundwater studies are capable of being managed appropriately by conditions***. The objectors do not suggest that the impacts *actually predicted* by the groundwater studies are not capable of being managed appropriately by conditions. Rather, they express concern that the predictions may turn out to be wrong. This possibility is also addressed appropriately by conditions (discussed below).

41. ***The evidence of Dr Webb and Dr Mudd does not justify requiring further studies before approval is granted***. Each was an unsatisfactory witness. They presented theoretical views which (in addition to being difficult to reconcile) have little foundation in hard data. Dr Webb, for example, accepted that his cross sections were mere "*hypothesis*" and that significant features were simply "*guessed*".31 Dr Webb's alternative theory as to matters such as folding under the GDR has not been shown to be valid. The available evidence suggests it is invalid. However, even if it is not dismissed completely, it does not warrant withholding approval. Neither Dr Webb nor Dr Mudd had done any modelling. Neither could make any reliable alternative prediction as to impacts. Indeed, neither sought to make any predictions as to the impact of the *Alpha mine alone* (Dr Webb's predictions as to impacts in the north were based on the cumulative impacts of the Alpha and Kevin's corner mines). Any doubt they create is quite removed from the *core features* of Hancock's groundwater analysis. For example, uncertainty as to the geology directly beneath the GDR does not cast doubt on what Hancock has actually observed and measured on site. It is unrealistic to expect Hancock to resolve all uncertainty in matters of off-site regional geology before being granted approval in respect of the confined proposed mining lease area.

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42. ***The proposed conditions address the remaining uncertainty adequately and ensure water security***. The Coordinator-General has imposed important and stringent conditions. They include: (1) a condition requiring approval of a groundwater monitoring program before the commencement of mining activities (Appendix 1, Condition 17); (2) a condition requiring Hancock to implement its commitments, including to implement make-good agreements with landholders affected by groundwater drawdown (Appendix 2, Part A, Condition 1 and Appendix 5); and (3) a condition requiring Hancock to design a groundwater monitoring and reporting program capable of being used on a basin wide basis, and to contribute to any basin wide project established by the administering authority (Appendix 2, Part B, Condition 2).

43. ***The objections trespass into areas that are properly the subject of consideration under the Water Act 2000 (Qld) or involve an impermissible challenge to the Coordinator-General's conditions***. In the end, the groundwater objections are about water security for landowners. There are no real issues about impacts on the GAB, water quality of ecology. The objections are concerned with the extraction of water from the groundwater system, which is a matter to be considered under the *Water Act* 2000 (Qld) (the "***Water Act***") not under the MRA or EPA: *Xstrata Coal Queensland Pty Ltd v Friends of the Earth – Brisbane Co-Op Ltd* [2012] QLC 13 ("***Xstrata***") at [210]-[211]. Further, to the extent that the objectors suggest that further monitoring should be required before mining is permitted to commence – a matter already covered by the conditions imposed by the Coordinator-General – they are seeking to have the Court recommend a condition contrary to the intent of the SDPWOA and EPA: *Xstrata* at [32]. At this stage further conditions will be imposed as set out in the Coordinator-General's Report.32 In their joint report, the experts agreed that the conditions regarding make-good ensure water security.

Climate change

44. ***Emissions calculations***. The undisputed calculations as to greenhouse gas ("**GHG**") emissions include: (1) average annual scope 1 emissions (direct emissions from the mine) will be 353,439 tonnes CO2-e representing 0.001% of global GHG emissions; (2) average annual scope 2 emissions (emissions upstream from the mine from, *e.g.*, the mine's source of electricity) will be 506,233 tonnes CO2-e; (3) average annual scope 1 and 2 emissions will be 859,672 tonnes CO2-e representing 0.002% of global GHG emissions; (4) average annual scope 3 emissions (emissions downstream from the mine, *e.g.*, from the burning of the coal in an overseas power station) will be 61 million tonnes CO2-e (rounded up); and (5) average annual scope 1, 2 and 3 emissions will be 61 million tonnes CO2-e (rounded down) representing 0.16% of global GHG emissions. In a global context, the scope 1 and 2 emissions associated with the mine are infinitesimal, and the scope 1, 2 and 3 emissions are negligible.

45. ***No net increase in GHG emissions***. Stopping the Alpha mine will not affect the amount of GHGs in the atmosphere. The GHGs will be produced almost wholly by the burning of the coal, which will take place outside Australia. If the demand for the coal is not met from the Alpha mine, it will be met from other mines with the same or possibly worse consequences in terms of GHG emissions.

46. ***No impact on environment in Queensland***. The emissions associated with the Alpha mine are not properly characterised as a cause of any impact on the environment in Queensland. Even assuming one can take into account scope 3 emissions for this purpose (contrary to the decision in *Xstrata* at [530], [564]-[570], and [597]-[605]), the emissions are too insignificant and too far removed from Queensland to be linked in any scientific way to an adverse environmental impact in Queensland. Moreover, as in other areas of discourse, an activity cannot properly be characterised as a cause of an impact if the impact would have occurred in any event. Here the alleged impact on the (global) environment will occur in any event (as the same quantity of coal will be burnt overseas irrespective of whether it is obtained from the Alpha mine or another mine).

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47. ***The Court should not lead a new policy agenda***. Part of the objectors' arguments seem to be that effective action on climate change is needed urgently and must start somewhere, and that this Court should halt the Alpha mine as a necessary first step in reducing and ultimately eliminating the extraction and burning of coal. The policy agenda thus promoted by the objectors is contrary to that of the Commonwealth and State governments. This Court is not the appropriate vehicle for the implementation of a new policy agenda of the kind promoted by the objectors. That is the province of other branches of government. The consequences of a shift in policy would be enormous, entailing very significant detrimental economic impacts without any significant corresponding benefit to the environment.

Economics

48. A project of this size will have significant economic benefits for Queensland. The theoretically based criticisms of the economic analysis undertaken on behalf of Hancock do not undermine this obvious proposition. The economic benefits outweigh any perceived adverse environmental impacts.

Ecology

49. The studies undertaken to date have been conservative. They do not suggest any ecological issues that cannot be managed by appropriate conditions. The conditions imposed in the draft environmental authority require further work before mining can commence and are comprehensive. Only one aspect of the conditions has been criticised (concerning offsets). That criticism is founded upon an unwarranted presumption of administrative failure. Applications such as the present engage the presumption of regularity, not the opposite.

Surface water

50. The unchallenged evidence adduced by Hancock demonstrates that there are no surface water issues that would warrant withholding approval."

[12] For her part, objector Kelly (Ms Kelly) summarises her view this way:[4]

"**CLOSING SUBMISSION OF KATHRYN KELLY (2 page summary)**

1. I submit that the application for the Alpha Coal Mining Lease (ML) and Environmental Authority (EA) should be refused on the basis of the serious environmental harm that it would cause the environment, without sufficient community benefit to counterbalance that harm.
2. My objection is based primarily on consideration of the impacts of the proposal on climate change and biodiversity. In relation to these, the UNFCCC, CBD and World Heritage Convention are applicable international laws or agreements under the EPA.
3. The decision to be made in this case is one of national and global significance. It requires consideration of the Alpha project and of the combined effects of up to 10 additional adjacent mines in the Galilee Basin.

Serious environmental harm from disrupting the global climate system

4. The Alpha project will cause serious environmental harm to the global climate system. Under the EPA, this is contrary to ESD principles; contrary to an applicable Commonwealth- State agreement, specifically the National Strategy for Ecologically Sustainable Development, and the UNFCCC; and against the public interest. Under the MRA it is not environmentally responsible, will cause an adverse environmental impact and will prejudice the public right and interest.
5. The science of climate change is not disputed and is set out in 'The *Critical Decade 2013*'. The primary cause of anthropogenic global warming is increasing concentrations of CO2 in the atmosphere mainly from burning fossil fuels including coal.

[4] Ms Kelly's two page summary conditions, 18 October 2014.

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6. Serious environmental harm to present and future generations is being caused now and becomes of even greater concern when global warming exceeds 2°C above pre-industrial levels. Professor Jones and Professor Karoly have brought evidence about the serious adverse environmental impacts resulting from greenhouse gas emissions, both globally and in Queensland and Australia.
7. The relevant 'activity' for which the EA and ML are sought is 'mining black coal'. In its natural state, coal is a stable store of carbon. **When extracted from its natural state, it is unavoidable that the carbon contained in product coal will be released to the atmosphere as CO2.**1 Serious environmental harm would be caused through the destruction of the stable carbon stock at the Alpha mine, which will lead directly to unavoidable massive greenhouse gas emissions, exacerbating global climate change.
8. The carbon budget links the quantity of CO2 that can be emitted to the atmosphere with the probability of the earth staying below the 2°C threshold. The CO2 pollution caused by the Alpha project is globally significant when measured against the global carbon budget and against annual emissions under scenarios representing 'business as usual' and effective global action on climate change. This represents a serious disruption of the climate system, on which life depends.
9. The net social impact of the Alpha project exceeds the threshold for serious environmental harm in Queensland. The harm will be magnified by additional planned and proposed mines in the Galilee Basin and is on top of that from existing mines in the region.
10. The Applicant argues that greenhouse gas emissions outside Australia should not be considered, in accordance with the NGERS Act and IPCC. These are greenhouse gas Reporting frameworks - they are not relevant to assessing environmental harm.
11. The Applicant argues that there will be no net change in greenhouse gas emissions if the Alpha project is refused because coal will be sourced from elsewhere. This is speculative and not relevant to assessing the impacts of the Alpha mine. Further, the UN Framework Convention on Climate Change states that 'developed country Parties should take the lead in combating climate change and the adverse effects thereof.'

Serious environmental harm from impacts on biodiversity

Climate change

12. The 'Critical Decade' describes the risks to Queensland's biodiversity from climate change, especially to the Great Barrier Reef and the Wet Tropics, both of which are World Heritage areas. Professor Jones' evidence concurs. There are no state or federal conditions on the project in relation to ameliorating the biodiversity impacts from climate change.

Habitat loss

13. There will be significant permanent biodiversity and habitat loss from the Alpha mine site through clearing of around 20,000 ha of high value native vegetation. Survey work undertaken for the EIS was inadequate to establish the presence or otherwise of endangered species on the site. The mine itself will create an impenetrable 24 km long east-west barrier to land-based movement of wildlife and geneflow.
14. This impact will be multiplied at least seven-fold and up to 10 fold if other mines in the Galilee Basin gain approval and comes on top of habitat loss from existing mines. Planned and proposed Galilee Basin mines extend over 300 km north-south and up to 40 km wide. Groundwater, surface water and final void impacts are integral components of healthy ecosystems, healthy habitat and protection of biodiversity. The risks associated with these habitat impacts are also for consideration by the court.
15. Dr Dique, the Applicant's biodiversity witness, agreed that habitat loss is one of the major threats to species and that there was inadequate survey effort. Dr Dique also agreed that a cumulative impact study in relation to the seven planned mines should be done.

Conditions ineffective

16. The Commonwealth, Coordinator General and the Draft Environmental Authority conditions fail to consider cumulative or combined impacts of multiple mines on biodiversity. Their conditions for approval of the Alpha mine all rely on offsets to mitigate the impact of the biodiversity loss. The evidence of Mr Vanderduys shows that offsets cannot result in 'no net loss' of biodiversity. Dr Dique agreed with eminent ecologists (Bekessey et al) that offsets need to be developed ahead of time.

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17. The conditions of the three authorities, taken together, lack rigour and will not be effective in protecting biodiversity. In particular, any counterbalancing benefit provided by offsets is temporary (Commonwealth and Coordinator General conditions), uncertain, or can be replaced by financial or 'alternative' measures (DEA). The legal mechanisms for protecting such land can be set aside in favour of future mining.

Costs and Benefits of the Project

18. There has been no adequate cost analysis of the environmental impacts of the mine globally, on Queensland and on the local region. A more comprehensive analysis of the environmental and other costs of the project is needed.

The Application should be refused

19. I provide evidence that the project would cause serious environmental harm to the climate and to Queensland's biodiversity. The ML and EA application does not meet the requirements of the EPA and the MRA and, in the context of the precautionary principle, should be refused.

GLOSSARY

CBD - Convention on Biodiversity
CCS – Carbon Capture and Storage
CG - Coordinator General
DEA - Draft Environmental Authority
DU – Desert Uplands
EA - Environment Authority
EIS - Environmental Impact Statement
EPA – *Environmental Protection Act 1994*
ESD – Ecologically Sustainable Development
GBR – Great Barrier Reef
GBOS - Galilee Basin Offset Strategy
HCPL – Hancock Coal Pty Ltd
IEA – International Energy Agency
IPCC - Intergovernmental Panel on Climate Change
ML - Mining Lease
MNES – Matters of National Environmental Significance
MRA – *Mineral Resources Act 1989*
NSESD – National Strategy for Ecologically Sustainable Development
NGERS – *National Greenhouse and Energy Reporting Act 2007*
QBOP - Queensland Biodiversity Offset Policy
UNFCCC- United Nations Framework Convention on Climate Change
WHC – World Heritage Convention"

[13] The objector Coast and Country Association of Queensland (CCAQ) says this in its summary:[5]

"**SUMMARY OF SUBMISSIONS**
COAST AND COUNTRY ASSOCIATION OF QUEENSLAND INC.

1. Mining poses a dilemma for the community. On the one hand, it has the potential to provide significant economic rewards. On the other hand, it imposes serious costs, in particular environmental costs.
2. At the heart of both the *Environmental Protection Act* and the *Mineral Resources Act* is a recognition of this reality. In order to ensure that the benefits of mining outweigh the costs, both Acts require the Court, as an independent umpire, to consider the impacts of the proposed mine, positive and negative, and to make a recommendation about whether the mine should be allowed to proceed.
3. It is CCAQ's position that, before it can recommend approval of Hancock's proposed Alpha mine, this Court needs to be positively persuaded that the grant of the approvals will result in a net benefit to the Queensland community.

[5] CCAQ summary submissions 18 October 2013.

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4. Here, the Court cannot be so persuaded because the information provided by Hancock to establish the impacts from Alpha cannot be relied upon:
   (i) In relation to groundwater, the critical issue is one of uncertainty. Dr Webb's evidence establishes that Hancock's modelling is fundamentally flawed, but Hancock has chosen not to address those flaws and instead to attack Dr Webb. This leaves the Court without any reliable prediction of the likely impacts of Alpha on groundwater supplies, a critical environmental resource. This kind of uncertainty presents a fundamental barrier to recommending approval.
   (ii) In relation to climate change, the science of climate change is undisputed. Alpha will contribute to the risk of dangerous climate change, mostly through emissions from the burning of the coal that will be mined there. Hancock asks this Court to ignore those emissions. CCAQ argues that it must not ignore them, but must take them into account in deciding whether to recommend approval. If all of Alpha's emissions are considered, then this is a strong factor weighing against approval.
   (iii) In relation to economics, Hancock argues that Alpha will produce substantial economic benefits. CCAQ contends that the predicted benefits are exaggerated by the choice of model and a failure to account for costs imposed by Alpha. More fundamentally, CCAQ contends that the basic assumption underlying these predictions, that is, constant growth in the demand for coal throughout the life of Alpha, is not substantiated by evidence.
5. If the Court is not persuaded that allowing Alpha to proceed will result in a net benefit to Queensland, then it is respectfully submitted that, consistent with the requirements of the statutory framework, the Court must recommend that the applications be refused."

[14] The objector Cassoni (Ms Cassoni) put her position this way:[6]

"The Bimblebox Nature Refuge (BNR) encompasses the whole of the property "Glen Innes" and is around 8,000 hectares in size. Approximately 96% of the property is made up of remnant woodland – vegetation that has never been cleared. The BNR is a "Private Protected Area" part of the National Reserve System and represents over 10% of the National Reserve estate in the Desert Uplands bioregion. Broad scale clearing reduced the total extent of woodland in the district and today there is less than 5% of the Desert Uplands held in conservation reserves.

Bimblebox is within the predicted aquifer drawdown area for dewatering of the proposed GVK/Hancock Alpha Coal Mine.

My objections to the Draft EA can be summarised as follows:

- the Applicant has not provided sufficient information to demonstrate that it will not have an unacceptable impact on groundwater;
- the environmental impacts on groundwater cannot be controlled such that the operations will cause serious environmental harm despite any conditions designed to avoid it;
- the environmental impacts have not been properly identified and the Court cannot be satisfied that those relating to the impact on groundwater can be managed; and
- given the intergenerational impacts of the proposed project, a greater level of scrutiny and analysis is required, well above that which the proponent has provided to date.

The objections to the MLA effectively include the foregoing and further that the proposed land use is inappropriate when considering the current land use.

[6] Ms Cassoni's summary submissions 18 October 2013.

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Key Groundwater issues

There remain significant uncertainties surrounding the groundwater modelling for the project. These uncertainties include:

- the project has failed to account for or model the cumulative impacts of this and other proposed projects;
- the recharge as modelled makes no sense; and
- insufficient field data has been obtained to determine the impacts of the project on the GAB.

Ecological impacts of drawdown on the Bimblebox Nature Refuge

It is predicted in URS 2012 that the impact of dewatering of the project extends onto the Bimblebox Nature Refuge, drawdown may be greater than modelled. The proponent has done no modelling of cumulative impacts, except for Kevin's Corner project, of the cumulative impacts of this project and other proposals nearby.

Given the uncontested evidence of Mr Friend that root depth of flora on the Refuge is likely to extend down at least 9 metres, any loss of groundwater may have a catastrophic impact upon the ecological values of the Refuge – an impact that will only be noticed under the current project proposal when plants start dying.

Need for a regional groundwater model and management plan

Prior to any project in this part of the Galilee Basin being approved, a regional model and underground water impact report should be prepared by DERM/EHP.

Conclusion

The hydrogeological modelling done by the project proponent is flawed and insufficient investigation has been undertaken. Thus the project should not be approved.

This project should not have been approved at first instance. The Court cannot recommend the EA or the MLA be granted given:

- the serious concerns raised by Dr Mudd, Dr Webb, RPS (2011) and the Interim Independent Scientific Committee;
- the uncertainty surrounding the cumulative impact of this project along with other known projects in the region; and
- the intergenerational impacts on groundwater availability and the potential for this to destroy the long-term future of the district for agricultural production and impacts on a valuable ecological area, Bimblebox.

In my submission, based on the evidence the Court:

- cannot be satisfied as to the degree of the adverse environmental impact likely to be caused by the operations of each of the MLA's (section 269(4)(j) MRA) because the Applicant has submitted insufficient information in support of its application such as to determine the extent of the adverse environmental impact;
- can be satisfied that good reason has been shown for a refusal to grant each of the mining lease applications (section 269(4)(l)MRA) because of threats to environmental value of existing groundwater and groundwater dependent ecosystems at Bimblebox.

In this instance there is not merely a threat of irreversible environmental damage should the project proceed, there is a certainty that such damage will occur. The lack of certainty surrounding the exact groundwater impacts of the project and the inadequacies of the investigations by the proponent point to an obvious conclusion – the Court has no choice other than to make an unfavourable recommendation regarding the proposed project.

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Given the inadequacy of the information provided by the Applicant and the serious risk, there is no reasonably way that conditions could be formulated to effectively take into account the unknown potential groundwater impacts."

[15] Mr and Mrs Anderson, who are also objectors, submitted as follows:[7]

"**Overview of Submissison**

1. The mine will leave a permanent, and irreversible impact on the quality and quantity of groundwater available to landholders around the project area. While there are conditions to make good affected bores, there is no requirement to remediate the affected aquifers.

2. There is a potential that this mine will have a devastating effect on the long-term livelihood of the agricultural industry in the region as the final impact on groundwater may potentially be much greater than predicted. This is due to inherent errors in modelling, and the use of assumptions in the current modelling that have not been tested.

3. Our integrated beef cattle business, comprising of three adjoining properties, is located between the four mines proposed in the area. Our groundwater will be impacted on a cumulative basis. No baselining or monitoring of our bores has been done and we are concerned it will be difficult for us to prove which mining company is accountable to make good water supplies. Given the limited amount of time we would be able to supply cattle with an alternate water supply, we are concerned for the welfare of our livestock. We are concerned our business could become unviable in this process.

4. We plan to increase the carrying capacity of our properties by bladeploughing to improve productivity, however we are concerned that the surplus of groundwater capacity we rely on to implement this may become impacted. In drought conditions we rely almost fully on bore water, and the potential to increase dam water supplies has been utilised.

5. We are concerned that there is insufficient data for experts to understand the complex structure of groundwater systems in the region, and this will lead to a much greater impact on groundwater than predicted. Landholders rely on this water for their business and without existing supplies their properties would become unsalable and unviable.

6. The Terms of Reference stated that a cumulative model of all the proposed mines in the area should be done, however the Applicant refused to do the model, even though it is reasonable for it to be done. This cumulative model is especially important for assessing what the potential impacts will be on Landholder's so planning can be done to ascertain how the company will meet their make good commitments.

7. Drilling and testing has not been done outside the mining lease to know if drilling deeper bores will provide a reliable alternative water supply for affected landholders.

8. The permanent impact the mine will have on groundwater quality and quantity, and the assumptions that have been used in the modelling process give way for the precautionary principal to be applied. Comprehensive modelling should be done by DERM to assess the cumulative impact of all the mining proponents in the Galilee Basin.

9. Once a regional model and groundwater network is established, a regional scale monitoring and mitigation approach should be developed to assess and manage the impacts. A condition should be made that the assumptions that impacted bores can be made good needs to be thoroughly tested.

10. As part of the Applicant's EA approval the precautionary principal should be applied that landholder's bores around the mining project should be baselined and monitored prior to dewatering.

[7] The Andersons' overview submissions 18 October 2013.

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11. The precautionary principal should be applied in that the Applicant should be conditioned to undertake further investigations in respect to groundwater and enter into reasonable, binding make good agreements with landholders who are potentially affected by adverse cumulative impacts on the availability and quality of their groundwater as a result of mining operations, prior to the approval of the EA.

12. A condition should be made that alternate water supplies are put in place before supplies from landholder bores are affected and that the costs of these changes are paid by the Applicant both during and after the life of the mine.

13. I ask that a strengthening of those conditions, that the cumulative impacts that the proposed mines will have on our business and other landholder's business' will be delegated to one mining company, in all areas'of the Basin and that it will be the responsibility of the company to seek reimbursement from other mining companies involved.

14. The precautionary principal should be applied in such a way it protects the livelihoods of those in the agricultural industry and agriculture – dependant industries for the duration of the life of the mine and for the generations to come."

[16] Due to illness, Mr and Mrs Currie were unable to supply their own written submissions. They advised the Court that they agreed with and relied upon Mr and Mrs Anderson's and Ms Cassoni's written submissions. Mr and Mrs Currie did appear for oral submissions and also provided written submissions in reply.

[17] The Statutory Party is only concerned with the objections under the EPA. Its executive summary is as follows:[8]

"**EXECUTIVE SUMMARY OF THE SUBMISSIONS OF THE STATUTORY PARTY**

1. The Statutory Party respectfully submits that the Court should recommend to the Minister that the application for the Environmental Authority be granted on the basis of the draft Environmental Authority for the application. That should be the result because:

   (a) the Applicant's application for an Environmental Authority was detailed and was subject to a number of amendments/improvements which drew attention to the real issues for consideration;

   (b) the Statutory Party subjected that application to a rigorous assessment, as did the Coordinator-General pursuant to the *State Development and Public Works Organisation Act* 19711;

   (c) as a result of its own rigorous assessment, the Statutory Party gave the Applicant a draft Environmental Authority subject to conditions (including conditions mandated by the Coordinator-General);

   (d) the conditions attached to the draft Environmental Authority provide satisfactory protection and mitigation measures to ameliorate the impacts of the Applicant's mining proposal;

   (e) the evidence before the Court has not revealed any rationale or reason warranting refusal of the application for the Environmental Authority; and

   (f) the evidence before the Court has not revealed any risks or impacts from the Applicant's mining proposal that are not adequately dealt with in the conditions of the draft Environmental Authority, or which will not be further dealt with in water licences required to be obtained by the Applicant under the *Water Act* 2000."

[8] Executive Summary of the submissions of the statutory party 18 October 2013.

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[18] It should be noted that there was a further objector, Mackay Conservation Group (MCG). However, as it chose to be a Level 1 objector and did not attend the hearing,[9] no submissions were received from them. Nonetheless, its objections remain as valid objections under the MRA and the EPA and will be considered where appropriate later in this decision.

Background

[19] In compiling this background, I have relied heavily on the submissions supplied by Hancock on 18 October 2013 and, in particular, paragraphs 1 to 37 of those submissions. I have also relied upon the Mining Registrar's report to the Land Court dated 27 February 2013 and the various materials attached to that report.

[20] I note that much of the facts as set out in Hancock's submissions used for the purposes of this background rely upon material contained within the affidavit of Mr Willis.[10] To spare the reader from an inordinate number of footnotes, it can be taken as read that, unless otherwise indicated, the background facts and circumstances which have been relied upon for the compilation of this background are sourced from either the affidavit of Mr Willis or from the Mining Registrar's report.

[21] The Alpha Mine proposed by Hancock is located approximately 130 km south-west of Clermont and approximately 50 km north of Alpha, and lies wholly within the area of the Barcaldine Regional Council. The predominant current land use in the general vicinity of the Alpha Mine is pastoral purposes, with an emphasis on grazing of cattle.

[22] Hancock proposes a huge mining operation for the Alpha Mine. The proposed mine life is 30 years, with the term applied for of 40 years to allow for construction, decommissioning and rehabilitation. At its peak, it is proposed that the mine will produce 30 Mtpa of thermal coal.

[23] The estimated capital cost of the Alpha Mine is $3.4 B.

[24] The Alpha Mine is a component part of the broader Alpha Coal project which includes the mine, together with rail and port facilities. It is proposed that coal mined from the Alpha Mine will be processed on site and then transported 495 km by rail to the Abbot Point Coal Terminal just north of Bowen in Central Queensland, from where it will be exported to overseas markets, primarily in Asia.

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9 MCG's Form 7, filed 5 March 2013.

10 Exh 13.

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[25] As indicated in the overview, the mine and rail aspects of the Alpha Project were declared to be a significant project under s 26(1)(a) of the SDPWOA. This declaration occurred on 24 October 2008. As a result of the declaration, the mine and rail aspects of the project were made subject to the environmental impact assessment processes under the SDPWOA. These processes are administered by the Coordinator-General for the State of Queensland.

[26] As well as the involvement of the Coordinator-General for Queensland, the mine and rail aspects of the Alpha Project also received Commonwealth attention, resulting, on 13 January 2009, in those aspects being determined to be a controlled action pursuant to s 75 of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (the EPBCA). As a consequence of the EPBCA determination, the mine and rail aspects of the Alpha Project became subject to assessment by the Commonwealth Minister administering the EPBCA in relation to matters of national environmental significance.

[27] The Coordinator-General proposed draft terms of reference for the environmental impact statement for the mine and rail aspects of the project and released same for public and advisory agency comment from 7 February to 9 March 2009. Twenty-two submissions were received on the draft terms of reference. Subsequently, on 1 June 2009, the Coordinator-General finalised the terms of reference for the environmental impact statement for the mine and rail aspects.

[28] The next significant step in the approval process occurred on 18 December 2009 when Hancock lodged its formal application for a mining lease with the Mining Registrar, Emerald. The application was made Mining Lease Application 70426 (MLA 70426). It should be noted that the application documents provided to the Mining Registrar for MLA 70426 are large, containing some 193 pages of material.

[29] MLA 70426 covers an extensive area. The diagram below[11] shows both the overall size of the MLA together with a helpful overview of the location of the MLA having regard to surrounding properties and the towns of Alpha and Jericho.

[30] The objectors' properties are shaded blue on the below map. "Speculation" is located to the north-west of the Alpha Mine and is owned by the Curries. Ms Cassoni's property "Glen Innes", also known as "Bimblebox Nature Refuge", is located to the south of the proposed Alpha Mine, while the Andersons' property, "Eureka", is located further to the south of Ms Cassoni's property.

[11] Extracted from Exh 13, attachment 3.

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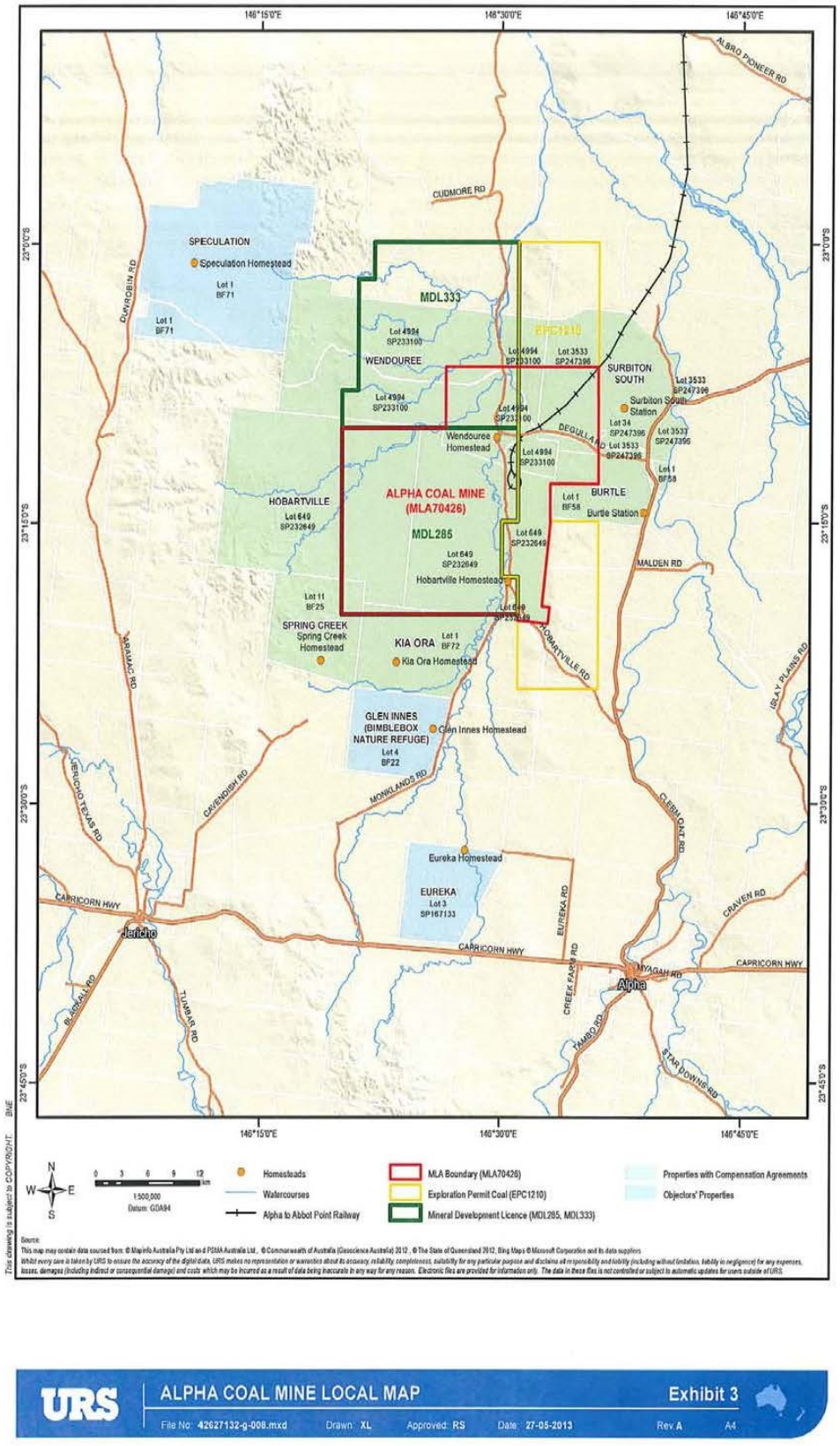

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[31] For completeness, it is noted that the map above also indicates in green those properties, both underlaying the Alpha Mine MLA area and surrounding it, over which Hancock has entered into compensation agreements with the landholders.

[32] Hancock provided an Environmental Impact Statement (EIS) to the Coordinator-General on 5 November 2010. Following public comment and review which was open from 5 November to 20 December 2010, 63 submissions were received. In response to the submissions made to the EIS, on 5 September 2011 Hancock provided a Supplementary Environmental Impact Statement (SEIS) to the Coordinator-General.

[33] As certain Government agencies had requested more detail on a number of aspects of the SEIS, an addendum to the SEIS was provided to the Coordinator-General on 21 November 2011.

[34] The Mining Registrar at Emerald issued a Certificate of Application for MLA 70426 on 21 December 2011. The Certificate of Application was formally accepted by Hancock on 13 March 2012.

[35] A further step in the process was taken by Hancock in March 2012 when it provided a further groundwater report, prepared by URS (URS 2012) to the Coordinator-General.

[36] In May 2012 the Coordinator-General released the Evaluation Report on the Environmental Impact Statement (the Coordinator-General's report). The Coordinator-General's conditions for the Alpha Mine are contained within the Coordinator-General's report.

[37] On 23 August 2012 the Commonwealth Minister granted approval for the Alpha Mine under the EPBCA, subject to further conditions.

[38] On 17 December 2012, in accordance with the EPA, draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN 101017310-Alpha Coal Mine (the draft EA) was issued. Following this, on 19 December 2012, the Mining Registrar at Rockhampton issued the Certificate of Public Notice for MLA 70426. It was a requirement of the public notification that any objections be lodged during the objection period which closed on 20 February 2013.

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[39] Objections were lodged during the objection period by Ms Kelly, CCAQ, MCG, Ms Cassoni, the Curries, and the Andersons. It should be noted that, whilst these are the only objections which remain current, during the objection period objections were also lodged by Mr and Mrs Coyne and Mr and Mrs O'Dell, but these objections were not pursued.

[40] As regards the current objections, all but the Curries make objection under both the MRA and the EPA. Although the Curries initially made objection under both Acts, by notice to the Land Court of 29 April 2013 the then solicitors for the Curries notified the Court that the MLA objection was withdrawn.

[41] As well as the chronology of events which I have substantially included in the background above, Hancock also included in its introductory submissions reference to certain geological features of the land in the vicinity of the Alpha Mine. This was a sensible course for their submissions to take, as in my view it would be impossible to understand the submissions, particularly relating to groundwater, without an overview of the geological features of the area, and the names attributed to the various geological features.

[42] The schematic below has been taken from Exhibit 106, page 17. It shows in general terms the underlying geology for not only the land lying directly under the area where the Alpha Mine is proposed, but also for the much broader Galilee Basin through to the Great Artesian Basin (GAB).

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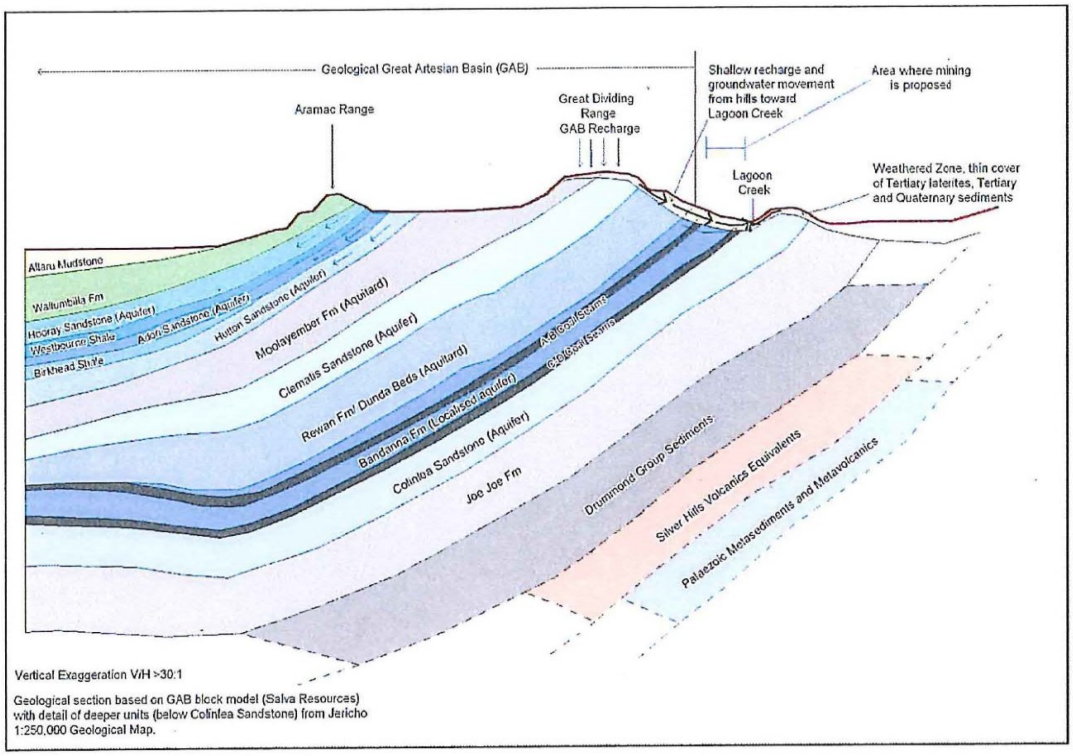
Figure 4-11 Schematic Section through Galilee Basin and GAB



[43] Further detail of the underlying geology can be understood by reference to a diagram set out in the joint expert report of the groundwater experts[12] and repeated in Hancock's submissions of 18 October 2013.[13] The diagram is as follows:

12 Exh 18.1.

13 At paragraph 12.

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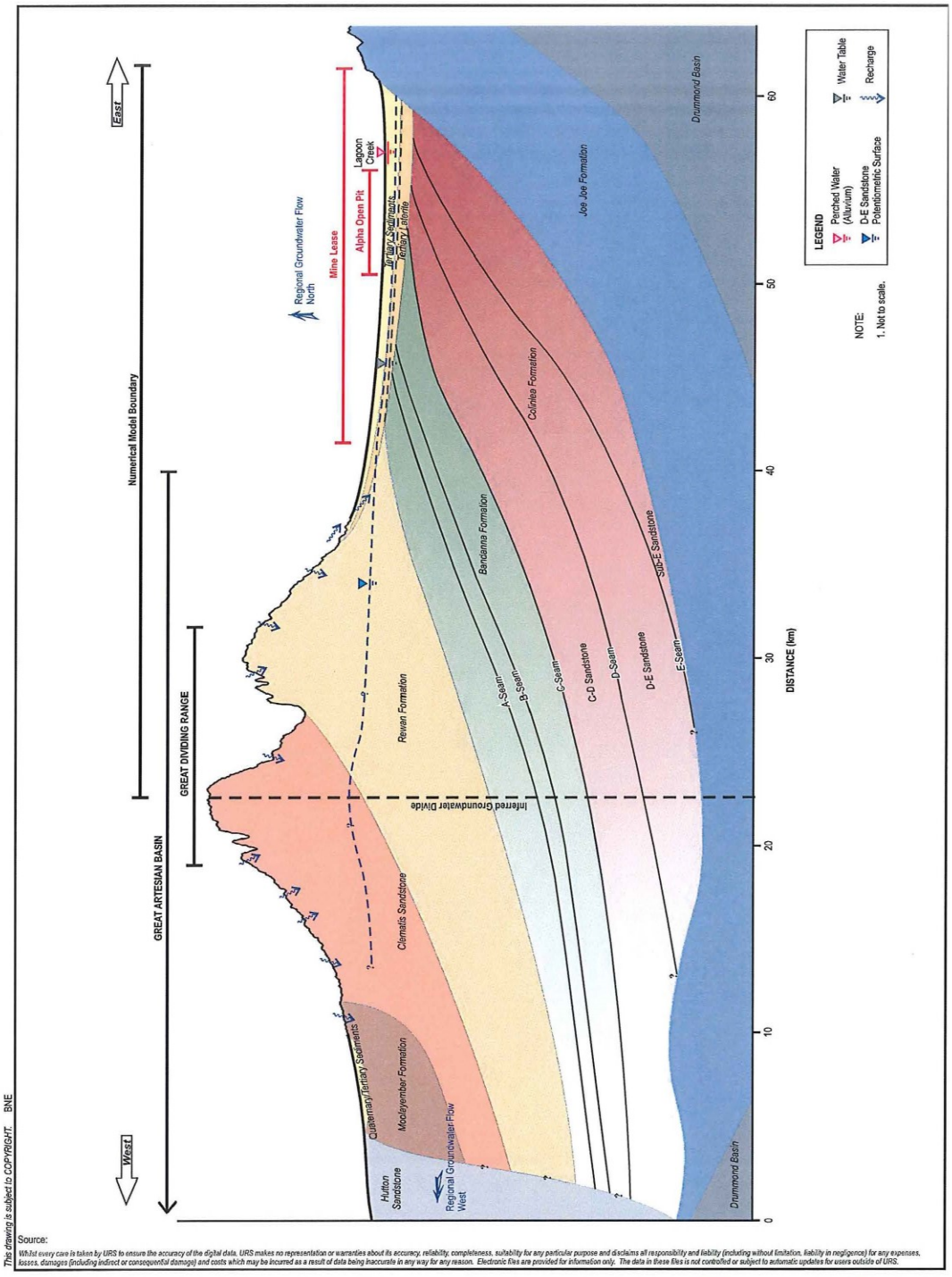

GVK RESOURCES

ALPHA COAL MINE PROJECT

CONCEPTUAL GROUNDWATER MODEL

URS | JOINT EXPERTS REPORT ON GROUNDWATER | Figure: 1

File No: 42627132-g-101.cdr | Drawn: XL | Approved: MS | Date: 31-07-2013 | Rev.A | A4

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[44] Although the diagram immediately above assists greatly in the understanding of this case, care needs to be taken when viewing this diagram as only some aspects of the diagram are agreed as between the experts; in particular, the location of the inferred groundwater divide is not universally agreed, nor are certain aspects of underground water movement which will be examined in detail later in these reasons.

