

Submission on the  
**Chain Valley Colliery Consolidation Project**  
**(SSD-17017460)**

prepared by

Environmental Justice Australia on behalf of the Nature Conservation Council of NSW

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## **About Environmental Justice Australia**

Environmental Justice Australia (formerly the Environment Defenders Office, Victoria) is a not-for-profit public interest legal practice. We are independent of government and corporate funding. Our legal team combines technical expertise and a practical understanding of the legal system to protect our environment.

We act as advisers and legal representatives to community-based environment groups, regional and state environmental organisations, and larger environmental NGOs, representing them in court when needed. We provide strategic and legal support to their campaigns to address climate change, protect nature and defend the rights of communities to a healthy environment.

We have been providing legal advice and representation to the community for over two decades on pollution issues. We advocate for better air pollution laws at the state and federal level to protect the health of communities and the environment. Through our legal advice, law reform and community legal education services we provide support to the community to understand the health impacts of pollution sources and how to best prevent them.

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## **About Nature Conservation Council of NSW**

The Nature Conservation Council of New South Wales is the state's peak environment organisation. It represents over 160 environment groups across NSW. Together, with those environment groups, it is dedicated to protecting and conserving the wildlife, landscapes, and natural resources of NSW.

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## 1 Executive Summary

1. Environmental Justice Australia (**EJA**) acts for the Nature Conservation Council of NSW (**NCC**) and makes this submission on its behalf.
2. NCC is the peak environmental advocacy organisation in New South Wales (**NSW**). Its mission is to protect nature in NSW and create the conditions it needs to thrive.
3. This submission is made in respect of the Chain Valley Colliery Consolidation Project (**the Project**), proposed by Great Southern Energy Pty Ltd (trading as Delta Coal) (**Delta Coal**). The Project seeks to combine the existing consents of Chain Valley Colliery (**CVC**) and Mannering Colliery (**MC**), extend the life of the mines by a further two years until 2029 and enable secondary extraction in the mining areas, which are located underneath Lake Macquarie. The mines supply coal to Vales Point Power Station (**VPPS**).
4. The decision maker is the Minister for Planning (**Minister**), who has delegated his power to the Department of Planning and Environment (**Department**).
5. NCC **objects** to the Project on the basis that the cumulative impacts of the Project pose significant risks to the environment and human health, including that the Project will contribute to climate change.
6. NCC also submits that the Environmental Impact Statement (**EIS**) for the Project is inadequate and fails to provide the information lawfully required by the Secretary's Environmental Assessment Requirements (**SEARs**). Notably, the EIS is deficient in respect of the following matters:
  - a. *Air quality*
    - i. All coal that is currently extracted at CVC and MC is burned at VPPS, which releases air emissions that contribute to health impacts for the community. The EIS and Air Quality Impact Assessment (**AQIA**) does not extend to the air quality impacts caused by burning coal at VPPS, despite these impacts being 'likely impacts' of the Project. As likely impacts of the Project, they must be included in the EIS and considered and assessed by the Department. The EIS is inadequate until it properly considers these secondary impacts arising from the Project.
    - ii. The EIS and AQIA do not include an assessment of the optimal control strategies to control future levels of air pollutants and an

assessment of potential future climate conditions and their possible influence on the attainment of air quality objectives.

- iii. Additionally, the AQIA is deficient because it does not quantitatively assess all of the combustion emissions from combustion engines, such as trucks, related to the Project. The Project is seeking consent for 270 coal-laden trucks to operate from the CVC site daily and therefore the EIS must address the air quality impacts resulting from these operations.

b. *Water*

- i. The Groundwater Impact Assessment does not adequately characterise the quality of groundwater extracted from the mining operations, which will impact surface water quality.
- ii. The Groundwater Impact Assessment does not consider the potential long-term impacts that could be caused by increasing the permeability of the formations underlying Lake Macquarie as a result of mining.
- iii. The Surface Water Impact Assessment does not characterise the potential impacts to Swindles Creek and Lake Macquarie that could result from the discharge of large quantities of mine water, other than to state that no changes are anticipated. This is an unacceptable approach to impact assessment.
- iv. The Surface Water Impact Assessment does not meet the requirements of the SEARs because it does not include an assessment of any likely flooding impacts on the Project.
- v. The EIS does not satisfy the SEARs because a detailed assessment of the cumulative impacts on water has not been completed.

c. *Biodiversity*

- i. The biodiversity assessment does not fulfill the SEARs because it only extends to a review of past benthic and seagrass surveys undertaken in relation to the mines.
- ii. The biodiversity assessment does not extend to the potential for impacts to aquatic, benthic and riparian communities that could result from the large-scale pumping of groundwater from the mine and the release of that groundwater, and other industrial water, into Swindles Creek and subsequently into Lake Macquarie.
- iii. There is no detailed assessment of the potential impacts of the Project on the ecology of Swindles Creek.

d. *Subsidence*

- i. The subsidence assessment does not meet with requirements of the SEARs because it does not include a detailed qualitative assessment of the potential subsidence effects and impacts of the development.
- ii. The subsidence assessment does not evaluate the adequacy and results of past monitoring or the potential impacts to ecological receptors above the mines, such as Lake Macquarie, in the event that subsidence exceeds predicted levels.

e. *Rehabilitation*

- i. The EIS does not appear to properly address the SEARs regarding rehabilitation, which requires the EIS to address the measures which would be put in place for the long-term protection and/or management of the site and any biodiversity offset areas postmining.
- ii. The EIS does not detail a program for ongoing monitoring of potential future subsidence, nor mitigations should the level of subsidence in the future exceed predictions.

f. *Greenhouse gas emissions*

- i. The Greenhouse Gas and Energy Assessment (**GHGEA**) does not explain the technical bases for the calculations of the fugitive greenhouse gas (**GHG**) emissions, quantify gases liberated by mine depressurisation systems that are not captured by the mine ventilation systems or assess the feasibility of capturing and burning the fugitive methane emissions caused by mine depressurisation.
- ii. The EIS fails to propose conditions or measures to minimise the Scope 3 GHG emissions assessed in the GHGEA.
- iii. The GHGEA fails to assess the likely impacts of GHG emissions from the Project in contributing to climate change.

g. *Health*

- i. The EIS does not properly assess the likely health impacts of the Project because it fails to take into consideration the air pollution caused by burning the coal extracted from the mines at VPPS.
- ii. The EIS does not consider the health impacts caused by climate change as a result of Scope 3 GHG emissions.
- iii. The EIS therefore does not adequately assess the likely risks to public safety or undertake an adequate health risk assessment that considers the adverse effects from human exposure to acute and cumulative Project-related environmental hazards arising from air emissions from VPPS.

h. *Social*

- i. The EIS does not adequately address health and wellbeing as part of the social impact assessment of the Project as it does not extend to all the 'likely impacts' of the Project, namely: health impacts and the social impacts of climate change. In this sense, the social impact assessment is not responsive and proportionate to the scale and nature of the cumulative impacts of the Project, and therefore has not been conducted in accordance with the SEARs, which require a *detailed* assessment of how the Project might affect people's way of life, community, health and wellbeing, among other things.

i. *Traffic*

- i. The Traffic Assessment is out of date and does not provide a detailed route for transportation of coal by truck to the Port of Newcastle, particularly with respect to roads near residential areas or schools. It is therefore not possible on the information before the Department to properly consider the likely impacts of the Project on the capacity, condition, safety and efficiency of the local and regional road network and what, if any, conditions of consent should apply to the Project having regard to potential truck movements.

7. NCC submits that on the basis of the information provided in the EIS, the Department cannot be satisfied that the environmental, social and economic impacts of the Project are positive or that the Project is consistent with the public interest and the principles of ecologically sustainable development.
8. **Appendix A** to this submission comprises the expert report of Gordon Johnson. Mr. Johnson was commissioned to provide his expert opinion in relation to the following aspects of the EIS:
  - a. Ground water;
  - b. Surface water;
  - c. Subsidence;
  - d. Biodiversity;
  - e. GHG emissions; and
  - f. Mine closure and rehabilitation.



## 2 Relevant Matters to be Considered

9. The Minister must exercise his powers for the purpose of achieving the objects of the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**) as are relevant to his decision.<sup>1</sup>

10. The objects of the EP&A Act are set out in section 1.3 as follows:

### 1.3 Objects of Act

(cf previous s 5)

The objects of this Act are as follows—

- (a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,
- (b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,
- (c) to promote the orderly and economic use and development of land,
- (d) to promote the delivery and maintenance of affordable housing,
- (e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,
- (f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),
- (g) to promote good design and amenity of the built environment,
- (h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,
- (i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,
- (j) to provide increased opportunity for community participation in environmental planning and assessment.

11. The Project is a state significant development. The Minister, as the consent authority, has the function of determining the Project in accordance with section 4.38 of the EP&A Act, which provides as follows:<sup>2</sup>

- (1) The consent authority is to determine a development application in respect of State significant development by—
  - (a) granting consent to the application with such modifications of the proposed development or on such conditions as the consent authority may determine, or
  - (b) refusing consent to the application.

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<sup>1</sup> *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**) s 2.1.

<sup>2</sup> *Ibid* s 4.38(1).

12. The function to grant or refuse consent must be exercised by reference to the matters in section 4.15 of the EP&A Act. Section 4.15(1) states:

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application—

- (a) the provisions of—
  - (i) any environmental planning instrument, and
  - (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and
  - (iii) any development control plan, and
  - (iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and
  - (iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),  
that apply to the land to which the development application relates,
- (b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,
- (c) the suitability of the site for the development,
- (d) any submissions made in accordance with this Act or the regulations,
- (e) the public interest.

## 2.1 Section 4.15(1)(a)(i): relevant environmental planning instrument – the Resources and Energy SEPP

13. Environmental planning instruments made under Division 3.3 of the EP&A Act are called a State environmental planning policy or SEPP.<sup>3</sup> Relevantly for this application is the *State Environmental Planning Policy (Resources and Energy) 2021* (NSW) (**Resources and Energy SEPP**) which regulates the consideration and determination of a development application for specified development, being development for the purposes of mining, petroleum production or extractive industries.<sup>4</sup>

14. The Resources and Energy SEPP repealed and replaced the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (NSW) (**Mining SEPP**).

15. Clause 2.20 of the Resources and Energy SEPP provides as follows:

- (1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following—

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<sup>3</sup> Ibid s 3.13(2).

<sup>4</sup> *State Environmental Planning Policy (Resources and Energy) 2021* (NSW) (**Resources and Energy SEPP**) cl 2.1.

- (a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,
  - (b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,
  - (c) that greenhouse gas emissions are minimised to the greatest extent practicable.
- (2) Without limiting subsection (1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.

16. Clause 2.20 replicates clause 14 of the Mining SEPP, which has been the subject of judicial consideration.<sup>5</sup> In particular, we note the following matters in relation to clause 2.20:

- a. It is for the proponent to propose conditions that would ensure that the impacts specified in clause 2.20(1)(a) and (b) and GHG emissions are minimised to the greatest extent practicable. Clause 2.20 does not impose an obligation on the consent authority to devise conditions, rather the obligation is to consider whether the Project and any proposed conditions have that effect.<sup>6</sup> In *KEPCO Bylong Australia Pty Ltd v Independent Planning Commission (No 2)* [2020] NSWLEC 179, Pain J found:<sup>7</sup>

The IPC as an independent consent authority considers what is proposed by a proponent and determines whether that is acceptable or not, based on a large number of factors in this case, and therefore whether development consent ought to be granted subject to conditions. It is not generally the job of the independent body to repair gaps in the application before it.

- b. The decision-making process is a singular, holistic decision-making process not a two-stage process.<sup>8</sup> The process “involves the weighing of conflicting considerations and results in a choice along a spectrum of permissible modifications and conditions.”<sup>9</sup>
- c. The reference to GHG emissions includes “downstream emissions” which are also known as Scope 3 emissions.<sup>10</sup>
- d. The language in clause 2.20(2) regarding policies, programs or guidelines is sufficiently general that it is open to the consent authority to determine what documents fall within it and there is no requirement that they be “directly relevant to assessing an assessment of GHG emissions”.<sup>11</sup>

17. Clause 2.22(1) of the Resources and Energy SEPP deals with transport and provides:

Before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following—

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<sup>5</sup> Ibid cl 2.20.

<sup>6</sup> *KEPCO Bylong Australia Pty Ltd v Bylong Valley Protection Alliance Inc* [2021] NSWCA 216 at [51].

<sup>7</sup> *KEPCO Bylong Australia Pty Ltd v Independent Planning Commission (No 2)* [2020] NSWLEC 179 at [83].

<sup>8</sup> *KEPCO Bylong Australia Pty Ltd v Bylong Valley Protection Alliance Inc* [2021] NSWCA 216 at [25-28].

<sup>9</sup> Ibid [28].

<sup>10</sup> Ibid [179].

<sup>11</sup> Ibid [65].

- (a) require that some or all of the transport of materials in connection with the development is not to be by public road,
- (b) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,
- (c) require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.

## 2.2 Section 4.15(1)(b): likely impacts – general principles

18. In addition to the provisions of any relevant environmental planning instrument, section 4.15 of the EP&A Act requires that in determining the Project, the Minister must take into account the likely environmental impacts of the development, the likely social impacts and the economic impacts in the locality of the Project.<sup>12</sup>

19. Section 4.15 of the EP&A Act is the statutory successor of former section 79C(1) and, before then, section 90(1) of the EP&A Act. *In Parramatta City Council v Hale* (1982) 47 LGRA 319 at [340], Justice Moffitt considered the application of section 90(1) and said:

The obligation is to take into consideration (a) to (s) matters which are in fact relevant, and not those which the authority or its officers considers relevant. By remaining ignorant of relevant environmental matters, an authority could not avoid its obligation to consider and, in its ignorance, give a valid consent without considering harm (not de minimis) to the environment which in fact fell within (b). Accordingly, despite the absence of a direct obligation to do so, the requirement of s. 90(1) to consider carries with it an indirect obligation, which rests upon the authority to acquaint itself with such material as will permit it to consider such s. 90(1) matters as are in fact material. Thus, if it is to consider the impact of the development upon the environment, if is [sic] to consider whether it is likely to cause harm, if it is to consider the ways the environment may be protected or, if it is to consider the ways likely harm may be mitigated, it must be aware of each of these matters, namely, what is the impact, the likely harm and the ways to protect or mitigate.

20. Therefore, the Minister is obliged to acquaint himself with such material as will permit him to consider the likely impacts of the development. He is not confined to the material placed before him by Delta Coal and, where likely impacts are in issue, the Minister must be aware of the impact, the likely harm and the ways to protect or mitigate.

21. The expression ‘likely impact’ has been considered by the Court. An impact is ‘likely’ if there is a ‘real chance or possibility’ of the impact whether or not the impact is ‘more probable than not’: *Hoxton Park Residents Action Group Inc v Liverpool City Council* (2011) 184 LGERA 104 at [43]-[47].

22. A ‘likely impact’ requires consideration of both direct on-site impacts and the direct and indirect off-site impacts of the proposed development: *Mullaley Gas and Pipeline Accord Inc v Santos NSW (Eastern) Pty Ltd* [2021] NSWLEC 110 at [140] (**MGPA v Santos**).

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<sup>12</sup>EP&A Act s 4.15(1)(b).

23. In *MGPA v Santos* at [141]-[144], Chief Justice Preston outlined the meaning of ‘off-site impacts’:

141 Off-site impacts can be caused by the proposed development directly impacting adjoining land or other land in an area of influence, neither land being land on which the development is to be carried out. Off-site impacts can also be caused indirectly by some other development on other land, provided that the impacts of that other development have “a real and sufficient link” with the proposed development, such as where the impacts are caused by “some further undertaking that is ‘inextricably involved’ with the proposed development”: *Bell v Minister for Urban Affairs and Planning* (1997) 95 LGERA 86 at 101; *Environmental Defence Society Inc v South Pacific Aluminium (No 4)* [1981] 1 NZLR 530 at 534-535; *Ballina Shire Council v Palm Lake Works Pty Ltd* at [6].

142 As the Full Federal Court of Australia held in *Minister for Environment and Heritage v Queensland Conservation Council* (2004) 139 FCR 24; [2004] FCAFC 190 at [53], the impact of an action includes not only the direct but also the indirect influences or effects of the action:

“‘Impact’ in the relevant sense means the influence or effect of an action: Oxford English Dictionary, 2nd ed, vol VII, 694-695. As the respondents submitted, the word “impact” is often used with regard to ideas, concepts and ideologies: “impact” in its ordinary meaning can readily include the “indirect” consequences of an action and may include the results of acts done by persons other than the principal actor. Expressions such as “the impact of science on society” or “the impact of drought on the economy” serve to illustrate the point. Accordingly, we take s 75(2) to require the Minister to consider each way in which a proposed action will, or is likely to, adversely influence or effect the world heritage values of a declared World Heritage property or listed migratory species. As a matter of ordinary usage that influence or effect may be direct or indirect. “Impact” in this sense is not confined to direct physical effects of the action on the matter protected by the relevant provision of Pt 3 of Ch 2 of the EPBC Act [Environment Protection and Biodiversity Conservation Act 1999]. It includes effects which are sufficiently close to the action to allow it to be said, without straining the language, that they are, or would be, the consequences of the action on the protected matter.”

143 The Court later indicated that “‘all adverse impacts’ includes each consequence which can reasonably be imputed as within the contemplation of the proponent of the action, whether the consequences are within the control of the proponent or not.” (at [57]): see also *Gloucester Resources* at [495]-[496].

144 As I noted in *Ballina Shire Council v Palm Lake Works Pty Ltd* at [7]-[8]:

“The critical factor is that there is a connection between the likely impact and the proposed development. This is because the category of relevant matters required to be considered is “the likely impacts of that development”. As Basten JA held in *Hoxton Park Residents Action Group Inc v Liverpool City Council* (2011) 81 NSWLR 638; [2011] NSWCA 349 at [44]:

‘The impact must be one flowing from the development the subject of the development application: the question is how remote a ‘likely’ impact must be, in order to disqualify it from the scope of the consideration.’

Increasing remoteness in the chain of likely consequences will decrease the significance of an impact. This flows from both the concept of “impact” and the concept of “likely”. As Basten JA held in *Hoxton Park Residents Action Group Inc v Liverpool City Council* at [46]:

‘Some such limitation must follow from the concept of ‘impact’: as remoteness from the development increases, impact is likely to decrease, until it no longer has practical significance in terms of approving or refusing to approve the application. Further, the likelihood of a particular impact may diminish with remoteness. ‘Likely’ in this context has the meaning of a ‘real chance or possibility’ rather than more probable than not...’.

24. It is NCC’s submission that the EIS for the Project does not adequately consider all of the ‘likely impacts’ of the Project. In particular, the EIS does not consider the likely impacts caused by the burning of the coal extracted at CVC and MC at VPPS.

