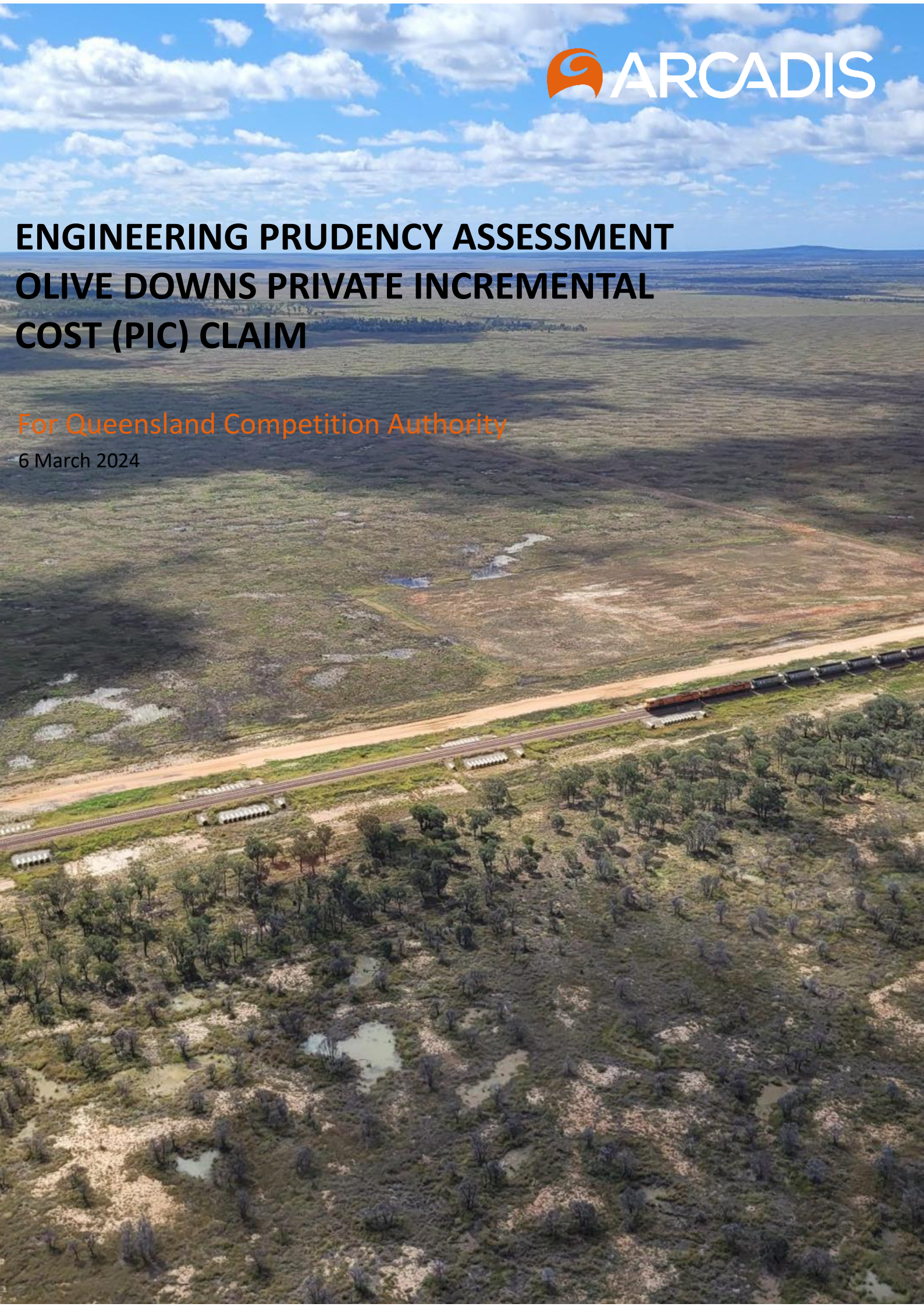

ENGINEERING PRUDENCY ASSESSMENT OLIVE DOWNS PRIVATE INCREMENTAL COST (PIC) CLAIM

For Queensland Competition Authority

6 March 2024

OLIVE DOWNS LOOP
Private Incremental Cost (PIC) Claim

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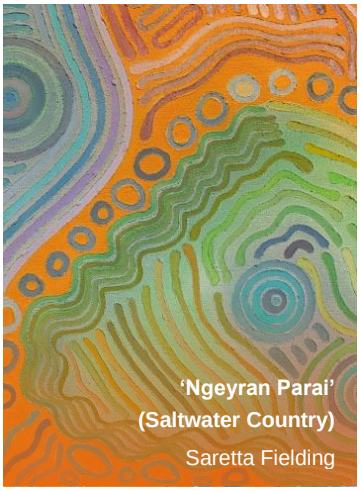

Arcadis acknowledges the Traditional Custodians of the land on which we work and live throughout Australia and recognize their continuing connection to Lands, Waters and Communities. We pay our respects Aboriginal and Torres Strait Islander Cultures and to Elders past, present and emerging.

Arcadis is committed to driving inclusion and diversity across our business. This includes specific and actionable policies that aim to make a positive impact on Aboriginal and Torres Strait Islander employment, education and a broader cultural change. Approved by Reconciliation Australia, Arcadis' Reconciliation Plan contains detailed and transparent strategies, targets and measurable actions. We continue to build respect, support education and create employment opportunities with Aboriginal and Torres Strait Island employees within our business.

Further information is available here.

REVISIONS

Revision	Date	Details	Prepared by	Reviewed by	Issued to
A		Draft for review		C.Owen	QCA

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Arcadis has relied on information provided to it by Pembroke to produce the report and arrive at its conclusions. The report is based upon information obtained on or before the report's completion (date above). Circumstances and events may occur following this date beyond our control and may affect the findings or projections contained in the report. We may not be held responsible for such circumstances of events and expressly disclaim any responsibility, therefore.

CONTENTS

ARCADIS 1

EXECUTIVE SUMMARY 4

1 INTRODUCTION 6

1.1 Background 6

1.2 Objective 7

2 OLIVE DOWNS LOOP OVERVIEW 7

2.1 General 8

2.2 Asset configuration 8

3 PIC PRUDENCY ASSESSMENT METHODOLOGY 9

3.1 Overall methodology 9

3.1.1 Stage 1 – Preparation 10

3.1.2 Stage 2 – Site Visit 11

3.1.3 Stage 3 – Analysis 11

3.1.4 Stage 4 and 5 – Reporting and finalisation 12

3.2 Extent of review 12

4 PEMBROKE PIC CLAIM SUBMISSION 13

4.1 Pembroke PIC submission claim overview 13

4.2 Summary of results 14

4.3 Overview prudency and efficiency 15

5 PRUDENCY ASSESSMENT: GENERIC ITEMS 15

5.1 Asset Management System 15

5.1.1 Overview 15

5.1.2 Whole of life 15

5.1.3 Prudency considerations asset management plan (scope) ..... **Error! Bookmark not defined.**

6 PRUDENCY ASSESSMENTS 16

6.1.1 Olive Downs Loop 16

7 CONCLUSION 25

A. SME FORM 27

B. RFI REGISTER 72

C. CONNECTION WORKS CALCULATION .....ERROR! BOOKMARK NOT DEFINED.

D. LIST OF DOCUMENTS PROVIDED 73

EXECUTIVE SUMMARY

Background

The Queensland Competition Authority (QCA) is an independent statutory body responsible for implementing competition policy in Queensland. As part of this role, it regulates third-party access to rail infrastructure operated by Aurizon Network.

Pembroke Resources (Pembroke) owns and operates Olive Downs. Pembroke has applied to have $125.2m as the private incremental cost amount related to their Olive Downs Loop and connecting infrastructure project (Olive Downs) approved. The rail loop and mine are located in the Bowen Basin of Queensland, approximately 40 kilometres southeast of Moranbah. The surface mine is being developed in three stages to produce up to 15 million tonnes per annum by Stage 3. Product coal in Stage 1 will be railed to Dalrymple Bay Coal Terminal.

Following development approval and construction completion, Pembroke is requesting the QCA to approve the Private Incremental Costs (PIC) for the Olive Downs Rail Loop under clause 6.3.2 of Aurizon Networks' 2017 Access Undertaking.

Objective

The QCA appointed Arcadis to assess the engineering prudency and efficiency of the claim for the Olive Downs Rail Loop project, based on the scope, standard, and cost, as per the terms outlined in Schedule E clause 6.3.2 of the Aurizon Network 2017 Undertaking (UT5), having regard to the more detailed framework that applies to the determination of prudency and efficiency of Aurizon Network's capital expenditure claims (Schedule E clause.2.2. Prudency and Efficiency). Arcadis assessed the Olive Downs PIC claim against the existing asset condition and performance requirements. These requirements include Rail Safety National Law, Aurizon Network's Civil Engineering Track Standards (CETS), Civil Engineering Structural Standards (CESS), Signalling General Signalling Specification (GSS), Rail Industry Safety and Standards Board (RISSB) and other industry approved standards and approaches by similar operations. This prudency assessment includes a review of key project documentation, visual site inspection of the works and discussions with relevant Pembroke staff.

Total capital expenditure submission

On 21 December 2023 Pembroke advised QCA it would be seeking approval of an indicative amount of $126m, with final costs confirmed to be $125.2 million for private incremental cost amount related to their Olive Downs Loop and connecting infrastructure project.

Assessment Summary

Overall, Arcadis assessed the Olive Downs Rail Loop as prudent and efficient in scope and standard with respect to the terms outlined in Schedule E clause 6.3.2 and with regard to the detailed framework for determination of prudency and efficiency of Aurizon Network's capital expenditure as outlined in Schedule E Clause 2.2 of the Aurizon Network 2017 Undertaking (UT5).

Olive Downs Rail Loop

Arcadis has assessed the scope, standard and cost for the Olive Downs Loop works and has deemed it overall as prudent and efficient. The view that the rail loop is prudent and efficient considers engineering factors such as:

- Golding was the Contractor and Aurizon was the Principal of the Civil Works (acted on behalf of the Pembroke as Representative under a Services Agreement)
- Aurizon was the principal for the track and operational systems package
- Aurizon acted as the construction RIM for both major packages
- whole of life considerations, such as material types and best available assets were used to optimise railway life. The design lives were appropriate for the life of the mine.
- reduced maintenance requirements will occur through the implementation of axle counters and LED signals
- the bridges were purposely designed to ameliorate the impacts of flooding on the structures

Pembroke and its representatives provided documentation for the assessment and assisted Arcadis and QCA on a site visit of the Olive Downs Rail Loop. From documentation and discussions, Arcadis have found the PIC claim to be prudent and efficient, with no findings that impact the claim. This is summarised in Table 1-1 below.