[45] Thankfully, there are some aspects of the geology as shown by the above two diagrams which is uncontroversial. This has been detailed in Hancock's submissions of 18 October 2013 at paragraph 13 and expressed as follows:

(a) the mine pits lie above the targeted C and D seams which are within the Colinlea Formation;

(b) the mining lease and pit are to the east of the Great Dividing Range (GDR) and the GAB;

(c) above and to the west of the Colinlea Formation are, inter-alia, the Bandana Formation, the Rewan Formation, and the Clematis Sandstone and the Moolayember Formation;

(d) below and to the east of the Colinlea Formation is, inter-alia, the Joe Joe Formation. The Rewan Formation is the basal formation of the GAB. The Clematis Sandstone is an aquifer for the GAB.

[46] In concluding this background, it is also worth noting that there are presently seven potential projects within the Galilee Basin for which MLAs have been lodged. Immediately to the south of the Alpha Project is the Warratah Project, which is also known as Galilee or China First. To the south of the Warratah Project is the South Galilee Project. North of the Alpha Mine is the Kevin's Corner Project, the Alpha North Project, the Carmichael Project and the Carmichael East Project.

[47] It is uncontroversial that the Alpha Project is the most advanced, whilst the next most advanced project is Kevin's Corner. It should be noted that the proponent of Kevin's Corner is a related company of Hancock.

The Hearing

[48] Both the MRA and EPA matters were heard together. The parties to both matters are identical, save for the Curries and the Statutory Party, who are only involved in the EPA proceedings.

[49] Oral evidence was heard over a 13 day period from 16 September to 2 October 2013. After this, the parties exchanged written submissions, and oral submissions were heard on 25 October 2013.

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[50] Because of the volume of material, the hearing proceeded by way of etrial, which was very successful. I thank all those responsible for the smooth operation of the etrial.

[51] Hancock was represented throughout the hearing by Mr Clotherier QC and Mr Pomerenke, instructed by Allens. CCAQ was represented by Mr Finanzio SC and Dr McGrath and Mr Watters, instructed by Environmental Defenders Office (Qld) Inc. Mr Loos represented the Statutory Party, instructed by the Department of Environment and Heritage Protection. Ms Kelly, the Andersons, Ms Cassoni, and the Curries all self represented.

[52] Oral evidence was given during the hearing by the following:

- Ross David Willis, Chief Operating Officer, Alpha Coal Project, called by Hancock
- Mark Stewart, Principal Hydrologist, URS Australia Pty Ltd, called by Hancock
- Bruce Bede Currie, self represented objector
- Janeice Marie Anderson, self represented objector
- Martin Argente, Corporate Counsel, Hancock, called by Hancock
- Ian Donald Hair, Principal Hydro Geologist, Douglas Partners, called by Hancock
- Professor Roger Neville Jones, Professorial Research Fellow, Centre for Strategic Economic Studies, Victoria University, called by Ms Kelly
- Dr David Dique, Zoologist and Ecologist, Partner, EMR Australia Pty Ltd, called by Hancock
- Marcus Robert Brown, Economist, Economic Associates Pty Ltd, called by Hancock
- Christopher John Loveday, Environmental Scientist, Department of Environment and Heritage Protection, called by the Statutory Party
- Dr Chris Taylor, Environmental Scientist, URS, called by Hancock
- Andre Offen, Coal Marketing Expert, called by Hancock
- Jonathan Jeffrey Stanford, Economist and Climate Change Public Policy Expert, Inside Economics Pty Ltd, called by Hancock
- Eric Vanderduys, Zoologist, CSIRO, called by Ms Kelly
- Robert Harry Friend, Ecologist, called by Ms Cassoni
- Fiorella Paola Cassoni, self represented objector
- Dr Gavin Mudd, Environmental Engineer, Monash University, called by Ms Cassoni
- Professor David John Karoly, Environmental Scientist, Climate Change, University of Melbourne, called by CCAQ

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- Dr John Allen Webb,[14] Hydrogeologist and Geologist, La Trobe University, called by CCAQ
- Dr Roderick Graham Duncan, Economist, Charles Sturt University, called by CCAQ
- Joanne Mary Salmond, property owner, Degulla Station, called by CCAQ
- Antoine Nsair, Energy Sector Statistical Expert, Marsden Jacob Associates, called by CCAQ

[53] All parties expressed an interest in having the decision in these matters delivered quickly. There is no doubt that the various issues discussed in this matter are important, and that the Alpha Mine is a project of State and National significance.

[54] At the conclusion of submissions, the parties were advised of my intention to deliver the decision by about the end of January 2014. Unfortunately, I was involved in a rather serious accident in December 2013 which of necessity meant that the decision had to be delayed. I apologise to all concerned regarding the delay, which was caused by circumstances beyond my control.

The statutory framework

[55] As previously mentioned, these matters involve the hearing of objections under the MRA and the EPA. Pursuant to the MRA, it is also necessary for the Court to make recommendations to the relevant Minister regarding Hancock's MLA 70426.

[56] There is a rather complex statutory framework underpinning these matters, which involves the MRA, the EPA, the SDPWOA and the *Water Act 2000* (Water Act).

[57] As Hancock's MLA is made pursuant to the MRA, it is appropriate to consider that legislation first.

MRA

[58] Pursuant to s 268 of the MRA, the Court is required to conduct a hearing into the application for the grant of the mining lease and the MRA objections. Section 268 relevantly provides as follows:

> "**268 Hearing of application for grant of mining lease**
>
> (1) On the date fixed for the hearing of the application for the grant of the mining lease and objections thereto, the Land Court shall hear the application and objections thereto and all other matters that pursuant to this part are to be heard, considered or determined by the Land Court in respect of that application at the one hearing of the Land Court.
>
> (2) At a hearing pursuant to subsection (1) the Land Court shall take such evidence, shall hear such persons and inform itself in such manner as it considers appropriate

[14] I note that Dr Webb's report of 27 June 2013, Exh 42, is signed off "Assoc Prof John Webb", although the front of the report says "Dr John Webb" and the Joint Report of the groundwater experts, Exh 18, refers throughout to "Dr Webb".

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in order to determine the relative merits of the application, objections and other matters and shall not be bound by any rule or practice as to evidence.

(3) The Land Court shall not entertain an objection to an application or any ground thereof or any evidence in relation to any ground if the objection or ground is not contained in an objection that has been duly lodged in respect of the application. …"

[59] Section 269 of the MRA then goes on to relevantly provide:

"**269 Land Court's recommendation on hearing**

(1) Upon the hearing by the Land Court under this part of all matters in respect of an application for the grant of a mining lease, the Land Court shall forward to the Minister—
(a) any objections lodged in relation thereto; and
(b) the evidence adduced at the hearing; and
(c) any exhibits; and
(d) the Land Court's recommendation.
Note—
For other relevant provisions about forwarding documents, see section 386O.

(2) For subsection (1)(d), the Land Court's recommendation must consist of—
(a) a recommendation to the Minister that the application be granted or rejected in whole or in part; and
(b) if the application relates to land that is the surface of a reserve and the owner of the reserve has not consented to the grant of a mining lease over the surface area, the following—
(i) a recommendation to the Minister as to whether the Governor in Council should consent to the grant over the surface area;
(ii) any conditions to which the mining lease should be subject.

(3) A recommendation may include a recommendation that the mining lease be granted subject to such conditions as the Land Court considers appropriate, including a condition that mining shall not be carried on above a specified depth below specified surface area of the land.

(4) The Land Court, when making a recommendation to the Minister that an application for a mining lease be granted in whole or in part, shall take into account and consider whether—
(a) the provisions of this Act have been complied with; and
(b) the area of land applied for is mineralised or the other purposes for which the lease is sought are appropriate; and
(c) if the land applied for is mineralised, there will be an acceptable level of development and utilisation of the mineral resources within the area applied for; and
(d) the land and the surface area of the land in respect of which the mining lease is sought is of an appropriate size and shape in relation to—
(i) the matters mentioned in paragraphs (b) and (c); and
(ii) the type and location of the activities proposed to be carried out under the lease and their likely impact on the surface of the land; and
(e) the term sought is appropriate; and
(f) the applicant has the necessary financial and technical capabilities to carry on mining operations under the proposed mining lease; and
(g) the past performance of the applicant has been satisfactory; and
(h) any disadvantage may result to the rights of—
(i) holders of existing exploration permits or mineral development licences; or
(ii) existing applicants for exploration permits or mineral development licences; and
(i) the operations to be carried on under the authority of the proposed mining lease will conform with sound land use management; and
(j) there will be any adverse environmental impact caused by those operations and, if so, the extent thereof; and
(k) the public right and interest will be prejudiced; and
(l) any good reason has been shown for a refusal to grant the mining lease; and
(m) taking into consideration the current and prospective uses of that land, the proposed mining operation is an appropriate land use.

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(5) Where the Land Court recommends to the Minister that an application for the grant of a mining lease be rejected in whole or in part the Land Court shall furnish the Minister with the Land Court's reasons for that recommendation."

[60] The objects of the MRA are also relevant. They are set out in s 2 as follows:

"**2 Objectives of Act**

The principal objectives of this Act are to—

(a) encourage and facilitate prospecting and exploring for and mining of minerals;
(b) enhance knowledge of the mineral resources of the State;
(c) minimise land use conflict with respect to prospecting, exploring and mining;
(d) encourage environmental responsibility in prospecting, exploring and mining;
(e) ensure an appropriate financial return to the State from mining;
(f) provide an administrative framework to expedite and regulate prospecting and exploring for and mining of minerals;
(g) encourage responsible land care management in prospecting, exploring and mining."

EPA

[61] It should be noted at the outset that the EPA has undergone significant amendment subsequent to the lodging of objections, and that those amendments directly relate to the objection process under the EPA. The significant amendments commenced on 31 March 2013.[15] For the purposes of this decision, s 683 of the EPA (as currently enacted) provides that the previous provisions of the EPA, under former Chapter 5, apply. Accordingly, the provisions which relevantly commenced on 31 March 2013 are to be ignored. All further references in this decision to the EPA will be to those provisions from the former Chapter 5 of the EPA. As Mr Loos points out in his submissions, the relevant reprint of the EPA is Reprint 11B as in force as at 11 December 2012.[16]

[62] The object of the EPA is important. Section 3 of the EPA provides as follows:

"**3 Object**

The object of this Act 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***).

4 How object of Act is to be achieved

(1) The protection of Queensland's environment is to be achieved by an integrated management program that is consistent with ecologically sustainable development.
(2) The program is cyclical and involves the following phases—
(a) phase 1—establishing the state of the environment and defining environmental objectives;
(b) phase 2—developing effective environmental strategies;
(c) phase 3—implementing environmental strategies and integrating them into efficient resource management;
(d) phase 4—ensuring accountability of environmental strategies.
(3) The relationship between each of the phases is shown in the figure appearing at the end of this Act.
(4) Phase 1 is achieved by—
(a) researching the state of the environment, including essential ecological processes; and
(b) deciding environmental values to be protected or achieved by consulting industry, government departments and the community.
(5) Phase 2 is achieved by—
(a) developing environmental protection policies that, among other things—

15 See *Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012 No. 16*.
16 Statutory Party Submissions, 18 October 2013, para 24.

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(i) decide environmental indicators; and
(ii) establish ambient and emission standards for contaminants; and
(iii) require waste management, including waste prevention and minimisation; and
(iv) advise on management practices; and
(b) promoting environmental responsibility and involvement within the community.

(6) Phase 3 is achieved by—
(a) integrating environmental values into land use planning and management of natural resources; and
(b) ensuring all reasonable and practicable measures are taken to protect environmental values from all sources of environmental harm; and
(c) monitoring the impact of the release of contaminants into the environment; and
(d) requiring persons who cause environmental harm to pay costs and penalties for the harm.

(7) Phase 4 is achieved by—
(a) reviewing the results of human activities on the environment; and
(b) evaluating the efficiency and effectiveness of environmental strategies; and
(c) reporting publicly on the state of the environment.

5 Obligations of persons to achieve object of Act

If, under this Act, a function or power is conferred on a person, the person must perform the function or exercise the power in the way that best achieves the object of this Act.

6 Community involvement in administration of Act

This Act is to be administered, as far as practicable, in consultation with, and having regard to the views and interests of, industry, Aborigines and Torres Strait Islanders under Aboriginal tradition and Island custom, interested groups and persons and the community generally."

[63] As I said in the Land Court decision of *Donovan v Struber & Ors*:[17]

"[14] The objects of the EP Act are vastly different from the objects of the MRA. While the key object of the MRA is to facilitate the mining of the State's resources, s.3 of the EP Act states that the object of that Act 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).

[15] Section 4 of the EP Act provides for an integrated management program, which involves implementing environmental strategies and integrating them into efficient resource management. Accountability is an important element, while s.8 defines **'environment'** and s.9 defines **'environmental value'**. Section 14 defines **'environmental harm'** and how it may be caused by an activity. Section 15 defines **'environmental nuisance'** as unreasonable interference or likely interference with an environmental value caused by:
(a) noise, dust, odour, light; or
(b) an unhealthy, offensive or unsightly condition because of contamination; or
(c) another way prescribed by regulation"

[64] Section 14 of the EPA refers to environmental harm:

"**14 Environmental harm**
(1) ***Environmental harm*** is 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.
(2) ***Environmental harm*** may be caused by an activity—
(a) whether the harm is a direct or indirect result of the activity; or
(b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors."

[17] (2011) 32 QLCR 226.

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[65] The administering authority prepared the draft EA pursuant to s 208 of the EPA. The draft EA includes conditions which have been included in accordance with s 210 of the EPA. This section is important in light of the Coordinator-General's Report and the conditions contained therein. Section 210 states as follows:

> "**210 Conditions that may and must be included in draft environmental authority**
> (1) The administering authority may include conditions in the draft environmental authority it considers necessary or desirable.
> (2) However, if a relevant mining lease is, or is included in, a significant project—
> (a) the administering authority must include in the draft any conditions for the draft stated in the Coordinator-General's report for the project (***Coordinator-General's conditions***); and
> (b) any other condition included in the draft must not be inconsistent with a Coordinator-General's condition.
> (3) The administering authority may include in the draft a condition that requires or otherwise relates to an environmental offset (an ***environmental offset condition***) if the administering authority is satisfied that all cost-effective on-site mitigation measures for the relevant mining activities have been, or will be, undertaken.
> (4) An environmental offset condition may require works or activities to be undertaken on land on which a relevant mining activity is carried out or on other land in the State.
> (5) An environmental offset condition may require a monetary payment to an environmental offset trust.
> (6) If the applicant has entered into an agreement about an environmental offset for this section, an environmental offset condition may require the authority holder to comply with the agreement.
> (7) In fixing proposed conditions for the draft, the administering authority must—
> (a) comply with any relevant regulatory requirement; and
> (b) subject to paragraph (a), consider—
> (i) the application documents for the application; and
> (ii) the standard criteria; and
> (iii) to the extent the application relates to mining activities in a wild river area—the wild river declaration for the area.
> (8) Subject to subsection (7), the proposed conditions must include conditions about rehabilitation objectives, indicators and completion criteria.
> (9) The applicant may enter into an agreement with the administering authority or another entity to establish the obligations, or secure the performance, of a party to the agreement about a condition.
> (10) In this section—
> *environmental offset* means works or activities undertaken to counterbalance the impacts of a relevant mining activity on the natural environment.
> *on-site mitigation measure*, for a relevant mining activity, means a measure, undertaken on land to which the activity relates, to avoid or minimise negative impacts of the activity on the natural environment."

[66] The right to make an objection under the EPA is set out in s 216. The objection may be about the EA Application, the draft EA for the application, or a condition included in the draft.

[67] Importantly, s 216(2) goes on to provide as follows:

> "(2) Also, a Coordinator-General's condition included in the draft under section 210 can not be objected to by anyone."

[68] The decision that this Court makes in hearing the EPA objection is governed by s 222, which relevantly provides as follows:

> "**222 Nature of objections decision**
> (1) The objections decision for the application must be a recommendation to the EPA Minister that—
> (a) the application be granted on the basis of the draft environmental authority for the application; or
> (b) the application be granted, but on stated conditions that are different to the conditions in the draft; or

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(c) the application be refused.

(2) However, if a relevant mining lease is, or is included in, a significant project and, under section 210, Coordinator-General's conditions were included in the draft, any stated conditions under subsection (1)(b)—

(a) must include the Coordinator-General's conditions; and

(b) must not be inconsistent with a Coordinator-General's condition.

…"

[69] Another important section to be considered by this Court is s 223 of the EPA. That section provides:

> **"223 Matters to be considered for objections decision**
>
> In making the objections decision for the application, the Land Court must consider the following—
>
> (a) the application documents for the application;
>
> (b) any relevant regulatory requirement;
>
> (c) the standard criteria;
>
> (d) … ;
>
> (e) each current objection;
>
> (f) any suitability report obtained for the application;
>
> (g) the status of any application under the Mineral Resources Act for each relevant mining tenement."

[70] It is via the mechanism of s 223 that the "precautionary principle" comes into play. As I stated in *De Lacey & Anor v Kagara Pty Ltd*:[18]

> "[174] 'Standard criteria' (see s. 223(c) above) is defined in Schedule 3 of the EP Act in part as follows:
>
> ' "standard criteria" means–
>
> the principles of ecologically sustainable development as set out in the 'National Strategy for Ecologically Sustainable Development'; and . .. . .'
>
> [175] Further in Schedule 3 of the EP Act, "National Strategy for Ecologically Sustainable Development" is defined as follows:
>
> ' "National Strategy for Ecologically Sustainable Development" means the 'National Strategy for Ecologically Sustainable Development' endorsed by the Council of Australian Governments on 7 December 1992." '
>
> [176] The National Strategy for Ecologically Sustainable Development of December 1992 contains the following statement of Australia's goal, core objectives and guiding principles for the Strategy:
>
> '**The Goal is**:
>
> 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.
>
> **The Core Objectives are**:
>
> - to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
> - to provide for equity within and between generations
> - to protect biological diversity and maintain essential ecological processes and life-support systems
>
> **The Guiding Principles are**:
>
> - decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations
> - 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
> - the global dimension of environmental impacts of actions and policies should be recognised and considered

[18] (2009) 30 QLCR 57. Note paragraphs incorrectly numbered in The Reports as [172] – [176].

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- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised
- cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms
- decisions and actions should provide for broad community involvement on issues which affect them

These guiding principles and core objectives need to be considered as a package. No objective or principle should predominate over the others. A balanced approach is required that takes into account all these objectives and principles to pursue the goal of ESD.'

[177] >From the precautionary principle perspective, the key is the second bullet point to the guiding principles in the paragraph above, which sets out in a lengthened form what is currently referred to as the precautionary principle – that is, '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.'"

SDPWOA

[71] As already indicated, Hancock provided to the Coordinator-General an EIS and an SEIS. Section 35 of the SDPWOA[19] then becomes relevant:

"**35 Coordinator-General evaluates EIS, submissions, other material and prepares report**

(1) The Coordinator-General must, after the end of the submission period, consider the EIS, all properly made submissions and other submissions accepted by the Coordinator-General about the EIS and any other material the Coordinator-General considers is relevant to the project.

(2) The Coordinator-General may ask the proponent for supplementary information or comment about the EIS and the project.

(3) The Coordinator-General must prepare a report evaluating the EIS.

(4) In evaluating the EIS, the Coordinator-General may—

(a) evaluate the environmental effects of the project and any other related matters; and

(b) state conditions under section 39, 45, 47C, 49, 49B, 49E or 49G; and

(c) make recommendations under section 43 or 52; and

(d) if division 8 applies to the project—impose, under that division, conditions for the undertaking of the project.

… "

[72] Part 4, Division 5 of the SDPWOA sets out the inter-relationship with the MRA, and provides relevantly as follows:

"**Division 5 Relationship with Mineral Resources Act**

44 Application of div 5

This division applies if the project involves a proposed mining lease under the Mineral Resources Act.

45 Application of Coordinator-General's report to proposed mining lease

(1) The Coordinator-General's report may state conditions (***Coordinator-General's conditions***) for the proposed mining lease.

(2) If Coordinator-General's conditions are included in the report—

(a) the Coordinator-General must give the MRA Minister a copy of the report; and

(b) the conditions of the proposed mining lease are, subject to section 47, taken to include the Coordinator-General's conditions.

[19] All references are to Reprint 7A of the SDPWOA as in force at 11 December 2012.

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46 Coordinator-General's conditions override other conditions

(1) This section applies if—

(a) the proposed mining lease is granted; and

(b) the conditions of the mining lease include a Coordinator-General's condition; and

(c) there is any inconsistency between the Coordinator-General's condition and another condition of the mining lease.

(2) Subject to section 47, the Coordinator-General's condition prevails to the extent of the inconsistency.

(3) In this section—

Coordinator-General's condition means—

(a) a Coordinator-General's condition that, under section 45, is taken to have been included in the proposed mining lease; or

(b) a condition that is substantially the same as a condition mentioned in paragraph (a).

… "

[73] Importantly, s 54E then goes on to provide as follows:

"**54E Imposed conditions override conditions of other approvals**

If an imposed condition for the undertaking of the project is inconsistent with a condition of an approval that applies to the undertaking of the project, the imposed condition prevails to the extent of the inconsistency."

[74] The relationship between the SDPWOA and the EPA is set out in Division 6 of Part 4 and is as follows:

"**Division 6 Relationship with Environmental Protection Act**

Subdivision 1 Relationship for non-code compliant environmental authority (chapter 5A activities)

47B Application of sdiv 1

This subdivision applies if—

(a) the project involves a proposed environmental authority (chapter 5A activities) under the Environmental Protection Act; and

(b) were the proposed authority to be issued, it would be a non-code compliant authority for chapter 5A of that Act.

Note—

See the Environmental Protection Act, section 309B(4) (Types of environmental authorities (chapter 5A activities)).

47C Application of Coordinator-General's report to environmental authority

(1) The Coordinator-General's report for the EIS for the project may state conditions for the proposed environmental authority.

(2) If conditions under subsection (1) are included in the report, the Coordinator-General must give the EPA Minister a copy of the report.

Subdivision 2 Relationship for environmental authority (mining lease)

48 Application of sdiv 2

This subdivision applies if the project involves a proposed environmental authority (mining lease).

49 Application of Coordinator-General's report to environmental authority (mining lease)

(1) The Coordinator-General's report may state conditions for any draft environmental authority under the Environmental Protection Act for the proposed environmental authority (mining lease).

(2) If conditions under subsection (1) are included in the report, the Coordinator-General must give the EPA Minister a copy of the report."

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[75] Division 8 of Part 4 of the SDPWOA relevantly provides:

> "**Division 8 Application of Coordinator-General's report if no relevant approval**
>
> **54A Application of div 8**
> This division applies to the extent that—
> (a) the project does not involve a material change of use that, under the Sustainable Planning Act, is impact assessable; and
> (b) division 4, subdivision 2 and divisions 5, 6, 6A and 7 do not apply to the project.
>
> **54B Report may impose conditions**
> (1) Subject to section 54C, the Coordinator-General's report for the EIS for the project may impose conditions for the undertaking of the project, and state when they take effect.
> (2) condition imposed in the report is an ***imposed condition*** for the undertaking of the project.
> (3) If there are imposed conditions for the undertaking of the project, the Coordinator-General may, for any imposed condition for the undertaking of the project, nominate an entity that is to have jurisdiction for the condition.
> (4) An entity may be nominated for 1 or more of the conditions.
> (5) A nomination under subsection (3) may be in the report or by public notification.
> (6) The public notification may be made at any time.
> (7) The Coordinator-General must give a copy of the report to each nominated entity for an imposed condition for the undertaking of the project.
> (8) Also, if a nomination under subsection (3) is by public notification, the Coordinator-General must give each of the following a copy of the notification—
> (a) the nominated entity under the nomination;
> (b) the proponent for the project;
> (c) the department in which the Environmental Protection Act is administered;
> (d) the relevant local government for the project."

[76] As regards MLA 70426 and the EA thereto, the Coordinator-General made recommendations for the mine under s 35(4) of the SDPWOA; imposed conditions for the mine under s 54B of the SDPWOA; and stated conditions for the EA under s 47C(1) of the SDPWOA.

[77] Importantly, Hancock considers the interaction of the SDPWOA, the MRA and the EPA in its submissions of 18 October 2013 and notes as follows:[20]

> "141. One important consequence of these provisions is that where (as here) the Coordinator-General has stated conditions for the draft environmental authority under s47C(1) of the SDPWOA but has not stated conditions for the proposed mining lease under s45(1) of the SDPWOA, the Court cannot recommend conditions for *either the proposed mining lease or draft environmental authority* that would be inconsistent with the Coordinator-General's conditions. In *Xstrata* at [32], the President held that the recommendation of such conditions would "*defeat the intent of both the [SDPWOA] and the EPA*". The point is that the three statutes (the SDPWOA, the MRA and the EPA) were enacted by the one legislature and must be read together in accordance with "*the presumption that ... laws made by the one legislature are intended to work together*": *Ferdinands v Commissioner for Public Employment* (2006) 225 CLR 130 at [49] (Gummow and Hayne JJ). It would be contrary to this presumption, indeed absurd, to interpret this coherent statutory scheme so that the primacy given to a condition under one part of the scheme could be rendered nugatory by the detached application of another part of the scheme."

[20] At para 141.

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[78] President MacDonald considered this issue of inconsistency in *Xstrata Coal Queensland Pty Ltd & Ors v Friends of the Earth – Brisbane Co-Op Ltd & Ors, and Department of Environment and Resource Management*.[21] In President MacDonald's view:[22]

> "… If one is asked to examine whether there is an inconsistency, there must necessarily be two or more conditions for examination. Thus, in my view, the ordinary meaning of "inconsistent" indicates that it was not the intention of Parliament, as expressed in s.222(2)(b) of the EPA, that any Coordinator-General's condition would prevent the Court from recommending any conditions dealing with the same subject matter, for the draft EA.
>
> Further, if the Legislature had intended that the Court could not impose a condition dealing with the same subject matter as a Coordinator-General's condition, the Legislature could have said so using clear words to that effect. There are no such clear words in the EPA, or indeed the MRA or the *State Development Act*.
>
> I consider therefore that the Court has power under the EPA to recommend conditions for the draft EA dealing with the same subject matter as conditions imposed by the Coordinator-General, provided that the Court's recommended conditions do not contradict or lack harmony with the Coordinator-General's conditions."

[79] I respectfully agree with President MacDonald

[80] For completeness, I note the submissions of the Statutory Party of 18 October 2013[23] that there has been no issue of conflict between the Coordinator-General's conditions and the other draft EA conditions raised in this case.

Water Act 2000

[81] Depending upon the manner in which any interaction between the Water Act and the MRA, EPA and SDPWOA is viewed, consideration of water issues is either irrelevant to the present proceedings (the view expressed by Hancock)[24] or is fundamental to the proceedings and a matter which can properly be addressed in the current proceedings (the view expressed by CCAQ, the Andersons, the Curries, and Ms Cassoni;[25] with the legal argument as to the impact of the Water Act carried by CCAQ).

[82] Importantly, President MacDonald in *Xstrata* specifically considered this aspect. Both Hancock and CCAQ contend that she was in error in her conclusions.

[83] Due to the importance of this issue, and in light of my final conclusions on groundwater issues as detailed later in these reasons, it is appropriate to quote extensively from what President MacDonald said in *Xstrata*:[26]

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21 (2012) 33 QLCR 79.
22 *Xstrata* paras [45] – [47].
23 At para 41.
24 See Hancock's submissions 18 October 2013 paras 142-145.
25 See in particular CCAQ's Notice of Contention filed 30 April 2013 and the contentions therein relating to points 1(a) and 1(b); and CCAQ's submissions 18 October 2013 paras 153-155.
26 At paras [205] – [215] and [606] – [610].

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"***Land Court jurisdiction concerning water issues***

[205] The objections in relation to water issues broadly centre around four main topics -

- whether the impact of the mining operations on the alluvium, shallow and deep aquifers will be adequately monitored. The objectors are concerned as to the potential contamination of and interference with their groundwater supplies by the mining operations;
- the impact of the possible extraction of construction water from the Precipice Sandstone Aquifer on the supply of water from that aquifer;
- the impact of the possible diversion of Woleebee Creek on the Richs' water supply from the Woleebee Creek alluvium;
- the need for satisfactory make-good agreements to be entered into between the applicants and the objectors, prior to the commencement of the mining operations.

[206] Activities involving water diversions and extractions are regulated by the *Water Act* and it will be necessary for the applicants to apply for water licences under that Act for proposed activities such as the mine dewatering program, taking water for construction purposes from the Precipice Sandstone Aquifer and the diversion of Woleebee Creek. Section 235(3) of the MRA provides -

> "235(3) 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."

[207] Section 269(4)(j) of the MRA provides that the Court shall, when making a recommendation to the Minister, take into account and consider whether there will be any adverse environmental impact caused by the proposed mining operations and if so, the extent thereof. Schedule 2 of the MRA provides that "environment" has the meaning given by the EPA. Section 8 of the EPA defines "environment" as follows -

> "**8 Environment**
>
> ***Environment*** includes—
>
> (a) ecosystems and their constituent parts, including people and communities; and
>
> (b) all natural and physical resources; and
>
> (c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and
>
> (d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c)."

[208] As discussed further below, the evidence is that some of the proposed extractions/diversions will have an adverse environmental impact within the meaning of s.269(4)(j) of the MRA. The applicants have submitted that the effect of s.235(3) is that such extraction/diversion is not a permitted or authorized use under the MRA and it is not therefore an activity about which I can make a recommendation pursuant to s.269 of the MRA in relation to the proposed mining leases.

[209] A similar issue arises in relation to any recommendations the Court might make about the draft EA. Environmental authorities are issued under the EPA for "mining activities".[27] Section 147 of the EPA defines a "mining activity" as follows -

> "**147 What is a mining activity**
>
> (1) A ***mining activity*** means an activity mentioned in subsection (2) that, under the Mineral Resources Act, is authorised to take place on -
>
> (a) land to which a mining tenement relates; or
>
> (b) land authorised under that Act for access to land mentioned in paragraph (a).
>
> (2) For subsection (1), the activities are as follows -
>
> (a) prospecting, exploring or mining under the Mineral Resources Act or another Act relating to mining;
>
> (b) processing a mineral won or extracted by an activity under paragraph (a);
>
> (c) an activity that—

[27] Section 146 of the *Environmental Protection Act 1994*.

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(i) is directly associated with, or facilitates or supports, an activity mentioned in paragraph (a) or (b); and
(ii) may cause environmental harm;
(d) rehabilitating or remediating environmental harm because of a mining activity under paragraphs (a) to (c);
(e) action taken to prevent environmental harm because of an activity mentioned in paragraphs (a) to (d);
(f) any other activity prescribed for this subsection under a regulation."

[210] The effect of s.147(1) of the EPA is that a mining activity is an activity that is authorised under the MRA to take place on land to which the mining tenement relates. It is clear from s.235(3) of the MRA that that Act does not authorise the holder of a mining lease to divert or appropriate water unless the holder has an authority under the *Water Act*. Since water diversions and extractions are not activities that are authorised by the MRA, they are outside the scope of an environmental authority under the EPA. That being the case, I do not consider that the Land Court has power in these proceedings to make recommendations under the EPA in relation to activities involving the extraction or diversion of water.

[211] More specifically, I do not consider that I can make recommendations to either of the relevant Ministers about the possible extraction of water for construction purposes from the Precipice Sandstone Aquifer, the possible diversion of Woleebee Creek or any mine pit dewatering. In my view, this limitation also extends to the inclusion of provisions in make-good agreements about the extraction or diversion of water.

[212] However, it is noted that the *Water Act* contains provisions which enable the landowners to seek the imposition of appropriate conditions in relation to the grant of any water licences in relation to the mining project. I have included, at the end of this decision, observations about this and other matters to the relevant Ministers.

[213] The position is different in relation to the Court's ability to consider the impacts of the mining operations, in terms of any drawdown in the aquifers and variation in groundwater quality.

[214] Drawdown of water from the aquifers may be a consequence of the mining activities or the dewatering of the mine pits. Although the dewatering aspect will be regulated under the *Water Act*, I consider that I may make recommendations about the impacts of the "mining activities" authorized under the MRA and the EPA (subject to any relevant conditions in the Coordinator-General's report, discussed further below). Similarly, I have power to make recommendations about the water quality impacts of such mining activities.

[215] The Coordinator-General's report and the draft EA contain conditions dealing with the impacts of mining activities in terms of drawdown, at least in relation to the shallow coal seam aquifers, and any mine induced variation in groundwater quality. Thus condition W38 in each document requires that a groundwater monitoring program be designed and implemented as described in Table W9. That table reveals that one of the purposes of the monitoring program is to measure the impact of the mine on water levels and quality.

…

Observations to the Honourable the Minister administering the *Mineral Resources Act 1989* and the Honourable the Minister administering the *Environmental Protection Act 1994*

[606] As can be seen from the discussion above at [205] – [215], the Land Court's jurisdiction under the MRA and the EPA to make recommendations for the project is effectively confined to the "mining activities" or activities authorised under the MRA. As a consequence of s.235(3) of the MRA, the Court has no jurisdiction or power to make recommendations in relation to activities involving the extraction or diversion of water. These activities will be authorised under another Act, namely, the *Water Act*.

[607] It appears to me that this is an undesirable dichotomy in the Land Court's jurisdiction and powers. The effect of the legislation is that two separate assessment and objection processes are established, one under the MRA/EPA and the other under the *Water Act*. Ultimately the Land Court hears any objections under the *Water Act* so there is a duplication of process. Further, those objectors who wish to protect their relevant interests under all three statutes are required to participate in two potentially extensive and expensive processes. It is possible, also, that inconsistent decisions may result.

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This is obviously undesirable for the effective administration of justice and the public interest generally.

[608] The Land Court's function under the MRA and the EPA is to make recommendations to the relevant Ministers about whether to grant or refuse the proposed MLs and environmental authority. The statutory criteria prescribed under the MRA and the EPA requires the Land Court to take into account and consider the environmental impacts of the project. The impacts of water diversions and extractions associated with the project seem to me to be highly relevant to any consideration of whether the project should be approved or refused. In my opinion, it is unsatisfactory that the impacts of water extractions and diversions are not properly assessed and considered under the *Water Act* until after the project has been approved under the MRA and the EPA.

[609] My recommendations with regard to the establishment of a monitoring program for the Hutton and Precipice Sandstone Aquifers and make-good agreements are confined to the potential adverse impacts of the mining operations on the yield and quality of water supplies since I am unable, in these proceedings, to deal with the impacts of the proposed mine pit dewatering, the taking of water for construction purposes and the diversion of Woleebee Creek. I draw these issues to the attention of the Honourable the Minister administering the *Mineral Resources Act 1989* and the Honourable the Minister administering the *Environmental Protection Act 1994*.

[610] I also draw to the attention of the Honourable the Ministers administering the *Mineral Resources Act 1989* and the *Environmental Protection Act 1994* that at [262] – [266] I have found that the groundwater monitoring program for the shallow and alluvium aquifers as set out in Condition W38 in the Coordinator-General's report and the draft EA is inadequate in relation to the areas covered by MLAs 50229 and 50231. For the reasons set out there, I have no power to make any recommendations in this regard."

[84] Hancock's views on this issue are succinct and are as follows:[28]

"***Water Act***

142. Another part of the interlocking statutory scheme is the *Water Act*. And the extraction of water from the groundwater system is a matter to be considered under the *Water Act*, not under the MRA or EPA: *Xstrata* at [210]-[211].

143. The essential reasons are that the extraction of water is not:
   (a) a "*mining activity*" within the meaning of s147 of the EPA;
   (b) part of the "*operations to be carried on under the authority of the proposed mining lease*" within the meaning of s269(4)(j) of the MRA; rather the extraction of water is to be carried on "*under the authority of*" a water licence granted under the *Water Act* (as is recognised by s235(3) of the MRA).

144. Thus issues of water security are to be addressed in accordance with the procedures under the *Water Act*, rather than as part of the present hearing. Again, as a matter of statutory interpretation, the presumption that the interlocking statutes are intended to work together is important. A legislative intention that these statutes would work together entails recognition of the inefficiency and undesirability of the same essential issue of water security being addressed twice in circumstances where:
   (a) that would give rise to significant duplication of effort and expenditure of both public and private resources;
   (b) one would expect there to be potential objectors on water security grounds who would not wish to be heard under the MRA or EPA processes, preferring to devote their energies to the *Water Act* process;
   (c) there are obvious dangers in addressing an issue before the full range of objectors who would wish to be heard have come to Court.

145. In *Xstrata*, the President held that, despite the foregoing, it was open to the Court to make recommendations about the "*impacts*" of mining activities or mining operations in terms of drawdown in aquifers, including recommendations concerning aspects of make-good agreements: *Xstrata* at [213]-[214], [286]. It is respectfully submitted that this is incorrect because:
   (a) Before one can have regard to "*impacts*" of an activity under either the EPA or MRA, one must first be satisfied that the activity is one regulated by the EPA or MRA.
   (b) For the reasons already given, the extraction of water from the groundwater system is not an activity regulated by the EPA or MRA.

[28] Hancock Submissions 18 October 2013 paras 142-145.

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(c) This conclusion is not altered by the fact that dewatering the mine might, in a broader non-statutory sense, be considered part of the operation of the mine.
(d) In statutory terms, the activity is either regulated or it is not. And if it is not, that is the end of the inquiry."

[85] In short, Hancock contends that President MacDonald erred in considering the impact of the drawdown in aquifers as that activity is not regulated by the MRA or the EPA but the Water Act.

[86] The Statutory Party, in its submissions of 18 October 2013,[29] after quoting from paragraphs [210] – [214] of *Xstrata* expressed its view that President MacDonald's conclusions on the Water Act point were correct.

[87] The submissions went on to state as follows:[30]

"47. Assessment under the *Water Act* is the process designed by the legislature to examine a groundwater take of the kind that the Applicant proposes. It is a more specific approvals process than that provided for in the EP Act, which involves more general considerations of wider impacts.
48. The application for the more specific Water Act approval is subject to public notification and an objector can, ultimately, appeal to the Court. At that hearing, a full examination of the effects (environmental and social) of the groundwater take can be made.
49. If all groundwater matters were to be considered at the EP Act stage, it would leave no work for the water licence assessment and approval process to do. What would result would be duplication. That is an unappealing outcome, hence the Court's recommendations for legislative change in *Xstrata*. There is no legislative change before this Court in these matters however.
50. CCAQ and Ms Cassoni ran their cases on the basis that groundwater is a defining issue before this Court. They appear to contend that there is some deficiency or mistake in the hydrogeology evidence put forward by the Applicant. Their position leaps from there to a contention that the deficiency/mistake must result in a refusal. That approach should be rejected for reasons outlined below.
51. Thus, the Statutory Party submits that the Court can be satisfied that impacts on groundwater caused by the Applicant's proposal can be effectively dealt with in two ways:
(a) by the extensive ongoing monitoring requirements that the conditions will impose, and that the Commonwealth approval imposes, which can detect emerging adverse effects and take action in response to those effects; and
(b) the water licence process that the Applicant must go through (including possible appeal/s to this Court).
52. Those two ways are not alternatives– they interact in a complementary way to ensure protection."

[88] The submissions of CCAQ are more complex. They are summarised in CCAQ's reply of 23 October 2013 in the following way:[31]

"27 …

(c) In relation to *Water Act* approvals process:
(i) CCAQ contends that each of the EPA, the MRA and the *Water Act* serve different, albeit related, purposes and need to be applied according to their terms;
(ii) If, properly construed, an impact is relevant under one of these Acts, then it must be considered under that Act, notwithstanding that the same impact may also be relevant under another Act;

29 Statutory Party Submissions 18 October 2013 paras 45-46.
30 Statutory Parties Submissions 18 October 2013 paras 47-52.
31 At para 27(c).

