Chain Valley Colliery Modification 4

Extension of Underground Mining Area and Increase in Workforce.
State Significant Development Modification Assessment Report
(SSD-5465 MOD 4)

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Subtitle: Extension of Underground Mining Area and Increase in Workforce.

Cover image: Aerial view of Chain Valley Colliery surface facilities and internal private access road on the shores of Lake Macquarie (Source: Delta Coal, 2021).

Executive Summary

Great Southern Energy Pty Limited (trading as Delta Coal) owns and operates the Chain Valley Colliery and nearby Mannering Colliery, which are underground thermal coal mines located at the southern end of Lake Macquarie, approximately 60 kilometres south of Newcastle. The two mines supply coal to the nearby Vales Point Power Station, which generates over 10 percent of the State's electricity.

The Chain Valley Extension Project (SSD-5465) was approved on 23 December 2013 and has been modified on three occasions. Under this approval, Delta Coal extracts and transports up to 2.1 Million tonnes per annum (Mtpa) of run-of-mine coal from Chain Valley Colliery until 31 December 2027. Up to 2.1 Mtpa of this coal is permitted to be transported via an underground mine linkage to Mannering Colliery for onward supply to Vales Point Power Station.

Delta Coal is seeking to modify the Chain Valley Extension Project consent to allow an extension of mining operations to the north of the current consent boundary into an area known as the 'Northern Mining Area'. This area has an existing underground mining approval under a separate development consent held by Centennial Myuna Pty Ltd. It is also seeking to increase the number of employees at Chain Valley Colliery from 220 to 330 through a transfer from Mannering Colliery to Chain Valley Colliery.

The Department publicly exhibited the proposed modification from 3 to 16 December 2020. It received advice from 10 government agencies, none of which objected. There were four community submissions, with two in support and two objecting to the proposed modification.

The Department considers that key risks for evaluation are subsidence and groundwater, while operational efficiency, ongoing employment and energy security are the main benefits.

The subsidence impacts from mining are likely to be negligible as the proposed modification involves first workings only. This has already been comprehensively assessed and approved through the existing Myuna Colliery consent (MP 10_0080). The Resources Regulator identified some minor residual risks associated with soft seam floor conditions but was satisfied that the risks could be adequately dealt with post-approval in accordance with relevant health and safety legislation.

The risk of groundwater impacts is low as there are no private bores or high priority groundwater dependent ecosystems in this area. Further, Delta Coal already holds adequate water licences to account for the additional expected underground water make.

The proposed mining of the Northern Mining Area represents a logical continuation of the current approved mining areas at Chain Valley Colliery. The extraction, processing and transportation of coal using existing infrastructure would achieve considerable operational efficiencies without any substantive changes to the approved environmental and amenity impacts of the existing operations.

Importantly, the proposal would also generate a range of social and economic benefits, including:

- the continued employment of the Chain Valley and Mannering workforce;
- improved energy security in NSW by contributing 50% of coal supply to Vales Point Power Station until 2027; and
- the provision of $15 million in royalties to the NSW Government in current dollars.

Overall, the Department is satisfied that there are no significant additional environmental or amenity impacts when compared with the mine's current operations, and that any residual impacts can be managed under the conditions of consent, as modified. The Department therefore considers that on balance the proposed modification is in the public interest and should be approved subject to the recommended revised conditions of consent.

Contents

1 Introduction

1.1 Background

Great Southern Energy Pty Limited (trading as Delta Coal), owns and operates the Chain Valley Colliery, an underground coal mine located at the southern end of Lake Macquarie, approximately 60 kilometres south of Newcastle (see **Figure 1**). The mine's development consent boundary straddles the Lake Macquarie and Central Coast Local Government Areas. All coal extracted is provided to Vales Point Power Station for domestic energy production which is owned by a related entity Sunset Power International (trading as Delta Electricity).

