HANCOCK PROSPECTING PTY LTD

Alpha Coal Project Environmental Impact Statement

02 Description of the Project

Section 02 Description of the Project

2.1 Introduction

In order to enable assessment of all aspects of the Alpha Coal Project (Rail) (herein referred to as the Project), a Project description detailing key information regarding the construction and operation phases of the Project is required. Accordingly, the following section provides baseline information on construction methodology and operational detail of the Project.

At the time of producing this Environmental Impact Statement (EIS), the Project was in the preliminary design phase and detailed information on different aspects of the construction and operation requirements were not available. Where appropriate, provisions have been made in the Environmental Management Plan (EMP) to ensure that all environmental issues are considered during the detailed design stage (refer to Volume 3, Section 26 of this EIS).

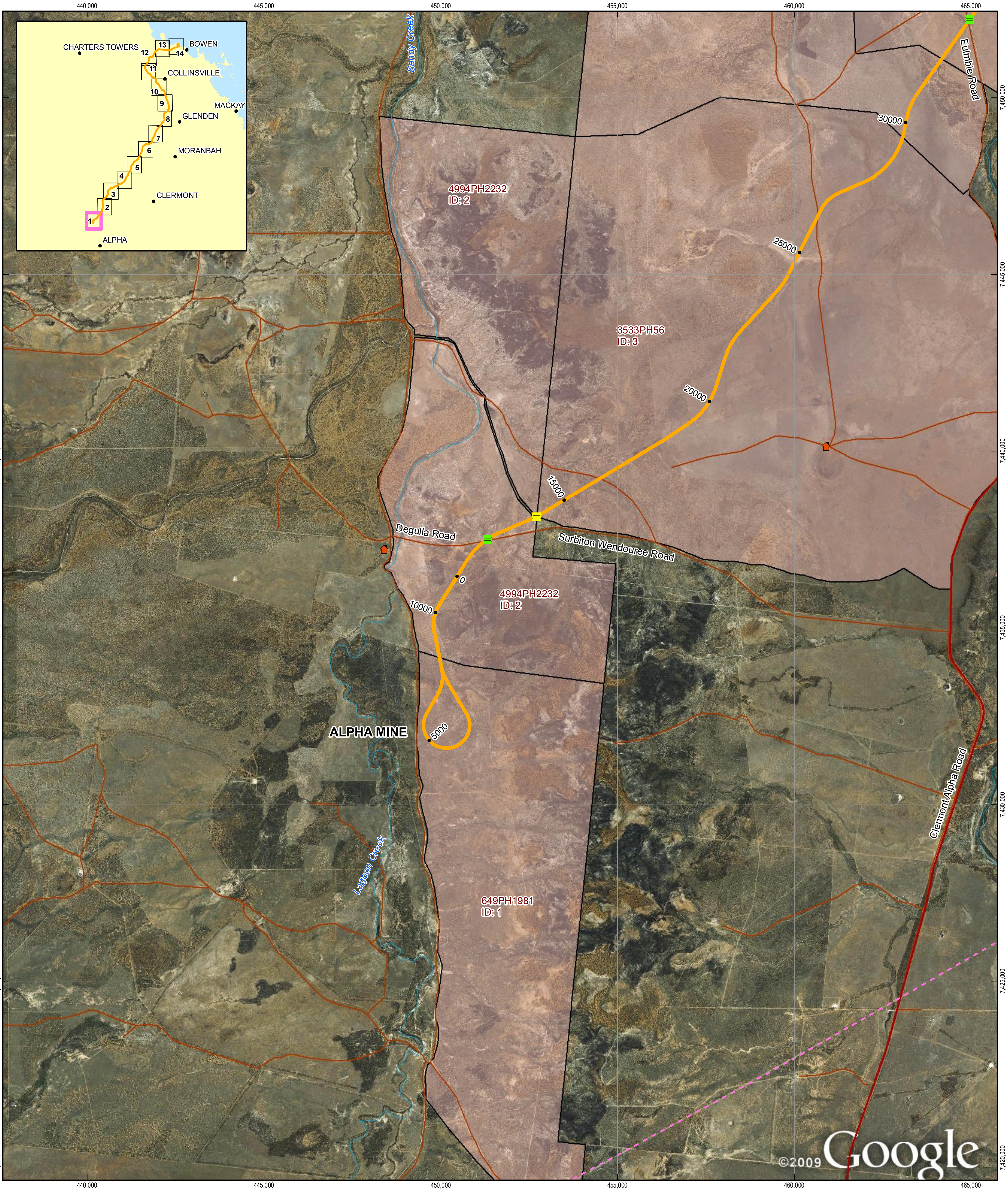
2.2 Overview of the Project

Hancock Prospecting Pty Ltd (HPPL) (the Proponent) is proposing to construct a standard gauge, single track, non-electrified, 495 km long railway line for the purposes of transporting processed coal from the Alpha Coal Mine to the Port of Abbot Point in Bowen (refer to Figure 2-1). The Project will connect the Galilee Basin in Central Queensland to the coastal Port at Abbot Point. The Galilee Basin spans over 247,000 km^2 of land and holds over 14 billion tonnes of Joint Ore Reserves Committee (JORC) compliant coal that has been identified by several proponents. As such, the Project will be an essential part of opening up the Galilee Basin for export of thermal coal and will benefit the Central Queensland region, State of Queensland and the nation. As the northern section of the Project enters the Abbot Point State Development Area (APSDA) and ends at a rail loop and dump station immediately south of the proposed Abbot Point Coal Terminal X110 Expansion Area, it will also benefit future industrial development of the APSDA.

The Project will enable export of 60 Mtpa of quality thermal coal for a lifespan of approximately 30 years. With construction of additional passing loops to the single line track and selective partial duplication, there is potential to further increase the tonnage and thus service other potential miners from the Galilee Basin. HPPL has undertaken to make the track available to third party users under a Voluntary Undertaking pursuant to the *Trade Practices Act 1974* (TPA). In addition to the main line from the Alpha Coal Mine to the Port of Abbot Point, the Project also involves construction of the following:

- two balloon loops, one at the Alpha Coal Mine and one at the Port of Abbot Point for loading and unloading;
- eight passing loops each approximately five kms long to accommodate for export of 60 Mpta of coal from the Alpha Coal Mine and the Kevin's Corner Mine;
- maintenance sidings along the railway line;
- marshalling yard at the entry to the APSDA; and
- five temporary workers' camps accommodating for 700 to 800 personnel per camp for the construction phase only (refer to Figure 2-1 for location of the camps).

Further detail on associated railway infrastructure is provided in Sections 2.4 and 2.5 below.



LEGEND

- Town
- Camp
- Marshalling Yards
- Depot
- House
- Level Crossing
- Level Crossing/Stock Crossing
- Stock Crossing
- Watercourse Bridge
- Road Bridge
- Proposed Alignment
- State Road
- Local Road
- Existing Railway
- Watercourse
- Powerline
- Gas Pipeline
- Water Pipeline
- Impacted Properties
- Waterbody

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Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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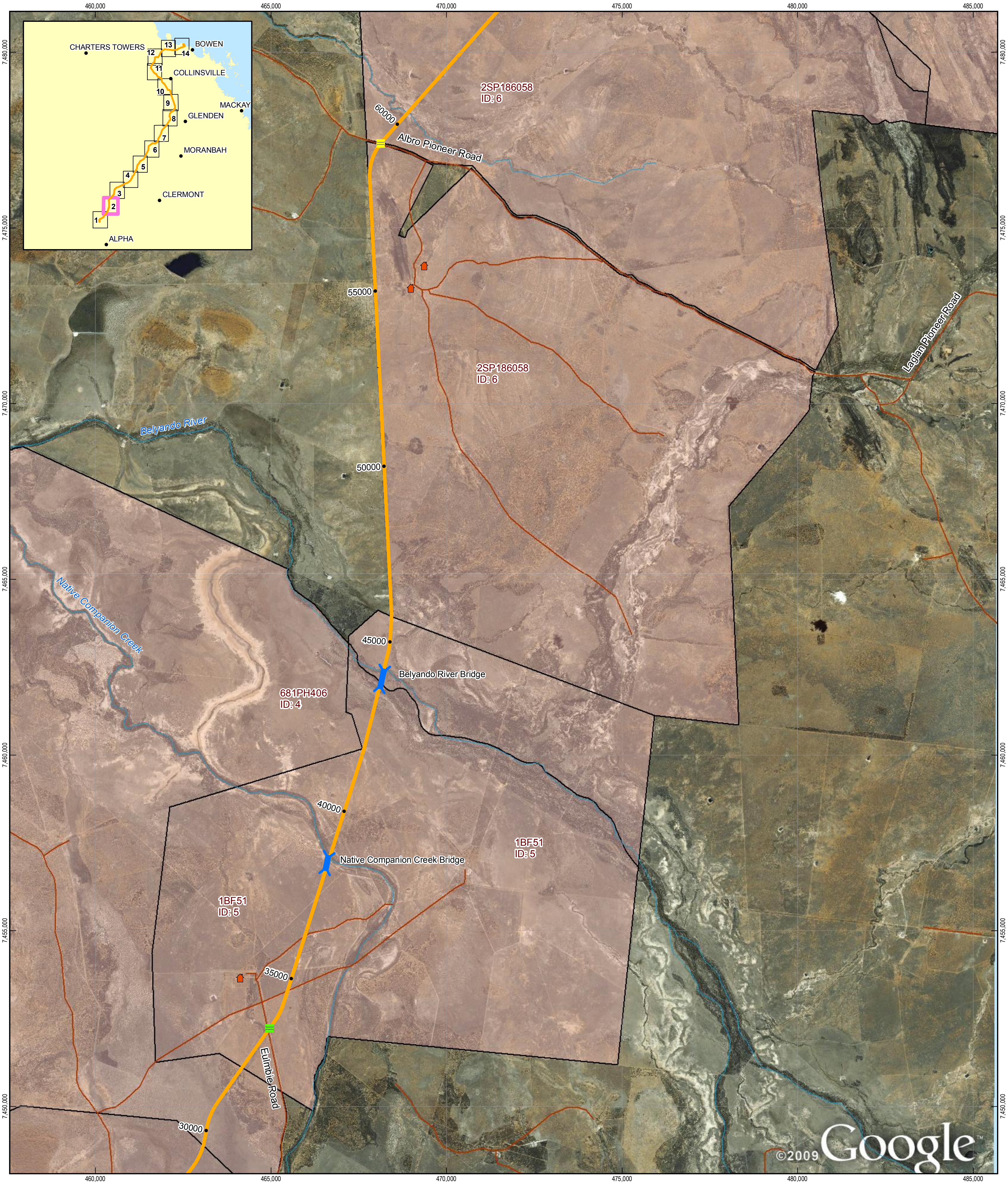

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Camp	Level Crossing/Stock Crossing	State Road	Gas Pipeline	Waterbody
Marshalling Yards	Stock Crossing	Local Road	Water Pipeline	
Depot	Watercourse Bridge	Existing Railway		
House	Road Bridge	Watercourse		

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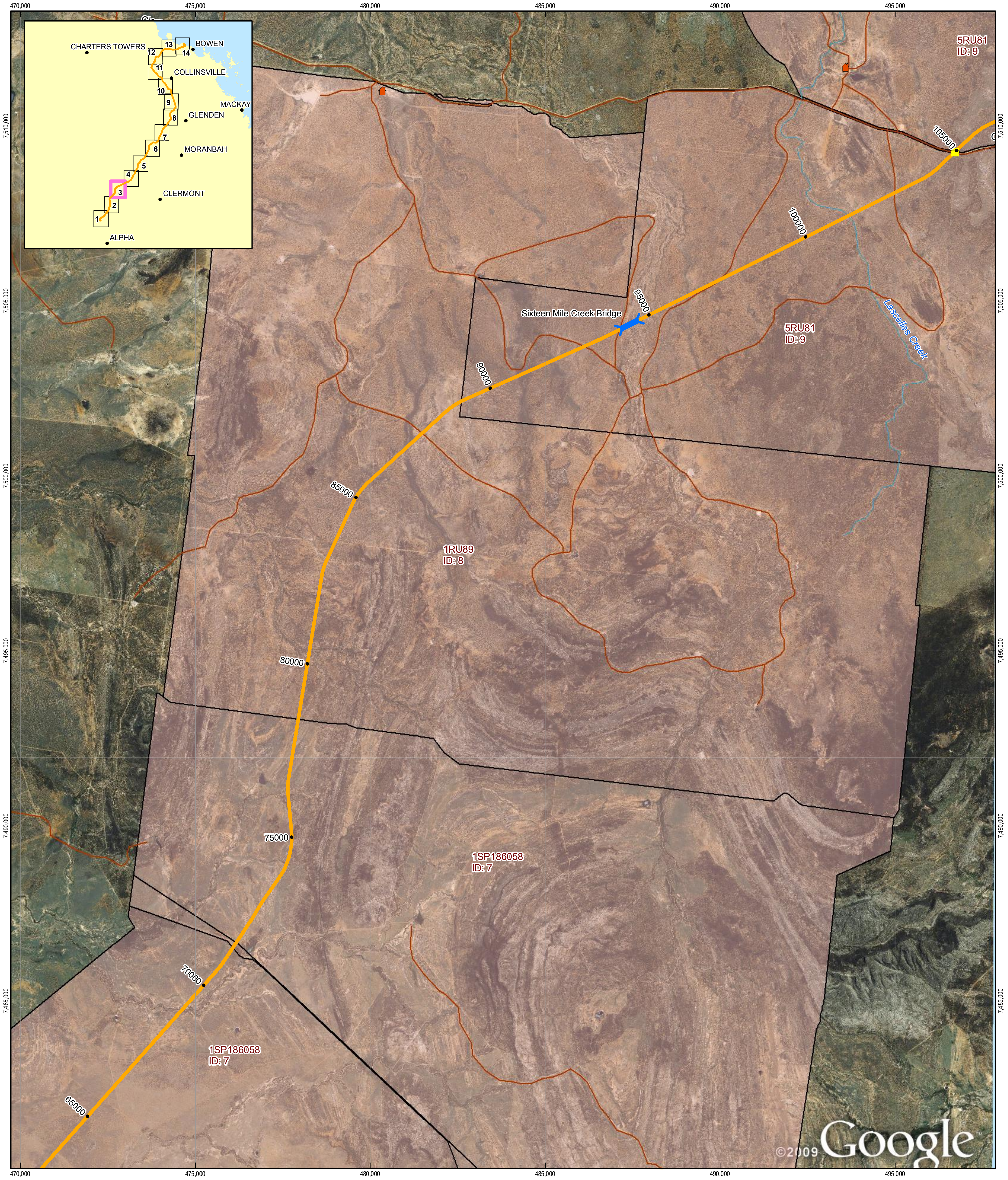