Table 1-1 Summary of outcomes of prudency assessment

Element	Assessment summary	Assessed as prudent			Impact on PIC Claim
		Scope	Standard	Cost	
Olive Downs Rail Loop – Below track and civils infrastructure	Assessed as prudent	✓	✓	✓	-
Olive Downs Rail Loop – signalling	Assessed as prudent	✓	✓	✓	-
Olive Downs Rail Loop – power	Assessed as prudent	✓	✓	✓	-
Olive Downs Rail Loop – structures	Assessed as prudent	✓	✓	✓	-
Value of overall claim					**125,177,290**
Value of impact to claim					**-**
Total revised claim					**125,177,290**

1 INTRODUCTION

1.1 Background

The Queensland Competition Authority (QCA) is an independent statutory body responsible for implementing competition policy and regulating infrastructure owned by state and private entities that requires third-party access. As such, the QCA is responsible for the regulation of third-party access to below-rail infrastructure operated by Aurizon Network Pty Ltd (Aurizon Network).

Aurizon Network is a wholly owned subsidiary of Aurizon Holdings Limited. Aurizon Network's below rail infrastructure comprises a 2,670-kilometre multi-user track network comprising four major coal systems and one connecting system servicing Queensland's Bowen Basin coal region: Newlands, Goonyella, Blackwater, and Moura with Goonyella Abbot Point Expansion - the connecting system link. Collectively this is known as the Central Queensland Coal Network (CQCN). The services provided by Aurizon Network's below rail network are declared for third-party access under the Queensland Competition Authority Act 1997 (the QCA Act).

Pembroke owns and operates Olive Downs. The surface mine is being developed in three stages to produce up to 15 million tonnes per annum by Stage 3. Product coal in Stage 1 will be railed to Dalrymple Bay Coal Terminal using the rail loop built by Pembroke which connects to the Aurizon network. A map showing the location of the Olive Downs Complex and its connection to the Aurizon Network's rail network is provided in Figure 1-1.

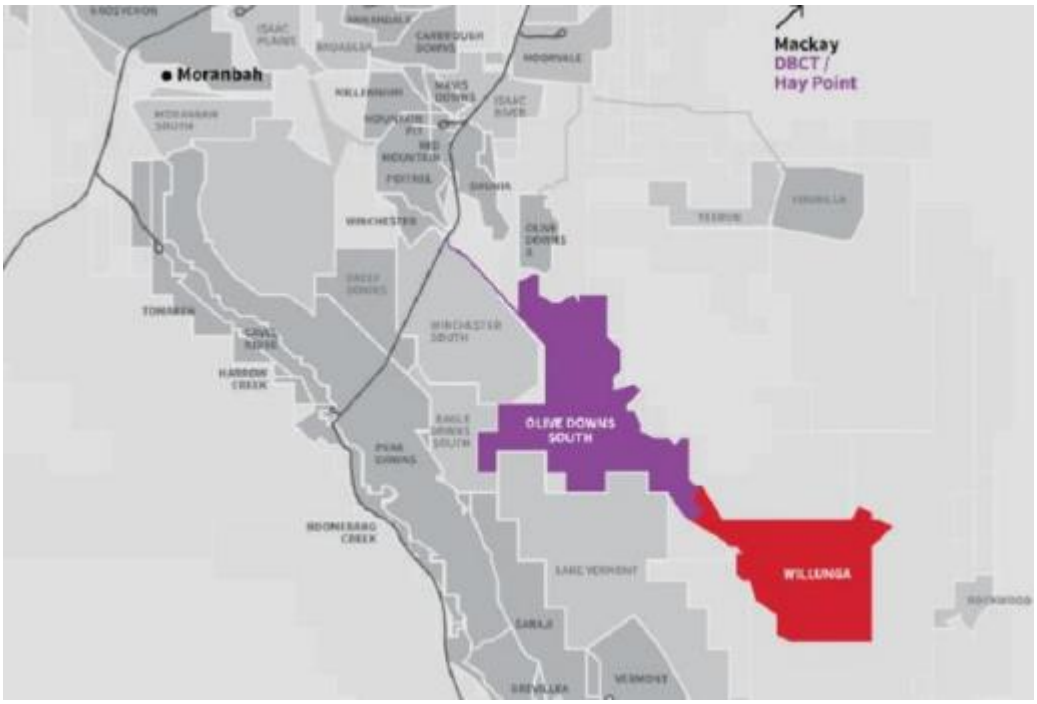


Figure 1-1 – Olive Downs complex and location

Arcadis has assessed the Olive Downs Rail Loop as per figure 1-2. Infrastructure to the right of the blue line reflects Pembroke assets. This part of the loop is assessed within this report.

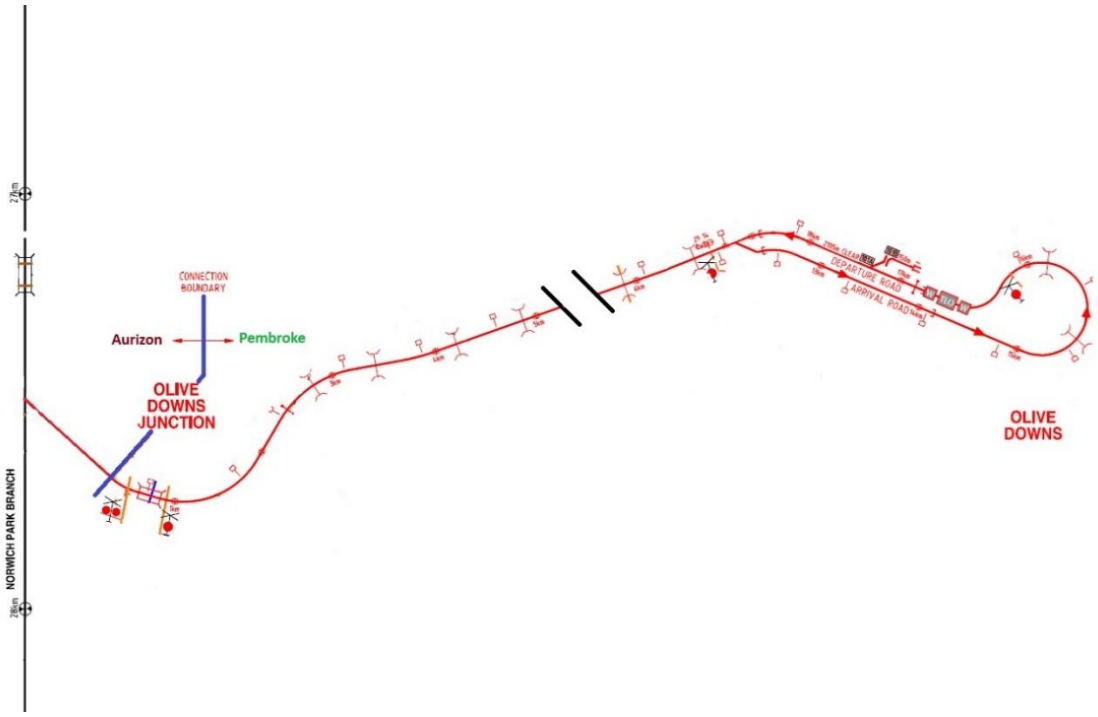


Figure 1-2 – Map of Olive Downs Rail Loop and Connection Works

1.2 Objective

The Queensland Competition Authority (QCA) has approved a Regulatory Asset Base (RAB) for the Central Queensland Coal Network. To ensure that current and future tariffs are charged fairly and for works deemed necessary, infrastructure work expenditure is subject to regulation from the Queensland Competition Authority Act 1997 (QCA Act) and the Queensland Competition Authority Regulation 2007 (QCA Regulation). Under the regulatory process, works must be submitted as a capital expenditure claim to the QCA, subject to the QCA approval process before inclusion in the RAB. An access undertaking, approved by the QCA and developed in accordance with the Act, provides a framework for the provision of access to Aurizon Network's rail network. The current undertaking agreement is the fifth version of this undertaking, *Aurizon Network 2017 Access Undertaking (UT5),* approved by the QCA – February 2019. UT5 requires maintenance of a RAB reflecting the value of the CQCN infrastructure.

Pembroke has requested the QCA approve the Private Incremental Cost Claim (PIC) of its Olive Downs rail infrastructure works under clause 6.3.2 of the 2017 undertaking.

QCA has engaged Arcadis to perform a prudency and efficiency assessment of Pembroke's rail infrastructure works in terms of their scope, standard and cost of the works. The acceptability of this claim will predominantly be based on Schedule E of UT5; specifically, this requires a test of prudency and efficiency of scope, cost and standard. Pembroke's rail infrastructure works include greenfield track work, signalling, formation and drainage works, environmental works, level crossings and project management services which are deemed necessary to deliver the works in compliance with regulatory and operational requirements.

2 OLIVE DOWNS LOOP OVERVIEW

2.1 General

The Olive Downs Coking Coal Mine is an open cut mine located in the Bowen Basin of Queensland, approximately 40 kilometres south-east of Moranbah. Commencement of production of open cut mining occurred in 2023. Olive Downs required a rail loop near the mine operation for loading and transporting coal.

In line with a required infrastructure development to support export of coal from the mine, the Olive Downs Rail Loop project was constructed to provide the infrastructure necessary to transport up to 15 million tonnes per annum (mtpa) of coal from the Olive Downs Mine, to Aurizon Networks Goonyella system which transports coal to the Dalrymple Bay coal terminals.

Figure 2-1 Bridge and culvert alongside the rail

2.2 Asset configuration

Taking into account the system operational requirements, the Olive Downs Complex Loop and connecting infrastructure was designed for 26.5 tal wagons and Goonyella size electric trains. The total cost of the project was $125.2m .

Table 2-1 below shows notable characteristics of the Olive Downs rail loop infrastructure solution.