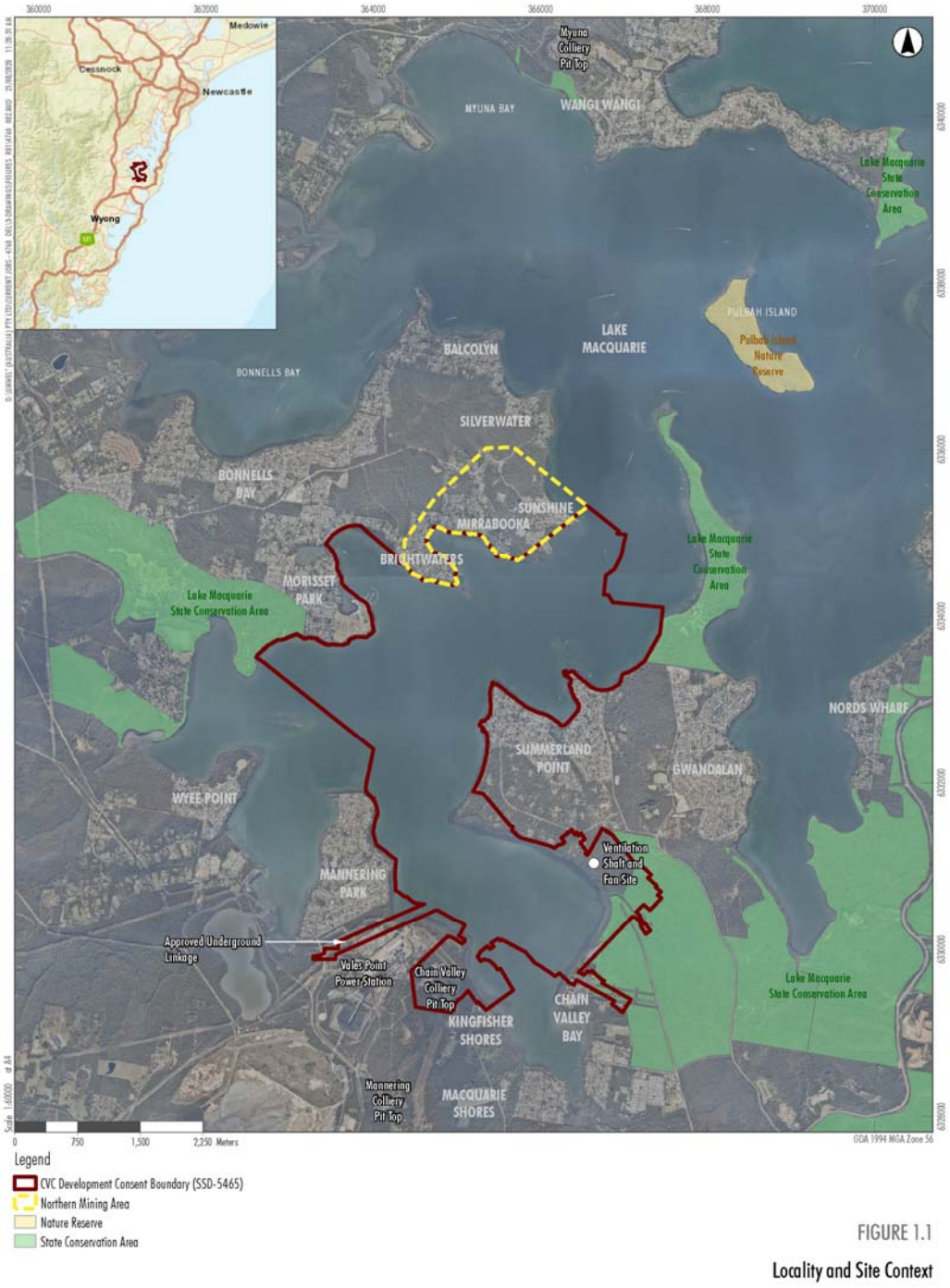

Figure 1 | Regional Location and Site Context

1.2 Approved Mining

The Chain Valley Extension Project (SSD-5465) was approved on 23 December 2013 by the then Minister for Planning and Infrastructure under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This consent allows Delta Coal to extract and transport up to 2.1 Million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from Chain Valley Colliery until 31 December 2027. This coal is transported via an underground mine linkage to Mannering Colliery for onward supply to Vales Point Power Station.

Chain Valley Colliery utilises both herringbone bord and pillar and miniwall mining techniques to extract coal from the Fassifern Seam.

The herringbone bord and pillar method involves the cutting of a regular grid of tunnels (headings and cut-throughs) within the coal seam. This creates pillars of coal, bounded by the headings and cut-throughs to support the overlying strata. These pillars are designed to be long-term stable.

The term 'miniwall' is used to distinguish the narrower width and shorter length of the extraction panels used at Chain Valley Colliery when compared to conventional longwall mining. Miniwall panel widths at Chain Valley Colliery are up to 97 m wide, compared to widths of between 200 - 400 m which are typical of traditional longwall panels.

The approved underground mining areas and methods of coal extraction have been designed to protect the Lake Macquarie lakebed, seagrass beds, foreshore, infrastructure and residences from the impacts of mine subsidence. Mine subsidence impacts are largely controlled through the application of two subsidence management zones, Zone A and Zone B, which have been established to limit subsidence impacts depending on the sensitivity of the overlying environmental receptors (see **Figure 2**).

Zone A is the most environmentally sensitive zone. Vertical subsidence within this zone is limited to a maximum of 20 millimetres (mm), which results in long term stable mining effects and negligible impacts.

Subsidence management Zone B is located entirely under Lake Macquarie**.** Subsidence impacts within this zone are limited to a maximum of 780 mm of vertical subsidence, consistent with the maximum predicted subsidence from the approved mining activities.

1.3 Approval History

The consent has been modified on three previous occasions (see **Table 1**):

Table 1 | Summary of previous modifications

MOD No.	Summary of Modifications	Approval Authority	Type	Approval Date
MOD 1	Construction of an underground conveyor linkage between Chain Valley Colliery and Mannering Colliery for coal transportation.	Executive Director as delegate of the Minister	96(2)	26 Nov 2014
MOD 2	Increase in the rate of coal extraction from 1.5 to 2.1 Mtpa, with additional coal to be transported to Vales Point Power Station. Mine design changes.	Executive Director as delegate of the Minister	96(2)	16 Dec 2015
MOD 3	Increase in the transport of product coal from Chain Valley Colliery to Mannering Colliery from 1.3 Mtpa to 2.1 Mtpa.	Independent Planning Commissions	4.55(1A)	26 June 2020