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Town	Level Crossing	Proposed Alignment	Powerline	Impacted Properties
Camp	Level Crossing/Stock Crossing	State Road	Gas Pipeline	Waterbody
Marshalling Yards	Stock Crossing	Local Road	Water Pipeline	
Depot	Watercourse Bridge	Existing Railway		
House	Road Bridge	Watercourse		

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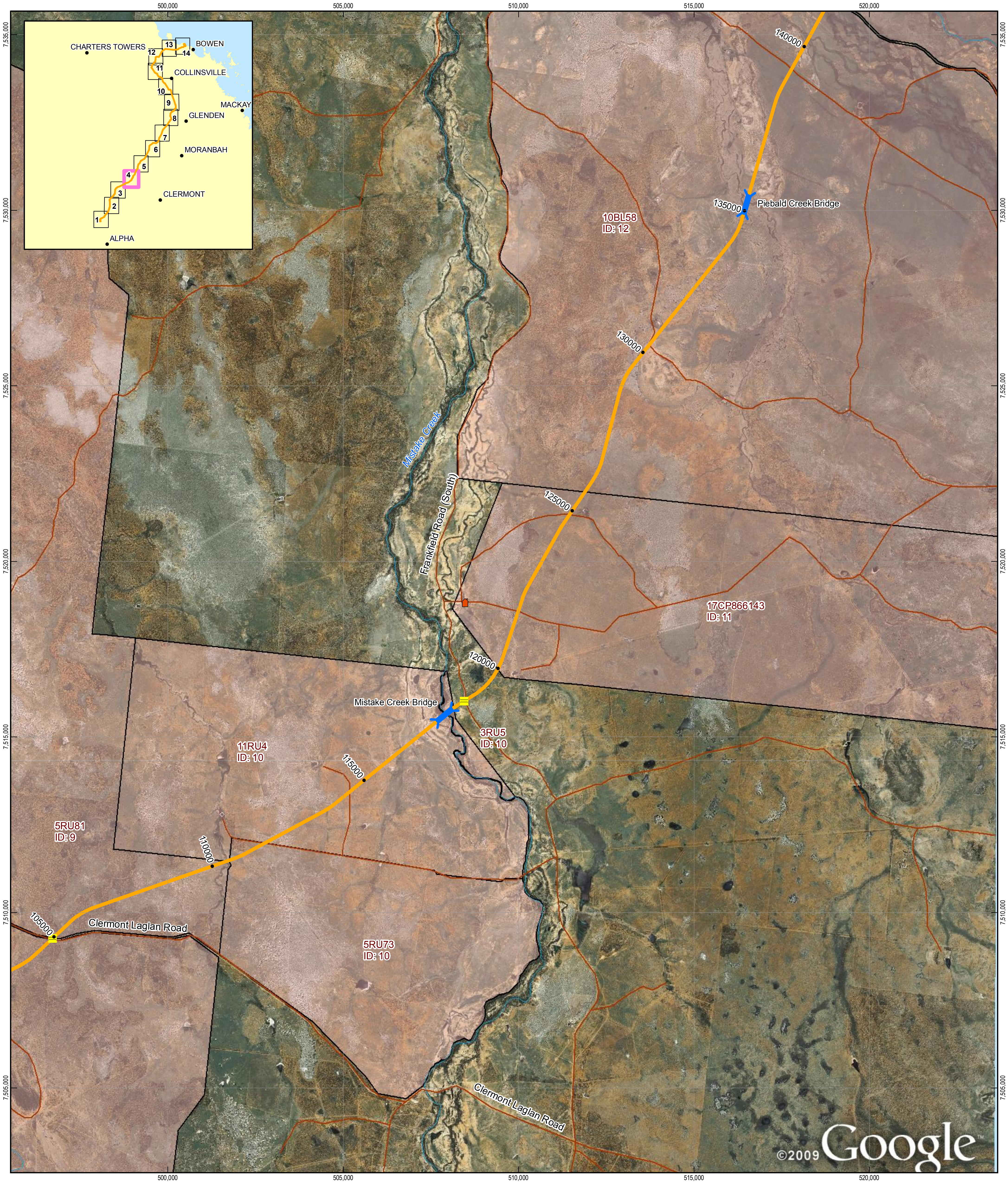

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- Stock Crossing
- Watercourse Bridge
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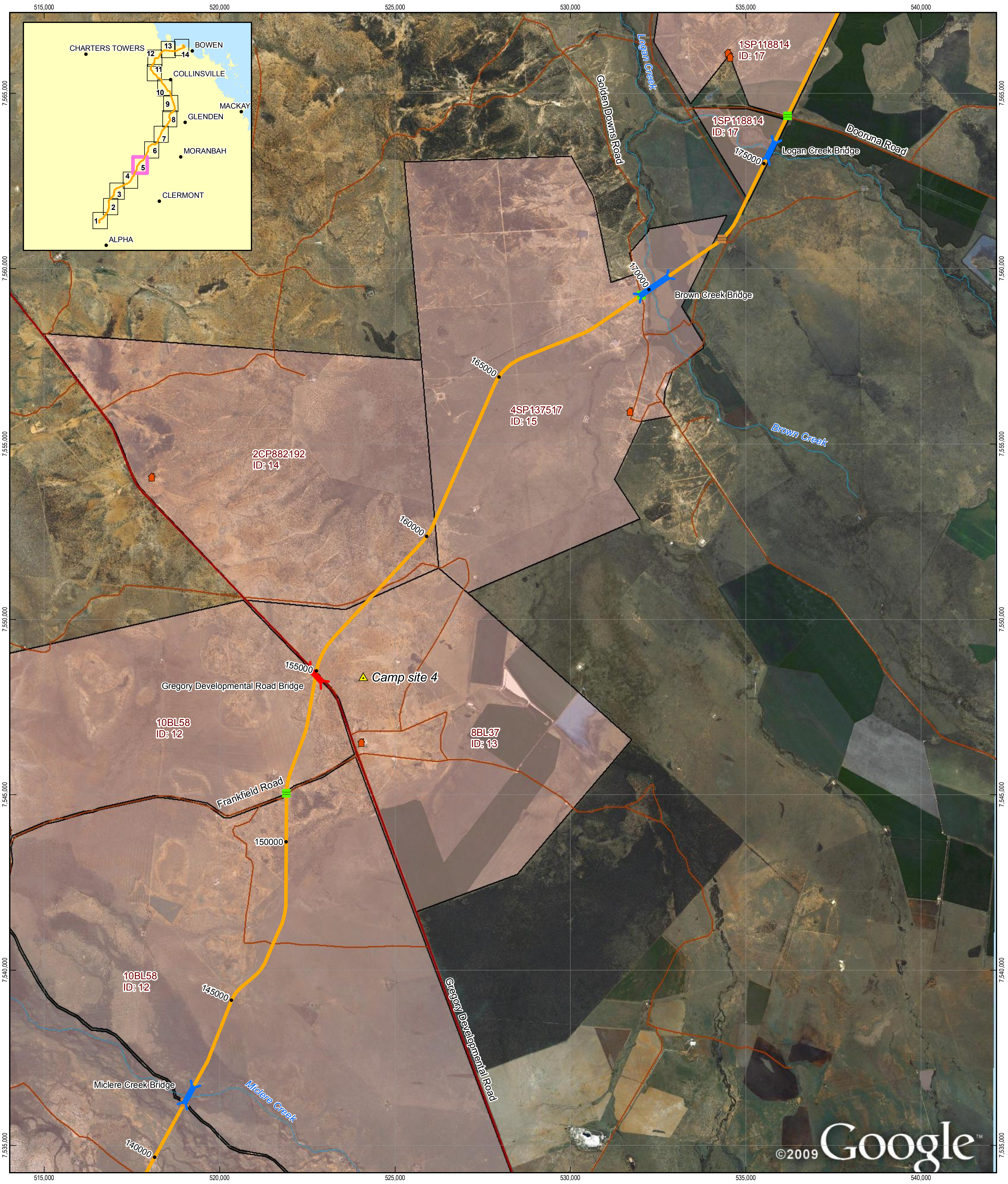

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Camp	Level Crossing/Stock Crossing	State Road	Gas Pipeline
Marshalling Yards	Stock Crossing	Local Road	Water Pipeline
Depot	Watercourse Bridge	Existing Railway	Impacted Properties
House	Road Bridge	Watercourse	Waterbody

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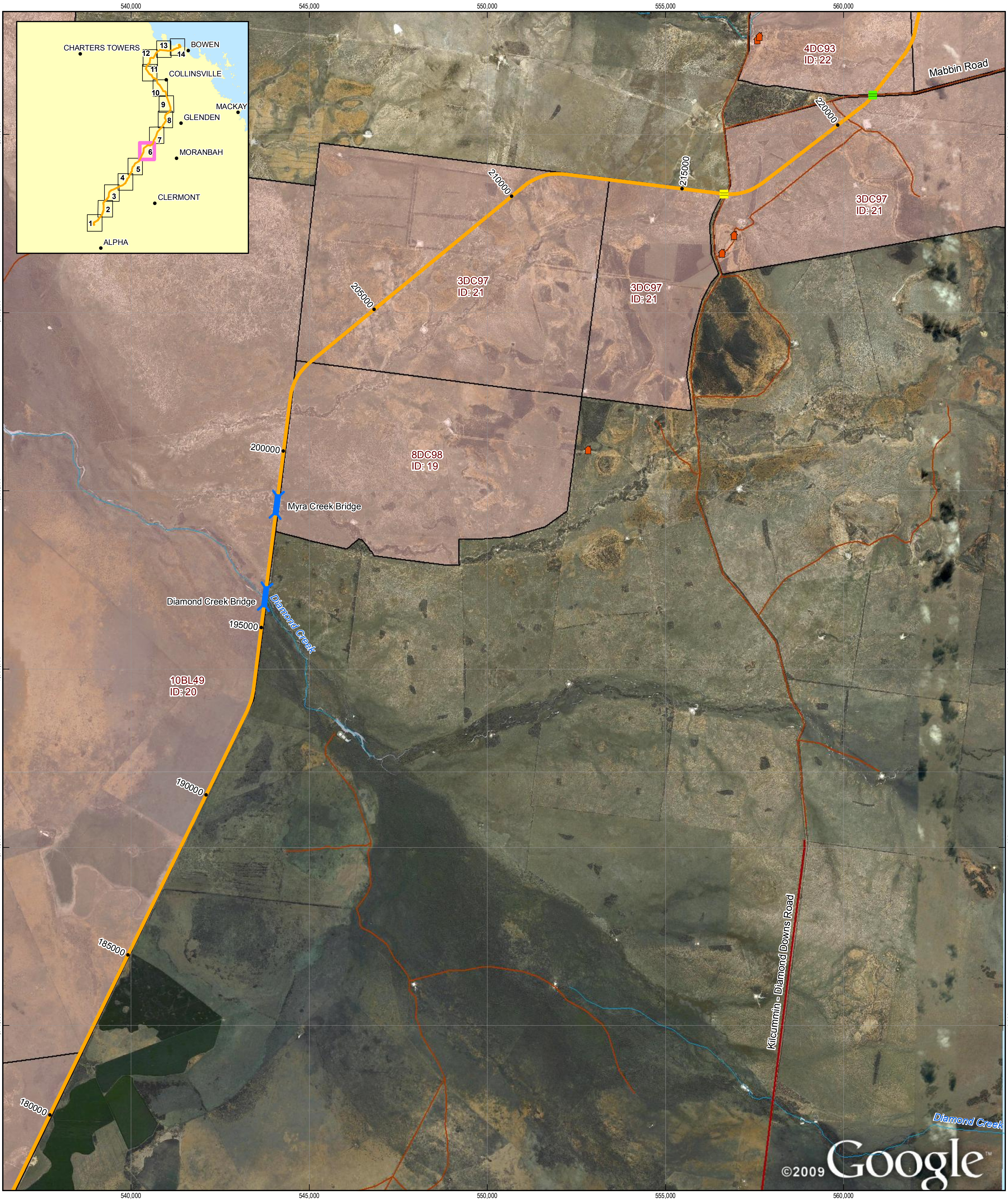

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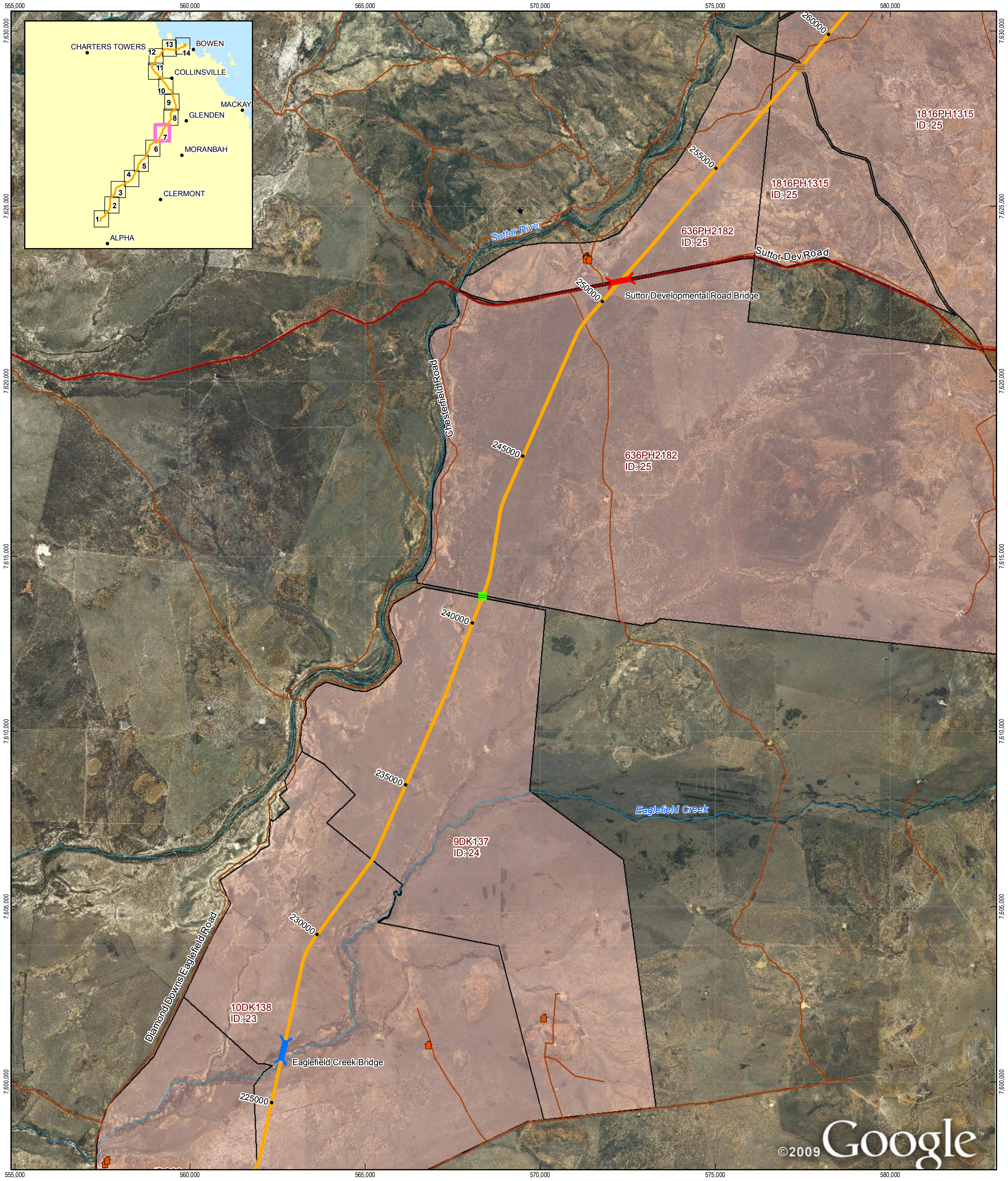

