

WELCOME TO MORANBAH

WINCHESTER SOUTH PROJECT

Environmental Impact Statement



WHITEHAVEN COAL



Winchester South Project

PROPOSED PROJECT

- The Winchester South Project involves the development of an open cut metallurgical coal mine within the established Bowen Basin coal region.
- The Project would produce a primary metallurgical coal product for the steel industry and a secondary thermal coal product for energy production.
- The Project includes mining at a rate up to 17 Mtpa and would supply the international market for approximately 30 years.
- Whitehaven WS, a subsidiary of Whitehaven Coal Limited, is seeking State and Commonwealth approval for the Project, with the application supported by a detailed Environmental Impact Statement and independent peer reviews of key technical assessments.
- Whitehaven WS has an established respectful relationship with the local Barada Barna Aboriginal Corporation, including an agreed and approved Cultural Heritage Management Plan.

SIGNIFICANT EMPLOYMENT AND ECONOMIC OPPORTUNITIES

- The Project would generate approximately 500 new direct, long term jobs with the majority of the Project workforce to be employed from the Isaac and Mackay Local Government Areas.
- The Project would generate indirect employment, including:
 - 285 full time equivalents in the Isaac Local Government Area.
 - 649 full time equivalents in the Mackay Local Government Area.
 - 1,894 full time equivalents in Queensland.
- The net benefit of the Project to Queensland is estimated to be \$756 million in net present value terms.
- An estimated \$4.9 billion in net present value terms would accrue to suppliers in Queensland as a result of the Project.
- The Project would enhance skills and capacities in local communities through targeted training and skills development initiatives.
- The Project would increase economic well-being in local communities through contributions to community development.

KEY PROJECT DESIGN CONSIDERATIONS

- Whitehaven WS has carefully considered feedback provided by the local community, government agencies and other stakeholders during development of the Project design and Environmental Impact Statement.
- The Project disturbance footprint has been refined to minimise impacts to threatened ecological communities, threatened species habitat, existing surface infrastructure and the Isaac River alluvium.
- Complete backfill of the Railway Pit to reduce the number and extent of residual voids.
- Avoid residual voids within the Isaac River floodplain.
- The key post mining land use of agriculture was developed in consideration of relevant government policies and planning strategies, the surrounding landscape and local community views.

KEY ENVIRONMENTAL ASSESSMENT OUTCOMES

- Negligible impacts to water quality and resources, including the Isaac River and associated alluvium.
- The final landform maximises post-mining land uses and would be safe, stable and non-polluting.
- Whitehaven WS would implement significant financial and community commitments, including construction of new houses in Moranbah and supporting members of the workforce seeking to move to local communities.
- No impacts on strategic cropping areas.
- No residual voids would be within the Isaac River floodplain.
- Minimal amenity impacts (e.g. air quality, noise and water supply impacts) to surrounding landowners.
- The Project includes a significant biodiversity offset developed in accordance with Commonwealth and State policies.

PUBLIC INTEREST

- In weighing up the environmental costs and benefits, the Project is, on balance, considered to be in the public interest.

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EXECUTIVE SUMMARY

ES1 BACKGROUND

The Winchester South Project (the Project) is located approximately 30 kilometres (km) south-east of Moranbah (Figure ES-1), within the Bowen Basin Coalfield in Queensland.

Whitehaven WS Pty Ltd (Whitehaven WS) is the proponent for the Project, and is a wholly owned subsidiary of Whitehaven Coal Limited.

This document is an Environmental Impact Statement (EIS) for the Project. The Project involves the development of an open cut coal mine in an existing mining precinct. Products would include metallurgical coal for the steel industry and thermal coal for energy production.

The EIS provides:

- a description of the Project (including consideration of alternatives);
- an assessment of potential impacts;
- a description of the rehabilitation strategy;
- the proposed environmental protection commitments and draft model conditions for the Project; and
- an evaluation of the merits of the Project.

ES2 THE PROJECT

ES2.1 Overview of the Project

The Project involves mining the coal reserves associated with the Rangal and Fort Cooper Coal Measures within mining lease application (MLA) 700049, MLA 700050 and MLA 700051. Run-of-mine (ROM) coal would be mined by open cut methods at a peak forecast rate of up to 17 million tonnes per annum, over approximately 30 years.

The Project would involve the development of an open cut coal mine and associated infrastructure, including the construction and operation of a mine infrastructure area (MIA) in MLA 700049 and an infrastructure corridor within MLA 700065 (raw water supply pipeline, electricity transmission line [ETL] and mine access road) (Figure ES-2).

The Project would generate approximately 500 new direct, long-term jobs, with a significant proportion of the Project workforce expected to be employed from the region (Isaac and Mackay Local Government Areas).

Whitehaven WS considers that the Project would achieve its objective of developing a high-quality, long-term, metallurgical coal asset due to the location within the Bowen Basin mining region, significant size and quality of the coal resource and proximity to existing infrastructure.

The extent of the Project open cut mining area, waste rock emplacements and infrastructure areas (i.e. the Project disturbance footprint) is approximately 7,130 hectares.

Table ES-1 provides a summary of the key attributes of the Project.

ES2.2 General Arrangement

The available resource definition information was used to determine the optimum extent of the open cut within the existing tenements held by Whitehaven WS. The open cut and associated waste rock emplacement extent was then refined in consideration of:

- surrounding developments and infrastructure (e.g. avoidance of the Norwich Park Branch Railway);
- the extent of Quaternary alluvium associated with the Isaac River; and
- outcomes of the environmental studies, e.g. minimise disturbance to threatened species, communities and habitat and reduce amenity impacts to nearby sensitive receivers.