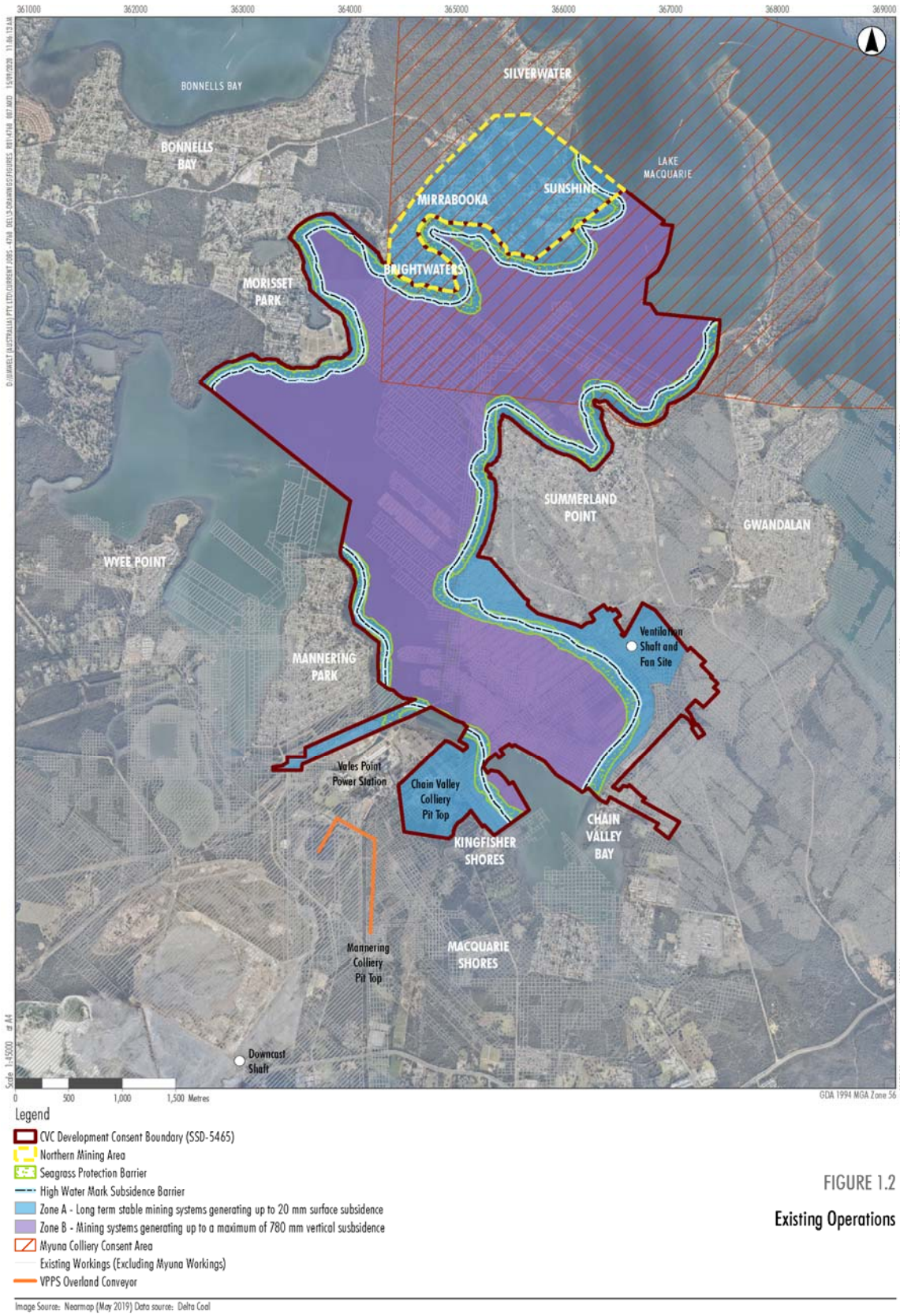

Figure 2 | Chain Valley Colliery existing consent boundary with the proposed Northern Mining Area extension (yellow dashed line) and consent overlap area with Myuna Colliery (orange stripes).

1.4 Local Context

Coal mining in the Lake Macquarie area has occurred for over 100 years and many of the residential communities around the lake were established to support the local mining industry. Chain Valley Colliery, which commenced operations in 1962, was established to supply coal to the Vales Point Power Station. It has remained a supplier of coal to the power station for over 50 years.

Mining at Chain Valley Colliery has historically occurred under Lake Macquarie and adjacent land. The mine is located within a designated mine subsidence district established under the *Coal Mine Subsidence Compensation Act 2007.*

The Chain Valley Colliery pit top is located at the southern end of Lake Macquarie in a heavily industrialised area adjacent to the Vales Point Power Station (see **Figure 2**). Land uses in the area are dominated by underground coal mining and associated surface facilities, electricity generation and transmission, fly ash emplacement, and discrete areas of residential development in the suburbs of Kingfisher Shores and Chain Valley to the south and Mannering Park to the north.

There is also an additional ventilation facility located to the east of the pit top at Summerland Point, across Chain Valley Bay, which is largely surrounded by the Lake Macquarie State Conservation Area to the south and residential areas to the north-west, and north-east.

Relationship to Mannering Colliery

Mannering Colliery operates under development consent MP 06_0311, granted on 12 March 2008 by the then Minister for Planning, under Part 3A of the EP&A Act. This consent, as modified, allows Delta Coal to extract up to 1.1 Mtpa of ROM coal from the Great Northern and Fassifern Seams using first workings bord and pillar mining methods, process coal from Chain Valley Colliery and Mannering Colliery at its onsite coal handling and processing plant, and transport all coal produced and/or received at the site to Vales Point Power Station by way of a dedicated overland conveyor. Mannering Colliery's pit top is located 1 km to the south of the Chain Valley Colliery pit top (see **Figure 2**). The operation provides employment for up to 170 FTE employees.

Since 2013, Chain Valley Colliery and Mannering Colliery have been managed as an integrated operation under various ownership and operating agreements. An underground linkage between Chain Valley Colliery and Mannering Colliery underground workings was constructed in 2017. This allows up to 2.1 Mtpa of ROM coal extracted from Chain Valley Colliery to be transported to Mannering Colliery for processing. This ROM coal, together with coal from Mannering Colliery, is then processed and sent via a dedicated overland conveyor to the Vales Point Power Station.

Relationship to Myuna Colliery

Myuna Colliery is located to the north of Chain Valley Colliery, although its development consent boundary overlaps part of the Chain Valley Colliery development consent boundary (see **Figure 2**). It is owned and operated by Centennial Myuna Pty Ltd (Centennial Myuna) under development consent MP10_0080, which was granted in 2012 and allows extraction of up to 2 Mtpa of ROM coal until 2033 using bord and pillar methods.

Myuna Colliery's mining system operates similarly to Chain Valley Colliery, through the application of two distinct subsidence management zones. Zone A allows long term stable mining generating no more than 20 mm of vertical subsidence, and within Zone B no more than 650 mm of vertical subsidence is permitted. Chain Valley Colliery's proposed extension (refer to **Section 0**), is located within Myuna Colliery's approved underground mining area, primarily within its Zone A subsidence management zone.

2 Proposed Modification

On 17 November 2021, Delta Coal lodged an application to modify the Chain Valley Extension Project (SSD-5465) under section 4.55(2) of the EP&A Act.

2.1 Modification Application

The proposed modification seeks to:

- extend the currently approved underground mining area by approximately 117 hectares (ha) into an area termed the Northern Mining Area, which is located under the suburbs of Brightwater, Mirrabooka and Sunshine, to extract an additional 2.6 Mt of ROM coal from the Fassifern Seam;
- access the proposed extension area via existing Chain Valley Colliery underground workings;
- undertake first workings coal extraction using herringbone bord and pillar underground mining methods;
- transport ROM coal extracted from the Northern Mining Area via underground workings to either the Chain Valley Colliery or Mannering Colliery surface facilities for processing; and
- increase the maximum number of employees reporting to the Chain Valley Colliery pit top by 110 to 330 FTE.

The modification does not seek to change any other aspect of the approved operations, including approved extraction rates, mining methods, surface facilities or operational hours.

The proposed changes to the approved operation are summarised in **Table 2** below. The proposed modification area is shown in **Figure 3**. A detailed description of the proposed modification is provided in the Statement of Environmental Effects (SEE) that accompanied the application (see **Appendix A**).