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Town	Level Crossing	Proposed Alignment	Powerline	Impacted Properties
Camp	Level Crossing/Stock Crossing	State Road	Gas Pipeline	Waterbody
Marshalling Yards	Stock Crossing	Local Road	Water Pipeline	
Depot	Watercourse Bridge	Existing Railway		
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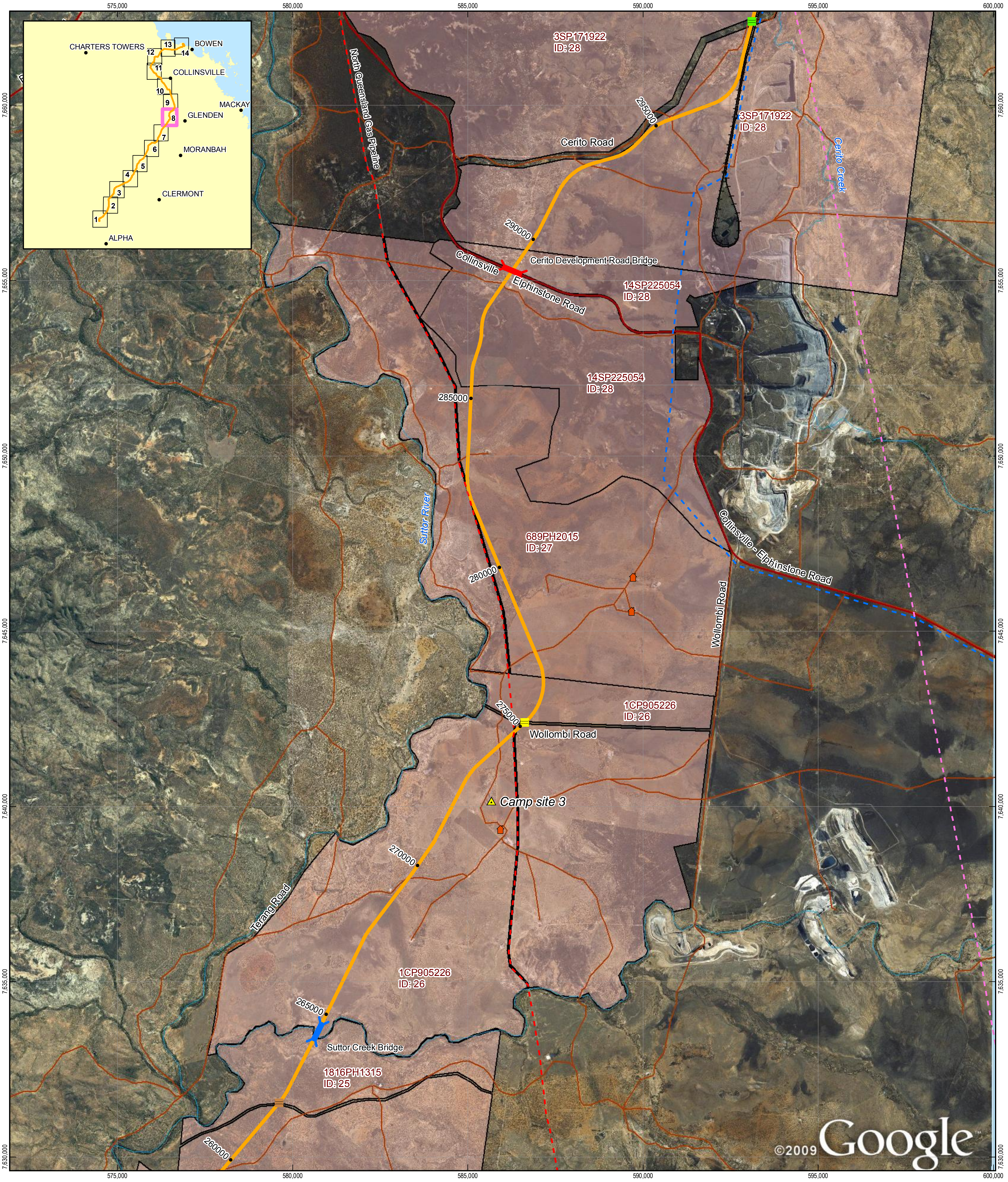

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Town	Level Crossing	Proposed Alignment	Powerline	Impacted Properties
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Marshalling Yards	Stock Crossing	Local Road	Water Pipeline	
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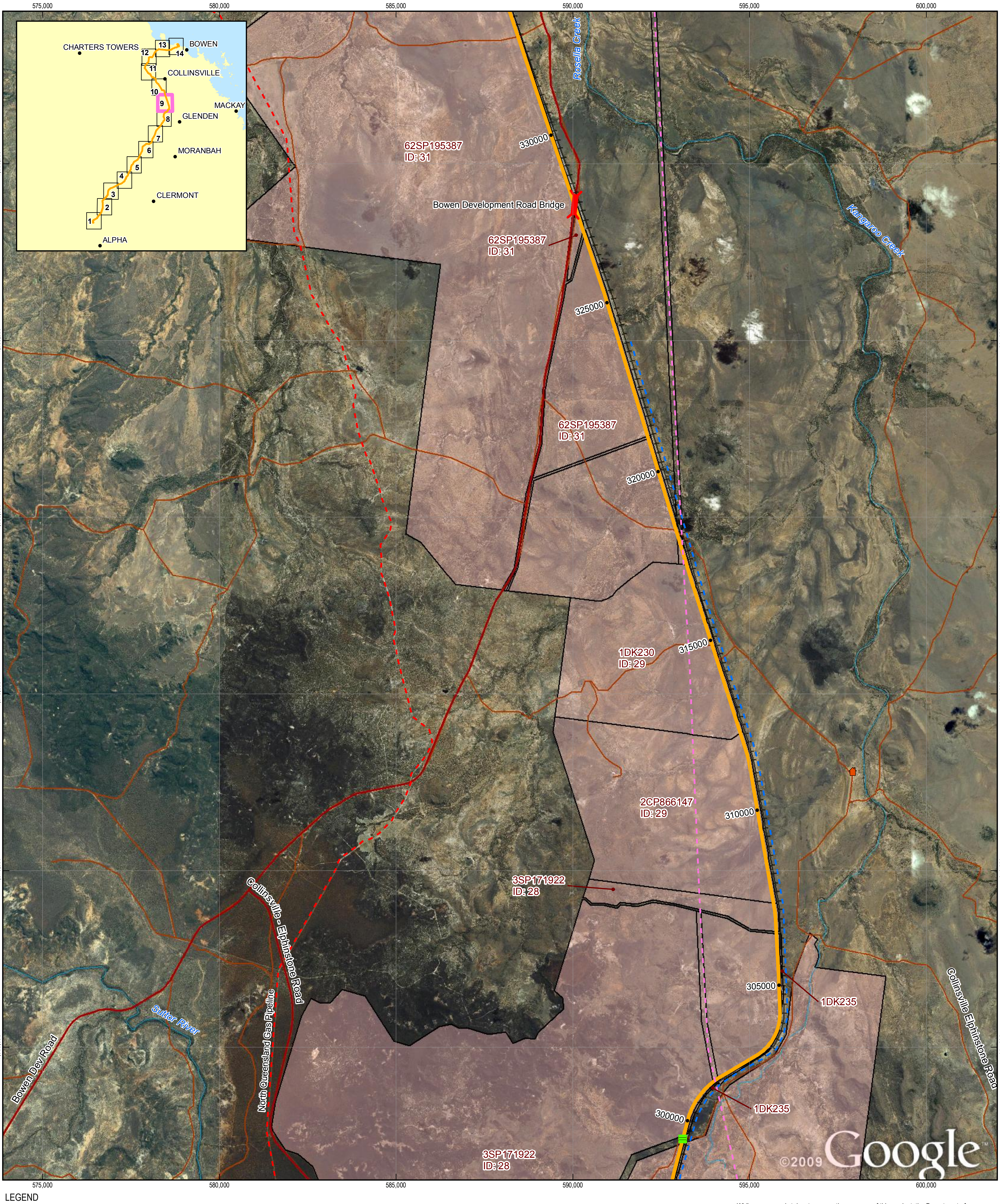

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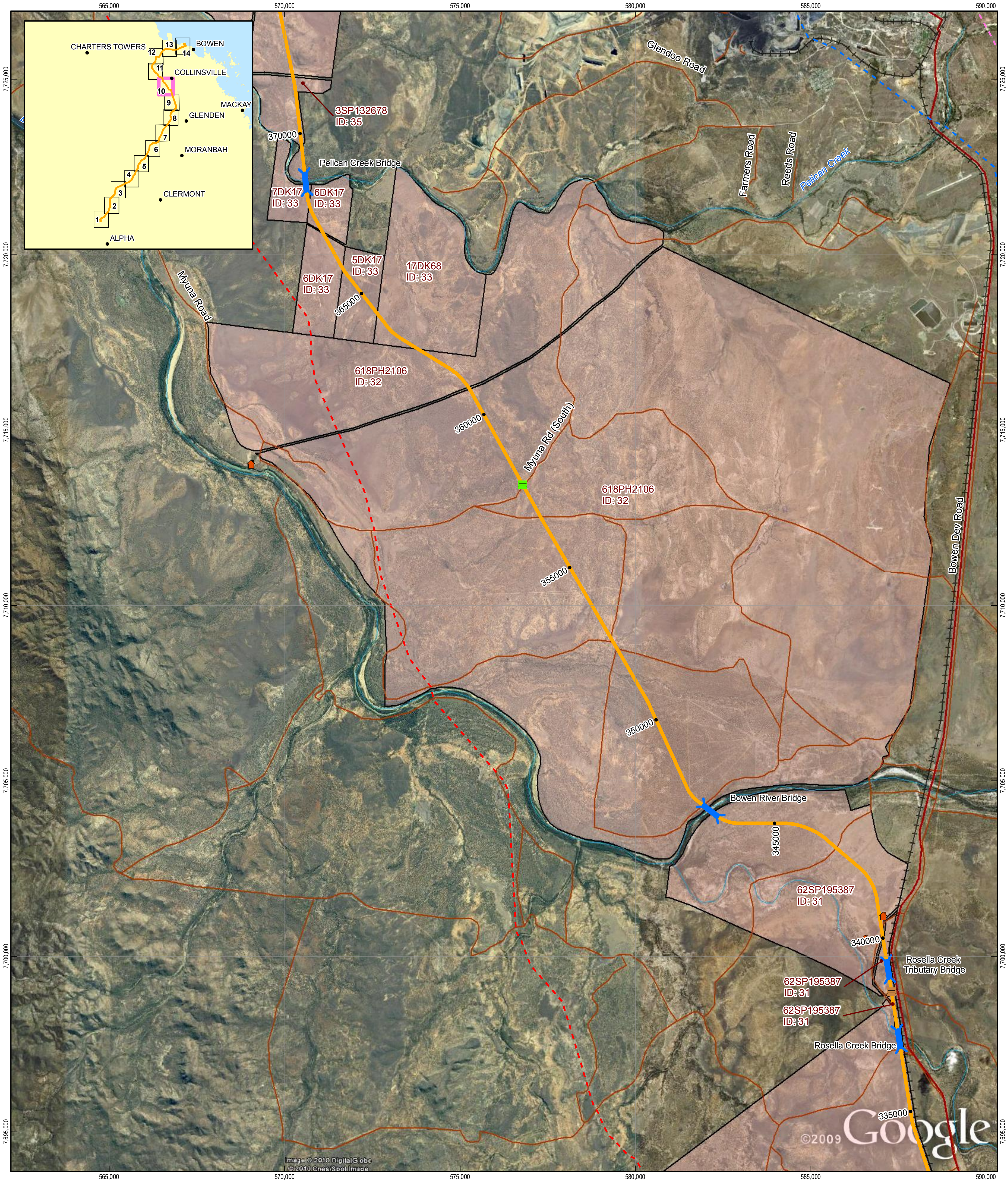