Burning the coal will create the following likely impacts:

- a. impacts on air quality due to the release of air emissions – including air pollutants such as nitrogen oxides (**NO<sub>x</sub>**), sulfur dioxide (**SO<sub>2</sub>**), coarse particles (**PM<sub>10</sub>**), fine particles (**PM<sub>2.5</sub>**) and mercury;
- b. impacts on health due to the release of the above air emissions; and
- c. impacts on social perceptions and community sentiment related to the Project.

25. It is NCC’s submission that the Project is sufficiently linked to the operations at VPPS, such that the impacts of those operations are connected to the Project. They are indirect off-site impacts of the Project that must be properly assessed and considered by the Department along with the other likely impacts of the Project.

### 2.3 Section 4.15(1)(d): submissions made in accordance with the EP&A Act or the Regulations

26. The Department must consider any submissions made in accordance with the EP&A Act or the *Environmental Planning and Assessment Regulation 2021 (NSW) (EP&A Regulation)*.<sup>13</sup>

### 2.4 Section 4.15(1)(e): the public interest

27. The Minister must also consider the public interest.<sup>14</sup>

28. The Courts have held that in order to determine the public interest of a development proposal there must be a consideration of the principles of ecologically sustainable development (**ESD**), including during the merits assessment stage of proposed projects.<sup>15</sup>

29. Further, the ‘public interest’ extends to and includes community responses to the Project.<sup>16</sup> As noted at paragraph [10], the objects of the EP&A Act include:

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<sup>13</sup> EP&A Act s 4.15(1)(d).

<sup>14</sup> Ibid s 4.15(1)(e).

<sup>15</sup> *Telstra Corp Ltd v Hornsby Shire Council* (2006) 146 LGERA 10 at [124]; *Minister for Planning v Walker* (2008) 161 LGERA 423 at [42]-[43]; *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347 at [58].

<sup>16</sup> *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347 at [63].

- a. to facilitate ESD by integrating relevant economic, environmental and social considerations in decision-making;<sup>17</sup> and
- b. to promote the social and economic welfare of the community and a better environment,<sup>18</sup> and to provide increased opportunity for community participation in environmental planning and assessment.<sup>19</sup>

30. The EP&A Act refers to the definition of ecologically sustainable development found in the *Protection of the Environment Administration Act 1992* (NSW) (**POEA Act**) which is as follows:<sup>20</sup>

...ecologically sustainable development requires the effective integration of social, economic and environmental considerations in decision-making processes...

31. The Minister must undertake a balancing exercise that weighs the social, economic and environmental benefits and disbenefits to determine whether the Project should proceed.<sup>21</sup>

32. The principles of ESD are set out in section 193 of the EP&A Regulation.<sup>22</sup> Each principle of ESD is considered below.

#### 2.4.1 The precautionary principle

33. The EP&A Regulation provides the following in relation to the precautionary principle:<sup>23</sup>

- (2) The precautionary principle is that if 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.
- (3) In applying the precautionary principle, public and private decisions should be guided by—
  - (a) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
  - (b) an assessment of the risk-weighted consequences of various options.

34. In *Telstra Corporation Limited v Hornsby Shire Council* (2006) 67 NSWLR 256 (**Telstra**) at [128], Chief Justice Preston explains how the precautionary principle is triggered, its two fundamental conditions and the concept of a proportionate response:

The application of the precautionary principle and the concomitant need to take precautionary measures is triggered by the satisfaction of two conditions precedent or thresholds: a threat of serious or irreversible environmental damage and scientific uncertainty as to the environmental damage. These conditions or thresholds are cumulative. Once both of these conditions or thresholds are satisfied, a precautionary measure may be taken to avert the anticipated threat of environmental damage, but it should be proportionate.

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<sup>17</sup> EP&A Act s 1.3(b).

<sup>18</sup> Ibid s 1.3(e).

<sup>19</sup> Ibid s (j).

<sup>20</sup> *Protection of the Environment Administration Act 1992* (NSW) s 6(2).

<sup>21</sup> *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Ltd* (2013) 194 LGERA 347 at [36].

<sup>22</sup> *Environmental Planning and Assessment Regulation 2021* (NSW) (**EP&A Regulation**) s 193.

<sup>23</sup> Ibid s 193(2)-(3).

35. Notably, *Telstra* also established that at the point that the precautionary principle is satisfied (being when there is a threat of serious or irreversible environmental damage and there is the requisite degree of scientific uncertainty), there is a shifting of the evidentiary burden of proof such that:<sup>24</sup>

A decision-maker must assume that the threat of serious or irreversible environmental damage is no longer uncertain but is a reality. The burden of showing that this threat does not in fact exist or is negligible effectively reverts to the proponent of the economic or other development plan, programme or project.

The preference is to prevent environmental damage, rather than remediate it. The benefit of the doubt is given to environmental protection when there is scientific uncertainty. To avoid environmental harm, it is better to err on the side of caution.

#### 2.4.2 Intergenerational equity

36. The EP&A Regulation sets out the principle of intergenerational equity as follows:<sup>25</sup>

... that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

37. Intergenerational equity involves both intergenerational equity – equity *between* the needs of the present and future generations – and intragenerational equity – equity *within* the present generation and its needs.<sup>26</sup> The needs that are to be equitably shared relate to the three components of ESD: economic development, social development and environmental protection. That is, equity extends to the maintenance, enhancement and protection of the environment and is not confined to the use or exploitation of natural resources.

38. In *Gloucester Resources Limited v Minister for Planning* (2019) 234 LGERA 257 (**Rocky Hill**), Chief Justice Preston explained that even after rehabilitation of a mine, the environmental, social and economic burdens will continue after the closure of the site. At [415] he stated:

The economic and social benefits of the Project will last only for the life of the Project (less than two decades), but the environmental, social and economic burdens of the Project will endure not only for the life of the Project but some will continue for long after. The visual impact of the Project, even after mining rehabilitation, will continue...The social impacts on culture and community, especially for the Aboriginal people whose Country has been mined, will persist... A sacred cultural land created by the Ancestors of the Aboriginal people cannot be recreated by mine rehabilitation. As discussed below, the Project will emit greenhouse gases and contribute to climate change, the consequences of which will burden future generations.

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<sup>24</sup> *Telstra Corporation Limited v Hornsby Shire Council* (2006) 67 NSWLR 256 at [150]-[151].

<sup>25</sup> EP&A Regulation s 193(4).

<sup>26</sup> *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256, 267 [116]-[117].



### 2.4.3 Conservation of biological diversity and ecological integrity

39. The EP&A Regulation defines the principle of the conservation of biological diversity and ecological integrity in the following way:<sup>27</sup>

The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

40. In *Bentley v BGP Properties Pty Ltd* (2006) 145 LGERA 234, Chief Justice Preston stated the following on the principle of ecological integrity:

[60] At a macro level, ecological integrity involves conservation of the ecological processes that keep the planet fit for life. They “shape climate, cleanse air and water, regulate water flow, recycle essential elements, create and recreate soil, and enable ecosystems to renew themselves...

[61] Maintaining ecological integrity involves maintaining ecosystem health. Ecosystems become unhealthy if their community structure (species richness, species composition or food web architecture) or ecosystem functioning (productivity, nutrient dynamics, decomposition) has been fundamentally upset by human pressures...

[62] Maintaining ecological integrity also involves maintaining ecosystem functioning and ecosystem services....

### 2.4.4 The polluter pays principle

41. Section 193(6) of the EP&A Regulation provides:

The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as—

- a) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and
- b) the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and
- c) established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

42. In *Bentley v BGP Properties Pty Ltd* (2006) 145 LGERA 234, Chief Justice Preston commented at [157]:

The fourth pillar of ecologically sustainable development is the internalisation of external environmental costs. Ecologically sustainable development requires accounting for the short term and long term, external environmental impacts of development. One way in which of doing so is by adoption of the user pays or polluter pays principle: J Moffet and F Bregha, “The Role of Law Reform in the Promotion of Sustainable Development”, (1997) 6 *Journal of Environmental Law and Practice* 1 at 7.

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<sup>27</sup> EP&A Regulation s 193(5).

43. This was qualified further in *Director-General, Department of Environment and Climate Change and Water v Venn* [2011] NSWLEC 118, where Chief Justice Preston stated at [328]:

The principle requires the polluter to take responsibility for the external costs to the environment and the community arising from its pollution. This can be done by the polluter cleaning up the pollution and restoring the environment as far as practicable to the condition it was in before being polluted. The polluter ought also to make reparation for any irreparable harm caused by the polluter's conduct such as death of biota and damage to ecosystem structure and functioning: *Environment Protection Authority v Waste Recycling and Processing Corp* [2006] NSWLEC 419; (2006) 148 LGERA 299 at [230] and see also *Bentley v BGP Properties Pty Ltd* [2006] NSWLEC 34; (2006) 145 LGERA 234 at [70], [157]

44. Ultimately, the responsibility to provide for the remediation of any ongoing environmental harm caused by the Project must be borne by Delta Coal.

### 3 Environmental Impacts and Consideration

#### a. Air quality impacts

45. The EIS outlines that air quality will be impacted by the Project in the following ways:<sup>28</sup>

- a. the conveying and transfer of coal, coal sizing and screening, front end loaders pushing coal and hauling coal will generate total suspended particulates (**TSP**), coarse particles ( $PM_{10}$ ) and fine particles ( $PM_{2.5}$ );
- b. wind erosion of exposed areas will cause TSP,  $PM_{10}$  and  $PM_{2.5}$ ;
- c. construction activities during the life of the mine have the potential to generate dust emissions;
- d. the outflow from upcast ventilation shafts has the potential to cause odour impacts;
- e. the combustion of diesel by mining equipment will result in emissions of particulate matter (primarily  $PM_{2.5}$ ),  $NO_x$ ,  $SO_2$ , carbon monoxide, carbon dioxide (**CO<sub>2</sub>**) and assorted volatile organic compounds (**VOCs**).

46. We note that the AQIA<sup>29</sup> prepared by EMM has not been prepared in accordance with the Environment Protection Authority's (**EPA**) recently revised *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2022) (**Approved Methods for Modelling 2022**). It is therefore unclear whether the methodologies adopted in the AQIA are consistent with the Approved Methods for Modelling 2022 and how this may impact the conclusions reached in the EIS regarding air quality impacts. Nevertheless, based on the information contained in the AQIA and EIS, we make the following submissions with respect to air quality impacts and the management and mitigation of air quality impacts at CVC and MC.

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<sup>28</sup> Chain Valley Colliery Consolidation Project, Environmental Impact Statement September 2022 (**EIS**), 6.4.1, p 89.

<sup>29</sup> EIS, Appendix 8.

### 3.1.1 Air quality impact assessment does not consider all 'likely impacts'

47. Fundamentally, the EIS is flawed because it does not consider the impact that burning the coal that is extracted from the CVC and MC at VPPS will have on air quality. NCC submits that this is a 'likely impact' of the project and must be considered by the Department in its assessment of the Project.

48. We refer to paragraphs [23] and [24] above and submit that per *MGPA v Santos*, off-site impacts can be caused indirectly by some other development on other land (such as VPPS), provided that the impacts of that other development have 'a real and sufficient link' with the proposed development. For example, a real and sufficient link can be established where the impacts are caused by "some further undertaking that is 'inextricably involved' with the proposed development".<sup>30</sup>

49. It is evident from the EIS that there is a real and sufficient link between the Project (i.e. operations at CVC and MC), and VPPS. Section 1 of the EIS outlines the integrated nature of CVC and MC with VPPS. It provides the following:<sup>31</sup>

- a. that CVC and MC are owned and operated by Great Southern Energy Pty Ltd (trading as Delta Coal);
- b. that Sunset Power International Pty Ltd, trading as Delta Electricity, owns and operates VPPS;
- c. that all coal from CVC and MC is currently supplied to VPPS, 'due to proximity to VPPS and common ownership';<sup>32</sup>
- d. that coal is transported from the mines to VPPS via rail, road or overland conveyor;
- e. that 'the owners of both Delta Coal and Delta Electricity are seeking to maximise the use of the Delta Coal assets to supply coal to the VPPS'; and
- f. that 'this extension would align the life of mining operations at both CVC and MC with the planned operational period of the VPPS'.

50. The EIS makes it very clear that one of the key objectives of the project is to 'align the Delta Coal extraction and production rates with the requirements of the VPPS'.<sup>33</sup> It also outlines that the Project would provide the following 'key benefits':<sup>34</sup>

- align production from the combined operations with the planned life of operations of the VPPS (to the end of 2029)
- provide VPPS with a cost effective and reliable supply of coal for the life of the VPPS operations.

51. It goes on to justify the Project on the basis that it aligns with the current operational requirements of VPPS. The EIS provides the following (emphasis added):<sup>35</sup>

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<sup>30</sup> *Mullaley Gas and Pipeline Accord Inc v Santos NSW (Eastern) Pty Ltd* [2021] NSWLEC 110 at [141]; *Bell v Minister for Urban Affairs and Planning* (1997) 95 LGERA 86 at [101]; *Environmental Defence Society Inc v South Pacific Aluminium (No 4)* [1981] 1 NZLR 530 at [534]-[535]; *Ballina Shire Council v Palm Lake Works Pty Ltd* at [6].

<sup>31</sup> EIS, 1.0, p. 1.

<sup>32</sup> *Ibid.*, 2.4, p. 38.

<sup>33</sup> *Ibid.*, 1.1, p. 2.

<sup>34</sup> *Ibid.*, 1.2, p.3.

<sup>35</sup> *Ibid.*, 7.2, p. 161.

The Project is a logical business decision for Delta Coal, **aligning the existing Delta Assets in order to provide for a local secure coal supply that aligns with the current operational requirements of the VPPS**. While the Delta Coal operations will not meet all of the VPPS demand, the ability to obtain a large percentage of VPPS coal via a local, reliable and cost-effective supply reduces VPPS's exposure to price fluctuations and supply chain restrictions. This in turn assists VPPS in supplying reliable and cost-effective electricity generation to NSW...

Should the Project not be approved, VPPS would be required to source all coal from at least 2028 onwards (and likely from 2026) from other sources.

**Coal sourced from other operations would be less suited to the design specifications of the VPPS operations which were specifically designed around the use of coal from the Wallarah, Great Northern and Fassifern coal seams.** The use of externally sourced coal would require additional rail movements between mines in NSW and the VPPS rail handling facilities. This would also expose the VPPS to cost fluctuations and potential supply uncertainty in the event of supply chain disruptions. The transport and handling of externally sourced coal also involved additional noise and air quality impacts. The improved operational efficiencies associated with the management of the CVC and MC operations as a single operation, **extended life of operations aligning with the planned VPPS operating life and ability to manage production rates between the two pit tops significantly reduces supply risks for VPPS.**

52. Moreover, Delta Coal and Delta Electricity are subsidiary companies of Delta Electricity Pty Ltd. Each of these entities are therefore related within a vertically integrated business model. This is acknowledged in the EIS as providing rationale for the Project. It states:<sup>36</sup>

Due to proximity to VPPS and common ownership, all of the coal produced at CVC and MC is currently supplied to the VPPS. Coal resource from the Fassifern and Great Northern seams mined at CVC and MC is known to have a low sulphur content, making it a preferable supply for power generation.

53. Based on the integrated nature of CVC and MC with VPPS, it is evident that the Project has a real and sufficient link to VPPS, such that the impacts on air quality caused by VPPS are ones that 'flow' from the Project. They are therefore 'likely impacts' of the Project and must be considered as part of the environmental impact assessment of the Project because they are 'likely impacts' of the Project.
54. Currently, the EIS and AQIA does not extend to the air quality impacts caused by burning coal at VPPS. For example, emissions from coal combustion such as NO<sub>x</sub>, SO<sub>2</sub>, VOCs and coarse and fine particulates are not addressed by the AQIA. The EIS does not consider the secondary air quality impacts of the Project caused by VPPS. It should consider these collectively with the other direct air quality impacts of the Project.
55. Finally, it appears that Delta Coal's position is that coal sourced from CVC and MC has low sulphur content and that coal sourced from 'other operations would be less well suited for burning at VPPS'<sup>37</sup> as VPPS operations were 'specifically designed' for coal

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<sup>36</sup> Ibid, 2.4, p. 38-39.

<sup>37</sup> Ibid, p 40.

from CVC and MC.<sup>38</sup> Delta does not otherwise specify in what respects the coal from CVC and MC is more suited to VPPS or how VPPS is 'specifically designed' for this coal. It is also NCC's understanding that VPPS already does rely on coal from other sources. It is not clear whether Delta Coal relies on this position to assert that higher sulphur content coal or allegedly 'less well suited' coal would result in increased air emissions or environmental impact. Regardless, we note that the AQIA (or GHGEA) does not appear to provide any information that supports Delta Coal's position.

56. This same 'substitution argument' was addressed in *KEPCO Bylong Australia Pty Ltd v Bylong Valley Protection Alliance Inc* [2021] NSWCA 216 (*Kepeco*). *Kepeco* examined a decision of the Independent Planning Commission (**IPC**) to refuse a thermal coalmine in the Bylong Valley. In that assessment process, KEPCO asserted that if the Project was refused, it would need to secure an alternative source of coal elsewhere. It stated the following:<sup>39</sup>

...if such coal is not readily available, KEPCO's power stations will continue to operate and will rely (and will probably need to rely) on substituted coal to ensure that its energy supply is not compromised. The use of lower quality coal in these power generation facilities will lead to a poorer environmental outcome...

If KEPCO is required to obtain substituted coal supplies, it is likely to have a higher ash and sulphur content and will be sourced from countries such as Indonesia. This will have an adverse effect on the Australian and New South Wales economies and the Korean environment.

57. The IPC determined that there was no evidence before it to determine whether KEPCO would secure an alternative source of coal of inferior quality. The IPC was not satisfied the information supplied with the application was rationally capable of supporting KEPCO's assertion.<sup>40</sup> The Court upheld the IPC's decision and found that 'no evidence' means 'no evidence capable of satisfying [the tribunal] on the issues in question.'<sup>41</sup> It is NCC's submission that in assessing the Project and Delta Coal's substitution argument, the Department should find that there is similarly no evidence before it to accept Delta Coal's position.

58. Based on the EIS in its current form, the Department cannot be satisfied that the EIS properly considers all likely impacts of the Project. It is NCC's submission that the Department cannot properly assess the Project until further information is provided by Delta Coal.

### 3.1.2 Other deficiencies with the air quality impact assessment

59. We make the following additional submissions with respect to the way that air quality impacts are assessed for the Project.

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<sup>38</sup> Ibid, p 161.

<sup>39</sup> *KEPCO Bylong Australia Pty Ltd v Bylong Valley Protection Alliance Inc* [2021] NSWCA 216 at [72]-[74].

<sup>40</sup> Ibid [Headnote 8].

<sup>41</sup> Ibid at [79].