Figure 3 | Proposed Northern Mining Area extension

Table 2 | Comparison of Chain Valley Colliery approved and proposed operations

Component	Approved Operation	Proposed Modification
Development consent area	Approximately 1,425 hectares (ha), as shown in Appendix 2 to SSD-5465.	1,425 ha existing plus an additional 177 ha Northern Mining Area, as shown in Figure 2.
Underground mining areas	Approximately 1,413 ha, as shown in Appendix 3 to SSD-5465.	Approximately 1,590 ha, as shown in Figure 2.
Period of mining operations	31 December 2027	No change
Annual extraction rate	Up to 2.1 Mtpa from the Fassifern Seam.	No change
Mining methods	Bord and pillar extraction (including herringbone pattern) and miniwall mining methods.	No change
Coal processing	Screening and crushing of ROM coal at Chain Valley Colliery, or alternatively, up to 2.1 Mtpa of ROM coal processing at Mannering Colliery.	No change
Product Coal Transport	• a maximum of 660,000 tonnes of product coal per annum on public roads for export; • a maximum of 180,000 tonnes of product coal per annum on public roads to domestic customers (other than Vales Point Power Station); • product coal to Vales Point Power Station via truck on private roads only; and • 1.3 Mtpa to Mannering Colliery via the underground linkage for subsequent delivery to Vales Point Power Station.	No change to the transport of coal by roads. No change to the restrictions on both the hours and frequency of dispatch of coal laden trucks. Transport of product coal to Mannering Colliery via the existing underground linkage increased to up to 2.1 Mtpa, for subsequent delivery to Vales Point Power Station.
Existing surface infrastructure	Utilisation of existing surface infrastructure, including: • personnel-and-material drifts, ROM coal conveyor drift; • upcast and downcast ventilation shaft and fans; • coal handling facilities for breaking, crushing, sizing and storing product coal; • administration and workshop facilities; • water management infrastructure; and Asset Protection Zones (APZs) around some items of surface infrastructure.	No change
Operating hours	24 hours a day, 7 days a week.	No change
Employment	Approximately 220 full-time equivalent personnel (including approximately 40 full-time equivalent contractors).	Transfer of 110 full time equivalent employees from Mannering Colliery to Chain Valley Colliery, increasing the number of employees reporting to Chain Valley Colliery from 220 to 330.
Mine access	Existing road access from Construction Road, off Ruttleys Road.	No change
Environmental Performance Measures	• Less than 20 mm subsidence within the High-Water Mark Subsidence Barrier and within the Seagrass Protection Barrier. • Less than 780 mm of subsidence under the lake-bed. • First workings limited to Zone A and second workings only permitted in Zone B as per Appendix 3 of SSD-5465	Updated Appendix 3 of SSD-5465 to include the Northern Mining Area
Rehabilitation	Decommissioning of surface facilities and final rehabilitation following mine closure.	No change

2.2 Modification Justification

Delta Coal submits that the proposed modification would improve energy security by providing certainty of supply for Vales Point Power Station, which generates over 10 percent of the State's electricity. Delta Coal advises that Vales Point Power Station requires approximately 3 Mtpa of ROM coal for at least the next 10 years and that it is seeking to supply the majority from its Chain Valley Colliery and Mannering Colliery operations.

Delta Energy (owner of Vales Point Power Station) contends that securing the majority of its coal from local Delta Coal assets would mitigate any unforeseen supply chain impacts associated with sourcing coal from external mines in the region or further afield. The proposed modification would enable access to a reliable and cost-effective source of coal to supply Vales Point Power Station.

The Northern Mining Area also represents a logical continuation of the current approved mining areas in the northern portion of Chain Valley Colliery's development consent boundary. Delta Coal advises it is currently mining near the Northern Mining Area and access to this area would allow efficient continuous mining rather than standing down staff and equipment for relocation to other approved areas.

Importantly, the magnitude of proposed subsidence within the Northern Mining Area would remain within the approved limits currently applicable to the area under the Myuna Colliery consent. As such, subsidence-related impacts would not increase beyond those already approved. When compared with other potential sources of coal supply to the Vales Point Power Station, this proposal represents a relatively low impact alternative.

3 Statutory Context

3.1 Scope of Modifications

The modification application seeks to modify SSD-5465 in accordance with section 4.55(2) of the EP&A Act, which allows for a consent to be modified if the consent authority is satisfied that the proposed modification would remain substantially the same as the development for which the consent was originally granted.

In this regard, the proposed modification involves an extension of underground mining within the Fassifern Seam into an area already approved for underground mining under the Myuna Colliery development consent (MP 10_0080). The proposed mining method in this area is first workings, which limits approved subsidence impacts to negligible (or less than 20 mm) vertical subsidence at the surface.

The Department has reviewed the scope of the modification and considers that there would be no changes to the mining methods, approved subsidence impact limits or intensity of mining operations. Chain Valley Colliery's annual production limit of 2.1 Mtpa would continue to apply, and no changes are proposed to existing coal handling, processing or transportation methods.

Therefore, the Department considers that the proposal can be characterised as a modification, as it:

- would not significantly increase the environmental impacts of the project as approved;
- is substantially the same development as originally approved; and
- would not involve any further disturbance outside areas already approved for disturbance under the Chain Valley Colliery or Myuna Colliery consents.

Therefore, the Department is satisfied that the proposed modification is within the scope of section 4.55(2) of the EP&A Act and does not constitute a new development application. Accordingly, the

Department considers that the application should be assessed and determined under section 4.55(2) of the EP&A Act rather than requiring a new development application to be lodged.

3.2 Overlapping Project Approvals

As noted above, the Northern Mining Area is adjacent to Chain Valley Colliery's current development consent boundary and is subject to an existing development consent held by Centennial Myuna (refer to **Section 1.4**). Delta Coal has provided the Department with evidence that the two companies have come to an agreement that would allow Delta Coal to mine within Centennial Myuna's development consent boundary. The Department notes that Delta Coal is proposing to adhere to the same mining methods and remain within the maximum subsidence limits already prescribed under Centennial Myuna's development consent (MP10_0080). Therefore, the Department is satisfied that the granting of the proposed modification would not create inconsistencies in the regulation of the overlapping consents.

3.3 Consent Authority

The Minister for Planning and Public Spaces (Minister) is the consent authority for the application under Section 4.5(a) of the EP&A Act. However, as Delta Coal has not reported any political donations, and there were fewer than 10 public objections, the Director Resource Assessments may determine the application under the Minister's delegation dated 26 April 2021.

3.4 Mandatory Matters for Consideration

The Department conducted a comprehensive assessment of the project against the mandatory matters for consideration as part of the original assessment of SSD-5465. The Department considers that the current modification application would not result in any significant changes that would alter the consideration of mandatory matters under section 4.15 of the EP&A Act or conclusions made as part of that original assessment.