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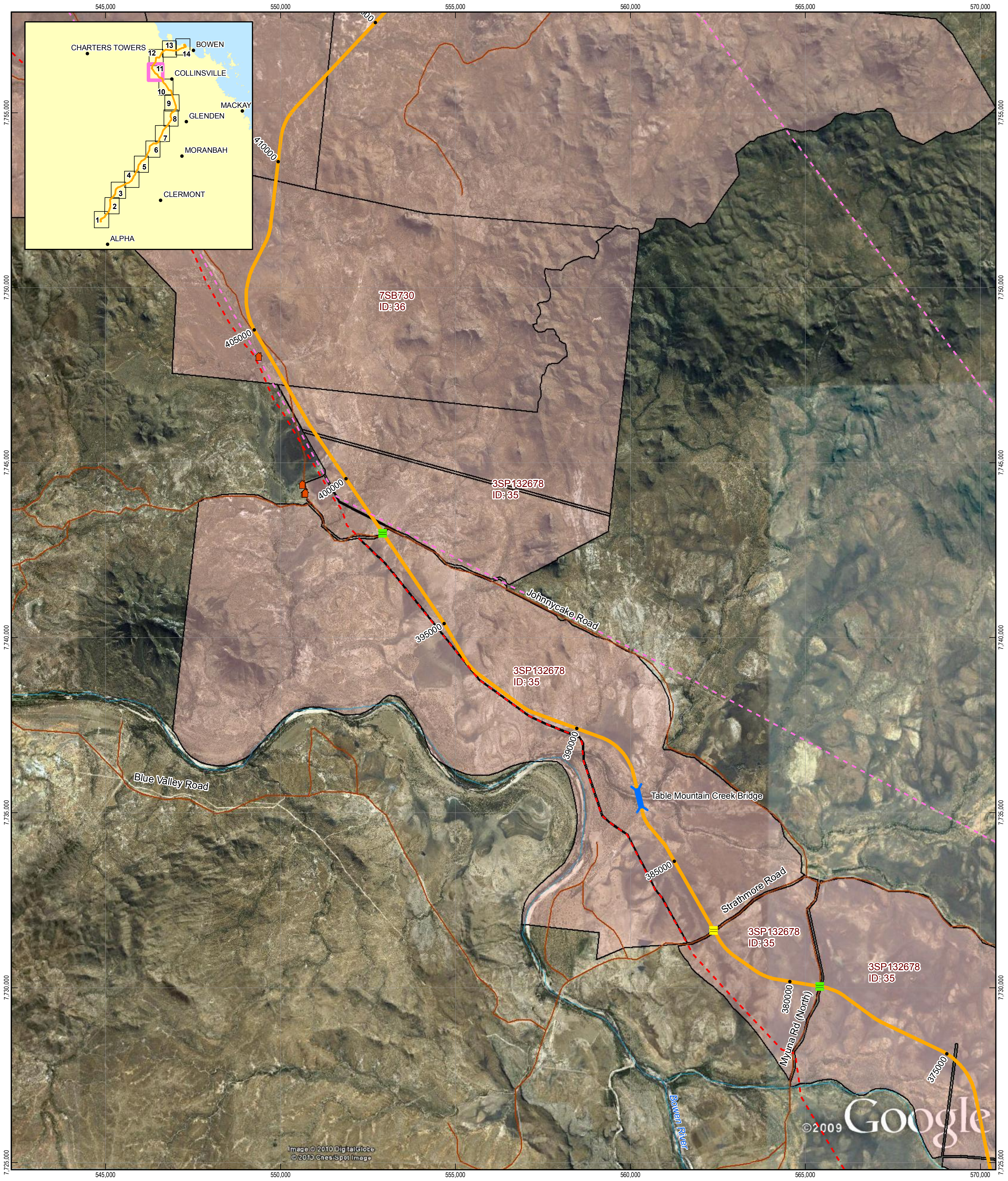

LEGEND

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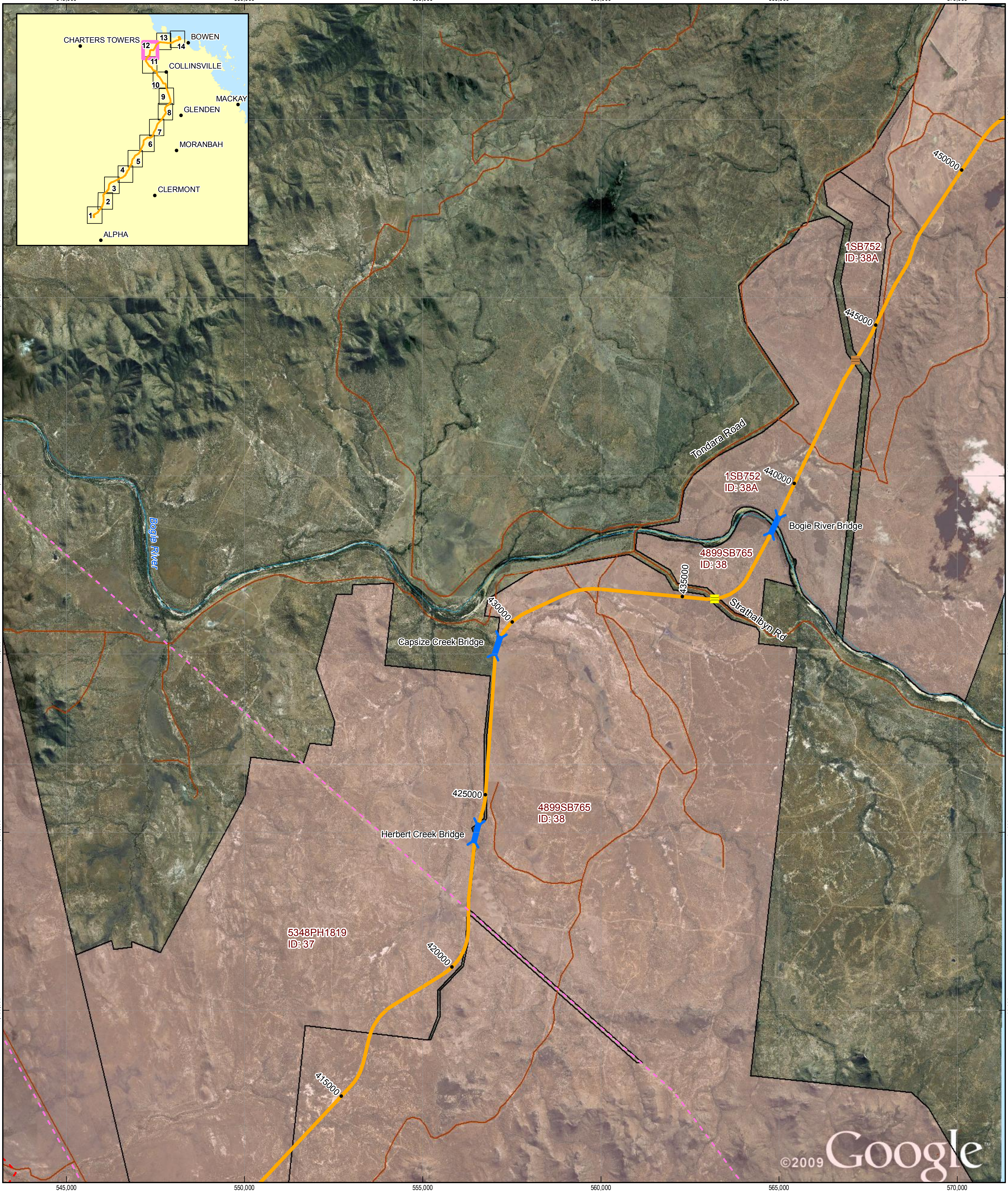

LEGEND

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Kilometres

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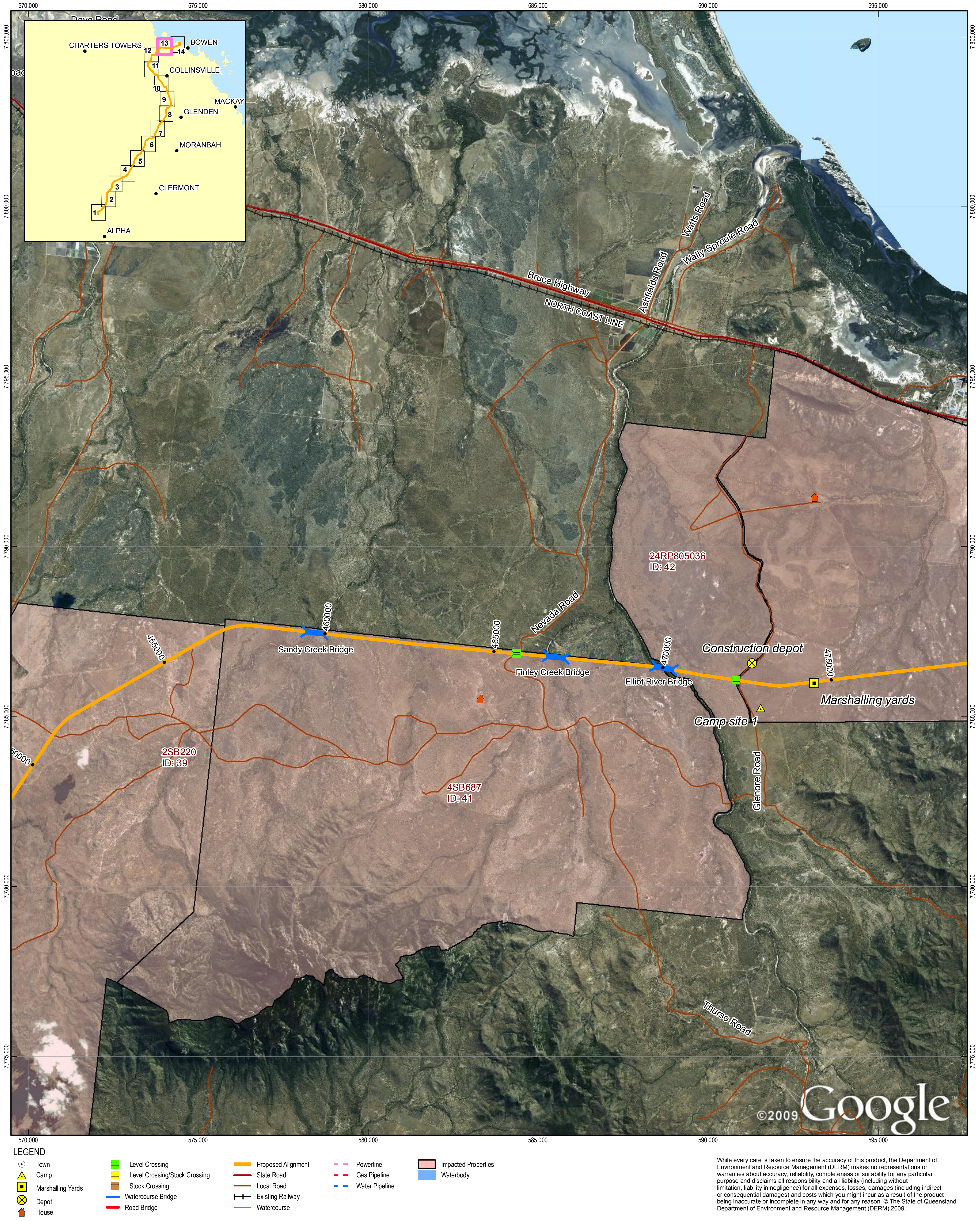

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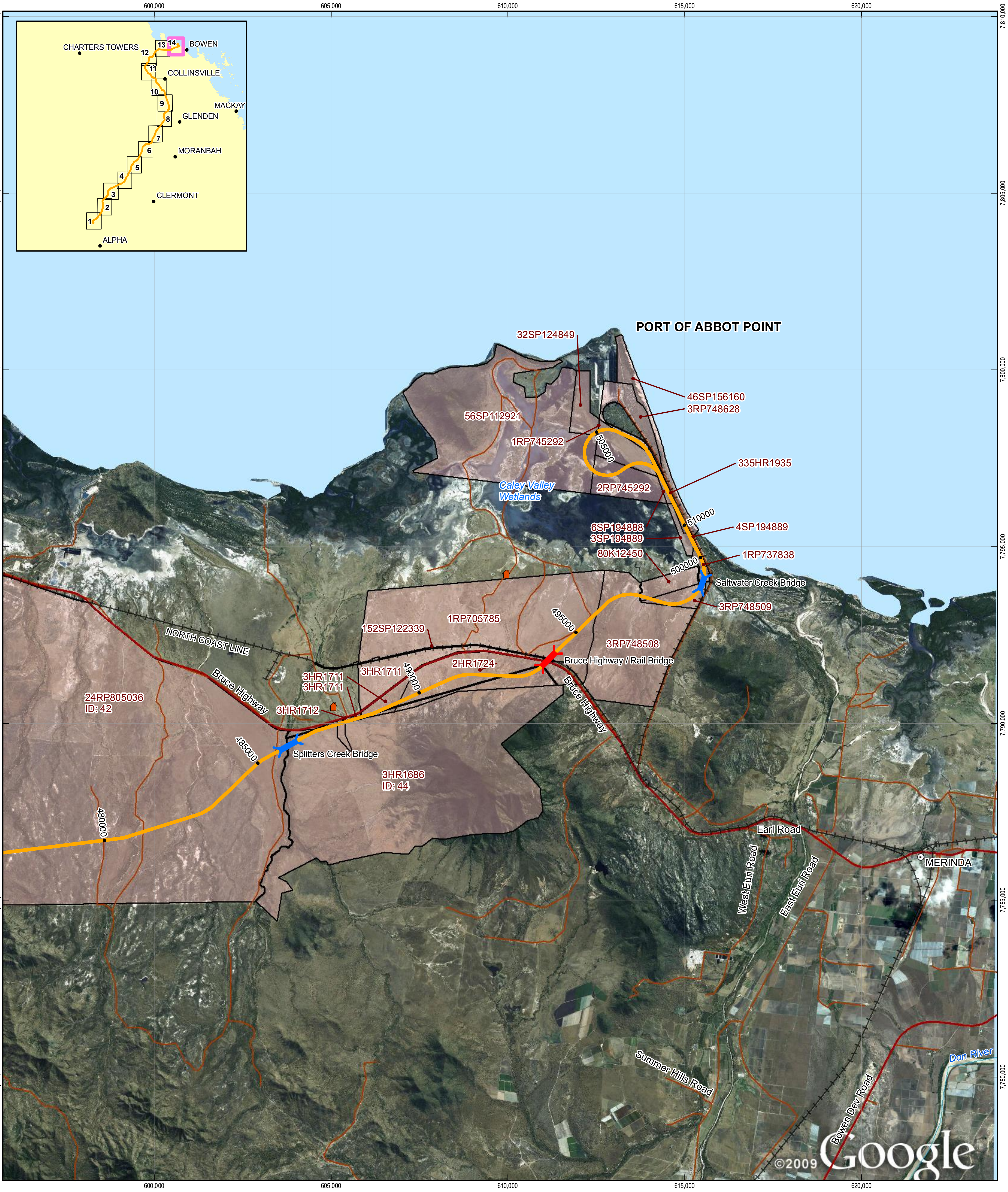

LEGEND

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2.2.1 Key Project Inter-relationships

In order to demonstrate the role of the Project within the Central Queensland region, it is essential to identify the relationship of the Project with other projects within the region. The Project corridor will be utilised for adjoining Kevin's Corner Mine Project and other Hancock Galilee Projects as further described below.