60. The AQIA models and assesses air quality impacts against the NSW assessment criteria, being the standards contained within the *National Environment Protection (Ambient Air Quality) Measure (NEPM AAQ)*. Those standards are as follows:

Pollutant	Averaging Period	Criterion	Goal for PM <sub>2.5</sub> from 2025
Particulate matter (PM <sub>10</sub> )	24-hour	50 µg/m <sup>3</sup>	-
	Annual	25 µg/m <sup>3</sup>	-
Particulate Matter (PM <sub>2.5</sub> )	24-hour	25 µg/m <sup>3</sup>	20 µg/m <sup>3</sup>
	Annual	8 µg/m <sup>3</sup>	7 µg/m <sup>3</sup>
Total Suspended Particulate (TSP) matter	Annual	90 µg/m <sup>3</sup>	-

**Table 1: NEPM AAQ assessment criteria**

61. The AQIA models two operational scenarios at the Project site:

- a. Scenario 1 – coal handling at the maximum approved rate of 2.8 Mt from MC; and
- b. Scenario 2 – MC operating at a coal handling rate of 1.3 Mt simultaneously with CVC operating at a coal handling rate of 1.5 Mt (for a total maximum approved rate of 2.8 Mt).

62. The AQIA concludes that based on the air dispersion and modelling results, both the predicted concentrations and deposition rates for incremental particulate matter (TSP, PM<sub>10</sub>, PM<sub>2.5</sub> and dust deposition) are below the applicable impact assessment criteria at all assessment location of the Project for both emission scenarios. It also concludes that the cumulative impacts and cumulative concentrations and deposition rates for all air pollutants and averaging periods are below the applicable NEPM AAQ assessment criteria.

63. However, whilst the cumulative concentration and deposition results are within the NEPM AAQ criteria, we point out that this is only *just* the case for PM<sub>10</sub> based on the 24-hour averaging period. For Scenario 1, PM<sub>10</sub> is predicted to reach as high as 44.9µg/m<sup>3</sup> at receptor R12, located in the residential area Kingfisher Shores and concerningly, 44.8µg/m<sup>3</sup> at Mannering Park Public School. Similarly, for Scenario 2, PM<sub>10</sub> is predicted to reach as high as 48.9µg/m<sup>3</sup> at Kingfisher Shores and 44.8µg/m<sup>3</sup> at Mannering Parl Public School. We note that 48.9µg/m<sup>3</sup> is above the 2021 World Health Organisation’s (WHO) recommended 2021 Global Air Quality Guidelines.

64. The WHO's 2021 Global Air Quality Guidelines are as follows:

Pollutant	Averaging Period	Criterion
Particulate matter (PM <sub>10</sub> )	24-hour	45 µg/m <sup>3</sup>
	Annual	15 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> )	24-hour	15 µg/m <sup>3</sup>
	Annual	5 µg/m <sup>3</sup>

**Table 2: WHO 2021 Global Air Quality Guidelines**

65. The WHO's 2021 Global Air Quality Guidelines have been devised to protect public health and is in response to the real and continued threat of air pollution to public health. Whilst we acknowledge that the 2021 Air Quality Guidelines are not legally binding and have not been adopted by the NSW Government, it is our submission that despite the Project's air quality impacts being assessed as falling under the NEPM AAQ assessment criteria, they still present a health risk to the community. We expand further on the health risk in Section [3.7] of our submission.

66. The AQIA is deficient because it does not quantitatively assess the combustion emissions (being NO<sub>x</sub>, SO<sub>2</sub>, carbon monoxide, CO<sub>2</sub> and VOCs created from combustion engines such as trucks) of the Project. This is despite the Project seeking consent to transport up to 600,000 tonnes of coal by road to the Port of Newcastle annually. It is worth noting that the GHGEA assesses two scenarios – the 'Planned Scenario' and the 'Export Scenario'. If Delta Coal exports coal from the Port of Newcastle, it may result in up to 270 laden coal trucks operating from the CVC site daily, or up to 32 per hour. The combustion emissions generated from these operations should be factored into the AQIA and the assessment of air and GHG emissions should be addressed consistently (i.e. for both the Planned Scenario and the Export Scenario) in all components of the EIS.

67. In addition, we note that the relationship between climate change and poorer air quality has been established in a number of studies which demonstrate the association between climate change and air quality (for example through increased frequency and size of bushfires and dust events).<sup>42</sup> As a result it can no longer be assumed that past weather and air quality are good proxies for future conditions when projects will be implemented and therefore assessments must include potential future

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<sup>42</sup> Daniel Jacob and Darrell Winner, 'Effect of Climate Change on Air Quality' (2009) 43(1) *Atmospheric Environment* 51; Patrick Kinney, 'Climate Change, Air Quality, and Human Health' (2008) 35(5) *American Journal of Preventive Medicine* 459; Gennaro D'Amato, Lorenzo Cecchi, Mariella D'Amato, Isabella Annesi-Maesano, 'Climate change and respiratory diseases' *European Respiratory Review* 2014 23: 161-169, available at: <<https://err.ersjournals.com/content/23/132/161.full>>; Centres for Disease Control and Prevention, 'Climate change decreases the quality of the air we breathe', available at: <[https://www.cdc.gov/climateandhealth/pubs/air-quality-final\\_508.pdf](https://www.cdc.gov/climateandhealth/pubs/air-quality-final_508.pdf)>; Annika Dean and Donna Green, 'Climate Change, Air Pollution and Human Health in Sydney, Australia: A Review of the Literature' (2017) 13(5) *Environmental Research Letters* 53003, 53003.

climate impacts.<sup>43</sup> The background air quality is likely to be changed as a result of climate change however these climate change impacts do not appear to have been adequately considered as part of the AQIA – indeed the AQIA excludes the air quality data from the period over the Black Summer bushfires of 2019-2020. The assumed background concentrations used 2018 datasets for PM<sub>2.5</sub> and PM<sub>10</sub><sup>44</sup> and in relation to PM<sub>10</sub> it is expressly stated that the 2019 and 2020 datasets were excluded due to the occurrence of bushfires and drought conditions.<sup>45</sup> While the AQIA acknowledges that previous exceedances of air quality criteria have occurred in the context of bushfires and drought conditions<sup>46</sup> the EIS should include an assessment of potential future climate conditions and how that may influence whether air quality standards are met in future.

68. It is clear from the EIS that the air quality monitoring network maintained by Delta Coal is insufficient and must be improved. There are no air quality stations continuously monitoring TSP concentrations in real-time in the vicinity of MC or CVC, despite operations at CVC and MC generating TSP.<sup>47</sup> Such monitoring would have the benefit of triggering real-time alarms in response to dust events at CVC and MC, which could ensure appropriate operations and controls are undertaken during dust events. Real time air quality monitoring data should be made publicly available to increase transparency of mining operations for the community.

### 3.1.3 Recommendations

69. NCC recommends the following with respect to air quality impact assessment. That:
- a. the Department require that the EIS addresses the likely impacts of the Project in the EIS, which includes the off-site impacts on air quality caused by operations at VPPS;
  - b. the Department require that the EIS and AQIA include an assessment of the optimal control strategies to control future levels of pollutants (such as PM<sub>2.5</sub>) and an assessment of potential future climate conditions and their possible influence on the attainment of air quality objectives;
  - c. the Department require that the EIS be prepared in accordance with the Approved Methods for Modelling 2022 and/or that the Minister commission an independent peer review of the AQIA to ensure the methodology contained in the AQIA is sound;
  - d. the Department require that the EIS includes a quantitative assessment of the combustion emissions of the Project;

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<sup>43</sup> “Policies to improve air quality and human health take meteorologic variables into account in determining when, where, and how to control pollution emissions, usually assuming that weather observed in the past is a good proxy for weather that will occur in the future, when control policies are fully implemented. However, policymakers now face the unprecedented challenge presented by changing climate baselines. There is growing recognition that development of optimal control strategies to control future levels of key health-relevant pollutants like ozone and fine particles (particulate matter, PM<sub>2.5</sub>) should incorporate assessment of potential future climate conditions and their possible influence on the attainment of air quality objectives.” Patrick Kinney, ‘Climate Change, Air Quality, and Human Health’ (2008) 35(5) *American Journal of Preventive Medicine* 459, 459

<sup>44</sup> Air Quality Impact Assessment (September 2022) (AQIA), p 30.

<sup>45</sup> AQIA, p 25.

<sup>46</sup> AQIA, p 27.

<sup>47</sup> EIS, 6.4.2.1, p. 90.



- e. if the Minister approves the Project, that he requires as a condition of consent that an air quality station that continuously monitors TSP, PM<sub>2.5</sub> and PM<sub>10</sub> concentrations in real-time be installed in close vicinity to CVC and MC and that data from the monitoring station is made publicly available in real time.

## 3.2 Impacts on water

### 3.2.1 Groundwater

70. Mr. Johnson undertook a review of the Groundwater Impact Assessment for the Project and concludes that the Groundwater Impact Assessment does not adequately characterise the quality of groundwater extracted from the mining operations, which will impact surface water quality (addressed below in this submission).
71. In Mr. Johnson's expert opinion, the Groundwater Impact Assessment is a:

... cursory assessment that rationalizes, 'because groundwater impacts have not yet been observed, additional impacts are not anticipated through the duration of the Project'.
72. In Mr. Johnson's opinion, the conclusions in the Groundwater Impact Assessment are not based on any rigorous analysis, instead relying only on historical data trends. In his view, the conclusions reached in the Groundwater Impact Assessment are not underpinned by rigorous analysis.
73. Mr. Johnson opines that mining, and subsequent collapse of bedrock above mine cavities will increase the permeability of the bedrock overlying the mine cavities, which will result in increased flows of seawater from Lake Macquarie into the brackish aquifers underlying Lake Macquarie.
74. In his view, the Groundwater Impact Assessment does not include analysis of the potential increase of flows into brackish aquifers, or sensitivity analyses in the event that bedrock collapses are larger than is anticipated. He opines that predictive analyses should be included in the EIS to assess the potential consequences of events that have not been observed to date but could occur, such as a sudden increase in groundwater inflow to the CVC and MC.
75. Further, the CVC Groundwater Management Plan identifies a number of private bores for inclusion in the groundwater monitoring program. Monitoring of these bores is required at least once before and once after mining of the relevant miniwall is completed. Mr. Johnson advises that it is not clear from the Groundwater Impact Assessment and EIS as to how monitoring of private bores has occurred, noting access constraints.
76. NCC submits that the Department must require further information from Delta Coal to assess the subsidence impacts of the Project. If the Department considers there to be a threat of serious or irreversible environmental damage *and* that there is scientific uncertainty as to the environmental damage, then the Department must apply the

precautionary principle to these impacts. It is therefore incumbent on Delta Coal to show that this threat does not in fact exist or is negligible via a more detailed EIS.

### 3.2.2 Surface water

77. The CVC and MC Pit Tops are located in the catchment of Swindles Creek, which is identified as being a 'slightly to moderately disturbed' system whereby the waterways have been adversely affected by human activities by a small to measurable degree.<sup>48</sup>
78. The EIS outlines that the largest proportion of water handled by the existing water management system at the mine sites comes from groundwater pumped from the mines, coupled with potable water used for spraying into the mine for dust control. Mine water is pumped into sedimentation dams that then discharge to Swindles Creek, which in turn discharges into Lake Macquarie.
79. Regardless of the level of disturbance or existing degradation of Swindles Creek the courts have found that in the context of assessing environmental harm there should be no advantage by way of mitigation because the receiving waters of a pollutant are already disturbed.<sup>49</sup> Indeed, a disturbed or modified environment might be less resilient to further disturbance.<sup>50</sup>
80. Mr. Johnson undertook a review of the Surface Water Impact Assessment for the Project. Based on his review, Mr. Johnson concludes that the Surface Water Impact Assessment does not adequately characterise the potential impacts to Swindles Creek and Lake Macquarie that could result from the discharge of large quantities of mine water, other than to state that no changes are anticipated.
81. Mr. Johnson observes that the Surface Water Impact Assessment acknowledges that Swindles Creek is entirely changed as a result of the mine water discharges.<sup>51</sup> Exceedances for salinity parameters, nitrogen compounds, fecal coliform, and some dissolved metals (Al, Ba, Fe, Mn and Zn) in samples collected from the facility discharge and Swindles Creek are noted in the Surface Water Impact Assessment. Additionally, high concentrations of nitrogen compounds are attributed to the groundwater source of the water. Fecal coliform levels are attributed to Mannering Park sewage treatment plant, although CVC operations were recognised as a potential source.
82. Mr. Johnson questions the appropriateness of only using sedimentation dams as a treatment method for large quantities of mine water in order to protect the aquatic environment of Swindles Creek and Lake Macquarie. He is unable to determine whether this process is appropriate due to the Surface Water Impact Assessment failing to include a detailed assessment of potential contaminants. It is NCC's submission that

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<sup>48</sup> Ibid, 6.5.2.1, p. 107.

<sup>49</sup> *Environment Protection Authority v Waste Recycling and Processing Corporation* (2006) 148 LGERA 299 at [145]-[149].

<sup>50</sup> Chief Justice Brian Preston, 'Principled Sentencing for Environmental Offences', October 2006, 17 available at: <<http://classic.austlii.edu.au/au/journals/ELECD/2011/317.html>>.

<sup>51</sup> EIS, Appendix 10, 7.2, p. 34.

this paucity of information means that the Department similarly cannot properly assess the impacts of the Project on surface water.

83. Based on Mr. Johnson's expert opinion, it appears that the Surface Water Impact Assessment does not extend to elevated concentrations of heavy metals, which are commonly associated with mine water including coal mines, and should be assessed in detail as part of the EIS along with total metals concentrations. Mr. Johnson opines that in his experience, elevated concentrations of phenolic compounds may also be associated with coal mining operations, and groundwater sourced from coal deposits. He concludes that these compounds should be included in the Surface Water Impact Assessment as they are potentially toxic to aquatic receptors.
84. In Mr. Johnson's opinion, the Surface Water Impact Assessment should include a detailed analysis of the quality of the mine water that makes up most of the surface water discharges, and its potential impacts on Swindles Creek and Lake Macquarie.
85. This echoes similar comments made by Lake Macquarie City Council when consulted on the draft SEARs for the Project. Lake Macquarie City Council requested that a detailed assessment of groundwater and mine discharge impacts on dissolved metal concentrations in receiving waters be undertaken. It also sought that such an assessment include consideration of cumulative impacts, and include ecotoxicological examination on aquatic ecosystems and food-chains (referencing the current EPA and DPI advice that currently limits consumption of seafood caught in Lake Macquarie due to elevated metal concentrations).<sup>52</sup> Whilst these matters could be considered to form part of the SEARs as they relate to water and hazards, the EIS does not consider these matters.
86. Further, Mr. Johnson advises that an assessment of cumulative impacts to surface water in general has not been completed, which was a specific requirement of the SEARs.
87. Finally, Mr. Johnson notes that the EIS does not include "*an assessment of any likely flooding impacts*", as required by the SEARs. NCC submits that the EIS is therefore deficient on this basis.
88. It would appear that the EIS takes the position that because Swindles Creek is a disturbed system whereby it already receives pollutants in the form of mine water discharges, a thorough assessment of the potential impacts of the Project on it is not required. NCC submits that this is not appropriate – existing disturbance does not abrogate Delta Coal's responsibility to assess the impacts on Swindles Creek.
89. We note that in accordance with clause 2.20 of the Resources and Mining SEPP, before granting consent for development for the purposes of mining, the Minister must consider

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<sup>52</sup> Letter to Department of Planning and Environment from Lake Macquarie City Council, 20 April 2021, p. 21 available at: <<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-17017460%2120210430T064520.662%20GMT>>.

whether or not the consent should be issued subject to conditions aimed at ensuring that the impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable. NCC submits that groundwater, Swindles Creek and Lake Macquarie are all significant water resources.

90. It is NCC's submission that the likely impacts of the Project on both groundwater and surface water are not adequately addressed in the EIS. On this basis, the Department cannot properly assess the Project and the Minister cannot properly determine it or consider what, if any, conditions are required to minimise impacts on significant water resources.

### 3.2.3 Recommendations

91. NCC makes the following recommendations regarding the likely impacts of the Project on water. That:

- a. the Department require that the EIS and Surface Water Impact Assessment:
  - i. properly characterise the potential impacts of discharging mine water to Swindles Creek and Lake Macquarie;
  - ii. include a detailed assessment of the potential impacts of heavy metals in water caused by the Project;
  - iii. include a detailed analysis of the quality of the groundwater pumped from the mines; and
  - iv. address the SEARs by including a thorough assessment of any likely flooding impacts.
- b. the Department require that the EIS and Groundwater Impact Assessment:
  - i. include rigorous analyses to underpin the conclusions made in the Groundwater Impact Assessment;
  - ii. include predictive analyses to assess the potential consequences of possible events that may occur, such as a sudden increase in groundwater inflow to the CVC and MC; and
  - iii. identify the extent to which monitoring of private bores has occurred and detail whether the inability to access certain private bores has any effect on the rigour of the Groundwater Impact Assessment.

## 3.3 Impacts on biodiversity

92. Mr. Johnson undertook a review of the EIS as it relates to biodiversity impacts associated with subsidence and water impacts. This submission is limited to those biodiversity impacts only.

93. Mr. Johnson outlines that the SEARs for the Project as they relate to biodiversity are as follows:

- accurate predictions of any vegetation to be cleared on site;
- an assessment of the likely biodiversity impacts of the development, paying particular attention to threatened species, populations and ecological communities and groundwater dependent

ecosystems, undertaken in accordance with Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report; and

- a strategy to offset any residual impacts of the development in accordance with the offset rules under the Biodiversity Offsets Scheme;

94. In Mr. Johnson's opinion, the EIS does not fulfill the SEARs as they relate to biodiversity because it only contains a desktop review of past benthic and seagrass surveys.
95. Mr. Johnson notes that there is potential for impacts to aquatic, benthic and riparian communities that could result from the large-scale pumping of groundwater from CVC and MC and the release of that groundwater, with other industrial water, into Swindles Creek and subsequently Lake Macquarie. In his opinion, this should be included in the biodiversity assessment – which does not even mention the potential impacts to these ecological communities. Mr. Johnson notes that only the Surface Water Impact Assessment makes a passing mention of the ecology of Swindles Creek.
96. It is NCC's submission that the biodiversity assessment is inadequate because it does not include an assessment of the ecology of Swindles Creek or consider the potential for impacts to Swindles Creek and Lake Macquarie resulting from mine water discharges. Further, NCC notes that per paragraphs [77] and [79] above, regardless of the level of existing disturbance or existing degradation of Swindles Creek the likely impacts of the Project on it must still be assessed because it may be less resilient to further disturbance. The Department cannot adequately assess the impacts of the Project or consider appropriate mitigations or consent conditions unless further information is given by Delta Coal.
97. NCC also submits that the likely impacts of the Project on biodiversity caused by its GHG emissions are also not factored into the EIS and resultingly, the EIS is deficient. The EIS must consider the likely impacts of the estimated GHG emissions of the Project on exacerbating global warming and the outcomes this may have for biodiversity. Further information on the impacts of GHG emissions is contained below in this submission in paragraphs [133] to [138].
98. We note that in accordance with clause 2.20 of the Resources and Mining SEPP, before granting consent for development for the purposes of mining, the Minister must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the impacts on threatened species and biodiversity are avoided, or are minimised to the greatest extent practicable. NCC submits that based on the information in the EIS, the impacts on Swindles Creek and Lake Macquarie are uncertain, and therefore conditions aimed at ensuring impacts are avoided or minimised to the greatest extent possible cannot currently be devised – more information is needed in order to be satisfied of this.