Environmental Planning Instruments

A number of environmental planning instruments (EPI)s apply to the modification, including:

- *State Environmental Planning Policy (SEPP) (State and Regional Development) 2011;*
- *SEPP (Mining, Petroleum Production and Extractive Industries) 2007;*
- *SEPP (Infrastructure) 2007;*
- *SEPP (Coastal Management) 2018;*
- *SEPP No.33 – Hazardous and Offensive Development;*
- *SEPP No. 55 – Remediation of Land;*
- *Lake Macquarie Local Environmental Plan 2004 and 2014;* and
- *Wyong Local Environmental Plan 2013.*

The Department has reviewed Delta Coal's consideration of the above EPIs as provided in its SEE and has also undertaken its own assessment of the EPIs (see **Section 5**). The Department considers that the proposed modification can be carried out in a manner that is generally consistent with the aims, objectives and provisions of these instruments.

Objects of the EP&A Act

The consent authority must consider the objects of the EP&A Act when making decisions under the Act. The Department has assessed the proposed modification against the current objects of the Act. The

objects of most relevance to the decision on whether or not to approve the proposed modification are found in section 1.3 of the Act.

The Department has considered these objects in its assessment of the proposed modification and considers that the modification can be conducted in a manner that is consistent with these objects. A summary of how relevant objects have been considered is presented in **Appendix F**.

Other Statutory Considerations

Mining Leases

The proposed modification seeks to expand Chain Valley Colliery's currently approved holdings, which comprise Consolidated Coal Lease (CCL) 707 and Mining Leases (ML) 1051, 1052, 1370 and 1632, administered under the *Mining Act 1992*.

The proposed modification area is located within the ML 1632 held by Centennial Myuna. The Department understands that on 28 April 2021, Delta Coal acquired 1301 ha from ML 1632 held by Centennial Myuna to create ML 1785 under a part transfer lease agreement in accordance with the *Mining Act 1992*. This would enable Delta Coal to ensure that mining can proceed into the Northern Mining Area until at least until 13 October 2022.

Delta Coal is considered to hold a relevant lease over the area covered by the proposed modification.

Environment Protection Licences

Delta Coal holds Environment Protection Licence (EPL) 1770 for Chain Valley Colliery, issued by the Environment Protection Authority (EPA) in accordance with the *Protection of the Environment Operations Act 1997*. The EPL would require a minor variation to include the Northern Mining Area should the modification be approved.

Works Approvals and Water Access Licences

Delta Coal currently holds Works Approval 20MW065025 and Water Access Licence (WAL) 41508 which enable it to extract up to 4,443 ML annually from the Sydney Basin North Coast Groundwater Source. No additional works approvals or WALs would be required for the proposed modification.

Landowners Consent

The Department is satisfied that Delta Coal has obtained the relevant landowner's consent for the proposed modification.

4 Engagement

4.1 Applicant's Engagement

Following submission of its final SEE, Delta Coal published a notice of application advertisement in a local newspaper, the *Lakes Mail,* on 27 February 2020. It also conducted a letterbox newsletter drop to surrounding residences during February 2020 and made a community information sheet regarding the proposed modification publicly available on the Delta Coal website. The proposed modification was also tabled at the May 2020 and February 2021 Chain Valley Colliery Community Consultative Committee (CCC) meetings.

4.2 Department's Engagement

The Department publicly exhibited the modification application and SEE (see **Appendix A**) in accordance with clause 10 of Schedule 1 of the EP&A Act and clause 118 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) by:

- placing a public exhibition notice in a regional newspaper, the Newcastle Herald;
- publicly exhibiting the applications and accompanying SEE, from Thursday 3 December to Wednesday 16 December 2020 on the Departments' website; and
- directly notified all previous submitters of the modification application and invited them to make a submission.

The Department also requested advice from government agencies, including Lake Macquarie and Central Coast Councils.

In undertaking these processes, the Department considers that the notification process met the requirements of the EP&A Act and EP&A Regulation, and that the relevant statutory public participation obligations have been satisfied.

4.3 Summary of Submissions

In response to the public exhibition of the proposed modification, the Department received advice from 10 government agencies, including LMCC, and four submissions from members of the community. Of the four community submissions, two were in support and two objected to the proposal. No submissions were received from special interest groups.

4.4 Response to Submissions

On 9 April 2021, Delta Coal provide a detailed RTS report. The RTS was subsequently made publicly available on the Department's website and was forwarded to relevant government agencies and Councils for comment.

The RTS contained peer reviews of the groundwater impact assessment and subsidence assessment and an updated subsidence assessment.

Copies of all submissions are included in **Appendix B**. A copy of the RTS and associated additional information are included in **Appendix C.**

The Department has considered Delta Coals RTS and additional information including further expert advice from government agencies in completing its assessment of the proposed modification (as presented in **Section 5)** and in developing recommended conditions (see **Appendix E**).

4.5 Government Agency Advice

None of the government agencies objected to the proposed modification, and where applicable, advised that they were satisfied with the Departments' recommended conditions for the modification.

Mining, Exploration and Geoscience (MEG) within the Regional NSW Department confirmed that the mining lease transfer arrangements between Centennial Myuna and Delta Coal have been finalised.

MEG provided an economic and resource recovery analysis which indicated that the proposed modification would generate an additional $15 million in State royalties and $210 million in total revenue, in present day terms.

MEG was satisfied that the proposal would optimise resource recovery, be an efficient use of resources and support the continued employment of the existing workforce and continuity of coal supply to Vales Point Power Station.

The **Resources Regulator** within the Regional NSW Department (RR) recommended that Delta Coal undertake a site-specific investigation into the soft seam floor claystone conditions in the Fassifern Seam to evaluate the expected performance of coal pillars in the Northern Mining Area. It also

recommended an independent review of Delta Coal's mine layout design, taking into consideration the results of the site-specific investigation of seam floor conditions.

Delta Coal responded to RR's recommendations by commissioning an independent peer review of the mine design layout and subsidence assessment and documenting the findings within its RTS report. Following consideration of the RTS, the RR indicated it was satisfied that any residual mine design issues could be adequately addressed and managed post-approval in accordance with relevant work health and safety legislation. Further consideration of the mine design and subsidence related elements of the proposed modification is presented in Section 5.1.

Subsidence Advisory NSW (SA NSW) recommended a peer review of the subsidence assessment to evaluate the risk of unplanned subsidence events due to soft seam floor conditions.