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(iii) As such, the existence of the *Water Act* approvals process should not be used to justify deferring consideration of groundwater impacts if they are otherwise relevant under the EPA and the MRA."

[89] CCAQ certainly gave all parties ample notice of its difficulties with certain aspects of the *Xstrata* decision relating to water issues in its Notice of Contention filed 30 April 2013. Those contentions were expanded in CCAQ's submissions of 18 October 2013 as follows:[32]

"155 …

(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:

(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, in substance, it is equivalent to impose such conditions as a decision maker 'thinks fit'. That phrase has been considered on many occasions. 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.

(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. 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;

(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.

[32] At para 155(b) – (h).

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

[90] Hancock's reply submissions on this topic make interesting reading. Relevantly they say as follows:[33]

"***Introduction***

27. CCAQ's submissions focus heavily on the assessment of groundwater impacts. At the same time they recognise that the impacts are connected with the dewatering of the Alpha mine. They are impacts that concern the taking of water from the aquifers, rather than other issues such as water quality.
28. Several points are to be made in this regard.
29. ***First,*** a favourable recommendation from the Court, if acted upon, will not permit Hancock to take water from the aquifers. This is common ground. A mining lease and environmental authority will not, if granted, result in any groundwater being impacted. As is to be expected, Hancock requires a number of approvals before the Alpha mine can commence operation. One such approval is a water licence under the

[33] Hancock Reply Submissions 23 October 2013 paras 27 – 31.

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Water Act 2000. It is only with a water licence that Hancock can undertake activities which involve dewatering the Alpha mine. The processes under the *Water Act* for the granting of a water licence are rigorous. Like the processes which have resulted in this proceeding they involve the potential for an objections hearing in this Court. This is significant to the present proceeding.

30. Hancock submits that it is not a requirement that Hancock demonstrate, at this stage, the matters which it would be required to demonstrate to obtain a water licence. If that were so, there would be no need for the necessary further approval. In Hancock's submission, the focus of the Court's consideration at this stage is on the activities which will be authorised by a mining lease and environmental authority and the impacts of those activities. Those activities do not include mine dewatering and therefore the impacts do not include groundwater impacts of a kind which have been agitated in this proceeding.
31. But even if the Court were to adopt a different view about the focus of its consideration, the fact that a favourable recommendation will not authorise Hancock to dewater the mine (and therefore will not authorise any resulting impacts) and the existence of the separate statutory process with respect to such activities and impacts, is material to the weight which the Court attaches to groundwater issues at this stage of the approval process. In this regard, Hancock submits that:
    (a) The groundwater evidence provides a reasonable and proper basis for the Court to conclude that the Alpha mine can proceed with any groundwater impacts being appropriately addressed and managed by conditions.
    (b) Even if there is some residual concern about groundwater impacts and how they are appropriately addressed and managed, they are not such as to prevent a favourable recommendation, especially given that the interlocking statutory processes provide another and equally rigorous mechanism for groundwater impacts to be further assessed and dealt with at the water licence stage."

[91] The statement above that "a mining lease and environmental authority will not, if granted, result in any groundwater being impacted" appears as first glance, at least from a factual perspective, absurd. This is particularly so when one considers that the various mining pits, once fully mined, will result in a final void which goes to a considerable depth, extending totally through the Bandanna Formation, C seam, part of the Colinlea Sandstone, and finally through the D seam, as is well illustrated in Figure 6-2 from Exhibit 106, page 60:

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6 Conceptual Groundwater Model

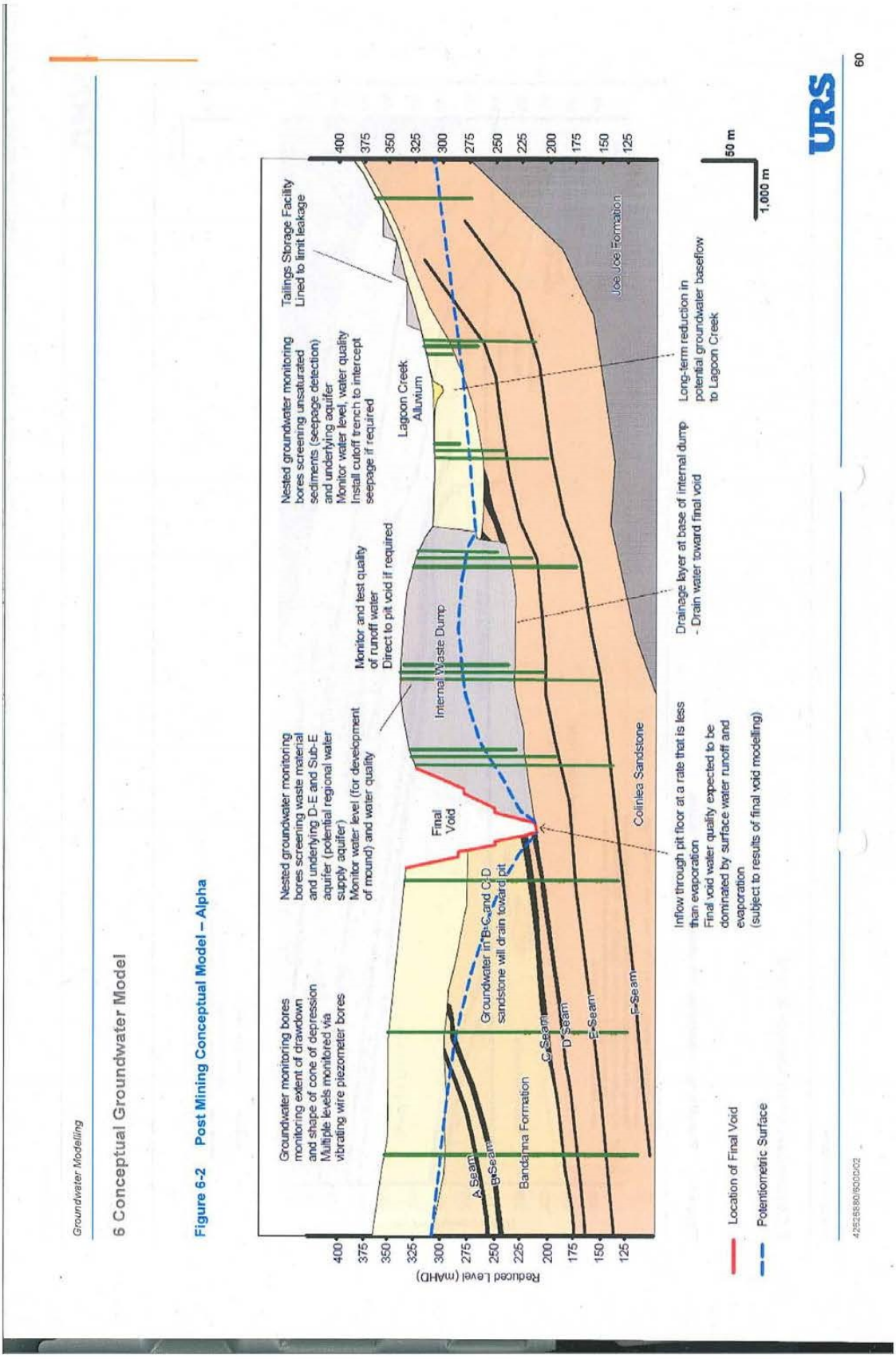

Figure 6-2 Post Mining Conceptual Model – Alpha

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[92] The evidence puts it beyond doubt that the mining operation proposed by Hancock will require dewatering to occur during the operational phase of the mine, followed by a movement of groundwater into the final void in perpetuity following conclusion of mining.

[93] Hancock's point however is that the legal authorisations under the MRA and the EPA do not of themselves impact on water; such legal impact can only occur under authorisations under the Water Act, and if Hancock does not have those authorisations, it cannot undertake the bulk of its mining operations.

[94] This of course ignores one significant fact. That is that, after the mine has ceased operations and all Water Act licences have long passed into history, the environmental impacts on water will continue, as a matter of scientific fact.[34]

[95] Should all water considerations fall solely under the Water Act, or is it permissible to also look at the provisions of the MRA, particularly s 269(4), and the EPA?

[96] In order to answer this question, it is necessary to first look at the relevant Water Act provisions more closely.

[97] Water licences are dealt with under Chapter 2 Part 6 of the Water Act. Section 206(1) and (2) provide as follows:

> "**206 Applying for a water licence**
> (1) An owner of a parcel of land, or the owners of contiguous parcels of land, may apply for a water licence for the parcel or parcels and any other land of the owner or owners contiguous to the parcel or parcels—
> (a) for taking water and using the water on any of the land; or
> (b) to interfere with the flow of water on, under or adjoining any of the land.
> (2) An application under subsection (1)(a) may be only for taking water from any of the following—
> (a) a watercourse, lake or spring on or adjoining any of the land;
> (b) an aquifer under any of the land;
> (c) water flowing across any of the land."

[98] It is clear that water licences are divided into two areas; those licensed for taking and using water under s 206(1)(a), and those for interfering with water under s 206(1)(b).

[99] It should be noted that there is the following definition of "taking" in Schedule 4 of the Water Act:

> "***taking***, for water, includes diverting water."

[34] Exh 18 point 21 page 12.

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[100] It should also be noted that "owner" of land is defined in s 203 of the Water Act for the purposes of Chapter 2, Part 6 relevantly as follows:

> "**203 Definition for pt 6**
> In this part—
> ***owner***, of land, means any of the following—
> …
> (d) an applicant for, or the holder of, a mineral development licence or mining lease under the *Mineral Resources Act 1989*;
> … "

[101] An application for a water licence is publicly notified,[35] and after a decision is made on the application, the Chief Executive "must give the applicant and any person who gave a properly made submission about the application an information notice".[36]

[102] A person who has been given an information notice becomes an 'interested person' pursuant to s 851(1) and accordingly has rights to internal review pursuant to Chapter 6 Part 2.[37] There is a right of appeal for an interested person to the Land Court pursuant to ss 877 and 878.

[103] In short, these provisions combined mean that an applicant for, or the holder of, a mining lease, may apply for water licences to take and use water, or interfere with water, and persons who disagree with any approval granted may, ultimately, appeal such approval to this Court.

[104] There are some further important provisions of the Water Act. Firstly, the Water Act does not bind the operation of the SDPWOA or the Coordinator-General. As s 4 says:

> "**4 Act binds all persons**
> (1) This Act binds all persons, including the State, and, in so far as the legislative power of the State permits, the Commonwealth and the other States.
> (2) Subsection (1) does not apply to—
> (a) the operation of the *State Development and Public Works Organisation Act 1971*; or
> (b) the powers of the coordinator-general under the *State Development and Public Works Organisation Act 1971*."

[105] Further, s 20 of the Water Act relates to general authorisations, and s 20(4) and (5) in particular provide as follows:

> "**20 General authorisations**
> …
> (4) A person may interfere with water if—
> (a) the interference is a diversion of a watercourse and is associated with a resource activity; and
> (b) the impacts of the interference were assessed as part of a grant of an environmental authority for the resource activity; and
> (c) the environmental authority was granted with a condition about the diversion of the watercourse.
> (5) In this section—
> ***resource activity*** see the *Environmental Protection Act 1994*, section 107."

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35 S 208 Water Act.
36 S 211(3) Water Act.
37 See, in particular s 862(1).

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[106] A resource activity under s 107 of the EPA includes a mining activity.[38]

[107] It should be noted that, although s 20(4) of the Water Act is only a recent inclusion,[39] it was operational at the time of the hearing of submissions in this matter.

[108] It may at first appear that s 20(4) allows an applicant for a mining lease, such as Hancock, to conduct its mining operations without the need for water licences so long as the issue is assessed as part of the mine's EA. However, that is only partly true.

[109] Section 20(4) only applies to an interference which is the diversion of a watercourse. "Diversion" is not defined in the Water Act. However, "watercourse" is mentioned in the definition of water in Schedule 4 of the Water Act as follows:

> "***water***—
> 1 Generally, *water* means all or any of the following—
> (a) water in a watercourse, lake or spring;
> (b) underground water;
> (c) overland flow water;
> (d) water that has been collected in a dam.
> … "

[110] Clearly, there is a distinction between water as found in a watercourse and underground water, although it is all "water" for the purposes of the Water Act.

[111] If Parliament had intended s 20(4) to apply to all water, it could easily have said so. The clear and plain meaning of s 20(4) only applies to the diversion of water in a watercourse and not to any aspect of underground water.

[112] I am in no doubt that, should the mining activities proposed by Hancock require Hancock to either take or use[40] any underground water, a Water Act licence is required.

[113] Due to Water Act interactions with the MRA, the position though is not necessarily clear as regarding any s 206(1)(b) Water Act interference with the flow of any underground water.

[114] As President MacDonald did in *Xstrata*, it is now necessary to consider s 235 of the MRA. Section 235 provides as follows:

> "**235 General entitlements of holder of mining lease**
> (1) Subject to section 236 and chapter 8, part 8, division 1, during the currency of a mining lease, the holder of the mining lease and any person who acts as agent or employee of the holder (or who delivers goods or substances or provides services to the holder) for a purpose or right for which the mining lease is granted—
> (a) may enter and be—
> (i) within the area of the mining lease; and
> (ii) upon the surface area comprised in the mining lease;
> for any purpose for which the mining lease is granted or for any purpose permitted or required under the lease or by this Act;

38 S 107(c) EPA.
39 Coming into force on 27 September 2013.
40 S 206(1)(a) Water Act.

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(b) may do all such things as are permitted or required under the lease or by this Act.

(2) During the currency of the mining lease, the rights of the holder relate, and are taken to have always related, to the whole of the land and surface area mentioned in subsection (1).

(3) 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."

[115] Section 235 of the MRA must be read in conjunction with s 234 of the MRA, which provides in part as follows:

"**234 Minister may grant mining lease**

(1) The Minister may grant to an eligible person or persons, a mining lease for all or any of the following purposes—

(a) to mine the mineral or minerals specified in the lease and for all purposes necessary to effectually carry on that mining;

(b) such purposes, other than mining, as are specified in the mining lease and that are associated with, arising from or promoting the activity of mining."

[116] It is unfortunate that s 235 of the MRA uses different terminology to the Water Act.

[117] In my view, s 235(3) of the MRA must be strictly applied. It applies to circumstances where mining involves the taking and using of water, including the diversion of a watercourse, and perhaps, arguable, the diversion of underground water, but not to the interference with the flow of underground water under s 206(1)(b) of the Water Act.

[118] There is tension between the requirement for a water licence to interfere with water under the Water Act on the one hand, and the positive pronouncement in s 234(1) of the MRA on the other.

[119] Without doubt, the mining lease in this case will authorise Hancock to dig a deep pit.

[120] Also without doubt, because of s 235(3) of the MRA, Hancock cannot take or divert water from those deep pits without a water licence. However, it is at least arguable that Hancock, as part of its authorised mining activities, could interfere with water, as an activity associated with or arising from[41] the mining, without the mandate for an authority under the Water Act, as the interference with water is a necessary consequence of the mining activities authorised under s 235(1) of the MRA, and such interference is not of the nature of those to which s 235(3) of the MRA applies.

[121] It would appear nonsensical for this Court, as part of these proceedings, to be permitted to consider the question of, and consequences which flow from, interference with groundwater, but not consider any aspect or consequence which arises from the taking or diversion of groundwater.

41 S 234(1)(b) MRA.

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[122] If one thing is clear from the expert groundwater evidence in this matter, it is that the study of groundwater is far from being an exact science. In what way, for instance, might Bimblebox possibly have its groundwater impacted upon by interference from the Hancock mine as opposed to a taking, use, or diversion by the Hancock mine? It might be said that, during active mining, the great bulk of any effect will come (if any) from dewatering, which is a taking of water, and not an interference. However, long after the mine has ceased, and the void remains open, Water Licences have expired, and water naturally evaporates from the void in perpetuity, will that be an interference that can properly be considered now?

[123] Furthermore, the evidence makes it quite clear that the activity of the deep pit passing through aquifers will result in water in the surrounding aquifer being interfered with during active mining, irrespective of whether there is a taking of water or not.

[124] In these circumstances, the submissions made by CCAQ have more force. They refer to the Privy Council decision of *Associated Minerals Consolidated Ltd v Wyong Shire Council*.[42] In *Wyong*, the decision of the Privy Council was delivered by Lord Wilberforce. Relevantly, he had this to say:[43]

> "In its wider presentation the argument raises the issue, which frequently arises, of the interrelation in law of two statutes whose field of application is different, where the later statute does not expressly repeal or override the earlier. The problem is one of ascertaining the legislative intention: is it to leave the earlier statute intact, with autonomous application to its own subject-matter; is it to override the earlier statute in case of any inconsistency between the two; is it to add an additional layer of legislation on top of the pre-existing legislation, so that each may operate within its respective field?
>
> Discussion of such questions commonly starts from the use of the maxim 'generalia specialibus non derogant' and with citation from the judgment of this Board in *Barker* v. *Edger* (1): 'The general maxim is, 'Generalia specialibus non derogant'. When the Legislature has given its attention to a separate subject, and made provision for it, the presumption is that a subsequent general enactment is not intended to interfere with special provision unless it manifests that intention very clearly. Each enactment must be construed in that respect according to its own subject-matter and its own terms."
>
> The principle stated in this passage and others to a similar effect is, of course, unexceptionable, but cases are rarely so simple as this, for even where the earlier statute deals with a particular and limited subject-matter which is included within the general subject-matter with which the later statute is concerned, it is still a matter of legislative intention, which the courts endeavour to extract from all available indications, whether the former is left intact, or is superseded, and the cases in which the latter has been held are almost as numerous as the former
>
> …
>
> 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."

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42 (1974) 2 NSWLR 681.

43 At page 686.

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[125] I note that *Wyong* has been referred to by the High Court with approval in *South Australia v Tanner*[44] and recently in *CMR of Police v Eaton*.[45] It should be noted that in *Eaton* part of the passage quoted above from *Wyong* was repeated in the joint decision of Justices Crennan, Kiefel and Bell.

[126] The MRA and the Water Act have different purposes, each of which is capable of being fulfilled.

[127] I do not accept that it is necessarily the legislative's intention that proponents such as Hancock, or indeed the objectors, should be forced to litigate what are in effect the same issues in both MRA and EPA objections hearings, as well as Water Act appeals, in separate proceedings.

[128] The legislature has clearly allowed for an applicant for a mining lease (such as Hancock) to be able to apply for water licences. There is no legislative requirement for such applicant to wait for the formal grant of the mining lease before seeking Water Act licences. Indeed, given the usual time constraints and financial pressures which require that these matters be dealt with speedily, one could reasonably expect a mining lease applicant to apply for any necessary water licences at an early stage so that the project was not delayed by any appeals by interested persons under the Water Act.

[129] Furthermore, if there were appeals to this Court under the Water Act, as well as objections to be heard by this Court for the same project under the MRA and/or the EPA, there would appear to be nothing preventing this Court from ordering that the appeals and objections hearings be heard together. That would certainly aide in the timely, cost effective determination of the question of water.

[130] Although it might be true that the parties to all proceedings may not be identical, that is an issue which can be simply dealt with at any hearing, just as there are different MRA and EPA parties currently before me in these proceedings.

The Objections

[131] The MRA and EPA hearings were conducted by the parties on the basis that the grounds of objection all fell under one of six headings, namely:

- groundwater
- climate change
- economics
- ecology

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44 (1988-89) 161 CLR 166 @ 170-71.

45 (2013) 294 ALR 608 @ 620 para [45] and [46].

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- surface water
- miscellaneous

[132] I must stress that, by placing some objections under a "miscellaneous" heading, I do not in any way wish to give the impression that such objections are lacking in importance or not worthy of major analysis. All objections will be considered in the course of this decision. There is however no utility in simply reciting each and every objection of each objector in circumstances were many of the objections can be rationally grouped together, just as the parties themselves have done.

[133] I will now examine each area of objection in turn.

Groundwater

[134] As already discussed, it is Hancock's primary submission that it is not necessary for it to concentrate on issues which relate to groundwater and thus to Water Licences under the Water Act, as the focus of the current proceedings is, as Hancock puts it, "on the activities which will be authorised by a mining lease and the environmental authority and the impact of those activities".[46]

[135] As I have already found, it is appropriate to consider the impact that the authorised mining activities will have on the interference with groundwater.

[136] On balance, I also favour the view as expressed by CCAQ that impacts from mining activities which depend on Hancock dewatering its pits via extraction and/or taking of groundwater are proper to consider as part of these proceedings.

[137] It is now necessary to consider the evidence of the groundwater experts. They are Mr Stewart, Mr Hair, Dr Webb and Dr Mudd.

[138] Analysing their evidence is no easy task. This is well highlighted by their Joint Expert Report on Groundwater.[47] The joint expert report itself, excluding Appendixes, comprises 65 pages with 229 paragraphs. Their joint report contains seven points of clarification; 17 points of agreement; 13 points of disagreement (with multiple paragraphs of comment by each expert on each point); and three agreed recommendations.

[139] It is difficult to do justice to the joint experts report by way of overview summary. However, an understanding of the views expressed in the joint report certainly helps to understand the complex evidence relating to groundwater. Further, there has been both written and oral evidence provided post the date of the joint experts report, including of course highly probing cross-examination. Some points have been further clarified, such

46 Hancock Reply Submissions, 23 October 2013, para 30.
47 Exhibit 18.

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as Mr Hair's rate of exchange as a percentage of Mean Annual Precipitation (MAP) of 0.23%.[48]

[140] Bearing in mind the additional evidence given post the joint experts report, it is nevertheless relevant to detail, at least in summary form,[49] the points of clarification, agreement, disagreement, and recommendation of the groundwater experts, as follows:[50]

> "**Points of Clarification**
> 10. During the Joint Experts Meeting several points of clarification were made and included below. These points facilitated in the groundwater experts' considerations of points of agreement and disagreement.
>
> **Point 1**
> 11. The modelling of the final void shows that it will be a permanent groundwater sink, so no pit water can migrate off site within the groundwater. The modelled potentiometric 270 m contour for the water table is concentric around the edge of the final void. This was not clear on the figure in the URS modelling report, and so Dr Webb misinterpreted the diagram as showing that groundwater would leak northwards from the void. Mr Stewart clarified this by presenting a better diagram of the modelled potentiometric contours around the void (Appendix A Figure 5b). Therefore paragraph 70 in Dr Webb's report needs to be modified by deleting sentences 2 and 3 (Northwards groundwater seepage ……. groundwater use.)
>
> **Point 2**
> 12. The latest groundwater modelling report (URS, 2012) addressed the Terms of Reference based on the requirements dated June 2009. This report supersedes all previous reports, because as new groundwater information has become available, the groundwater concepts have been refined.
>
> **Point 3**
> 13. The impact of the coal mine dewatering has been modeled for the Alpha mine alone and as cumulative impacts for both the Alpha and Kevin's Corner mines. The distinction between the two models needs to be kept in mind. Groundwater Model Report (URS, 2012) provides an impact assessment for Alpha Coal Mine alone, and for the cumulative impacts of mining at both Alpha and Kevin's Corner. Where necessary the impact being assessed needs to be considered.
>
> **Point 4**
> 14. Groundwater information presented in the Alpha Coal Project Environmental Impact Statement (EIS), Supplementary EIS (SEIS), and additional hydrogeological reports for the proposed coal mine has been refined over time as new groundwater information became available. The EIS groundwater concepts are superseded in the latest groundwater modelling report (URS, 2012). The latest Groundwater Conceptual Model is included in Appendix A Figure 1 attached.
>
> **Point 5**
> 15. The potential impact of seepage from the Tailings Storage Facility (TSF) was assessed by numerical modelling. The simulation, which adopted conservative input parameters, was considered to be a "worst case scenario". Results showed that seepage would not reach Lagoon Creek until after 300 years (10 times the life of mine). This scenario modelled included a constant water level within TSF simulating constant 12 to 15 m head over 300 years, inclusion of the sub-E model layer (which is not located below the TSF based on drilling results), and no inclusion of an under drain.
>
> 16. Mr Stewart states that the simulation of seepage from TSF was an indicative simulation rather than a quantitative one. The display scale used in the model simulation, ranging from 1 to 10, allowed for the tracking of possible plume migration for 300 years under

[48] See Mr Hair's evidence, T 11, and in particular at T 11 p 84.
[49] That is, leaving out the many pages of clarification by each expert.
[50] Taken from Exh 18.

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worst case conditions. The scale allows for an indication of plume endpoint after 300 years, where 10 indicates the most probable plume endpoint and 1 being the least likely endpoint (similar approach as particle tracking).

Point 6

17. The conceptual geological / hydrogeological model considered in the Waratah Coal China First EIS has been superseded in the Waratah Coal SEIS.

Point 7

18. It was discussed that the bulk sample pit wall failure, as noted by Dr Mudd in the note for his report cover page photograph, is related to the variable bench / pit wall angles included during construction. This was done to allow for the assessment of pit wall stability, as part of the pit geotechnical evaluation.

Points of Agreement

19. The groundwater experts are in general agreement on the following matters:

Geology

Point 8

20. Tertiary extrusive basalt is not mapped, on the 1:250 000 scale geological map Jericho, to extend onto the eastern mine lease boundary. It is recognised to do so.

Point 9

21. Local geology, within the Alpha Mine Lease, has adequately been represented in the EIS reports in terms of units, strata thickness, dip, and strike. The local geology within the mine area, as defined by extensive drilling, consists of Colinlea Sandstone and Bandanna Formation dipping shallowly (1 to 2°) to the west.

Point 10

22. The Tertiary cover comprises laterite and saprolite, where the saprolite comprises clay-rich residual material considered to be Permian sediments altered during the Tertiary period and iron-cemented Tertiary sediments.

Point 11

23. The Permian age geological units inclusive of the Bandanna Formation and the Colinlea Sandstone are confined, where present, above by Tertiary age saprolite and below by the Joe Joe Formation.

Groundwater Resources

Point 12

24. No groundwater discharge, from the Permian (Bandanna Formation and Colinlea Sandstone) aquifers, to the ephemeral creeks and rivers within the Alpha and Kevin's Corner coal mine leases has been reported.

Point 13

25. The confined aquifer hydrographs (time series graphs of groundwater levels and rainfall, Figures 4-15 to 4-20, Groundwater Model Report URS, 2012) indicate little or no response to seasonal rainfall variation due to slow recharge rates.

…

Point 14

27. There is little or no risk to groundwater quality within the Great Artesian Basin (GAB) aquifers as a result of the proposed Alpha mining project. The Coordinator-General's Condition 17(a)(i) includes for monitoring of GAB units including the Clematis Sandstone and Rewan Formation.

Point 15

28. In response to Dr Mudd's enquiry regarding recharge assessment at the Colinlea Sandstone it was noted that groundwater recharge within the Colinlea Sandstone (east of

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Lagoon Creek) was assessed based on the hydrograph (groundwater level versus rainfall over time) compiled for the existing monitoring bore, ASTF-06B. ASTF-06B intersects the D-E sandstone subcrop at 38 to 44 m below surface. Appendix A Figure 2a depicts the monitoring bore network layout across both the Alpha and Kevin's Corner coal mine areas, and includes the nested bores along Sandy Creek; Appendix A Figure 2b presents the hydrograph for monitoring bore ASTF-06B (adjacent to Lagoon Creek).

Groundwater Conceptualisation

Point 16

29. It was agreed that topography influences groundwater flow and that groundwater within the model domain flows to the north east. Groundwater recharge occurs along the entire Great Dividing Range to the west and south of the Alpha Coal Mine (refer to Appendix A Figure 3, showing surface water drainage direction in the upper reaches of the Burdekin River Catchment, containing the Alpha Coal Mine).

…

Point 17

31. Groundwater quality (chloride method for estimating groundwater recharge) indicates low recharge rates to the confined aquifers (< 1% of Mean Annual Precipitation, or ≤ 5 mm per year as estimated in Smerdon and Ransley, 2012).

Groundwater Model

Point 18

32. It was agreed that the groundwater model construction and calibration, specifically with regard to model layers and hydrogeological parameters (hydraulic conductivity and storage parameters) are appropriate. Mr Hair commented that the numerical modelling undertaken by URS (2012) is of a high standard.

Point 19

33. As the Great Dividing Range represents a no-flow boundary, there will be no impact of dewatering within the Alpha Coal Mine on the Great Artesian Basin (in terms of groundwater quality or quantity). Dr Webb, Mr Hair, and Mr Stewart agree that this is the case, but Dr Webb's conceptual hydrogeological model that determines the no flow boundary is very different from that of Mr Hair and Mr Stewart (see point 29 of disagreement).

…

Final Void

Point 20

35. Final void integrated modelling included for variations in rainfall and evaporation rates, to assess uncertainty regarding pit water quality and pseudo steady-state pit water level projections (Section 12.6 of the model report (URS, 2012)). Dr Mudd acknowledges this but considers that predicted trends in climate change were not included in the long term model simulations.

Point 21

36. The local groundwater flow patterns and resources will be impacted in perpetuity due to the final void acting as a "sink". It was agreed that the potential impacts of the final void on groundwater resources can be addressed through the provision of alternative water supply, as per the Applicant's make-good commitment and enforcement through the provisions of the *Water Act 2000*.

…

Point 22

39. As modelled by URS, the salinity of the water within the final void will increase over time (an accumulation of salts due to evaporation). The predictive modelling considering 300 years into the future is sufficient to assess suitability of the water in the void for use.

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Environmental Authority Conditions

Point 23

40. Management and conditions will limit the potential impacts of Acid Mine Drainage. The Coordinator-General's condition includes for the management of acid rock drainage, namely:

> **Condition 13. Water Management Plan**
> (b) The Water Management Plan must:
> (i) provide for effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and
> (ii) be developed in accordance with the administering authority's guideline *Preparation of water management plans for mining activities* and include:
> (A) a study of the source of contaminants;
> (B) a water balance model for the site;
> (C) a water management system for the site;
> (D) measures to manage and prevent saline drainage;
> (E) measures to manage and prevent acid rock drainage;
> (F) contingency procedures for emergencies; and
> (G) a program for monitoring and review of the effectiveness of the water management plan.
>
> **Condition 15. Acid Rock Drainage**
> (a) The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of acid rock drainage.

Point 24

41. Make-good commitments include for unduly affected groundwater supplies. It was agreed that the conditions for Alpha Coal Mine regarding make-good ensures water security. Dr Mudd acknowledges that whilst this is technically true; he has reservations regarding the Applicant's ability to ensure the provision of alternative water in perpetuity.

…

Matters of Disagreement

44. Based on the discussions held during the Joint Experts Meeting and the subsequent drafting of the Joint Experts Report, the following matters of disagreement and the reasoning were identified:

Conceptual Hydrogeological Model

Point 25

45. Geological conceptualisation (structures) below the Great Dividing Range and influence on potentiometric surfaces of the confined Permian units and groundwater flow mechanisms. Uniformly westwards dipping beds (Mr Stewart, Mr Hair, and Waratah Coal China First SEIS (Heritage Computing Report, 2013)) compared to broad open folding (Dr Webb, Dr Mudd, and Waratah Coal China First EIS (E3 Consulting, 2010)).

…

Point 26

74. A point of disagreement was the regional geology based on differences in the Salva Resources regional geology and Dr Webb's data sets. Some of the geological boundaries in the Salva Resources GAB Model, particularly the upper and lower boundaries of the Clematis Formation, differ from those mapped by Dr Webb using remote sensing and also from those depicted on the Jericho 1:250,000 geological map.

…

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Point 27

84. A water table, unconfined and semi-confined, occurs within the Tertiary saprolite, as recognised within the bore logs below the TSF.

…

Groundwater Model

Point 28

89. It was agreed by Dr Webb, Mr Hair, and Mr Stewart that it was appropriate to simulate a no-flow boundary along the western boundary of the groundwater model to simulate a groundwater divide. During the conclave, Dr Mudd indicated the need to consider the model boundary in more detail, in particular the field work required to assess and demonstrate the behavior of the Great Dividing Range acting as either a 'no-flow' or 'constant head' boundary condition for regional groundwater flow.

…

Point 29

103. Western boundary of the groundwater model a no flow boundary to simulate a groundwater divide. Dr Mudd questioned the western boundary, arguing it was most likely a constant head, as shown by the Waratah SEIS conceptual groundwater model used for the numerical modelling study in that study (Appendix B Figure 1).

…

Point 30

112. Zone of influence (drawdown impacts) and propagation of drawdown cone to the north over time due to removal of recharge.

113. Dr Webb considers that the drawdown cone will propagate to the north over time due to interception of recharge and northwards groundwater flow.

…

Point 31

118. Constant head boundaries – southern model boundary

119. Dr Webb comments that because the drawdown cone will propagate to the north over time, due to interception of recharge and northwards groundwater flow, the assumption in the model of a constant head southern boundary needs revision.

…

Point 32

136. Constant head boundaries – northern model boundary

137. Dr Webb comments that because the drawdown cone will propagate to the north over time, due to interception of recharge and northwards groundwater flow, the assumption in the model of a constant head northern boundary needs revision.

…

Recharge

Point 33

156. Recharge mechanisms, rates and influence on model.

157. Mr Stewart comments that the negligible recharge (<0.1% of Mean Annual Precipitation), determined during model calibration, simulated in model, allowed for a "worst case" scenario resulting in the assessment of possible groundwater drawdown

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impacts, i.e. the largest potential zone of influence at the end of mining, as increased recharge to the model would result in less drawdown.

158. Dr Webb states that the amount of recharge is significant. In any case, assuming negligible recharge (<0.1 % of MAP) is not a worst case scenario, because although additional recharge results in less drawdown, it also reduces groundwater flow through the site.

…

Point 34

177. The Rewan Formation, although recognised to have zones of increased hydraulic conductivity, is regarded as an effective regional aquitard by Mr Stewart. Dr Webb's conceptualisation is that the Rewan Formation is largely an aquitard but contains zones of high hydraulic conductivity that allow significant recharge in places.

…

Impact Assessment

Point 35

191. Impacts on and source of springs, including Degulla Lagoon

Point 35(a) Registered springs, source, and impact assessment

192. Three registered springs, 405, 70 and 71, are located to the north of Alpha Coal Mine (Appendix A Figure 8). These include the Albro Springs (70 and 71) and are, according to Dr Webb, permanent and artesian.

193. In the Groundwater Model Report (URS, 2012) Mr Stewart considers the springs to be seasonal and not artesian. Dr Webb states that if the springs are fed by groundwater flow from the confined aquifers, they could be impacted by mine dewatering if the drawdown cone propagates to the north (see point 32).

…

Point 35 (b) Degulla Lagoon, source, and impact assessment

207. Dr Webb states that Degulla Lagoon is the only large, permanent surface water body in the region surrounding the Alpha lease; it may be groundwater fed, so could be impacted by mine dewatering if the drawdown cone propagates to the north (see Point 32).

…

Point 36

216. Regional impact on the Burdekin River Catchment, significance of impact on a regional scale.

217. Dr Webb states that because the interception of recharge and groundwater flow is permanent, this will have a regional impact on the Burdekin River Catchment.

…

Point 37

226. Groundwater experts could not agree that the groundwater approval conditions included in the following documents:

(a) Coordinator-General's Evaluation Report on the environmental impact statement, dated May 2012;
(b) Approval Decision under the *Environment Protection and Biodiversity Conservation Act 1999*, dated 23 August 2012; and
(c) Environmental Authority (Mining Lease) Non Code Compliant Level 1 Mining Project Permit Number: MIN101017310 – Alpha Coal Mine, dated 17 December 2012,

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are appropriate and sufficient.

…

Agreed Recommendations

1. During the Joint Experts Meeting it was discussed that the conditions required additional consideration and the agreed recommendations included:

    - It was agreed that clarity is required with regards to the conditioned Galilee Basin regional groundwater model in regard to extent. That is, the regional model should focus only on the eastern central limb of the Galilee Basin where coal mining is proposed to occur.

    - The Groundwater Monitoring Program must include a groundwater monitoring network that allows for the monitoring of potential drawdown to the north, south, and west of the Alpha Coal Mine. Groundwater monitoring network is to include locations to the east, adjacent to mine water and waste infrastructure.

    - It is recommended that the audits of the groundwater model should occur at intervals of no longer than 3 years during the life of mine and post-closure."

[141] At this point, it is appropriate that I give my general, and specific, views as to the expert evidence of the groundwater experts.

[142] As will be examined shortly, no groundwater expert has escaped criticism in this matter. I agree that much of this criticism is well made. However, far from resulting in much of that expert evidence being rejected, it simply serves, in my view, to demonstrate both the complexities and uncertainties involved with groundwater evidence.

[143] To a greater or lesser extent, each expert during cross-examination conceded points or agreed to some extent with the contrary evidence of another groundwater expert. This does not diminish their evidence, but rather highlights that each expert understood their obligations to the Court as expert witnesses.

[144] There were instances where the experts each became rather rigid as to the correctness of their opinion compared to that of some of the other experts. For reasons that will become obvious, it is not necessary for me to rule one way or the other on each such issue, although I do make general findings at the conclusion of this part. Suffice it to say that such evidence simply reinforces the doubt in my mind as to the ultimate impacts of the mining activities on groundwater. This in turn means that, in my view, a precautionary approach must be taken to the issue of groundwater.

[145] That said, it is still necessary to consider the evidence in dispute to some extent so as to justify my reliance on a precautionary approach.

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Hancock's reasons for adverse findings against Dr Webb and Dr Mudd

[146] This is some of what Hancock has to say in its submissions as to the evidence of Dr Webb and Dr Mudd:[51]

> "41. ***The evidence of Dr Webb and Dr Mudd does not justify requiring further studies before approval is granted***. Each was an unsatisfactory witness. They presented theoretical views which (in addition to being difficult to reconcile) have little foundation in hard data. Dr Webb, for example, accepted that his cross sections were mere "*hypothesis*" and that significant features were simply "*guessed*". Dr Webb's alternative theory as to matters such as folding under the GDR has not been shown to be valid. The available evidence suggests it is invalid. However, even if it is not dismissed completely, it does not warrant withholding approval. Neither Dr Webb nor Dr Mudd had done any modelling. Neither could make any reliable alternative prediction as to impacts. Indeed, neither sought to make any predictions as to the impact of the *Alpha mine alone* (Dr Webb's predictions as to impacts in the north were based on the cumulative impacts of the Alpha and Kevin's corner mines). Any doubt they create is quite removed from the *core features* of Hancock's groundwater analysis. For example, uncertainty as to the geology directly beneath the GDR does not cast doubt on what Hancock has actually observed and measured on site. It is unrealistic to expect Hancock to resolve all uncertainty in matters of off-site regional geology before being granted approval in respect of the confined proposed mining lease area.
>
> …
>
> 73. Dr Webb's approach was not that of a responsible independent expert. For example:
>
> (a) He formed his views very early, being "*reasonably firm*" about them by the time of his visit to Bimblebox with Dr Mudd, and was avowedly "*enthusiastic*" about his model with "*a fair degree of commitment*" to it from this early stage. This commitment was evdiecne by the matters referred to below.
>
> (b) He was highly selective in his analysis of and reference to relevant material, as is evident from the following exchange:
>
> *"... can I suggest that you had formed a view, and you were happy to refer to those parts of documents which you thought were consistent with your view, and not necessarily to others which were not? --- That's correct."*
>
> This was a telling exchange, betraying a fundamental misconception on the part of Dr Webb as to his role.
>
> (c) He collaborated with Dr Mudd in connection with theories designed to cast doubts on Hancock's analysis and did not disclose his collaboration in his report. This included Dr Mudd providing Dr Webb with a superseded cross section from the Waratah EIS which showed some folding that seemed to provide some support for Dr Webb's theory, and the two men exchanging draft reports. The undisclosed dealings between these purportedly independent experts are a matter of concern.
>
> (d) He honoured the wishes of the landholders in preference to his obligation, which he recognised, to identify his sources of information in his report. He then purported to acknowledge that he had discharged his duty to the Court. Further, when confronted about this in cross-examination, he initially pretended that the failure to identify his sources was an oversight rather than a deliberate decision.
>
> (e) He expressed his views in trenchant terms without any proper foundation for doing so. A prime example here concerns statements in his report to the effect that URS had significantly underestimated recharge. He similarly made a statement in the joint experts' report that "*[t]here is **no possibility**, based on the groundwater composition, that recharge can only be 0.1% of rainfall*". These statements should never have been made given that, as Dr Webb later acknowledged, his criticism was based on his use of a method which was neither recognised nor reliable. The

[51] Hancock Submissions, 18 October 2013.