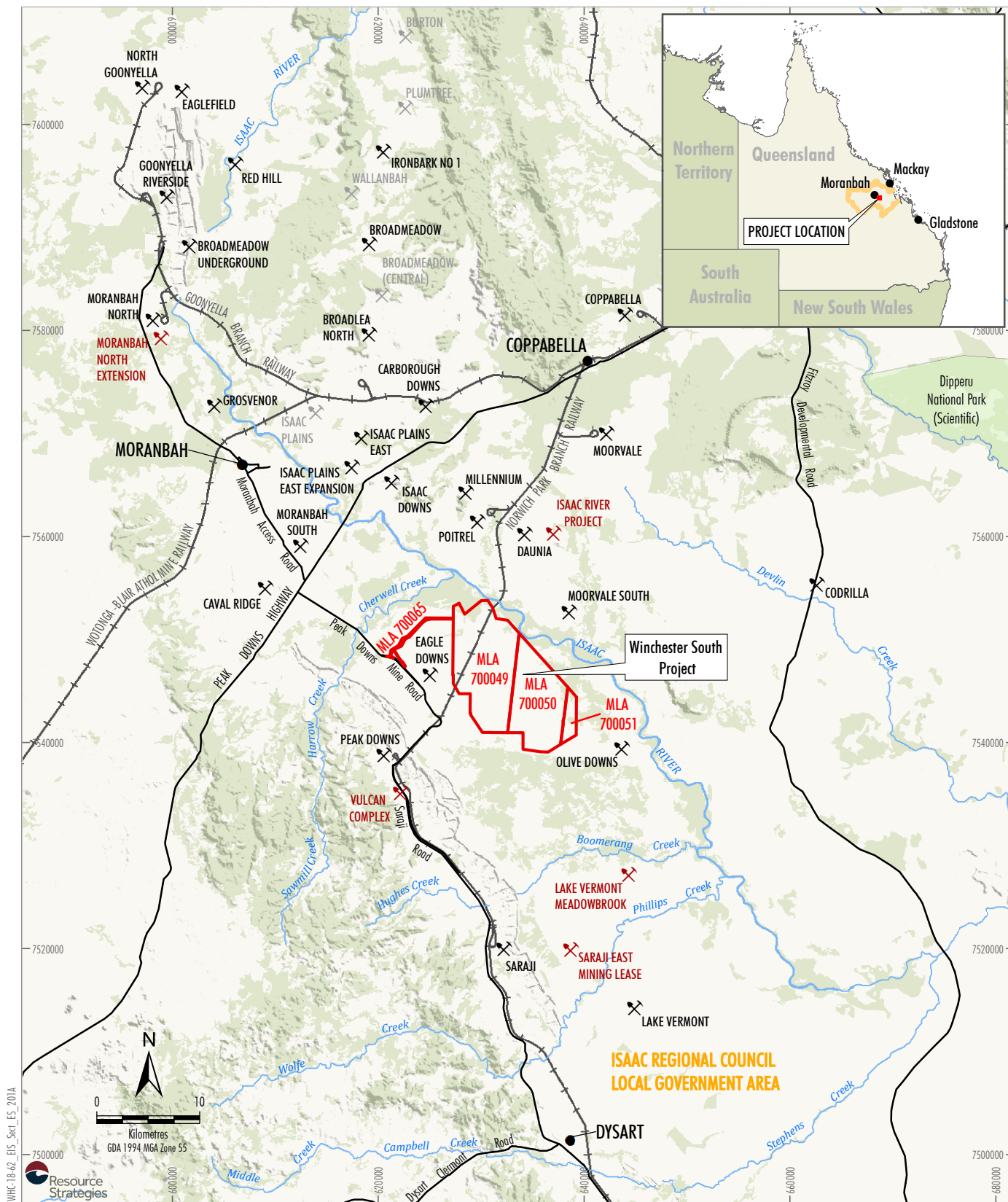
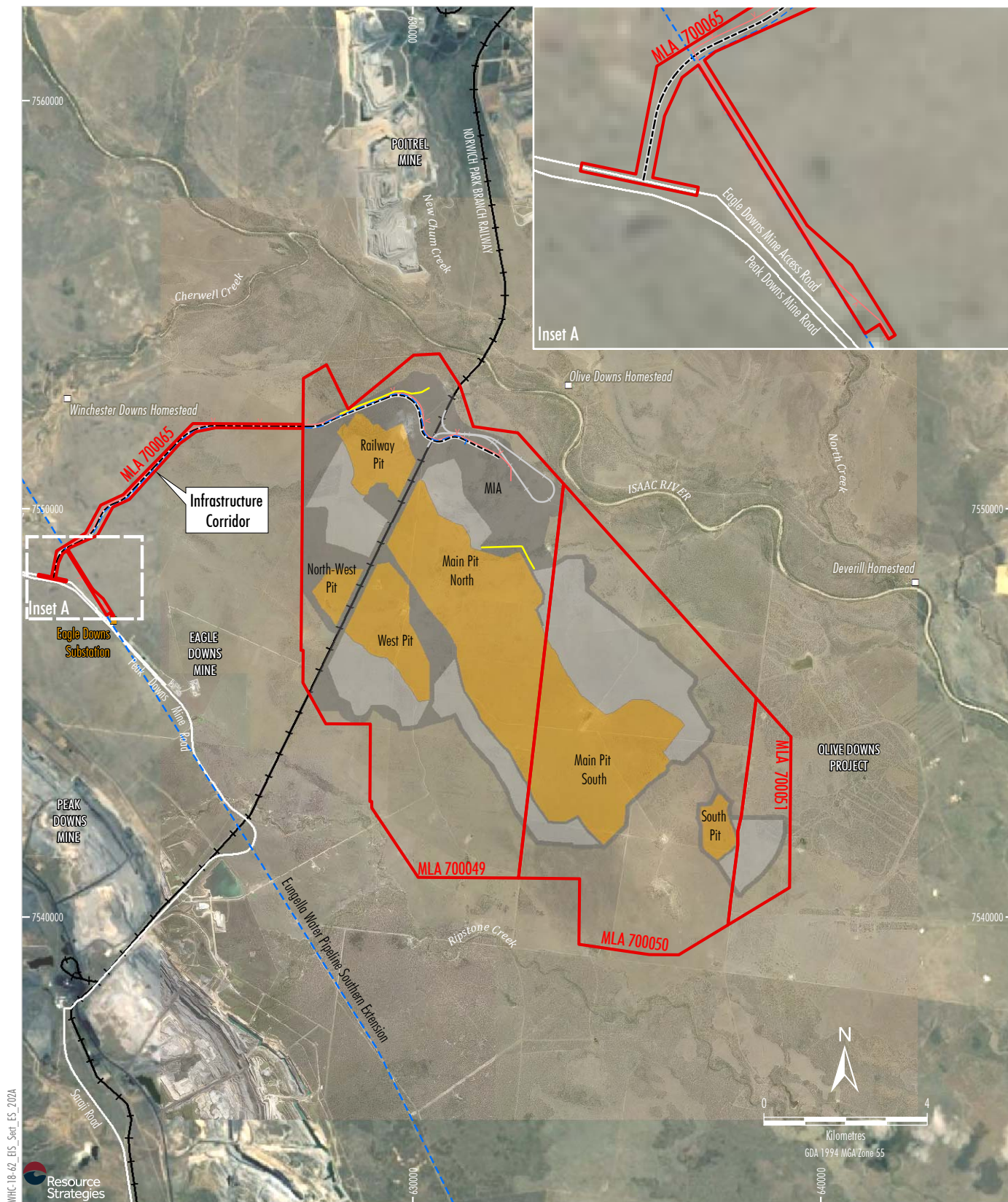