Delta Coal responded to SA NSW's recommendations by commissioning an independent peer review of the subsidence assessment and documenting the findings within its RTS report. Following a review of the RTS, SA NSW noted that Delta Coal's RTS included a revised geotechnical assessment of long-term pillar stability and subsidence impacts. It offered no further comments.

The **Biodiversity and Conservation Division** within the Department (BCD) commented that unexpected mine subsidence would require assessment and offsetting in accordance with the Biodiversity Assessment Method (BAM) under the *Biodiversity Conservation Act 2016*. BCD had no further comments.

Lake Macquarie City Council supported the proposed modification on the basis of providing ongoing employment in the local area and a reliable supply of coal to Vales Point Power Station. Lake Macquarie City Council also provided comment on several aspects of the SEE which included support for Delta Coal's proposal to include residents living within the extension area on the CCC, and that the environmental impacts would be limited to < 20 mm of vertical subsidence. Lake Macquarie City Council reviewed the RTS and had no further comments.

Crown Lands within the Department reviewed the SEE and did not raise any issues with the proposed modification.

The **Environment Protection Authority** (EPA) advised that the modification could be regulated in accordance with the current EPL for Chain Valley Colliery (EPL 1770). The EPA noted that a minor EPL variation is required to incorporate the additional mining area following approval of the modification. It offered no further comments on the proposal. Delta Coal acknowledged this requirement in its RTS.

DPIE Fisheries did not object to the proposed modification, provided that the existing and any proposed mitigation measures to protect seagrass and foreshore habitats remained in place.

The Departments' **Water Group** (DPIE Water) and the **Natural Resources Access Regulator** (NRAR) reviewed the SEE and recommended that an independent peer review of the water model be undertaken to ensure its consistency with the relevant policies, guidelines and robustly assessed as fit for purpose. It also recommended the transfer of relevant water licences to Delta Coal or its parent company and a water census of private bores prior to any extraction activities occurring in the proposed extension area.

Delta Coal responded by commissioning an independent peer review of the groundwater impact assessment and documenting the findings within its RTS report. DPIE Water and NRAR reviewed the RTS and had no further comments.

Transport for NSW (TfNSW) did not object to the proposal and did not identify any significant impacts to the State road network from the proposed modification. TfNSW advised that Central Coast Council is the designated road authority for the Ruttleys Road/Construction Road intersection.

The Department did not receive any advice from **Central Coast Council**. The Department notes that Central Coast Council is currently under administration.

4.6 Community Submissions

The two community submissions that objected to the proposed modification raised concerns over additional noise and vibration, air quality, greenhouse gas, and human health impacts. Delta Coal responded to these concerns in its RTS. It reasoned that the proposed modification would not increase amenity or human health impacts or greenhouse gas emissions beyond those already assessed and approved under the Chain Valley Colliery, Mannering Colliery or Myuna Colliery consents. It also committed to continuing to manage these impacts in accordance with Chain Valley Colliery's approved environmental management system.

5 Assessment

In assessing the merits of the proposed modification, the Department has considered the:

- modification application, SEE, RTS and additional information provided by Delta Coal;
- Environmental Impact Statement, and SEEs for the original development application, as modified;
- existing conditions of consent for the development, as modified;
- advice from government agencies and community submissions; and
- relevant environmental planning instruments, policies and guidelines.

The Department considers the key assessment issues relate to groundwater and subsidence. Consideration of these issues is provided below, with other issues discussed further in **Table 3**.

5.1 Mine Design and Subsidence

Potential Mine Subsidence Impacts

Mine subsidence can cause vertical movements, tilts and strains on the ground surface which can directly impact a range of built and natural surface features and influence surface water and groundwater dynamics. The extent of mine subsidence is influenced by several factors including topography, geological conditions, depth of cover, mining method and mine design.

Mine Design to Manage Potential Subsidence Impacts

The target coal seam in the Northern Mining Area is the Fassifern Seam, which has an approximate seam thickness of between 3.4 m and 4 m and depth of cover of between 140 m and 190 m in this area. There are no existing or proposed multi-seam workings in the Northern Mining Area.

Delta Coal has proposed a uniform nominal mining height of 3.2 m. It has also proposed to only undertake first workings using bord and pillar mining in a herringbone pattern throughout the Northern Mining Area. The proposed workings have been designed to be long-term stable and limit vertical subsidence to less than 20 mm at the surface. This proposed subsidence limit is within with the approved limits currently applicable to the Northern Mining Area under the Myuna Colliery development consent.

Delta Coal's subsidence assessment and mine design considered the design criteria required for negligible surface effects using a bord and pillar herringbone layout, taking into consideration the

geological environment, rock strength, in-situ stresses, stress strength ratios, pillar design factors and historic experiences of ground behaviour. The subsidence assessment concluded that the risk of fracturing of the substratum above the mined coal seam is extremely low.

Response to Agency Concerns Regarding Unplanned Subsidence

The RR and SA NSW identified the presence of claystone in the seam floor as a potential risk for unplanned subsidence. At the request of these agencies, Delta Coal commissioned a peer review of the mine design and subsidence assessment to be undertaken by Professor Bruce Hebblewhite. The review made a number of recommendations regarding revisions to pillar design specifications and concluded that, following the adoption of these specifications, Delta Coal could adequately manage potential risks associated with a weak claystone floor. Following completion of the peer review, Delta Coal updated its mine design and subsidence assessment to incorporate Professor Hebblewhite's recommendations as part of the RTS. Delta Coal also committed to continue its program of floor drilling and testing and monitoring of the Fassifern Seam floor condition to further inform the mine design process.

Following its review of the RTS, the RR was satisfied that any residual mine design issues could be adequately addressed and managed prior to the commencement of mining in accordance with relevant work health and safety legislation. SA NSW offered no further comment following review of the RTS.

The Department is satisfied that the feedback provided by these agencies has been appropriately dealt with as part of the assessment process and any residual mine design issues can be adequately in consultation with RR in accordance with Work Health Safety legislation prior to extraction.

Assessed Impacts

The proposed mining into the Northern Mining Area represents an extension into an area that has already been assessed and approved for underground mining under the Myuna Colliery development consent (MP10_0080). The proposed modification would not increase subsidence-related impacts beyond those already approved under the Myuna Colliery consent.

No impacts to sensitive natural features such as the seagrass beds and foreshore of Lake Macquarie or built features including dwellings or infrastructure within the areas overlying the Northern Mining Area have been predicted.