### 3.3.1 Recommendations

99. NCC recommends that with regards to the biodiversity assessment for the Project the Department require a more thorough biodiversity assessment including one that extends to the ecology of Swindles Creek and the potential impacts to Swindles Creek and Lake Macquarie as a result of water discharges from the CVC and MC sites.

## 3.4 Subsidence

100. The EIS notes that there are two significant potential negative impacts that may be caused by subsidence:
  - a. impacts to biodiversity, with focus on the foreshore, seagrass, and benthic organisms; and
  - b. impacts to manmade structures, infrastructure and surface facilities.
101. Mr. Johnson undertook a review of the subsidence assessment for the Project which drew particular attention to the following issues:
  - a. the assessment of subsidence relies entirely on past predictions of subsidence and existing performance measures and monitoring – it does not include a new subsidence assessment;
  - b. review of the graphical representations of subsidence indicates that subsidence is generally increasing over time for the shoreline monitoring data as a whole;
  - c. it appears that bathymetric surveys over Zone B mining areas are discontinued 3 years after mining in the underlying area is complete, with no justification provided; and
  - d. there is considerable uncertainty associated with predicting subsidence associated with underground coal mining which are not given sufficient consideration in the EIS.
102. In Mr. Johnson's expert opinion, important components of 'a detailed qualitative assessment of the potential subsidence effects and impacts of the development' are not included in the EIS, namely predictions of subsidence, assessment of related impacts, and an evaluation of potential mitigations other than those that are already in place. NCC submits that this results in the EIS not satisfying the requirements of the SEARs.
103. In Mr. Johnson's expert opinion, the subsidence assessment should evaluate the adequacy and results of the past monitoring and should consider the potential impacts to ecological receptors (Lake Macquarie) and land occupants above the mines, in the event that subsidence exceeds predicted levels.
104. Mr. Johnson also notes that a detailed temporal assessment of the subsidence monitoring data appears to be warranted to evaluate and extrapolate trends that indicate measured amounts of subsidence appear to be increasing over time.
105. He further advises that it may not be appropriate to discontinue bathymetric surveys three years after mining has been completed in the underlying area,

noting that the highest levels of subsidence as measured by bathymetric surveys was made in 2020, over areas mined in 2017.

106. Finally, Mr. Johnson advises that the assessment of mine rehabilitation and closure as part of the EIS does not include an assessment of the long-term risks of subsidence, which in his opinion have the potential to adversely affect benthic and aquatic biota. He recommends that appropriate programs for monitoring subsidence and biota should be proposed for the period following closure of the mines.
107. Additionally, we note that when consulted on the draft SEARs for the project, Lake Macquarie City Council requested that the subsidence assessment consider the potential for increases in wave climate, coastal risk and foreshore stability resulting from subsidence impacts resulting in increased water depths in Chain Valley and Wye Bays. It sought that the Department require a detailed assessment of the potential for increased coastal risks, including foreshore erosion, wave overtopping or foreshore inundation, addressing clause 15 of the Coastal Management SEPP.<sup>53</sup> It does not appear that any of these factors have been addressed in the subsidence assessment for the Project.
108. It is NCC's submission that subsidence is a likely impact of the Project that has not been given adequate consideration in the EIS. This is particularly concerning given the history of mine subsidence in the Lake Macquarie area<sup>54</sup> and the considerable uncertainty associated with predicting subsidence – including the implications for communities and the environment if subsidence predictions are exceeded. Further, it is noted that the Project proposes to mine areas in the western areas of the currently approved CVC and MC mining areas. The western area has not been mined before. It is unclear from the information provided in the EIS as to what subsidence risks and potential impacts exist in relation to mining the western area. Based on the paucity of information in the EIS, the Department cannot properly assess the likely impacts of the Project.

### 3.4.1 Recommendations

109. NCC recommends the following with respect to subsidence:
  - a. that the Department requires that the EIS undertake a more thorough and detailed subsidence assessment that extends beyond an assessment based on past predictions and monitoring and includes:
    - i. consideration of the potential impacts to ecological receptors, including Lake Macquarie, and land occupants above the mines, in the event that subsidence exceeds predicted levels;
    - ii. a detailed temporal assessment of the subsidence monitoring data;
    - iii. further information on the programs for monitoring subsidence and biota during the closure and rehabilitation phase of the Project.

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<sup>53</sup>Ibid.

<sup>54</sup> EIS, 2.2.1, p. 19.

- b. that, in the event that the Minister approves the Project, he requires as a condition of consent bathymetric surveys for a period of longer than three years after mining has been completed in the underlying area.

### 3.5 Contamination impacts and comments on rehabilitation

110. The EIS identified that as part of mine closure, the following indicative activities will take place:<sup>55</sup>

- removal of fleet and equipment (including ventilation fans)
- demolition of buildings and sheds
- removal and/or capping of carbonaceous material associated with stockpiles
- removal and/or on-site treatment of any contaminated soil material
- decommissioning of water management infrastructure
- removal of cement flooring, foundations (potentially include rock breaking and crushing machinery)
- removal of hardstand areas
- shaft and decline filling and sealing operations
- revegetation of disturbed areas.

111. Mr. Johnson reviewed the rehabilitation aspects of the EIS. He concludes that the above indicative actions appear to be appropriate, however notes that there are two significant long-term risks associated with mine closure that are not addressed in any detail in the rehabilitation and closure summary, namely:

- a. the potential for contaminated groundwater to impact groundwater users and/or surface receptors;
- b. the potential for surface impacts caused by collapse of the mine.

112. The EIS states:<sup>56</sup>

Maintenance and management requirements will be developed as part of the mine closure process. During rehabilitation, a detailed Groundwater Impact Assessment will be undertaken to identify any post-mining impacts and determine required mitigation/management measures.

113. Mr. Johnson notes that the specifics of the Groundwater Impact Assessment to be undertaken as part of mine closure are not detailed in the EIS. In his opinion, they should be as it is possible to complete the assessment now while the CVC and MC are operating. He opines that in so doing, there would be an opportunity implement mitigating measures that may be identified by the Groundwater Impact Assessment.

114. In respect of subsidence, in Mr. Johnson's opinion a program for ongoing monitoring of potential future subsidence should be described in the EIS and viable mitigation measures identified should higher levels of subsidence occur in the future.

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<sup>55</sup> Ibid 3.12, p. 49.

<sup>56</sup> Ibid 6.16.1, p. 151.



115. Finally, Mr. Johnson advises that it does not appear that the SEARs for the Project have been addressed because the EIS does not appear to include ‘the measures that would be put in place for the long-term protection and/or management of the site and any biodiversity offset areas postmining’.
116. It is NCC’s submission that based on the information contained in the EIS the Department cannot properly assess the likely long-term impacts of the Project or be satisfied that those impacts will be adequately addressed by rehabilitation.

### 3.5.1 Recommendations

117. NCC recommends that the Department require that the EIS:
  - a. contain specific information on the Groundwater Impact Assessment that will be undertaken as part of mine closure. The Department should seek that this assessment be undertaken now while CVC and MC are operational and that any mitigating measures identified by the assessment be implemented.
  - b. details a rigorous subsidence monitoring program that will apply to the Project site beyond mine closure. The Department should seek that this program include viable mitigation measures should subsidence exceed current predicted.

## 3.6 Greenhouse gas emissions and likely impacts

### 3.6.1 Assessment of GHG emissions

118. The GHGEA provides for both a “Planned Scenario” and an “Export Scenario”. The “Planned Scenario” is based on extracting an additional 9.5 Mt ROM coal from 2023-2029 to be used at VPPS. The “Export Scenario” assesses the GHG emissions that would result if Delta Coal exported up to the proposed limit of 660,000 tonnes per year from 2023-2029. Both the Planned Scenario and the Export Scenario have assessed that the Project would result in more than triple the GHG emissions than the planned extraction under existing approvals.
119. The EIS estimates that the additional GHG emissions (Scope 1,2 and 3) associated with the Project (relative to current operations) is 25,350,157 (t CO<sub>2</sub>-e). Over 90% of those additional GHG emissions are assessed as being Scope 3 emissions.<sup>57</sup>

### 3.6.2 Inadequacies and inaccuracies in the assessment of GHG emissions

120. We refer to the expert report of Mr. Johnson and make the following summary comments regarding the assessment of GHG emissions:
  - a. The primary contributor to Scope 1 GHG emissions is caused by fugitive methane emissions. Mr. Johnson highlights that the technical bases for the calculations of the fugitive GHG emissions have not been and should be

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<sup>57</sup> Greenhouse Gas and Energy Assessment (July 2022) (GHGEA), Table 3.2 & 3.4.

fully explained.<sup>58</sup> As an example, the use of the value of 5.3m<sup>3</sup>/tonne as the starting point for the calculation is not explained.

- b. The GHGEA assessment also does not attempt to quantify gases liberated by the mine depressurisation systems that are not captured by the mine ventilation systems.<sup>59</sup>

121. We also note the following which appear to be errors in the GHGEA:

- a. Table 3.3 in the GHGEA purports to represent the estimated GHG emissions from the “Export Scenario”. However, it provides that export product transport emissions would be zero. The tables provided at B-4 indicate that the estimated transport emissions (truck and ship) in the “Export Scenario” total 584,580 (t CO<sub>2</sub>-e).
- b. Tables 6.16 and 6.17 of the EIS are duplicates of Table 3.3 from the GHGEA. For the reason explained above, these tables do not accurately represent either estimates for the Planned Scenario or the Export Scenario as they are titled.

122. Finally, it is simply illogical and nonsensical for Delta Coal to claim that the Project “does not result in any overall increase in GHG emissions relative to the Project not proceeding”.<sup>60</sup> The Project is assessed to result in an additional 25,350,157 t CO<sub>2</sub>-e. Delta Coal has not substantiated its assertion which would presumably require evidence that if the Project proceeds then the additional 25,350,157 t CO<sub>2</sub>-e will no longer be emitted elsewhere or that a similar amount of coal (13.4 mt) would no longer be extracted elsewhere. If the Project is approved then it will be in addition to existing approvals. The Minister in determining whether to consent to this application must consider an assessment of the GHG emissions of this Project if it proceeds.

### 3.6.3 Inadequate measures to minimise GHG emissions

123. The EIS does not propose any conditions to minimise GHG emissions. As noted above at paragraph [119] over 90% of the estimated additional GHG emissions as a result of the Project are Scope 3 emissions. The EIS and appendices do not discuss or propose any measures to minimise or mitigate the Scope 3 emissions assessed in the GHGEA. The EIS states:<sup>61</sup>

The Project also meets the policy aims of *State Environmental Planning Policy (Resources and Energy) 2021* by demonstrating a continued ability to mine the State’s resources in an environmentally and socially acceptable manner through the implementation of design features,

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<sup>58</sup> Gordon Johnson, Expert Opinion, 8 December 2022 (**Johnson Opinion**), 7-3.

<sup>59</sup> GHGEA, Executive Summary.

<sup>60</sup> *Ibid* p. 11.

<sup>61</sup> EIS p. 37, 165.

operational controls and safeguards to minimise adverse effects on the surrounding environment (refer to **Section 6.0** and **Appendix 4**).

...

A range of environmental management and mitigation measures (summarised in Appendix 4) will continue to be applied or have been developed and evaluated to minimise the impact on the environment as far as practicable.

124. Appendix 4 – Management and Mitigation Measures of the GHGEA referred to above does not discuss any management and mitigation measures regarding GHG emissions at all.
125. Section 6.9 of the EIS addresses “Greenhouse Gas and Energy” however it does not detail any measures to minimise Scope 3 emissions. It provides as follows:

Scope 2 and 3 emissions have been included in the GHGEA to demonstrate the potential upstream and downstream impacts of the Project. All Scope 2 and 3 emissions identified in the GHGEA are attributable to, and may be reported by, other sectors. While the Project has limited control over Scope 3 emissions, Scope 2 emissions can be mitigated through improved energy efficiency of the operations. The GHGEA includes a calculation of the energy efficiency of the Project relative to other operations.
126. The executive summary of EIS states as follows:<sup>62</sup>

Greenhouse gas management practices will be developed and implemented as required through the updates and implementation of the Air Quality and Greenhouse Gas Management Plan.
127. The Air Quality and Greenhouse Gas Management Plan (which was not provided as part of the EIS) does not contain any measures to minimise the Scope 3 GHG emissions assessed in the GHGEA.<sup>63</sup>
128. The EIS does not discuss or propose any measures or steps to minimise the Scope 3 emissions that would result from coal which is exported or used at VPPS, as assessed in the GHGEA. Delta Coal and Delta Electricity, the operator of VPPS, are wholly owned by the same private company and we also note that Delta Electricity and Delta Coal report to the National Greenhouse and Energy Reporting Scheme in relation to Safeguard Mechanism as a combined facility.<sup>64</sup> As a result, it is expected Delta Coal is in a position to provide substantial information with respect to Scope 3 emissions.
129. The GHGEA repeatedly states that Delta Coal is not seeking approval to generate Scope 3 emissions. This however, overlooks the mandatory considerations on the consent authority as set out in clause 2.20 of the Resources and Energy SEPP.

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<sup>62</sup> EIS v.

<sup>63</sup> Section 5.4 includes Table 12: Greenhouse Gas Control Measures which includes measures relating to “GHG emissions from DC operated facilities”.

<sup>64</sup> GHGEA p. 16.

130. The Court of Appeal has held that it was open to the IPC to determine that the absence of conditions to minimise Scope 3 GHG emissions was a factor against approval of an application.<sup>65</sup> In particular, Chief Justice Preston found as follows (emphasis added):<sup>66</sup>

...This focuses attention on how the applicant proposes to undertake the development and, in particular, on whether the applicant proposes to undertake the development in a manner to ensure that greenhouse gas emissions are minimised to the greatest extent practicable.

With this understanding, the consent authority is in a position to consider whether the consent **should be issued subject to conditions to ensure that greenhouse gas emissions are minimised to the greatest extent practicable, thereby ensuring that the development is undertaken in an environmentally responsible manner.**

In the present case, the IPC was of the view that KEPCO had not proposed to undertake the development in a manner that would ensuring that greenhouse gas emissions are minimised to the greatest extent practicable. KEPCO had proposed to develop an Energy and Greenhouse Gas Management Plan that would set out measures to minimise greenhouse gas emissions from the development. The IPC noted that the measures proposed by KEPCO related only to minimising Scope 1 and 2 greenhouse gas emissions, not Scope 3 greenhouse gas emissions (at [660] and [696]). **As KEPCO did not propose to minimise Scope 3 greenhouse gas emissions at all, but instead only Scope 1 and 2 greenhouse gas emissions, the IPC was of the view that KEPCO has not minimised Scope 1, 2 and 3 GHG emissions to the greatest extent practicable.**

131. NCC's submits that it is open to the Minister to adopt the same reasoning and approach in relation to this project.
132. In addition, we also refer to the report of Mr. Johnson which highlights the failure of the GHG assessment to consider possible mitigations for Scope 1 emissions including assessing the feasibility of capturing and burning the fugitive methane emissions caused by mine depressurisation.

#### 3.6.4 Impacts of GHG emissions

133. It is established science that GHG emissions contribute to climate change.<sup>67</sup> Caselaw has also established that the NSW Government does not dispute an extensive series of facts as to the actual and potential impacts of climate change both globally and on the State of NSW, including the fact that:<sup>68</sup>

Climate change cannot meaningfully be addressed without multiple local actions to mitigate emissions by sources and remove greenhouse gas emissions by sinks.<sup>69</sup>

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<sup>65</sup> *KEPCO Bylong Australia Pty Ltd v Bylong Valley Protection Alliance Inc* [2021] NSWCA 216 at [44] per [136-138] per Preston CJ.

<sup>66</sup> *Ibid* [136]-[138].

<sup>67</sup> IPCC, 2022: *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844

<sup>68</sup> *Bushfire Survivors for Climate Action Incorporated v Environment Protection Authority* [2021] NSWLEC 92 at [76].

<sup>69</sup> *Ibid* (38).

134. The EIS acknowledges that:<sup>70</sup>

Greenhouse gas emissions associated with coal combustion, and the established links to climate change, are likely to generate environmental impacts across generations.

135. However, the GHGEA contains only two paragraphs regarding the impact on the environment from the GHG emissions generated by the Project. They are as follows:

The primary impact of greenhouse gas emissions is the accumulation of carbon in 'carbon sinks'. Historically, anthropogenic greenhouse gas emissions have accumulated in three major carbon sinks - the ocean (30%), terrestrial plants (30%) and the atmosphere (40%) (BOM and CSIRO 2014).

The accumulation of greenhouse gas in the atmosphere is an important driver of global warming, sea level rise and climate change (IPCC 2013). Sea level rise and climate change may have many ramifications for the natural and built environment. The accumulation of greenhouse gas in the ocean is also an important driver of ocean acidification (IPCC 2013).

136. Despite acknowledging that GHG emissions add to climate change, the EIS and the GHGEA fail to adequately address or acknowledge the following:

- a. Methane which makes up the majority of the Scope 1 emissions<sup>71</sup> is a potent GHG and second biggest contributor to global warming after carbon dioxide. Methane is a more fast-acting and fast decaying GHG than CO<sub>2</sub>.
- b. All GHG emissions whether Scope 1, 2 or Scope 3 contribute to the effect of climate change<sup>72</sup> and cannot be ignored when considering the likely impacts of this Project.
- c. Limiting global warming requires urgent reductions of GHG (by 74% by 2030, whereas the Project would instead increase Australia's emissions by 25 million tonnes over the next 7 years.<sup>73</sup>
- d. The impacts of climate change and increasing global warming include bushfires, floods, heatwaves, marine acidification, heavy precipitation and flooding and drought. The regularity, scope and intensity of these events will increase with increased global warming. These impacts of climate change are occurring in NSW (and globally) as evidenced by the 2019-20 bushfires and the floods experienced throughout 2022.
- e. These effects of global warming will have impact on a number of matters that are required to be assessed as part of the EIS including:
  - i. Air quality

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<sup>70</sup> EIS, 7.3.2, p. 164.