Table 2-1 Key asset characteristics

Characteristic	Olive Downs Loop infrastructure
Total single track length (excl. bad order siding)	18.755km
Track construction	60 kg/m rail on concrete sleepers

Characteristic	Olive Downs Loop infrastructure
Maximum axle load	26.5 tonnes
Electrified	Yes
Control System	RCS
No of Level Crossings	7
Turnouts	1 x 1in16 60kg SNX turnout 1 x 1in12 60kg RBM turnout (bad order siding) 1 x Catch Point 60kg
Culvert structures	13 RCBC Culverts including 2 under access roads, largest is 13/1800x1200
Bridge structures	1 x 3/25m spans PSC girders 1 x 2/25m spans PSC girders

3 PIC PRUDENCY ASSESSMENT METHODOLOGY

3.1 Overall methodology

Arcadis has implemented a four-stage process to assess the Olive Downs Loop PIC claim. Figure 3-1 identifies the key milestones with brief descriptions below.

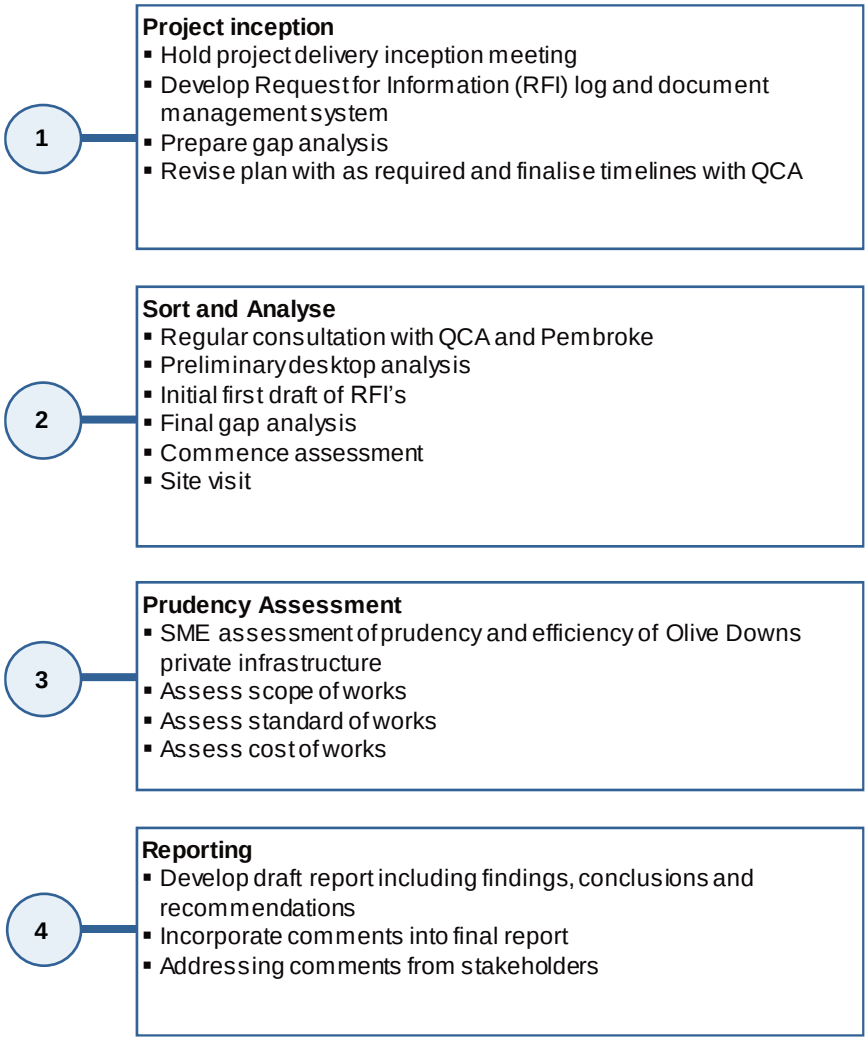


Figure 3-1 Summary of the process for prudency and efficiency assessment

3.1.1 Stage 1 – Preparation

The Arcadis team conducted an internal kick-off meeting to formalise the handover of information/resources required to perform the assessment. During this meeting, the following were confirmed:

- Confirmation of the Request for Information (RFI) process and agreement by all parties
- Communication channels were formalised and agreed
- Pembroke staff provided a background summary of the project
- Date was confirmed for the site visit

The following table lists the initial documentation submitted for assessment; it is noted that additional documents were requested and acquired for clarification through the RFI process, with a final list of RFI's sent on 27 February 2024 (Appendix B).

Table 3-1 List of preliminary documentation provided

Check list	Documentation Type	Name of document
Essential documents		

Y	Project Management Plan	Project Execution Strategy
Y	Breakdown of costs	Asset Cost Breakdown Update
Y	Business Case Justification (IAR)	Bankable Feasibility Study
Y	Commissioning data and completion, acceptance, and handover validations.	Civil and track drawings Bridges Structures Drawings
Y	Completion report	Level Crossing upgrade/installation signed checklist Rail signed completion report
Other documents provided		
Refer Appendix C		

3.1.2 Stage 2 – Site Visit

A site visit by representatives of QCA and Arcadis was undertaken on 13 February 2024.

The site visit included a visual inspection of the loop, staff area, access road, and sample of drainage structures. The site inspections provided the technical review team with an opportunity to develop an interactive platform to enable quick and efficient clarification on several items, which we consider more efficient than multiple email correspondence.

The site visit facilitated the assessment process by providing visual verification of the compliance of the works with industry standards and safe operations. It was easier, after reviewing documentation, to have a targeted approach to visually verify items. For example, project designs and drawings were adequately reviewed and approved by Registered Professional Engineer of Queensland (RPEQ) before construction had been achieved whilst visual site inspection assured that operations were safely undertaken.

Arcadis would like to thank Pembroke for their time and commitment to our team during the site inspections.

3.1.3 Stage 3 – Analysis

After the site visit, Arcadis' engineering Subject Matter Experts requested specific documentation to validate compliance and assure that what had been seen and quoted on-site complied with regulatory requirements and aligned with the feasibility study and IFC drawings. Through this inspection, Arcadis was also able to confirm that the works aligned with the design and drawings provided by Pembroke and assess the prudency of the scope and standard of the rail loop.

During this stage, Arcadis performed a desktop assessment of prudency and efficiency based upon the visual inspection and preliminary information provided by Pembroke. Arcadis used a framework template developed in alignment with the requirements of UT5 Schedule E and approved by the QCA. The key criterion used to create the framework is summarised in the flow chart depicted in Figure 3-2.

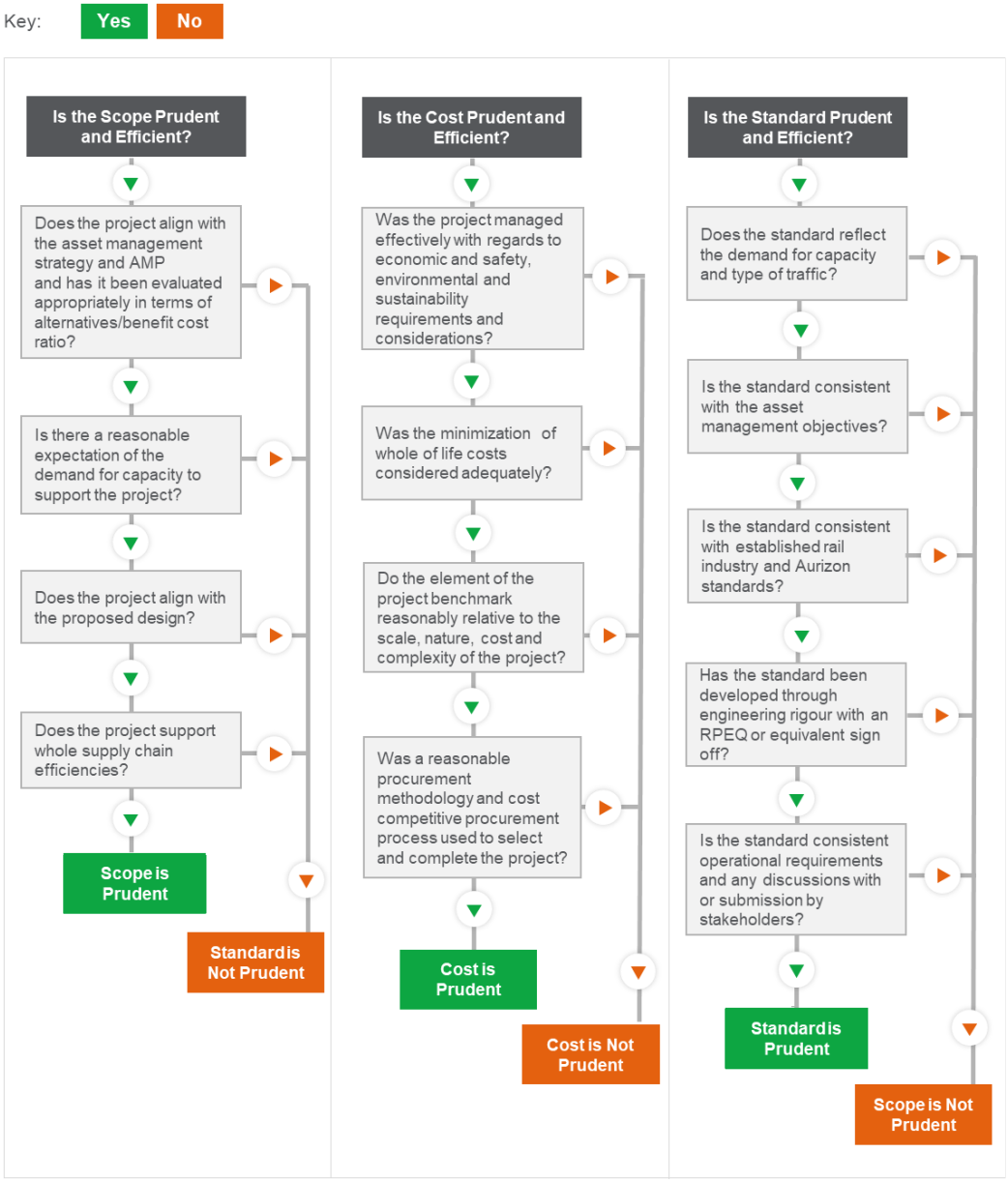


Figure 3-2 Summary of the critical criteria for the assessment of prudency and efficiency

On submitting the draft and following further discussions between the parties, Arcadis received additional information requested and responses to the RFI's. The list of final RFI's, clarifications and additional information provided is shown in Appendix B.

The RFI items included clarification of cost information, scope, and confirmation of completion certification. Upon clarification of issues raised, the team made revisions accordingly and completed the prudency and efficiency assessment.