Adaptive Management

The existing conditions of consent require an 'adaptive management' approach to achieve all subsidence performance measures. These include monitoring and periodic evaluation of environmental consequences against the performance measures. If necessary, mitigation measures, mine design and/or mining extent can be adjusted to achieve the performance measures. These requirements would become applicable to the proposed extension area.

Conclusion

The Department considers that, as Chain Valley Colliery proposes to only undertake first workings within the Northern Mining Area, and the area has already been subject to previous assessment and approval for bord and pillar mining under the Myuna Colliery development consent, the proposed modification mining methods are acceptable and pose minimal risk to the built and natural environment, subject to being undertaken in accordance with strict subsidence performance measures. The Department is also satisfied that the feedback provided by government agencies has been appropriately

dealt with as part of the assessment process and any residual mine design issues can be adequately managed post-approval.

The Department considers that the current adaptive management framework implemented at Chain Valley Colliery to manage subsidence related environmental impacts can be readily applied to the proposed mining in the Northern Mining Area.

5.2 Groundwater Impacts

Potential Groundwater Impacts

Groundwater resources in the Chain Valley Colliery area are characterised by unconfined shallow alluvial and weathered rock aquifers that flow generally towards Lake Macquarie and a series of deeper coal seam aquifers.

Potential groundwater impacts from underground coal mining can typically include changes to groundwater inflows, groundwater levels and water quality.

Assessed Impacts

The SEE included a Groundwater Impact Assessment (GIA) (GHD, 2020) prepared to assess the potential incremental impacts of the proposed modification on the groundwater environment. It was supported by a staged numerical groundwater model that predicted potential changes in groundwater flow and levels. The GIA was peer reviewed by Dr Noel Merrick, who concluded that the groundwater model was fit for purpose.

The GIA model predicted that total groundwater inflows to the Chain Valley Colliery mine workings would increase by up to 0.4 ML/day as a result of the proposed modification. Combined with existing operations, the total groundwater inflows to underground workings were predicted to remain within the currently approved peak of 10.5 ML per day.

Delta Coal holds water access licenses to extract up to 4,443 ML annually from the Sydney Basin North Coast Groundwater Source. The proposed modification would not require any increase to this licensed extraction limit.

Previous model predictions have indicated that historical mining is likely to have caused some depressurisation of groundwater sources in the vicinity of the Chain Valley Colliery consent area, including the Fassifern Seam. The GIA found that ongoing mining within the seam would have little additional impacts on groundwater depressurisation beyond those already approved.

No reductions in baseflows to ephemeral creeks within the Northern Mining Area have been predicted. No private bores were identified in the Northern Mining Area, and although 25 registered bores occur within a 5 km radius, only four are used for stock watering or domestic supply. The bores extend to a maximum of 61 m depth, with low groundwater yields. Potential impacts on these bores were assessed as negligible given the depth of the coal seams.

Groundwater impacts attributable to the proposed modification were assessed against the Level 1 minimal impact considerations under the *NSW Aquifer Interference Policy*. The GIA concluded, and the Department agrees, that the proposed modification is considered to be low risk in terms of groundwater impact as:

- it involves first workings only with predicted subsidence impacts of less than 20 mm;
- there are no groundwater users (private bores) or high priority groundwater dependent ecosystems located within the proposed extension area; and

- the proposed extension area has already been approved for underground mining under the Myuna Colliery consent and the proposed modification does not seek to change the method of mining or the scale of resource to be extracted.

Existing Management Requirements

Groundwater inflows from the Fassifern Seam workings within the Northern Mining Area would be managed in accordance with Chain Valley Colliery's approved surface water and groundwater management system.

Delta Coal is required to implement a comprehensive groundwater monitoring program to regularly review potential impacts associated with ongoing mining at Chain Valley Colliery. Delta Coal has committed to expanding the existing monitoring program and associated trigger action response plan to encompass the proposed extension area to identify and manage any unforeseen impacts.

Conclusion

The Department has carefully considered the GIA predictions and concludes that the proposed impacts are of low risk to groundwater sources and that the predicted maximum groundwater take from the porous groundwater source would remain within approved extraction limits.

Therefore, the Department is satisfied that the management of groundwater impacts can continue to be managed in accordance with Chain Valley Colliery's Water Management Plan, which the Department has also recommended be updated to incorporate the Northern Mining Area, following approval of the proposed modification.

5.3 Other Issues

Other issues are those that are not considered key issues but have been raised either in the SEE or in submissions are discussed further in **Table 3** below:

Table 3 | Other Issues

Issue	Findings	Recommendations
Traffic and Transport	• The SEE included a Traffic Impact Assessment (TIA) (GHD, 2020) which predicted that relevant intersections would continue to operate at a good Level of Service (LOS A) as a result of the proposed modification. • TfNSW advised that no adverse impacts to the State road network would be expected from the proposed modification. • Due to the close proximity of the Chain Valley Colliery and Mannering Colliery pit tops, the redistribution of employees would be unlikely to cause traffic impacts to the local roads or State highway beyond those that have previously been assessed for both the Chain Valley Colliery and Mannering Colliery.	• No changes to existing conditions are recommended.

Issue	Findings	Recommendations
Surface Water Management	• Chain Valley Colliery has an existing surface water management system supported by existing conditions of consent and an approved water management plan. • Dirty water from the surface facilities and mine water from underground workings is treated and discharged under Chain Valley Colliery's current EPL. • The change to inflows into the surface water management system from the proposed modification can be managed adequately in accordance with the existing conditions of consent.	• No changes to existing conditions are recommended.
Greenhouse Gas and Energy Assessment	• The SEE included a detailed assessment of the potential greenhouse gas emissions of the proposed modification. • Greenhouse gas emissions associated with the extraction of coal from the Northern Mining Area and associated downstream emissions have previously been assessed and approved under the Myuna Colliery consent. • The proposed modification would not increase greenhouse gas emissions beyond those already assessed and approved for the Myuna Colliery.	• No changes to existing conditions are recommended.
Socio-economic Impacts	• The proposed modification would have local and regional benefits through: o ongoing employment for staff at both Chain Valley and Mannering collieries and the associated economic and social benefits; o securing a reliable and local supply of coal for Vales Point Power Station, improving energy security; and o the provision of approximately $15 million in royalties to the State.	• No changes to existing conditions are recommended.
Biodiversity	• Recent Chain Valley Colliery operations have not resulted in any significant negative impacts to Lake Macquarie, including the seagrass beds and benthic communities. Recent seagrass monitoring has indicated a net increase in seagrass in the foreshore areas.	• No changes to existing conditions are recommended.