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method was purportedly the Chloride Mass Balance method but Dr Webb used salinity data rather than chloride data. Further, Dr Webb persisted in the use of this invalid method and the conclusions he had reached in respect of it even after obtaining Mr Stewart's supplementary report which contained chloride data, His explanation given for the first time in evidence that he did this because he did not have underlying information was unconvincing given he was prepared to use the salinity data in Mr Stewart's supplementary report. He made no mention of this explanation in his reports or of requiring further information and he made no attempt to ask for the underlying information. He only belatedly acknowledged in cross-examination that he was wrong. He similarly expressed the view, in trenchant terms, that the final void would contaminate groundwater to the north. This view, expressed without any apparent basis, was also one he had to retract in the face of indisputable evidence.

(f) He was also a studied witness. He had been given the transcript for the whole of the hearing prior to his giving evidence, including the transcript of the cross-examination of his collaborator Dr Mudd. His evident purpose was to anticipate the cross-examination and prepare to defend his argument. His attempt to deflect criticism about this – by suggesting that he was merely being given the transcript "*to read for [his] enjoyment*" – did him no credit. Giving evidence as an independent expert witness is not an occasion for such flippant remarks.

(g) Another example of his approach was his explanation for not reading the (superseded and discredited) E3 groundwater report from the Waratah EIS that contained the cross section upon which he relied. He said, contrary to the reference in his report, that he did not read the report to ascertain whether the cross section was based on an assessment of data because he "*didn't want to read another EIS*". This was irresponsible. It suggests a man gathering support for his argument, rather than attempting to present a balanced assessment having regard to all salient considerations.

(h) Further, he was evasive and argumentative in much of his evidence. One example was his refusal to state whether he had disclosed his assumption about salinity when making his erroneous recharge calculations, preferring instead to point to his understanding of what Mr Hair had done. This was a naked attempt to avoid criticism by diverting attention elsewhere. Another example was his answer to a question about the *speed* of recharge through the Rewan Formation on his theory, saying that "*[w]e all agree that recharge is only 0.2 per cent of rainfall*". The answer was not (at least directly) responsive because it addressed the percentage of mean annual precipitation taken up as recharge, rather than the speed with which it moved through the Rewan. Perhaps more importantly, however, the answer misstated the experts' position evidently in an attempt to deflect the question. Neither Mr Stewart nor Dr Mudd was a party to the 0.2% calculation. And Mr Hair had made it clear that, whilst he was performing a calculation using the Chloride Mass Balance method, there were limitations on the utility of that method in the context of deeper confined systems such as the present, it being "*much more applicable to shallow unconfined groundwater systems with low residence times*". His ultimate opinion was not that 0.2% should be taken as definitive, but rather that *"[t]here is no justification to increase recharge for [the URS 2012] model*". It was unprofessional for Dr Webb to misstate the position of his colleagues in this way.

74. These considerations suggest that, perhaps subconsciously, Dr Webb assumed the role of advocate for his position, rather than carefully preparing and presenting a balanced view of things.

75. Further, Dr Webb's argument evolved as time went on, often as obstacles in the way of his theories emerged. For example:

(a) In none of his reports prior to the hearing had he suggested that the URS CHM was "*untenable*", volunteering this view for the first time in cross-examination. This significant evolution in his position was largely unexplained. And, for the reasons developed below, it should not be accepted.

(b) When it was pointed out to him that his cross sections showed a syncline running through the middle of the Kevin's Corner and Alpha mining lease areas (where the data shows that no syncline exists), he suggested that evidence of the syncline had

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been "*removed*" by "*erosion*" and that one "*could argue that [he] should've moved [it] a bit further to the west*", whilst at the same time confessing that the position of the syncline axis was mere "*hypothesis*" and had simply been "*guessed*". This demonstrates both the malleable nature of Dr Webb's views and the fragile basis upon which they rest.

(c) In his early contributions, Dr Webb made it clear that his estimate of recharge was a factor in his assessment of the interception of groundwater that would otherwise have flowed to the north (the theory being that URS had underestimated recharge, and therefore underestimated impacts to the north).

(d) However, his theory about impacts to the north encountered a number of obstacles. Three of those obstacles forced Dr Webb to change his position in an attempt to salvage his theory.

(e) The first was the evidence given by Mr Stewart on the second day of the hearing when Mr Finanzio SC was putting Dr Webb's original theory to Mr Stewart:

> *"... the higher the recharge, the greater the impact on downstream flow any interception of the recharge will be? --- No, because that doesn't change the aquifer parameters. So how fast can it move in the aquifer, it depends on the permeability. So you can have as much water as you like in the upstream area, you can't force it through the rock."*

(f) This response, which was plainly correct, was a significant problem for Dr Webb's theory because the aquifer parameters were known, having been assessed by reference to actual field data. Further, the problem was compounded by the fact that the experts had agreed in their joint report that:

> *"... the groundwater model construction and calibration, specifically with regard to model layers and hydrogeological parameters (hydraulic conductivity and storage parameters) are appropriate."*

(g) Dr Webb's response to the problem was not (as it should have been) to reconsider his view. Rather, it was to retract an aspect of his agreement as expressed in this paragraph of the joint report so as to be able to adhere to his view, and to develop his original theory by asserting (without any analysis) that his flawed estimate of additional recharge could be accommodated by the adoption of the higher end of the range of measured hydraulic conductivity values. CCAQ applied for and was granted leave to adduce this additional evidence from Dr Webb.

(h) The second and third obstacles were:

(i) The further report of Mr Stewart which showed that the groundwater system simply could not accommodate the additional volume of recharge postulated by Dr Webb, even using significantly higher hydraulic conductivity values (beyond the values measured in the field, and beyond what would be regarded as scientifically appropriate).

(ii) The further report of Mr Hair which showed that Dr Webb's recharge estimates were wrong.

(i) Dr Webb's response was to reformulate his original theory by ignoring all that he had said previously about the interception of significantly higher recharge. In cross-examination, Dr Webb suggested for the first time that his theory about impacts in the north was not linked to recharge, and that he had "*put the recharge aside*". The result is that much of Dr Webb's original theory has been discarded, and one can have little confidence in that which remains.

76. These considerations obviously undermine Dr Webb's views. They reinforce the proposition that Dr Webb was advocating a position which would ebb and flow depending upon his perception as to what he might ultimately be able to persuade the Court to accept.

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82. Dr Mudd was also an unsatisfactory witness who seemed to assume the role of advocate. In his report, he expressed himself in trenchant terms across a wide range of issues often without any foundation for doing so. He was also evasive and sought to deflect criticism of his own work by offering up gratuitous criticism of others. Particular aspects of his evidence are addressed in more detail in Part V below.

83. However, unlike Dr Webb (who would seek to mould his arguments when confronted with inconvenient facts), Dr Mudd was on occasion prepared to make appropriate concessions. For example, he was prepared to accept that:

(a) The Heritage Computing report for the Waratah project SEIS contained "*important evidence*" that, at least on one view, undermined the folding theory.

(b) A "*physical control*" on groundwater levels need not be a "*geological control*".

(c) In the absence of folding, hydrogeological and topographical considerations provided an explanation for the north easterly groundwater flow that was "*quite plausible*".

(d) If you set the model boundaries sufficiently far away that the model impacts did not come close to them, that would not affect the model outcomes, at least not "*too much*".

84. In the result, for the reasons developed in more detail in Part V below, Dr Mudd's evidence:

(a) does not warrant withholding approval;

(b) actually undermines some important aspects of Dr Webb's evidence.

…

188. Dr Mudd was an evasive witness. It was often the case that he would not answer direct questions and had to be forced to do so. When his own work was under attack he would attempt to avoid addressing the topic by seeking to criticise the work of others. His responses were not of a kind to be expected from a reliable independent expert. Moreover, he did not apply the same critical standards to his own work that he sought to apply to the work of URS.

189. Dr Mudd's undisclosed collaboration with Dr Webb was also inconsistent with his duties to the Court as an independent expert, particularly in circumstances where, by reason of a lack of expertise on his behalf, he deferred to Dr Webb on matters relating to geology. His evidence was to the effect that, whilst he and Dr Webb were at Bimblebox, they discussed *"the issues ... extensively"*. Dr Mudd was heavily influenced by his dealings with Dr Webb but, rather than be frank about this, he sought to pass off some of Dr Webb's theories as ones which he had arrived at independently.

190. Dr Mudd's approach to the preparation of his report was also unsatisfactory. It was exemplified by his own explanation as follows:

> "*I ... structured my report as a way to try to build that case or basically explain it and justify it ...*"

191. This suggests he was concerned to build a case against Hancock, rather than present a balanced view.

192. This approach manifested itself in a number of ways.

193. At a superficial level, it can be seen in Dr Mudd's use of capitals to emphasise his views, *e.g.*, where he answers a question in the negative writing "*In summary, NO*". This manner of expression is not consistent with an appropriate degree of detachment.

194. At a more substantive level, it can be seen in Dr Mudd's expression of trenchant views in his report without any foundation for doing so.

…

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195. Dr Mudd's approach in frequently levelling criticisms without having sufficiently acquainted himself with the material betrayed a man arguing his client's cause.

…

199. Dr Mudd's criticisms of URS' work were unfounded. They were often based on his own failure to undertake proper investigations, or his own imperfect understanding of the material. His views do not warrant withholding approval. However, his evidence does undermine Dr Webb's views in some important respects."

[147] Of course, the reply and oral submissions of the objectors, in particular CCAQ, do their best to answer each of these criticisms. For present purposes, it is not necessary to detail those submissions.

CCAQ's reasons for adverse findings against Mr Stewart and Mr Hair

[148] CCAQ's criticisms of Mr Stewart and Mr Hair are smattered throughout its 59 pages of submissions on groundwater. Some of these criticisms are repeated below:[52]

"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.

…

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

[52] CCAQ Submissions, 18 October 2013.

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(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.

…

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 (Transcript 11-22.12 to 11-22.19), 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 (Transcript 2-44.1 to 2-44.2, 2-44.11 to 2-44.21, 2-44.24 to 2-44.29); and

(c) he was unclear about standard usage of the geological term "plunge" as it relates to the orientation of folding (Transcript 2-48.1 to 2-48.18).

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 (Transcript 1-51.1 to 1-51.15).

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

(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 (Transcript 11-25.12).

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(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 (Transcript 4-77.41 to 4-77.42), 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.

…

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 (Transcript 5-76.36 to 5-76.47).

(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 Report 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 (Transcript 11-54.44 to 11-54.45).

(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 (Transcript 4-72.34 to 4-72.42).

(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:

(A) about the 'simplifying assumption' of constant head boundaries; 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].

(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 (Transcript 2-57.4 to 2-57.6, 2-57.34 to 2-57.35).

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This is notwithstanding that Hancock was provided a copy of the RPS Review on 3 January 2012, 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);

(B) The need for further constraint of influential model parameters based on field data and professional judgement; and

(C) The need for further justification of the choice of parameter values.

(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; 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.

…

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. (Transcript 1-59.44 to 1-60.4)

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 (Transcript 2-14.29 to 2-14.31).

…

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) (Transcript 11-53.34 to 11-54.15); and

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(ii) Mr Stewart and Mr Hair expressly deny the possibility of recharge through the Rewan Formation, and characterise it as a regional aquitard (Transcript 2-22.32 to 2-22.33, 11-52.30 to 11-52.31, 11-54,29 to 11-54.32)

(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.

(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* (Transcript 13-14.44 to 13-15.4)

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 (Transcript 5-59.44 to 5-59.45)

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 (Transcript 12-57.18 to 12-57.20); and

(ii) provide more information about chemistry than a simple field inspection (Transcript 13-23.27 to 13-23.30); and

(b) Mr Stewart accepts that field inspection does not tell you what is going on under the ground (Transcript 2-37.20 to 2-37.23).

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 (Transcript 11-58.25 to 11-58.28); and
(ii) in cross-examination, Mr Hair described the Dunda beds as 'mainly dominated by silt stones and shales' (Transcript 11-60.41 to 11-60.42), which bears no

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resemblance to the description of 'sandy' in the explanatory notes (R. vine and F. Doutch (1973) *Galilee Queensland 1:250 000 Geological Series Explanatory Notes,* Exhibit 134 [OCCA0058.000.000], p. 11).

…

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

    (b) as Dr Webb has pointed out, this very shallow dipping would be very difficult or impossible to see at close range (Joint Expert Report by Mr Stewart, Mr Hair, Dr Mudd and Dr Webb, Exhibit 18 [AH018.000.0000], p. 21, [68];

    (c) Mr Stewart now accepts that you would not necessarily see evidence of subtle folding on the ground (Transcript 2-36.39 to 2-36.40) 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 (Supplementary Expert Report by Mr Stewart, Exhibit 23 [AH024.000.000], p. 11);

…

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 accept the possibility of recharge through the Rewan Formation (Transcript 2-22.32 to 2-22.33, 11-52.30 to 11-52.31, 11-54.29 to 11-54.32). This is so notwithstanding:

    (a) Mr Stewart's acceptance that his CHM does not explain recharge into the Permian aquifers at the groundwater divide (Transcript 2-42.1 to 2-42.11); and
    (b) Mr Stewart's acceptance in cross-examination that the groundwater quality data presented in Table 1 of his Supplementary Expert Report (Supplementary Expert Report by Mr Stewart, Exhibit 23 [AH024.000.0000], p. 34) does not support the diffuse recharge mechanism (Transcript 11-29.22 to 11-29.24).

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 (Transcript 11-30.5 to 11-30.16); 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 (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).

…

71. Notwithstanding his frequently repeated view that recharge is occurring in, and is applied in the model in (URS (2012) *Hancock Coal Pty Ltd Groundwater Modelling Report – Alpha Coal Project,* Exhibit 106 [AH027.000.000], p. 35 (soft copy p. 53), the topographic highs of the GDR, Mr Stewart in fact applied recharge across the entire model area (Transcript 11-19.44 to 11-20.2.).

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.

…

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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 (Transcript 11-19.44 to 11-20.16), which simply restates:

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

(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 fluctuations in the deeper Permian layers that comprise the major aquifer systems in the MLA areas (*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).

(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* (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).

(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 (Transcript 2-10.34 to 2-10.44).

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

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A: To the outcrop areas.

Q: To the outcrop areas?

A: Yes, to the top layers… that are outcropped in the model, yes (Transcript 2-12.22 to 2-12.30).

(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 (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);

(ii) determines an appropriate recharge rate for each of these zones (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);

(iii) clearly depicts the location and spatial extent of each of these recharge zones in Figure 4.5 (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).

(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 words (Transcript 11-19.18) – and is clearly inconsistent with both the recharge rate and recharge mechanism described in the URS Report.

…

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' (Transcript 11-37.43 to 11-37.44), Mr Stewart:

(i) made no attempt to test the range of recharge values proposed by Dr Webb (Transcript 11-38.1 to 11-38.8); 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 (Further Supplementary Expert Report by Mr Stewart, Exhibit 132 [AH082.000.0000], p. 15 of 20 (soft copy p. 20).

…

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."

[149] Just as CCAQ did, Hancock attempted to meet these criticisms in their reply.

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Ms Cassoni's reasons for adverse findings against Mr Stewart and Mr Hair

[150] In her submissions,[53] Mr Cassoni is critical of the evidence of Mr Stewart and Mr Hair in a number of areas, including the following:

> "12. The use of assumptions, simplifications and insufficient data in the predictive mining modelling for the Alpha Coal proponents is especially worrying. The lack of scientific rigour in the in-put data and modelling for the aquifer drawdown from Alpha Coal means that we cannot have reasonable confidence that the surrounding grazing environment would survive 30 or 40 years of coal extraction. I contend that mining should not proceed before we know with more certainly the extent of the likely impacts, including cumulative impacts of other projects.
>
> …
>
> 35. It came out in the cross-examination of Mr Stewart how he applied recharge to the model – rather than applying recharge to "recharge zones", the URS model applies "recharge of one times 10 to the minus eight metres per day across the whole model" (T11-19 ln 16-19; T11-19 ln 44- T11-20 ln 2). Mr Stewart agreed that this application of recharge is not apparent from URS 2012 or any materials (T11-20 In 4-5). Dr Webb – the only hydrogeological expert witness that gave evidence after Mr Stewart was recalled to the stand – found this "astonishing" (T12-69 ln 1-3). In URS 2012 Mr Stewart applied a total annual groundwater inflow of 19 ML to the whole of the model area.
>
> 36. Mr Stewart's evidence seems at odds with the statement in URS 2012 that:
>
> > *...for the purpose of groundwater modelling, recharge is applied to topographically elevated areas of the Great dividing range.*
>
> 37. It is also apparently at odds with how Mr Stewart indicated the recharge was modelled in the joint expert meeting (T13-32 ln 34-37)
>
> …
>
> 41. Mr Stewart:
>
> 41.1 agrees there is little drilling data in the Great Dividing Range (T2-23 ln 16-22), and none that is in a position to prove or disprove Dr Webb's conceptualisation (T2-25 ln 27-28; T2-31 ln 22-29);
>
> 41.2 cannot categorically say that Dr Webb's conceptualisation is incorrect (T2-23 ln 24-27);
>
> 41.3 agrees that Dr Webb's conceptualisation is plausible (T2-23 ln 29);
>
> 41.4 agrees there is no direct data to disprove Dr Webb's conceptualisation (T2-23 ln 31-32; T2-26 ln 46-47);
>
> 41.5 agrees that there is data to the east and west of the Great Dividing Range, but there is a gap in the middle of the relevant area (T2-29 ln 37-39);
>
> 41.6 agrees that you wouldn't necessarily see evidence of folding on a site inspection (T2-36 ln 39-40);
>
> 41.7 agrees that the URS geological conceptualisation does not explain the potentiometric gradient, whereas Dr Webb's conceptualisation does (T2-41 ln 7-40); and

[53] Cassoni Submissions filed 18 October 2013.

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41.8 accepted that the conceptual model adopted by URS does not explain the observed data, in particular the potentiometric head in the D and E aquifers across the mine site (T2-42 ln 10-11).

…

62. Mr Hair was evasive under cross-examination. An example of this was when he was asked repeatedly if he has treated the Parsons Brinckerhoff report as if it was a review of 2012 URS and he refused to answer direct questions (T4-78 ln 7-11; ln 13-17 and ln 19-28). The next day Mr Hair agreed to the proposition that he assumed the Parsons Brinckerhoff report referred to the 2012 URS (T5-86 ln 42-43; T5-87 ln 8-10).

63. He clearly adopted a partisan and adversarial approach to questions asked in cross-examination and acted more as an advocate than as an independent expert. The result of which is that little if any weight should be given to his evidence and he should not be considered independent.

64. Mr Hair considers the CHM proposed by Dr Webb to be flawed as Dr Webb's geological mapping does not accord with the regional geological mapping "*…particularly in regard to the extent of the Clematis Sandstone and the geological boundary between the Clematis Sandstone and the Dunda Beds / Rewan Formation unit within Cudmore National Park*." (Supplementary Expert Report of Iain Hair, Doc ID AH025.000, Exhibit 24 page 7)

65. Mr Hair was unaware of the composition of the Dunda Beds both while preparing his reports and during his site visit (T11-60 ln 38 – T11-61 ln 16) – it is highly likely that he confused the Dunda Beds with the Clematis Sandstone and that he most likely was in error in his criticisms of Dr Webb's mapping. This casts serious doubt on the entire URS modelling of the Great Dividing Range and GAB interaction with the units to be dewatered by the project proponent.

…

69. … the unsigned PB report reviewed an earlier version of the 2012 URS (2011 Revision C) which is not in evidence and the differences, if any, between the two versions is unclear. Mr Hair was not provided with a copy of the 2011C URS revision, only URS 2012 (T4-58 ln 18-22). How he could be aware of the "rigorousness" of the PB review given he is unfamiliar with the version of the URS report it actually reviewed?

70. PB 2012 is worthless from an evidentiary standpoint both on its face and in the context of this proceeding where, if expert evidence on groundwater were to be relied on by any party, it should not be provided second-hand and without giving the other experts or the parties the opportunity to respectively confer with or question the author.

71. Given Mr Hair's partisan approach to his evidence, effectively the only full independent peer review of URS 2012 is that of Dr Mudd and Dr Webb – both of which have pointed out significant issues with the conceptual hydrogeological model, paucity of data and boundary issues. RPS49 reviewed the model and found it wanting, as did the IIESC."

[151] These criticisms were responded to by Mr Hancock in its reply.

Mrs Anderson's reasons for adverse findings against Mr Stewart and Mr Hair

[152] Mrs Anderson is also critical of Mr Stewart and Mr Hair. This criticism is both inferred and direct:[54]

"1. Our objection to this mining lease is that the mine will leave a permanent, and irreversible intergenerational impact on the quality and quantity of groundwater available to landholders around the project area. This is based on the fact that the mine is predicted to lead to a decline in groundwater levels of up to 5m within a 10km circumference of the

[54] Anderson closing submissions filed 18 October 2013.

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mining area. Whilst there are conditions to 'make good' affected bores, there is no requirement to remediate the affected aquifers which can lead to irreversible harm.

2. There is a potential that this mine will have a devastating effect on the long-term livelihood of the agricultural industry in this area. This is due to the fact that the final impact mine dewatering will have on groundwater supplies' has not been comprehensively modelled. … The reliability of predictions is also limited due to inherent errors in groundwater modelling, partly due to the lack of bore data outside the mining lease and lack of scientific data on the complex structures of the aquifers in this area. There is a genuine risk that the final impact on groundwater may potentially be much greater than currently predicted, which will have a significant impact on land holders who rely on this water for the viability of their business and on future generations of groundwater dependent enterprises in the district.

…

6. We believe our concerns that there has not been enough research done to fully understand the complex groundwater structures in the area is validated by the expert's disagreements on what the recharge areas are. This could lead to a greater impact than predicted from the proponents's project. This is in part due to the fact that an Artesian bore has been drilled on the mining lease, even though the area is no longer declared part of the Great Artesian Basin. This boundary was shifted in 2009, and the area is now declared the Highlands sub-artesian area. Mark Stewart confirmed his awareness of the existence of the bore, even though it has not been mentioned in the reports, T2-80Ln44 – T3-81Ln1-23:

   "Okay. So can just clarify – do you know of a bore that's on the mining lease that's actually been drilled, and it's a flowing bore. Do you know anything about that at all?---An artesian bore. Yes. That's been found on the mining lease?---I do remember there was something like that. Yes?---Yes. I can't, off the top of my head, think where it is though . …

   In the unpredicted event this bore is affected by mining activities, it could potentially lead to further unpredicted impacts to the Great Artesian Basin and on the landholders who rely on these aquifers.

…

8. This is made reference to by the Applicant's representative, Mr Clothier, T1-20Ln25-30:

   "Your Honour, a criticism that's also made of the work that has been done today, is that the modelling doesn't model the cumulative effects of the Alpha project together with the other projects that I have described. Now, according to Mr Stewart, it would not have been possible to do that in a reliable way, because each project is at a different stage of development, with different stages of investigation."

   And by Mr Stewart, T2-77Ln25-29:

   "So on page 36 of your report you state, "I consider that a cumulative model at this stage without all the proponents buy-in and data would not provide a very accurate assessment of potential impacts of mine dewatering associated with all proposed projects within this portion of the Galilee Basin?---That's right. So that was a statement done in – when we did the modelling in March 2012."

9. However, during cross-examination, groundwater experts' - Iain Hair and Dr Gavin Mudd both gave conflicting expert opinions' to Mr Stewart's and agreed it could be done: Iain Hair: T4-66Ln15-16:

   And you've heard evidence that these models cannot be joined together?---No, I don't agree with that at all. The - these models could be readily stitched together.

   Dr Mudd: T10-90Ln43-47 - T11-91Ln1-5:

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"So, certainly, I think it's quite reasonable to expect that if the terms of reference say that you've got to do a cumulative impact assessment of all known projects, those projects were well-known in 2011 when this modelling – excuse me – when this modelling was done. So I think it's perfectly reasonable to therefore expect that there's some scenarios that do properly account for what was known about these various projects, and there was certainly more than enough known to be able to do what South Galilee did in terms of saying we'll assume the depth of the open-cut is the base to the north from, say, Alpha and set that as a boundary condition and run that as a scenario. And so I think it's quite reasonable. It's still work, but it's not hard or complex or extremely difficult to do. It can be done."

11. If Mr Hair' and Dr Mudd's opinions are correct, and disproves Mr Stewart's opinion in T2-77Ln39-42, a cumulative model would be very helpful in assessing whether the potential impacts currently predicted are accurate.

    "So if that's the case, if you cannot get a cumulative model that's very accurate – assessment of potential impacts, is it fair to say that an expert such as yourself would not be able to know if the Alpha and Kevin's Corner's mines may have a greater impact cumulatively than at present it's predicted? ---Right"

…

19. Given that our bores will be affected by the Applicant on a cumulative basis, the process of how the condition to make good water supplies can be achieved. Mark Stewart suggested one alternative, T2-79Ln20-29:

    "So we know quite a bit about the Colinlea and the Bandana and those sandstones so one of the alternative water supplies, because that's what you'd require to provide to make good, is to drill deeper bores into the underlying – below the ecoal. So with depth in Colinlea sandstone, it gets more and more – it's quartz rich sandstone so it's more clay in the Bandana and then the Colinlea is more – better groundwater potential. So the one alternative is to drill deeper holes in the same area into those units and extract water out of there, but then your make good needs to include the costs of deeper pumps and maintenance and power and the likes and we did put that in a lot of the EIS documentation."

20. Mr Hair also agreed with Mr Stewart's alternative make good supply, T4-55Ln7:

    "My understanding is that the primary way of making good will be to deepen bores into the deeper access of the Colinlea seam so – which won't be affected by the mine"

    Mr Hair also said it's reasonable to assume the that new bores could replace affected bores,T4-55Ln35:

    "Given that those bores are in those formations, the – it's reasonable to assume that the deeper parts of the Colinlea exist at depth at those locations and so it's just simply a matter of replacing a bore which has become affected with a deeper bore beside it."

21. However, in T11-54Ln19-20, Mr Hair gave conflicting evidence of their knowledge of the Colinlea sandstone by stating that the intake beds of the Colinlea sandstone are not well known:

    "---The intake beds of the Colinlea sandstone are not well known."

    Mr Hair also was unsure if drilling had been done to ascertain if this option had been tested, T4-55Ln10-12:

    "…has the applicant done any drilling outside the mining lease area to ascertain that this supply is in fact available and in sufficient quantity and quality? ---I'm not sure.

22. If the experts are not sure how these formations are recharged, whether they may be present or not at certain locations, and there has been no testing done outside the mining lease to test the quantity and quality of the aquifers they are relying on to make good

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affected water supplies, how do we know this option is even feasible? This, combined with the fact that no drilling has been done on our property to test this assumption, has the potential to lead to affected bores not being able to be made good with alternate groundwater supplies. …

23. The evidence supporting the feasibility of Mr Stewart's and Mr Hair's statements appears somewhat insufficient and infers a bias to the Applicant. …

24. The groundwater experts' on both sides have areas of disagreement in terms of modelling processes. During cross-examination by Mr Clothier, Dr John Webb gave criticism to the legitimacy of the URS report, T12-67Ln18-30:

"You did not see your role as to put both sides of the story? ---My role is to come up with a hypothesis that best explains the data available, and in this case, there are two hypotheses, one of which is untenable and the other of which, mine, may be right, but the other hypothesis – the one in the URS report cannot be correct. Well, you've never expressed that view before, have you Doctor? ---I've said that it's difficult to understand. You've not expressed the view in the course of the joint expert report, for example, that the URS report is impossible? ---What I said was that in order for the URS report to be correct, the Rewan formation had to allow recharge, which it does, and since they do not allow the Rewan formation to allow recharge, ipso facto, it cannot be correct."

And of Mr Stewart's modelling, T12-69Ln1-3:

"Yes? ---My understanding from the transcript I was shown of the cross-examination yesterday is that Mr Stewart applied recharge to the entire area of his model which I find astonishing, to be frank."

25. In the RPS Recommendations Report to CG,(Exhibit 140.1, Doc ID OCCA 0062.000.001) pg 8, paragragh 2,4, makes a criticism that the modelling done has been compromised by a number of simplifying assumptions:

"The regional model has been used for preliminary assessment of mining impacts and post-mining recovery of groundwater levels, but the modelling has been compromised by a number of simplifying assumptions. This significantly reduces the reliability of the predicted impacts and recovery."

"…Because of the above limitations with the groundwater modelling, it is difficult to have confidence in the model integrated predictions obtained to date. More advanced modelling is required."

26. The uncertainties in the Applicant's groundwater modelling , differences and inconsistences in Expert opinions leads one to conclude that the condition for a cumulative modelling of predicted impacts should be enforced. …

33. In closing, I submit that there is insufficient data and modelling done of the Applicant's groundwater impacts to predict the final impacts the mine's dewatering will have on an individual project and cumulative basis."

[153] Again, Hancock responded to these criticisms in its reply.

Mr Currie's reasons for adverse findings against Mr Stewart and Mr Hair

[154] It should be remembered that, due to illness, Mr Currie agreed with Mrs Anderson's and Ms Cassoni's submissions. He did however express some views as to his belief that Hancock's expert evidence was insufficient when he had this to say in his reply submissions:[55]

[55] Mr Currie, Reply submissions filed 24 October 2013.

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"If the Applicant's predictive modeling is wrong, and there is an impact on the Great Artesian Basin, which would impact on our property, how is that impact going to be managed? How far west will the impact extend? The applicant's research doesn't cover that possibility so if it occurs then there is currently no management plan. Such a state of groundwater management can not be regarded as acceptable, there is no management plan if an impact on the Great Artesian basin occurs.

…

Hancock has never been in contact with us to enquire about doing exploration drilling on our property or any other activity so as to gain more data. For our property they have based all their conclusions on predictive modeling which has been shown to have a very questionable accuracy.

…

Also the uncertainty of how much impact will occur on our property from each mine was demonstrated by my cross examination of Mark Stewart. Tuesday 17th September, Page 76.

…

Due to the uncertainty surrounding impacts on groundwater by the proposed Alpha Coal Mine and emphasizing by Hancock that this should be regarded as acceptable, has created an air of uncertainty as to what conditions, how and when the Coordinator-General will require Hancock to implement. Hancock (67)"They do not claim to provide complete accuracy or certainty. But that is neither possible nor required. "Having such a carefree approach to their research on the impacts on groundwater, when it is the life blood of our business, raises our concerns and enforces the need to get our business protected by signed documentation prior to the granting of Alpha mining lease."

Statutory Party's views on Expert Groundwater Evidence

[155] For completeness, the views of the Statutory Party regarding the expert groundwater evidence, and in particular the respective merits of their evidence, should be considered:[56]

"54. The Court heard evidence from four hydrogeologists (of different backgrounds and qualifications) – Mr Stewart, Mr Hair, Dr Mudd and Dr Webb. At first blush, the contest was between Mr Stewart and Mr Hair on one hand, against Dr Mudd and Dr Webb on the other.

55. Dr Mudd's evidence is of less assistance to the Court because the nature of his qualifications limited the work that he could do. He conducted something akin to a literature review. A literature review might be helpful if it is carried out by an experienced hyrdogeologist (such as Mr Hair). When carried out by an expert in the more general field of Environmental Impact Assessment (such as Dr Mudd), it is of only limited value to the Court.

56. Dr Webb presented the clearer counterpoint to the Applicant's expert evidence. Before Dr Webb came to give his oral evidence, the disputed issues between him and Stewart/Hair had narrowed to:

(a) the conceptual hydrogeological model; and
(b) rate of recharge.

57. As he gave his oral evidence, Dr Webb ultimately agreed with the Stewart/Hair position on rate of recharge. That fell away as an issue disputed between the experts.

58. The remaining issue in dispute was about the conceptual hydrogeological model. Dr Webb's thesis was that subtle folding in the geological structure might be present at the subject site. Mr Stewart and Mr Hair did not agree.

[56] Statutory Party, Submissions, 18 October 2013.

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59. The deficiency with Dr Webb's evidence was that he did not clearly explain what the consequences would be if his conceptual hydrogeological model was preferred. CCAQ appear to say that that uncertainty is enough for their objection to succeed. It is not.

60. The open-endedness of Dr Webb's evidence renders it of less assistance to the Court than the detailed modeling carried out by Mr Stewart. In fact Mr Stewart was the only expert in the case to have actually carried out modeling, as opposed to simply reviewing the modeling work of others. CCAQ questioned Mr Stewart's modeling and other modeling carried out for the Applicant's proposal and adjoining mining proposals. What was left undisturbed, however, was the fact that Mr Stewart's modeling methodology was industry practice, was sound and was based on his carefully considered opinions about parameters. Opinions may differ, but Mr Stewart's opinions are well within the range of reasonable expert opinions about model parameters.

61. Mr Stewart was taken to a number of possible geological scenarios in crossexamination. He was given every chance to admit that a particular scenario would significantly alter the conclusions that he had formed. He did not, in the face of competing theories, see a need to substantially alter his views.

62. Mr Stewart's evidence should be preferred. Even if Dr Webb's evidence about the geological concept is accepted, it does not lead to a conclusion that the Applicant's proposal should be refused. The conditions and other approvals provide more than adequate safeguards."

Impressions as to the evidence of each groundwater expert

[156] It is difficult to put across in written words the voluminous extent of groundwater material that the experts had to come to grips with, and the underlying complexity of that material. For instance, the joint experts report on groundwater details 21 reports which all of the groundwater experts took into account,[57] in addition to the experts own reports and supplementary material.

[157] Each expert was faced with complexities that saw opinions move and become refined over time. For instance, the science had moved so far from 2010 by the time of the 2012 URS Report that the direction of flow of groundwater had been reversed, as is evident from Exh 25, page 9 (showing a westward flow down aquifers and proposed in 2010) and Exh 18, point 16, page 10, where the joint experts agree that the groundwater flow within the Alpha lease is to the east and north (average north-east).

Mr Stewart

[158] Like all of the experts, Mr Stewart both corrected himself and gave evidence which could be viewed as contradictory.

[159] However, that said, he came across in the witness box as a careful witness who gave, generally, short, clear, confident answers to questions.

[160] He was careful on day two of the hearing to comment that he does not say that Dr Webb is wrong as to his hypothesis.[58]

---

57 Exh 18 pages 3-5.

58 T 2 p 23 lines 24-35.

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[161] He was also willing to point out that the modelling for groundwater off the minesite is not as rigorous as that which has been done on the minesite.[59]

[162] When Mr Stewart gave further evidence on Day 11, it was apparent to me that he was not overly dogmatic when he disagreed with a question. Further, he showed a willingness to agree with some fundamental aspects which were contrary to his own Exh 132 statement.

[163] My comments on Mr Stewart could not pass without making specific reference to his evidence contained in his report of 27 September 2013.[60] At 4.1 of Exh 132,[61] Mr Stewart had this to say:

> "I consider the groundwater associated with the deeper confined aquifers reflect the water associated with the fluvial deposits, trapped during the rock formation, and the inert nature of the quartz-rich host rock."

[164] During cross-examination,[62] Mr Stewart went on to confirm that what he was saying was that water was present when the rock had formed some 250 million years ago and had been trapped there since. The following evidence was then given:[63]

> "Okay. It is the case here that there is a measured potentiometric gradient, isn't there?---There is, yes.
>
> And that means that the water is moving?---Yes.
>
> And it is moving and has been moving - - -?---For a while.
>
> - - - for 250 million years?---Right.
>
> Right?---Yes.
>
> Even if it's moving very slowly, it's true, isn't it, that in all likelihood, the original water trapped there has been flushed out?---That's a good summary, yes.
>
> That's not what you say?---What I'm trying to say here is that the chemistry that Dr Webb's talking about – why is it low chloride values.
>
> I don't know but you've proffered an explanation which can't be right, haven't you?---I can see what you're saying, yes.
>
> It can't be right?---It depends. If you don't have any recharge or very small recharge - - -
>
> Let me put it to you this way?--- - - - would it flush the whole system?
>
> I see. Let me put it to you this way: that statement that you've made there has never been demonstrated anywhere in the world. That is water that old where there is a hydraulic gradient being, if you like, locked in the rock formation. Are you in a position to disagree with that?---No, I'm not.
>
> Now, even on your recharge mechanism, the relevant part of the Colinlea sandstone is only 10 to 20 kilometres away from the recharge area, isn't it? …

59 T2 p 30 lines 19-33.
60 Exh 132.
61 Exh 132, page 4.
62 T 11 p 21.
63 T 11 p 22.

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> So if the recharge is happening there, it makes it even more unlikely, doesn't it, that the original water that was trapped in the rock formations is still there because it's close to the point where the tap is turned on?---Right.
>
> You agree with that?---I agree with you."

Mr Hair

[165] Mr Hair commenced his evidence as a witness who gave considered but concise answers which he attempted to make as simple as possible. When he first gave evidence on day 4 I was quite impressed with him.

[166] Things changed somewhat for Mr Hair on day 5 of the hearing when the topic of the groundwater divide was considered.

[167] Mr Hair was specifically taken to two diagrams, being figure 4.2 of the EIS,[64] and figure 1 of the groundwater joint experts report.[65] Figure 4.2 is reproduced below, and figure 1 has already been reproduced in the Background part of this decision.

64 Exh 13.7.12.
65 Exh 18.1.

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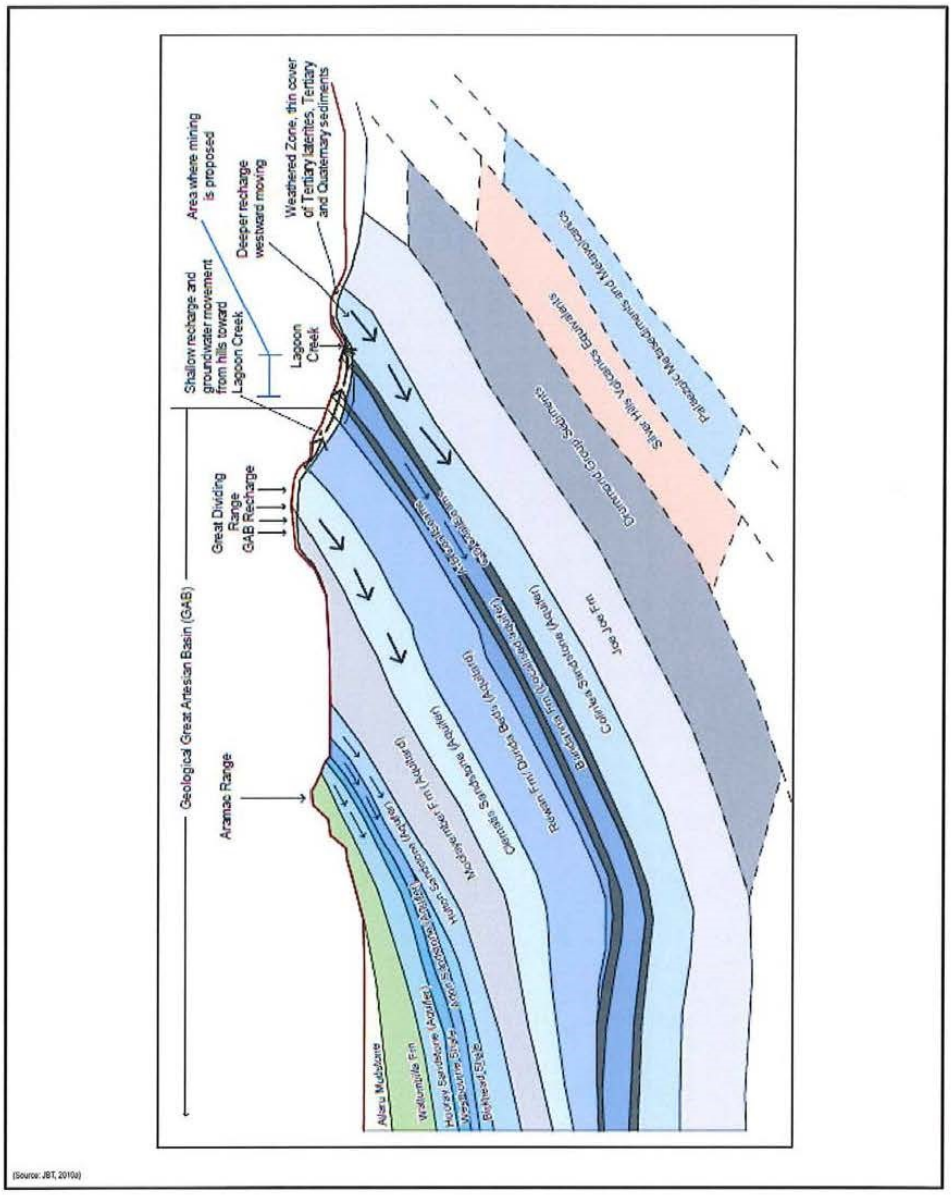
Area where mining is proposed
Deeper recharge westward moving
Weathered Zone, thin cover of Tertiary laterites, Tertiary and Quaternary sediments
Shallow recharge and groundwater movement from hills toward Lagoon Creek
Lagoon Creek
Great Dividing Range GAB Recharge
Geological Great Artesian Basin (GAB)
Aramac Range
Cretaceous sediments
Cenozoic sediments
Cretaceous Sediments
Cenozoic Sediments
Paleozoic Metasediments and Metavolcanics
Silver Hills Volcanics Equivalents
Carnarvon Group Sediments
Jose Jose Fm
Cretaceous Aquifer
Cretaceous Aquifer
Cretaceous Aquifer

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[168] This is part of Mr Hair's evidence relating to these two diagrams and the question of a groundwater divide:[66]

> "If you go to 4-2 – figure 4-2. It's only about - - -?---Thank you. Yes. I have it.
>
> You have that there. That's the geological cross-section – schematic geological cross-section which formed the basis of various – well, formed the basis of various other conceptions throughout the process. You've seen that diagram before?---I have. Yes.
>
> There's nothing in that diagram which depicts the existence of the groundwater divide, is there?---No. The – the groundwater flow regime is – is now changed from that.
>
> Yeah. In fact, what that diagram shows is deeper recharge moving westward, consistent with the gradient of the stratas; correct?---Yes.
>
> And the only difference – the only difference in substance between that diagram and this … diagram which I had – which I took you to earlier is the indication of the groundwater divide showed by the dotted lines crossing one another?---It's the indication of groundwater flow directions, which is different, and the divide. Yes.
>
> Yes?---The divide is now included, whereas it wasn't before.
>
> Now, do you think – let's go back one step. There is no explanation in the material for the existence of the divide in that location proved by objective evidence, is there?---The explanation for why the model treats that as a – as a boundary condition is explained in the document outlining the model.
>
> Yeah. Answer my question. It's not proved by objective evidence, is it?---There's no drilling in that area. No.
>
> No. Do you think that the absence of an explanation about geological conditions used as a basis for modelling is a matter which should have been identified by you in your first report?---The geological structure is the basis of the conceptual hydrogeological model and it's fine.
>
> You're not really answering my question. Let me put it to you in more fundamental terms. Do you agree with the proposition that if someone looked at the image which was just up a moment ago or any of the subsequent images that flowed from that and also read the URS report which discussed the existence of a groundwater divide in that location, now depicted in the newer image, that it would raise a question about how it can be said that the groundwater divide exists in that location?---No. We went through all that and – and this – Salva Resources, as far as the groundwater flow directions are concerned and the lack of indication of a groundwater divide in that, it's now superseded. Studies - - -
>
> No, no, no?---Studies move on and as you obtain more and more information things change.
>
> In the absence of an explanation about why the geology permits a conclusion that there is a groundwater divide in that location, you don't think it's a relevant line of inquiry for a third party independent reviewer to at least raise the question?---The – 30 the – the model boundaries were examined by myself and I was comfortable with the explanation in the URS 2012 report as to why – as to what boundary conditions were applied to the model and – and why.
>
> Well, I think we know what boundary conditions were applied to the model. What I'm pressing you on is whether or not there was an adequate geological explanation for the assumption of those boundary conditions and there was no explanation for that in the material

[66] T 5 p 52 line 25 – T 5 p 55 line 35.