Figure ES-1



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- LEGEND**
- Mining Lease Application Boundary
 - Eungella Water Pipeline Southern Extension
 - Railway
 - Substation

Project Component*

- Indicative Infrastructure Area
- Indicative Out-of-pit Waste Rock Emplacement
- Indicative Open Cut Pit Including In-pit Waste Rock Emplacement
- Indicative Mine Access Road
- Indicative Rail Spur and Loop
- Indicative Electricity Transmission Line
- Indicative Raw Water Supply Pipeline
- Indicative Flood Levee

*Note: * Excludes some project components such as water management infrastructure, access tracks, topsoil stockpiles, explosives magazines, power reticulation, temporary offices, other ancillary works and construction disturbance.*

Source: The State of Queensland (2018 - 2020); Whitehaven (2020).
Orthophoto: Google Image (2019); Whitehaven (2017).



WINCHESTER SOUTH PROJECT
Project General Arrangement

Figure ES-2

Table ES-1
Summary of Key Project Attributes

Project Component	Summary Description
Project Life	Approximately 30 years. Projected three years of construction, 28 years of mining operations (overlapping with years 2 and 3 of constructions) and one year of final landform shaping.
Mining Method	Open cut mining to a depth of approximately 160 metres below ground level.
Resource Recovery	Approximately 353 million tonnes of ROM coal from coal seams in the Rangal and Fort Cooper Coal Measures (Leichhardt Seams, Vermont Upper Seam and Vermont Middle Lower Seam).
Annual Extraction	Forecast peak extraction of up to approximately 17 million tonnes per annum of ROM coal.
Management of Waste Rock and Coal Rejects	Approximately 2,012 million bank cubic metres of waste rock would be placed in the waste rock emplacement including within the footprint of the open cut void. Co-disposal of coal reject material from the Coal Handling and Preparation Plant (CHPP) within waste rock emplacement areas.
Product Transport	Construction and use of train load-out and rail spur infrastructure for the transport of up to approximately 11 million tonnes per annum of product coal by rail to port. An average of three (over the life of the Project) and a maximum of eight loaded train departures per day.
Water Management	On-site water management system comprising water management storages and collection drains, flood levees, up-catchment diversions, sediment control and open cut dewatering.
Water Supply	Mine water supply to be obtained from inflows to open cut areas, processing water re-use and recycling, treated wastewater, rainfall and runoff collection and supplementary raw water supply expected from the Eungella pipeline network and/or surrounding mining operations. Mine water supply may also be obtained from flood harvesting, which would only include flood water taken flowing through site (i.e. surface runoff) during major rainfall events, and would not include take from the Isaac River during flood events.
Electricity Supply	Construction of a 132 kilovolt (kV)/22 kV electricity switching/substation and 132 kV ETL to connect to the existing regional power network.
General Infrastructure	A range of supporting infrastructure including an MIA, CHPP and other ancillary infrastructure.
Workforce	During operation, the Project would directly employ approximately 500 personnel ¹ . Initial construction activities would require approximately 500 personnel.
Rehabilitation	Progressive rehabilitation of waste rock emplacements and surface disturbance areas. At Project closure, four residual voids would remain in perpetuity.
Operating Hours	Mining, processing and train loading and rail movements on the Project rail spur would occur 24 hours per day, seven days per week.
Estimated Capital Investment Value	Approximately \$1 billion.

¹ Note: Whitehaven WS is investigating automation of the fleet for the Project. Direct employee numbers include consideration of automation. Employee numbers may increase depending on the extent of automation. This EIS has considered the effect of the extent of automation on employee numbers as part of the impact assessment.

The location of the MIA (Plate ES-1) and other infrastructure included consideration of resource sterilisation, safety, flood immunity, accessibility and minimisation of surface disturbance.

ES2.3 Construction

Construction would include development of the following key Project infrastructure:

- MIA (including the CHPP) and mine access road (including an overpass of the Norwich Park Branch Railway);
- rail spur and loop;
- water management infrastructure (including flood protection levees);
- water and electricity supply infrastructure;
- progressive development and augmentation of dams, sumps, pipelines, up-catchment diversions, storages and other water management equipment and structures;
- progressive development of haul roads, light vehicle access roads and services;

- progressive construction and use of soil stockpile, laydown and gravel burrow areas (e.g. for road base and ballast materials);
- construction and installation of ancillary infrastructure (e.g. electricity distribution infrastructure, explosives storage facilities, consumable storage areas, potable water supply, sewage treatment facilities, site communications, remote crib huts and security); and
- installation or replacement of environmental monitoring equipment.

ES2.4 Operations

The Project includes open cut mining within the Rangal and Fort Cooper Coal Measures. Three main coal seams of the coal measures would be mined, including the Leichhardt Seams, Upper Vermont Seam and Vermont Middle Lower Seam.

The open cut mining areas would generally include supporting infrastructure such as haul roads, bunding, embankments, soil stockpiles, hardstands and water management structures.