Issue	Findings	Recommendations
	• The subsidence limits set in the consent would continue to apply new Northern Mining Area, accordingly no additional impacts to biodiversity are predicted.	
Heritage (European and Aboriginal)	• The proposed modification does not propose any additional surface disturbance above what was approved under the Myuna Colliery consent.	• No changes to existing conditions are recommended.
Noise	• The proposed modification would not generate noise beyond the existing approved noise limits. • The management of noise generated at the Chain Valley Colliery would continue to be effectively managed through the existing conditions of consent.	• No changes to existing conditions are recommended.

6 Evaluation

The Department has undertaken an assessment of the modification application and supporting information in accordance with the relevant requirements of the EP&A Act, and in consultation with relevant Government agencies. This has included evaluating the merits of the proposal by taking into consideration the likelihood and magnitude of potential adverse and beneficial social, economic, and environmental impacts and assessing its strategic need.

The Department considers the aspects with the greatest potential for adverse impacts relate to potential subsidence and groundwater impacts and to a lesser extent traffic and transport and surface water impacts.

The proposed workings have been designed to be long-term stable and limit vertical subsidence to less than 20 mm at the surface. This proposed subsidence limit is the same as the approved limits currently applicable to the Northern Mining Area under the Myuna Colliery development consent.

The key issue of concern from agencies was the potential for unplanned subsidence events within the Northern Mining Area. Delta Coal responded to these concerns by commissioning an independent peer review of the mine design and subsidence assessment, updating its mine design to incorporate the recommendations of the review and committing to undertaking further investigations to further inform the mine design process. These actions and commitments were able to satisfy the relevant agencies that any residual risks associated with unplanned subsidence could be adequately addressed and managed. The Department is satisfied that the feedback provided by agencies with regard to subsidence assessment and management has been appropriately addressed and any residual issues can be managed. Accordingly, the Department is satisfied that potential subsidence impacts from the proposal are acceptable.

Groundwater impacts from the proposed modification have been assessed as low risk. This finding is supported by an independent peer review of the groundwater assessment. The Department is satisfied that Chain Valley Colliery's current water management system can be readily adapted to accommodate the expected minor changes to groundwater inflows and outflows from the proposed modification.

The Department recognises that there are several benefits from the proposed modification. Firstly, the proposed extension to the underground mining area would allow resource recovery from an area already approved for underground mining and increase operational efficiencies for Delta Coal, ensuring continuity of operations and employment. This continued extraction of an approved coal resource could be achieved with minimal environmental impacts.

The modification would also allow Delta Coal to continue to provide a reliable source of coal to Vales Point Power Station, which generates over 10 per cent of the NSW's electricity. Additionally, the modification would continue to provide social and economic benefits through ongoing local employment and broader economic and social benefits to the people of NSW through the payment of an additional $15 million in mining royalties to the State. The Department considers these aspects of the proposed modification to be in the public interest and key reasons to recommend approval of the modification.

The Department considers its recommended conditions of consent provide a comprehensive, rigorous and contemporary approach to ensuring that the underground mining operations at Chain Valley Colliery can continue to operate safely, efficiently and with adequate environmental controls to strictly manage subsidence risks, protect sensitive environmental areas, and minimise impacts on the surrounding community. Any residual impacts can continue to be managed and mitigated through the existing and recommended conditions of consent.

Based on its assessment, the Department considers that, on balance, the proposed modification is in the public interest and is approvable, subject to the recommended conditions outlined in **Appendices D** and **E**.

7 Recommendation

It is recommended that the Director, Resource Assessments, as delegate of the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report;
- **determines** that the application SSD-5465 Modification 4 falls within the scope of section 4.55(2) of the EP&A Act;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to approve the modification;
- **modifies** the consent SSD-5465; and
- **signs** the attached instrument of modification (**Appendix D**).

Recommended by:

Melissa Anderson
Senior Environmental Assessment Officer
Resource Assessments

Recommended by:

James McDonough
Team Leader
Resource Assessments

8 Determination

The recommendation is **Adopted** by:

Carl Dumpleton
A/Director - Resource Assessments

as delegate of the Minister for Planning and Public Spaces

Appendices

Appendix A – Statement of Environmental Effects

https://www.planningportal.nsw.gov.au/major-projects/project/40581

Appendix B – Submissions

https://www.planningportal.nsw.gov.au/major-projects/project/40581

Appendix C – Response to Submissions Report and Additional Information

https://www.planningportal.nsw.gov.au/major-projects/project/40581

Appendix D – Notice of Modification

https://www.planningportal.nsw.gov.au/major-projects/project/40581

Appendix E – Consolidated Consent

https://www.planningportal.nsw.gov.au/major-projects/project/40581

Appendix F – Consideration of Relevant Objects of EP&A Act

Table F1 | Consideration of the proposal against the relevant objects of the EP&A Act

Objects of the EP&A Act (section 1.3)	Considerations
(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*;	The modifications would provide ongoing social benefits through continuing employment, and economic benefits to the people of NSW through the payment of mining royalties, without any significant increase in environmental or social impacts.
(b) *to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment*;	The Department has considered the principles of ESD in its assessment and considers that the modifications have been designed to minimise potential environmental impacts where practicable and can be carried out in a manner that is consistent with these principles. Further evaluation of these impacts is provided in **Section 5**.
(c) *to promote the orderly and economic use and development of land*;	The modifications would improve and optimise orderly economic outcomes by recovering coal resources within a currently approved development area, and utilising Delta Coals' existing infrastructure and workforce.
(e) *to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats*;	The modifications do not propose any significant biodiversity impacts beyond what has previously been assessed for the current project. No additional vegetation clearing is proposed, and the proposed bord and pillar mining is likely to result in less subsidence impacts at the surface than those associated with other mining methods available. Environmental impacts are considered further in **Section 5**.
(f) *to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)*;	The Department considers that the modifications are unlikely to impact on significant heritage values beyond what has previously been assessed and approved. Notwithstanding, the Department has recommended contemporary conditions to ensure the sustainable management of heritage values are implemented (see **Appendix E**).
(i) *to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State*;	The Department has consulted widely with relevant government agencies and relevant Councils on the modifications (see **Section 4**) and has considered the advice received in **Section 5**.
(j) to provide increased opportunity for community participation in environmental planning and assessment.	The Department publicly exhibited the modification applications and consulted with the relevant Councils. The consultation outcomes are outlined in **Section 4**.