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that you looked at, was there?---In the URS 2012 report the boundaries used for their numerical model are explained sufficiently for me, to my satisfaction.

I see. So if Dr Webb is to say when he gives his evidence, that he observed this conundrum as a pretty fundamental issue which was absent explanation, you would disagree with him, would you?---I would, because that ground water flow direction that you're referring to in Salva Resources is now superseded – it's no longer – it no longer applies.

Both Dr Webb and Dr Mudd will say that the issue which I have raised with you is one of the first things that they noticed about this material. Now you were the independent third party reviewer and you did your third party review by the 30th – 29th of May 2013, and you simply didn't think it was an issue that warranted you even entering upon discussion about, is that right?---Because I knew that they had been superseded. That it no longer was the case. That it is not the basis of the URS 2012 model.

But it was always the case that there was, even up to the time when you prepared your first report, that there was no express justification or in geological terms for the existence of a ground water divide on the western boundary?---The ground water divide on the western boundary of the numerical model is adequately explained in the 2012 report. This diagram of Salva Resources, apart from the structural geology, as far as the ground water flow pattern it shows is concerned, is redundant.

I see?---And so I – I paid no further attention to it because it is no longer required upon.

So you just accepted that the ground water divide existed?---On the basis of my experience in previous modelling and the explanation in URS 2012, yes.

Well it's really got nothing to do with modelling has it – hasn't it – it's really got to do with whether or not there's an adequate geological explanation for the existence of the model parameter?---There's – there's an adequate explanation for the existence of the western boundary in the report of URS 2012.

Righto?---And I agree with it.

Okay, and you agreed with it to the point where you didn't think it required any further explanation as an independent third party reviewer when you prepared your main report, and would just assume that to be the case?---I said I agreed with the – the use of a no flow boundary along the western boundary of the numerical model.

Okay. I suggest to you that even in the evidence that you presented in your supplementary report, you do not seek to enter upon any further discussion about the existence of the ground water divide or why it exists?---It's normal modelling practice for there to be a divide underneath ranges and lines of hills.

I see. I suggest to you that really your supplementary report was concerned with attempting to prove Dr Webb wrong rather than to explain what he had observed to be a fundamental aspect of the geology which was absent explanation?---No, that's not true at all. Dr Webb's model, I can't agree with at all. It has – has no basis in hard data at all.

Well, it has no basis in hard data at all?---That's right.

And in that way it doesn't distinguish itself from your assumption that there is a ground water divide and a potentiometric raised surface at the western edge of the area of study?---No, the model - - -

There's no hard data to support that conclusion?---The model of Dr Webb in fact the drilling data, the geological data that does exist is counter to his model.

All right, well, we'll come to that. Why don't we go to Dr Webb's conceptualisation? I wonder if I could ask the Registrar to go to OCCA 0011 then zeros. And I want to take you to page 18 of that report if I can, which is the cross sections of Dr Webb. You see them?---Yes I do.

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> And you see in those images – I'm reasonably certain you're familiar with them by now, that Dr Webb has arrows moving through the range in a location of the – what he agrees with you, is a ground water divide. See that? See how he has those arrows there?---Which particular cross section are we talking about?
>
> Either or – either or – just look up at me for a moment. I'm talking about these arrows in this location - these arrows here and these arrows here. Do you see the arrows that go into the formation and then break east and west?---Yes.
>
> You understand him there to be describing a recharge – a form of recharge occurring in that location, breaking in an east and west direction, correct?---A ground water divide, yes.
>
> Yeah, and it's true isn't it, that that kind of call it a phenomenon would explain the existence of a ground water divide in that location?---Yes, the – you get percolation of rainfall across the topography. It seeps down to the ground water table and then flows east and west.
>
> Yeah. In terms of explaining the ground water divide, it's a plausible explanation?---Yes, recharge – recharge goes west and goes east on either side of the ground water divide.
>
> Yeah?---That's true."

[169] Mr Hair's evidence can best be described as somewhat circular and inconsistent. Further, he seemed very ready to blame Dr Webb for proceeding on a basis which lacked "hard evidence" when precisely the same criticism can be made of him for his location of the groundwater divide.

[170] I agree with the contention put to Mr Hair by Mr Fainazio that this topic certainly warranted further explanation in Mr Hair's various reports.

Dr Webb

[171] I found Dr Webb to be a very eloquent, quite convincing witness. He expressed his views very clearly and was also very forthright in expressing his reasons as to why the opinions of other experts were wrong.

[172] That said, however, he was found wanting in some respects during cross-examination.

[173] At paragraph 73(b) of its submissions, Hancock is very critical of Dr Webb for selectively using documents which supported his opinion, and not necessarily using documents which did not.[67]

[174] Whilst the criticism is certainly well made by Hancock, to some degree it should be afforded less impact than would otherwise be the case as it was not a comment by Dr Webb as to his whole research, but limited to the issue of the detail of folding shown in the Jericho 1:250,000 map.[68]

[175] This is certainly clear when the transcript is read in context:[69]

> "That is, it's likely that you were given a diagram by Dr Mudd, which apparently was consistent with your theory and that you were happy to refer to that consistency without further investigation?---Indeed, but I didn't regard it as a major confirmation of my theory.

---

67 Hancock submissions 18 October 2013 p 13 para 73(b).
68 Exh 31.
69 T 12 p 66 line 35 – T 12 p 67 line 30.

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> You regarded it as significant enough to put it in your report, didn't you?---And I also refer to the fact that you see similar folding in the cross-section beneath the Jericho 1:250,000 map.
>
> Yes, you do refer to that. But you don't refer to the fact that that folding is not depicted in the map in the area that you're talking about?---I say in fact, it's very similar to the broad open folds further west, beyond the Great Dividing Range. I'm quite explicit about that.
>
> But you don't identify that the cross-section in the area that we're concerned with does not show support for your theory?---Not directly, but I haven't referred to them saying that folding occurs between the Great Dividing Range because of course they don't.
>
> Again, can I suggest that you had formed a view, and you were happy to refer to those parts of documents which you thought were consistent with your view, and not necessarily to others which were not?---That's correct.
>
> So you saw your role really as being, as I said earlier, to form a view and to argue in its favour?---It's my role, once again, is to assist the data and come up with a hypothesis that best explains the data, and that's what I did.
>
> Did you see your role – sorry?---No – sorry – keep going.
>
> No, you continue. I cut you off?---No, that's all I was going to say in fact.
>
> You did not see your role as to put both sides of the story?---My role is to come up with a hypothesis that best explains the data available, and in this case, there are two hypotheses, one of which is untenable and the other of which, mine, may be right, but the other hypothesis – the one in the URS report cannot be correct.
>
> Well, you've never expressed that view before, have you, Doctor?---I've said that it's difficult to understand.
>
> You've not expressed the view in the course of the joint expert report, for example, that the URS report is impossible?---What I said was that in order for the URS report to be correct, the Rewan formation had to allow recharge, which it does, and since they do not allow the Rewan formation to allow recharge, ipso facto, it cannot be correct."

[176] Of course, other evidence given in this case by Dr Hair explains the point. Put simply, the Jericho 1:250,000 map shows folding through identification of anticlines and synclines when seismic data has been obtained for an area. The absence of recorded anticlines and synclines on Jericho 1:250,000 simply means that no seismic survey has been undertaken in that area. As Mr Hair said during cross-examination:[70]

> "Yeah. So the fact that a dotted line on this map doesn't appear east of the Great Dividing Range in the location of the mine doesn't mean that there are no anticlines or synclines in this area, does it?---It means that no seismic has been done there, I guess."

[177] Moving back to Dr Webb, he made errors which he subsequently acknowledged. The best example is to be found in the following transcript:[71]

> "You had, in fact, expressed the view that the recharge which came out of the model of .1 per cent was not possible, hadn't you? I'm not suggesting it's in this report, but do you recall, Doctor?---I found the .1 per cent of recharge difficult to believe but based on Mr Hair's calculations of .2 per cent, clearly it's less than I imagined.
>
> Significantly less, in terms of orders of magnitude?---Well, I said .5 per cent here, it looks like Mr Hair might be right with .2 per cent.

---

70 T11 p 72 lines 11-13.

71 T 12 p 69 line 39 – T 12 p 7- line 34.

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Could Dr Webb see AH018.000.000 – the joint expert report?

And if we could go, please to page 46, paragraph 174. You expressed the view, didn't you, based upon your modified analysis, that is the modification of the chloride mass balance method, that there was no possibility, based on groundwater composition, that recharge can only be .1 per cent of rainfall?---I do say that.

And that was wrong?---It was.

It was a dogmatically expressed view, wasn't it?---It was wrong.

It was a dogmatically expressed view?---It was wrong.

And without justification, wasn't it?---The justification is in the paragraph where I point out that I use salinity rather than chloride because I had no access to reliable chloride data. Now that I have access to reliable chloride data, I'm happy to acknowledge that I was wrong.

Right. You did not, in your expert report initially or in the joint expert report, identify that you needed access to additional data or that access to additional data might assist you in your methodology?---I said that reliable data on the latter, i.e. chloride, are lacking.

Yes?---And I was unaware that reliable chloride data were available.

It's likely on a project of this size, given what you've seen about the investigations, that there has been some chemical analysis of groundwater?---None of that data had been made available so far - - -

I understand, but you knew, didn't you, that it was likely that it existed?---I have no idea what analyses they were doing.

You didn't expect that on a project of this size, given the extent of the groundwater investigations that you know took place, that there was some chemical analysis of groundwater?---In retrospect, it seems likely that they would have done it, but at the time I had no way of knowing."

Dr Mudd

[178] Each of the groundwater experts bring different forms of expertise on groundwater. Dr Mudd was certainly challenged as to the depth of his expertise.[72]

"Dr Mudd, you are an environmental engineer; is that correct?---Correct.

You are not a hydrogeologist?---An environmental engineer that's spent a lot of my career working in groundwater and on hydrogeology.

You are not a hydrogeologist?---Do I spend 100 per cent of my time on hydrogeology, no, but do I spend a lot of my time, yes.

You've not studied hydrogeology, have you?---I've taught groundwater at Monash University for many years. I have been long involved in hydrogeology. I did my PhD in Hydrogeology.

And you are not a geologist?---No, I'm an environmental engineer that works on a range of aspects, including groundwater and hydrogeology.

And you've not studied geology?---As part of my environmental engineering degree, I did the - the geology/mining stream, the elective stream within that course which, of course, is where I've worked ever since.

I understand, but you have no formal qualifications as a geologist?---As part of my engineering degree I did do geology, yes. I did do some geology units, yes.

[72] T 10 p 6 line 16 – T 10 p 7 line 30.

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> Is it right to say that most of your work is within the university within the academic sphere?---I'm not quite sure what the question was, sorry. Please can you rephrase?
>
> Is it right to say that most of your work is within the academic sphere?---It has been research oriented, yes.
>
> You are a senior lecturer and course director, currently, aren't you?---I'm a senior lecturer in environmental engineering and I run the environmental engineering course at Monash.
>
> And you're - that's a full-time job?---That's my full-time job, yep.
>
> And is it right to say that you've never before conducted an groundwater impact assessment in relation to a large mining project?---I was involved in doing that during my PhD years and I have reviewed a number of EISs that 5 have done that.
>
> Sorry, can we take it step by step. When you say during your PhD years, how long ago was that?---Back from about 1995 to about 2000.
>
> And you have subsequently reviewed the results of other people's work in relation to such studies; is that correct?---Been the main focus of my work. There has been some modelling I've done at times, but most of my work has been reviewing the work of others.
>
> And so have you haven't been involved in any recent way in any groundwater impact studies for large scale mining projects, that is, involved in preparing such studies?---In preparing them, no. In reviewing them, yes.
>
> And do you have training in relation to modelling of groundwater impacts?---I've done groundwater modelling on and off for many years including during my PhD.
>
> And what type of scale? There are different types of models. Some are simple. Some are more complicated. What's your experience?---From simple through to complex.
>
> You have conducted complex groundwater models, have you?---I have, yes.
>
> Personally or have you supervised and been conducted by other people?---I was personally involved with the running complex groundwater models for the Latrobe Valley coal mines back in the 1990s."

[179] I have no doubt that Dr Mudd is well qualified to give evidence on groundwater, given his experience in hydrology, geology/mining, and complex groundwater models.

[180] I am also satisfied of his ability to critique the work of others, given his history as both a developer of models, and in particular as a reviewer of the work of others.

[181] Unlike the other groundwater expert witnesses, Dr Mudd tended to speak very quickly and to answer questions almost immediately. As a result, at times he tended to tie himself up in knots somewhat. An example of this is found in his evidence relating to folding:[73]

> "All right. Now, you then, in your report, expressed a preference for scenario three, which was the folding theory. Correct?---At that point; yes. And I still think there's – that is a more plausible explanation than a no-flow boundary.
>
> It's fair to say you've moved on since then as a result of further information that you've taken into account?---Well, there's still no drilling done in that region to be able to identify what the – the exact structure is beneath the great divide and what's causing this. So – and until that drilling's done, all of this is guesswork. So - - -
>
> I see. So when you said, in paragraph 5.1.3 of your report, that "it's clear that the local folding underneath the Great Dividing Range is a locally significant 5 control," that was a complete

[73] T 10 p 38 line 42 – T 10 p 39 line 18.

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> overstatement?---Hang on. I'm just reading through the report to catch up. Which paragraph, sorry?
>
> 5.1.3?---Just trying to work out where it actually says "it's clear."
>
> If you go down six lines - - -?---Okay. Thank you. That's been pointed out. Thank you.
>
> - - - as per my area. Oh, sorry – as per my previous comments?---I'm saying that based on the evidence that I'd compiled for my report.
>
> And you're now saying it's not clear. Are you?---Well, it's not 100 per cent clear. But I think, to me, that's still the most plausible explanation."

[182] Dr Mudd was criticised for travelling to Bimblebox and doing aerial inspection work with Dr Webb. The criticism also extended to their exchange of emails.

[183] I can completely understand why, to save funds, Dr Mudd and Dr Webb travelled together and did the aerial inspection in the same helicopter. There was little difference in the fact of Mr Stewart and Mr Hair travelling together.

[184] As regards not only Dr Mudd, but also Dr Webb, Mr Stewart and Mr Hair, I have no doubt that they applied their own expertise to their reports and oral evidence, and drew their own independent conclusions.

[185] As Dr Mudd explained in cross-examination:[74]

> "In paragraph 206, you adopt some things that Doctor Webb says about certain springs being artesian?---I believe he has a – a good logical argument to explain the behaviour of those springs. Yes.
>
> Do I take it then that you haven't looked at the issue yourself. You've just accepted what he had to say?---No. I looked at the evidence that he was presenting in the – during the conclave and also in the joint experts report and, after his report was submitted, I then read his report.
>
> And – but you yourself hadn't investigated the issue?---Beyond what I've just described, no.
>
> And you were very much reliant on Dr Webb's view with respect to the issue, weren't you?---But it's also not something that I'm trying to argue one way or another in terms of – like, I'm not quite sure what the – what – what you're getting at. Sorry.
>
> Well, you're not supposed to anticipate my question; you're just supposed to answer it. It's not something that you actually looked at, is it?---Not as part of my expert report. No.
>
> And even as part of the joint expert process, you really just adopted what Dr Webb had to say?---I didn't just adopt. I actually considered the evidence he put forward and the arguments and the – and basically thinking about it for myself and then saying okay. That is a – a view – an interpretation that I think is reasonable.
>
> And there might be another reasonable view, I take it?---It's always possible in groundwater to have more than one explanation, sometimes. That's one of the reasons why groundwater can be so difficult to get – to understand."

Closing Remarks on the Expert Groundwater Evidence

[186] I could certainly go on and in great detail consider each challenge against each groundwater expert, the opposing responses to such challenges, and then make multiple

[74] T 10 p 87 lines 10-38.

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specific findings. However, save for what I have said about each groundwater expert already, I do not believe that the result in this case would be any different to the conclusions I have drawn.

[187] I have taken account of all the groundwater evidence and all of the challenges against the weight that I should give the varying parts of that evidence.

[188] In short, what remains, due in my view to a lack of data particularly outside the MLA area, are validly held opposing positions by experts in their field.

Conclusions on Groundwater

[189] The groundwater evidence in this case shows the truth of Dr Mudd's statement that it is always possible in groundwater to have more than one explanation sometimes, and that that is why groundwater can be so difficult to understand.

[190] However, when I take a step back and attempt to look at the totality of the groundwater evidence in this matter, some points are clear to me.

[191] Firstly, the more time that passes, and the more research that is undertaken, the better the groundwater evidence becomes. This can lead to what appeared to be quite clear and correct statements being reversed, such as the direction of flow of groundwater on the eastern side of the GDR.

[192] Secondly, that in so far as groundwater research relates to the area of the MLA itself, together with Kevins Corner, the work undertaken by Hancock is of high quality, based on much data, and likely to be correct.

[193] As regards the groundwater modelling outside of the area of the MLA and Kevins Corner, there is insufficient hard data to have a sufficient level of confidence that groundwater impacts will be as predicted by the model. In other words, impacts unforseen by the model may very well occur to the disadvantage of landholders such as the Andersons, Curries and Ms Cassoni.

[194] I find the proposition that there is subtle folding between the GDR and MLA more than just a remote possibility. On balance, I consider it more likely than not that subtle folding exists in that area.

[195] Next, I find it highly unlikely that Hancock's mining operations, involving open cut mining, will impact on the GAB. Further, by way of general statement, I find on the evidence of this case that were Hancock to undertake longwall mining,[75] the possibility of impact on the GAB would become real due to possible fracturing of the Rewan Formation and Dunda Beds resulting in possible interference with groundwater in the Clematis Sandstone.

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[75] Not currently proposed for this MLA but certainly foreshadowed for Kevins Corner.

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[196] To be abundantly clear, as regards proposed mining under this MLA in question, I find the possibility of impact on the GAB highly unlikely.

[197] I find that the activity of Hancock in digging six deep pits will cause an interference with groundwater in perpetuity over a land area which certainly exceeds that of the MLA, but I am unable to say on the evidence of this matter, and taking a precautionary approach, just how far that interference with groundwater in perpetuity will extend. Nor am I able to say what the environmental and agricultural consequences of such impact will be.

[198] The drawdown of groundwater through Hancock's extraction and use of water will have an impact on groundwater in the surrounding district which may be different to that as forecast by the model.

[199] The Coordinator-General's conditions and the Draft EA, so far as they relate to groundwater, are based on predictive modelling which has not been assessed by processes under the Water Act.

[200] The quality of water is likely to be as predicted by the model, and the conditions imposed adequately monitor such quality.

Climate change

[201] The issue of climate change was an important one in President MacDonald's decision in *Xstrata*. Many of the arguments in *Xstrata* have, in effect, been re-run in these proceedings.

[202] More specifically, CCAQ, by its Notice of Contention filed 30 April 2013, gave notice of its view that *Xstrata* was in error by confining the Land Court to only considering the direct impacts of coal mining activities. Relevantly, the Notice of Contention had this to say:

> "4. In relation to paragraph 1(c), the Objector contends that the *Xstrata* Court erred for the following reasons:
>
> (a) The *Xstrata* Court held that greenhouse gas emissions produced by the transporting or burning of coal mined from a coal mine were not relevant to the Land Court's assessment of whether an environmental authority should be granted for that mine because the activities of transporting and burning coal were not 'mining activities' within the meaning of the EPA.
>
> (b) In reaching this conclusion, the *Xstrata* Court misconceived the nature of the Land Court's functions under the EPA:
>
> (i) The *Xstrata* Court interpreted its function as making a recommendation about the grant of an environmental authority for specific activities to be carried out at the mine site. By doing so, it effectively confined its consideration to the direct environmental impacts of the mining activities themselves.
>
> (ii) Properly construed, the function of the Land Court is to make a recommendation about the grant of an environmental authority for the environmental harms associated with the specific activities carried out at the mine site:

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(A) The EPA imposes a general prohibition on any act causing serious or material environmental harm.

(B) The EPA provides an exception to this general prohibition were the person doing the act has, among other things, an environmental authority.

(iii) Accordingly, the effect of an environmental authority is to authorise what would otherwise be unlawful environmental harms.

(iv) In order to properly exercise its function of making a recommendation, the Land Court must consider all of the environmental harm that may arise if the authorisation is granted. The EPA expressly provides that environmental harm under the Act includes:

(A) Indirect harm; and

(B) Harm which result 'from the combined effect of the activity and other activities and factors.'

(v) The environmental harm caused by the transportation and burning of coal is indirect harm caused by the mining of that coal combined with other activities, including the transport and burning.

(vi) Accordingly, by confining the task of the Land Court to considering the direct impacts of coal mining activities, the *Xstrata* Court erred and its decision should not be followed."

[203] It is important to understand the terminology used in discussions on climate change. In particular, throughout the evidence and submissions, there were many references made to "Scope 1", "Scope 2" and "Scope 3" emissions.

[204] Helpfully, Dr Taylor, in his report[76] of 30 May 2013 had this to say:[77]

> "Scope 1 and scope 2 GHG emissions are respectively defined under the National Greenhouse and Energy Reporting Regulations 2008 (the Regulations) as follows:
>
> *'Scope 1 emission of greenhouse gas, in relation to a facility, means the release of greenhouse gas into the atmosphere as a direct result of an activity or series of activities (including ancillary activities) that constitute the facility'*
>
> *'Scope 2 emission of greenhouse gas, in relation to a facility, means the release of greenhouse gas into the atmosphere as a direct result of one or more activities that generate electricity, heating, cooling or steam that is consumed by the facility but that do not form part of the facility'*
>
> Scope 1 emissions include the combustion of fuel in an organisation's owned or controlled mobile plant or vehicles. Scope 2 emissions are indirect and generally occur at the facility that generated the electricity, heating, cooling or steam used by the facility.
>
> Scope 3, or "other indirect" emissions are not discussed in the Regulations, but are defined elsewhere. For example, the Greenhouse Gas Protocol (World Business Council for Sustainable Development and World Resources Institute, 2004) states:
>
> *'Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services'* "

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76 Exh 5.

77 Exh 5 page 8.

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[205] There has been some toing and froing between the parties as to the exact percentages and amounts of Greenhouse Gas ("GHG") emissions that will result from Scope 1, 2 and 3 emissions that are either a direct or indirect result of the Alpha mine.

[206] As CCAQ put it in their submissions:[78]

> (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.
>
> (ii) The 'business as usual' scenario is one in which little or no action is taken on climate change and emissions continue to tract 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'.
>
> (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."

[207] For the purposes of this decision, I am prepared to rely upon the GHG emissions as summarised by Hancock in their submissions as follows:[79]

> "44. ***Emissions calculations***. The undisputed calculations as to greenhouse gas ("**GHG** emissions include: (1) average annual scope 1 emissions (direct emissions from the mine) will be 353,439 tonnes $CO_{2\text{-}e}$ representing 0.001% of global GHG emissions; (2) average annual scope 2 emissions (emissions upstream from the mine from, *e.g.*, the mine's source of electricity) will be 506,233 tonnes $CO_{2\text{-}e}$; (3) average annual scope 1 and 2 emissions will be 859,672 tonnes $CO_{2\text{-}e}$ representing 0.002% of global GHG emissions; (4) average annual scope 3 emissions (emissions downstream from the mine, *e.g.*, from the burning of the coal in an overseas power station) will be 61

[78] Submissions CCAQ filed 18 October 2013 para 118(a)-(c).
[79] Submissions Hancock filed 18 October 2013 para 44.

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> million tonnes CO_{2-e} (rounded up); and (5) average annual scope 1, 2 and 3 emissions will be 61 million tonnes CO_{2-e} (rounded down) representing 0.16% of global GHG emissions."

[208] I note that Hancock goes on in the next sentence in their submissions to refer to the Scope 1 and 2 emissions associated with the mine at 0.002 of global GHG emissions as "infinitesimal". I agree. However, I cannot agree with the next statement that the combined Scope 1, 2 and 3 emissions at 0.16% of global GHG emissions are "negligible".

[209] Expressed another way, a percentage of 0.16 equates to a ratio of 1 as to 625. In my view, particularly considering the possible local, State and global consequences which may flow from increased GHG emissions, a factor of 1 as to 625 is both real and of concern. It cannot be dismissed as negligible.

[210] That said, the core question becomes: as the Scope 3 emissions are the primary factor in arriving at the 0.16% figure, can this Court take into account Scope 3 emissions for the purpose of these proceedings?

[211] That was effectively the same question President MacDonald had to consider in *Xstrata*.

[212] President MacDonald's decision insofar as it relates to climate change was extensive, occupying paragraphs [488] – [605]. Extracted below are key aspects of President MacDonald's reasoning on this issue in *Xstrata*:

> "***Mineral Resources Act 1989***
>
> …
>
> [528] It is apparent from these statutory provisions that "the operations to be carried on under the authority of the proposed mining lease" are confined to the physical activities associated with winning and extracting the coal from the place where it occurs or from its natural state. It is these activities which will be carried on under the authority of the proposed mining leases. The "operations" referred to in s.269(4)(i) and (j) do not, on a proper reading of the legislation, extend to the transportation of the coal to ports and to the burning of the coal in power stations overseas. …
>
> [530] It follows that the transportation and use of the coal fall outside the scope of the "operations" referred to in s.269(4)(j). The Court's task in relation to subparagraph (j) is therefore limited to considering the adverse environmental impact caused by the physical activities associated with winning and extracting the coal. In my opinion, this does not extend to a consideration of the GHG emissions from the burning of coal by end-users. It would be beyond the Court's jurisdiction to take into account and consider the impact of activities which will not be carried on under the authority of the proposed mining leases and will not be the subject of the Court's recommendation under s.269 of the MRA. The Court is therefore required only to consider the impact of the scope 1 and scope 2 emissions generated by the physical activities associated with winning and extracting the coal.
>
> …

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[547] As is evident from the passage quoted previously, the Full Court of the Federal Court in the *Nathan Dam* case considered that the Minister's assessment under s.75(2) of the EPBCA should have included a consideration of the impacts of the activities of third parties, regardless of the fact that such activities are not within the control of the project proponent, so long as those impacts may be imputed as within the contemplation of the proponent for the action.

[548] I do not consider that the reasoning in the *Nathan Dam* case can be applied in this case because of the differences in the definitions of the words "action" and "operations". The word "operations" is limited to the activities of mining and extracting coal. The word "action" is not so constrained.

…

Conclusions about s.269(4)(j) of the MRA

…

[565] For the reasons set out above, I consider that the effect of s.269(4)(j), s.234 and s.6A of the MRA is that the Court is required to consider the extent of the adverse environmental impact caused by the activities of winning and extracting the coal, that is, the scope 1 and 2 emissions generated by this project. …

…

Section 269(4)(k): The public right and interest will be prejudiced

…

[573] The decision of the High Court of Australia in *Sinclair v Maryborough Mining Warden* appears to be the most relevant authority dealing with "public interest" considerations. *Sinclair* was a case dealing with an earlier Queensland statutory mining regime, but to some extent the statements are relevant to the operation of s.269 of the MRA.

…

[576] The issue of climate change is clearly a matter of general public interest and a matter which may militate against the grant of the proposed leases. However, it is only one of a number of matters that the Court must weigh up in considering whether the public right and interest will be prejudiced by the project. The Court must balance all of the relevant considerations, including the economic and associated benefits of the project proceeding.

…

Section 269(4)(l): Any good reason has been shown for a refusal

…

[584] For the reasons I have already given, I am not persuaded that the FoE's climate change objections, on their own, are a "good reason" to justify a recommendation that the proposed mining leases should be refused.

…

Environmental Protection Act 1994

[586] The reasons relied upon by the FoE in support of their contention that the Court ought to recommend refusal of the environmental authority under the EPA may be summarised as follows -

- the project will cause environmental harm;
- the project is not in the public interest;

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- the project is not consistent with the objects of the EPA; and
- the project does not conform to the principles of ecologically sustainable development (ESD).

…

[597] In applying the criteria in s.223 of the EPA, it is my opinion - consistent with the conclusion I reached in relation to the MRA - that the Court's jurisdiction does not extend to a consideration of activities which do not fall within the scope of an "environmental authority". In other words, in applying the statutory criteria under the EPA, the Court is limited to considering the activities which may be authorised by the environmental authority.

[598] DERM's submissions support this approach. DERM submits that the objection and evidence adduced by the FoE about adverse climate change effects from the burning of the coal sourced from the proposed coal mine is "completely irrelevant" to the Court's consideration of the application before it. The application before the Court was made under the EPA for a "mining activity" which is defined by s.147 to include only, in effect, the digging of the coal out of the ground and directly related activities, such as coal processing on the relevant mining tenement. Accordingly, in DERM's submission, there is no scope for consideration of GHGs emitted from, or potential environmental impacts arising from, the activities of transporting and using the coal.

[599] I agree with DERM's submissions. The Court can only be concerned with the activities which are the subject of the environmental authority application. The FoE concede that the application under consideration by the Court does not include the transportation and use of the coal.

…

[601] The principles of ESD form part of the "standard criteria" defined in Schedule 4 of the EPA, which the Court must consider under s.223 of the EPA. The reference in the ESD principles to "the global dimensions of environmental impacts of actions and policies" appears to allow the Court to take into account the global impacts of the project. But whilst the FoE argue that limiting the consideration of GHG emissions to the extraction of the coal would be inconsistent with this principle of ESD, it is my view that the Court can only be concerned with the global impacts of the "mining activities" which are the subject of the environmental authority application before the Court - that is, the physical activities of winning and extracting the coal that may be authorised under the MRA. …

…

[605] … Stopping the project will not result in any, or any substantial, difference in the levels of GHGs in the atmosphere. If the project proceeds, the evidence indicates that it will have a comparatively minor adverse impact on the environment in terms of its GHG emissions. In the circumstances, I do not consider that the climate change issue outweighs all other issues so as to justify a recommendation under the EPA that the EA be refused."

[213] Both CCAQ and Ms Kelly strongly disagree with President MacDonald's findings on climate change in *Xstrata*.

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[214] As Ms Kelly put it at the conclusion of the climate change submissions filed 18 October 2013:[80]

> "111. Professor Jones and Professor Karoly have established that serious environmental harm will be caused by the destroying of the carbon stock at the Alpha mine and its unavoidable conversion to carbon dioxide with measurable impacts on the Queensland environment and economy.
>
> (k) the public right and interest will be prejudiced
>
> 112. Professor Jones provided evidence regarding the public risk from the project which would be contrary to the public right and interest.
>
> (l) any good reason has been shown for a refusal to grant the mining lease
>
> 113. All of the evidence provided regarding the harm to Queensland, and globally from climate change indicates that a good reason to refuse the application is that such a refusal would avoid contributing to serious harm to Queensland's environment and to the global environment."

[215] I have read and re-read and carefully considered the submissions of CCAQ and Ms Kelly on climate change. Both submissions are well written and are certainly not without logic on their side.

[216] However, this Court is a creation of statute, and all of its jurisdiction is sourced in statute. It is beyond power for the Court to exceed its jurisdiction. Accordingly, on balance, I agree with the conclusions on climate change made by President MacDonald in *Xstrata*.

[217] In saying this, I note that CCAQ contends[81] that *Xstrata* "does not appear to have considered whether s 269(4)(k) independently authorised consideration of Scope 3 emissions". Reference to s 269(4)(k) is of course to the MRA.

[218] President MacDonald did consider MRA s 269(4)(k) in the climate change part of *Xstrata*. I note in particular paragraphs [571] – [581], part of which has been repeated above. In particular, in my view, President MacDonald's reference to public interest in para [576] of *Xstrata* must be taken to include a consideration of Scope 3 emissions. In any event, for my part, my decision must be read on the basis that paragraph [576] of *Xstrata* includes necessarily a consideration of Scope 3 emissions.

[219] Further analysis of the issue of public interest will, however, be left until I consider other aspects of the mine's impact, and in particular economic issues. All public interest issues must be considered and weighed before a conclusion is reached in this regard.

[220] There are two further important issues relating to climate change which I should consider before concluding my reasons on this aspect. They are the 'demand for coal will be met from another source' argument, and certain challenges to climate change experts in this case attacking their credit.

---

80 Submissions Ms Kelly paras [111] – [113].

81 Submissions, CCAQ, 1 October 2013 para 109(c).

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Demand for coal will be met from another source

[221] There is no dispute on the evidence that Hancock will mine thermal coal. Thermal coal is used for burning in power stations to cause the generation of electricity. It is also not contentious in this case that the burning of the thermal coal (or, in other words, the Scope 3 emissions) will occur overseas, in Asia, most probably in India or China.

[222] As Hancock put it in its submissions:[82]

> "89. The world has abundant coal resources. The amount of coal combusted in the world, including for the purposes of generating electricity, is driven by demand. That is to say, global supplies exceed demand such that preventing a particular mine from proceeding will not lead to demand not being met. Rather, the demand would be met from another source. To take a simple example, India's coal requirements for electricity generation will not abate merely because it is unable to source that coal from one mine in Australia. That is because, rather than leave its citizens without electricity, India would simply obtain the coal from another source. There was a substantial body of evidence to this effect."

[223] It is appropriate to consider the evidence on this point in some depth.

[224] In the Joint Expert Report of Messrs Standord, Offen and Nsair,[83] their key issues of agreement included the following:

> "● That the amount of coal combusted in the world, including for the purpose of generating electricity, will be determined by demand rather than restrictions on supply, at least under current global policy settings.
>
> …
>
> ● That under current global policy settings, while the share of coal in the fuel mix for electricity generation will most likely decrease in the future as the relative cost of renewables declines, the absolute volume of coal burned may still increase due to increased power consumption mainly in emerging economies. Material increases in the cost of coal as a fuel, such as may occur through a widespread application of a price on carbon, could change this equation."

[225] Mr Stanford, in his report dated 30 May 2013, gave the following evidence:[84]

> "… it should be noted that while the Australian coal industry has exhibited strong growth, in *relative* terms it may already be falling behind other countries. Globally the coal industry continues to expand rapidly. According to the World Coal Association, total production of coal globally reached 7,678 million tonnes (Mt) in 2011, an increase of 6.6 per cent over 2010 having grown at an annual rate of 4.4 per cent since the turn of the century. Coal production declined in Australia in 2010-11, although this was largely due to the Queensland floods which led to a reduction of production of 30 per cent in that State.32 It may be seen from Exhibit 2 below that while Australia is a major coal exporter, its production is much lower than that of China and the USA.

82 Hancock submissions filed 18 October 2013 para [89].
83 Exh 109 page 2.
84 Exh 4 pages 20, 21, 28, 29 and 30.

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Exhibit 2: Major Coal Producing Countries (2011)

Country	Production (Mt)
China	3,471
USA	1,004
India	585
AUSTRALIA	414
Indonesia	376
Russia	334
South Africa	253
Germany	189
Poland	139
Kazakhstan	117

As a result of the significant proportion of high value coking coal (used for steel production) in its exports, Australia is still the world's leading coal exporting country in terms of value.33 In terms of volumes, however, it is increasingly being challenged. Perhaps partially as a result of the Queensland floods, Australia fell to second place in terms of export volumes in 2011, the latest year for which data are available. … Indonesia overtook Australia in 2011 as the world's leading coal exporter by volume, with exports of 309 Mt (up by over 50 per cent in three years). In addition, other countries such as the USA are becoming significant competitors in the energy export trade.

…

In terms of the effectiveness of an approach based on refusing mines, it would almost certainly be quite ineffective and possibly even be counter-productive because of carbon leakage. Coal is a commodity for which there is a high and growing demand in the world economy, as is evidenced by the considerable increase in its global production in recent years. Global reserves of coal are very substantial and, in contrast to resources such as uranium, where Australia accounts for a major share of global reserves, Australia only has less than nine per cent of the world's black coal reserves.42 In addition, despite being one of the world's largest coal exporting countries, Australia ranks fourth in coal production, accounting for six per cent of the global total.43 If Australian governments take action effectively to reduce the supply of coal, therefore, there is no evidence at all that this would constrain global production of the commodity. Global demand for coal will not change as a result of Australia's actions and the requirements of the market could readily be supplied from somewhere else.

…

I do not accept that in prohibiting this proposed mine from going ahead there would be an upward pressure on the price of coal, thus reducing demand.

First of all, according to the World Coal Association there are abundant resources of coal worldwide and, hence, many alternative sources of supply to Australian mines. Germany's Bundesanstalt für Geowissenschaften und Rohstoffe, for example, estimates that there are 1,004 billion tonnes of coal reserves available, equivalent to 130 years of production at 2011 levels. Data produced by the US Energy Information Administration suggests that while Australia's coal endowments are extensive, they amount to less than nine per cent of global reserves.