2.2.1.1 Port Infrastructure

The Project will utilise the proposed Multi Cargo Facility (MCF) terminal and the proposed X110 stockpiles. Figure 2-2 depicts the footprint of the proposed MCF and X110 projects in relation to the Project.

Abbot Point Coal Terminal X110 Expansion Project (EPBC 2008/4468. 2008/4438)

The North Queensland Bulk Ports Corporation Limited (NQBP) is currently seeking approval for development of the Abbot Point Coal Terminal X110 Expansion, incorporating two components: the Infrastructure Development Project and the Capital Dredging Project. The X110 Expansion comprises of the development of coal terminal infrastructure adjacent to the existing Abbot Point Coal Terminal and the development of two off-shore wharfs and associated dredging.

The X110 development area for the on-shore infrastructure is adjacent to the existing stockpiles and to the south east of the proposed MCF reclamation and east of the proposed transport road. The proposed MCF reclamation area is located to enable independent development of the X110 berths and jetty or alternatively to enable a jetty to link to the proposed coal berths on the northern arm of the MCF.

This project is currently under assessment by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC).

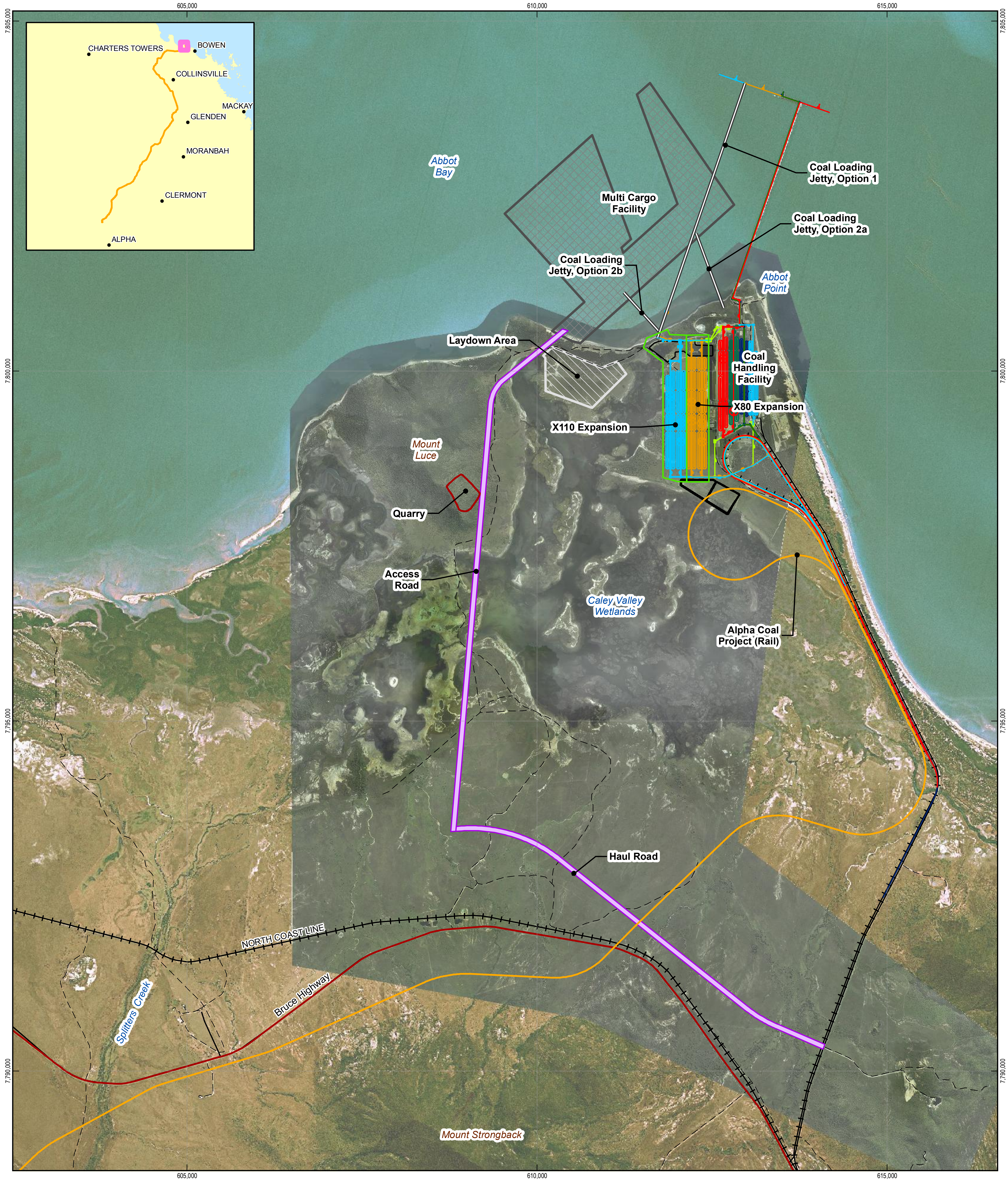
The project was also declared a significant project not requiring an EIS under the *State Development and Public Works Organisation Act 1974* (SDPWOA). The project requires a number of approvals under the Queensland State legislation and these will be sought during the final quarter of 2010.

The X110 stockpiles will be utilised for the purposes of this Project. HPPL has been awarded preferred developer status by NQBP for development of the X110.

Abbot Point Multi Cargo Facility (MCF) (EPBC 2009/4837)

The NQBP is proposing to construct a new multi trade port facility at Abbot Point involving construction of a dredged basin and channel access and associated reclamation to create a breakwater-protected harbour capable of handling up to 220,000 DWT (Cape Size) vessels, adjacent to the existing Abbot Point Coal Terminal (APCT) berths.

The project was declared to be a controlled action requiring an EIS under the *Environmental Protection Biodiversity and Conservation Act 1999* (EPBCA). The EIS has been completed and is currently available for public comment. The Alpha Coal Project (Rail) will utilise the berths located on the MCF for export of coal.



LEGEND

- Proposed Alignment
- State Road
- Road
- Track
- Railway
- Coal Loading Jetty
- MCF Area
- Laydown Area
- ExpansionAreas X80 & X110
- Quarry
- Proposed Road Corridor

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Kilometers

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
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ABBOT POINT PROJECTS

Job Number | 41-22090
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Figure: 2-2

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2.2.1.2 Hancock Coal Projects

Key Hancock Coal projects that are relevant to the Alpha Coal Project (Rail) are:

Kevin's Corner Coal Mine (EPBC 2009/5033)

Hancock Galilee Pty Ltd (HGPL), a wholly owned subsidiary of HPPL is proposing to establish a 30 Mtpa coal mine in the Galilee Basin. The project is the second for HPPL, with the Alpha Coal Project on adjoining land. The proposed mine, with open-cut and underground operations, is expected to have a mine life in excess of 30 years. In addition to the mine, the project involves construction of a rail spurt to connect the mine to the proposed Alpha Coal Project (Rail) to transport processed coal to a new or expanded port export terminal.

The Kevin's Corner project proposes to utilise the Alpha Coal Project (Rail), the multi-user rail, Port of Abbot Point facilities and the aerodrome. The rail and port will be designed to cater for more than the combined production level of both the Kevin's Corner and Alpha Coal Projects.

Environmental studies for the project are currently being undertaken.

2.2.1.3 Other Galilee Projects

Other Galilee projects related to the Project are described below and depicted in Figure 2-3.

Galilee (Waratah) Coal Project (EPBC 2009/4737)

Waratah Coal Pty Ltd (Waratah) proposed to establish a new coal mine in the Galilee Basin, Central Queensland to supply thermal coal to overseas customers.

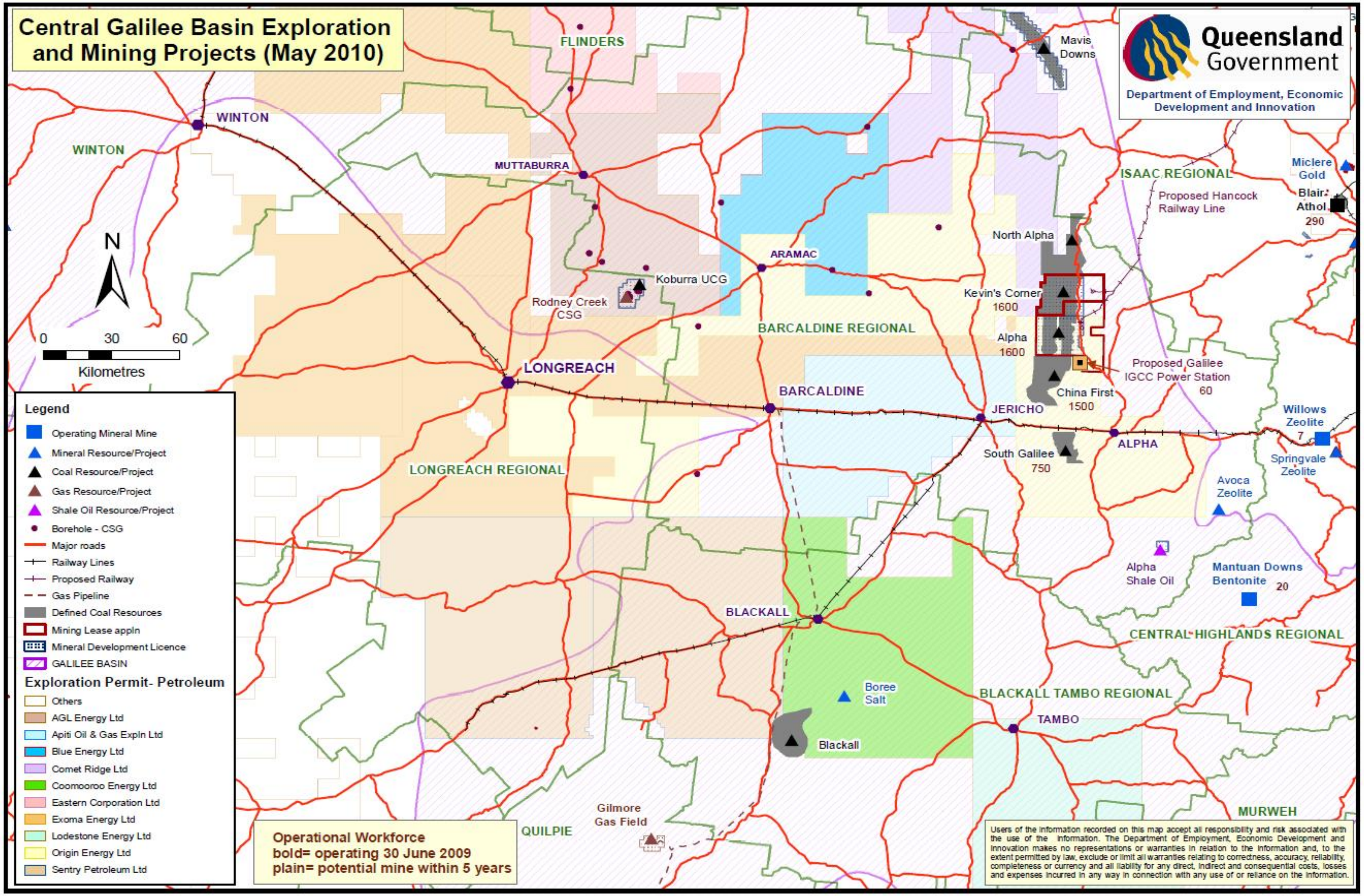
The project would involve:

- coal mine near Alpha incorporating open cut and underground techniques;
- construction of a new/upgraded railway, approximately 500 km long, to transport processed coal from the mine for export through the Port of Abbot Point;
- coal stockyards and associated transfer infrastructure within the APSDA, to link with the port through a proposed APSDA multi-user infrastructure corridor; and
- major new water and power supply infrastructure.

The project was declared to be a significant project requiring an EIS under the SDPWOA and also a controlled action under the EPBCA.

The coal will be sourced from Waratah's mining tenements near Alpha in the Galilee Basin, Central Queensland and taken by rail to the APSDA where stockyards will be established that tie in with a proposed multi-user infrastructure corridor. This corridor will link industrial areas with the APSDA and the Port of Abbot Point. The coal would then be exported through the proposed MCF, or a new jetty, berth, and conveyor of a design similar to that currently in use at Abbot Point.

Figure 2-3: Central Galilee Basin Exploration and Mining Projects (Queensland Government, 2010)



2.2.1.4 Other Infrastructure Projects

Other infrastructure projects relevant to the Project are:

Water for Bowen Project (EPBC 2006/2527)

The Water for Bowen Project is a proposed water transport system that will provide up to 60,000 mega liters of water per annum (ML/annum) from water allocations sourced from the Burdekin Falls Dam. The water will be transported from the Clair Weir on the Burdekin River as far south as Bowen. The Water for Bowen project is located near the townships of Bowen (within the Whitsunday Regional Council) and Home Hill and Ayr (within the Burdekin Shire Council).

The Water for Bowen project is strategically supported by the national Water Reform Framework and National Water Initiate and Queensland's Northern Economic Triangle Infrastructure Plan 2007-2012, Statewide Water Policy, the Program of Works, Statewide Water Grid, Regional Water Infrastructure Projects and the Coal Infrastructure Program of Actions.

The project supports the proposed expansion of the Port of Abbot Point and the establishment of the APSDA. These projects are driven by the need to provide the infrastructure to support the export of thermal and coking coal from the northern Bowen Basin and the future development of industrial uses in the APSDA. It is anticipated that over half of the water transported will be supplied to industrial and urban users in the Bowen and Abbot Point area while the remainder will go to agriculture. Public notification of the EIS for the project closed on 14th December 2009.

Water from this project will be utilised for construction and operation of the Project.

2.2.2 Cost and Timing of the Project

The expected capital expenditure for the Project is $2.5 billion. The key timeframes for the Project construction are indicated in Table 2-1. These timeframes are indicative only and the construction timeframes largely depend on receipt of required EIS and other statutory approvals.

Table 2-1: Project timeframes

Stage	Year
Completion and approval of the EIS	Mid to Late 2010
Environmental and government approvals	Early to Mid 2011
Commence construction of railway line	3rd Quarter 2011 to 2nd Quarter 2014
First shipments of coal	2nd Quarter 2014

2.2.3 Employment

The Project is expected to employ approximately 225 people during the operational phase, mostly in operations and maintenance roles. Most of these roles will be based at or near Bowen in the Whitsunday Shire and it is expected that there will be significant support business associated with the running of the Project which will be sourced from this region.