<sup>71</sup> Johnson Opinion, 7-2.

<sup>72</sup> This has been accepted in *Gloucester Resources* at [514].

<sup>73</sup> Z. Nicholls, M. Meinshausen, Comparison between Australia's 2030 and 2050 emission reduction targets and 1.5°C pathways, Climate Resource, March 2022.

- ii. Health
- iii. Biodiversity
- iv. Water
- v. Social impacts

137. The EIS and GHGEA does not properly assess the likely impacts of greenhouse gases from the Project in contributing to climate change or the resulting cumulative air quality, health biodiversity, water and social impacts.

### 3.6.5 Recommendations

138. The Project be refused on the basis that Australia's GHG emissions must be urgently reduced by 74% by 2030. The Project would instead increase Australia's emissions by 25 million tonnes over the next 7 years.

139. NCC recommends the following in relation to the assessment of GHG impacts as part of the EIS. That:

- a. Delta Coal be required to
  - i. Explain the technical bases for the calculations of the fugitive GHG emissions.
  - ii. Quantify gases liberated by mine depressurisation systems that are not captured by the mine ventilation systems.
  - iii. Assess the feasibility of capturing and burning the fugitive methane emissions caused by mine depressurisation.
  - iv. Assess the likely impacts of GHG emission from the Project in contributing to climate change.
- b. It is open to the Minister to determine that the absence of conditions to minimise Scope 3 GHG emissions is a factor against approval of an application.

## 3.7 Health impacts

140. The SEARs issued for the Project require that during the preparation of the EIS, consultation with NSW Health must occur. It is unclear from the EIS whether Delta Coal has consulted with NSW Health. The SEARs also require that a health risk assessment that considers the adverse effects from human exposure to acute and cumulative Project-related environmental hazards for the community in the immediate vicinity of the Project be conducted. Whilst we note that a health risk assessment is included as part of the EIS, it is NCC's submission that a complete Health Impact Assessment which examines the potential social, economic, lifestyle and behavioural costs and benefits to the immediate community as well as the 'downstream' direct and indirect impacts that will occur in other communities should be undertaken.

141. In relation to the health risk assessment for the Project, NCC submits that it is insufficient because it does not consider all of the 'likely impacts' of the Project, namely, it does not consider the:

- a. health impacts arising from air pollution generated by VPPS; and

- b. health impacts arising from climate change due to the Scope 3 emissions generated by the Project.

142. As outlined above at paragraphs [47] to [57] of this submission, the EIS must address the off-site air pollution impacts of the Project caused by burning the coal that is extracted at CVC and MC at VPPS due to the Project. The likely off-site impacts of the Project therefore extend to the impacts on community health of air pollutants emitted from VPPS. These impacts are sufficiently linked to the Project and must be found to be 'likely impacts' of the Project. As 'likely impacts', they must be considered by the Department in its assessment of the Project.

### 3.7.1 Health impacts from air emissions from VPPS

143. Burning coal for electricity generation emits a broad range of air pollutants. There is no safe level of air pollution<sup>74</sup> and strong associations have been found between air pollution and cardiorespiratory mortality and morbidity, all-cause mortality and morbidity, birth outcomes, asthma, reduced lung function, and atopy.<sup>75</sup> In Australia, air pollution from coal-fired power has been associated with low birth weight in 845 babies and 14,434 children with asthma annually.<sup>76</sup>

144. In 2013, electricity generation was the major source of NO<sub>x</sub> in the NSW Greater Metropolitan Region, accounting for around 45%.<sup>77</sup>

145. There are five key pollutants emitted from VPPS that contribute to health impacts for the community, these are PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>2</sub> and mercury. Delta Electricity reported to the National Pollutant Inventory that in 2020/21 VPPS emitted:<sup>78</sup>

- a. 95,870 kilograms of PM<sub>2.5</sub>
- b. 192,000 kilograms of PM<sub>10</sub>
- c. 16,008,300 kilograms of NO<sub>x</sub>; and
- d. 16,000,008 kilograms of SO<sub>2</sub>.

146. The following general health impacts are attributable to each major pollutant:

- a. PM<sub>2.5</sub> and PM<sub>10</sub>:
  - i. The most dangerous form of air pollution is PM<sub>2.5</sub>. There is abundant evidence that PM<sub>2.5</sub> exposure can cause adverse health effects and

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<sup>74</sup>Adrian G Barnett, 'It's safe to say there is no safe level of air pollution' (2014) 38(5) *Aust N Z J Public Health*.

<sup>75</sup>Clare M Walter et al., 'The health impacts of ambient air pollution in Australia: a systematic literature review' (2021) 51(10) *Intern Med J*.

<sup>76</sup>Dr. Aidan Farrow et al. 'Lethal Power: How Burning Coal is Killing People in Australia' (2020) *Greenpeace Australia Pacific* pp 22-24.

<sup>77</sup>NSW Environment Protection Authority, 'Regulatory Impact Statement – Proposed Clean Air Regulation 2022', (2022) p. 62..

<sup>78</sup>Department of Climate Change, Energy, the Environment and Water, 'National Pollutant Inventory 2020-2021', (Web Page) available at: <<https://www.dcceew.gov.au/environment/protection/npi/data/search-npi-data>>.

increased risk of death.<sup>79</sup> There is no lower threshold for these effects.<sup>80</sup>

- ii. Long term exposure is particularly damaging, even at lower levels of pollution. A recent study from Queensland found that long-term exposure to PM<sub>2.5</sub> was associated with increased all-cause mortality of two percent for each 1 µg/m<sup>3</sup> increase in annual PM<sub>2.5</sub>, even where PM<sub>2.5</sub> levels were measured well-below air quality standards.<sup>81</sup>
- iii. PM<sub>2.5</sub> causes cardiovascular effects including chronic obstructive pulmonary disease, ischaemic heart disease, lung cancer, stroke,<sup>82</sup> birth outcomes (such as low birth weight and short gestation)<sup>83</sup>, cancer<sup>84</sup> and respiratory mortality and total mortality.<sup>85</sup>
- iv. Research led by the University of Sydney has found up to a four percent increased risk of out of hospital cardiac arrest (**OHCA**) associated with every 10 µg/m<sup>3</sup> increase in PM<sub>2.5</sub>.<sup>86</sup> OHCA is a major medical emergency, with less than one in 10 people worldwide surviving these events.<sup>87</sup>
- v. A recent epidemiological study found that maternal exposure to PM<sub>2.5</sub> is associated with pregnancy loss i.e. stillbirth and miscarriage and that almost half of the stillbirths in the study could be linked to exposure to PM<sub>2.5</sub>.<sup>88</sup>
- vi. It has been estimated that power stations account for 10.5% of anthropogenic PM<sub>2.5</sub> exposure in the Greater Metropolitan Region, that 64% of this exposure is caused by secondary particles from NO<sub>x</sub>, and that power stations are responsible for 0.1% of mortality (equivalent to 620 years of life lost) attributable to long term anthropogenic PM exposure.<sup>89</sup>

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<sup>79</sup> Douglas W Dockery et al, 'An Association between Air Pollution and Mortality in Six US Cities' (1993) 329(24) *The New England Journal of Medicine* 1753; D Krewski et al, 'Reanalysis of the Harvard Six Cities Study, Part I: Validation and Replication' (2005) 17(7–8) *Inhalation Toxicology* 335.

<sup>80</sup> Ibid.

<sup>81</sup> Wenhua Yu et al, 'The Association between Long-Term Exposure to Low-Level PM<sub>2.5</sub> and Mortality in the State of Queensland, Australia: A Modelling Study with the Difference-in-Differences Approach' (2020) 17(6) *PLoS Medicine* e1003141:1–17.

<sup>82</sup> World Health Organisation, *WHO Global air quality guidelines* (Report, 22 September 2021) 11.

<sup>83</sup> Ibid.

<sup>84</sup> United States Environment Protection Agency, *Integrated Science Assessment for Oxides of Nitrogen – Health Criteria* (Research Report, January 2016) xxxii, Chapters 5 and 6 <[https://ofmpub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=526855](https://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=526855)>.

<sup>85</sup> World Health Organisation, *WHO air quality guidelines* (Report, 22 September 2021) 11.

<sup>86</sup> Bing Zhao et al, 'Short-Term Exposure to Ambient Fine Particulate Matter and Out-of-Hospital Cardiac Arrest: A Nationwide Case-Crossover Study in Japan' (2020) 4(1) *Lancet Planet Health* 15.

<sup>87</sup> University of Sydney, 'Air Pollution Impacts Can be Heart-Stopping: Biggest Study of Dangerously Small Particulate Matter and Cardiac Arrest', *ScienceDaily* (online, 28 January 2020).

<sup>88</sup> Tao Xue et al., 'Estimation of pregnancy losses attributable to exposure to ambient fine particles in south Asia: an epidemiological case-control study' (2021) 5(1) *The Lancet. Planetary Health*, e15–e24.

<sup>89</sup> Richard Broome et al, 'The mortality effect of PM<sub>2.5</sub> sources in the Greater Metropolitan Region of Sydney, Australia' (2020) 137 *Environment International* 105429, 6.



- b. NO<sub>x</sub>:
- i. NO<sub>x</sub> impacts health in the following ways: Both short and long-term exposure to NO<sub>x</sub> has a significant adverse effect on public health and there is no safe level of NO<sub>x</sub> pollution below which adverse health effects do not occur.<sup>90</sup>
  - ii. NO<sub>x</sub> causes respiratory effects, in particular asthma<sup>91</sup> which is significant given Australia has one of the world's highest prevalence rates of asthma and high asthma death rates<sup>92</sup> and that health data shows that, when compared to the NSW average, the Central Coast and Lake Macquarie LGA's have higher rates of asthma.<sup>93</sup>
  - iii. Adverse effects of NO<sub>x</sub> on current asthma in children occurs even at low levels of concentration.<sup>94</sup> A 25% reduction in exposure to NO<sub>x</sub> from current values across NSW would lead to between 2,597 and 12,286 fewer children developing asthma.<sup>95</sup>
  - iv. NO<sub>x</sub> also contributes to secondary fine particle pollution PM<sub>2.5</sub> – the effects of which are detailed above.
- c. SO<sub>2</sub>:
- i. SO<sub>2</sub> is primarily emitted from coal combustion at coal fired power stations. Even short-term exposure to high levels of SO<sub>2</sub> can adversely impact breathing, particular for those with underlying respiratory diseases such as asthma.<sup>96</sup> Long term exposure to SO<sub>2</sub> has been associated with cardiorespiratory mortality,<sup>97</sup> with this relationship persisting at low concentrations. SO<sub>2</sub> also reacts with other chemicals in the air to form fine PM<sub>2.5</sub> particle pollution.
  - ii. The WHO 2021 Global Air Quality Guidelines notes the causal relationship between short-term SO<sub>2</sub> concentrations and respiratory effects. The association between short-term SO<sub>2</sub> concentrations and

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<sup>90</sup> United States Environment Protection Agency, *Integrated Science Assessment for Oxides of Nitrogen – Health Criteria* (Research Report, January 2016) xxxii, Chapters 5 and 6

<[https://ofmpub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=526855](https://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=526855)>.

<sup>91</sup> Ibid and Australian Institute of Health and Welfare, *Asthma in Australia* (AIHW Asthma Series No 4 Cat No ACM 22, 18 October 2011) <<https://www.aihw.gov.au/getmedia/8d7e130c-876f-41e3-b581-6ba62399fb24/11774.pdf.aspx?inline=true>>.

<sup>92</sup> Luke Knibbs et al, 'The Australian Child Health and Air Pollution Study (ACHAPS): A national population based cross-sectional study of long-term exposure to outdoor air pollution, asthma, and lung function' (2018) 120 *Environment International* 394, 401.

<sup>93</sup> The Public Health Information Development Unit (PHIDU):Torrens University Australia, 'Social Health Atlases', (Web Page) <<http://phidu.torrens.edu.au/social-health-atlases>>.

<sup>94</sup> Ibid 401.

<sup>95</sup> Ben Ewald, Luke Knibbs and Guy Marks, 'Opportunity to reduce paediatric asthma in New South Wales through nitrogen dioxide control' (2021) 45(4) *Australian and New Zealand Journal of Public Health* 400.

<sup>96</sup> Kan H, Wong CM, Vichit-Vadakan N, et al.. 'Short-term association between sulfur dioxide and daily mortality: the Public Health and Air Pollution in Asia (PAPA) study.' (2010) 110(3) *Environ Res* 2010.

<sup>97</sup> 4 Wang, X., Hu, W., & Tong, S., 'Long-term exposure to gaseous air pollutants and cardio-respiratory mortality in Brisbane, Australia' (2009) 3(2) *Geospatial Health*.

total mortality was also deemed to be suggestive of a causal relationship.<sup>98</sup>

d. Mercury:

- i. Coal burning is a key source of mercury discharge into the environment globally.<sup>99</sup>
- ii. Mercury is a well-known and potent neurotoxin. Although mercury is released in lower levels than solid particles, nitrogen oxides and sulphur dioxide, it is highly toxic and accumulates in both the environment and organisms. Mercury may have toxic effects on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes.<sup>100</sup>

147. All State, Territory and Commonwealth governments, as well as the NSW EPA, have acknowledged that there is no 'safe' level of exposure for many pollutants and there are harmful impacts from exposure.<sup>101</sup> Additionally, the NSW EPA acknowledges that air pollution from industrial sources such as coal fired power stations 'are associated with significant public health impacts' and that:<sup>102</sup>

Significantly, there is no safe concentration threshold for exposure to PM<sub>2.5</sub> at which adverse health effects have not been observed. This means that even low levels may have an adverse impact on human health.

148. The above summary of the health impacts of air pollutants indicates that every emission of an air pollutant contributes to the overall health impacts experienced by the community. It is NCC's submission that the EIS does not properly consider and apply the above information to the air emissions caused by VPPS and the likely impacts that result for community health. The Department must properly assess the health impacts of this Project, which includes the off-site health impacts caused by the burning of coal extracted from CVC and MC and VPPS.

149. That air emissions are regulated by Environment Protection Licence No. 761 (EPL) which applies to VPPS does not negate the requirement for the Department to consider the air emissions, and resulting health impacts, arising from VPPS as part of its assessment of this Project. We note that licensing activities are separate to the planning assessment process. Consequently, the likely impacts of this Project, which includes off-site health impacts resulting from air emissions generated by VPPS, must be properly addressed in the EIS. A

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<sup>98</sup> World Health Organisation Global Air Quality Guidelines 2021. See pages 45-46; 126-138 and 265-269.

<sup>99</sup> United Nations Environment Programme, Global Mercury Assessment 2013: Sources, Emissions, Releases and Environmental Transport (Report, 2013).

<sup>100</sup> World Health Organisation, 'Mercury and health', (Web Page, 31 March 2017) <<https://www.who.int/news-room/fact-sheets/detail/mercury-and-health#:~:text=Mercury%20may%20have%20toxic%20effects,of%20major%20public%20health%20concern>>.

<sup>101</sup> Senate Community Affairs References Committee, Parliament of Australia, 'Impacts on Health of Air Quality in Australia', pp5,8; World Health Organisation, (2003) 'Health Aspects of Air Pollution with Particulate Matter, Ozone and Nitrogen Dioxide', Report on WHO Working Group pp 5-6.

<sup>102</sup> NSW Environment Protection Authority, 'Regulatory Impact Statement – Proposed Clean Air Regulation 2022', (2022) pp. 3 and 61.

failure to do so renders the EIS incomplete and the Minister cannot determine the Project until such a time as they are adequately addressed by the EIS.

### 3.7.2 Health impacts from climate change

150. As noted above at paragraph [119], the total GHG emissions associated with the Project (relative to current operations) will total 25,350,157 (t CO<sub>2</sub>-e).
151. As noted above at paragraphs [133]-[136], it is NCC's submission that the Project's GHG emissions will contribute to climate change. As a result, the Project will contribute to the cumulative health risks associated with climate change. The EIS, including the health risk assessment, does not interrogate these impacts and is therefore deficient.
152. AdaptNSW, the NSW Government agency tasked with helping NSW take action and adapt to climate change notes the close relationship between climate change and health, stating:<sup>103</sup>
- The effects of climate change are already having consequences for human health.
  - The impacts of climate change can worsen symptoms of many health conditions, such as heart disease, asthma and other lung conditions, and mental health.
  - More frequent and intense weather events caused by climate change can lead to more emergency room visits, hospitalisations and deaths. These events may also affect electricity supply, transport and communication systems, which in turn will affect our ability to meet an increased health services demand.
153. It goes on to note that the following groups of people are particularly at risk from changes as a result of climate change:<sup>104</sup>
- people who are socio-economically disadvantaged
  - rural and geographically isolated communities
  - people with disabilities
  - children and older people
  - pregnant women and unborn children
  - Aboriginal and Torres Strait Islander people.
154. The World Health Organisation has described climate change as the defining issue for public health in the 21<sup>st</sup> Century and warns that:
- The severity of impacts of climate change on health are increasingly clear and threatens to undermine the last 50 years of improvements in health.<sup>105</sup>
155. In its 2021 report 'How Climate Change Affects Your Health: The Facts', Doctors for the Environment Australia draw on numerous peer-reviewed studies and reports to outline the effects of climate change on health. It summarises:<sup>106</sup>

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<sup>103</sup> NSW Government, 'Climate change impacts on our health and wellbeing', *AdaptNSW*, (Web page, 2022) <<https://www.climatechange.environment.nsw.gov.au/health-and-wellbeing>>.

<sup>104</sup> Ibid.

<sup>105</sup> WHO, *COP 24 special report: health and climate change* (2018) World Health Organisation, available at: <<https://www.who.int/globalchange/publications/COP24-report-health-climate-change/en/>>.

<sup>106</sup> Doctors for the Environment Australia, 'How Climate Change Affects Your Health: The Facts', (2021), available at: <<https://dea.org.au/wp-content/uploads/2021/08/How-Climate-Change-Affects-Your-Health-August-2021.pdf>> p. 2.

Climate change affects health in many ways – directly through physical trauma, illness and mortality caused by extreme weather events such as floods, storms, bushfires and heatwaves, and indirectly through changing patterns of infectious diseases, changing patterns of air pollution, exposure to bushfire smoke and allergens, rising sea levels with coastal inundation, biodiversity loss, and threats to secure shelter, food, and water. A warming climate is clearly and inextricably linked to the disruption of environmental conditions that provide the very fundamentals for our physical and mental health - clean air, clean water, reliable sources of healthy and nutritious food, adequate shelter, and stable climatic conditions.