The conclusion from this is that Australia can have little control over the global supply of coal or its price. In my opinion, failure to allow this mine to proceed would have no upward effect on the price of coal. If increasing demand for coal justified industry expansion, prohibiting such expansion in Australia would merely lead to the development of another mine in another country with no consequential upward pressure on the coal price. …"

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[226] It should be noted that Mr Stanford repeated his view in two joint expert reports.[85]

[227] Mr Offen's report of 30 May 2013[86] considered this aspect in some detail. His report relevantly stated:[87]

> "**4.1 In your opinion, if coal from the proposed Alpha Coal Mine is not produced, is it reasonable to expect that coal from an alternate source will replace the proposed Alpha Coal Mine coal?**
>
> (a) In my opinion, if the proposed Alpha Coal Mine did not proceed, the coal which would have been supplied from the proposed Alpha coal mine will readily be supplied by alternative suppliers.
>
> (b) Whilst many potential supply sources exist, the most likely source to replace the coal from the proposed Alpha Coal Mine would be either Indonesian export coal or increased domestic supply from India and China. Other credible sources of long term coal supply also exist even if these likely alternates are not realized (such as Mongolia, Mozambique, USA, Colombia, Russia).
>
> (c) The reasons for this view are as follows:
>
> (i) The proposed Alpha Coal Mine will produce 30 million tonnes per annum of thermal coal for the export market shipped through the Abbot Point Coal Terminal (See, for example, SEIS, Vol 1, Section 2). In the overall scheme of the global thermal coal industry, the volume forecast to be produced by proposed Alpha Coal Mine is relatively insignificant. In 2011, the global thermal coal industry produced approximately 5.7 billion tonnes of thermal coal (Study, page 8), of which 818 million tonnes was traded internationally on the seaborne market (Study, page 8).
>
> (ii) In this context, 30 million tonnes per annum from the proposed Alpha Coal Mine equates to 0.006% of global production and 3.6% of the current seaborne demand. As the thermal coal market is growing (Study, page 7, table 2), these figures will be even lower by the time the proposed Alpha Coal Mine is developed and its product reaches the market. The forecasts in the Study show by the year 2020 the exports from the proposed Alpha Coal Mine will represent only 2.3% of the total seaborne market demand and by 2030 only 1.5%.
>
> (iii) Indonesia alone has increased its supply to the seaborne market by 184 million tonnes between 2008 and 2012 (Study, page 10, figure 7), demonstrating a significant capability to quickly develop and ship new capacity. …
>
> (iv) The Indian and Chinese coal sectors are huge global scale industries in their own right. China produced 2.8 billion tonnes of thermal coal in 2011 and India produced 467 million tonnes in the same year …
>
> (v) Mongolia and Mozambique have also recently begun to develop their coal industries. From my experience of working on project feasibility studies for projects in both countries, I know both countries have large reserves of coal with relatively low production costs but both are challenged by limited logistical infrastructure, which makes large scale development of their coal provinces difficult. Both are, however, poor countries with a strong motivation to develop a resource export sector to sponsor economic development. …
>
> (vi) In addition to the above mentioned alternative supply sources, the USA, Colombia and Russia also have large coal industries competing in the export market. …
>
> (vii) Further, it is my experience that power suppliers make their choice of fuel source at the earliest stage of development when designing the equipment to provide new power capacity. Once this choice is made and projects have commenced construction, fuel type is an irreversible decision. It is a statement of the obvious, but a coal fired power plant burns coal to generate power and cannot generally use alternate fuel sources. This means the design of power generating capacity is the primary determinant of the

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85 Exh 15 pages 4-5 and Exh 45 para 9-10.

86 Exh 6.

87 Exh 6 pages 3-8.

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amount of coal consumed, rather than the availability of coal which is plentiful and cheaply available from multiple sources.

…

4.2 If your opinion in relation to [the] question [above] is yes, is the coal from an alternate source likely to create a similar, lower or higher level of emissions to the proposed Alpha Coal Mine coal?

(a) The alternate supply sources to coal from the proposed Alpha Coal Mine are many and varied and it is therefore difficult to make generalized statements about the quality of alternate coal types and the emissions which would result from their use.

(b) In general, however, the following trends can be observed: …

…

(iii) When burnt, a tonne of coal will generate CO_2, however different types of coal will generate different quantities of CO_2 emissions depending on the characteristics of the coal. If coal contains less energy (has a lower calorific value), then the amount of CO_2 released per unit of energy released becomes higher. The relationship between calorific value and CO_2 emissions behind these general statements is detailed in a recent paper published in Journal of Industrial Ecology (Whitaker, M. et al.,'Life Cycle Greenhouse Gas Emissions of Coal-Fired Electricity Generation', 2 April 2012, *Journal of Industrial Ecology*, Vol 16 No S1, Yale University).

…

(v) The coal from the proposed Alpha coal mine will be a washed bituminous product with a gross calorific value of 5800 kcal GAR (as noted on the Hancock Coal website); GAR stands for Gross as Received and is a standard industry measure of the energy content of coal.

(vi) Indonesia produces a range of different coal types, but Indonesian coal is generally lower ranked than the coal from the proposed Alpha coal mine. This means that coal sourced from Indonesia will generally have a lower calorific value and a much higher moisture content than coal from the proposed Alpha Coal Mine. … Consequently, if the alternate to coal from the proposed Alpha Coal Mine is primarily sourced from Indonesia, such coal is likely to create a higher net level of emissions.

(vii) Indian domestic coal is also generally much lower in calorific value than coal from the proposed Alpha Coal Mine …This, again, means for the reasons detailed above, a higher volume of CO_2 emissions would likely result if Indian domestic coal was used as a replacement to the coal from the proposed Alpha Coal Mine.

…

(c) In conclusion, it is reasonable to assume that if the proposed Alpha Coal Mine did not proceed, the use of coal from alternate sources that would replace it would produce a similar or higher level of emissions. In particular, should Indonesian and/or Indian domestic coals form the primary replacement for Alpha coal should the proposed Alpha Coal Mine not go ahead, it is reasonable to assume higher net emissions would result."

[228] Hancock provides forceful submissions on this aspect in their reply submissions filed 23 October 2013 where they say:[88]

"120. But whatever figure is taken, this evidence which CCAQ itself refers to and therefore accepts as reliable, demonstrates the proposition that there are more than enough globally proven (in the sense of economically recoverable) reserves to supply demand in the event the Alpha mine does not proceed.

121. Rather than address this matter as a relevant fact, CCAQ attempts to dismiss it in other parts of its submissions as *"the hypothetical possibility of an alternative mine in a foreign country"*.CCAQ makes no attempt to meet the proposition. In consequence the evidence is all one way:

[88] Hancock reply submissions para 120-122.

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(a) It is the effect of the evidence of Mr Stanford and he was not challenged on this point.
(b) It is the effect of the evidence of Mr Offen and he was not challenged on this point.
(c) The evidence of Mr Stanford and Mr Offen is not contradicted by other evidence.
(d) CCAQ originally intended to attempt to contradict the proposition but then made the decision not to do so. As to this:
(i) In paragraph 62 of the *"Facts and Contentions"* of its original objection, CCAQ contended:

> *"There is no need for this coal. The world has many other energy sources. If this mine does not go ahead it will exert some upwards pressure on coal prices. This reduction in supply and increase in price of coal will push some consumers towards other energy sources which are already becoming cheaper. It is not correct that the same amount of coal would be obtained from another sources and burnt to create the same amount of greenhouse gas emissions."*

(ii) CCAQ's solicitors made contact with Mr Nsair's company in mid June 2013. This was after receiving the reports of Mr Stanford and Mr Offen. Paragraph 62 was described as *"the key paragraph for your consideration"*. In response CCAQ was told that *"the report outcomes may not fully support your expectation"*.

(iii) There were further dealings between CCAQ's lawyers and Mr Nsair's company and arrangements were made for Mr Nsair to give his *"preliminary oral opinion"* before providing a report.

(iv) On about 27 June 2013, CCAQ amended paragraph 62 as follows:

> *"There is no need for this coal. The world has many other energy sources. ~~If this mine does not go ahead it will exert some upwards pressure on coal prices. This reduction in supply and increase in price of coal will push some consumers towards other energy sources~~ which are already becoming cheaper. It ~~is not correct~~ cannot be assumed without further analysis that the same amount of coal would be obtained from another sources and burnt to create the same amount of greenhouse gas emissions."*

(v) On 28 June 2013, evidently after the discussions which CCAQ's solicitors foreshadowed, Mr Nsair was sent a formal letter of retainer. He was not asked to address the point in question, despite being apparently qualified to do so.

122. Moreover, this proposition is not sensitive to CCAQ's claims that coal exports face an uncertain future. They make those claims based on speculation that events may occur which affect the demand for coal. As Professor Jones pointed out, a decrease in demand would only have the effect of making coal cheaper and (possibly) more attractive as a fuel source. But whatever events may impact on demand, the proposition remains true that export coal markets are driven by global demand and whatever the level of demand there is sufficient coal to supply it. This leads inevitably to the conclusion that the fact that a particular mine does not proceed will have no effect on global demand for coal and therefore no effect on the amount of GHGs emitted globally.

[229] I agree with Hancock's reply submissions. This has the result that, even if both myself and President MacDonald are wrong in our assessment of the proper methods for dealing with climate change under the MRA and the EPA, the evidence above would necessarily lead to the conclusion that global Scope 3 emissions will not fall if Alpha does not proceed as the coal will simply be sourced from somewhere else.

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[230] Put another way, it is the demand for electricity to the extent that it is met by coal-fired generators that causes the Scope 3 emissions, and the facts as set out in this case clearly show that Alpha is but one of a myriad of suppliers, both local and around the world, who will seek to meet this existing demand.

[231] I can sympathise with the position of the objectors who see GHG emissions rising, and the likely adverse climate change consequences that will flow should nothing be done to alter the course that the world is heading down. I have no reason to doubt the eminent expert evidence that was presented in this case to that effect. However, I must on the evidence of this case determine that it is the demand for coal-fired electricity, and not the supply of coal from coal mines, which is at the heart of the problem.

[232] Clearly, the possibility of dire consequences from climate change is a matter which falls to be addressed by the international community and the Federal Government. Even if it were within the jurisdiction of this Court (which apart from "Public Interest" principles I have found it not to be) then the clear and unambiguous facts of this case show that there will be no reduction of GHGs if the Alpha mine is refused, and, indeed, depending on the source of replacement coal, such replacement coal may well, on the evidence, result in an increase in GHG emissions.

Credibility of climate change witnesses

[233] By its submissions, Hancock challenged the credibility of Professor Jones and Professor Karoly.

[234] As regards Professor Karoly, the evidence shows that he opposes the expansion of the coal industry, and believes that no new export coal mines should be developed in Australia.[89] Hancock contends that this stance compromises his independence. I do not agree.

[235] There can be no doubt, given his impressive CV, that Professor Karoly is an expert witness of high calibre. Despite the attack made on his credibility, his evidence stood up very well under cross-examination. Overall, in my view he was a very impressive witness.

[236] The same can be said of Professor Jones. Hancock attacked his evidence on the basis that his scenarios were based on old data (2010) and that, as he conceded, some of the assumptions had already "passed".[90]

[237] I found Professor Jones to be a careful witness who, in my view, did not allow words to be put into his mouth. He was also very careful not to range outside of his field of expertise. He was particularly careful when it came to questions of 'scientific certainty'.

89 See T 12 page 21 line 25 to page 22 line 12.
90 See T 5 page 24 lines 1-20.

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Economics

[238] In considering this topic, there are three specific aspects to evaluate. They are:

- The social costs of carbon;
- Economic impacts, including environmental, ecological and social costs; and
- Projections as to the future use of coal.

I will deal with each of these headings in turn.

Social Costs of Carbon

[239] Hancock has provided a useful summary of the evidence on the social cost of carbon. Although the summary is not of course comprehensive, and is capable of being given a different slant to some extent, as CCAQ pointed out in their reply submissions,[91] I am prepared to adopt Hancock's summary of the evidence in order to give the reader an overall understanding of this issue.

[240] Professor Jones' evidence was that:

(i) To his knowledge, the social cost of carbon has never been quantified or brought into account in private project decision making in Australia or other places such as the United Kingdom or the United Stated. The work that has been done to date has been done by academics or in the context of governmental action, such as the consideration of policy and regulation.[92]

(ii) One of the reasons for this is that it is not feasible to do this on a project by project basis, if it is to be done, it has to be done on a global scale by governments or institutions.[93]

(iii) This global scale analysis is an "*enormous task*" which is an emerging and evolving proposition which is a long way off its final evolution and which no-one in the world has come "*even close*" to perfecting.[94]

(iv) The task involves a great deal of assumption and uncertainty that he did not think would ever be overcome.[95]

(v) Even if you could undertake a full and proper assessment on a global scale, there is presently no way of apportioning impacts on a regional or local basis for both economic and policy reasons.[96]

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91 CCAQ Reply Submissions 23 October 2013 para 42.
92 T5 page 17 line 39-T5 page 19 line 19; T5 page 31 line 30-T5 page 32 line 15.
93 T5 page 19 line 3-20; T5 page 32 line 43-T5 page 33 line 14.
94 T5 page 32 line 25-T5 page 33 line 40.
95 T5 page 33 line 41-47.
96 T5 page 34 line 11-24.

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[241] Mr Standord's evidence was that:

(i) A net social cost of carbon should be included in an assessment of the impact of the mine on the welfare of Queensland residents, but not necessarily by an economic analysis.[97]

(ii) However, he did not think there would be any material impact in this particular case because the mine will not have any material impact on global emissions.[98]

(iii) Where applicable, what he would expect is some indication of roughly what the impact on the environment would be, this not being a matter to be addressed in the economic impact assessment.[99]

(iv) He had never seen an economic impact assessment incorporating such costs.[100]

(v) Any attempt to incorporate such costs would be "*extremely difficult*", depending on a range of factors variously described as "*nebulous*", "*imprecise*" and "*hard to actually quantify*".[101]

[242] Dr Duncan's evidence was that:

(i) He is " *not an expert on the social cost of carbon*", and had done no more than a literature review.[102]

(ii) He did not know much about the practical aspects of assessment of private projects, and was speaking purely from a theoretical perspective.[103]

(iii) However, he recognised that the analysis:

A. would require account to be taken of both costs and benefits on a global scale;[104]

B. was "*enormously complex*" and "*productive of an enormous degree of uncertainty*".[105]

[243] One of the leading academics in the field, Professor Richard Tol, has said that the task "*is beset with uncertainties and the need for heroic assumptions*".[106]

[244] I have already given my favourable impression of Professor Jones as a witness. There is no need to say more in that regard.

[245] Mr Stanford came across as a very careful witness who went out of his way to ensure that his views were not only properly expressed, but that they could be clearly understood. It was notable that he made it clear to the Court that he agreed with climate change science.

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97 Joint report of Mr Stanford, Professor Jones and Dr Duncan, Exh 45 para 7; T8 page 57 line 29-T8 page 58 line 12.

98 Joint report of Mr Stanford, Professor Jones and Dr Duncan, Exh 45 para 9.

99 T8 page 57 line 29-T8 page 58 line 13.

100 T8 page 58 line 14; T8 page 77 line 16-24.

101 T8 page 77 line 25-T8 page 78 line 25.

102 T13 page 56 line 4-6.

103 T13 page 57 line 29-34.

104 T13 page 59 line 5-10.

105 T13 page 59 line 25-30.

106 Exh 97 at pp 156-157; Exh 95; Exh 96.

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[246] Dr Duncan, during his oral evidence, was very careful to ensure that he both understood and fully considered each question put to him, and in answering those questions, stayed within his area of expertise. That said, he did stray into aspects of non-expert opinion in parts of his report.

[247] Hancock submits that the question of the social impact of carbon is moot if there is a finding that Alpha will have no net impact on GHGs. I agree.

[248] Of course, I have already found that Alpha will have no impact on Scope 3 emissions, and that the bulk of the GHGs which CCAQ and Ms Kelly seek to attribute to Hancock fall within this category.

[249] It would appear to also follow that another producer of coal in place of Alpha would also produce similar amounts of Scope 1 and Scope 2 emissions as Alpha. Even if that is not the case, and the Scope 1 and 2 GHG emissions from Alpha should be considered for their social cost of carbon, as I have already found, those impacts, for a global perspective, are infinitesimal.

Economic impacts, including environmental, ecological and social costs

[250] There has been some rather complex evidence given, and varying opinions by experts expressed, as to the scope and appropriate nature of the economic impact analysis which was used, or should have been used, by Hancock for assessing the Alpha Mine.

[251] The methodology used by Hancock was an "input-output" model ("IO").[107]

[252] The evidence has made it clear that it was open to Hancock to have used different approaches for its economic impact analysis, such as computable general equilibrium (CGE)[108] or cost benefit analysis (CBA).[109]

[253] It must be borne in mind why the IO model was prepared by Hancock in the first place. It was because of a requirement of the terms of reference for the EIS.[110] As Mr Brown pointed out in his report,[111] there was nothing in the terms of reference which precluded Hancock from using an IO model.

[254] As CCAQ pointed out in their submissions:[112]

> "**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.

107 Expert Report Mr Brown, Exh 7, page 1 part 2(a).
108 T7 page 57 lines 9 and 10.
109 T7 page 84 lines 19-23 and page 86 lines 27-28.
110 See Exh 7.
111 Exh 7.
112 At paras 147-148.

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> 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."

[255] Despite the shortcomings that may be said to exist in the IO model, there are a number of facts from the case which are fundamentally clear.

[256] If the Alpha mine is developed and progresses to full production as forecast, then the direct economic benefits of the mine are many. As was said in the EIS,[113] the Alpha project represents a major potential stimulus to the regional, State and National economies, and will generate significant demand for labour in both the development and operational phases. Further, the EIS indicated that the mine will generate significant positive economic impacts in the form of additional exports, increased employment and demand for local and regional production.

[257] As the Coordinator-General's report[114] shows:

- the estimated capital cost of the mine, as at the date of the report, was $3.5 billion[115]
- the mine will create 1,500 jobs during construction[116]
- the mine will create 800 jobs during operation[117]

[258] Mr Brown's report indicates that:[118]

- Alpha will produce $2.9 billion per annum of average export revenues when in production; and
- $204 million per annum in Queensland Government royalties.

[259] The tasks of the Court in hearing this matter must be clearly kept in mind. I am hearing objections under the MRA and, because of those objections, I am also hearing Hancock's application for ML 70426. I am of course also hearing objections under the EPA.

[260] It is primarily as a function in hearing Hancock's application for MLA 70426 that this aspect of the evidence is necessary to be considered. As Hancock points out in their reply submissions,[119] none of the objectors raised as a ground of objection that there will not be an acceptable level of development and utilisation of the mineral resource. This is directly relevant to s 269(4)(c) of the MRA.

[261] There are precedents regarding the proper interpretation of s 269(4)(c) MRA, particularly as regard the concept of "economic mineralisation".

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113 Exh 13.7.59 Appendix N, Executive Summary page xvii.
114 Exh 13.10.
115 Exh 13.10, Synopsis, page ix.
116 Exh 13.10, Synopsis, page ix.
117 Exh 13.10, Synopsis, page ix.
118 Exh 7 page 8.
119 Reply Submissions, Hancock, filed 23 October 2013 para 138(d)(i).

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[262] The most relevant authority in this regard is *Armstrong v Brown*[120] a decision of the Court of Appeal. In *Armstrong*, the Court, in response to a submission that profitability of a mine should be taken into account when considering s 269(4)(c) MRA, had this to say:[121]

> "[14] The second question concerns what the submissions made for Mr and Mrs Armstrong in this court and in the Tribunal have referred to as "economic mineralisation". If the Tribunal was entitled to conclude that the area applied for contained the relevant minerals, Mr and Mrs Armstrong argue that the Tribunal should not have recommended the grant of a lease without being satisfied that those minerals could be mined profitably. Within the various matters required to be considered by the Tribunal according to s 269(4) of the Act, there is no reference in terms to "economic mineralisation" or profitable mining. But the submission is that it is implicit within paras (b) and (c) of s 269(4) of the Act that the Tribunal must consider this question. Section 269(4)(c) of the Act provides that the Tribunal is obliged to take into account and consider whether:
>
> "(c) if the land applied for is mineralised there will be an acceptable level of development and utilisation of the mineral resources within the area applied for;"
>
> [15] The submission strongly relies upon statements in *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473. *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. 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, because mining is unlikely to occur if it is unlikely to be profitable. The relevance in this way of the likely profitability of mining is effectively recognised by para (c) of s 269(4), which requires the consideration of whether there will be an acceptable level of development and utilisation of the mineral resources. If there is unlikely to be a profit from the mining of the resources, it is unlikely that there would be an acceptable level of development and utilisation of those resources. What the appellants refer to as "economic mineralisation", is thus a point which is relevant in the consideration of the matters within s 269(4)(c). Accordingly, I agree with the views of Kingham DP in *Salmon v Armstrong* [2001] QLRT 72, where she said that whilst there is no specific reference in s 269(4) to the "economic viability" of a project, "it is relevant to interpreting the information about mineralisation" and to at least the matters set out in s 269(4)(c).
> [16] As I read the reasons of Smith DP, he did consider the likely profitability of the mining operation as far as it was relevant, which was the extent to which it indicated that there would be an acceptable level of development and utilisation of the mineral resources. He said that: "What is relevant is whether or not the land holds mineral and if it does, there will be an acceptable level of development and utilisation of the mineral, given the size and shape of the application and the term of the application." Then after specifically referring to s 269(4)(c), and citing Barwick CJ in *Sinclair* and Kingham DP in *Salmon v Armstrong*, he concluded that there would be an acceptable level of development and utilisation of the mineral resources … "

[263] I have no doubt that, if the mine goes into operation, and if the mine is operated for the term as contemplated, and given the size and shape of the MLA, and the method of mining proposed, there will be an acceptable level of development and utilisation of the coal resources within the MLA.

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120 (2004) 2 QdR 345.

121 Per PD McMurdo J, with whom McPherson and Jerrard JJA agree, at paras [14] – [16].

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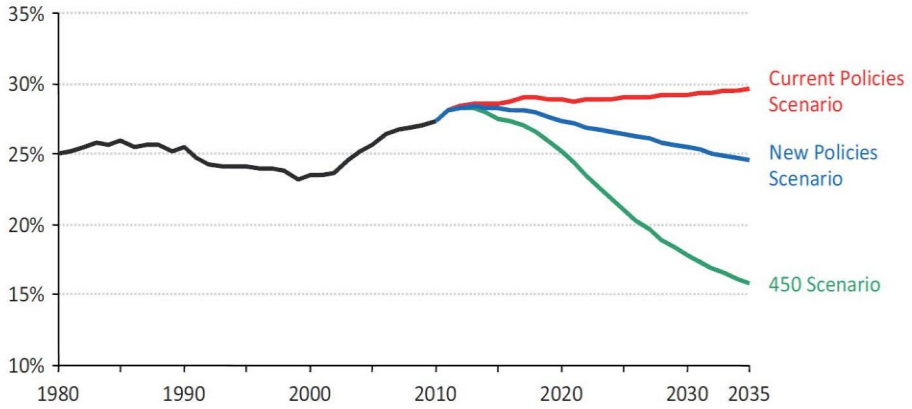
Projections as to future use of coal

[264] Having heard and considered all of the evidence, in my view a good summary as to the future use of coal is to be found in Dr Duncan's report where he said:[122]

> "5.26 Prediction of anything out to 2045 is a difficult proposition. The most common manner in which to handle uncertainty about the future in studies of climate change has been to develop alternative future scenarios. The use of scenarios is one manner in which the large uncertainty about the future of climate change and climate change policy has been handled in the Intergovernmental Panel on Climate Change's various Assessment Reports, in the Stern Review (Stern 2007) in England, in the Garnaut Review in Australia and in the International Energy Agency's World Energy Outlook (IEA various).
>
> 5.27 As an example, the International Energy Agency (IEA) produced three scenarios of possible energy futures in its World Energy Outlook 2012. These three scenarios, illustrated in "Figure 5.1" from IEA (2012, p. 156) below, were based on different assumptions about the climate change policies followed by world governments:
>
> - "Current Policies Scenario" where governments continued with currently-enacted policies;
> - "New Policies scenario" where governments continued with currently-enacted policies plus any new policies to which governments had already committed and
> - "450 Scenario" where governments switched to policies which would achieve a 2° Celsius increase in future average world temperatures.
>
> Under the 450 Scenario in IEA (2012), the share of coal in world primary energy demand falls from 27% in 2012 to 15% in 2035.

Figure 5.1 ▷ Share of coal in world primary energy demand by scenario



Source: IEA (2012, p. 156)

> 5.27 The analysis presented for the mine has no scenario analysis to help decision-makers understand the uncertainties facing the future of the mine, despite the fact that this mine faces large future threats which are due to exactly the same risks the IPCC, Garnaut, Stern and the International Energy Agency considered. Instead 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.
>
> 5.28 There are at two threats and one opportunity to the mine within the market for coal linked to climate change and government policies as a response to climate change. The first threat is the raising of carbon taxes in customer markets in the future, which will

[122] Exh 41 pages 10-11.

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> render thermal coal less competitive as a power source compared to less carbon-intensive sources. The second threat is the development of cheaper means of generating renewable energy, which will also render thermal coal uncompetitive. Both threats would lead to lower future export prices for thermal coal. The opportunity in the market is the potential of improved methods of carbon capture and storage, which would keep thermal coal competitive even with the introduction of low levels of carbon tax."

[265] I particularly agree with Dr Duncan's statement that "*the one thing we can be quite certain about the future is that it will not be like today*".

[266] Given the evidence in this case, I have no doubt as to the validity of the predictions set out in Figure 5.1 from Dr Duncan's report as shown above. However, what that table does not take into account is the projected growth in world energy demand. This has been examined in some detail already in this decision under the "demand for coal will be met from another source" topic.

[267] Even if the percentage of coal used in generating energy should fall as some models predict, such circumstances will correspond with an expected overall growth in world demand for energy.

[268] I am in no better position to predict the future than any of the experts in this case, even after their valuable contributions.

[269] Am I certain that, if approved, the Alpha mine will ever be developed? Certainly not. Significant circumstances could change in the near future, not in the least of which is a change in the world economic situation.

[270] Am I confident that, given a stable world economic situation, and taking into account new policy scenarios with respect to GHG (at a national and international level) that thermal coal will still be a significant (even if no longer major) component of world energy production 30 years hence? Yes I am.

Ecology

[271] In order to properly understand the project's likely impact on the Ecology of the Application Area and how those impacts may be appropriately dealt with, it is first necessary to understand the land uses proposed by the Hancock mine.

[272] The total area of Hancock's MLA 70426, noting that there has been a partial abandonment of the Application Area,[123] is 64,690ha.[124] As table 26 of the Draft EA shows, this area is separated into 1,887 ha of pits, 14,613 ha of mine waste, 2,237 ha of tailings, 2,016 ha of infrastructure and 43,937 ha noted as "Remainder of Mining Lease Area" which I take to be essentially a buffer area.

---

123 Exh 85 Draft EA, part 5.0, page 225.

124 Exh 85 Summation of areas from table 26, Draft EA, page 271.

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[273] Table 27 of the draft EA[125] shows that approximately 1 ha of the remainder area will be used for roads and tracks, and 0.5 ha for exploration and groundwater monitoring bores, meaning that 43,935.5 ha of the mining lease land will not be altered in any significant way from its present state.

[274] In short, this means that the mine will significantly disturb 20,754.5 ha, of which 18,867.5 ha will be rehabilitated, whilst 43,935.5 ha will not be significantly disturbed.

[275] In considering the mine's ecological impacts, it is appropriate to take into account some of the Coordinator-General's conditions as well as conditions of the draft EA.

[276] Conditions F47 – F50 of the draft EA relates to Wildlife Corridor Investigation.[126] Condition F47 requires a Wildlife Corridor Strategy to be developed and submitted to the administering authority within five years of the grant of the EA.

[277] Condition F48 of the draft EA then goes on to provide as follows:[127]

> "F48 The Wildlife Corridor Strategy must:
>
> a) provide how the environmental authority holder will successfully reinstate sufficient wildlife corridor(s) (minimum one wildlife corridor) across pits 1 to 6 to facilitate the interaction and movement of native fauna species east-west;
>
> b) The Wildlife Corridor Strategy must, at a minimum, include:
>
> i. details of the fauna species dependent on vegetation and ecosystems which existed prior to the mining project's development in the area of pits 1 to 6 for migration and/or habitat;
>
> ii. a discussion on the temporary, or permanent, impacts likely to be experienced by migrating fauna species dependent on vegetation or ecosystems in the area of pits 1 to 6 as a result of **mining activities;**
>
> iii. details of wildlife corridors installed, or to be implemented during the mine's operation along the northern and southern creek diversions, to mitigate the impacts and effects on fauna species dependent on the area of pits 1 to 6 for migration or habitat;
>
> iv. a plan to revegetate the proposed corridor(s) with local native vegetation similar in composition to that which existed prior to the mining project's development;
>
> v. a discussion of the proposed wildlife corridor's ability to re-establish and support landscape, habitat, ecological and evolutionary connectivity;
>
> vi. detailed information to support the proposed width of the corridor(s), such as:
>
> • the length to width ratio;
> • the maintenance of functionality of the east-west linkage throughout the mining operation(through staged mining and staged rehabilitation); and
> • the maintenance of landform and acceptable slope and stability;
>
> vii. include rehabilitation objectives, indicators and success criteria specific to reinstatement of the wildlife corridor(s) in terms of ecosystem function, structure and composition for inclusion in *Appendix 1: Rehabilitation Requirements;*
>
> viii. the timing by which the proposed wildlife corridor(s) is to be reinstated and monitoring required to confirm its successful reinstatement."

[278] As regards biodiversity offsets, reference must be had to both the Coordinator-General's conditions and the conditions of the draft EA.

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125 Exh 85 page 271.
126 See Exh 85 pages 275-6.
127 Exh 85 page 275.

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[279] Part D of Appendix 2 of the Coordinator-General's May 2012 Report[128] provides as follows:

> "**PART D. IMPOSED CONDITIONS RELATING TO OFFSETS**
> The mandatory provisions of the Queensland Biodiversity Offset Policy (QBOP) do not apply to significant projects declared under the SDPWO Act. However, the QBOP provides for the Coordinator-General to consider the QBOP in consideration of offset requirements for the declared significant project.
>
> For the Alpha Coal Project, I note that the draft Biodiversity Offset Strategy provided by the proponent commits to applying the QBOP to the project site (mine).
>
> I therefore imposed the following condition:
>
> **Condition 1.**
>
> (a) Prior to the commencement of mining activities, the proponent must submit the Alpha Coal Project—Biodiversity Offset Strategy – draft (Eco Logical Australia April 2012) for the approval of the administering authority for the EP Act
> (b) the Strategy in (a) is to demonstrate that impacts on State significant biodiversity values identified within the QBOP have been avoided or minimised
> (c) the Strategy in Condition 1(a) is to include the offset commitments made by the proponent in the EIS and SEIS and listed in Appendix 5
> (d) prior to the commencement of mining activities, the proponent and the administering authority are to sign a Deed of Agreement for offsets to be provided for impacts on State significant biodiversity values in accordance with the QBOP
> (e) the proponent is to only impact on State significant biodiversity values in accordance with the Deed of Agreement
> (f) the proponent is to undertake an ecological equivalence assessment using the Ecological Equivalence Methodology of the QBOP within six months of the grant of a final Environmental Authority.
>
> **Condition 2.**
>
> The strategy in Condition 1(a) is to address any offsets requirements for the loss of threatened flora and fauna species and threatened ecological communities listed as Matters of National Environmental Significance under the EPBC Act."

[280] The draft EA also has specific conditions relating to Biodiversity Offsets. These are set out in conditions FX1 – FX17 as follows:

> "**Schedule FX: Biodiversity**
>
> **Biodiversity Offset Plan**
>
> **FX1** A Biodiversity Offset Plan must be developed by an Appropriately Qualified Person.
>
> *NOTE: Where there is Inconsistency between the conditions of this environmental authority and conditions contained within Part D of Appendix 2 of the Coordinator-Generals Evaluation Report on the environmental impact statement- Alpha* Coal *Project dated May 2012, the Coordinator-Generals' conditions prevail.*
>
> **FX2** The Biodiversity Offset Plan must:
> a) identify each proposed stage of the project that may impact State Significant Biodiversity Values:
> b) provide for how potential impacts to State Significant Biodiversity Values will be assessed in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority:
> and

[128] Exh 13.10.

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c) include a detailed description of how the Biodiversity Offset Plan aligns with the requirements. for offsets imposed on the holder under the *Environmental Protection and Biodiversity Act 1999* (Cth).

NOTE: The holder may apply to change the Biodiversity Offset Plan at any time, by submitting a new Biodiversity Offset Plan or an amendment to the plan to the administering authority for approval.

FX3 The Biodiversity Offset Plan must be submitted to the administering authority and approved prior to the commencement of Mining Activities, other than Minor Early Works and Mineral Development Maintenance Activities.

Assessment of State Significant Biodiversity Values

FX4 In accordance with the Biodiversity Offset Plan, an assessment for each stage of the project identified in the plan must be undertaken by an Appropriately Qualified Person to identify the presence, type, and extent of any State Significant Biodiversity Values, including an Ecological Equivalence Assessment for those areas to be disturbed.

NOTE: commencement of *a stage of mining includes undertaking any disturbance associated with Mining Activities.*

FX5 The assessment required under condition FX41or Stages 1 and 2 of the project (as identified in the EPBC Act Report, June 2012) must be submitted together to the administering authority at least 2 months prior to the commencement of Mining Activities, other than Minor Early Works and Mineral Development Maintenance Activities, for the relevant stage.

Biodiversity Offset Strategy

FX6 Where the assessment required by condition FX4 identifies that the proposed Mining Activities for a stage of the project will potentially impact on a State Significant Biodiversity Value, the holder of the environmental authority must develop a Biodiversity Offset Strategy for the proposed stage of mining.

NOTE: The holder may apply to change the Biodiversity Offset *Strategy for* a *mining* stage, *by submitting* a *new Biodiversity Offset Strategy or amendment to the strategy to the administering authority for approval.*

FX7 The Biodiversity Offset Strategy for the proposed stage of mining must:

a) quantify the offset requirements for that stage of mining and include a detailed description of the surveyed locations of State Significant Biodiversity Values, having regard to the assessment conducted under condition FX4;
b) if the holder of the environmental authority proposes to offset impacts to State Significant Biodiversity Values through: ·

1. a Legally Secured offset, identify the land within the Galilee Basin bioregions (including the land on which the relevant mining activity is canned out) or on other land in the State which may have the relevant State Significant Biodiversity Values and identify the proposed process by which that land will be investigated (including Ecological Equivalence Assessment) and Legally Secured; and/or

2. an offset payment:

    i. Indicate any commitment to make an offset payment in accordance with the *Queensland Biodiversity* Offset *Policy* or an alternative approach approved by the administering authority, including the amount(s) and timing of that payment; and/or
    ii. indicate the level of offset delivery for which an offset payment(s) may be considered; and/or

3. an offset transfer, indicate the level of offset delivery for which an offset transfer may be considered; and

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c) include a proposal that the ecological equivalence assessment of the impacted area and offsets area be undertaken in accordance with the Queensland Biodiversity Offset Policy or an alternative approach approved by the administering authority.

FX8 The Biodiversity Offset Strategy required under condition FX6 must:

(a) be submitted to the administering authority for approval no more than 6 months after the commencement of Mining Activities, other than Minor Early Works and Mineral Development Maintenance Activities, for the stage; and

Offsets Delivery

FX9 The holder must provide a Legally Secured offset for any land identified in condition FX7 in accordance with the *Queensland Biodiversity Offset Pokey,* or an alternative approach approved by the administering authority, within 3 years of submitting the relevant Biodiversity Offset Strategy.

FX10 The holder must provide any offset payment(s) identified in condition FX7 in accordance with the Queensland Biodiversity Offset Policy or an alternative approach approved by the administering authority:
(a) in accordance with any commitment given in the Biodiversity Offset Strategy; and
(b) within 3 years of submitting the relevant Biodiversity Offset Strategy.

FX11 The holder must enter into an agreement with the administering authority to provide any offset transfer identified in condition FX7 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority within 3 years of submitting the relevant Biodiversity Offset Strategy.

Legally Secured Offsets (Direct Offsets) for land owned by Holder

FX12 The holder must develop an Offset Area Management Plan for the land it owns that is Legally Secured under FX11 in the format specified by the administering authority.

FX13 The Offset Area Management Plan required under condition FX 12 must contain the following information:
a) management and environmental objectives and outcomes, performance criteria and monitoring requirements;
b) an analysis of the risks to achieve the objectives and outcomes;
c) any restrictions imposed on the use of the offset area, including the management/control of weeds, cattle and site access;
d) the activities that will be undertaken to achieve the objectives and outcomes, including the managemenUcontrol of weeds, site access, erosion and sediment and fire management;
e) a map that shows spatially the areas subject to the Offset Area Management Plan; and
f) a reporting programme.

FX14 The Offset Area Management Plans must be submitted to the Administering Authority with 3 months of the land being Legally Secured under condition FX9.

FX15 Land Legally Secured under FX9 must be managed in accordance with the Offset Area Management Plan as approved by the administering authority.

FX16 Land Legally Secured under FX9 must be managed in accordance with the approved Offset Area Management Plan for each stage for a period of 30 years unless otherwise approved.

Offset Transfers

F17 The holder of the environmental authority must comply with the requirements of any agreement under condition FX11."

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[281] Three expert witnesses gave evidence with respect to ecology: Dr Dique, who was called by Hancock; Mr Friend who was called by Ms Cassoni; and Mr Vanderduys, who was called by Ms Kelly.

[282] Dr Dique provided evidence essentially covering the field of ecology, including evidence significantly linked to groundwater expert evidence, whilst Mr Friend's evidence concentrated on the impacts to ecology linked to groundwater expert evidence, and Mr Friend gave evidence on the issue of offsets. For this reason, two joint expert reports were put into evidence: a joint report[129] of Dr Dique and Mr Friend linked closely to the groundwater issue; and a joint report of Dr Dique and Mr Vanderduys relating to biodiversity offsets.[130]

[283] I will deal firstly with the Joint Report of Dr Dique and Mr Friend and their related individual expert reports.[131]

[284] Their areas of agreement and disagreement are concisely set out in their joint reports and are as follows:[132]

> "**7. Areas of Agreement**
>
> 7.1. Based on the above discussion the following are areas of agreement between Dr Dique and Mr Friend.
>
> 7.1.1. Neither Dr Dique or Mr Friend consider themselves to be experts in issues surrounding groundwater
>
> 7.1.2. Dr Dique and Mr Friend acknowledge the construction of the mine and associated infrastructure will result in environmental impacts and these impacts will result in the loss of vegetation and habitats within and immediately adjacent to the Mine.
>
> 7.1.3. Dr Dique and Mr Friend may need to consider findings of the Joint Expert Report from the Groundwater Experts, as there is potential for areas of agreement or disagreement to affect what is documented in this expert report.
>
> **8. Areas of Disagreement**
>
> 8.1. Areas of disagreement are provided below.
>
> 8.1.1. Mr Friend is of the view based on the information provided in the reports cited and used to give the required approvals that there is insufficient information provided to make any proper statements with regard to the potential impacts to terrestrial vegetation and native grass based pastures within the receiving environments.
>
> 8.1.2. The State, in issuing the required approvals has depended on conceptual modelling as reported in the URS Report (2012), based on that information Mr Friend is not convinced that the information provided in the sections which describe the potential impacts on Vegetation i.e. 10.6.3 adequately provide sufficient clarity as to the potential impacts on terrestrial and riparian vegetation.

129 Exh 20.
130 Exh 19.
131 Dr Dique Exh 12 and Exh 101 (CU) and Mr Friend Exhibits 51 and 59.
132 Exh 20 pages 5-6.

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8.1.3. Dr. Dique has quoted from the URS (2012) Report with respect to the limits of the drawdown from the mine void as being 10 to 100 metres for the impacts on perched aquifers. Mr Friend again notes that the finding are not substantially supported as are the conceptual models by the groundwater experts Dr Gavin Mudd (see section 4, 5, 7, 7, 8) or Dr John Webb (see 2.1 and 2.2).

8.1.4. Mr Friend has made comment on the plausible impacts to terrestrial vegetation from the drawdown of groundwater including perched water tables as a result of the mine dewatering in a north south alignment. Mr Mudd also raises issues that the complexity of the geological and as a result the groundwater within the area may not have been fully taken into consideration due to lack of data and has pointed to potential impacts in that north-south geological alignment.

8.1.5. Mr Friend notes in paragraph 7.1.6 and 7.1.7 of his report that the State have not made available data from monitoring programs associated with open cut mines that may assist with determining impacts to vegetation communities associated with groundwater and surface water impacts. Mr Friend's view is that there are other coal bearing deposits which have been mined via open cut and long wall operations within the state and the State Government as part of its monitoring requirements for those mining operations and the State own responsibilities under the licencing of mining operations should have sufficient data to identify discrepancies between predicted and/or conceptualised models and the status of ecological values around those mines some years after those operations have commenced with respect to impacts of these mines on neighbouring land systems and properties. As the Alpha Coal Project is the first such project in the Galilee Basin, Dr Dique is of the view that based on the groundwater modelling that indicates negligible impact to vegetation communities (URS 2012) and that the approval conditions stipulate a regional approach to management and monitoring plan development (i.e. Biodiversity Offsets Strategy, Rehabilitation Management Plan, Receiving Environment Monitoring Program, Sediment and Erosion Control Plan, Water Quality, Sediment Quality and Aquatic Fauna Monitoring Program and MNES Management Plan), the potential for such impacts will be appropriately managed.

8.1.6. Mr Friend is of the view that while a regional approach is commendable, it may be to the detriment of the local vegetative and biodiversity values. And that the impacts may not become apparent until they are such that they may not be able to be mitigated against or restored as part of the make good provisions of the conditional approval."