There is limited information available on the skills or demographic status of the proposed construction workforce. This information will become more detailed during tendering stage and when the construction contractors have been commissioned. It is acknowledged that there is a small resource pool and limited skills base within communities surrounding the Project area as a result of the mining industry. It is the responsibility of the construction contractors to ensure that suitably skilled personnel are employed for the Project. The peak construction workforce for the Project is estimated to be approximately 2,680 personnel with an operational workforce of approximately 225. Further details in relation to workforce are provided in Volume 3, Sections 20 and 22 of this EIS.

Once the Project is constructed, it is anticipated that it will open up the Galilee basin coal province and significantly increase the coal export within the next 30 years. As a result, this will enable further expansion of the Project and require further workforce from the region. Regional towns such as Alpha, Barcaldine, Emerald and Claremont and surrounding communities will directly benefit from the increased employment opportunities, and the establishment of vital support service industries and training development.

2.3 Project Location

2.3.1 Regional Context

From a regional perspective, the majority of the Project lies within the Whitsunday Hinterland and Mackay (WHAM) region, with a small area lying within the Central West Region at the Alpha Township.

The Project corridor traverses the following regional councils (refer to Figure 2-1):

- Barcaldine Regional Council from chainage 0 to chainage 45 km;
- Isaac Regional Council from chainage 45 km to chainage 282 km; and
- Whitsunday Regional Council from chainage 282.5 km to chainage 490 km.

The northern section of the Project area, beginning from chainage 490 km to the end of the Project corridor lies within the APSDA.

2.3.2 Local Context

As depicted in Figure 2-1, the Project stretches between the Alpha Coal Mine, 38 km northwest of the Alpha Township and the Abbot Point Coal Export Terminal, 25 km north of Bowen. The Project corridor proceeds in a generally north-easterly direction from the Alpha Coal Mine, crossing the Belyando River and several of its tributaries in the first 100 km. The Project corridor crosses relatively flat lowlands before commencing a gentle climb from near Eaglefield (around 272 km from the mine) adjacent to the Suttor River, to a point near the existing Newlands mine (around 280 km from the mine). This is the highest point on the Project corridor at approximately 300 m above sea level. In the vicinity of the Newlands mine, the Project corridor runs parallel to the Queensland Rail (QR) Northern Missing Link (NML) railway for approximately 70 km through a pass in the Leichhardt Range and parallel to the Newlands Railway to a point near the Bowen River. The Project corridor then travels in a north westerly direction on crossing the Bowen River at approximately 344 km from the mine, then passes down the Bowen River valley through mostly grazing land toward Mt Herbert. The Project corridor passes to the west of Mt Herbert through a pass in the Clarke Range. From this point, the Project corridor travels north-easterly crossing the Bogie River at about 436 km from the mine, then finally in an easterly direction entering the Abbot Point area on its western boundary at 495 km from the Alpha Coal Mine.

The Project corridor passes approximately 70 km to the northeast of the town of Clermont, 55 km to the northeast of the town of Moranbah, 35 km to the east of Mt Coolon, 20 km to the west of Collinsville, and enters the APSDA 25 km west of Bowen.

2.3.3 Project Footprint

A 60 m wide corridor will be required for the track, drainage, access roads and other infrastructure to support the construction and operation of the Project. In some areas, the Project corridor may be wider so as to allow for deep cuttings and to meet engineering requirements. For the purposes of technical assessments such as geology, terrestrial and aquatic ecology and air and noise impact assessments a buffer of 500 m was used.

The Project alignment will cross approximately 37 landholdings that are held in predominantly lease hold ownership. Most freehold properties are located within the surrounds of the Port of Abbot Point area. For information related to direct property impacts refer to Volume 3, Section 6.3.2 of this EIS.

The results of the geotechnical study indicated that the Project alignment traverses mainly sandy, silty and gravely surficial soils between the Alpha Coal Mine (chainage 0) to chainage 335 km. Minor volcanics, sandstone and other sedimentary rocks are also encountered. The basalt outcrops along the Project alignment are potential sources for rail ballast, while the gravels and sandstone should be suitable as general embankment fill. Between chainage 335 km and 495 km the predominant rocks consist of granite, diorite, sandstones, siltstones and basalt. These materials may be suitable as sources of rail ballast and general fill.

In order to construct the Project, clearing of vegetation will be undertaken. Detail regarding the area of clearing and type of vegetation is included in Volume 3, Section 9.3.1.1 of this EIS.

The location of the following Project components related to the Project footprint is not available at this stage and will be available at the detail design stage of the Project:

- borrow pits;
- stockpiles;
- contractors' project administration and facilities;
- plant locations;
- water storage;
- hardstands;
- car parks; and
- site access points.

2.3.4 Selection of Preferred Rail Alignment

2.3.4.1 Overview

In order to identify the most suitable railway alignment, assessment of key economic, engineering, geographic, geotechnical, environmental and social factors has been undertaken (refer to Figure 2-4).

Key pre-feasibility studies, value engineering and detailed bridging studies that covered the following factors studies included:

- the refinement/improvement of possible routes and the testing of other potential options. This was done by undertaking horizontal and vertical alignments using 12D modelling and 1:250,000 scale digital mapping. In addition Quantum's super computer was used to undertake the initial evaluation of the rail alignment, with over 200 potential alignments assessed;
- environmental, land tenure and cultural heritage issues affecting route design and selection;
- technology and recommendations for signalling and communications issues;
- civil engineering works;
- structural engineering, including bridging and culverts;
- interactions with roads and access points;
- rail maintenance and provisioning facilities;
- rolling stock selection for the preferred alignment;
- temporary construction activities;
- a geotechnical desktop study and investigation of local construction materials;
- a desktop study of available hydrology data for water supply and flooding issues; and
- power supply and utilities options.

The key objectives of the Project alignment assessment were to:

- determine the lowest cost, lowest risk option to deliver the specified coal transport task;
- ensure operational scenarios and the potential alignment are viable and sustainable; and
- ensure the selected route is feasible from engineering, environmental and social perspectives.

Due to the scale of the Project and complexity of aforementioned factors approximately 200 various railway alignment options were analysed. These options were further refined into sub-options. The selection of the alignment was also dependent on the most suitable port location. The two port locations that were considered the most feasible for the Alpha Coal Project with the capacity to service the handling of 60 Mtpa of coal for export were the Port of Abbot Point and the proposed Dudgeon Point expansion of the Port of Hay Point.

2.3.4.2 Port Options

2.3.4.2.1 Port of Abbot Point

The Port of Abbot Point is currently a dedicated coal export port with infrastructure designed to cater for this single purpose. However, with significant demand for additional coal exports through the port, the NQBP has proposed to construct a new multi trade port facility at Abbot Point. This will involve construction of a dredged basin and channel access and associated reclamation so as to create a breakwater-protected harbour capable of handling up to 220,000 DWT vessels, adjacent to the existing Abbot Point Coal Terminal (APCT) berths. As such the port will be able to accommodate for export of 60 Mtpa of coal from the Alpha Coal Mine and Kevin's Corner mine.

2.3.4.2.2 Dudgeon Point Port

Dudgeon Point is located approximately five km north-west of Hay Point. The port site offers similar conditions to those pertaining to the adjacent Dalrymple Bay and Hay Point Coal Terminals. Access to Dudgeon Point would be facilitated through a designated road and rail access established for the Project. Dredging is required for the berth, swing basin and approach area and departure channel via the Dalrymple Bay Coal Terminal (DBCT) area. A new rail access would be required down the Sarina Range to Dudgeon Point.

Land surrounding Dudgeon Point is predominantly held in freehold or lease by the NQBP. Approximately, 1,300 ha is under NQBP control of which 600 ha is considered 'developable'. NQBP continues to acquire properties when opportune in order to establish port access and buffer zones in the long term development interests of Dudgeon Point.

On the basis of these two port locations, preferred railway alignment was analysed. Table 2-2 identifies the two main options, namely Option 1 (Alpha Coal Mine to Port of Abbot Point) and Option 2 (Alpha Coal Mine to Dudgeon Point) and several other sub-options that were considered during the Option Selection Study in 2008. The sub-options allowed for finer refinement of the preferred alignment.

2.3.4.2.3 Preferred Port Location

The Port of Abbot Point was selected as the preferred port location based on a comparative assessment of the strengths and weaknesses of each option. Comparably the Dudgeon Point represented a less preferred option based on the following:

- development of a standard gauge rail corridor to link to the proposed stockyard areas included a significantly higher number of issues to resolve:
  - greater number of landholders would be affected by the corridor;
  - the corridor would be adjacent to existing QR infrastructure; and
  - grade separated access would be required for a number of spurs.
- another alignment was required down the range given that it was not expected to be possible to add additional tracks to the current Sarina Range alignment;
- the likely alignment indicated from the pre-feasibility study traversed the communities from Eton to Timberland with many landholders affected including sugar producing properties;
- the alignment arriving at the Dudgeon Point Terminal would pose issues for the Timberland community;
- at the Port there is plenty of available land for a Terminal. It is likely that water and power would be available;
- offshore berths would be required and associated issues relating to disposal of dredge material;
- once the offshore berths were constructed, their performance being similar to existing berths at the Port of Hay Point, would be inferior to Abbot Point due to higher tidal range, and exposure to the south easterly wind and swell; and
- the stockyard is much closer to communities leading to dust management issues.

HPPL has been identified by NQBP as the preferred developer for the X110 Expansion.

2.3.5 Refinement of the Alignment

Following determination of the Port of Abbot Point being the preferred port option, the alignment was further refined on the basis of the following:

- consultation with affected landowners and identification of key social impacts such as dust and noise impacts, direct physical and economic property impacts;
- location of other resources areas; and
- location of significant vegetation, national parks and State Forests.

Currently the preferred alignment avoids all Reserves, National Parks and State Forests and minimises the potential for sterilisation of other resource areas.

Figure 2-4: Determining factors for the preferred railway alignment

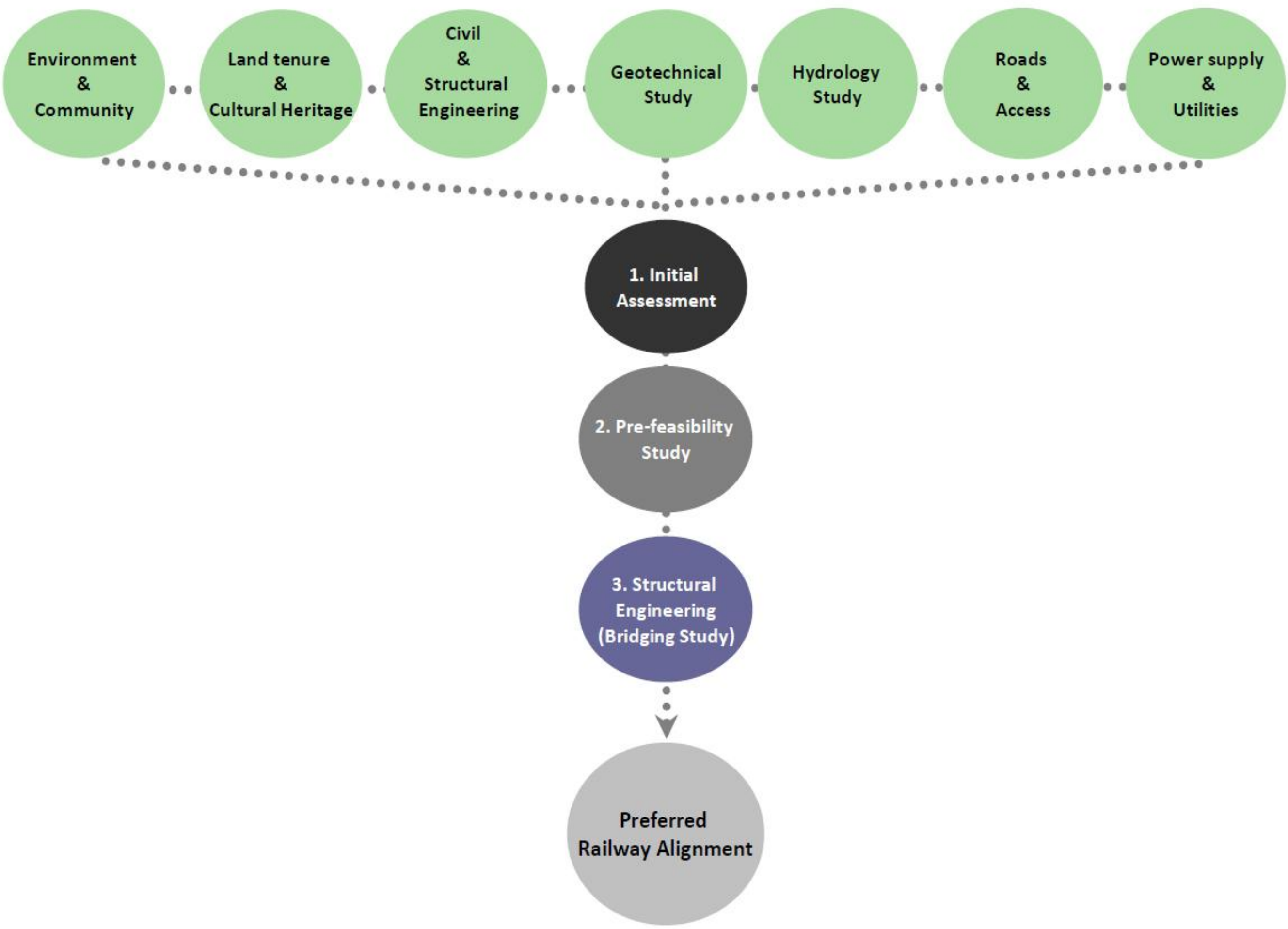
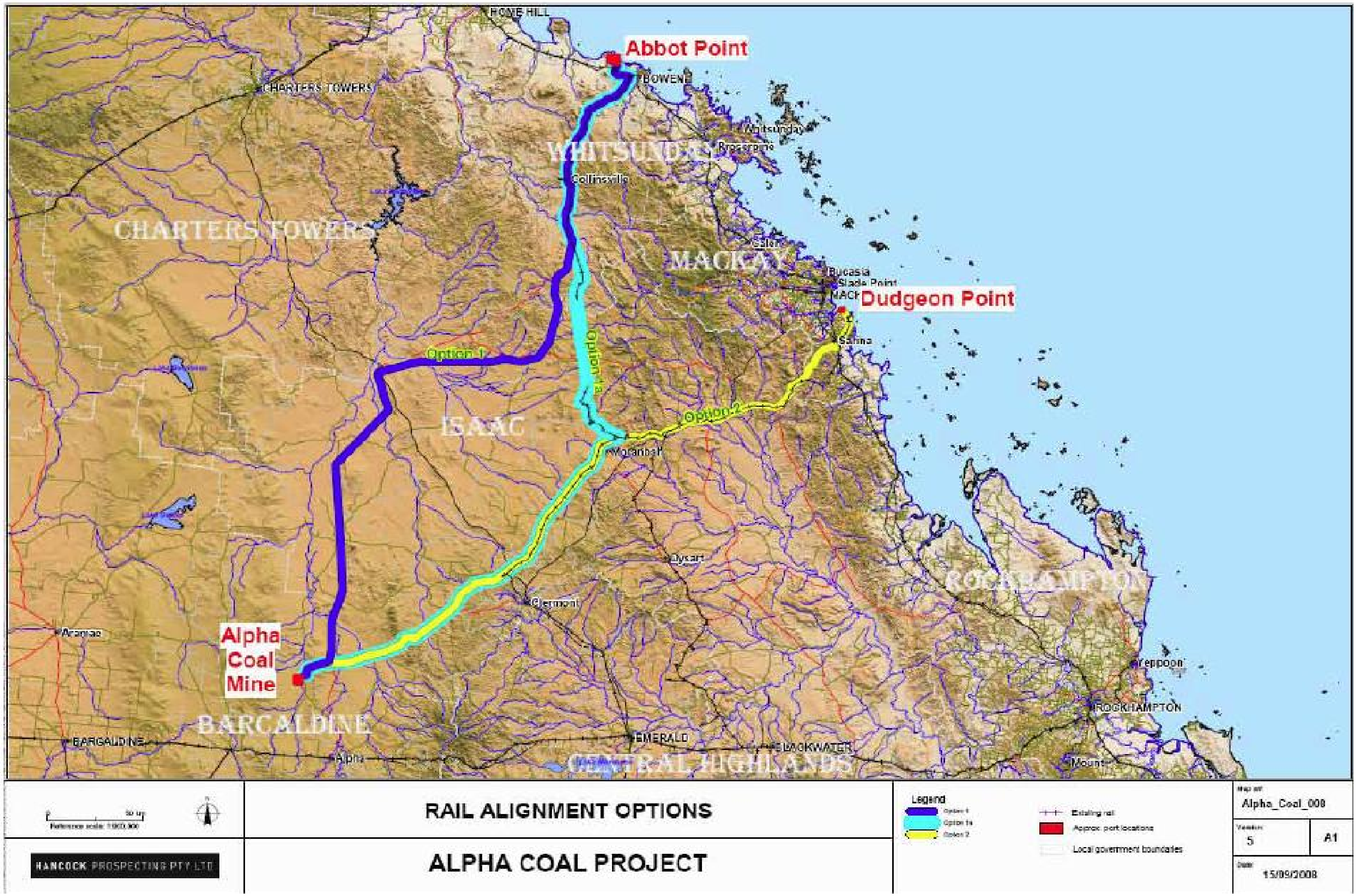