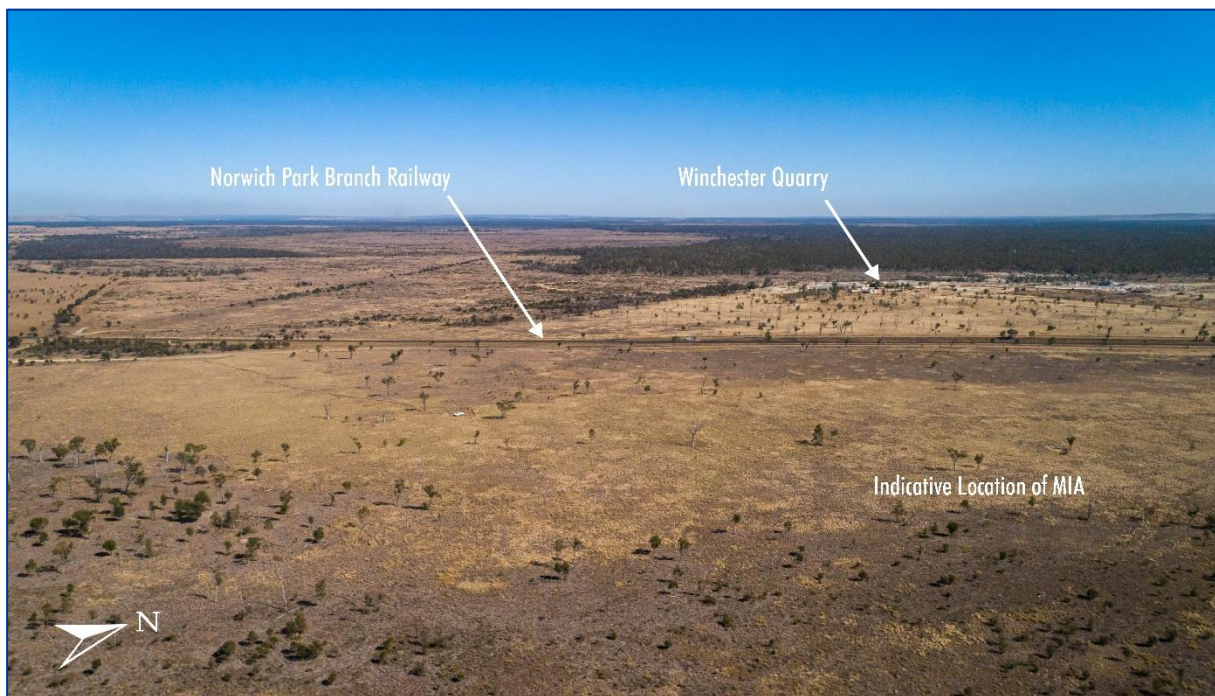


Plate ES-1 – Location of the Mine Infrastructure Area

Indicatively, the open cut would commence in the Railway Pit and Main Pit North and would develop to the south, with waste rock progressively emplaced behind the advancing open cut face once sufficient space is available. Pit progression and sequencing would be reviewed throughout the life of the Project and revised, if necessary, as part of the Progressive Rehabilitation and Closure Plan process. It is estimated that approximately 353 million tonnes of ROM coal would be mined over the life of the Project.

Mining operations would generally occur 24 hours per day, seven days per week, with open cut mining activities and general sequence entailing:

- progressive clearing of vegetation;
- stripping and stockpiling of soil from disturbed areas for storage and reuse in future rehabilitation of the mine landforms;
- pre-stripping of weathered tertiary sediments (e.g. unconsolidated friable overburden, including clays) using scrapers, excavators and trucks;
- drilling and blasting for fragmentation of competent overburden and interburden;
- removal of waste rock and inter-seam partings to expose coal seams, and placement in out-of-pit waste rock emplacements, or as infill in the mine void behind advancing mining operations;
- mining of coal and haulage to the ROM coal handling facilities using a combination of dozers, excavators, loaders and trucks; and
- re-shaping of the waste rock emplacements, re-application of topsoil (or topsoil/subsoil) and revegetation of the final landform surfaces.

The Project ROM coal processing rate would be determined by the requirements of the coal market, product specification and/or blending requirements.

Waste rock produced by mining would be initially placed in out-of-pit waste rock emplacements located adjacent to the open cut mining area. When sufficient space is created within mined-out areas, subsequent waste rock would be placed within in-pit waste rock emplacements. Coal rejects from the CHPP would be co-disposed with waste rock.

Product coal would be loaded onto trains at the Project rail loop for transportation to port via the existing Norwich Park Branch Railway.

ES2.5 Rehabilitation, Mine Closure and Post-mining Land Use

Whitehaven WS has developed a rehabilitation strategy for the Project in consideration of the Terms of Reference and requirements of the *Guideline – Progressive rehabilitation and closure plans (PRC plans)*. The rehabilitation strategy also considers the outcome of consultation with underlying landowners, the Isaac Regional Council, Queensland Government agencies and other stakeholders. Accordingly, the Project has been designed to:

- be rehabilitated to a safe and stable landform;
- not cause offsite environmental harm; and
- maximise areas that sustain a post-mining land use.