[285] Hancock in its submissions is critical of Mr Friend.[133]

"***Mr Friend***

266. Mr Friend was called by Ms Cassoni. His two reports do little more than argue in general terms that different results may follow if:

(a) contrary to the evidence of the groundwater experts, there is connectivity between the perched water systems and the deep aquifers;

(b) one were to accept that there were greater impacts on groundwater based on the reports of Dr Webb and Dr Mudd.

267. Mr Friend tried to cast doubt on URS' groundwater analysis despite accepting that he had no groundwater expertise and was not in a position to contradict those who did.339 His inexplicable willingness to venture opinions beyond his expertise340 suggested that he was concerned to argue Ms Cassoni's case rather than present a reliable independent opinion.

268. In the end Mr Friend's evidence does not:

(a) provide any basis for doubting the URS groundwater analysis;

(b) establish any possible connection between the perched water systems and the deep aquifers within Bimblebox or elsewhere;

[133] Hancock Submissions 18 October 2013 para 266-268.

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(c) identify any particular impact that might arise if the URS groundwater analysis turns out to be wrong;

(d) provide any basis for withholding approval on ecological grounds."

[286] I will turn firstly to the criticism that Mr Friend's evidence went beyond his expertise as an ecologist.

[287] Although Hancock's submissions refer to Transcript 9-64 line 1 to Transcript 9-65 line 23 to found their criticism of Mr Friend, in my view a more correct understanding of his evidence is found by referring to Transcript 9-63 line 17 to Transcript 9-65 line 23, which is as follows:

> "Well that's the answer to my question, you wanted to go back to paragraph 6.8 of your first report, if we could go there, you're dealing there with the URS opinion about groundwater recharge?---As I said just before, I think I'm dealing with a 20 comment in – in Mr Dique's report about the URS 2012 report and making that – a comment about that comment in terms of my review of Mr Dique's report – Dr Dique I should say. So yeah, that's – that may be the confusion which 6.8 is – is bringing.
>
> When I read 6.8, it says in addition, the URS 2012 report effectively argues that diffused recharge and so on, you're making a statement about what the URS 2012 report effectively argues, aren't you?---Well, I am making a comment about what is in Dr Dique's report and Dr Dique making a comment, potentially, about the URS 2012 report, not making a comment about the URS report particularly based on my review of that document.
>
> So you don't think you read the URS report and formed your own view about what it effectively argues and you were taking it second-hand from Dr Dique?---I am commenting on – on Mr Dique's statement Mr Dique made.
>
> All right. And therefore you're commenting on Dr Dique's interpretation of the URS report?---That's correct, yes.
>
> And you are having an argument with Dr Dique about his interpretation of the URS report, is that what you are trying to say in this paragraph?---That's what I'm trying to say, yes.
>
> And – and the subject matter of your argument is a perception of what URS is saying about diffusing recharge?---That's correct.
>
> And you have got no expertise in diffusing recharge, do you?---No.
>
> And you seem to be suggesting that there was something wrong with the proposition about diffused recharge derived from the URS 2012 report?---As an ecologist, yes. You're saying that the proposition about diffused recharge, in your opinion, is wrong?---I am saying that that – it is not ringing true, there is something 5 amiss in – in those statement and in that statement particularly- - -
>
> But you don't- - -?---- - - but in my – to my mind as an ecologist, but- - -
>
> But you have no expertise one way or the other to argue with the ground of an expert about diffused recharge and groundwater questions, do you?---I'm – I certainly don't, but I feel, as an ecologist, I could have made a comment about recharge which is a fairly easy concept to contemplate - - -
>
> But you remember- - -?---- - - what impacts that may or may not have on terrestrial ecology.
>
> But you accept that in 6.8 you are entering into an argument that is plainly beyond your expertise?---Not entirely.

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What expertise do ecologists have in diffused recharge?---Ecologists have an expertise in – in ecology and in plants and in animals and certainly issues that go to whether those systems can be sustained by the application of additional waterage, should they be drained or fenced, I think we can make comment on those things, but as you say, I cannot make substantive comment about whether the – the recharge is reasonable or unreasonable.

Could I ask you to go to the joint report, please, this is document AH020.0, and if you go, please, to paragraph 5.3.13, and in particular the last sentence, now this is a sentence that you have included in this draft report, isn't it, Mr Friend?---Yes, that is the sentence commencing with however.

Yes, and that's true, isn't it, that's true?---That is true.

If we look at the substance of 5.3.12 and 5.3.13, in 5.3.12, you are offering your own comments on matters that were addressed by URS?---By them, yes.

But yet, you are not a groundwater expert and confess that you can't comment on the veracity of what the URS says?---I can't comment on the veracity of that – those comments, I can comment on what they say and what I – what – what my thoughts are.

And looking at 5.3.13, you say you find it difficult to believe that [indistinct] deepwatering will only have an effect to the extent stated in the URS report?---I still do, yes.

These are matters plainly beyond your expertise, aren't they?---As I said, in terms of what those statements are saying, I cannot comment on the veracity of those statements, but I find them difficult to believe and therefore I feel I am able to make a statement that I am – I find it difficult to believe.

But without any- - -?---So if – if they're- - -

- - - without any expertise, you couldn't ask his Honour to [indistinct] on a personal difficulty that you feel in believing something, surely?---Well that's – that's for his Honour to make a decision on, not me, but certainly as an ecologist and I feel I am quite able to say that, yeah, that – that statement or that information marries with what I know or what I don't know.

The upshot is that you are prepared to express opinions notwithstanding that the subject matter is plainly beyond your expertise, aren't you?---I'm – I'm expressing that opinion about what I interpret that information, I am not expressing the opinion on the validity of the information, but, you know, whether the information was true, but I've – I would still hold that I find it difficult that – to believe that a [indistinct] and deepwatering off the mine would only have an effect between 10 and 100 metres.

But in that same answer, you say you can't question its validity, and that's true, isn't it?---That's – that's true, yes."

[288] In my view, Mr Friend withstood the attack on his credibility reasonably well, particularly by acknowledging that he is not a groundwater expert and that he was expressing his views as an ecologist. To the extent that Mr Friend may have strayed outside his field of expertise, the same could be said of Dr Dique.

[289] At paragraph 7 of his report,[134] Dr Dique said that:

"**7) In your opinion, what are the potential impacts of the proposed Alpha Coal Mine (including from ground and/or surface water) on the receiving ecological environment of Bimblebox Nature Refuge, the flora and fauna dependent on it, and its ecological values.**
In my opinion, there will be negligible impact on the receiving ecological environment for Bimblebox Nature Refuge. Further detail is provided in Section 5, page 22."

[134] Exh 12 page 3.

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[290] Dr Dique expanded on this answer later in his report where he said:[135]

> "**7 IMPACTS ON THE RECEIVING ECOLOGICAL ENVIRONMENT**
> Potential impacts on the receiving environment have been provided above and will be managed and monitored by the project commitments and approval conditions outlined in Table 5 . With regard to the Bimblebox Nature Refuge, there is likely to be limited if any impact to the flora and fauna utilising the habitats that occur on Bimblebox. This is due to the distance of Bimblebox from the proposed mine site (6.5 km to the south) and because Bimblebox is located in the upper catchment of Lagoon Creek, and therefore will not be impacted by any surface water flows from the proposed mine site.
>
> The predictive groundwater modelling undertaken for the proposed mine site indicates drawdown of groundwater may extend up to 10 km from the southern boundary of the proposed mine site, the largest zone of influence resulting from mine dewatering and depressurisation. Given the local geology, it can be assumed that the surface flows and perched systems at Bimblebox are similar to those at the proposed mine site, and are not connected to the aquifers impacted by drawdown.
>
> Therefore, although there is potential for some drawdown impacts to be experienced up to 10 km from the proposed mine site, there is unlikely to be any impact on surface water and related ecology at Bimblebox."

[291] Dr Dique is clearly relying on his reading and understanding of the URS 2012 Report for his conclusions as to the impact on ecology in light of groundwater evidence.

[292] I make no criticism whatsoever of Dr Dique and the manner in which he has referred to the URS 2012 Report. However, in the same vein, only limited criticism can be made of Mr Friend for the manner in which he has expressed his concerns about the URS 2012 Report. What he should have done in his oral evidence was refer more specifically to the expert opinions of Dr Webb and Dr Mudd and relied upon their criticisms of the URS 2012 Report. Despite this deficiency, due to my findings on groundwater, it amounts to a distinction without a difference – that is Mr Friend's evidence would have not changed, in my view, had he more appropriately referred as his basis to Dr Webb and Dr Mudd.

[293] Further, of course Mr Friend was entitled to comment on Dr Dique's reliance on the URS 2012 Report.

[294] I have already made substantive findings as to my concerns regarding the expert groundwater evidence. In my view, the interaction between the groundwater evidence and ecology evidence only serves to reinforce my view as to the necessity of fully understanding water issues as part of this process, and the folly of Hancock, in saying that "there are no unacceptable impacts from the Alpha mine which cannot be appropriately addressed …… (in relation to groundwater) through the process which exist under the Water Act",[136] and the like position of the Statutory Party, through the evidence of Mr Loveday:[137]

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135 Exh 12 page 22.
136 Hancock, Reply Submissions, 23 October 2013 paragraph 184.
137 Exh 85, Affidavit of Loveday, paragraphs 17 and 18.

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> "17. I have formed the view that much of the discussion in the expert reports addressing hydrogeology relates to the take of groundwater as a result of the mining operation, and the potential impacts associated with that take, both on the groundwater resource and existing users in the area.
>
> 18. I was not required to take those specific matters into consideration when making my decision to grant the Draft EA under the EP Act. Those matters will be considered in the assessment of an application for a water licence under the Water Act 2000."

[295] I am left in the situation where I cannot be confident on the expert evidence on Ecology, given that such evidence has as its basis so much reliance on groundwater evidence.

[296] This remains the position even though, as Hancock points out in its submissions,[138] the vast majority of Dr Dique's evidence, being the URS 2012 Report, is subject to some doubt, which casts a shadow of doubt over Dr Dique's conclusions.

[297] It is worth repeating part of Ms Kelly's submissions as they show the diversity of flora and fauna potentially impacted by the Hancock mine. She had this to say:[139]

> "*Known significant ecosystems, flora and fauna*
>
> 148. An Endangered Regional Ecosystem (ERE 10.3.25 – Eremophila Mitchellii) under the DERM Biodiversity status is located on the project site. The Coordinator General's Evaluation report (Exhibit 13.10 Doc AH013.010 p. 33 Table 5.3), identified 4 other DERM listed 'Of Concern' regional ecosystems (RE) within areas to be cleared on the mine site.
>
> 149. Two state-listed threatened fauna species, the vulnerable squatter pigeon and the near-threatened little-pied bat were recorded on the mine site (Exhibit 13.10 Doc AH013.10 p. xii). The Blackthroated Finch has been recorded nearby (Transcript 9-70 lines 1-2). Dr Dique agreed that the level of effort required to establish the presence or otherwise of a species on the site was not done (Transcript 6-37 lines 26-40).
>
> 150. The Federal Environment Minister's approval conditions (Exhibit 13.11 Doc AH013.011 p.2-3) (which are included in the CG's conditions and which apply to both the mine site and rail corridor) (Exhibit 13.10 Doc AH013.010 Appendix 2 p.294) require measures to be taken to protect the following federally listed flora and fauna species and communities:
>
> Brigalow
> Semi-Evergreen Thickets of the Brigalow Belt and Nandewar Bioregions
> Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin
> Black-throated Finch
> Squatter Pigeon
> Star Finch
> Red Goshawk
> Australian Painted Snipe
> Northern Quoll
> Greater Long-eared Bat
> Retro Slider (reptile)
> Yakka skink
> Ornamental Snake
> Brigalow Scaly-foot (reptile)
> Dichanthium Queenslandicum (Flora)
> Dicanthiium setosum
> Eucalyptus raveretiana
> Croton magneticus

138 At paragraph 265.
139 Submissions, Ms Kelly, 18 October 2013, paragraphs 150-152.

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151. *Environmental Values – Flora* (Exhibit 13.7.17 Doc AH013.007.017 EIS Vol 2 Section 9 p.9-24)

> The following vegetation community-specific environmental values apply to the Project site:
>
> - The Fringing Riparian Woodland [on banks of creeks] provides refuge for fauna in the form of water, shade and mature, hollow-bearing tree species;
> - Floral diversity was considered relatively high in most communities, in particular the Fringing Riparian Woodland, Silver-leaved Ironbark Woodland, Weeping Bottlebrush Heath and Queensland Yellowjacket Low Open Woodland. These communities provide a high diversity of floral structure therefore adding value to the regional integrity of each community;
> - Landscapes such as floodplains (in particular the Poplar Box Open Woodland, RE 10.3.27), skeletal hills (represented by the Lancewood Woodland RE 10.7.3) and tertiary sand plains (represented best by the Queensland Yellowjacket Low Open Woodland, RE 10.5.1) are intact and relatively devoid of degradation by grazing; and
> - The relatively intact patches of Poplar Box Open Woodland, Gidgee Open Woodland, Fringing Riparian Woodland and Thozet's Box Open Woodland are listed as 'Of Concern' under DERM's Biodiversity Status and have the potential to contribute to the overall preservation of threatened ecosystems.

152. Environmental Values – Fauna (Exhibit 13.7.17 Doc AH013.007.017 EIS Vol 2 Section 9 p. 9-37-8)

> The faunal environmental values that are associated with the Project site include the following:
>
> - Suitable habitat for threatened species. Fallen timber within the Brigalow Open Woodland and Gidgee Open Woodland has the potential to provide a distinct microhabitat for certain fauna, including the listed Yakka Skink (Egernia Rugosa) and Brigalow Scaly Foot (Paradelma Orientalis). A permanent water source with open woodland and surrounding grassland has the potential to provide habitat for the Star Finch (Neochmia ruficauda ruficauda) and Black-throated Finch (Poephila cincta cincta);
> - Small and medium sized mammals are well represented on the Project site. The abundance of these species are low, which is normal due to the decline in this weight range following the introduction of pest fauna such as the Feral Cat (Felis catus), Dingo (Canis lupus dingo) and Red Fox (Vulpes vulpes); and
> - The avian species recorded on the Project site are mostly typical woodland birds and represent a healthy population and diversity of species within the region.

…

154. Fauna species which were found on the site included: the vulnerable Squatter Pigeon, the near-threatened Little Pied Bat, the Ornate Burrowing Frog, the Green Tree Frog, the Desert Tree Frog, Zebra and Double-barred Finches, Brolga, Pelican, Wedge-tailed Eagle, 'several Duck species,' Forest Kingfisher, 'nine microbat species,' the Sugar Glider, Rufous Bettong, Koala, Echidna, Sand Goanna, Central Netted Dragon, 'eight skink species.' This is just some of the 162 fauna species seen on the site (Exhibit 13.7.17 Doc AH013.07.017 pp 9-34 to 9.37)"

[298] It must of course be noted that some of the flora and fauna referred to above relates to the mine and the rail corridor. Consideration of the rail corridor ecology impacts are not relevant to the proceedings currently before me.

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[299] I now turn to consider the Joint Report of Dr Dique and Mr Vanderduys[140] and their related individual expert reports.[141]

[300] The joint report of Dr Dique and Mr Vanderduys sets out areas of agreement and disagreement, extracts of which are as follows:[142]

> "**2. Key issues of Agreement**
>
> With relevance to the Alpha Coal Project, the report prepared by Dr Dique principally focused on a response to objections associated with potential changes in groundwater and surface water that may result from the development of the Alpha Coal Project (Mine), and the associated impacts on terrestrial ecology.
>
> The report prepared by Mr Vanderduys focused on an assessment of the biodiversity offsets proposed for the Alpha Coal Project.
>
> The meeting by phone conference was limited to a discussion about what was presented in Mr Vanderduys' report. The following presents the key issues of agreement as a result of the expert meeting.
>
> (a) In the context of biodiversity offset policies in general (both State and Federal), offsets can achieve a "no net loss" goal, however, there are uncertainties that currently exist. Specifically, where there is a residual impact to protected vegetation communities and listed threatened species' habitats as a result of a proposed development, existing biodiversity offset policies present a suitable theoretical mechanism to offset the impact by:
>
> - quantifying the value or condition of the vegetation communities or listed threatened species habitat to be impacted; identifying suitable offset sites that contain vegetation communities that are not currently protected and that may develop in time to become similar in type to those vegetation communities or listed threatened species habitats proposed to be impacted; and
>
> - detailing specific management strategies that must be implemented if the offset plan is to improve the status of the vegetation community so that it becomes protected (either by changes in tenure or by recognition on vegetation mapping that is protected by existing legislation).
>
> (b) With regard to the Alpha Coal Project, it was agreed that some existing vegetation communities within the proposed Mine have been altered due to existing land use (including clearing, grazing), while others are in good condition, and that field studies at the proposed Mine have been undertaken with the aim of determining the presence of listed threatened species. Where listed threatened were not identified from observations, habitat modelling and mapping of potential habitats was undertaken to assist with the quantification of impacts to potential listed threatened species habitats to inform the development of an offset strategy. It is recognised that there are assumptions that underpin habitat modelling exercises, and that often outputs from modelling do not always provide a true reflection of habitat on the ground.
>
> **3. Key issues of Disagreement**
>
> Key issues of disagreement are provided below.
>
> (a) Mr Vanderduys is of the view that there is currently insufficient detail in the Alpha Coal Project offset strategy to assess the likely efficacy of the offset strategy in achieving "no net loss":

140 Exh 19.
141 Dr Dique Exh 12 and Exh 101 (CV) and Mr Vanderduys' Exh 111.
142 Exh 19 pages 1-4.

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(i) the offset strategy falls victim to an all too common syndrome: "most offset policies contained vague, ambiguous statements and difficult to apply concepts and these results were consistent with a plethora of existing literature, which had identified that the planning of offsets lacked effective consideration and implementation of landscape-ecological principles, and that the protection of biodiversity through offsetting was not occurring"

(ii) In response, Dr Dique is of the view that the additional work to be performed, as per the project approval conditions detailed below, will provide the detail required to effectively manage and implement an appropriate offset program.

(b) There is little evidence to demonstrate that threatened species habitats can be reconstructed or adequately rehabilitated and evidence presented in Mr Vanderduys' original report suggests that habitat reconstruction or rehabilitation is likely to fail, or at the very least have a high uncertainty as to whether it will be successful or not. Hence offsets cannot be guaranteed. This is due in part to the paucity of information on what constitutes all components of a threatened species habitat (particularly those species that are cryptic) and that there have been few quantitative studies measuring habitat reconstruction success.

(c) Mr Vanderduys asserts, as in his original report, that without habitat reconstruction or rehabilitation as part of the offset strategy, then the offset strategy can only result in a net loss of habitat for threatened species.

(d) Evidence presented in Mr Vanderduys' original report suggests that final offset ratios using restored habitat are likely to be very high.

(e) Mr Vanderduys' report made comment that there is insufficient detail in the Alpha Coal Project's proposed offsets strategy to assess whether the strategy will achieve its goal. Dr Dique suggested that the detail required for determining an appropriate offset arrangement (including both direct and indirect offset measures) will be provided by the Alpha Coal Project approval conditions …

…

(f) Despite the information that will be obtained to meet these conditions, and that approval of various components of these conditions will be reviewed and approved by Ministers from both State and federal Governments prior to any construction commencing, Mr Vanderduys remains of the view that without being able to review the information obtained, it is inappropriate to comment on the likelihood that these conditions will appropriately offset residual impacts associated with the proposed project.

(g) Dr Dique is of the view that the level of scrutiny that is conditioned to reviewing and approving the development of field methodologies, preclearance survey results, the preparation of detailed Management Plans and Biodiversity Offset Plans (as outlined above), will likely result in a net ecological benefit to the Galilee Region, particularly when compared to the current "do nothing" scenario.

(h) Mr Vanderduys is of the view that 3 (a) EPBC Act Approval Condition 4 and draft EA Conditions F47 to F50, above, stating respectively "offsets must be secured within 3 years of commencement of construction" and "develop a wildlife corridor strategy within 5 years" can only fail, as stated in Mr Vanderduys' previous statement to the court using the example that a species only needs to be extinct for a moment to be extinct forever. …

(i) Dr Dique is of the view that offset strategies are not designed to offset through restoration projects, but rather specific management action (that may include some restoration activities, stock management, weed management, water management etc.), according to a detailed offset plan, for existing regrowth areas and at high offset ratios so that the outcome is increased availability and quantity of habitat.

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> There is no evidence to suggest that the Alpha Coal Project will lead to any extinction of species."

[301] Ms Kelly has gone to great length in her submissions to paint a bleak picture of the use of ecology offsets. There is no doubt that the evidence of Mr Vanderduys supports her submissions.

[302] My observation of Mr Vanderduys as a witness is that he is clearly an intelligent person who is not afraid to be outspoken or to speak his mind. I found him to be quite cynical of the process of government, but based on reasoned logic.

[303] In my view, Hancock provided a fair assessment of Mr Vanderduys' evidence in its submissions:[143]

> "***Mr Vanderduys***
>
> 269. Mr Vanderduys was called by Ms Kelly. His report was very narrow in its focus. It related only to the question of offsets, and was couched at a very high level of abstraction. However, Mr Vanderduys' misgivings were misplaced.
>
> 270. First, his criticism of offsets on logical grounds overlooked the manner in which offsets actually work in practice. His example assumed a 1:1 ratio between the area impacted and the area dedicated as an offset when, as he accepted in cross-examination:
>
> (a) in practice the ratios imposed require much larger areas of land to be dedicated as offsets; (T9-41/45-T9-42/5)
>
> (b) in practice, you cannot ignore the improvements that happen with management over time; (T9-42/10-12)
>
> (c) the larger the area that is protected and well managed, the greater the protection for environmental values. (T9-41/10-11)
>
> 271. As Dr Dique explained: (Joint report [AH.019.000.000], [Ex 19] at page 4, para (i))
>
> "… offset strategies are … designed to offset through … specific management action (that may include some restoration activities, stock management, weed management, water management etc.), according to a detailed offset plan, for existing regrowth areas and at high offset ratios so that the outcome is increased availability and quantity of habitat."
>
> 272. Secondly, Mr Vanderduys completely overlooked the conditions in the draft environmental authority. (T9-42/20-40) In cross-examination, he agreed that these conditions were significant, (T9-42/45-T9-43/5) but said ultimately that he was pessimistic about them because he assumed that the administering authorities would implement them inappropriately by, for example, approving an inadequate offsets plan (T9-43/20-23) or approving the release of an offset area before it was appropriate to do so. (T9-44/40-47)
>
> 273. Mr Vanderduys' pessimism is thus founded on an unwarranted presumption of administrative failure. Applications such as the present engage the presumption of regularity, not the opposite. That approach was applied in respect of the conduct of the miner in Gregcarbil Pty Ltd v Backus (No 2) [2013] QLC 46 at [137] (referring to Elliot v Hicks & Hicks [2001] QLRT 38). It applies a fortiori in respect of the conduct of an administering authority."

[143] Submissions, Hancock, filed 18 October 2013, paragraphs 269-273.

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[304] As I observed in *Gregcarbil Pty Ltd v Backus & Ors (No. 2)*:[144]

> "[136] It is not unusual for this Court to hear concerns from objectors, particularly from landholders over whose land mining operations are proposed, that proper rehabilitation will not be undertaken by the miner. In this regard, it is important to bear in mind the role of the Land Court in the consideration of the matters currently before it. the role of this Court is to make a recommendation as to whether or not the mining operation should be allowed to proceed and, if it is convinced that the mining operation should proceed, what conditions should apply to those approvals from a mining and environmental perspective.
>
> [137] As Mr Barlow rightly pointed out in his submissions relating to the mining lease applications, in the Land and Resources Tribunal matter of *Elliott v Hick & Hicks* ((2001) QLRT 38) I noted that as a matter of law, it must be assumed that miners conducting mining operations will operate lawfully. In particular, this means that, unless there is good reason to expect otherwise, it must be assumed that the miner will abide by all mining and environmental conditions."

[305] I agree with Hancock's proposition that, a foriori, the same presumption must be made by this Court as regards the conduct of the administering authority. It must be assumed that the administering authority will undertake its duties according to law.

[306] Subject to my reservations as to the evidence relating to groundwater and the resulting impact of that evidence on ecology, I am satisfied with the evidence of Dr Dique regarding the appropriateness of the conditions regarding offsets.

Surface Water

[307] As Hancock points out in its submissions,[145] this issue relates to an objection by Ms Cassoni, and she did not adduce any evidence in support of the objection, and she did also not seek to cross-examine Hancock's expert witnesses, Mr Zammit and Mr Kijlstra.

[308] Of course, because the evidence of Mr Zammit[146] and Mr Kijlstra[147] was not challenged, it stands before this Court, and it was not necessary for Hancock to call either expert to give evidence.

[309] Hancock's submissions of 18 October 2013 very helpfully provided a summary of the evidence of Mr Zammit and Mr Kijlstra which I agree with and repeat in the following paragraphs.

[310] Mr Zammit's key conclusions were:[148]

(a) The available surface water quality data obtained from Native Companion Creek and the five main creeks identified on the Alpha mine area provide sufficient data to establish an interim background or reference water quality for the area.

(b) The surface water quality of the area is naturally highly variable due to the ephemeral nature of the streams.

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144 [2013] QLC 46 at paragraphs [136] – [137].
145 Hancock Submissions, 18 October 2013, paragraph 277.
146 Exh 11.
147 Exh 10.
148 Report of Mr Zammit dated 30 May 2013 [AH011.000.000], [Ex 11] at pp 9-10.

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(c) The surface water quality has naturally elevated levels of certain dissolved metals and is enriched with nutrients probably as a result of agricultural activities of the area.

(d) The methodology used in the documentation and reports that supported the mining lease application were consistent with standard industry practice, as well as legislative and guideline requirements.

(e) Given the conditions in the draft environmental authority and commitments made by Hancock as reflected in the Coordinator-General's report, the risk of mine contaminated water from any area of the proposed Alpha mine, including the void, having any impact on the receiving waters is negligible.

(f) Whilst design strategies within the proposed Alpha mine will effectively flood proof the facility, in the event of uncontrolled release of mine contaminated waters during a major flood it will unlikely have any impact on the receiving waters due to the high dilution effects.

(g) The creek diversions will be constructed and maintained according to Australian best practices and as such are not expected to have any significant negative impact on the receiving waters' environmental values.

(h) Environmental authority conditions required for a receiving environment monitoring program will continuously assess the integrity of the diverted channels, as well as provide detailed information on the quality and biological health of the surface waters.

[311] Mr Kijlstra's key conclusions were:[149]

(a) The EIS and associated documents, and in particular the Bridging Report, have adequately addressed the Terms of Reference for the EIS and addressed how the surface water components for the proposed Alpha Coal Mine will be implemented. The documents clearly set out the design criteria required to meet the regulatory requirements, including those presented in the EA, CG report and EPBC Act approval.

(b) The design, as presented in the EIS and addendums, is not a detailed design and is not suitable for construction purposes. However, a detailed design for construction purposes would not be expected at this stage.

(c) EIS design would typically be based on a 30% design, where the principles of design are well defined but detailed calculations and modelling have not yet been carried out to verify that the design principles are achievable. For the Alpha mine,

[149] Report of Mr Kijlstr dated 30 May 2013 [AH010.000.000], [Ex 10] at p 8.

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however, the EIS design extended to well beyond 30% design and included some robust modelling and reviews of the hydrology and hydraulics to verify that the proposed design and mitigation measures were both achievable and effective in minimising risk to the environment.

(d) He is confident, subject to the mine being developed and managed in accordance with the EIS, EMP and draft EA, that the mine will not have a severe or unacceptable impact on surface water hydrology, including the character, resilience and values of surface water hydrology.

(e) A Mine Site Water Management Plan, supported by a Sediment and Erosion Management Plan (SEMP) and a Receiving Environment Monitoring Plan (REMP), will be prepared for regulatory approval in accordance with the current draft EA.

(f) Levees and diversions are all subject to licensing approval, in accordance with the applicable legislation. Referable and hazardous dams are subject to approval in accordance with regulatory requirements, as set out in the current draft EA, prior to construction of the infrastructure.

(g) Ongoing monitoring of surface and groundwater will continue throughout the construction and operation of the mine site, including the monitoring of water quality both on site and off site, periodic inspections and monitoring of diversions and levees, and annual inspections of all referable dams.

(h) Monitoring and inspection data is compiled in periodic reporting and submitted to the authorities for consideration.

(i) The conditions that are presented in the draft EA, CG Report and EPBC approval, all support this process and will ensure that the conditions imposed on the mine site and proponent are met.

[312] I accept the evidence of Mr Zammit and Mr Kijlstra. It accordingly follows that there is no surface water evidence to support Ms Cassoni's surface water objection.

Miscellaneous Objections

[313] Most helpfully, Hancock has provided the Court with details of the remaining objections that need to be addressed.[150] I accept the accuracy of Hancock's list and will deal with each objection in turn.

CCAQ's Public Interest Objections

[314] CCAQ's Public Interest Objections inter-relate directly with the analysis already given of the issues of groundwater, climate change and economics.

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150 Hancock Submissions filed 18 October 2013 paras 281-293.

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[315] Nothing further needs to be said in addition to what I have already said relating to public interest.

Filling of Final Voids

[316] CCAQ contends that the final voids proposed to be left when mining is completed should be filled. CCAQ drew support for this objection from the evidence of Dr Webb as follows:[151]

> "[68] When mining of the Alpha lease is complete, a final void will remain at the western edge of the open cut (Figure 10c,d). Modelling shows that this will cause a cone of depression drawing groundwater flow almost radially toward the void (due to negative climate balance), with the surface of the lake in the void equilibrating at about 250 mAHD, always below the potentiometric surface for the CD sandstone to the east, west and south (the modelling suggests that there will be groundwater outflow to the north). Therefore the void will permanently intercept all groundwater flow from the southern recharge area, and if the mine void extends north into the Kevin's Corner open cuts, then it will permanently intercept over 70% of groundwater flow from this recharge area as well. The final mine void will therefore cause a permanent lowering of the potentiometric surface to the north of the mine, and any resulting deleterious effects on the springs, surface drainages, Degulla lagoon and local agricultural groundwater use will be permanent.
>
> …
>
> [72] The final void remaining when mining is complete will negatively and permanently impact on the groundwater and probably also the surface water, as discussed above. This can be easily overcome by filling the final void, and thereby allowing the groundwater system to re-establish (approximately) the pre-mining configuration. The ground surface over part of the open-cut area would, as a result, be several meters lower than before mining commenced, and this would have to be graded so that it did not divert Lagoon Creek, but the impact on the groundwater system would be much less than leaving a final void."

[317] CCAQ did not call any expert mine design and engineering evidence in support of its objection that the final voids be filled. Nor did CCAQ require Hancock's mine design and engineering expert, Mr Kankkunen, for cross-examination.

[318] Mr Kankkunen gave significant evidence in his report as to why in his opinion final voids will be necessary for the Alpha mine. Relevantly, Mr Kankkunen had this to say:[152]

> "10. …
> (i) At the end of the mine life:
> (i) there will be stable land bridges between the pits that are approximately 120 metres wide;
> (ii) there will be stable mining ramps down to the bottom of all of the pits;
> (iii) the final voids for each of the six pits will be approximately 1,900 metres wide, which will include approximately 1,200 metres of rehabilitated land the surface of which is below the natural ground level (as shown in Diagram 3 of Exhibit MK-2);
> (iv) the final voids for each of the six pits will be a maximum of 109 metres deep (as shown in Diagram 3 of Exhibit MK-2); and
> (v) the total volume of the Mine's six final voids will be approximately 1.7 billion cubic metres.
>
> …

151 Exh 42 paras 68 and 72.
152 Exh 21 paras ??.

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14. If a requirement was imposed that the final voids for the Mine's six pits be backfilled and Hancock carried out progressive rehabilitation of disturbed land during the life of the Mine, this would mean that at the end of the life of the Mine (potentially 45+ years after commencement of operations):
    (a) the rehabilitated landforms for the six pits would need to be dug up and moved up to 5 kilometres by conveyor or truck to fill the final voids;
    (b) the sites previously covered by those landforms would need to be rehabilitated;
    (c) digging up the rehabilitated landforms:
        (i) would destroy established flora; and
        (ii) would destroy established fauna habitats; and
        (iii) while spotters would be used, could result in the death of some fauna;
    (d) any PAF materials that had been capped in those landforms would be exposed again and would similarly need to be capped when relocated to the final voids; and
    (e) the six final voids would need to be rehabilitated.

15. If a requirement was imposed that the final voids for the Mine's six pits be backfilled but (contrary to standard industry practice, good environmental practice and Hancock's intention), progressive rehabilitation of disturbed land did not occur until the end of the life of the Mine:
    (a) Prestrip material would be dumped in out-of-pit dumps, but would not need to be progressively rehabilitated into final landforms;
    (b) No other rehabilitation would need to be carried out on out-of-pit dumps;
    (c) PAF materials would still need to be excavated and placed in identified cells in the out-of-pit dump and capped in accordance with the Environmental Authority;
    (d) Rehabilitation of the disturbed land at the Mine would not need to commence until all mining had been completed, potentially 45+ years;
    (e) It is my experience that topsoil quality can deteriorate over time to the point where it can no longer be put to beneficial use. As Hancock will not be able to commence in-pit prestrip dumping until Year 11 of operation, it would have to stockpile topsoil for very long periods. As a result, Hancock might not have adequate quantities of suitable topsoil to cover the whole of the disturbed area and to facilitate seeding.

16. Based upon the matters set out in paragraphs 11 to 15 above, I consider that it is not feasible to fill the Mine's final void.

Industry Practice

17. In my 32 years' experience In open cut coal mining in Queensland, India, Mongolia and Indonesia:
    (a) It has always been standard mine planning practice to provide for an open cut coal mine to have a final void;
    (b) I have only become aware of one open cut coal mine in Australia (Baralaba Coal Mine, Bowen Basin, Queensland) that has a requirement imposed on it to fill its final void. Baralaba Coal Mine is a very small coal mine. According to the mine's website (www.baralabacoal.net.au). it currently produces only approximately 0.5 Mtpa coal per annum. I understand the mine Is located on a floodplain;
    (c) I have not been made aware of any other open cut coal mine (aside from Baralaba) in Australia that has a requirement to fill its final void;
    (d) I have never designed an open cut coal mine where the final void was intended to be filled in; and
    (e) The design of the Mine with a final void is therefore consistent with industry practice for open cut coal mines."

[319] I note that Mr Kankkunen holds a Bachelor of Engineering (Civil, 2nd class A honours) and a Graduate Diploma in Computing.[153] He has extensive experience in open cut coal

[153] Exh 21 para 3.

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mining operations in Queensland, India, Mongolia and Indonesia, as well as open cut mining operations in Western Australia.[154]

[320] I accept the evidence of Mr Kankkunen. I also note that Dr Webb does not have expert mine design and engineering qualifications.

[321] It follows that CCAQ has not made out its objection regarding filling of the final voids, and that such objection should therefore be rejected.

Impact of Final Void on Surface Water

[322] Hancock contends that Ms Cassoni's objection 2(c) of her further amended objection, relating to the impact of the final void on surface water, should not be considered because it is a new ground of objection submitted after the time for making objections has closed.[155]

[323] However, as Ms Cassoni explains in her reply submissions,[156] the objection was part of her original objection dated 20 February 2013,[157] appearing as Objection 2(b)(iii). By Ms Cassoni's amended objection of 30 August 2013,[158] so as, as she puts it, to make the order of objections more logical, Objection 2(b)(iii) was partly reworded and moved to Objection 2(c)(i). However, by Ms Cassoni's further amended objection of 13 September 2014,[159] paragraph 2(c)(i) was moved back to its original position of 2(b)(iii).

[324] Thus, as Ms Cassoni rightly points out, she has no current objection 2(c)(i).

[325] In light of the next submission made in Ms Cassoni's reply submissions,[160] this objection becomes moot, as Ms Cassoni concedes that she did not proceed with this part of her objection as the additional information provided by Hancock's experts addressed the majority of her concerns.

[326] It is not necessary for me to consider the objection further.

Investigation of Bores on Mr and Mrs Currie's Property

[327] Much of the relevant material for this objection has already been dealt with in my detailed consideration of the issue of groundwater.

[328] Hancock has again run the argument that this objection should properly be left for consideration under Water Act processes.[161] I have already expressed my views as to the inter-relationship between the Water Act and the MRA and the EPA.

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154 Exh 21 para 5.
155 Hancock Submissions filed 18 October 2013 para 286.
156 Ms Cassoni reply submissions, 23 October 2013 paras 74-78.
157 Exh 50.
158 Exh 62.
159 Exh 65.
160 Ms Cassoni, reply submissions, 23 October 2013, para 79.
161 Hancock Submissions, 18 October 2013, para 289(a)(i).

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[329] Further, Hancock complains that the objection "amounts to a suggestion of further groundwater monitoring which seeks impermissibly to go behind the Coordinator-General's conditions".[162]

[330] I have dealt with the operation of the SDPWOA earlier in this decision. As indicated, it is beyond doubt that this Court cannot recommend conditions which are inconsistent with Coordinator-General conditions. This position is consistent with that of President MacDonald in *Xstrata*.

[331] There are of course two key elements to this proposition: firstly, it relates to Coordinator-General Conditions, and secondly there must be an inconsistency, with, for instance, a Court recommendation.

[332] As has already been seen in my evaluation of the statutes of core relevance to this decision, any Coordinator-General conditions for the ML, made under s 45(1) of the SDPWOA, prevail over any other conditions for the ML to the extent of the inconsistency (per s 46(2) SDPWOA).

[333] Further, s 49(1) of the SDPWOA provides that the Coordinator-General may state conditions for any draft EA issued pursuant to the EPA. Section 222(2) of the EPA is then relevant, providing that any recommendations made by the court as to conditions of the draft EA must include the Coordinator-General's conditions and must not be inconsistent with a Coordinator-General's condition.

[334] Additionally, if the Coordinator-General make an imposed condition for the undertaking of the project under s 54B of the SDPWOA, then s 54E operates so that, if the imposed condition is inconsistent with a condition of approval of the project, which in my view must necessarily include any recommendation in this decision, then the imposed conditions prevail to the extent of the inconsistency.

[335] If the ML or the EA were to be covered by a special condition in terms requiring Hancock to undertake groundwater monitoring on the Curries'; Andersons' and Ms Cassoni's properties, would such a condition be inconsistent with a Coordinator-General conclusion?

[336] The Coordinator-General stated conditions for the draft EA pursuant to s 49 of the SDPWOA. Those stated conditions included Condition 17[163] relating to groundwater. Condition 17 has subsequently been incorporated into the draft EA as conditions C50 to C56.[164]

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162 Hancock Submissions, 18 October 2013, para 289(a)(ii).
163 Exh 13.10 page 265.
164 See draft EA, Exh 85, pages 254-260.

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[337] Conditions C50 and C51 of the draft EA provides as follows:

> "**Groundwater**
>
> **C50** A groundwater monitoring program must be developed and submitted to the administering authority for approval before the commencement of mining activities. The monitoring program must :
>
> a) allow for the compilation of representative groundwater samples from the aquifers identified as potentially affected by mining activities. The geological units monitored include alluvium, Bandanna Formation, Colinlea Sandstone, Clematis Sandstone, Rewan Formation, and Joe Joe Formation;
> b) include at least 12 sampling events, no more than 2 months apart over a 2 year period, to determine background groundwater quality;
> c) obtain background groundwater quality in hydraulically isolated background bore(s), and
> d) allow for the identification of natural groundwater level trends, hydrochemical trigger levels, and contaminant limits.
>
> **C51** In addition to condition C50 groundwater quality and levels must be monitored at the locations and frequencies specified in *Table 15: Groundwater monitoring network locations and frequency* and *Figure 4: Groundwater Monitoring Locations.*"

[338] Table 15 of the draft EA then goes on to list groundwater monitoring network locations and frequency.

[339] I note that the bulk, if not all, of the monitoring locations are in either MLA 70426 or Kevins Corner (MLA 70425). A diagram showing the location of many of the monitoring locations is to be found in URS 2012.[165] It should also be noted that "TSF VWP bores", as set out in Table 15, refers to Tailings Storage Facility bores.

[340] Is the additional of three additional monitoring locations into Table 15 (which would appear to be the most logical place for their inclusion) inconsistent with the Coordinator-General's conditions? I do not think so. Given the general wording of draft EA conditions C50 and C51, the additional of extra monitoring sites into Table 15 is complimentary to the Coordinator-General conditions, and not inconsistent with them.

[341] Nothing contained within draft EA conditions C52-C56 change my opinion.

[342] Draft EA conditions C50-C56 are not of course the only Coordinator-General conditions that must be considered. Next for consideration are those conditions imposed by the Coordinator-General under s 54B of the SDPWOA.