156. Finally, the relationship between climate change, poorer air quality and health has also been established in a number of studies which demonstrate the association between climate change and respiratory diseases, and climate change and air quality.<sup>107</sup> For example, studies have recognised:
- a. a strong positive correlation between temperature and PM<sub>2.5</sub>;<sup>108</sup>
  - b. the link between climate change and PM<sub>2.5</sub> concentrations;<sup>109</sup> and
  - c. the increased likelihood of bushfires in Australia due to climate change and the resultant increase in particulate matter.<sup>110</sup>

### 3.7.3 Recommendations

157. NCC recommends the following in relation to the assessment of health impacts as part of the EIS. That:
- a. the Department require that Delta Coal addresses the likely impacts of the Project in the EIS, which includes the off-site impacts on health caused by operations at VPPS;
  - b. the Department require that Delta Coal addresses the likely health impacts of climate change resulting from the contribution of the Project's GHG emissions to climate change;
  - c. the Department require that the EIS contain a detailed Health Impact Assessment which examines the potential social, economic, lifestyle and behavioural costs and benefits to the immediate community as well as the 'downstream' direct and indirect impacts that will occur in other communities; and
  - d. the Department require that Delta Coal consult with NSW Health, including with respect to the Health Impact Assessment.

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<sup>107</sup> Gennaro D'Amato, Lorenzo Cecchi, Mariella D'Amato, Isabella Annesi-Maesano, 'Climate change and respiratory diseases' *European Respiratory Review* 2014 23: 161-169, available at: < <https://err.ersjournals.com/content/23/132/161.full>>;

<sup>108</sup> Amos Tai, Loretta Mickley and Daniel Jacob, 'Correlations Between Fine Particulate Matter (PM<sub>2.5</sub>) and Meteorological Variables in the United States: Implications for the Sensitives of PM<sub>2.5</sub> to Climate Change' (2010) 44(32) *Atmospheric Environment* 3976, 3981-3982.

<sup>109</sup> Annika Dean and Donna Green, 'Climate Change, Air Pollution and Human Health in Sydney, Australia: A Review of the Literature' (2017) 13(5) *Environmental Research Letters* 53003, 53003.

<sup>110</sup> Jeff Spickett, HL Brown and Krassi Rumchev, 'Climate Change and Air Quality: The Potential Impact on Health' (2011) 23(2) *Asia-Pacific Journal of Public Health* 37, 38-39.

## 3.8 Social impacts

158. The Social Impact Assessment (**SIA**) in the EIS contains a number of serious omissions, which NCC submits results in the Department being unable to properly assess the social impacts of the project.

### 3.8.1 SIA omits the social impacts of health impacts and concerns

159. The SIA inadequately addresses health and wellbeing because it does not extend to all of the 'likely impacts' of the Project, which include the off-site impacts resulting from operations at VPPS. Section 5.4.1 of the SIA briefly touches on this in its consideration of the health impacts of air pollution. It notes that community members who participated in the SIA raised their concerns about dust, air quality, asthma and respiratory diseases. It dismisses these concerns as being unrelated to the Project on the basis that '...these concerns were largely raised in relation to the presence of the VPPS and are therefore not the focus of the current Project.'<sup>111</sup> The SIA concludes that the AQIA for the Project outlines that the Project will not exceed applicable air quality criteria and therefore, the impacts on physical health are considered a 'low' to 'medium' social impact.

160. Whilst relying on the conclusions in the AQIA, the SIA does however confirm that based on a review of health data:

Review of health data shows that, when compared to the NSW average, the Central Coast and Lake Macquarie LGA's have higher rates of asthma, with the Central Coast also having higher rates of hospitalisations for respiratory system diseases (PHIDU 2021).

The SIA is therefore alive to recent health data on illnesses related to air pollution.<sup>112</sup>

161. It is NCC's submission that concerns raised by community members relating to the air quality impacts of VPPS are valid and should not be discounted by the SIA in reaching its conclusions on social impacts relating to physical health. This is because the indirect, off-site impacts caused by VPPS have a real and sufficient link to the Project and should therefore be considered as part of the 'likely impacts' of the Project.
162. Consequently, the SIA for the Project should be revised to ensure that community concerns relating to health impacts from air emissions from VPPS are properly considered by the EIS. Doing so may result in the SIA concluding that the social impacts of the Project as they relate to physical health are in fact considered to be 'high'. In paragraphs [143] and [157] of this submission we expand further on the likely health impacts of the Project.

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<sup>111</sup> EIS, Appendix 17, 5.4.1, p. 113.

<sup>112</sup> Ibid 4.4, p. 79.

### 3.8.2 SIA omits the social impacts of climate change

163. The SIA does not adequately address the social impacts of climate change, despite ranking them as a 'high social impact' of the Project.<sup>113</sup>
164. The SIA does not provide a breakdown of how many stakeholders raised climate change as a concern related to the Project, but it does very briefly identify that during the Round 2 consultation climate change was raised as a concern by stakeholders, particularly in relation to the need to phase out coal mining and replace coal fired power stations with renewable energy generation.<sup>114</sup> It goes on to note that there was also 'a desire from the community to see Delta Coal, and the industry generally, transition to renewable energy sources and provide adequate support for workers to re-skill and retrain.'<sup>115</sup>
165. Aside from identifying that concerns relating to climate change have been raised, the SIA does not identify the wide range of adverse social impacts that climate change will bring for communities. The SIA does not further research the concerns of local stakeholders, who are not expected to be either researchers or social impact experts. The failure to do so is that the EIS does not properly consider a relevant and significant social impact.
166. The adverse social impacts that climate change will bring for communities include serious public health impacts, including infections and morbidities, rising death rates, mass population movements, loss of livelihoods, eroding shorelines, extreme weather events and conditions (including flooding and drought), poverty, social distress and civil violence.<sup>116</sup> These impacts will be felt globally, and also by NSW communities such as those located near the Project.
167. The SIA refers to the GHGEA in its consideration of climate change impacts. Some of the conclusions reached in the GHGEA for the Project include that 80% of the Project's emissions occur downstream, reasonable and feasible measures will be taken to minimise GHG emissions and due to the close proximity of CVC and MC to VPPS there is a reduction in emissions associated with coal transport that would otherwise be generated if coal was sourced from elsewhere.<sup>117</sup> The SIA relies on these conclusions to justify the following management strategies for the social impacts of climate change:<sup>118</sup>

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<sup>113</sup> Ibid 5.3.6, p. 110.

<sup>114</sup> Ibid 4.1.4, p. 63-65.

<sup>115</sup> Ibid 5.3.6, p. 110.

<sup>116</sup> IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001.

<sup>117</sup> EIS Appendix 17, 5.3.6, p. 111.

<sup>118</sup> Ibid Table 5.15, p. 111.

- Develop a transition plan to facilitate further employment opportunities for the mine workforce in other industries e.g., renewable energy, gas/power generation, tourism, and relevant support; and to effectively manage changes to local suppliers/contractors
  - Burning of higher quality coal somewhat reduces greenhouse gas emissions.
168. Firstly, the EIS has not provided evidence that the coal from the Project is of 'higher quality'. It should also be noted that there is no mention at all of any steps to mitigate the vast majority of the Project's GHG emissions, namely, the Scope 3 emissions as assessed by the GHGEA. These management strategies are inadequate and not representative of the fact that the SIA assesses 'the impacts from continued risk to the environment for current and future generations due to climate change...as a high social impact'.<sup>119</sup> That is, the proposed approach to cumulative impacts outlined in the EIS is not proportionate to the scale and nature of the cumulative impacts of the Project. In this way, the SIA does not comply with the assessment approach outlined in Department's Cumulative Impact Assessment Guidelines for State Significant Projects (October 2022), which says that a cumulative impact assessment must be proportionate to the scale and nature of the potential cumulative impacts, which, if large, are likely to trigger the precautionary principle.<sup>120</sup>

### 3.8.3 Context within which SIA was undertaken

169. It is worth noting that the SIA was conducted throughout the Covid-19 pandemic during 2020-2021. The SIA outlines that a total of 34 stakeholders participated in Round 1 community engagement during November to December 2020, whilst a total of 117 stakeholders participated in Round 2 engagement during August to October 2021. Round 2 engagement comprised the distribution of an information sheet on the Project with a link to an online survey and an invitation for people to get in contact with the project team if they had questions or feedback.<sup>121</sup>
170. Round 2 community engagement therefore coincided with strict Covid-19 restrictions, including when residents may have had other matters to deal with, for example home schooling. These factors may have resulted in fewer people being able to participate in community engagement. The SIA identifies that during Round 2 community engagement, people raised concerns about the process during Covid-19 restrictions, stating that there should have been other options for engagement.<sup>122</sup> It appears that there was no substantive attempt to address these concerns as part of the SIA.
171. Finally, we note that in the 20 months since Round 2 community engagement was undertaken NSW has faced 'unprecedented flooding', which was widely been attributed to climate change. As such, the engagement may not reflect an

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<sup>119</sup> Ibid 5.3.6, p. 111.

<sup>120</sup> Department of Planning and Environment, 'Cumulative Impact Assessment Guidelines for State Significant Projects'(2022).

<sup>121</sup> EIS, Appendix 17, Table A1.1, p. A-1-A-2.

<sup>122</sup> Ibid 4.3, p. 74.

accurate representation of the community's current level of concern about the impacts of extracting and burning coal on the climate.

#### 3.8.4 Recommendations

172. NCC recommends that with regards to the SIA for the Project:
- a. The Department find that the SIA is inadequate to properly assess the likely social impacts of the Project, including the socio-health impacts caused by air pollution from VPPS and the impacts that climate change associated with the Project's Scope 3 emissions will have on society.
  - b. The Department require that further engagement with the community be undertaken and that a more thorough SIA that is responsive and proportionate to the scale and nature of the cumulative impacts of the Project be conducted in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (October 2022).

### 3.9 Transportation of coal by truck on public roads

173. The existing CVC consent allows for the transportation of 660,000 tonnes per year of coal from the CVC Pit Top on public roads to the Port of Newcastle for export. It also enables the transportation of 180,000 tonnes per year of coal to domestic customers, other than VPPS. The EIS indicates that this would result in:<sup>123</sup>
- a. a total of 270 laden coal trucks per day by public roads;
  - b. a total of 32 laden coal trucks per hour; and
  - c. an average of 16 laden coal trucks per hour by public roads during peak hour periods.
174. Although the EIS notes that currently all coal extracted from CVC and MC is transported by conveyor belt and on private roads only to VPPS,<sup>124</sup> it is notable that Delta Coal seeks to retain the existing ability to transport coal to the Port of Newcastle and other domestic consumers for the Project. The EIS does not explain the justification for seeking to retain the existing ability to transport coal to the Port of Newcastle for export. This is in contrast to the rest of the EIS, which justifies the transport of coal from the CVC and MC to VPPS on the basis of securing a coal supply for VPPS.
175. The Traffic Assessment for the Project notes that since 2017, all of the coal mined and processed at the CVC and MC has been delivered to VPPS which:<sup>125</sup>
- ...has resulted in a significant reduction in the volumes of heavy vehicles activity associated with the operation of the collieries. Based upon discussions with the mine operator, coal exports are not expected to recommence and Vales Power Station will continue to use all the coal produced at the collieries.

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<sup>123</sup> EIS, Appendix 15, p. 2.

<sup>124</sup> EIS, 3.6, p. 47.

<sup>125</sup> EIS, Appendix 15, p. 3.



176. It is NCC's submission that the EIS does not adequately address the impacts of transporting coal by public road to the Port of Newcastle and to other domestic customers. The EIS and Traffic Impact Assessment is insufficient in the following ways:
- a. it is greater than two years old, and therefore does not consider any potential changes to the road network since August 2020;
  - b. it does not map the transport route of trucks to the Port of Newcastle, including mapping any residential areas and schools located on the transport route;
  - c. it does not sufficiently assess the likely transport impacts of the Project on the capacity, condition, safety and efficiency of *all* public roads intended to be used as part of the transport route to the Port of Newcastle; and
  - d. it does not describe any potential mitigation measures in relation to the transportation of coal by road to the Port of Newcastle;
177. As noted above at paragraph [17], before granting consent for a development for the purpose of mining that involves the transport of materials, the Department must consider whether or not the Project should be issued with conditions that limit or preclude truck movements, in connection with the Project, that occur on roads in residential areas or on roads near to schools.<sup>126</sup> NCC submits that it is impossible for the Minister to properly consider what conditions should be applied to the Project in relation to the transport of materials due to the limited information provided in the EIS.
178. The Traffic Impact Assessment appears to have taken the same approach to the impacts from coal transportation by road as the AQIA – that is, both assessments preclude an assessment of the likely impacts (i.e. traffic impacts and air quality) arising from the transportation of coal by truck from the Project based solely on the word of Delta Coal that it intends that all the coal from CVC and MC will be transported to VPPS. If Delta Coal seeks these conditions then it must discharge its requirement to assess the likely impacts of them. In any event, because Delta Coal is seeking to retain the ability to transport coal to the Port of Newcastle and other domestic users by road, a thorough assessment of the traffic and air quality impacts of such operations must be undertaken. Until this occurs, the Minister cannot make a determination that accounts for the impacts.

### 3.9.1 Recommendation

179. NCC recommends that the EIS be revised in relation to the impacts that transportation of coal via trucks on public roads will have on traffic and air quality.

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<sup>126</sup> *State Environmental Planning Policy (Resources and Energy) 2021* (NSW) cl 2.22(1)(b).

## 4 Conclusion

180. Section 4.28 of the EP&A Act relevantly provides:

- (1) The consent authority is to determine a development application in respect of State significant development by—
  - (a) granting consent to the application with such modifications of the proposed development or on such conditions as the consent authority may determine, or
  - (b) refusing consent to the application.

181. NCC's position is that it:

- a. objects to the Project due to the cumulative environment and health impacts of the Project, including the impacts that the Project will cause by contributing to climate change;
- b. the EIS is deficient with respect to the Project's likely impacts on air quality, water, biodiversity, subsidence, rehabilitation, GHG emissions, health, society and transport such that it does not provide information lawfully required by the SEARs; and
- c. as a result of the paucity of information in the EIS, the Department cannot properly consider, weigh and balance the likely environmental, social and economic impacts of the Project – including considerations of the principles of ESD.

**Expert Opinion  
Chain Valley Colliery Consolidation  
Project (SSD-17017460)**

Submitted to:  
**Environmental Justice Australia**

Date:  
December 8, 2022

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## 1 INTRODUCTION

### 1.1 Background

This opinion (Report) has been prepared in response to a brief (the Brief, Appendix A) from Environmental Justice Australia (EJA) dated 18 November 2022. The Brief requests review of the Environmental Impact Statement (EIS) for the Chain Valley Colliery (CVC) Consolidation Project (Project) and to provide an expert report on the adequacy of how each of the following matters are addressed in the EIS:

- a) water resources (including groundwater and surface water)
- b) subsidence
- c) mine closure and rehabilitation
- d) biodiversity as related to potential surface water and groundwater impacts
- e) greenhouse gas (GHG) emissions
- f) compliance with the Secretary's Environmental Assessment Requirements for the Project (SEARs) as they relate to the matters addressed in the review

I confirm I am qualified to provide expert opinion on these matters. I have over 35 years of experience providing services to the mining and petroleum industries in the fields of environmental and regulatory consulting, and geotechnical engineering. This experience includes environmental assessment of mines and mining facilities. A copy of my C.V. is provided as Appendix B.

I have read and agree to be bound by Division 2 of Part 31 of the Uniform Civil Procedure Rules 2005 (UCPR), and the Expert Witness Code of Conduct (Code of Conduct) contained in Schedule 7 of the UCPR.

My opinions in this matter are stated in Section 2: Summary of Opinions of this report, and the technical bases of my opinions are described in subsequent sections of this report.

### 1.2 Understanding of Project

CVC and MC are underground coal mines, owned and operated by Great Southern Energy Pty Ltd, which trades as and is referred to as Delta Coal in this report as well as the EIS. Existing operations are currently approved through Consent SSD-5465 (CVC, as modified), and Approval MP 06\_0311 (MC, as modified), which expire on 31 December 2027. While authorized under a separate Consent and Approval, Delta Coal states that the operations of CVC and MC are integrated.

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These operations are approved to provide coal for both export and for domestic power generation; however, all product coal from the operations is currently supplied to the Vales Point Power Station (VPPS), which is owned and operated by Delta Coal's parent company, Delta Electricity Pty Ltd. Coal for the VPPS can be transported via rail, road and overland conveyor.

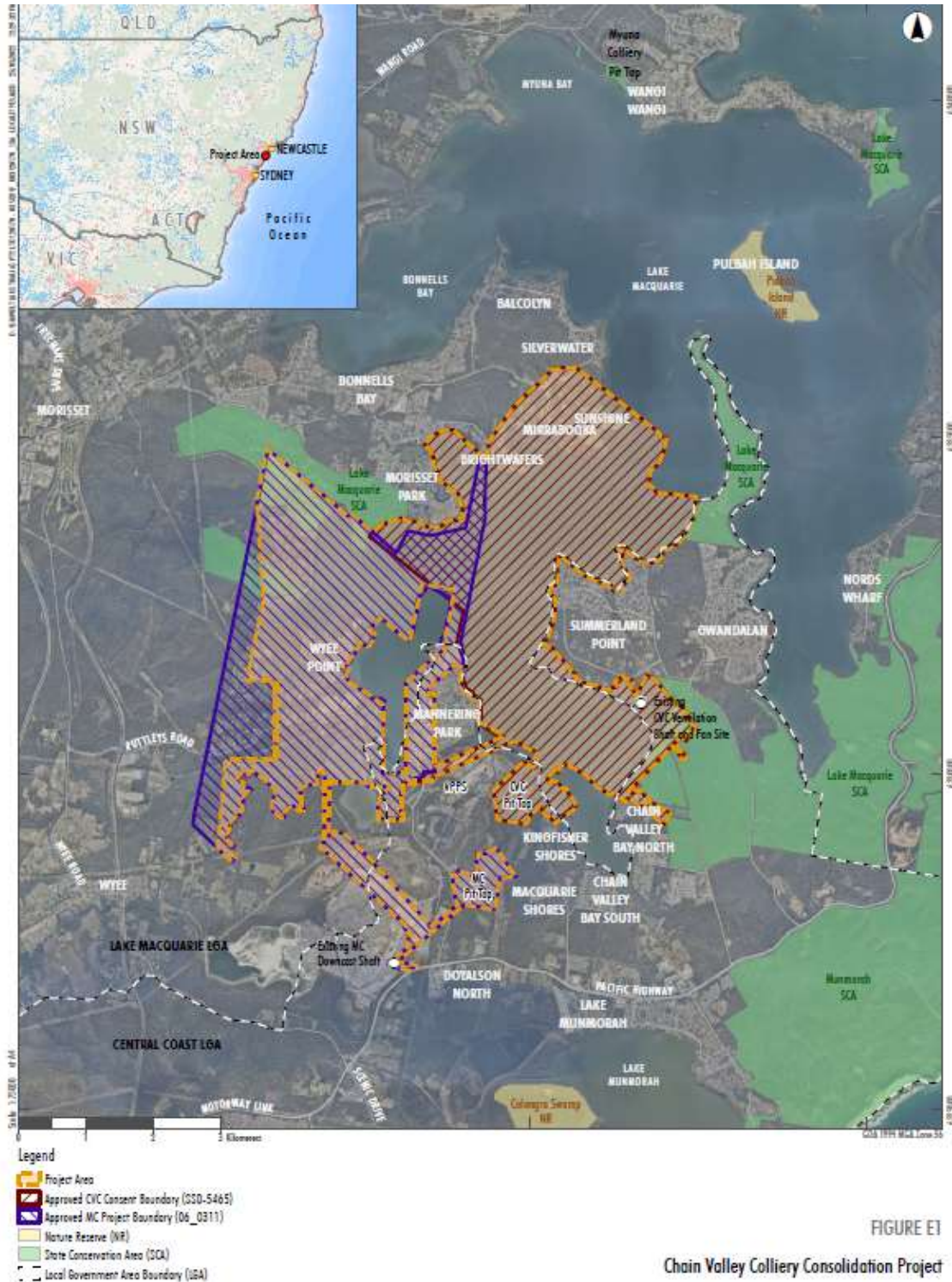
The objectives of the Project are to consolidate the authorizations for CVC and MC, extend the operations of CVC and MC by 2 years, and maximise the proportion of coal burned at VPPS that is supplied by CVC and MC. The EIS was prepared to assess the environmental and social impacts of the Project and accompanies a State significant development (SSD) application for the Project, under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Delta is applying to consolidate the operations and consents for the existing CVC and MC, and to obtain approval for the following changes (see Figure 1-1):

- extend the mine lives for 2 years (from 2027 to 2029), which coincides with the planned closure of the VPPS
- increase the approved throughput at the MC pit top from 2.1Mtpa to 2.8 Mt ROM coal (within an overall complex cap of 2.8Mtpa ROM coal)
- allow secondary workings in parts of the approved MC mining area below Lake Macquarie consistent with existing approved operations under the CVC Consent

Delta Coal is also seeking to expand the extent of the approved underground mining works that are located primarily beneath Lake Macquarie.