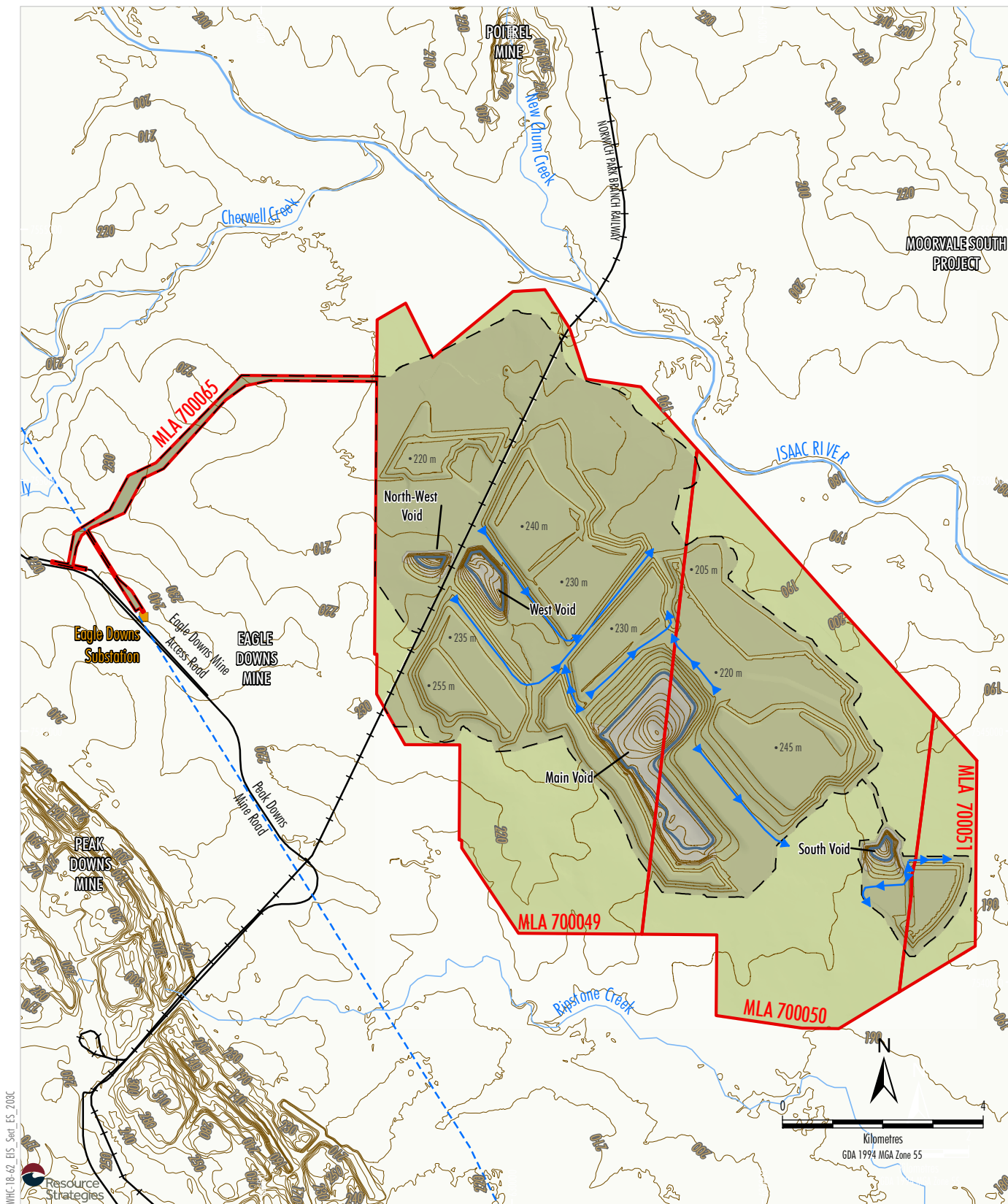
Low-intensity grazing has been selected as the primary land use post-mining (Figures ES-3 and ES-4).

The Project schedule has been optimised so that backfilling of open cut pits occurs progressively, and the number and extent of residual voids is minimised. An additional key design constraint was to ensure that residual voids are located outside the extent of the Isaac River floodplain (up to and including the probable maximum flood event) (Figures ES-3 and ES-4).

The final landform would be designed to minimise the surface catchment area of the residual voids. Surface water drainage would be constructed to direct runoff from the final landform, as well as up-catchment runoff, to the surrounding landscape and the Isaac River. Residual void lakes, and highwall and steeper low walls associated with residual void lakes would form the non-use management areas in the final landform (Figure ES-4).

Water levels in the residual voids are predicted to equilibrate between 20 metres to 60 metres below the pre-mining groundwater levels, and therefore would act as sinks to groundwater flow. The equilibrated water levels would also be between 47 metres to 74 metres below the overflow level of the residual voids.

As with all closed-system residual voids, the salinities of the water bodies would continue to increase over time. However, the gradual increase in salinity would not pose a risk to the surrounding groundwater or surface water environment as the residual voids would remain as groundwater sinks in perpetuity.



Source: The State of Queensland (2018 - 2020); Whitehaven (2020).

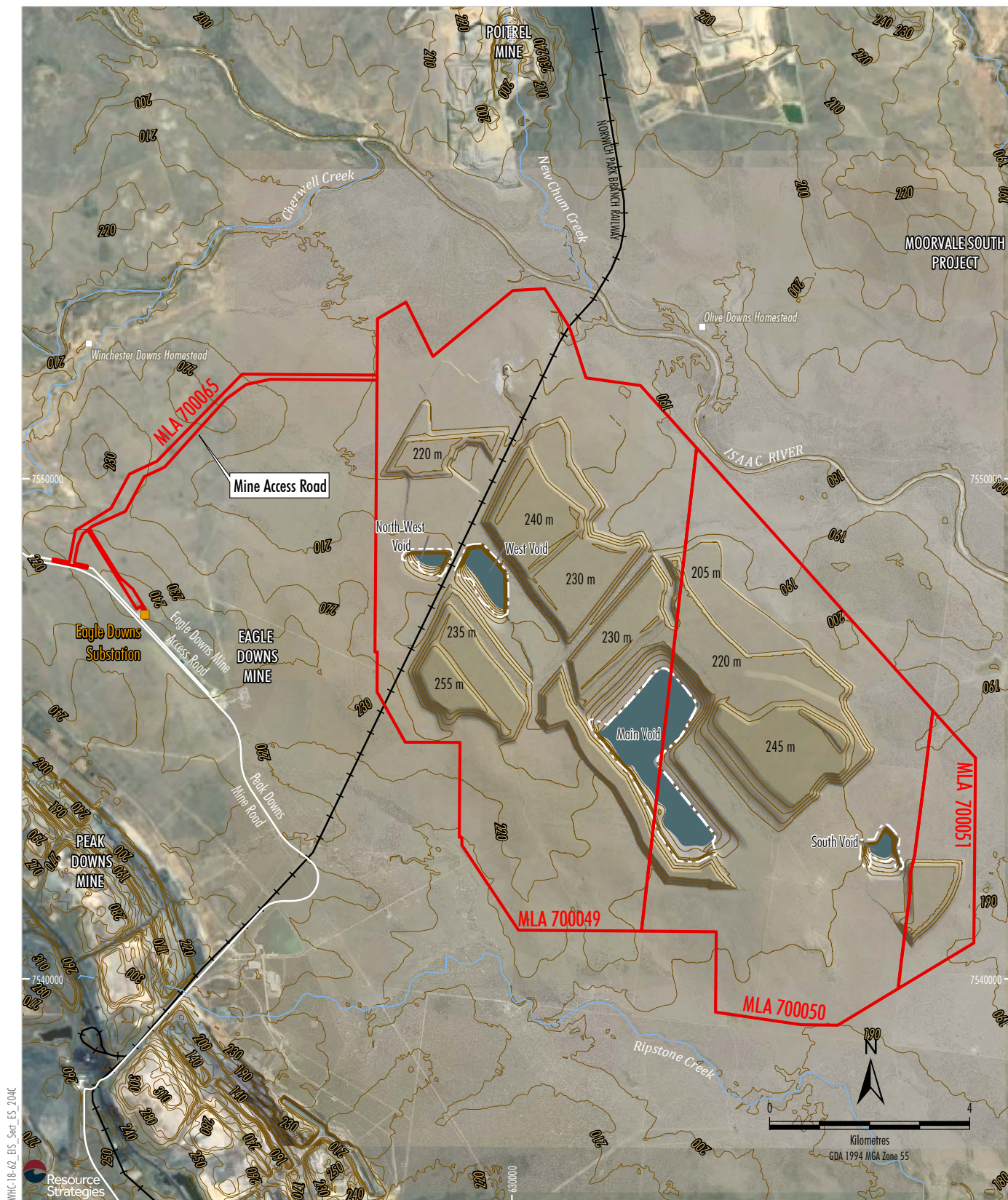
- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Indicative Residual Void Lake
 - Indicative Extent of Non-Use Management Area
 - Indicative Extent of Rehabilitation to Low-Intensity Grazing Post-Mining Land Use*
 - Land Outside Indicative Surface Disturbance Extent with a Low-Intensity Grazing Post-Mining Land Use
 - Contours (10 m)
 - Indicative Surface Water Drain