Table 2-2: Key railway alignment options and sub-options

Option	Preferred Port	Description of alignment
1. Initial Assessment of Railway Alignment		
1	Port of Abbot Point	This option included 484 km of new track extending from the mine in a north north-easterly direction before utilising the existing Newlands to Abbot Point Rail Corridor. The track would continue through the existing QR rail corridor to the Port of Abbot Point.
1A		This option included 100 km of new rail to connect to the QR rail line at Blair Athol. This option traverses existing QR lines, including the Northern Missing Link, to join the existing Newlands line to Port of Abbot Point. Total distance from mine to port would be 525 km.
2	Dudgeon Point Port	This option included 401 km of new track extending from the mine in a north-easterly direction before utilising the existing rail corridor from Blair Athol to the Connors Range. A new rail spur will link the line near the Connors Range to the proposed coal terminal at Dudgeon Point.
2A		This option included 100 km of new rail to connect to the QR line at Blair Athol. This option would utilise an expanded QR infrastructure and rail corridor to the coast, with a new spur line to the proposed coal terminal at Dudgeon Point. Total distance would be approximately 401 km.
2. Pre-Feasibility Stage		
1C	Port of Abbot Point	This option included 457 km of Greenfield standard gauge rail extending from the mine in a north north-easterly direction to Eaglefield and Newlands. It then runs adjacent to the Newlands line to join the Abbot Point rail corridor. The final approach to the port and rail loop would be on a greenfield track.
1D		This option included 162 km of new rail to connect to the QR line at Blair Athol. This option traverses the existing QR lines using narrow gauge rail, to Wotonga, via the Northern Missing Link to Newlands, to join the existing rail line at the Port of Abbot Point. The final approach to the port and rail loop would be on a greenfield track. The total distance from mine to port is 510 km.
1E		This rail corridor is a greenfield standard/dual/narrow rail line to port via Blair Athol. A new line then runs adjacent to the existing QR rail line located south of Wotonga, to Newlands. The final approach to the port and rail loops is on a greenfield track. The total distance to port is 488 km.
2B	Dudgeon Point Port	This rail corridor includes 164 km of new track extending from the mine in a north north-easterly direction and then a new line adjacent to the QR line from Blair Athol to Connors Range. A Greenfield alignment will be followed through the Connors Range, through to the proposed coal terminal at Dudgeon Point. The total distance from mine to port is 401 km.

Option	Preferred Port	Description of alignment
2H		This rail corridor includes 162 km of new track extending from the mine in a north-north-easterly direction, north of Blair Athol State Forest and then a new QR adjacent line from Blair Athol to the Connors Range. A new spur line will head north northwest near the Connors Range to the proposed coal terminal at Dudgeon Point. The total distance from mine to port is 427 km.
2J		This rail corridor includes 162 km of new track extending from the mine in a north-north easterly direction, north of the Blair Athol State Forest before utilising the existing rail corridor from Blair Athol to the Connors Range. A new rail spur line will head north northwest near the Connors Range to the proposed coal terminal at Dudgeon Point. The total distance from mine to port is 427 km.
3. Bridging Study		
1C	Port of Abbot Point	This option has been identified as the preferred rail alignment option on the basis of the Initial Assessment Study, Pre-Feasibility and the Bridging Study. Includes 495 km of Greenfield standard gauge rail extending from the mine in a north north-easterly direction to Eaglefield and Newlands. It then runs adjacent to the Newlands line to join the Abbot Point rail corridor. The final approach to the port and rail loops is on a Greenfield track.
4. Final Project Alignment		
	Port of Abbot Point	Following the aforementioned studies, the alignment was re-adjusted on the basis of consultation with affected landowners and identification of key social impacts such as dust and noise impacts, direct physical and economic property impacts, location of significant vegetation, National Parks and State Forests and key resource areas (refer to Section 2.3.2 above and Figure 2-1 for Project alignment).

Figure 2-5: Two main options (Alpha Coal Mine to Port of Abbot Point and Alpha Coal Mine to Dudgeon Point)



2.4 Construction of the Project

2.4.1 Overview

The following section provides general information regarding construction methodology and associated activities.

At the time of producing this EIS, the project was in the preliminary design phase. As such detailed information on the following aspects of the Project was not available:

- up-grade, relocation, realignment or deviation of roads and other infrastructure;
- disposal/reuse of surplus excavated material and if this material can be coordinated with concurrent construction activities in the vicinity; and
- project schedule identifying the staging of the project and development sequencing.

This information will be available during the detail design stage of the Project.

2.4.2 Pre-construction Activities

The following activities are proposed to be undertaken prior to construction of the proposed railway line:

- geotechnical investigations to assess expected physical and chemical properties and quantities of soil and rock to be excavated;
- meetings with landowners, community and stakeholder groups;
- notification of project and construction timeframes;
- identification of areas of significance from wildlife, environmental and heritage viewpoints;
- acquisition of immediately affected land;
- clearing of vegetation (refer to Volume 3, Section 9.3.1.1 of this EIS);
- fencing of proposed corridor so as to prevent cattle from accessing the work area;
- establishment of site so as to provide site access, power, telecommunications, water supply and workers camps; and
- access roads are to be identified and designated throughout the corridor footprint.

2.4.3 Construction Methodology

Consideration has been given to the construction methodology to enable pricing and schedule issues to be addressed together with adequate risk management considerations. More detailed investigations are planned to be undertaken mid to late 2010 to suit the delivery schedule of the proposed works with due regard to pre-conduct advanced works.

The following construction activities are likely to be undertaken on the project:

Civil works including:

- earthworks construction;

- drainage construction;
- road work construction; and
- bridge work construction.

Rail construction including:

- track laying;
- signalling installation; and
- communications installation.

A maintenance access track has also been allowed for to run parallel adjacent to the Project corridor. The final design, location and standard of the maintenance access track will be determined as part of the detail design.

A rail corridor width of 60 m has been nominated, which is considered sufficient to accommodate majority of the permanent infrastructure. At the detail design stage and following land owner consultation, the precise rail corridor will be defined.

Construction material such as borrow material, capping material, ballast and construction water may have to be sourced from outside the 60 m rail corridor. This will be determined from the ground breaking investigations for geology and hydrogeology which is planned to be undertaken as part of the detail design.

2.4.4 Construction Staging Options

The objective of the Project is to deliver rail infrastructure to enable the delivery of 60 Mtpa of coal from the Alpha Coal and Kevin's Corner mines to the Port of Abbot Point. This will be enabled using standard gauge trains of approximately four km length delivering 24,000 t per train to the port at an axle load of 32 t (refer to Table 2-3).

In order to achieve this objective and to help manage the risk exposure while ensuring that the capacity of the system "matches" the demand it is proposed to increase the production across several years. The increase in production is summarised in Table 2-3.

Table 2-3: Increase in production of coal export and required infrastructure

	2014	2015	2016	2017
Throughput required	6,000	15,000	24,727	30,000
Train sets	1	3	4	5
Passing loops	2	4	5	5

2.4.5 Access Roads

No new access roads or tracks are envisaged to be required during the construction of the Project. Existing access at Bruce Highway, Bowen Development Road, Suttor Developmental Road, the new Cerito Elphinstone Road, the Gregory Developmental Road, and the Clermont Alpha Road will serve as the major access roads. Initially, however, some additional access paths may need to be negotiated with landowners to obtain access into sites if the construction contractor requires them. Where private farm roads are to be used, these will be negotiated with the landowner and be restricted to the main property road and major secondary roads.

2.4.6 Equipment, Materials and Logistics

The following construction equipment is likely to be required for the project works:

- civil works: dozers, graders, excavators, scrapers, dump trucks, rollers, backhoes, water carts, cranes and piling rigs; and
- track works: track layer, ballast wagons, rail welding machine, tamper, water carts, excavators and backhoes.

It should be noted that these are estimates only and the actual type and number of vehicles is to be determined by the construction contractors.

The bulk earthworks will be undertaken using scrapers for the short hauls and with excavators and dump trucks used for long distance earthmoving. It is intended that the majority of the general fill will be obtained from the cutting excavations. The design of the alignment has been done so as to maximise the balance between cut and fill, and minimise haul distances. The design will be optimised during detail design to account for likely quantities of unsuitable material obtained from detailed geotechnical investigations, and the requirement for selected, quality fill material.

Track laying is likely to be undertaken using an automated, integrated machine that lays sleepers at correct spacing and brings in the rail in one continuous pass. It is envisaged track laying will commence from the port end and head towards the mine in one construction front. The civil works are required to be completed and handed over so that there is no delay to the track laying.

Table 2-4 provides an estimated volume of the major materials required for the Project. As the project is still within the preliminary design phase, detailed information is not available for the type of equipment, volume or source of construction material or storage locations. Investigations are currently being undertaken to determine potential sources of rock and gravel.

Construction equipment and materials to be sourced outside the project area will be transported via road to the project area.

Table 2-4: Type and quantity of materials to be used for construction

Major Materials to be used for construction	Estimated Quantities*
Formation Works Excavation – Common	6,627,300 m3
Formation Works Excavation – Rock	5,627,300 m3
Formation Works – Borrow material for General Fill	7,311,500 m3

Major Materials to be used for construction	Estimated Quantities*
Formation Works – General Fill (used from both excavation & borrow)	17,187,500 m3
Formation Works Top Capping Layer	815,500 m3
Bridge Length	8,360 m
Ballast	751,800 m3
Sleepers	840,100 No
Rail	1,090,400 m

* These quantities are indicative only based on preliminary design and are subject to variation pending completion of detailed engineering design.

2.4.7 Ballast Supply and Logistics

Currently the ballast supply for the Project has not been defined. It is intended that the ballast is sourced within close proximity to the rail corridor and the project area from existing or new quarry sites. Potential locations to source ballast will be indentified as part of geotechnical investigations planned for the detail design. An alternative option will be to source ballast from commercial quarries near by. All quarry materials will be sourced from licensed facilities.

Depending on the source, it is expected that ballast material will be transported to the Project area, then loaded onto ballast wagons for transport and distribution by rail. If a ballast quarry is in close proximity to the proposed rail alignment, a rail spur may be constructed to the quarry site and the ballast transported entirely via rail.

More detailed investigations are currently been undertaken on sources of the ballast in the vicinity of the Project area and to determine the preferred quarry(s) for the Project. This information will be available at a later date.

2.4.8 Water Supply and Storage

It has been estimated that approximately 11 x 10^9 litres of water will be required for construction activities of the Project. There is currently limited information available on the source of water for the construction activities. A hydrogeology investigation will be undertaken as part of the detail design to define water source locations. Water will be required for the following construction activities on the project:

- dust suppression;
- weed wash-down bays;
- earthworks material conditioning;
- capping material conditioning;
- access track and haul road maintenance;
- rehabilitation; and
- temporary construction camps.

A combination of water bores and existing water pipelines may be used to supply water for the construction activities. A hydrogeology desktop investigation is planed to be conducted to identify all potential water supply locations for the project. The results of this investigation will be available at a later date.

2.4.9 Storage

Water is to be stored on site within purpose built tanks/dams. Turkey nests can be constructed to store groundwater and any recycled or reclaimed water.

2.4.10 Stormwater Drainage

The Project corridor will intercept with a number of major and minor creeks and drainage lines, generally moving in an east to west direction. Majority of the drainage lines from an east to west direction. A preliminary assessment of the types of drainage structures required for the Project to provide a 1 in 50 year flood immunity to the top of rail formation for major drainage lines and a 1 in 20 year flood immunity to the top of rail formation for minor drainage lines has been completed as part of the preliminary design phase.