Figure 1-1  
Project Location





## 2 SUMMARY OF OPINIONS

In my opinion, the EIS and its supporting assessments provide more of a cursory review of past performance monitoring than a forward-looking assessment of potential future impacts. While the review of past performance of long-standing operations is reasonable and informative, it should not be relied upon in near-entirety to predict future performance, or potential impacts not adequately addressed or predicted by past monitoring.

The following comments and opinions pertain to the EIS components that are the subject of this review:

### **Groundwater (Section 3)**

The groundwater assessment does not adequately characterize the quality of groundwater extracted from the mining operations, which will impact surface water quality (see below). It also does not quantify the gases (carbon dioxide and methane) that will be liberated by depressurization of the coal seams, or consider the associated impacts, other than to estimate fugitive emissions captured in the mine ventilation systems. These fugitive emissions contribute to overall GHG emissions and potentially present a risk to ecological receptors (Lake Macquarie) and land occupants above the mines. It does not consider the potential long term impacts that could be caused by increasing the permeability of the formations underlying Lake Macquarie as a result of mining.

### **Surface Water (Section 4)**

The surface water assessment does not adequately characterize the potential impacts to Swindles Creek and Lake Macquarie that could result from the discharge of large quantities of mine water, other than to state that no changes are anticipated. The surface water assessment should include a detailed analysis of the quality of the mine water that makes up most of the surface water discharges, and its potential impacts on Swindles Creek and Lake Macquarie. It does not include *“an assessment of any likely flooding impacts”* as required by the SEARs. The surface water assessment should evaluate the potential impacts that could be caused by a flood (e.g.: the 1 in 200 years flood event).

### **Subsidence (Section 5)**

The subsidence assessment consists solely of a cursory review of past monitoring and performance measures. It does not include *“a detailed qualitative assessment of the potential subsidence effects and impacts of the development”* as required by the SEARs. The subsidence assessment should evaluate the adequacy and results of the past monitoring, and should consider the potential impacts to ecological receptors (Lake Macquarie) and land occupants above the mines, in the event that subsidence exceeds predicted levels.

## **Biodiversity (Section 6)**

The biodiversity assessment consists of “*a desktop review of information relating to seagrass and benthic community monitoring conducted by CVC*” (EIS, Appendix 11, Section 2), and does not fulfill the SEARs for biodiversity, which state, “*an assessment of the likely biodiversity impacts of the development, paying particular attention to threatened species, populations and ecological communities and groundwater dependent ecosystems, undertaken in accordance with Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report*” (EIS, Appendix 2). Specifically, the EIS should address the potential impacts to the biodiversity of Swindles Creek and its discharge into Lake Macquarie because large volumes of mine-water are discharged into Swindles Creek.

## **Greenhouse Gas Emissions (Section 7)**

The estimate of GHG emissions does not attempt to quantify gases liberated by the minedepressurization systems that are not captured by the mine ventilation systems. The feasibility of capturing and burning the fugitive methane emissions caused by mine depressurization should be evaluated to reduce GHGs.

## **Rehabilitation and Final Landform (Section 8)**

The SEARs include “*the measures which would be put in place for the long-term protection and/or management of the site and any biodiversity offset areas postmining*” (EIS, Appendix 2), which does not appear to have been completed for the underground mine component of the Project. A program for ongoing monitoring of potential future subsidence should be described, and viable mitigations identified should the levels of subsidence in the future exceed predictions.

## **Cumulative Impacts Assessment**

The SEARs require “*a detailed assessment of the cumulative impacts of the development, in combination with other existing and approved mining projects in the locality, with a particular focus on air quality, noise, traffic and social impacts, as well as impacts on water resources*”. A detailed assessment of cumulative impacts on water resources has not been completed, and should be to satisfy the SEARs. The intense level of mining that has occurred in the area also warrants a detailed assessment of cumulative impacts.

## 3 GROUNDWATER ASSESSMENT

### 3.1 Scope of EIS

The groundwater assessment was completed by GHD (EIS, Appendix 9) and addressed the SEARs for the Project, which require the identification of any potential impacts to groundwater quantity and quality, aquifers, watercourses, riparian land, water-related infrastructure and water users as a result of the Project. The groundwater assessment also described the licensing requirements and/or approvals needed under the NSW Water Act 1912 and/or the WM Act and demonstrates that operations would be undertaken in accordance with the relevant Water Sharing Plan (WSP) (EIS, Section 6.5.1). The GHD groundwater assessment was also reviewed by Hydro Algorithmics.

The GHD review of licensing requirements and/or approvals needed under the *Water Act 1912* (NSW) and/or the *Water Management Act 2000* (NSW) appears to be accurate and reliable, although it was not independently checked as part of Burgess' review. The groundwater assessment relies primarily on the historical trends of groundwater pumping volumes from the mine, and the salinity of that water, to evaluate potential impacts and changes to those impacts, over the life of the CVC and MC mines. In general, the premise of the groundwater assessment is that the historical data is a reliable indicator of future performance and impacts. Only flow data are summarized in the groundwater assessment, and it is not clear that any new data analyses were completed as part of the groundwater assessment.

### 3.2 Impact Summary

The groundwater assessment concludes that the dewatering rate could increase the maximum pumping rate by up to 0.9 ML/day as a result of the Project. GHD considers this to be a short term impact related to the dewatering of rock above and below the Fassifern Seam in the zones of secondary extraction, and concludes that the total pumping rate will remain below the permitted limit. The groundwater assessment (EIS, Section 6.2) also concludes the following:

- No drawdown of alluvial groundwater or the water table is predicted as a result of the Project, and no impact on baseflow to ephemeral creeks is predicted.
- It is not expected that there will be a change in groundwater quality attributable to mining under proposed conditions.
- The Project will result in two additional years of dewatering of underground workings.
- Following the cessation of mining activities (and associated dewatering activities), groundwater pressures within the strata surrounding the mine will recover at a similar rate to currently approved operations.

- The Project is not predicted to result in additional leakage from Lake Macquarie to the underlying fractured and porous rock groundwater sources, and groundwater salinity is not expected to increase.

No rigorous analyses are included in the groundwater assessment to support these conclusions, which appear to be based primarily on monitoring the rate of mine-water pumping on a daily basis, and GHD's judgment.

Based on the response to a Delta Coal community mail-out, GHD concludes that there is limited use of groundwater in the area.

### **3.3 Mitigations and Monitoring**

No mitigations relating to groundwater impacts are proposed. Mine-related monitoring includes daily metering of total underground mine water input and output. Water sampling and quality testing are also undertaken as part of the surface water monitoring program (see Section 5). The CVC Groundwater Management Plan identifies a number of private bores for inclusion in the groundwater monitoring program. Monitoring of these bores is required at least once before and once after mining of the relevant miniwall is completed, although it is not clear from the assessment report that monitoring of private bores has occurred due to access constraints (EIS, Appendix 9, Section 4.2).

### **3.4 Review Comments**

I would characterize the groundwater component of the EIS as a cursory assessment that rationalizes, 'because groundwater impacts have not yet been observed, additional impacts are not anticipated through the duration of the Project'. While that may be the case, these conclusions are not based on any rigorous analysis; they simply rely on historical data trends. In my opinion, mining, and subsequent collapse of bedrock above mine cavities will increase the permeability of the bedrock overlying the mine cavities, which will result in increased flows of seawater from Lake Macquarie into the brackish aquifers underlying Lake Macquarie. The groundwater assessment does not include analysis of the potential increase of flows into brackish aquifers, or sensitivity analyses in the event that these bedrock collapses are larger than is anticipated. Predictive analyses should be included to assess the potential consequences of events that have not been observed to date but could occur, such as a sudden increase in groundwater inflow to the CVC and MC mines.

Further, the groundwater assessment does not include a compilation of the data on which it is based, so it is not possible to check or verify. The EIS should contain sufficient information and data to allow regulators and stakeholders to independently verify the proponents conclusions.

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Depressurization of the coal seams and adjacent strata will result in the dissolution of gases dissolved in that groundwater under the pre-mining pressures. A portion of those liberated gases will be collected and released to the atmosphere by the mine ventilation systems. Over time, the remaining liberated gases will work their way upwards (under buoyant conditions) through flooded mine works and permeable strata as methane and carbon dioxide bubbles. These fugitive emissions contribute to overall GHG emissions and potentially present a risk to ecological receptors (Lake Macquarie) and land occupants above the mines.

The peer-review did acknowledge that the GHD assessment was simplistic and limited to a review of historical trends in monitoring groundwater pumped from the mines. The peer-review also acknowledged the role of fracturing and did estimate the degree of fracturing that could be anticipated. It also referred to an existing, numerical groundwater model that GHD may or may not have relied upon in completing its assessment. The groundwater assessment should include a detailed analysis of these factors, which should include a sensitivity analysis that evaluates impacts in the event that their assumptions regarding fracturing and permeability are not accurate.

## 4 SURFACE WATER ASSESSMENT

### 4.1 Scope of EIS

The surface water assessment completed by GHD (EIS, Appendix 10) addresses the SEARs and describes the permitting and licensing requirements associated with surface water. The scope of the surface water assessment reportedly includes the following (EIS, Appendix 10, Section 1.3):

- Review existing assessments and data relevant to the Project;
- Review relevant statutory requirements;
- Establish the existing and/or approved conditions for the surface water systems;
- Determine the water management requirements for the Project;
- Undertake an assessment of the potential impacts of the Project on:
  - Water and salt balance;
  - Surface water quality;
  - Downstream water users, including licensed water users and basic landholder rights.
- Undertake an assessment of the cumulative impacts of the Project in association with other operations in the region;
- Identify licensing requirements;
- Develop measures to avoid, minimise and mitigate potential impacts of the Project and provide recommended management, monitoring and reporting requirements.

### 4.2 Impact Summary

Table 4.1 summarizes the mine water release criteria for CVC and MC, as specified in their environmental protection licences. This water is released into Swindles Creek and subsequently into Lake Macquarie.

A site model was developed to estimate/predict the volumes of water in the management system and the discharges to the environment. The groundwater pumped from the mine coupled with the potable water used for spraying into the mine for dust control represent by far the largest proportion of the water handled by the system. Discharges are reduced by evaporation and reuse, but these proportions are very small in comparison. In essence, the mine water is pumped into sedimentation structures that discharge to Swindles Creek, which in turn discharges into Lake Macquarie.

**Table 4.1**  
**Surface Water Release Criteria (Tables 4.1 and 4.2, EIS Appendix 10)**

## CVC

Pollutant	Unit	100th percentile concentration limit
Faecal coliforms	colony forming 200 units per 100 millilitres	200
pH	pH units	6.5 to 8.5
Total suspended solids	mg/L	50

## MC

Pollutant	Unit	100th percentile concentration limit
Oil and Grease	mg/L	10
pH	pH units	6.5 to 8.5
Total suspended solids	mg/L	50

## 4.3 Mitigations and Monitoring

Treatment for this water involves a series of sedimentation basins to reduce the concentrations of suspended solids. Mine water, water that has come into contact with coal, and other industrial runoff water are directed to these systems. There are also procedures in place to reuse some of this water for dust control to reduce discharge volumes. These existing mitigations are to be continued, unchanged, through the duration of the Project. All of the dissolved salts are discharged into Swindles Creek, along with whatever contaminants are dissolved in the water or associated with the residual suspended solids.

Grab samples of the discharges are reportedly collected on a monthly basis in accordance with conditions on the separate Environment Protection Licences that applies to both CVC and MC, and are analyzed for the parameters indicated in Table 4.2.

**Table 4.2**  
**Surface Water Quality Monitoring (Table 7.1, EIS, Appendix 10)**

Site	Monitoring location	Description	Analytes	Period of record reviewed
CVC	CVC LDP001	EPL 1770 Licensed discharge point 1	pH*, total suspended solids (TSS)*, biochemical oxygen demand (BOD), faecal coliforms*, Enterococci, oil and grease, electrical conductivity (EC), total nitrogen, total phosphorus, Anionic surfactants (MBAS).  Aluminium <sup>1</sup> , Arsenic <sup>1</sup> , Arsenic (total), Beryllium <sup>1</sup> , Cadmium <sup>1</sup> , Chromium <sup>1</sup> , Cobalt <sup>1</sup> , Copper <sup>1</sup> , Lead <sup>1</sup> , Mercury <sup>1</sup> , Molybdenum <sup>1</sup> , Nickel <sup>1</sup> , Nickel <sup>2</sup> , Selenium <sup>1</sup> , Silver <sup>1</sup> , Vanadium <sup>1</sup> , Zinc <sup>1</sup>	07/01/2015 - 20/01/2021
		Dam 10 piped discharge		
	OTC	Outlet where discharged water enters Swindles Creek		
	USSP	Upstream reference location on Swindles Creek		
	RW1	Downstream reference location on Swindles Creek		12/04/2011 - 17/03/2021
MC	MC LDP001	EPL 191 Licensed discharge point 1 Pond B overflow	Aluminium <sup>1</sup> , Aluminium (total), Antimony, Arsenic <sup>1</sup> , Arsenic <sup>2</sup> , Barium, Beryllium <sup>1</sup> , Beryllium <sup>1</sup> , Boron, Cadmium <sup>1</sup> , Cadmium <sup>1</sup> , Calcium, Chromium <sup>1</sup> , Chromium <sup>2</sup> , Cobalt <sup>1</sup> , Cobalt <sup>2</sup> , electrical conductivity, Copper <sup>1</sup> , Copper <sup>2</sup> , Iron, Lead <sup>1</sup> , Lead <sup>2</sup> , Lithium, Magnesium, Manganese <sup>1</sup> , Manganese <sup>2</sup> , Mercury <sup>1</sup> , Mercury <sup>2</sup> , Molybdenum <sup>1</sup> , Molybdenum <sup>2</sup> , Nickel <sup>1</sup> , Nickel <sup>2</sup> , Nitrogen (ammonia), Oil and Grease*, pH*, Phosphorus, Potassium, Selenium <sup>1</sup> , Selenium <sup>2</sup> , Silica, Silver <sup>1</sup> , Silver <sup>2</sup> , Sulfur, Tin, Titanium, Total suspended solids*, Vanadium <sup>1</sup> , Vanadium <sup>2</sup> , Zinc <sup>1</sup> , Zinc <sup>2</sup>	13/01/2014 - 20/01/2021
	MC Downstream	Downstream reference location on an unnamed creek		

Default guideline values (DGVs) were derived for selected parameters in accordance with the Australian and New Zealand Environment and Conservation Council (ANZECC) 2018 guideline, and the historical water quality values were compared to these reference criteria. These DGVs and site specific guidelines were not independently verified.

The surface water assessment acknowledges that Swindles Creek is entirely changed as a result of the mine water discharges (EIS, Appendix 10, Section 7.2). Exceedances are noted for salinity parameters, nitrogen compounds, fecal coliform, and some dissolved metals (Al, Ba, Fe, Mn and Zn) in samples collected from the facility discharge and Swindles Creek. High concentrations of nitrogen compounds are attributed to the groundwater source of the water. Fecal coliform levels are attributed to Mannering Park sewage treatment plant, although CVC operations were recognized as a potential source.

The assessment considered dissolved metals “given their bioavailability to aquatic marine species” (EIS, Appendix 10, Section 7.2). A high measurement of dissolved manganese was attributed to laboratory error. GHD concluded that, “*elevated dissolved metal concentrations may reflect natural surrounding geology*” (EIS, Appendix 10, Section 7.2), which is presumably an indirect reference to the source of the vast majority of this discharged water being groundwater pumped out of the coal-producing formations.

#### 4.4 Review Comments

The fundamental basis of the water management plan is to discharge large quantities of mine water into Swindles Creek, and subsequently Lake Macquarie, using only sedimentation as a treatment method. The basic question that should be answered is whether this is protective of the aquatic environment of Swindles Creek and Lake Macquarie. Based on my review of the GHD surface water assessment, this question is not answered because the assessment does not include a detailed assessment of potential contaminants. The following quotation is provided for perspective:

*“The intercepted groundwater is expected to have similar water quality to that currently extracted under approved conditions and the receiving water body of Lake Macquarie. Inorganic nitrogen compounds and dissolved metals exceeding respective SSGVs or DGVs will likely have a greater pollutant mass load discharging into Swindles Creek via CVC LDP001 and MC LDP001, however concentrations, and therefore the level of ecotoxicity, are expected to remain similar”* (EIS, Appendix 10, Section 8.3).

In my experience, total metals concentrations are typically used to evaluate surface water quality, and dissolved metals concentrations are typically used to evaluate groundwater quality. The reasoning behind this approach is that aquatic receptors are exposed to all metals in surface



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water. GHD's assessment implies that the dissolved metals represent the fraction that is bioavailable, but this assumption is not technically supported by the surface water assessment. Elevated concentrations of heavy metals are commonly associated with mine water, including coal mines, and should be assessed in detail as part of the EIS, including total metals concentrations.