3.1.4 Stage 4 and 5 – Reporting and finalisation

Upon completing the prudency and efficiency assessment, Arcadis compiled and submitted this final draft report to the QCA for review.

On receipt of any revisions, Arcadis will revise the draft and submit the final report.

3.2 Extent of review

Pembroke advised QCA it would be seeking approval of $125,177,289 as the prudent and efficient amount of private incremental cost related to Olive Downs under clause 6.2.3 of 2017 Access Undertaking (UT5).

For this review, key elements of the works were assessed by the Arcadis team in line with the primary discipline aligned with that work. Works were assessed within the breakdown submitted with Olive Downs Rail Loop PIC claim. A summary of the final cost claim breakdown is provided in Table 3-2.

Table 3-2 Summary of PIC claim – breakdown

Element	Total Expenditure Claimed ($)
Civil and Track	[redacted]
Signalling and telecommunications	[redacted]
Power	[redacted]
Structures	[redacted]
Project management	[redacted]
Other	[redacted]
Total PIC claim total	**125,177,289**

The assessment of the PIC claim was conducted with respect to the Terms of Reference[1] as set by the QCA and the terms and criteria outlined in Schedule E (schedule E, clause 6.3.2) and having regard to the more detailed framework that applies to determination of prudency and efficiency Aurizon Network's capital expenditure claims (Schedule E Clause 2.2. Prudency and Efficiency) of the 2017 Aurizon Network access undertaking (UT5) and summarised in the methodology outlined in Section 3.1.

The following section presents the findings from the Arcadis assessment in detail.

4 PEMBROKE PIC CLAIM SUBMISSION

4.1 Pembroke PIC submission claim overview

The primary requirement of the Olive Downs Rail Loop project was to enable access from the Olive Downs Mine to the Dalrymple Bay Coal Terminal, via the Aurizon CQCN Goonyella system. The intent was that this connection would enable access to transport of up to 15 Mtpa of coking coal per year from the Olive Downs Mine to Aurizon Network's Goonyella system, which eventually is transported to the coal terminal and sold as an export product. This report includes the prudency and efficiency assessment of the Olive Downs Loop, which connects the Aurizon rail network.

Table 4-1 summarises the information provided to the Arcadis for review; Appendix C provides the complete list of data provided.

[1] Queensland Competition Authority Terms of Reference – 21/12/2024

Table 4-1 Summary of provided documentation for review

Other documents provided Name of document	Description
Correspondence	Application for Pembroke's claim of $125.2m estimated total amount of the Private Incremental costs
Drawings	Issued for construction drawings (IFC), include structures and track and civil drawings Olive Downs Spur and Loop Schematic Work management plans
Cost breakdowns	Breakdown of Pembroke costs for Private Rail Infrastructure works Breakdown of Pembroke total costs for Olive Downs Rail Loop
Reports	Scope of Works Project execution strategy Environmental management plan Construction management plan System Requirement Specification
Other	RFI Register Quality Management Plan Community and Stakeholder Management Plan

4.2 Summary of results

To align costs with a specific scope of works, elements were assessed in line with the Olive Downs Rail Loop and connecting infrastructure PIC cost breakdown provided to Arcadis.

Pembroke submitted its expenditure claim in December 2023 for QCA approval. Table 4-2 lists the project element breakdown and summarises the results of the prudency assessment on the Olive Downs Rail Loop and connecting infrastructure.

Table 4-2 Prudency assessment summary

Element	Assessment summary	Assessed as prudent			Impact on PIC Claim
		Scope	Standard	Cost	
Olive Downs Rail Loop – Below track and civils infrastructure	Assessed as prudent	✓	✓	✓	-
Olive Downs Rail Loop – signalling	Assessed as prudent	✓	✓	✓	-
Olive Downs Rail Loop – power	Assessed as prudent	✓	✓	✓	-

Element	Assessment summary	Assessed as prudent			Impact on PIC Claim
		Scope	Standard	Cost	
Olive Downs Rail Loop – structures	Assessed as prudent	✓	✓	✓	-
Value of overall claim					125,177,289
Value of impact to claim					-
Total revised claim					**125,177,289**

4.3 Overview prudency and efficiency

Overall, Arcadis has assessed the scope, standard and cost for the Pembroke claim to be prudent and efficient for the Olive Downs Loop.

Arcadis highlights that our assessment was undertaken based upon the financial and engineering information provided to the team. To facilitate the assessment, each discipline lead focused their analysis on evaluating the prudency of the works within specific subcomponents – track and civil infrastructure, signalling, power and structures. The Arcadis team assessed that the scope and standard of all four aspects was prudent and efficient.

5 PRUDENCY ASSESSMENT: GENERIC ITEMS

5.1 Asset Management System

5.1.1 Overview

Aurizon Network has a specific approach to asset management that aims to deliver consistent network performance. The Aurizon Network approach focuses on delivering appropriate service levels throughout the asset life cycle by providing "asset availability and sustained, reliable below rail performance at the most efficient cost of ownership[2]".

5.1.2 Whole of life

The whole of life approach typically delivers strategies to optimise the balance between risk, cost and performance whilst simultaneously considering the design of whole of life durability and resilience. The team acknowledged that Pembroke has taken long term durability considerations in its rail loop into account.

The life of the mine is 80 years, and the life of the railway is designed for a maximum of 50 years. Arcadis has witnessed good-quality materials installed in the railway loop such as multiple layers of geogrid to provide a resilient and long lasting formation. We expect the assets to achieve their design lives, provided the right maintenance is given throughout the life of the railway. It is noted that coal loops, in particular, can be subjected to accelerated degradation without appropriate

[2] Aurizon Network – FY22 Final Draft Maintenance and Renewals Strategies and Budgets, Appendix E Aurizon Network 21 January 2021 Accessed 19 August 2022

maintenance. However, with the correct maintenance regime, we note that this should uphold the design life noted in the SRS and design. It is in the interest of the RIM (rail infrastructure managers) for the entire loop to maintain the loop to a high level.

Eventually, Pembroke will need to do an extension of life to keep up with the life of the mine. This would entail rail replacement and potentially sleeper replacement at some point. There are no costs included for the future need to replace railway as this is beyond the timeframe that we are assessing. Therefore, we see a maximum railway life of 50 years and expect that whole of life extension program will occur at some point during the 80 year mine life period.

5.2 Environmental assessment

It is acknowledged that impacts to the environment are primarily mitigated and managed through design adaptation measures based on consultation and collaboration with other technical disciplines during the design and construction phases. Arcadis notes, the Olive Downs Rail Loop was a component of the overarching Olive Downs project which comprises the development of a metallurgical coal mine and associated infrastructure (the Project). The Project was determined to be a coordinated project under the *State Development and Public Works Organisation Act 1971*, thereby requiring an Environmental Impact Statement, (EIS) to be prepared and submitted for evaluation. The EIS was approved with conditions by the Coordinator-General in May 2019. The EIS approved for the Project, which includes the Olive Downs Rail Loop, is considered to have been undertaken in accordance with the regulatory and legislative framework for a project of this nature and its anticipated environmental risks and impacts.

The EIS addressed all environmental matters associated with the Project and not just those specifically associated with the rail loop, therefore, although there are works in this project that have been considered in the EIS, the costs directly relating to the EIS have not been captured within the Olive Downs Loop cost breakdown. Excluding the EIS costs from the Olive Downs Loop PIC claim is appropriate. Arcadis has completed a high-level environmental assessment relating to environmental requirements that were adhered to during construction of the Olive Downs Rail Loop, focusing on the EPBC referral (EPBC 2017/7870) for the purposes of the prudency assessment. The construction and operation of the spur line and balloon loop was determined to be a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999*, (EPBC Act), and therefore required an EPBC Act referral to submitted for determination. The EPBC referral application was approved with conditions (EPBC 2017/7870). Noteworthy conditions of this approval include:

- a restriction to clearing outside the project area; and
- limitations attached to the clearing of habitat for six (6) listed threatened species.

In addition, the proponent was required to comply with environmental offset requirements which include developing and implementing an Offset Area Management Plan (OAMP) which is to be published on their website, (sighted 22/02/24).

Based on a high-level review of publicly available information Pembroke is considered to have demonstrated prudency associated with their environmental commitments in accordance with the legislative framework and conditions of approval.

6 PRUDENCY ASSESSMENTS

6.1.1 Olive Downs Loop

Overview

The Olive Downs Loop works claim included the track and bridges, drainage, earthworks, telecommunications and building facilities. The items assessed included all works related to civil, track, signalling, structures, power and environmental works.

The Olive Downs Rail Loop is 18.755km. The scope of works outlined in the tender documentation included all the rail formation works, including earthworks, stormwater drainage, level crossings, signage and fencing. Arcadis reviewed the scope, as defined in the information provided, including the tender, for construction and as-constructed drawings.

Figure 6-1 Olive Downs Rail Track

To assess the loop works, the assessment team divided the work elements into four key components:

- Track and civil
- Signalling
- Power
- Structures

Table 6-1 summarises the outcome of the prudency assessment for scope, standard and cost of the loop works and discussion below provides further details on the prudency assessment.

Table 6-1 Assessment of prudency rail loop works

In accordance with clause 6.3.2, Schedule E of the Aurizon Network The 2017 Undertaking (UT5), was there sufficient demonstration of prudency and efficiency to satisfy:	**Prudent and Efficiency Assessment Outcome**		
	Scope	✓	**Overall scope and standard were assessed as prudent, claimed cost considered prudent.**
	Standard	✓	

	Cost	✓	
Capital Expenditure Claim (total)		$ 125,177,289	
Impact of findings on Claim		$ -	
TOTAL ACCEPTED		$ 125,177,289	

The following provides further detail and summary on our review and considerations made in the assessment of prudency for the scope, standard and cost for the Olive Downs Loop works.