Note: * Should the Winchester Quarry remain at the end of the Project life, the PMLU for its extent would be quarrying and not low-intensity grazing.

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WINCHESTER SOUTH PROJECT Conceptual Final Landform and Land Use

Figure ES-3



- LEGEND**
- Mining Lease Application Boundary
 - Indicative Extent of Non-Use Management Area
 - Indicative Residual Void Lake
 - Contours (10 m)

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020).

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT
Conceptual Final Landform Simulation

Figure ES-4

ES3 ASSESSMENT PROCESS

The EIS is the key document supporting applications for primary approvals required for the Project under Queensland legislation, including the *State Development and Public Works Organisation Act 1971*, the *Environmental Protection Act 1994* and the *Mineral Resources Act 1989*. The EIS also supports an application for approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EIS has been prepared to allow the Coordinator-General to evaluate the environmental effects of the Project, decide whether it may proceed, make recommendations, and state or impose conditions about how the Project should be undertaken. This evaluation will be detailed in the Coordinator-General's 'Evaluation Report', which is published and considered by the relevant State and Commonwealth authorities involved in the grant of environmental approvals required to undertake the Project. As a result, the EIS is prepared to ensure that there is sufficient information to enable primary and secondary approvals to be granted for the Project.

ES4 ENGAGEMENT

Consultation with key Queensland Government agencies, specifically in relation to the Project, has been conducted during preparation of the Initial Advice Statement, draft Terms of Reference, finalisation of the Terms of Reference and the draft EIS.

Consultation has also been undertaken with the Isaac Regional Council, landowners within and adjacent to the Project mining lease application areas, neighbouring mining companies and numerous community and social organisations. Engagement with relevant stakeholders has included:

- briefings on the Project;
- discussion of key assessment considerations;
- discussion of community and social impacts, including proposed accommodation and employment strategies;
- formation of land access agreements to conduct baseline environmental surveys and install environmental monitoring equipment;
- discussion of proposed final land uses;

- description of the environmental assessment process; and
- presentation of the findings of the environmental assessments and Project development schedules.

Whitehaven WS has consulted a wide range of stakeholders regarding the Project and would continue to consult with these stakeholders during construction and operation of the Project.

Whitehaven WS is committed to establishing itself as a long-term community partner that makes a positive contribution to community development.

ESS KEY ENVIRONMENTAL ISSUES AND PROJECT MITIGATION

ESS.1 Water Quality and Water Resources

The Project is located within the headwaters of the Isaac sub-catchment of the greater Fitzroy Basin. The main watercourse proximal to the Project is the Isaac River (to the east) and flows in a north-west to south-east direction. Named tributaries of the Isaac River in the vicinity of the Project include Cherwell Creek, Ripstone Creek and New Chum Creek (Figure ES-2).

A conceptual hydrogeological model of the groundwater regime was developed based on existing contemporary models for neighbouring mining projects, available groundwater data and Project specific groundwater investigation programs. The hydrogeological regime relevant to the Project comprises the following hydrogeological units:

- Cainozoic sediments:
 - Quaternary alluvium – unconfined aquifer localised along Isaac River;
 - regolith – unconfined and largely unsaturated unit bordering alluvium;
- Triassic Rewan Group – aquitard;
- Permian coal measures with:
 - hydrogeologically 'tight' interburden units; and
 - coal sequences that exhibit secondary porosity through cracks and fissures.

Available surface water data indicates that baseline water quality does not meet the default guideline values for the region, in particular for the Isaac River. These background exceedances of the regional default guideline values are also generally reflected in the other sampling locations along Ripstone Creek and the unnamed tributaries of the Isaac River.

While water within the Isaac River is largely fresh, water within the Quaternary alluvium associated with the Isaac River ranges from fresh to moderately saline. Water within the Quaternary alluvium is generally suitable for stock water supply and short-term irrigation, however, generally exceeds default guideline values for drinking water, freshwater aquatic systems and long-term irrigation.

Groundwater within the underlying regolith and coal measures is generally saline, however groundwater in the sandstone units adjacent to the coal measures is generally suitable for stock water supply.

The Project would intercept the Permian coal measures (sub-artesian aquifer) through the development of the open cut pits, but would avoid interception of the Quaternary alluvium associated with the Isaac River. The numerical groundwater modelling results indicate there would be negligible drawdown within the Isaac River alluvium due to the Project.

Further, the numerical groundwater modelling indicates that no privately-owned bores in the vicinity of the Project (and outside the surface disturbance extent) would experience more than 1 metre drawdown.

To minimise potential impacts to the water quality of the receiving environment, the Project water management system has been designed to:

- maintain separation of clean, sediment-laden and mine-affected water within the limitations of operational requirements; and
- minimise uncontrolled releases to the receiving environment through design and operation.

A significant proportion of site water requirements would be sourced from water collected on-site, including rainfall runoff and groundwater inflows to the open cut pits. Collected water would be stored in the mine-affected water storages for recycling and reuse.