In my experience, elevated concentrations of phenolic compounds may also be associated with coal mining operations, and groundwater sourced from coal deposits. These compounds should be included in the surface water assessment as they are potentially toxic to aquatic receptors.

The SEARs for water assessment also requires "*an assessment of any likely flooding impacts of the development*" (EIS, Appendix 2), which does not appear to have been completed. Only a statement that flood risk will not change is included in the surface water assessment.

An assessment of cumulative impacts to surface water in general, and Lake Macquarie in particular, does not appear to have been completed. This was specifically included in the SEARs (EIS, Appendix 2).

## 5 SUBSIDENCE ASSESSMENT

### 5.1 Scope of EIS

The assessment of subsidence is summarized in Section 6.2 of the EIS and is presented in greater detail in Appendix 3. The assessment of subsidence relies entirely on past predictions of subsidence, and the existing performance measures. It also relies on the existing monitoring programs to quantify subsidence, which includes bathymetric monitoring, fixed foreshore monitoring surveys, remote LiDAR monitoring and visual inspection.

No new subsidence assessment is included in the EIS. The following rationale for this approach was provided, *“as a detailed assessment of potential subsidence impacts is required as part of the Extraction Plan approval processes should secondary extraction be proposed in this area in the future, and the Consolidation Project does not propose any changes to currently approved first workings mining methods or areas where these can be undertaken, no additional assessment of subsidence impacts has been undertaken (or is considered to be required) in relation to the extended Zone B or the Zone A areas”* (EIS, Section 6.2.4). In short, Delta argues that subsidence has already been addressed, or will be addressed elsewhere, so it is not required as part of the EIS.

The EIS also states, *“the extension of Zone B into the currently approved MC mining area below Lake Macquarie provides a consistent approach to managing underground mining operations below lake areas and avoids arbitrary restrictions on mine design which may limit future resource extraction in this area”* (EIS, Section 6.2.4). Delta’s position in this regard is not explained or supported in the context of an environmental assessment process, which is meant to consider and quantify potential impacts.

The impact assessment for subsidence relies on previous predictions of subsidence (Strata, 2020), subsidence monitoring (Delta Coal, 2022), and the performance measures summarized in Section 2.2.4 of the EIS. The SEARs for assessment of subsidence require, *“a detailed qualitative assessment of the potential subsidence effects and impacts of the development”* (EIS, Appendix 2), which does not appear to have been completed.

### 5.2 Impact Summary

Two significant potential negative impacts that may be caused by subsidence are identified: (1) to biodiversity, with focus on the foreshore, seagrass, and benthic organisms; and (2) to manmade structures, infrastructure and surface facilities.

No subsidence impact assessment is included to support the Project EIS, and a summary of the methodology and predictions for subsidence is not included in the EIS. The EIS reiterates the existing acceptable subsidence limits, which are as follows:

- Maintaining long-term stable underground workings for the Zone A (bord and pillar) mining beneath the shoreline and foreshore, where subsidence is expected to be less than 20 mm.
- Maintaining subsidence of less than 780 mm for Zone B (secondary, miniwall mining), which is constrained to deeper coal-bearing layers beneath Lake Macquarie. This aspect of mining and subsidence prediction is subject to an Extraction Plan process that is not fully explained in the EIS, although NSW (2022) provides guidance in this area.

Strata (2020) estimated subsidence and impacts resulting from Herringbone bord and pillar, and miniwall mining in the Northern Mining Area and for the Fassifern Seam. It is assumed that this methodology and the general conclusions of the Strata (2020) report were relied upon for the subsidence impact assessment. The bord and pillar designs rely on the strength and spanning capabilities of conglomerate layers in the geological profile, as well as pillars to spread load into the softer underlying claystone. The strength formula for the mine pillars is based on experience gained in South Africa and Australia, and factors of safety are based on potential consequences of failure, which is an accepted approach.

The quantification of impacts relies on compliance with the performance measures that are in place for CVC, and the results of subsidence monitoring, which is summarized in Annual Reports (Delta Coal, 2022). The subsidence impact performance measures are summarized in Table 5.1 below.

Review of the subsidence monitoring completed in 2021 indicates the following:

- With the exception of survey results for Summerland Point, measured subsidence along the shoreline and foreshore were typically less than 20 mm.
- Regarding Summerland Point, *“The foreshore along Summerland Point has been monitored since 1994, after secondary extraction was undertaken in the Wallarah beneath the south-western point (corresponding to mark S63 – 74). A maximum of 145mm of subsidence was measured (Point S71) since 1994”*. Additionally, for Line 40 the report states, *“Minor ground movement along the line is limited to  $\pm 5$ mm and appears seasonal, subsidence appears to be limited to negligible subsidence (<20mm)”*.
- Bathymetric survey results indicate measured subsidence varying between <200 mm and 550 mm. Measured subsidence varied up to 50% above and below the predicted amounts

of subsidence, and the highest levels of subsidence were measured in the areas where mining was completed four years prior to the survey.

The high levels of subsidence at Summerland Point reportedly occurred prior to 2008, but there is no explanation as to why high amounts of subsidence occurred at this location, whether or not it was caused by the CVC mine, or what adverse surface impacts may have occurred.

Review of the data generated for Line 40 indicates that subsidence is approaching the 20 mm limit. The uncertainty associated with Delta’s statement that, “*subsidence appears to be limited to negligible subsidence*” is not explained. Further, review of the graphical representations of subsidence indicates that subsidence is generally increasing over time for the shoreline monitoring data as a whole. It appears that bathymetric surveys over Zone B mining areas are discontinued 3 years after mining in the underlying area is complete. The rationale for discontinuing the bathymetric surveys is not included in the Annual Report or the EIS.

**Table 5.1**  
**CVC Subsidence Impact Performance Measures (EIS, Table 6.1)**

Aspect	Performance Measures
<b>Vertical Subsidence</b>	
Land Areas	<20 mm vertical subsidence (Zone A).
High Water Mark	<20 mm vertical subsidence (Zone A).
Zone B (excluding seagrass beds)	<780 mm vertical subsidence.
Seagrass Beds	<20 mm vertical subsidence (Zone A and Zone B).
<b>Biodiversity</b>	
Threatened species or endangered populations	Negligible environmental consequences.
Seagrass beds	Negligible environmental consequences including: <ul style="list-style-type: none"> <li>• negligible change in the size and distribution of seagrass beds</li> <li>• negligible change in the functioning of seagrass beds</li> <li>• negligible change to the composition or distribution of seagrass species within seagrass beds.</li> </ul>
Benthic communities	Minor environmental consequences, including minor changes to species composition and/or distribution.
<b>Mine Workings</b>	
First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences	To remain long-term stable and non-subsiding (Zone A and Zone B).
Second workings	To be carried out only in accordance with an approved Extraction Plan (Zone B only).
<b>Built Features</b>	
Trinity Point Marina Development Other built features	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repaired, replaced or fully compensated.
<b>Public Safety</b>	
Public Safety	Negligible additional risk.

## 5.3 Mitigations and Monitoring

Commitments to mitigations related to subsidence include the following:

- performance measures as specified in Table 5.1
- mining in accordance with an approved extraction plan
- predictive modeling and mine design to comply with performance measures

Monitoring completed to quantify subsidence and to assess the potential impacts of subsidence include the following:

- bathymetric monitoring for three years after mining
- fixed foreshore monitoring surveys
- remote LiDAR monitoring
- visual inspection
- seagrass survey (annual)
- benthic survey (annual)

## 5.4 Review Comments

The EIS does not include predictions of subsidence, assessment of related impacts, or an evaluation of potential mitigations other than those that are in place. In my opinion, these are important components of “*a detailed qualitative assessment of the potential subsidence effects and impacts of the development*” (EIS, Appendix 2). The EIS relies entirely on the existing approvals and measures being implemented to predict, control, and measure subsidence, and its potential impacts.

In my opinion, the methods implemented to design the mine workings to comply with the subsidence performance, and the monitoring programs being implemented to quantify subsidence, are appropriate. However, there is considerable uncertainty associated with predicting subsidence associated with underground coal mining, and there are many instances of damaging subsidence occurring long after mining has been completed (Australian Coal Alliance, 2010; Canmore Commons, 2021). In my opinion, these uncertainties and potential adverse effects are not given sufficient consideration in the EIS.

Additional, specific comments regarding the assessment of subsidence are as follows:

- The high levels of subsidence measured in the past at Summerland Point warrant further analysis and explanation. More specifically, was this subsidence caused by the CVC mine, and if so, what has changed to prevent this sort of subsidence from reoccurring?

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- The measured amounts of subsidence appear to be increasing over time. A detailed temporal assessment of the data appears to be warranted to evaluate and extrapolate these trends.
- It appears that bathymetric surveys are discontinued three years after mining has been completed. As the highest levels of subsidence as measured by the bathymetric surveys was made in 2020, over areas mined in 2017, discontinuing the bathymetric surveys after 3 years may not be appropriate.
- The assessment and reporting of mine rehabilitation and closure does not include assessment of the long-term risks of subsidence, which have the potential to adversely affect benthic and aquatic biota. Appropriate programs for monitoring subsidence and biota should be proposed for the period following closure of the mines.

## 6 BIODIVERSITY

The focus of the biodiversity assessment is on *“the potential impacts to seagrass and benthic communities associated with ongoing operations. A desktop review of information relating to seagrass and benthic community monitoring conducted by CVC was undertaken”* (EIS, Appendix 11, Section 2). This contrasts with what is required by the SEARs for the EIS as it relates to biodiversity, which are as follows (EIS, Appendix 2):

- *“accurate predictions of any vegetation to be cleared on site;*
- *an assessment of the likely biodiversity impacts of the development, paying particular attention to threatened species, populations and ecological communities and groundwater dependent ecosystems, undertaken in accordance with Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report; and*
- *a strategy to offset any residual impacts of the development in accordance with the offset rules under the Biodiversity Offsets Scheme;”*

Clearly, a desktop review of past benthic and seagrass surveys does not fulfill the Biodiversity SEARs for the Project EIS because the SEARs related to biodiversity do not limit the biodiversity assessment to desktop review of past seagrass and benthic surveys.

Further, there is the potential for impacts to aquatic, benthic and riparian communities that could result from the large-scale pumping of groundwater from the mine and the release of that groundwater, and other industrial water, into Swindles Creek and subsequently into Lake Macquarie. This should be included in the biodiversity assessment.

No detailed assessment of the potential impacts to these ecological communities is provided in the Biodiversity Assessment, in fact it is not even mentioned. Only the surface water assessment makes passing mention of the ecology of Swindles Creek (EIS, Appendix 10, Section 7.2).

## 7 GREEN HOUSE GAS ASSESSMENT

### 7.1 Scope of EIS

The greenhouse gas and energy assessment was completed by Umwelt (EIS, Appendix 14). The following emissions were included in the scope of the assessment of GHG emissions:

- Scope 1: fuel combustion and fugitive emissions associated with coal mining, processing and transportation.
- Scope 2: emissions associated with electricity use.
- Scope 3: emissions resulting from combustion of the coal produced by the CVC and MC mines.

The emissions were calculated in accordance with Australian standards published by the National Greenhouse Accounts (NGA) and emissions factors published by the Australian Department of Industry, Science, Energy and Resources (DISER, 2021). The GHG quantification estimates were reportedly completed in accordance with these standards and guidance, although a detailed checking of the calculations was not made.

This review focuses on the calculation component of the GHG emissions, and not the potential impacts of those emissions.

### 7.2 Impact Summary

Planned GHG emissions are summarized in Table 7.1. The Planned Scenario is forecast to generate an additional approximately 1,971,372 t CO<sub>2</sub>-e Scope 1 emissions over the life of the Project relative to existing approved operations. Scope 3 emissions associated with the additional combustion of coal from the Project will generate an additional 23,157,149 t CO<sub>2</sub>-e relative to the Approved Operations (EIS, Section 6.9.2.2). The EIS claims that these Scope 3 emissions are associated with the combustion of coal at the VPPS and would be generated irrespective of the source of coal; however, CVC, MC and VPPS are ultimately owned by the same organization and are fully integrated.

The forecast energy use intensity associated with the additional coal generated by the Project is approximately 121 MJ/product tonne, which is reported to be lower than the industry average. The EIS claims that the GHG emissions associated with the Project are consistent with the Australian and NSW commitments with respect to GHG emissions targets. This is because the Project is scheduled to end prior to the onset of these commitments in 2030 and 2050 (EIS, Section 6.9.3).



The primary contributor to the Scope 1 GHG emissions is caused by fugitive emissions of methane that occurs as groundwater within the coal seams is depressurized and the mined coal is exposed to atmospheric conditions. Scope 1 emissions account for 13% of the total Project GHG emissions, and of those Scope 1 emissions, the vast majority results from the emission of mine gases, primarily methane. The basis of this aspect of the GHG calculation from the active mining operation is shown in Table 7.2, and from the legacy operations is shown in Table 7.3 below (EIS, Appendix 14). The technical bases of these fugitive emissions calculations should be properly explained.

**Table 7.1**  
**Summary of Additional GHG Emissions (EIS, Appendix 14, Table 3.2)**

Stage	Scope	Source	Source Totals (t CO <sub>2</sub> -e)	Scope Totals (t CO <sub>2</sub> -e)	
Operation	Scope 1 (Direct)	Diesel use	11,262	1,971,372	
		Fugitive emissions (historical mining)	929,413		
		Fugitive Emissions (ROM Coal)	1,030,697		
	Scope 2 (Indirect)	Electricity	221,637	221,637	
	Scope 3 (Indirect)	Product use	23,111,850	23,157,149	
		Domestic product transport	16,943		
		Export product transport	0		
		Associated with energy extraction and distribution	21,356		
	<b>Additional operational greenhouse gas emissions associated with the Planned Scenario</b>				<b>25,350,157</b>

**Table 7.2**  
**Summary of Calculation Inputs (EIS, Appendix 14, Appendix A)**

Gas Component	
Gas Content Fassifern Seam - CVC Mining Area (m <sup>3</sup> /t ROM Coal)	5.30
Methane (CH <sub>4</sub> ) percentage of Fassifern Seam Gas	97%
Carbon Dioxide (CO <sub>2</sub> ) percentage of Fassifern Seam Gas	3%
Methane Global Warming Potential factor	28

**Table 7.3**  
**Summary of Fugitive Emissions (EIS, Appendix 14, Appendix A)**

Domain	Activity Data	Emission Factors	
		CO <sub>2</sub>	CO <sub>2</sub> /CH <sub>4</sub>
	ROM Coal Tonne	t CO <sub>2</sub> -e/ ROM t	
Project	13,422,983	0.098	
Additional	9,488,627	0.098	
Fugitive Emissions attributable to ROM	Project	1,314,784	
	Additional	929,413	

## 7.3 Review Comments

The calculations of direct and indirect emissions associated with the Project appear to have been completed in accordance with Australian standards, although insufficient detail is included in the EIS to check these calculations independently. The actual calculations should be included in the EIS so that they can be independently verified.

Delta Coal claims that the Scope 3 emissions will be incurred irrespective of the Project; however, the VPPS is owned by the same company that owns Delta Coal and the two operations are reported to be integrated and interdependent (see Section 1.2). The two year continuance of these mining operations will result in increased GHG emissions because the coal will be used for power generation.

An important aspect of the GHG emissions associated with the Project is the fugitive methane emissions. This calculation appears to be based on the methane and carbon dioxide content of the coal within the Fassifern seam, and the amount of coal mined as part of the Project. The methane and carbon dioxide are primarily dissolved in the groundwater within the coal seams, and overlying and underlying strata. The solubility of methane and carbon dioxide in groundwater increases with pressure; hence, these gases will come out of solution when the groundwater is depressurized in support of mining. The quantifications presented by Umwelt appear to be based on the volume of coal mined and not the total mass subject to depressurization in support of the mining operation, which could underestimate of the volumes of these gases that are emitted.

The technical bases of the fugitive GHG emissions calculations should be fully explained. For example, the starting point of the fugitive GHG emissions calculation is the 5.3 m<sup>3</sup>/tonne of ROM coal, which is of fundamental importance to this calculation.

The GHG assessment does not consider possible mitigations. For example, lower intensity power generating alternatives, such solar and wind power, could likely be implemented in the Project time frame to reduce GHGs. The practicality of collecting and incinerating the fugitive methane should also be assessed to reduce GHGs.

## 8 MINE CLOSURE AND REHABILITATION

The rehabilitation plan presented in Section 6.16 of the EIS primarily focuses on the rehabilitation of the surface developments associated with the mines, and making the lands safe and secure. It also refers to currently approved rehabilitation and land use plans for CVC and MC as the basis for closure. The measures summarized for rehabilitation of surface facilities appear to be appropriate. Delta Coal plans to close and secure all access portals and vent shafts associated with the mines, which is standard practice for closure of underground mines.

The two most significant long-term risks associated with the closed, underground mines are the potential for contaminated groundwater to impact groundwater users and/or surface receptors, and the potential for surface impacts to be caused by collapse of the mine. Neither of these issues are addressed in any detail in the rehabilitation and closure summary. The plan states that “*a detailed Groundwater Impact Assessment will be undertaken to identify any post-mining impacts and determine required mitigation/management measures*” (EIS, Section 6.16.1); however, the specifics of this assessment are not provided and should be. It is also possible to complete this assessment now, while the mine is operating, and the opportunity is available to implement mitigating measures that may be identified by the groundwater assessment.

Regarding the potential for future subsidence, a program for ongoing monitoring of potential future subsidence should be described, and viable mitigations identified should higher levels of subsidence occur in the future.

The SEARs for rehabilitation and final landform include “*the measures which would be put in place for the long-term protection and/or management of the site and any biodiversity offset areas postmining*” (EIS, Appendix 2). This requirement does not appear to have been addressed, in the EIS and should be before the document is considered complete.

## 9 REFERENCES

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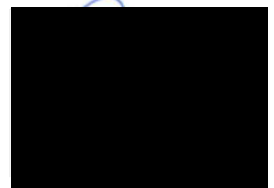
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## 10 CLOSURE

This report has been prepared for Environmental Justice Australia. The text contained herein documents the review of the Chain Valley Colliery Consolidation Project Environmental Impact Statement carried out by Burgess Environmental Ltd. This report represents the opinions of Gordon J. Johnson, M.Sc., P.Eng. (AB) based on information generated by Delta Coal and provided by Environmental Justice Australia, which has not been independently verified, publicly available information, and the experience and judgment of the Author. No other warranty is expressed or implied.

All data contained herein has been reviewed and interpreted by, or under the direct supervision of Gordon J. Johnson, M.Sc., P.Eng., P.Eng.

“original signed and sealed by author”



December 8, 2022

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