Assessment of scope

Track and civil infrastructure

Arcadis completed a visual inspection of the track and civil infrastructure. The following items were noted in the track and civil scope:

- Single track bi-directional spur and a single track uni-directional loop (with provision for reverse shunting) plus bad order siding (BOS)
- 60kg/m rail and 28 Tonne Axle Load (TAL) sleepers. The reduced sleeper spacing locations were identified on site with signs to assist maintainers.
- 300mm minimum ballast depth below sleepers.
- The BOS buffer was observed to have a clear zone between it and the TLO
- Fencing placed on both sides of the track in order to deter larger wildlife. Fencing was topped with straight lined wire to not impinge on the movement of smaller species such as greater gliders.
- The use of underpasses is a positive indication of an intent to minimise interactions with train traffic

Our engineers reviewed the scope and completed constructed works and contract and actual price, which required a review of (but not inclusive of) the SRS, relevant regulatory associated documentation, IFC drawings and leveraged site observations. Using this information, they assessed that the project aligned with the assessed design and scope. The scope was designed and delivered with future proofing requirements included. We have not been made aware and/or provided additional submissions, requests or consultations to the QCA that may not been addressed appropriately. From our assessment of the documentation provided and what was observed on site Arcadis deems the scope of track and civil for Olive Downs as prudent and efficient.

Figure 3-1 Bad order siding buff point

Signalling

The scope for signalling works relates to the signalling installation, testing and commissioning activities within the following sites:

- Goonyella System - 23.950km to the 31.200km;
- Olive Downs Junction (OJ) - new main line Junction Station (SER -27.428km);

The following staging and/or commissioning activities have been considered when developing the scope of works and estimate for Olive Downs:

- Construction Turnout Simple Detection implementation to UTC
- Connecting Rail Infrastructure commissioning;
- Private Rail Infrastructure commissioning.

Based on the Olive Downs Spur and Loop Schematic, the Scope of works and the SRS, the project scope aligns with the proposed design of the infrastructure. As noted in the Quality Management Plan, appropriate Project Management systems followed during the design, approvals, and construction of the proposed signalling design. From the available information, it is noted that the sufficient documents have been submitted to QCA. From a signalling perspective, it is noted that the future demand and capacity levels have been taken into account the Olive Downs Complex Loop and connecting infrastructure was designed for 26.5 tal wagons and Goonyella size electric trains. From the information provided, Arcadis assesses that the scope of the signalling works is prudent and efficient.

Power

Arcadis notes that the electrification of the Olive Downs Spur and Balloon Loop was undertaken as a variation to the original project scope of works.

While limited detail was provided on the electrification works, it is understood to include:

- Establishment of 25 kV ac Overhead Line Equipment (OHLE) for the 18.8 km total single track rail length (including 12 km spur and 6.8 km loop lengths)
- Interconnection to the existing Norwich Park Branch Line OHLE

From the available information, it is confirmed that sufficient documentation has been provided to the QCA and Arcadis for the determination of prudency. Arcadis is not aware of any additional submissions that have not been appropriately addressed as per the information provided.

Consistent with similar rail infrastructure projects in the CQCN, OHLE was understood to be designed and constructed in close adherence to Aurizon Network requirements. This is expected given Aurizon were engaged by Pembroke to design and construct the electrified network. It is also noted that the future demand and capacity levels have been taken into account. From the information provided and the site visit Arcadis assess that the scope of the electrification works is prudent and efficient.

Figure 6-4 60kg/m rail on TAL sleepers and overhead line equipment

Structures

The scope for structures includes two bridges at 0.733km (3 x 25 m span) and 6.507km (2 x 25 m Span) and six major culvert structures.

The scope of structures include:

- Relieving slabs and splay-rails have been specified at bridges
- Bridge piles are consistent across structures, bringing efficiency in construction and maintenance

- Bridges and drainage structures are 300LA consistent with the SRS
- Stairs and landings with handrails have been installed to permit access to the track from the bottom of the bridge abutment.
- Ballast mats are specified on bridge girders
- Electrical bonding is evident across the handrails on both the access stairs and the bridge handrails. They appear to be bonded back to the OHLE masts
- Abutment drainage has been facilitated with a good number of weep-holes in both the transverse and longitudinal shotcrete faces. Frog-flaps are fitted to the outlets of the weep-hole

The project scope aligns with the proposed design of the infrastructure. As noted in the Project Execution Strategy, appropriate Project Management systems, for construction design followed during the design, approvals, and construction of the proposed design. All the documents submitted to QCA are accurately listed. Although we did not obtain completion certificates in the document submission, the Arcadis team were able to observe the completed infrastructure during the site visit, and confirm that the completed works aligned with design scope.

It is confirmed that the design of the Olive Downs Complex Loop and its structural elements has considered future demand and capacity levels. The loop was specifically designed to accommodate 26.5-ton axle load wagons and Goonyella size electric trains. The structural elements were designed to meet a 300LA loading capacity, which aligns with the appropriate design reference vehicles and ensures the necessary loading capacity for 26.5-ton axle load trains. Based on the assessment above, Arcadis deems the scope of structures prudent and efficient.

Assessment of standard

Track and civil infrastructure

Arcadis has reviewed the Scope of Works, IFC drawings and System Requirement Specifications to find that the civil and track works appear to align with required standards and be adequate to meet the current and future capacity levels. Aurizon made a significant contribution to the project delivery including key certification stages in the scoping and design process. Australian Standards have been stipulated throughout the design. For Aurizon, civil and track works are business as usual, and it is noted that Aurizon standards have been considered in and aligned with, in all the design works. It is noted that all works have been signed of by appropriate RPEQ certified engineers, as per Queensland regulatory requirements.

Arcadis also noted a generous number of level crossings for the length of the spur and loop, indicating a robust level of negotiation with affected landowners.

Arcadis visited the site and undertook a complete circuit visual inspection of track and civil works. This included construction of the access road and drainage works. On visual inspection, it was determined that the track and civil works aligned with relevant standards, including state electrical, water, fire and emergency regulations and statute as well as construction standards and safe rail operations.

From the information provided, Arcadis assesses that the standard of the civil works is prudent and efficient.

A sample from our site inspection used to assess the standard of track and civil infrastructure is provided in Figure 6-5.

Figure 6-5 Weigher North of TLO

Signalling

Arcadis has reviewed the Olive Downs PIC application, SRS and Spur and Loop schematic and noted that the project designs were adequately reviewed and approved by Registered Professional Engineer of Queensland (RPEQ) before construction. The applied standard of works aligns with the general rail industry standards and Aurizon GSS requirements, which by the nature of being approved standards are considered industry leading practice to achieve optimised and balanced whole of life outcomes. From the information provided and visual inspection on site, the standard applied is consistent with established and approved rail standards. From our assessment, signalling standard is prudent and efficient.

Power

Arcadis reviewed the provided Olive Downs Spur and Balloon Loop drawings to ascertain detail of the Overhead Line Equipment (OHLE) design. These drawings provided limited OHLE detail, and requests for further information were made, however Pembroke was unable to provide additional detail. However, based on site observations, Arcadis observed that the works were performed consistent with Aurizon standards and practices as applied elsewhere in the Contral Queensland Coal Network (CQCN).

After reviewing documentation and visiting the site, the Arcadis team confirms that the standard of the power scope for the Olive Downs Loop is prudent and efficient.

Structures

Based on the available information, the project designs were reviewed and approved by a Registered Professional Engineer of Queensland (RPEQ) before construction, aligning with Aurizon standard specifications. These approved standards are recognized as industry-leading practice to

achieve an optimized and balanced whole-of-life outcome. Consequently, the standard is consistent with the asset management objectives and appears to align with Aurizon Asset Management Policy. Furthermore, the civil and track works meet the requirements outlined in the scoping and SRS, demonstrating consistency with the asset management objectives. Approved asset lives for bridges is 100 years and culverts 50 years.

Aurizon actively participated in key certification stages during the scoping and design process, making a significant contribution to the project delivery. Australian Standards were adhered to throughout the design phase.

The projects were delivered in compliance with the requirements of the Rail Safety National Law (RSNL) and the National Rail Safety Regulator (ONSR). Aurizon actively participated in key certification stages during the scoping and design process, making a significant contribution to the project delivery. Arcadis reviewed the drawings and noted that the standard reflects current demand and likely future capacity levels and type of traffic.

Further, the standard and level of works applied is consistent with operational requirements in that it is deemed necessary to ensure a reliable and safe operational railway.

Overall the standard for structures is prudent and efficient.

Figure 6-5 Bridge with stairs and railings and Culvert

Assessment of cost

Arcadis has reviewed all cost information provided by Olive Downs. We note that overall the cost of the works appears to be reasonable considering similar works and environmental and regulatory considerations. For example project management costs, including design costs and service agreements, were at the lower end of costs. Noting that efficiencies occurred, such as the OHLS being delivered under one contract, project management costs were at the lower end of available benchmarks, which is expected with such gained efficiencies.

Benchmarking, based upon Arcadis engineers experience on similar projects, and our annual cost and commercial research undertaken on global and national construction costs, has been used to sense-check the prudency and efficiency of the cost claim.

Track and civil infrastructure

Based on our professional experience, standard gauge heavy-haul is between $5-6m per kilometre. We note that Pembroke's budget estimated approximately $5m per kilometre using 2020 costs, including track, civil, signalling and power. Whether a greenfield rail loop projects sit within this range is strongly determined by site-specific factors, the asset configuration and the scope of works. Olive Downs is located in a regional area, but close-to established railway expertise, relatively standard

earthworks, leading to a lower price per kilometre railway. However, given it is a short loop, and that it was constructed during the pandemic, these are factors that could increase the costs of the rail per kilometre significantly.

The amount claimed for the Olive Downs Rail Loop is at a rate of $6.7m per kilometre. This is beyond the initial estimate by 12%. Incurring 12% higher costs of the rail loop relative to the upper limit of the bound can be noted due to the following reasons:

- The relatively short **length of this loop** would cause the per kilometre rate to exceed our standard bounds because a longer loop would secure greater economies of scale.
- **Track construction** is comprised of entirely 60kg deep head hardened track. Aurizon standards generally require loops built with 60kg track for rail connection and balloon loop turnouts.
- Volatile market during the pandemic, causing **labour and material costs** to increase significantly during the construction of the Olive Downs Rail Loop, creating an increase in overall costs.
- A **variation of the contract** to accelerate construction to make up for delays that were driven by wet weather [redacted].

By assessing the cost breakdown, Scope of Works, the SRS, combined with the discussion that took place during the site visit, the civil and track works appear to have been managed effectively, designed to a nominal standard without excess and delivered with an intent to optimise. Although some temporary works costs may seem higher than expected, such as the establishment of site for $0.5m and the site offices for $0.6m, this can be justified by the project being delivered during the pandemic. It was also noted in available documentation that a shortage of temporary buildings existed during the time of construction.