Whitehaven WS would source water from either an external water supplier (e.g. Sunwater) via a water supply pipeline or via water sharing arrangements with surrounding mining operations. Therefore, there would be no material impacts to regional water availability.

Based on the proposed release conditions, it is expected that sediment dam overflows and controlled releases would not have a measurable impact on receiving water quality or environmental values.

Water levels in residual voids remaining at the cessation of mining are predicted to equilibrate between 20 metres to 60 metres below the pre-mining groundwater levels, and therefore would act as sinks to groundwater flow. The equilibrated water levels of the residual voids would be between 47 metres to 74 metres below the overflow level.

As with all closed-system residual voids, salinities would increase over time. However, the gradual increase in salinity equilibrated water body would not pose a risk to the surrounding groundwater regime or receiving environment as the residual voids would remain as groundwater sinks in perpetuity.

The extensive surface water and groundwater monitoring programs established for the Project to date would continue during operations to monitor potential impacts on water quality and resources. A Water Management Plan and a Receiving Environment Monitoring Program would be developed and would describe the monitoring and management of water quality and water resources over the life of the Project.

ES5.2 Flooding

The Project would not result in any significant impacts on flow velocities in the Isaac River channel and floodplain. Flood modelling results indicate that the residual voids would be outside the probable maximum flood design event, and therefore would not be inundated post-mining.

ES5.3 Social Values and Economic Effects

The Isaac Regional Council Local Government Area stretches from the central Queensland coast to the Bowen Basin coalfields. This area includes the townships of Moranbah, Dysart, Middlemount, Coppabella, Nebo, Clermont and Glenden, all identified as 'nearby regional communities' for the Project.

Mackay is approximately 180 km from the Project by road and is the principal service centre for the broader region. It is anticipated that the Isaac and Mackay Local Government Areas would be integral to the Project as a source of employees, construction services, labour and equipment, supply of goods and services and supply of social infrastructure and services.

Based on views communicated during the social impact assessment consultation process, the residents of the local communities of Moranbah and Dysart agreed that their communities are resilient, family orientated and cohesive. The results indicate a very strong sense of community spirit and pride.

The potential for the Project to create increased local employment options and opportunities for local businesses were key benefits identified by local stakeholders.

The Social Impact Assessment concluded that the Project would have various social impacts and benefits, primarily accruing in the Isaac Regional Council Local Government Area. However, employment opportunities and benefits for businesses are expected to extend to other regions including the Mackay Regional Council Local Government Area.

The Project would result in a total net benefit to the Queensland community of \$756 million in net present value terms. This value is inclusive of estimated costs for environmental externalities and internalisation of environmental mitigation and management costs by Whitehaven WS.

The estimated net benefit of the Project for Queensland in net present value terms consists of royalties of \$563 million, company income tax of \$136 million and net producer surplus of \$79 million.

It is estimated that \$4.9 billion in net present value terms would accrue to suppliers in Queensland as a result of the Project.

In addition, the Project would result in the following additional socio-economic benefits:

- Generation of approximately 500 new direct, long-term jobs, with a significant proportion of the Project workforce to be employed from the region (Isaac and Mackay Local Government Areas).

- Indirect (flow-on) employment as the result of increased wages, and participation of regional businesses, including:
 - 285 full time equivalents in the local area;
 - 934 full time equivalents in the region; and
 - 1,894 full time equivalents in Queensland.
- Enhanced skills and capacities in local communities due to targeted training and skills development initiatives.
- Increased economic well-being in local communities through contributions to community development.

A critical part of assessing potential social impacts has been the development of a Social Impact Management Plan. One of the key considerations has been potential impacts and benefits of the Project in relation to housing and accommodation. Key commitments made by Whitehaven WS with regard to housing and accommodation include:

- Facilitating the construction of a maximum of 34 new houses in Moranbah dedicated for Project employees.
- Providing a financial contribution of \$500,000 over the Project life to the Isaac Affordable Housing Trust and/or Emergency and Long-Term Accommodation Moranbah Inc, for the construction of additional affordable housing in Moranbah.
- Providing subsidised housing costs for members of the workforce who choose to live locally.
- Providing high quality workforce accommodation to non-resident personnel and monitoring workforce satisfaction with the provided accommodation.
- Providing support to members of the workforce seeking to move to local communities (e.g. providing connections to local advice and support services).

The Social Impact Management Plan also details other significant financial and community commitments to appropriately avoid or mitigate any potential adverse social impacts.

ES5.4 Flora and Fauna

The majority of vegetation within the Project area has been historically cleared to facilitate livestock grazing and agriculture and exists in a non-remnant state (Plate ES-2).

A total of 11 remnant regional ecosystems were ground-truthed within the Project area.

Of these 11, four have a conservation status of 'Endangered' under the *Vegetation Management Act 1999* and three have a conservation status of 'Of Concern'. The remaining four regional ecosystems have a conservation status of 'Least Concern'.

Two threatened ecological communities listed under the EPBC Act have been recorded within the Project area, namely, the *Poplar Box Grassy Woodland on Alluvial Plains* threatened ecological community and the *Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin* threatened ecological community.

A small population of *Solanum adenophorum* plants, listed as 'Endangered' under the *Nature Conservation Act 1992*, were identified within the Project area.

Four conservation significant fauna species (listed under both the Queensland and Commonwealth legislation) were recorded within, or immediately adjacent to the Project area:

- Ornamental Snake (*Denisonia maculata*);
- Squatter Pigeon (southern subspecies) (*Geophaps scripta scripta*);
- Greater Glider (*Petauroides volans*); and
- Koala (*Phascolarctos cinereus*).

There are no well-defined fauna movement corridors being impacted by the Project that would need to be retained nor would the Project infrastructure corridor cross any waterways.

No aquatic flora or fauna species listed under the EPBC Act, *Nature Conservation Act 1992* or *Fisheries Act 1994* were identified within the Project area.

Aquatic habitat within the Project area is generally limited to unnamed ephemeral waterways with limited in-stream habitat features and high levels of disturbance to the bed and bank, likely from cattle access and land clearing.