[343] The first such condition of relevance here is Part A, condition 1[166] which provides that the proponent must implement proponent commitments as detailed in Appendix 5. Appendix 5 contains a part on groundwater which is as follows:[167]

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165 Exh 106 page 22.
166 Exh 13.10 page 280.
167 Exh 13.10 page 378.

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"**GROUNDWATER**

HCPL will:

- Develop and implement a Groundwater Monitoring Program detailing the location and frequency of groundwater monitoring activities, as well as trigger levels and response actions,
- Expand the existing groundwater monitoring network over time to enable ongoing groundwater impact evaluations,
- Install groundwater monitoring bores a minimum six months prior to mining in an area,
- Undertake groundwater monitoring and sampling via a suitably qualified and experienced professional in accordance with recognised procedures and guidelines,
- Conduct an annual review of the monitoring data, using suitably qualified expert,
- Include in the review an assessment of groundwater level and water quality data, and the suitability of the monitoring network,
- Undertake groundwater modelling audits on a regular basis (intervals not exceeding three years) and provide the modelling results to the administering authority for review,
- Investigate all groundwater-based complaints, including the maintenance of a complaints register. The register will be made available to the regulating authority upon request, and
- Implement make-good agreements with land holders affected by groundwater drawdown."

[344] Again, I consider the addition of extra monitoring sites as complimentary to, and not inconsistent with, those commitments which are conditions pursuant to the Part A Condition 1 condition already referred to.

[345] There are further imposed conditions under s 54B SDPWOA which may be considered relevant. I note in particular Appendix 2, Part B, Condition 2 which is as follows:[168]

Condition 2. Regional groundwater monitoring and reporting program

To address the potential cumulative impacts on groundwater quality and availability in the Galilee basin, the Coordinator-General has imposed the following condition for the Alpha project that will be similarly imposed for other projects in the basin. DEHP is designated as the agency responsible for this condition.

(a) The proponent must:

(i) before commencing mining activities prepare to the satisfaction of the administering authority and implement a groundwater monitoring and reporting program for aquifers impacted by the project off the mining lease
(ii) design the program to complement the environmental authority requirements and other groundwater management programs in the Galilee basin. The program should aim to enable a basin groundwater model to be developed to predict, verify and monitor groundwater impacts.
(iii) make monitoring results from the program publicly available on the proponent's web site updated at least annually
(iv) contribute to any basin wide collaborative project established by the administering authority to develop a basin groundwater model, including pro-rata funding
(v) contribute to development of a basin wide groundwater model for determining the capacity of aquifers and acceptable extraction rates, including pro-rata funding Imposed condition 2, Part B, Appendix 2 would be complemented by DEHP/DNRM as the lead agencies for developing a coordinated basin wide monitoring and assessment program, to organise and collate basin wide monitoring programs, data and reports, and to ensure such outcomes influence the ongoing management of groundwater resources."

[346] On first glance, it may seem that the amendment to Schedule 15 I propose is unnecessary in light of the contents of 2(a)(1) above. Two things can be said about that.

[168] Exh 13.10 page 282.

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[347] Firstly, Part B is headed "Imposed Conditions to Address Cumulative Impacts", and both the precursor to the Part B conditions, as well as both actual conditions, clearly state their purpose is relating to "potential cumulative impacts". The amendment I suggest to Table 15 is not related to cumulative impacts but to impacts of the Alpha mine.

[348] Secondly 2(a)(1) is stated to be "for acquifers **impacted** by the project off the mining lease" (my emphasis). There is a subtle, but important, difference in my suggested amendment to Table 15. The outcome of my suggested amendment would be to obtain baselines so that it could be determined (by taking into account all relevant material including of course use of groundwater by the landholders themselves) whether or not the Alpha mining activities impact the groundwater under those properties. Without my suggested amendment, those properties are taken by the model to not be impacted and accordingly no testing on those properties would occur. My proposed amendment to Table 15 is a precautionary approach consistent with the precautionary principle.

[349] Put simply, it is Hancock's case, at least with respect to some of the landholder objectors, that the modelling of URS 2012 shows that those properties will not be impacted. It would be a potential tragedy to those landholders if the aquifers under their properties were therefore done on the basis of the model, only for impacts to later actually occur but be undetected by the miner due to lack of monitoring. I am not satisfied, on the evidence presented to me, that any impact on the landholders would necessarily be picked up by groundwater monitoring on the MLA. The groundwater modelling and evidence is far from precise enough to give me any comfort in that regard.

[350] In this regard, I agree with the reply submissions of Mr Currie:[169]

> "Base lining of bores outside to predicted impact contours needs to be done prior to leases being granted and agreed monitoring installed. If this is not done then the predicted impacts CAN'T be managed because there is no base lining to indicate problems. Strategic monitoring would forewarn the parties of a pending problem, and binding documentation would contain the management solutions. With no binding documentation stating conditions to be implemented if there are impacts, then NO appropriate management strategy can be claimed to be in place. As state previously if there is any impact contrary to Hancock's research then I have not been made aware of, seen or heard of any management plan."

[351] I now turn to consider Appendix 3, Part b, of the Coordinator-General's report.[170] This relates to the Coordinator-General's general recommendations made under s 35(4) of the SDPWOA.

[352] There is little doubt that Part b of Appendix 3, in its entirety, makes extensive provision relating to approvals for the extraction and use of groundwater under the Water Act. However, as these are only recommendations, there is nothing precluding this Court from

169 Currie, Reply Submissions filed 24 October 2014, page 4.
170 Exh 13.10 page 330.

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making its own recommendations, even if there is an inconsistency with the Coordinator-General's recommendations.

[353] Further, it must also be noted that the Coordinator-General's recommendations relate only to the extraction and use of groundwater and not to the interference with groundwater.

[354] Having considered all of the circumstances, in my view, adopting a precautionary approach, and in order to ensure baseline monitoring, it is appropriate to amend Table 15 of the draft EA to provide for monitoring locations on the properties owned by the Curries, Andersons, and Ms Cassoni, with each given the parameter of water level, with at least one reading every 12 hours by electronic data readers.

Make Good Agreements sought by the Curries and the Andersons

[355] Both the Curries and the Andersons are seeking that make-good agreements should be entered into between themselves and Hancock.

[356] Hancock contends that the make-good objections should be rejected because these matters are dealt with under the Water Act, and there is no reason to doubt the adequacy of the Coordinator-General's conditions.[171]

[357] Hancock has the following to say in its 2012 Environmental Management Plan:[172]

> "3.4.4 Control strategies
> Water Level Impacts
> Under the Water Act 2000 the DEHP has authority to direct the licensee to provide and maintain alternative water supplies for other holders of water entitlements who are materially impacted.
> HCPL will develop alternate water supply agreements with landholders potentially impacted by mine dewatering and aquifer depressurisation. HCPL's commitment includes providing an altern ate water supply of comparable yield and quality. Specific actions will be based upon the following:
> - Details regarding the baseline data compi led during the bore survey of groundwater use;
> - Details from a groundwater data validation program to be undertaken on all identified at-risk bores;
> - Access to groundwater monitoring data, trend analyses, and interpretation;
> - Groundwater level data trends and comparison to Environmental Authority trigger values;
> - Groundwater monitoring using suitably qualified independent experts;
> - Implementation of make-good arrangements as soon as impacts are predicted or observed;
> - Repair or replacement of damaged bores or water supply infrastructure, if applicable;
> - A contribution to cover additional costs associated with:
>   - Larger or different pump types,
>   - Pumping from deeper depths,
>   - Additional water related infrastructure,
>   - Additional power costs, and
>   - Costs related to maintenance and spare parts for new larger or deeper set pumps.
> - Establishment of a dispute resolution system; and
> - In the absence of agreement the provision for arbitration to settle the terms of agreement.
>
> The make-good strategies to be. put in place for groundwater level impacts could include:
> - Lowering pumps within an existing borehole, or supplying pumps with a greater head capacity;

171 Hancock Submissions, 18 October 2013, paras 290 and 291.
172 Exh 85, Hancock, Environmental Management Plan pages 95-96.

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- Drilling new bores to a greater depth, e.g. to intersect the sub-E sands or deeper (sub-F) aquifers,which are not a target of dewatering by the operation and therefore are not predicted to be impacted to the degree predicted for the D-E sandstone and overlying sediments; and
- The provision of replacement bores for affected landholders will be such that the new bores are able to continue to supply water for the maximum predicted impacts of mining on water level."

[358] The Statutory Party made relevant submissions as regards make-good agreements:[173]

> "69. Mrs Anderson and Mr Currie told the Court about their fears that groundwater supplies upon which their respective businesses rely, might be adversely affected by the proposal. Their concerns are quite obviously genuine and extremely important to each of them, and to their businesses. Mr Currie emphasised that he wanted "certainty" about how his business would be affected.
>
> 70. Without diminishing in any way the power of their concerns, the security of their groundwater supply will be more than adequately ensured by the requirements imposed on the Applicant by the draft EA and the water licences that the Applicant must obtain. That is assured. The Coordinator-General has recommended conditions be attached to the water licences requiring make-good agreements be entered into. There is a mechanism in those conditions for resolving disagreements, in circumstances where a make good agreement cannot be achieved through ordinary negotiations between the Applicant and the landowner.
>
> 71. The Court can be satisfied that there will be make good agreements in place before the Applicant commences mining activities. For that reason, the Court can be satisfied that the concerns of the Andersons and the Curries will be adequately met by the conditions proposed."

[359] My difficulty with those submissions is essentially the same as my concerns relating to the baseline monitoring of bores. If the starting point of monitoring, or for the entering into of make-good agreements, is an assessment of whether or not the respective properties will be impacted in accordance with the modelling outcomes predicted in URS 2012, then, adopting a precautionary approach, the wrong question is being asked.

[360] The better question is, is there a possibility that the groundwater under the Currie and Anderson properties (and, indeed, Ms Cassoni's property) will be impacted by the Alpha mining operation?

[361] This is some of what Mr Currie has to say in this regard:[174]

> "The operational life of Alpha Coal Mine is approximately 30 years, with an applied lease of 40 years. However the predicted impact the mine will leave on groundwater supplies will be permanent and irreversible. This predicted impact on groundwater has placed a huge burden of uncertainty over the productive capacity of properties closest to the proposed Alpha mining lease. The problem of productive capacity is straight forward; cattle need to drink every day. If there is the slightest doubt about the security of groundwater in an area that relies heavily on the supply then this has an immediate impact on your operation. Put simply the productive capacity of the property is called into question.
>
> Our property "Speculation" is north-west of Alpha and west of Kevin's Corner Coal Mines. It is an extensive cattle property.
>
> …

173 Statutory Party Reply Submissions pages 21-22,
174 Currie, Reply Submissions, pages 1-4.

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Page 4 HANCOCK; (15) The Co-ordinator- General's Evaluation Report, May 2012; concluded; The various potential impacts, identified in both the EIS and SEIS have been identified and assessed. I consider those impacts to be acceptable and manageable.

CURRIE; If the Applicant's predictive modeling is wrong, and there is an impact on the Great Artesian Basin, which would impact on our property, how is that impact going to be managed? How far west will the impact extend? The applicant's research doesn't cover that possibility so if it occurs then there is currently no management plan. Such a state of groundwater management can not be regarded as acceptable, there is no management plan if an impact on the Great Artesian basin occurs.

Page 6 HANCOCK; (31). The Currie's are landholders. Their property, known as "Speculation", is outside the proposed mining lease area to the north-west of the Alpha mine.

CURRIE; That is the unenviable situation we are in, we are outside the mining lease but we are close enough that we will be impacted. Outside the proposed mining lease so the company doesn't need to purchase our property, therefore we are compelled to put our case forward so as to get security for our groundwater. The next paragraph by the Applicant in relation to groundwater highlights that fact: "Of course, uncertainties remain particularly in relation to features outside the mining lease area where more data is not available and not readily obtainable." Hancock has never been in contact with us to enquire about doing exploration drilling on our property or any other activity so as to gain more data. For our property they have based all their conclusions on predictive modeling which has been shown to have a very questionable accuracy. …

…

Hancock not being prepared or willing to date to put in place a management plan for groundwater impacts under our property raises massive suspicion and distrust of the company by us. If they are so certain of their claims regarding the mines impact on groundwater why are they resisting giving us certainty in an effective signed document?

…

These conditions need to be more stringent as implementing make-good agreements with landholders affected by groundwater drawdown needs more certainty for the landholder. Implementation of Make-Good Agreements (if you can get one from the company) with landholders effected by the groundwater drawdown, places an impossible onus of proof with the landholder. If conditions regarding groundwater supplies are not in place prior to the granting of mining leases then landholders will have NO way of getting Hancock to make good due to the lack of proof. As a neighbouring landholder, before Alpha Mine or Kevin's Corner coal mine leases are granted we need our bores base lined, so that all parties concerned know and acknowledge the initial groundwater parameters. Also effective monitoring and a Make-good agreement agreed and signed so all parties are clear on the management steps if an impact occurs. …

…

Complete certainty IS REQUIRED in one shape or another otherwise Hancock has a license to destroy our business. Hancock is arguing that they will not impact on our property, no problem, just support and back up your claims with a signed document. Demonstrate that you believe in your own research and support your own claims and put them in a binding document that gives us protection. For Hancock to now write down their research "They do not claim to provide complete accuracy or certainty", so now how accurate are their claims. How much do we believe, will we now have an increased impacted because we now fall into the inaccurate category!"

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[362] For her part, Mrs Anderson made the following submissions:[175]

> "17. The conditions in their current form lack the ability to protect Landholders, as the Applicant is only required to enter into a mutually acceptable agreement with Landholders who are affected by drawdown. Given our properties' and others' ground water quantity/and or quality will be impacted upon cumulatively, there needs to be a strengthening of these conditions so that they are effective. True water security can only be reached if the Landholders in the area have effective make good agreements in place prior to groundwater being affected so that a plan can already be in place that can be practically implemented so make good water supplies are given to livestock within a very short time period.
>
> …
>
> 21. As mentioned in paragraph 18, effective Make Good Agreements should be offered to Landholder's who will be cumulatively affected by the Alpha mine prior to Approvals to ensure make good water supplies can be quickly implemented to livestock. If a long term supply is not able to be given, then Landholder's need to be adequately compensated for any losses incurred on their business.
>
> 22. The implementation of the conditions the Co-ordinator General has made leaves a serious doubt in my mind, given our negotiations with Hancock to date. As outlined in my evidence in given in Land Court (T4-13Ln 22 to T4-14Ln20), and in my Affidavit (Exhibit 66, Doc ID OPJA.0001.000,pg 5, paragraph 12), we have gone to great lengths to negotiate with the Applicant however we are in the position now where we have been left substantial legal and hydrogeologist's expenses as well as much loss of our time trying to secure our business, yet without any success.
>
> …
>
> 25. As landholders we hope we would never have the need to implement a MGA. While my aim is not to maliciously attack the creditability of Hancock, I believe the above record of our experiences negotiating with Hancock sheds some light on why it is important effective MGA's are reached prior to groundwater quantity and quality is affected. I don't think anyone will disagree that cattle are unable to survive for 5 months without water while a MGA is negotiated on."

[363] Although Mrs Anderson's submissions relate to cumulative impacts, I am prepared to accept her submissions as also relating to possible direct impacts of the Alpha mine. This is consistent with her views on groundwater taken as a whole.

[364] For the reasons which I have set out under the groundwater topic already discussed, I believe there is sufficient doubt as to the overall impact on groundwater under the Currie and Anderson properties to warrant conditions being imposed in the ML to compel Hancock entering into make-good agreement with the Curries and Andersons, within either 12 months after the grant of ML 70426; or before the commencement of extraction activities under ML 70426; which ever is the earlier. Given Ms Cassoni's groundwater objections and submissions, I consider it appropriate that the same conditions apply to Bimblebox.

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[175] Anderson, Reply Submissions, pages 5-6.

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MCG's objections

[365] As noted earlier, MCG was a level 1 objector and as such, did not attend the hearing or provide any evidence or submissions to the hearing. MCG was content to simply rely on the contents of its objection.

[366] As regards MCG's objections relating to groundwater, surface water, economics, climate change (including ocean acidification), and ecology, in my view I have adequately dealt with those in the preceding parts of this decision.

[367] That leaves MCG's objections relating to social, dust and air quality, and mine hazard safety to be considered.

[368] Hancock has responded to each of these objections in their submissions.[176] I agree with Hancock's submissions, which I incorporate into this decision in the following paragraphs

[369] As regards social objections, the potential impacts have been assessed, considered and conditioned appropriately as follows:

(i) EIS: Vol 1, Section 5; Vol 2, Sections 20 and 27; Vol 5, Appendix M;

(ii) SEIS: Vol 2, Appendix E;

(iii) Addendum to SEIS, Appendix A;

(iv) Coordinator-General's Report: Section 10; Appendix 2, Part C, Conditions 1-13; Appendix 3, Part D, Recommendation 5; Appendix 5, pages 369 and 370.

[370] With respect to dust and air quality, the potential impacts have been assessed, considered and conditioned appropriately as follows:

(i) EIS: Vol 2, Sections 9, 13 and 21; Vol 5, Appendices H and P;

(ii) SEIS: Vol 2, Appendix P;

(iii) Addendum to SEIS, Appendix B;

(iv) EMP, Section 3.2.

(v) Air Quality Assessment Model Refinements Report.

(vi) Coordinator-General's Report: Section 5.11; Appendix 3, Part A, Schedule 2, Recommendations 4-9; Appendix 5, page 376.

[176] Hancock Submissions, 18 October 2013, para 293.

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[371] Finally, as regards the objections relating to mine hazard safety, the potential impacts have been assessed, considered and conditioned appropriately as follows:

(i) EIS: Vol 2, Sections 15 and 24; Vol 5, Appendices I and P;

(ii) SEIS: Vol 2, Appendix R;

(iii) EMP, Section 3.8;

(iv) Coordinator-General's Report: Sections 5.11 and 11.8; Appendix 3, part A, Schedule 4, Recommendations 18 and 19; Appendix 5, page 376.

MRA s 269(4) considerations for MLA 70426

[372] As already indicated, when considering Hancock's application for MLA 70426 and the MRA objections thereto, the Court must at all times be cognizant of the provisions of s.269 of the MRA. In particular, s.269(4) sets out various considerations that the Court must take into account in making a recommendation to the Honourable the Minister. I will consider each of those elements of s.269(4) separately.

[373] Before turning to the individual elements of s.269(4) of the MRA, it is essential to understand that, to save repetition, I will not repeat the detailed analysis which I have already undertaken with respect to the MRA objections under the various headings. However, I must stress that, in considering each of the criteria relevant to s 269(4) I have taken into account and considered all of the relevant MRA objections made in this matter.

Section 269(4)(a) – Have the provisions of the Act been complied with?

[374] On 21 December 2011, the Mining Registrar, Emerald, issued a Certificate of Application. The Mining Registrar can only issue the Certificate if satisfied that Hancock is eligible to apply for the mining lease and has complied with the requirements of the MRA with respect to the Application.[177]

[375] In my opinion, there is sufficient evidence of compliance with the provisions of the MRA in respect to this Application.

Section 269(4)(b) – Is the land applied for mineralised or are the other purposes for which the lease is sought appropriate?

[376] I am in no doubt from the evidence presented on behalf of Hancock that the land applied for is mineralised in that it contains significant quantities of coal.

[177] See s. 252 of the MRA.

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Section 269(4)(c) – If the land applied for is mineralised, will there be an acceptable level of development and utilisation of the mineral resources within the area applied for?

[377] I have already considered s 269(4)(c) MRA, and in particular the topic of economic mineralisation under the topic of Economics, sub heading Economic impacts, including environmental, ecological and social costs.

[378] Having considered all of the evidence presented in this matter, I am in no doubt that Hancock is entering the Alpha project acutely aware of the cost of establishing the mining operation.

[379] I am satisfied that Hancock currently believes that it will be able to operate a profitable mining operation.

[380] The material before me shows an appropriate development and utilisation of the mineral resources within the area applied for.

Section 269(4)(d) – Is the land and the surface area of that land in respect of which the mining lease is sought of an appropriate size and shape?

[381] The material before me appears to indicate a MLA, in its configuration as at the date of issue of the Certificate of Application, of an appropriate size and shape in light of the proposed mining operation.

[382] As Mr Willis said in his affidavit:[178]

> "47. The size and shape of the MLA area generally seeks to best utilise the economic mineral resources.
>
> 48. Some modifications have been made to the size and shape of the MLA area since the original MLA was lodged.
>
> 49. Hancock Coal formally abandoned 11,118 hectares from the south-east side of the original MLA area in December 2012, prior to the issue of the CPN. **Exhibit RDW-18** is a true copy of the notice of partial abandonment.
>
> 50. That land was surrendered because Hancock Coal does not currently require it for resource development or for the development of infrastructure or utilities for the Mine. A related entity of Hancock Coal has nonetheless retained the underlying tenement, Exploration Permit for Coal 1210, in case the situation changed in the future.
>
> 51. A map of the current MLA area is included in Exhibit RDW-1.
>
> 52. I believe the size and shape of the MLA area is appropriate."

[383] I am satisfied that the requirements for this criterion have been met.

[178] Exh 13 paras 47-52, page 10.

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Section 269(4)(e) – Is the term sought appropriate?

[384] The term sought for this mining lease is 40 years. As Mr Willis said with respect to this criterion:[179]

> "53. Hancock coal has sought a term of 40 years for the Mining Lease. This term is sought:
>
> (a) to accommodate the construction and operational schedule described in detail in Sections 1 and 4 of Volume 2 the EIS, and Section 2 of Volume 1 of the SEIS:
>
> (i) first coal will not be produced until Year 4, due to the time required to construct the Mine;
>
> (ii) it is expected that the coal produced in Year 4 will only be 3.8 mtpa, in Year 5 will only be 12 mtpa, in Year 6 will only be 18.1 mtpa and in Year 7 will only be 25 mtpa;
>
> (iii) the Mine will not reach full production of 30 mtpa until Year 8; and
>
> (iv) the productive life of the Mine is 30 years.
>
> (b) because construction of the Mine may not commence immediately after the Mining Lease is granted as:
>
> (i) the Mine is part of the wider Alpha Coal Project, and commencement of work on the Mine will be linked to commencement of work on the Rail and Port;
>
> (ii) further approvals will need to be obtained; and
>
> (iii) equipment and contractor arrangements, including with respect to workforce engagement, will need to be finalised; and
>
> (c) to allow for rehabilitation of the site to be carried out post-production.
>
> 54. On page ix of the Synopsis of the CG Report, the CG notes, 'The expected life of mine is 30 years, with sufficient resource to potentially extend the project life beyond 30 years.'
>
> 55. Accordingly, I believe the term sought is appropriate."

[385] I agree.

Section 269(4)(f) – Has the applicant the necessary financial and technical capabilities to carry on mining operations under the proposed mining lease?

[386] Mr Willis explained the financial and technical capabilities of Hancock this way:[180]

> "56. There was a change in ownership of Hancock Coal in September 2011. Prior to then, Hancock Coal was a wholly-owned subsidiary of Hancock Prospecting Pty Ltd (HPPL).
>
> 57. Hancock Coal is now a subsidiary of:
>
> (a) GVK Natural Resources Private Limited – through GVK Resources (Singapore) Pte Ltd, GVK Coal Developers (Singapore) Pte Ltd and GVK Coal Exploration & Production Pte Ltd (**GVK**); and
>
> (b) HPPL – through Hancock Energy Pty Ltd.

[179] Exh 13 paras 53-55, pages 10-11.
[180] Exh 13 paras 56-66, pages 11-13.

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58. In September 2011, GVK acquired various interests in the Alpha Coal Project from the Hancock Prospecting Group for $1.26 Billion USD. Those interests included a 79% share in the Mine. The Hancock Prospecting Group retained a 21% share in the Mine.

59. While the Mine is GVK's first venture into Australia, GVK is one of India's (and South-East Asia's) largest infrastructure developers, with considerable experience and expertise spanning areas such as energy, resources, airports, roads, hospitality and urban infrastructure.

60. Having already invested over USD 4.3 billion in its infrastructure business, GVK has projects worth over USD 6.6 billion in the pipeline in India alone. After acquiring the majority ownership in Australian coal and infrastructure projects in Queensland, GVK envisages an investment of approximately USD10 billion in mine, rail and port projects.

61. As noted in section 2.1 of the CG Report, HPPL is an Australian company that has engaged in mineral resources exploration and development for over 50 years, with capability encompassing iron ore, thermal coal, uranium, molybdenum, lead, zinc, gold, diamonds and petroleum. The company has a long-standing interest in developing the Galilee Basin, having held substantial coal tenements and conducted investigations in the Alpha region since the 1970s.

62. Significant work has been carried out in relation to the development of the Mine since the change in ownership in September 2011. This has included work undertaken with potential equity investors in the Mine and with the global financial markets in relation to debt funding.

63. Hancock Coal has a term of experienced people (many of them engineers) working on the development of the Mine. Areas of expertise include:

    (a) in the feasibility, development, construction and operation of mines and other large civil works;

    (b) the operation of open cut coal mines;

    (c) as General Managers of coal mines;

    (d) in mining infrastructure and utilities;

    (e) project management;

    (f) environmental science;

    (g) business development and marketing;

    (h) continuous improvement of mining operations, including environmental performance; and

    (i) community and stakeholder engagement, including social responsibility.

64. Hancock Coal is already actively engaged in negotiations:

    (a) for early contractor engagement in relation to construction of the Mine;

    (b) with potential suppliers of specialised equipment for the Mine; and

    (c) with a preferred mine operator and other specialist service providers.

65. The Alpha Coal Project's proposed coal production has been over-subscribed via letters of intent and memorandums of understanding, with an order book of potential customers covering 19 different companies in 9 different countries.

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66. Accordingly, I believe Hancock Coal has the financial and technical capability to successfully develop and operate the Mine."

[387] The evidence indicates that Hancock has the financial and technical capabilities to carry on the mining operations. I am satisfied that the requirements of this criterion are met.

Section 269(4)(g) – Has the past performance of the applicant been satisfactory?

[388] With respect to this criterion, Mr Willis said that:[181]

"67 Apart from being the Applicant for MLA 70426, Hancock Coal is the holder of Mineral Development License 285 (**MDL 285**).

68. Hancock Coal has:

(a) carried out exploration; and

(b) constructed and operated a bulk test pit,

on MDL 285.

69. In relation to the bulk test pit:

(a) the environmental authority for MDL 285 was varied on 30 June 2010, granting approving for bulk sample activities;

(b) MDA 285 was varied on 23 July 2010, granting approval for bulk sampling of up to 450,000 tonnes of run-of-mine (ROM or raw) coal;

(c) site works commenced in September 2010;

(d) coal was progressively transported from the site over the period from June to July 2011;

(e) a total of 123,000 tonnes of crushed coal was transported offsite for washing and transport to overseas customers in South Korea and China for combustion trials; and

(f) site remediation works were concluded in October 2011.

70. Hancock Coal has not bee issued with a show cause notice under the Act (or the *Environmental Protection Act 1994*) in relation to MDL 285, or had any mining tenement cancelled under the Act.

71. Accordingly, I believe the past performance of Hancock Coal is satisfactory."

[389] I am satisfied that the past performance of Hancock has been satisfactory.

Section 269(4)(h) – Will any disadvantage result to the holders of existing exploration permits or mineral development licences or existing applicants for exploration permits or mineral development licences?

[390] As Mr Willis pointed out:[182]

"72. When the MLA was lodged, the proposed ML area overlapped parts of the following mining tenements held by persons other than the Applicant:

(a) Exploration Permit for Coal (EPC) 1201; and

[181] Exh 13 paras 67-71, pages 13-14.
[182] Exh 13 paras 72-77.

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(b) Mineral Development Licence (MDL) for Coal 333.

73. At that time, EPC 1201 and MDL 333 were held by wholly-owned subsidiaries of HPPL.

74. Page 22 of Exhibit RDW-1 is a letter from HPPL acknowledging the MLA and consenting to its grant over EPC 1210 and MDL 333.

75. EPC 1210 is now held by Hancock Kevin's Corner Pty Ltd. Page 23 of Exhibit RDW-1 is a letter from Hancock Kevin's Corner Pty Ltd acknowledging the MLA and consenting to its grant over EPC 1210.

76. MDL 333 is now held by Hancock Galilee Pty Ltd. Page 24 of Exhibit RDW-1 is a letter from Hancock Galilee Pty Ltd acknowledging the MLA and consenting to its grant over MDL 333.

77. Accordingly, I do not believe any disadvantage will result to the rights of existing holders or applicants for exploration permits if the Mining Lease is granted."

[391] I agree with Mr Willis.

Section 269(4)(i) – Do the operations to be carried on under the authority of the mining lease conform with sound land use management?

[392] I have no doubt that at least some of the objectors believe that no mining operations should be undertaken on the land. Other objectors are content for the mine to proceed only if it is specially conditioned so that make-good agreements are entered into as well as baseline bore monitoring.

[393] On the other hand, it must be accepted, given the evidence in this matter, that the subject area contains a very significant amount of coal which Hancock believes it can economically mine.

[394] Although the objects of the MRA can be said to favour the grant of a mining lease, I have already addressed my concerns regarding groundwater, as well as made-good agreements and baseline bore monitoring.

[395] If following full statutory processes, Hancock is granted all necessary water licences to take and interfere with water, and on the basis that conditions as proposed by me relating to baseline bore monitoring and make good agreements are made, then and only then would I be satisfied that this criterion has been met.

Section 269(4)(j) – Will there be any adverse environmental impacts, and if so, the extent thereof:

[396] There are clear environmental concerns regarding this mining project, which is why I am recommending a precautionary approach be undertaken.

[397] If following full statutory processes, Hancock is granted all necessary water licences to take and interfere with water, and on the basis that conditions as proposed by me relating to baseline bore monitoring and make good agreements are made, then and only then would I be satisfied that this criterion has been met.

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Section 269(4)(k) – Will the public right and interest be prejudiced?

[398] Given the unsatisfactory nature of the evidence relating to groundwater, it is not in the public interest for MLA 70426 to be granted. However, if, following full statutory processes, Hancock is granted all necessary water licences to take and interfere with water, and on the basis that conditions as proposed by me relating to baseline bore monitoring and make good agreements are made, then and only then would I be satisfied that this criterion has been met.

Section 269(4)(l) – Has any good reason been shown for a refusal to grant the mining lease?

[399] Given the unsatisfactory nature of the evidence relating to groundwater, good reason has been shown for a refusal to grant the mining lease.

[400] However, as previously indicated, if, following full statutory process, Hancock is granted all necessary water licences to take and interfere with water, and on the basis that conditions as proposed by me relating to baseline bore monitoring and make good agreements are made, then and only then would I be satisfied that this criterion has been met.

Section 269(4)(m) – Is the proposed mining operation an appropriate land use taking into consideration the current and prospective uses of the land?

[401] The materials show that the project is for the extraction of a very valuable resource in accordance with the environmental processes and Coordinator-General conditions.

[402] My concerns relate to groundwater issues, make-good agreements, and baseline monitoring, all relevant not to the actual area of the MLA, but to the surrounding district.

[403] I am satisfied that the proposed mining operation is an appropriate land use of the application land.

Conclusion

[404] I am not afraid to admit that my findings and conclusions as already expressed leave me in somewhat of a conundrum as to the legal nature of the recommendations that I should properly make pursuant to the MRA and the EPA.

[405] There is no difficulty as regards baseline bore monitoring and make-good agreements with respect to the landholders' properties.

[406] My concern relates principally to my lack of confidence, from a precautionary perspective, in the groundwater evidence and, because of that, my concerns regarding the knock-on effect to ecology should the predictive groundwater modelling relied on by Hancock not be correct.

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[407] CCAQ had this to say regarding my concern:[183]

> "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."

[408] There is no doubt that s 271(A) MRA allows an MLA matter to be referred back to the Land Court. However, that step follows the Land Court first making its recommendations to the Minister and, as previously set out, that recommendation must be 1 of 3, vis

- the MLA be granted
- the MLA be rejected
- the MLA be granted on stated conditions

[409] I do not believe that it would be a proper recommendation for me to recommend acceptance of the MLA subject to the matter being referred back to the Land Court for hearing of the groundwater and related ecology matters. Such a recommendation is not a condition.

[410] I am of the opinion that, particularly after further research is undertaken by Hancock in light of the evidence of Dr Webb and Dr Mudd (and, for that matter, its own experts Mr Stewart and Mr Hair)the groundwater evidence and modelling may well be sufficient, following full Water Act processes, for Water Licences to be granted to Hancock to take and use water pursuant to s 206(1)(a) of the Water Act and to interfere with water pursuant to s 206(1)(b) of the Water Act, on such conditions, including but not limited to those recommended by the Coordinator-General, with the result that all my concerns that arise under the precautionary principle are satisfactorily answered for the purposes of my recommendations in this matter.

[411] However, as matters currently stand, I cannot be so satisfied.

[412] Given this state of affairs, I have decided to make recommendations to the Honourable the Minister responsible for the MRA in the alternative. Those recommendations are as follows:

EITHER

"That MLA 70426 be rejected"

OR

"That MLA 70426 be granted, subject to the condition that approval be subject to Hancock first obtaining licences to take, use and interfere with water under s 206(1)(a) and (b) of the Water Act such that all concerns pursuant to the precautionary principle are resolved"

[183] CCAQ Submissions, 18 October 2013, para 91 page 59.

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[413] As regards the EPA, my reasoning is the same as that for the MRA.

[414] I recommend to the Honourable the Minister responsible for the EPA in the alternative. Those recommendations are as follows:

EITHER

"That draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN101017310 – Alpha Coal Mine be refused"

OR

"That draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN101017310 – Alpha Coal Mine be granted, subject to the following conditions:

(a) that approval be subject to Hancock first obtaining licences to take, use and interfere with water under s 206(1)(a) and (b) of the Water Act such that all concerns pursuant to the precautionary principle are resolved;

(b) the draft Environmental Authority be amended by the insertion in table 15 of three additional monitoring points, one located on each of the Anderson's Currie's and Ms Cassoni's properties, with each given the parameter of water level, with at least one reading every twelve hours by electronic data reader;

and

(c) that there be a condition in the draft Environmental Authority to the effect that Hancock enter into make-good agreements with the Curries, the Andersons, and Ms Cassoni, within either twelve months of the grant of ML 70426, or before commencement of mining activities, whichever is the sooner".

Independence of the Land Court

[415] I find it unfortunate that the question of the Land Court being a "rubber stamp" under the MRA and EPA processes first raised its head at the directions hearing on 13 March 2013, and concerns in that regard continued up until CCAQ's submissions on 18 October 2013 (at least).

[416] As CCAQ said in their submissions:[184]

> "116. …
>
> (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 forum for the ventilation of argument and the rigorous testing of evidence and, after that, to make a full and frank report to the

[184] CCAQ Submissions, 18 October 2013, para 116.

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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…*

(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 Court and this Court should not shy away from fully and vigorously examining the evidence simply because of a perception of what 'Governments' want."

[417] In case anyone is in any doubt, I accept the observations of Barwick CJ from *Sinclair*.[185] I too cannot accept the proposition that the hearing of the application and of the objections is a mere formality.

[418] Further, I must stress that I do not believe that there was ever any intent by Hancock or any of its legal advisors to suggest otherwise, and that any suggestion to the contrary was mere inadvertence.

[419] I accept without reservation the assurance given by Mr Clothier QC as follows:[186]

> "MR CLOTHIER: And I'm happy too-----
>
> …
>
> MR CLOTHIER: -----clarify that immediately. That's certainly not the intention, and in response to something that Ms Kelly had to say, for example, the applicant takes this objections process very seriously and recognises the rights of objectors to object under the statutory process and recognises that your Honour certainly isn't in a position of rubber stamping an application for a mining lease. Your Honour considers the objections together with the application and makes a decision according to your Honour's oath. So I don't assert - the applicant certainly doesn't assert that there is any disentitlement of the objectors to object, to go through a full process, which will have regard to your Honour's impartial consideration of the matter and recommendation.
>
> HIS HONOUR: It just reads that way.

185 *Sinclair v Maryborough Mining Warden* (1975) 132 CLR 473 at 481.
186 T 13 March 2013 p 8 line 35 – p 9 line 15.

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> MR CLOTHIER: It shouldn't. But then, your Honour, I understand that. … We don't urge, for a moment that this is anything other than a proper and independent and transparent process, the result of which is that your Honour will make an honest recommendation according to your Honour's views, which may be in favour of granting the application and the recommendation, or maybe against it. There's no pre-emption of the outcome."

[420] To state what I hope is the obvious, I hold dear the principle of the independence of the judiciary from government. I also hold dear the Oath that I have sworn to decide all matters before me, without fear or favour, to the best of my ability.

[421] In case it is of any interest to anyone, one side of my family includes proud work in the coal mines of Ipswich, while the other side of my family worked the land growing sugar cane. As for me, it was an honour and a privilege to serve the people and government of Queensland as a public servant for over 25 years.

[422] I also do not suggest in any way that any element of government of this State or the Commonwealth has in any form whatsoever (save of course for the most proper submissions of the Statutory Party) sought to influence the outcome of this decision in any way. Nothing could be further from the truth.

Postscript and Clarification

[423] Firstly, by way of clarification, I wish to express my understanding should any of the parties (if not all of the parties) be dissatisfied with my making of recommendation in the alternative.

[424] I have not adopted this course without considerable thought, or taking into account the likely consequences.

[425] In particular, I accept that it is at least arguable that the MRA and EPA do not contemplate the making of recommendations in the alternative. However, I have followed that course cognisant of the fact that in making recommendations, the Land Court is exercising administrative power and not a power of final determination.

[426] Should it be considered, either by the Ministers, or on appeal,[187] that it was improper of me to make recommendations in the alternative, and I should instead make singular recommendations to each Minister, then my recommendations would of necessity be, in light of the precautionary principle, and however reluctantly, that MLA 70426 be rejected and the draft EA be refused.

[427] I now turn to some final comments by way of postscript.

---

[187] Should an appeal be open to any party in light of the Land Appeal Court decision of *Dunn v Burtenshaw* (2010) 31 QLCR 156.

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[428] Firstly, I apologise that this decision is so long and contains so many quotes. As the parties are aware, I understand the urgency of the matter and have sought to do the decision as quickly as possible. However, that comes at a cost. As Mark Twain so eloquently put it:[188]

> "I didn't have time to write a short letter, so I wrote a long one instead."

[429] Secondly, I apologise for the delay in completing this decision caused by the accident I suffered in December 2013 (as mentioned earlier in this decision). The parties can be assured that I profoundly wish that the accident had never occurred and I did not sustain injury.

[430] Next, I would like to thank the officers of the Supreme Court who are responsible for the behind-the-scenes operation of the eTrial and the electronic database.

[431] The fact that all material was available to me in electronic format was of immense assistance to me.

[432] Finally, I must thank the staff of the Land Court, in particular my Deputy Registrars, Keren Astill (during the period leading up to the hearing and throughout the hearing) and Greg Grodecki (post hearing), and Executive Assistant, Margaret Christison, who has typed this entire decision.

Orders

1. I recommend to the Honourable the Minister responsible for the MRA in the alternative as follows:

   EITHER

   "That MLA 70426 be rejected"

   OR

   "That MLA 70426 be granted, subject to the condition that approval be subject to Hancock first obtaining licences to take, use and interfere with water under s 206(1)(a) and (b) of the Water Act such that all concerns pursuant to the precautionary principle are resolved"

2. I recommend to the Honourable the Minister responsible for the EPA in the alternative as follows:

   EITHER

   "That draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN101017310 – Alpha Coal Mine be refused"

   OR

[188] Quote attributed to Mark Twain – see www.thequotefactory.com/quote-by/mark-twain/i-didn't-have-time-to-write-a/4679. Similar quotes are attributed to George Bernard Shaw and Blaise Pascal.

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"That draft Environmental Authority (Mining Lease) Non-Code Compliant Level 1 Mining Project Permit Number MIN 101017310 – Alpah Coal Mine be granted, subject to the following conditions:

(a) that approval be subject to Hancock first obtaining licences to take, use and interfere with water under s 206(1)(a) and (b) of the Water Act such that all concerns pursuant to the precautionary principle are resolved;

(b) the draft Environmental Authority be amended by the insertion in table 15 of three additional monitoring points, one located on each of the Anderson's Currie's and Ms Cassoni's properties, with each given the parameter of water level, with at least one reading every twelve hours by electronic data reader;

and

(c) that there be a condition in the draft Environmental Authority to the effect that Hancock enter into make-good agreements with the Curries, the Andersons, and Ms Cassoni, within either twelve months of the grant of ML 70426, or before commencement of mining activities, whichever is the sooner".

PA SMITH
MEMBER OF THE LAND COURT

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