The track and civil works appear to have been designed and constructed to minimise whole of life costs and appear to have been procured in a reasonable manner. Overall, the track life is designed for 50 years, which is within our expectation given the mine life of 80 years. Track and civil works appear to have minimised disruption to Aurizon and its customers. Track and civil works benchmark reasonably well to the scale and nature of the works, considering the volatility over the past four years.

Overall, the cost of track and civil works are prudent and efficient.

Signalling

By assessing the scope of works, the approved tender list authorisation and cost breakdown, we found that the project was managed effectively and that practical completion was achieved within schedule, with all stage gates and budget within the approved estimate. From the information provided, it is evident that items such as axle counters and LED signals will achieve long term benefits by minimising whole of life costs such as maintenance costs. The implementation of LED signals provides higher luminous efficiency, reliability and lower operating costs with a typical Mean Time Between Failures (MTBF) of 250.000 hours. Axle counters allow for lower maintenance costs in both time and cost, lower life cycle costs, high uptime, low power requirements, and overall reliability in extreme weather and environmental conditions.

Connection works to the Aurizon network on the South Goonyella Branchline was carried out by Aurizon under a separate agreement/contract. Apart from the connection works, all the other works were undertaken via an open tender. From the available information, we recognise that adequate information was included in the scope of works and change request documents. All the construction works outside the Aurizon corridor were greenfield in nature hence no disruptions to rail users were noted. However, these works across multiple public and private roads where adequate quality and safety measures were undertaken to carry out the work at those locations.

Based on this analysis, Arcadis assesses that the signalling costs for the Olive Downs Rail Loop works is prudent and efficient.

Power

The lump sum cost for Overhead Line Equipment (OHLE) for the spur, loop and connection to the existing Aurizon traction network was $[redacted] m. This is understood to include all costs for execution of the OHLE works by Aurizon, apart from a separate variation cost of $[redacted]m for design by Aurizon.

Works were not subject to a competitive bidding process, which is considered appropriate to ensure:

- Works were designed and performed consistent with Aurizon requirements
- Works would take advantage of Aurizon technical and construction expertise
- Design review and approval processes would be expedient
- Cost-effective and timely supply of pre-approved components is provided by access to Aurizon period procurement contracts and stock holdings.
- Time and cost savings from circumventing the Competitive Tender process

Based on the available information, the following observations were made:

- Design costs of [redacted]% of capital works cost are consistent with industry expectations and similar infrastructure projects
- Capital costs of ~[redacted]m/km are consistent with national and international benchmarks, especially with consideration given to the relatively short track length involved, which reduces the economies of scale of the project.

From this analysis, the OHLE is deemed prudent and efficient.

Structures

From the information provided the structure works appear to have been effectively managed across all fronts, including customer satisfaction, economic viability, safety, and sustainability. The information provided on the project demonstrated adequacy in scope definition and change request documentation. Based on the available information, the following observations can be made:

- The scope of works and change request documents contained sufficient information.
- Practical completion was successfully achieved within the scheduled timeframe, with all stage gates and budget remaining within the approved estimate.

The cost breakdown for the bridges amounted to $5.9m and $7.8m for the concrete culverts. These costs align reasonably with similar works during the pandemic period, as benchmarked using professional experience and the Arcadis IDC Construction Costs Report. The track and civil works appear to have been designed and constructed to minimise whole of life costs.

The contract works, including the procurement of structural elements, were conducted through an open tender process, indicating a competitive procurement approach. Based on the information provided, the process was carried out in accordance with the necessary probity and competitive requirements. The track and civil works demonstrate a reasonable alignment with the scale and nature of the project, taking into account the volatility experienced over the past four years. According to the Arcadis Industry Construction Costs annual report, material costs witnessed significant increases (ranging from 28% to 35%) during the pandemic period, further compounded by regulatory challenges in project execution. Considering these circumstances, the cost elements benchmark reasonably well. Additionally, when comparing the bridge and culvert costs to similar projects undertaken in recent years, they align favourably.

The structural works, along with the civil and other works, were executed with minimal disruption to the local landowners and businesses. As the construction works were greenfield in nature outside the Aurizon corridor, there were no reported disruptions to rail users. However, these works did involve crossings over multiple public and private roads. Adequate quality and safety measures were implemented at these locations to ensure the smooth execution of the work. Overall, the structures are deemed prudent and efficient for the Olive Downs Rail Loop.

7 CONCLUSION

Overall, Arcadis has assessed the scope, standard and cost for the Olive Downs Rail Loop to be prudent and efficient.

ARCADIS Design & Consultancy for natural and built assets

APPENDICES

A. SME FORMS

7.1

PEMBROKE (CAPEX) – STRUCTURES ASSESSMENT

The following provides detail of the prudency assessment for Pembroke's capital expenditure:

ASSESSMENT SUMMARY

In accordance with clause 6.3.2, Schedule E of the Aurizon Network The 2017 Undertaking (UT5), was there sufficient demonstration of prudency and efficiency to satisfy:	Prudency of Scope	✓
	Prudency of Standard	✓
	Prudency of Cost	✓
Capital Expenditure Claim (total)		125,177,289
Impact of findings on Claim		-
TOTAL ACCEPTED		125,177,289

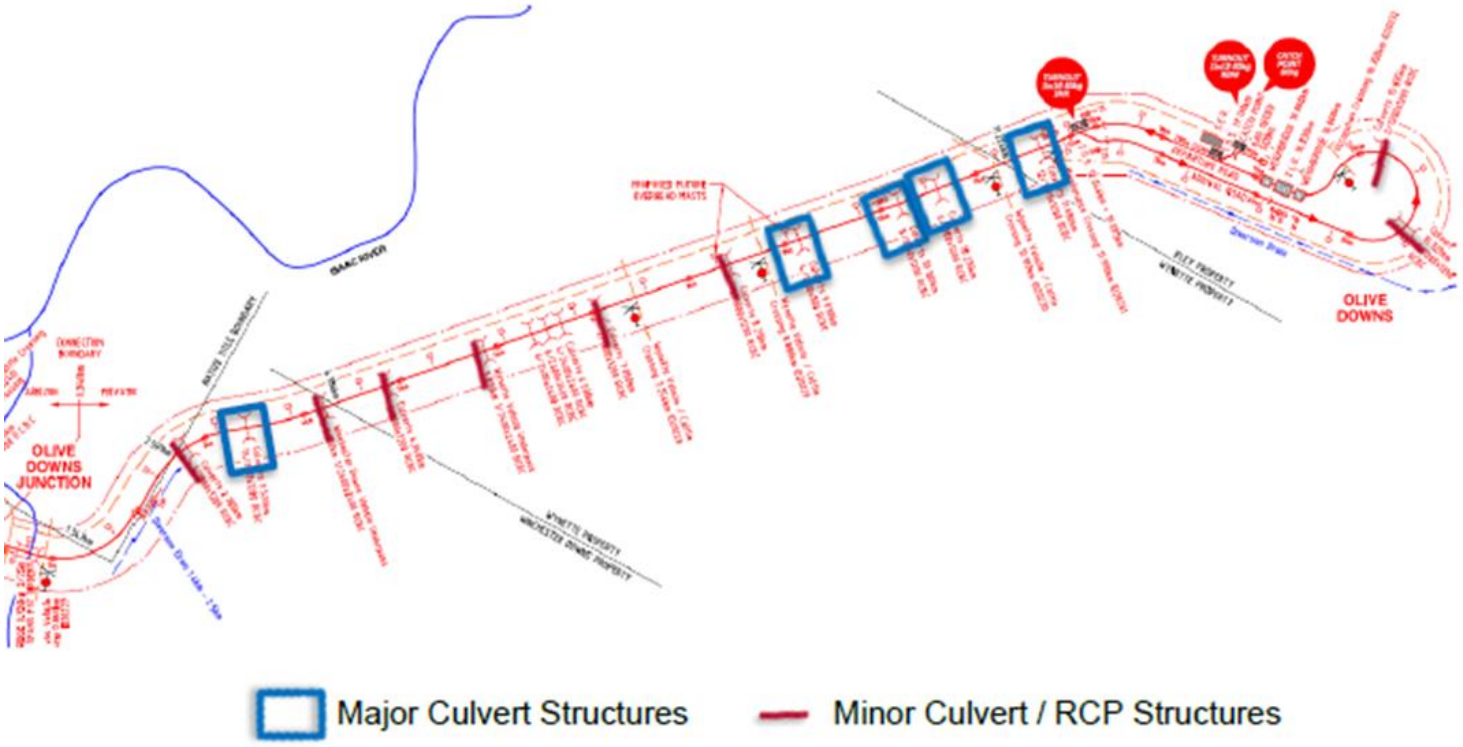
Check list	Documentation Type	Name of document
Essential documents		
Y	Project Management Plan	Project Execution Strategy
Y	Breakdown of costs	Asset Cost Breakdown Update
Y	Business Case Justification (IAR)	Bankable Feasibility Study
Y	Commissioning data and completion, acceptance, and handover validations.	Civil and track drawings Bridges Structures Drawings
Y	Completion report	Level Crossing upgrade/installation signed checklist Rail signed completion report
	Other documents	SRS

Details	
Project Name	Olive Downs Rail Loop
Project Type	Prudency Assessment
Pre-Approval	N/A
Asset Description	Rail loop that connects into Goonyella Network
Location(s)	Olive Downs
Expenditure Claimed	125,177,290

PROJECT OVERVIEW

Scope

The scope includes two bridges at 0.733km (3 x 25 m span) and 6.507km (2 x 25 m Span) and five major culvert structures (shown in diagram below)



Both bridges are three span concrete structures.

- Relieving slabs and splay-rails have been specified at bridges
- Bridge piles are consistent across structures, bringing efficiency in construction and maintenance
- Bridges and drainage structures are 300LA consistent with the SRS
- Stairs and landings with handrails have been installed to permit access to the track from the bottom of the bridge abutment.
- No provision has been made to access the bridge bearings for inspection.
- Ballast mats are specified on bridge girders
- Electrical bonding is evident across the handrails on both the access stairs and the bridge handrails. They appear to be bonded back to the OHLE masts
- Abutment drainage has been facilitated with a good number of weep-holes in both the transverse and longitudinal shotcrete faces. Frog-flaps are fitted to the outlets of the weep-holes.