Different sizes and numbers of culverts (Corrugated steel pipe (CSP) and Precast concrete box culverts (RCBC)) will be used to accommodate majority of the drainage lines along the Project alignment. For select few major drainage lines identified, bridges will be constructed.

As the Project is still within the preliminary design phase, detailed information is not available on stormwater drainage systems for construction and operation phases. This information will be available at a later date.

2.4.11 Chemicals and Hazardous Goods

All hazardous items will be stored in accordance with required regulations, and having regard to the information provided in Volume 3, Section 24 of this EIS.

2.4.12 Workforce

There is limited information available on the skills or demographic status of the proposed construction workforce. This information will become more detailed during tendering stage and when the construction contractor has been commissioned. It is acknowledged that there are limited numbers of unskilled people within. It is the responsibility of the construction contractors to ensure that suitably skilled personnel are employed for the Project.

The peak construction workforce for the Project is estimated to be approximately 2,680 personnel with an operational workforce of approximately 225. Further details in relation to workforce are provided in Volume 3, Sections 20 and 22 of this EIS.

2.4.13 Workforce Accommodation

Construction activities will require the establishment of five workers camps. Given the length of the rail alignment the location of the construction camps has been strategically selected. Two existing and three temporary camps will be utilised. The existing camps are located at Merinda and the Alpha Township, while three temporary ones are within the middle section of the corridor (refer to Figure 2-1).

The camps have been equally spaced along the rail alignment to minimise travel for the construction personnel. The camps have also been positioned in the vicinity of an existing access or main road to aid in the transport of goods and services and staff to the camp and to minimise interaction of camp traffic with construction traffic.

2.4.14 Licensing Permits for Construction Works

All statutory approvals required for the construction and operation stages of the project will be obtained. For a list of necessary approvals refer to Volume 3, Section 1.11 of this EIS.

2.4.15 Construction Standards and Site Management

The construction of the proposed railway line will comply with relevant standards and in accordance with the EMP. Detail on site management is provided in the EMP (refer to Volume 3, Section 26 of this EIS).

Construction road access will be required to the Project corridor during construction. The design parameters for construction roads are shown in Table 2-5.

Table 2-5: Construction access parameters

Description	Design Parameters
Formation width	Camp/stockpile access – 8 m Other construction access – 6 m
Cross fall	5% two way
Embankment	Batter slope assumed to 1 in 2
Design speed	60 kph (no super elevation)
Pavement Nominally	300 mm
Surfacing	Unsealed

2.5 Project Operations

2.5.1 Overview

The project's rail operations plan will provide a rail safe working system that allows for capacity growth and technical innovation. These criteria would be developed during the detailed design phase, once the operational parameters of the alignment and infrastructure are further defined.

Based on the criteria, a plan would be developed to manage operations during the ramp up from the first year to the final tonnages over the first five years of operation. This staged approach will cater for other rail operators and regulatory involvement in the delivery of the operating railway.

The railway is designed to accommodate 60 Mtpa which is equivalent to the transport of product from the Alpha Coal mine and the proposed Kevin's Corner Coal mine.

Table 2-6 outlines the details of the track structure parameters that will be applied to the Project corridor.

Table 2-6: Track structure parameters

Description	Limits
Standard (1,435 mm) *Non electrified*	Design life – 50 years Axle loads 32 t Continuously welded Rail Sleeper – 32 tal Concrete Ballast profile – 200 mm under sleeper and 150 mm shoulder width Fastening type - resilient Formation width at top 6.0 m

Table 2-7 details the track alignment parameters that will be applied to the preferred alignment.

Table 2-7: Track alignment parameters

Description	Limits
Design speed	80 km/h (coal)
Maximum grade	1 in 320 (loaded) 1 in 100 (empty) 1 in 200 (passing loops - empty)
Minimum main line track horizontal radius	1,000 m

2.5.2 Rollingstock and Operations

Current design calls for 32 tonne axle loads for rollingstock, consistent with other heavy haul coal railways around the world. Western Australian iron ore systems have moved further through to 37.5 t axle loads, and to 40 t axle loads, noting that coal is lower density compared to iron ore (approximately 850 kg/m3 compared with iron ore at 2,300 kg/m3).

The ruling grade selected for the proposed railway line is based on current practice from Pilbara heavy haul railways. The 1 in 320 grade allows for 24,000 tonne payloads to be hauled by three locomotives with a total of 13,500 hp. When compared with other coal haulage over increased grades, generally being 10,000 t payload hauled by locomotives totalling 17,200 hp, this provides a significantly increased efficiency.

The empty grade of 1 in 100 is also significant for the loaded train travelling downhill where dynamic brake capability, as well as train brake capability, is extremely important. The sustained downgrade performance of the train is critical from both a safety of operation target, as well as for the ongoing operating costs due to brake wear and overall train energy flows.

The railway is being designed to ensure that a loaded train has priority of movement to balance the energy flows in the train, minimise braking and minimise fuel usage. The increased train size also ensures that there are a minimum number of crossing points between the empty and loaded trains. This is balanced by the time taken to load and unload the trains. HPPL has selected high loading and unloading rates to ensure the operational performance of the system. It is expected that the 24,000 tonne trains will be loaded and unloaded in no more than four hours.

The lower grade also provides for a smaller fleet of locomotives, reducing both capital and operating costs for the fleet. Operational and environmental efficiency is also enhanced by moving to significantly larger trains. For the transportation of 60 Mtpa of coal, seven trains per day will be required on average (14 train movements per day).

Utilisation of proven diesel locomotives similar to those in use in the Pilbara system and wagons in use elsewhere in Australia and overseas will further reduce above rail operational costs. Diesel consists have proven to be highly effective, with consideration of electric rollingstock not warranted. The locomotives purchased will represent the latest state of the art American freight locomotive design featuring fuel efficiency and low noise and exhaust emissions.

In order to limit the environmental impact of the project it is planned to utilise a coal rail wagon which is a development of the standard gauge wagon currently in use in the NSW Hunter Valley service. These wagons will have lip seals on the bottom dump doors to prevent coal loss through the doors, angled sills to prevent coal from remaining on the sills after loading and subsequently dislodging en-route, and a high body design which shrouds the coal payload resulting in reduced dust emissions.

Plate 2-1: Example of GE Locomotive

2.5.3 Train Signalling

The Project's signalling and communications systems will be designed during the detailed design phase of the Project once the operational parameters of the alignment and infrastructure are further defined.

Due to the staged production build up and rail usage, a phased approach will be taken for the safe-working system:

Stage 1: Train Order

For the initial operation, a simplified safe-working system such as a train order working and some low-level signalling for loops would be provided as the formal operational procedure. This system is a low Project risk since it uses off-the-shelf technologies proven elsewhere in similar roles. It would also reduce initial capital expenditure.

This system would have power-operated points, locally controlled for crossing loops, mine and port balloon loops, and with movement authority controlled using a train order system. The train crew requirements would be determined as the system tonnage grows. This provides a staged implementation plan for the safe-working system that will be considered with operational needs. A simplified safe-working system would provide adequate safety and meet production requirements during initial operations.

Stage 2: In-cab Signalling

Implementation of in-cab signalling would be introduced in the later stage of operations. Power-operated points, but remotely controlled, would be required for crossing loops, and mine and port balloon loops. Movement authority is transmitted to the locomotives consol and a management system integrated into the locomotive engine management system to provide automatic train protection (ATP). While this may have a greater initial capital cost, it will allow system expansion without any system change-over.

The cost and extent of a more complex safe-working system depends on the number of trains in the system and operational requirements.

The optimum control strategy and the signalling system selected for a new rail operation depends upon the tonnage growth rate and hence number of trains on the network.

The 'in-cab' system can also undertake speed control and driver assistance, thus eliminating the need for wayside signals which is consistent with an European Rail Traffic Management System (ERTMS) level 2 or equivalent. This will also allow for growth without the expense of more signalling infrastructure. Over-speed and roll-back protection can be incorporated into such a management system, providing increased safety and additional protection for the track and rollingstock. This may also set the platform for the consideration of ATO.

The summary of signalling parameter for each route option is indicated in the Table 2-8.

Table 2-8: Signalling parameters summary

Parameter	Detail
Signals and Control	
Gauge and traction	Standard gauge Diesel with AC traction motors
Power supply – remote areas	Solar and battery system
Power supply with grid access	From grid with battery or generator backup depending on load
Control centre	Port or Rail maintenance facility
Communications	Radio/Fibre Optic

Parameter	Detail
QR compatibility	Not required
Signalling	
System	In-cab signalling (ERTMS level 2)
Train positioning	Transponder/ Global positioning system (GPS)
Backup System	Radio Control
Location case (equipment housing)	At each set of points – with shading hood
Signal equipment room	At each passing loop yard and port unloading
Depots (mine loading, maintenance	Wayside signals and ground signals
Wayside Asset Protection	
Hot bearing detectors	At 25 km centres (alternative on train monitoring)
Bank slip and flood detectors	As required
Dragging equipment detectors	1 no. between each passing loop
Wheel Impact Load Detector	1 no. between Port and marshalling yard
Broken rail detection	DC coded tracks – 6–10 km sections
Backup System	Radio Control
Location case (equipment housing)	At each set of points – with shading hood At each DC-coded track joint
Signal equipment room	At each passing loop yard and port unloading)
Depots (mine loading, maintenance	Wayside signals and ground signals
Subsystems	
Hot bearing detectors	At 25 km centres (alternative on train monitoring)
Bank slip and flood detectors	Located in areas of cutting instability or potential flood locations (None provided for current pricing)
Dragging equipment detectors	1 no. between each passing lane

2.5.4 Railway Marshalling Yards and Maintenance Facilities

A rail yard including provisioning, stabling and maintenance facilities will be required and is at this time planned to be near the Port of Abbot Point on land that has been identified by HPPL as suitable for this facility (between chainage 472 km and chainage 480 km). The maintenance and provisioning yard will provide sufficient length to accommodate the maximum length train consist intended to supply the final port destination.

The yard/maintenance facility will occupy an area up to six km long by 500 m wide and includes approximately 25 km of track and will include facilities to undertake:

- fuelling and servicing of trains as part of their cycling;
- holding trains for their next planned path;

- minor maintenance on operating trains;
- conducting roll-by inspections of active trains;
- replacing wagons and locomotives on trains for planned maintenance or for repair; and
- servicing and maintenance of rollingstock.

The servicing and maintenance facilities include:

- locomotive servicing and maintenance workshops;
- coal wagon servicing and maintenance workshops;
- underfloor wheel lathe;
- locomotive washing facilities;
- water and wastewater treatment plants;
- fuel and lube storage;
- warehouse components and consumables;
- train crew depot;
- staff facilities; and
- administration offices.

2.6 Associated Infrastructure

2.6.1 Camp Facilities

The temporary construction camps will need to be largely self sufficient. The construction camps are to be made from demountable single units built on concrete slabs or gravel.

The temporary construction camps will contain the following facilities:

- accommodation units;
- central dining/kitchen hall;
- enclosed food storage (include cold storage), preparation and serving areas;
- wet mess;
- laundry facilities;
- septic sewerage system sufficient to accommodate the number of workforce personnel;
- first aid station and designated vehicle;
- fuel, chemical and waster storage;
- recreational facilities; and
- parking facilities.

A fire management plan is to be prepared in consultation with the local fire service for each camp, identifying fire wardens, warning signal and evacuation and emergency procedures. All residents of the camp will be made aware of the requirements outlined in the fire management plan during induction training and ongoing training for residents at permanent camps.

2.6.2 Transport

The rail corridor will cross and be in the vicinity of a number of publicly controlled roads. It is envisaged that the major roads will be used to transport heavy machinery, construction vehicles and construction material.

In general major roads are crossed with grade separated crossing, either road over rail or in the case of the Bruce Highway rail over road. The remainder of crossings are at grade with signalling treatments to be determined during the final design.

Full details of road crossings are included in Volume 3, Section 17 of this EIS.

2.6.3 Water Supply and Storage

Operational water supply will be limited and is expected to be either sourced locally or from other available local supplies. At the northern part of the alignment water is likely to be sourced from the Water for Bowen Project.

2.6.4 Stormwater Drainage

Suitable stormwater infrastructure will be developed as part of the detailed design stage of the project. The EMP in Volume 3, Section 26 of this EIS identifies the key stormwater measures that will be developed during the project.

2.6.5 Waste Management

Where possible, waste generated during both the construction and operational phases will be managed in accordance with a waste hierarchy of (in decreasing order of priority) minimisation, reuse, recycling, reprocessing and disposal.

For construction and operational phases each potential waste stream will be identified along with appropriate waste management strategies and procedures. These strategies and procedures will be based on the waste hierarchy. Waste disposal and recycling facilities will be provided on site by licensed, commercial operator/s. Waste will be disposed at a local council landfill as negotiated with the licensed operator and the local council.

2.6.6 Energy

Electricity is likely to be supplied from the existing electricity network that is currently providing energy to the APSDA. Electricity will only be required for the operation of the marshalling and maintenance facility.

Solar power will be used for all remote wayside locations and points with battery backup. Solar power has been effectively and efficiently employed on other lines in Australia. This would remove the need for power cables, generators and uninterrupted power supply (UPS) at passing loops. Backup battery capacity can be provided to run signalling equipment for a minimum number of days depending upon worst case weather patterns. For sites where power is available this will be used and backup supplies by UPS.

2.6.7 Telecommunications

The rail telecommunication system will support:

- rail signalling, data and mobile voice communications for both rail operations and maintenance personnel; and
- corporate, control centre, mine and port requirements.

The telecommunication system will be a single mode optic fibre (SMOF), installed along the length of the railway with the necessary transmission equipment throughout from port to mine. This system will provide telecommunications for the mine, rail and port assets, and be installed within the Project corridor.

The rail telecommunication system network will support at a minimum:

- rail signalling to provide a network for telecommunication between trackside, mine, port and the control centre. The system capability will allow for automatic train protection (ATP), future ATO, and other trackside equipment and devices;
- Rail Voice to provide a voice and data telecommunications network for both fixed and mobile. Optionally it could provide HPPL with:
  - future corporate telecommunication; and
  - mine and port facilities.

The final design will be completed during the detailed design phase.

2.7 Decommissioning and Rehabilitation

At the completion of the construction activities for civil and track work, all temporary construction facilities and areas will be rehabilitated. These include but are not limited to:

- temporary construction camps;
- stockpiles;
- borrow areas;
- temporary access tracks and haul roads; and
- turkey nest dams.

Information regarding the decommissioning of the rail corridor is detailed in Volume 3, Section 25 of this EIS.