Plate ES-2 – Modified Non-Remnant Vegetation

Potential and actual groundwater dependent ecosystems (GDEs) were identified in the vicinity of the Project area, including aquatic ecosystems and terrestrial ecosystems potentially dependent on sub-surface groundwater (Plates ES-3 and ES-4). The Project is not predicted to have any material impacts on potential or actual GDEs due to changes in groundwater quality or groundwater resources.



Plate ES-3 – Government Mapped Palustrine Wetland (Outside of Project Area)

Source: Appendix E.



Plate ES-4 – Government Mapped Lacustrine Wetland (Farm Dam within Project Area)

Source: Appendix E.

At a broad level, Project elements have been located and designed to avoid or minimise impacts to vegetation and threatened fauna habitat.

Whitehaven WS would implement a number of measures to mitigate potential impacts on biodiversity, such as vegetation clearance protocols, weed management, and rehabilitation and revegetation of disturbed areas.

The Project also includes a significant biodiversity offset in accordance with Queensland *Environmental Offsets Policy*, EPBC Act and supporting *Offsets Assessment Guide*.

ES5.5 Noise and Vibration

An acoustic model was developed that simulates the components of the Project using noise source information (i.e. sound levels and locations) and predicts noise levels at relevant receptor locations.

Proposed noise management measures include proactive and reactive noise control measures. With these measures in place, all sensitive receptors are predicted to comply with the relevant noise limits during the day, evening and night for all modelling cases throughout the life of the Project, with the exception of the Olive Downs Homestead.

Accordingly, Whitehaven WS intends to reach a mutually beneficial agreement with the land owner of the Olive Downs Homestead regarding acoustic treatment or other suitable measures. The Project would also adopt adaptive management measures for noise that include:

- response to community issues or complaints including discussions with relevant landowners;
- refinement of on-site noise mitigation measures and mine operating procedures, where required and practicable;
- use of real-time noise and meteorological monitoring as a management tool; and
- if necessary (i.e. as informed by operational noise monitoring results and subject to any agreements), implementation of feasible and reasonable mitigation at relevant sensitive receptors, in accordance with the relevant policies.

ES5.6 Air Quality

General dust mitigation measures that would be implemented for the Project to minimise dust generation would include:

- watering of haul roads and potential implementation of chemical dust suppressants on selected haul roads (or alternative technologies with equivalent effectiveness) as required;
- dust suppression systems for drilling operations;

- progressive rehabilitation of waste rock emplacements to minimise wind generation of dust;
- reshaping and/or profiling of product coal stockpiles to minimise wind generation of dust;
- water sprays on coal stockpiles, ROM coal handling at CHPP and the train load-out facility;
- enclosure of ROM crushing infrastructure; and
- profiling of the coal in wagons and the use of a veneering system (e.g. spray of the coal surface in the wagons) to manage emissions associated with product coal transport.

Whitehaven WS would also implement proactive and reactive dust control measures. These measures would include the use of weather forecasting and real-time measurement of dust levels and meteorological conditions to modify mining operations as required.

Modifying mining operations could include, for example, the application of additional dust controls, an increase in the intensity of applied dust controls, reducing the intensity of particular operations, or ceasing particular operations.

ES5.7 Transport

The major road transport routes in the vicinity of the Project are:

- the Peak Downs Highway, located approximately 11 km to the north-west of the mine access road for the Project; and
- the Peak Downs Mine Road, located immediately to the west of the mine access road for the Project.

The Project is expected to result in no significant worsening of road safety at any location on the State Controlled Road network, nor on local roads.

Further, Project-generated traffic would have a negligible impact on the performance of the railway level crossing on the Peak Downs Mine Road.

The Project would result in an increased number of trains travelling along the Norwich Park Branch Railway, with a peak of up to eight product coal trains per day being loaded for the Project. Project trains would be operated and coordinated by Aurizon.

ES5.8 Land

No strategic cropping areas are located within the Project area and grazing is the primary land use across the Project area (Plate ES-5). The majority of vegetation within the Project area has been historically cleared to facilitate livestock grazing and agriculture and exists in a non-remnant state.

Direct views of the elevated mine landforms for the Project are not expected to be significant from nearby dwellings, given the large separation distances and presence of intervening vegetation.

There are two areas designated as stock routes (reserves) in the vicinity of the Project, however these would not be intersected by the Project area, and therefore would not be impacted.

ES6 GENERAL ENVIRONMENTAL MANAGEMENT COMMITMENTS AND MODEL CONDITIONS

As part of this EIS, Whitehaven WS has developed proposed draft Environmental Authority conditions that are generally consistent with the *Model Mining Conditions*, the guideline *Structures which are dams and levees constructed as part of environmentally relevant activities*, and contemporary Environmental Authorities for similar developments surrounding the Project.

Key environmental management measures to be implemented for the Project include:

- Minimisation of surface disturbance associated with the Project and provision of staged biodiversity offsets.
- Implementing the significant commitments in the Social Impact Management Plan.
- Operation of a water management system for the Project to protect the integrity of local and regional water resources.



Plate ES-5 – Cattle Grazing at Winchester Downs – Indicative of Proposed Grazing Final Land Use

- Location of residual voids outside the Isaac River floodplain.
- Progressive rehabilitation of the surface disturbance associated with the Project to achieve a safe, stable and non-polluting final landform.

In addition to the above, Whitehaven WS has committed to the preparation and implementation of numerous plans, programs and strategies to minimise impacts to environmental values.

ES7 CONCLUSION

Potential impacts of the Project have been assessed against established thresholds of acceptability contained in relevant guidelines and policies, including for surface water, groundwater, social, ecology, noise, air quality, road transport, soils, economics, heritage and geochemistry. Potential impacts have been avoided or minimised as far as is reasonable or feasible. Mitigation measures and offset strategies are proposed where residual impacts are predicted.

Throughout the Project design and EIS process, Whitehaven WS has carefully considered the feedback from these stakeholders provided by the local community, government agencies and other stakeholders. This has also included feedback from these stakeholders on surrounding contemporary projects.

The potential for the Project to create increased local employment options and benefit local businesses is a key benefit identified in local community and other stakeholder engagement.

The Project would generate a significant net benefit to the State of Queensland. Economic benefits potentially forgone if the Project does not proceed amount to a net benefit to the State of Queensland of \$756 million in net present value terms.

In weighing up the environmental impacts (costs and benefits) associated with the proposal as assessed and described in this EIS, the Project is, on balance, considered to be in the public interest.