Completion Summary

In this section the assessment of prudency and efficiency of the scope, standard and cost of capital works is summarised. The summary is split into three sub-sections addressing each area assessed. Namely:

- **Section 1** considers whether the **scope** prudent and efficient,
- **Section 2** considers whether the **standard** is prudent and efficient, and finally
- **Section 3** considered whether the **cost** is prudent and efficient

SECTION 1 - IS THE SCOPE PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
1.1	Does the project align with proposed design	Y	The project scope aligns with the proposed design of the infrastructure. As noted in the Project Execution Plan, appropriate Project Management systems, for construction design followed during the design, approvals, and construction of the proposed design	Site visit Olive Downs Spur & Balloon Loop, Bridges at 0.733km and 6.507km Bridge Arrangement Plan and Elevation and associated drawing package.	-
1.2	Have there been any additional submissions, requests, or consultations to the QCA that have not been addressed appropriately?	N	All the documents submitted to QCA are accurately listed in SharePoint. Based on the available information, it is confirmed that all required documents have been provided to QCA. Arcadis is not aware of any additional submissions that have not been appropriately addressed as per the information provided.		-
1.3	Is there a reasonable expectation of the demand for capacity to support the project?	Y	Based on the available information, it is confirmed that the design of the Olive Downs Complex Loop and its structural elements has considered future demand and capacity levels. The loop was specifically designed to accommodate 26.5-ton axle load wagons and Goonyella size electric trains. The structural elements were designed to meet a 300LA loading capacity, which aligns with the	Olive Downs Spur & Balloon Loop, Bridges at 0.733km and 6.507km Bridge Arrangement Plan and Elevation and associated drawing package. Olive Downs	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
			appropriate design reference vehicles and ensures the necessary loading capacity for 26.5-ton axle load trains.		

SECTION 2 - IS THE STANDARD PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.1	Does the standard reflect the current demand and likely future capacity levels and type of traffic?	Y	Design and construction of the structures to 300LA ensures the structures will be capable of future load requirements	Dwg AUR-Q-0840-0103	-
2.2	Is the standard consistent with the asset management objectives?	Y	Based on the available information, the project designs were reviewed and approved by a Registered Professional Engineer of Queensland (RPEQ) before construction, aligning with Aurizon standard specifications. These approved standards are recognized as industry-leading practice to achieve an optimized and balanced whole-of-life outcome. Consequently, the standard is consistent with the asset management objectives and appears to align with Aurizon Asset Management Policy. Furthermore, the civil and track works meet the requirements outlined in the scoping and SRS, demonstrating consistency with the asset management objectives. Approved asset lives for bridges is 100 years and culverts 50 years	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC's Dwg AUR-Q-0840-0103 Site observations	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.3	Is the standard consistent with the requirements of established Rail Industry and Aurizon Standard Civil Specifications s?	Y	From the available information, it is noted that the project designs were adequately reviewed and approved by Registered Professional Engineer of Queensland (RPEQ) before construction and consistent with Aurizon standard specifications. Design aligns with AS 5100-2017 AS/NZS, 1170.2 and Aurizon Bridge Design Criteria	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC's Dwg AUR-Q-0840-0103 Site observations	-
2.4	Is the standard of works consistent with having regard for the requirements of Australian design and construction standards (including RPEQ or equivalent sign off)? If not, have the appropriate risk assessments and verification processes been implemented in the development of the standard	Y	The project designs were reviewed and approved by a Registered Professional Engineer of Queensland (RPEQ) before construction, ensuring consistency with Aurizon standard specifications. The projects were delivered in compliance with the requirements of the Rail Safety National Law (RSNL) and the National Rail Safety Regulator (ONSR). Aurizon's objective to construct the works safely and with minimal environmental harm was achieved. Aurizon actively participated in key certification stages during the scoping and design process, making a significant contribution to the project delivery. Australian Standards were strictly adhered to throughout the design phase.	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC's Dwg AUR-Q-0840-0103 Site observations CP6001 - Approved Tender List Authorisation Construction Management Plan	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.5	Is the standard consistent with the operational requirements and other as per discussions with or submission by stakeholders?	Y	From the information provided, the standard and level of works applied is consistent with operational requirements in that it is deemed necessary to ensure a reliable and safe operational railway.	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC's Dwg AUR-Q-0840-0103 Site observations	-

SECTION 3 - IS THE COST PRUDENT AND EFFICIENT

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
3.1	Was the project managed effectively with regards to the customer, economic and safety, environmental and sustainability requirements and considerations?	Y	From the information provided the structure works appear to have been effectively managed across all fronts, including customer satisfaction, economic viability, safety, and sustainability. The information provided on the project demonstrated adequacy in scope definition and change request documentation	Scope of Works Pembroke Olive Downs Project Works Package: C024 Rail Package Civil Works 22nd March 2022	-
3.2	Was the project managed effectively with regards to schedule and cost	Y	Based on the available information, the following observations can be made: - The scope of works and change request documents contained sufficient information. - Practical completion was successfully achieved within the scheduled timeframe, with all stage gates and budget remaining within the approved estimate. The cost breakdown for the bridges amounted to $5,865,338 and for the concrete culverts $7,834,875. These costs align reasonably with similar works during the pandemic period, as benchmarked using professional experience and the Arcadis IDC Construction Costs Report.	Asset Cost Breakdown Update (version 1) Scope of work documents: Olive Downs Spur and Loop Schematic (for construction) EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
3.3	Was the minimization of whole of life costs considered adequately and other principles defined in the strategic asset management plan?	Y	The track and civil works appear to have been designed and constructed to minimise whole of life costs.	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC's Dwg AUR-Q-0840-0103 Site observations	-
3.4	Was a reasonable procurement methodology and cost competitive procurement process used to select and complete the project?	Y	The contract works, including the procurement of structural elements, were conducted through an open tender process, indicating a competitive procurement approach. Based on the information provided, the process was carried out in accordance with the necessary probity and competitive requirements.	CP6001 - Approved Tender List Authorisation	-
3.5	Do the cost elements of the project benchmark reasonably relative to the scale, nature, cost and complexity of the project?	Y	The track and civil works demonstrate a reasonable alignment with the scale and nature of the project, taking into account the volatility experienced over the past four years. According to the Arcadis Industry Construction Costs annual report, material costs witnessed significant increases (ranging from 28% to 35%) during the pandemic period, further compounded by regulatory challenges in project execution. Considering these circumstances, the cost elements benchmark reasonably well. Additionally, when comparing the bridge and culvert	Asset Cost Breakdown Update (version 1)	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
			costs to similar projects undertaken in recent years, they align favourably. -		
3.6	Have the works been scheduled and staged to minimise disruption to the operation of users?	Y	The structural works, along with the civil and other works, were executed with minimal disruption to Aurizon and its customers. As the construction works were greenfield in nature outside the Aurizon corridor, there were no reported disruptions to rail users. However, these works did involve crossings over multiple public and private roads. Adequate quality and safety measures were implemented at these locations to ensure the smooth execution of the work.	Scope of Works Pembroke Olive Downs Project Works Package: C024 Rail Package Civil Works 22nd March 2022 - Construction Management Plan, Project Execution Plan	-

PEMBROKE (CAPEX) – SIGNALLING ASSESSMENT

The following provides detail of the prudency assessment for Pembroke's capital expenditure:

ASSESSMENT SUMMARY

In accordance with clause 6.3.2, Schedule E of the Aurizon Network The 2017 Undertaking (UT5), was there sufficient demonstration of prudency and efficiency to satisfy:	Prudency of Scope	✓
	Prudency of Standard	✓
	Prudency of Cost	✓
Capital Expenditure Claim (total)		125,177,289
Impact of findings on Claim		-
TOTAL ACCEPTED		125,177,289

Check list	Documentation Type	Name of document
Essential documents		
Y	Project Management Plan	Project Execution Strategy
Y	Breakdown of costs	Asset Cost Breakdown Update
Y	Business Case Justification (IAR)	Bankable Feasibility Study
Y	Commissioning data and completion, acceptance, and handover validations.	Civil and track drawings Bridges Structures Drawings
Y	Completion report	Level Crossing upgrade/installation signed checklist Rail signed completion report
	Other documents	SRS

Details	
Project Name	Olive Downs Rail Loop
Project Type	Prudency Assessment
Pre-Approval	N/A
Asset Description	Rail loop that connects into Goonyella Network
Location(s)	Olive Downs
Expenditure Claimed	125,177,290

PROJECT OVERVIEW

Scope

Signalling Works:

1) Specific sites are:

Signalling Installation, test and commissioning activities will be conducted at the following sites (including approximate locations and limits of works)

- Goonyella System - 23.950km to the 31.200km;
- Olive Downs Junction (OJ) - new main line Junction Station (SER -27.428km);
- Winchester (WR) - existing adjacent station; and
- Red Mountain (RM) - existing adjacent station.

2) Enabling Works: Optical Fibre Relocation

The following staging and/or commissioning activities have been considered when developing the scope of works and estimate for this project;

- Construction Turnout Simple Detection implementation to UTC
- Connecting Rail Infrastructure commissioning;
- Private Rail Infrastructure commissioning.

3) Signalling works will include the supply, installation and testing of the following:

SER's, Huts & Locations Cases (Locs):

- New Olive Downs Junction SER/CER/PER - Westrace Mk2 Processor Based Interlocking (PBI)
- Relay and signalling cable termination racks
- Frauscher axle counter evaluator
- Standby alternator and UPS
- Signalling battery banks.

4) Existing Winchester SER Modifications - Interlocking wiring and data modifications and installation of new Frauscher axle counter equipment for interface to the new Olive Downs connecting rail infrastructure;

5) Existing Red Mountain SER Modifications - Interlocking wiring modifications and Frauscher axle counter data update for interface to the new Olive Downs Connecting Rail Infrastructure;

6) One new level Crossing hut;

7) Four new location cases;

8) Removal of eight redundant location cases;

9) New Central Metering Point (CMP); and

10) Active level crossing protection half booms and flashing lights: Winchester Downs Quarry Access Rd;

11) Signals:

- Six new LED signals
- Relocate one signal (install new, remove redundant): RM27P
- Modify controls for WR14P signal.

12) Points:

New 1:25 SNX turnout with asymmetrical switch controlled using electric hydraulic points motors.

13) Tracks:

The existing Winchester to Red Mountain Frauscher axle counter block section track circuit will be modified to facilitate the new Olive Downs Connecting Rail Infrastructure as follows:

- Olive Downs Junction: Install New Frauscher evaluator and eight new counting points;
- Winchester: Modify existing Frauscher evaluator and install one additional counting point;
- Red Mountain - Modify existing Frauscher evaluator and install one additional counting point;

These changes will enable the addition of the following axle counter tracks: -

- Olive Downs: 7x new tracks;
- Winchester: 2x new track;

- Red Mountain: 2x new track; and
- Eight existing frequency track circuits will become redundant and will be removed.

14) Main and Local cabling:

- 7,700m of main and local direct buried cable route;
- 825m of ducted cable route;
- 3,210m of cable hauling:
- 9x under road / rail bores;
- Isaac River under bore - 250m;
- Approximately 6,520m of power cables;
- Approximately 14,160m of signalling cables; and
- Approximately 8560m of optic fibre cables.

15) Misc. Equipment:

Relocation of existing mainlLine Dragging Equipment Detector (DED), associated equipment housing and radio Link; and Install new Dragging Equipment Detector on spur line to Olive Downs balloon.

On site findings and other considerations

Completion Summary

In this section the assessment of prudency and efficiency of the scope, standard and cost of capital works is summarised. The summary is split into three sub-sections addressing each area assessed. Namely:

- **Section 1** considers whether the **scope** prudent and efficient,
- **Section 2** considers whether the **standard** is prudent and efficient, and finally
- **Section 3** considered whether the **cost** is prudent and efficient

SECTION 1 - IS THE SCOPE PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
1.1	Does the project align with proposed design	Y	The project scope aligns with the proposed design of the infrastructure. As noted in the Quality Management Plan, appropriate Project Management systems followed during the design, approvals, and construction of the proposed design	Olive Downs Spur and Loop Schematic (for construction) EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) Connecting Infra scope of works	-
1.2	Have there been any additional submissions, requests, or consultations to the QCA that have not been addressed appropriately?	Y	All the documents provided to QCA are listed in SharePoint. From the available information, it is noted that the sufficient documents have been submitted to QCA		-
1.3	Is there a reasonable expectation of the demand for capacity to support the project?	Y	From the available information, it is noted that the future demand and capacity levels have been taken into account the Olive Downs Complex Loop and connecting infrastructure was designed for 26.5 tal wagons and Goonyella size electric trains.	Olive Downs Complex – Private Connecting Infrastructure Application: Olive Downs Rail Loop December 2023	-

SECTION 2 - IS THE STANDARD PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.1	Does the standard reflect the current demand and likely future capacity levels and type of traffic?	Y	From the available information, it is noted that the future demand and capacity levels have been taken into account.	Olive Downs Complex – Private Connecting Infrastructure Application: Olive Downs Rail Loop December 2023	-
2.2	Is the standard consistent with the asset management objectives?	Y	From the available information, it is noted that the project designs were adequately reviewed and approved by Registered Professional Engineer of Queensland (RPEQ) before construction. The applied standard of works aligns with the general rail industry standards, which by the nature of being an approved standard are considered industry leading practice to achieve an optimised and balanced whole of life outcomes.	Olive Downs Spur and Loop Schematic (for construction) EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	-
2.3	Is the standard consistent with the requirements of established Rail Industry and Aurizon Standard Civil Specifications s?	Y	From the information provided and visual inspection on site, the standard applied is consistent with established and approved rail standards.	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.4	Is the standard of works consistent with having regard for the requirements of Australian design and construction standards (including RPEQ or equivalent sign off)? If not, have the appropriate risk assessments and verification processes been implemented in the development of the standard	Y	From the available information, it is noted that the project designs and drawings were adequately reviewed and approved by Registered Professional Engineer of Queensland (RPEQ) before construction. It is also noted that the tendering processes for the works generated a competitive outcome and the nature of the works and the costs incurred were reasonable	Olive Downs Spur and Loop Schematic (for construction) EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) CP6001 - Approved Tender List Authorisation	-
2.5	Is the standard consistent with the operational requirements and other as per discussions with or submission by stakeholders?	Y	From the information provided, the standard and level of works applied is consistent with operational requirements in that it is deemed necessary to ensure a reliable and safe operational railway. The specific operational requirements are defined in the SRS	Olive Downs Spur and Loop Schematic (for construction) EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	-

SECTION 3 - IS THE COST PRUDENT AND EFFICIENT

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
3.1	Was the project managed effectively with regards to the customer, economic and safety, environmental and sustainability requirements and considerations?	Y	From the available information, the following is noted. • Adequate information was included in the scope of works and change request documents	Scope of Works Pembroke Olive Downs Project Works Package: C024 Rail Package Civil Works 22nd March 2022	-
3.2	Was the project managed effectively with regards to schedule and cost	Y	From the available information, the following is noted. • Adequate information was included in the scope of works and change request documents • Practical completion was achieved within schedule, with all stage gates and budget within approved estimate	Asset Cost Breakdown Update (version 1) Scope of work documents: Olive Downs Spur and Loop Schematic (for construction) EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	-
3.3	Was the minimization of whole of life costs considered adequately and other principles defined in the strategic asset management plan?	Y	From the information provided, achieving the benefits/outcomes by completing this project would result in minimised whole of life costs. Items include the use of axle counters and LED signals		-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
3.4	Was a reasonable procurement methodology and cost competitive procurement process used to select and complete the project?	Y	Connection works to the Aurizon network on the South Goonyella Branchline line was carried out by Aurizon under a separate agreement/contract. Apart from the connection works, all the other works were undertaken via an open tender. From the available information, it is note that adequate information was included in the scope of works and change request documents.	CP6001 - Approved Tender List Authorisation	-
3.5	Do the cost elements of the project benchmark reasonably relative to the scale, nature, cost and complexity of the project?	Y	Connection works to the Aurizon network on the South Goonyella Branchline was carried out by Aurizon under a separate agreement/contract. Apart from the connection works, all the other works were undertaken via an open tender. From the available information, it is note that adequate information was included in the scope of works and change request documents. -		-
3.6	Have the works been scheduled and staged to minimise disruption to the operation of users?	Y	Connection works to the Aurizon network on the South Goonyella Branchline was carried out by Aurizon under a separate agreement/contract.	-	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
			All the construction works outside the Aurizon corridor were greenfield in nature hence no disruptions to rail users were noted. However, these works cross multiple public and private roads where adequate quality and safety measures were undertaken to carry out the work at those locations.		

PEMBROKE (CAPEX) – POWER ASSESSMENT

The following provides detail of the prudency assessment for Pembroke's capital expenditure:

ASSESSMENT SUMMARY

In accordance with clause 6.3.2, Schedule E of the Aurizon Network The 2017 Undertaking (UT5), was there sufficient demonstration of prudency and efficiency to satisfy:	Prudency of Scope	✓
	Prudency of Standard	✓
	Prudency of Cost	✓
Capital Expenditure Claim (total)		125,177,289
Impact of findings on Claim		-
TOTAL ACCEPTED		125,177,289

Check list	Documentation Type	Name of document
Essential documents		
Y	Project Management Plan	Project Execution Strategy
Y	Breakdown of costs	Asset Cost Breakdown Update
Y	Business Case Justification (IAR)	Bankable Feasibility Study
Y	Commissioning data and completion, acceptance, and handover validations.	Civil and track drawings Bridges Structures Drawings
Y	Completion report	Level Crossing upgrade/installation signed checklist Rail signed completion report
	Other documents	SRS

Details	
Project Name	Olive Downs Rail Loop
Project Type	Prudency Assessment
Pre-Approval	N/A
Asset Description	Rail loop that connects into Goonyella Network
Location(s)	Olive Downs
Expenditure Claimed	125,177,290

PROJECT OVERVIEW

Scope

Establishment of the narrow gauge Olive Downs Spur and Balloon Loop included:

- Establishment of Private Rail Infrastructure (PRI) – the spur and loop track works
- Establishment of Connecting Rail Infrastructure (CRI) – for connection of the spur to the existing Norwich Park Branch Line, being part of the Aurizon Network Central Queensland Coal Network (CQCN).

Electrification of the Olive Downs Spur and Balloon Loop was undertaken as a variation to the original project scope of works.

While limited detail was provided on the electrification works, it is understood to include:

- Establishment of 25 kV ac Overhead Line Equipment (OHLE) for the 18.8 km total single track rail length (including 12 km spur and 6.8 km loop lengths)
- Interconnection to the existing Norwich Park Branch Line OHLE

Consistent with similar rail infrastructure projects in the CQCN, OHLE was understood to be designed and constructed in close adherence to Aurizon Network requirements.

On site findings and other considerations

Site observations supported the understanding that the OHLE was designed and constructed in close adherence to Aurizon Network requirements.

Completion Summary

In this section the assessment of prudency and efficiency of the scope, standard and cost of capital works is summarised. The summary is split into three sub-sections addressing each area assessed. Namely:

- **Section 1** considers whether the **scope** prudent and efficient,
- **Section 2** considers whether the **standard** is prudent and efficient, and finally
- **Section 3** considered whether the **cost** is prudent and efficient

SECTION 1 - IS THE SCOPE PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
1.1	Does the project align with proposed design	Y	The project scope aligns with the proposed design of the infrastructure.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-
1.2	Have there been any additional submissions, requests, or consultations to the QCA that have not been addressed appropriately?	Y	From the available information, it is noted that the sufficient documents have been submitted to QCA		-
1.3	Is there a reasonable expectation of the demand for capacity to support the project?	Y	From the available information, it is noted that the future demand and capacity levels have been taken into account.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-

SECTION 2 - IS THE STANDARD PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.1	Does the standard reflect the current demand and likely future capacity levels and type of traffic?	Y	From the available information, it is noted that the future demand and capacity levels have been taken into account. This is consistent with the Aurizon Network SRS procedures.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-
2.2	Is the standard consistent with the asset management objectives?	Y	From the available information, it is noted that the OHLE was designed and constructed in accordance with Aurizon Network requirements.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-
2.3	Is the standard consistent with the requirements of established Rail Industry and Aurizon Standard Civil Specifications s?	Y	From the available information, it is noted that the OHLE was designed and constructed in accordance with Aurizon Network requirements.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-
2.4	Is the standard of works consistent with having regard for the requirements of Australian design and construction standards (including RPEQ or equivalent sign off)? If not, have the appropriate risk assessments and verification processes been implemented in the development of the standard	Y	From the available information, it is noted that the OHLE was designed and constructed in accordance with Aurizon Network requirements, which includes conformance to applicable Australian design and construction standards.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.5	Is the standard consistent with the operational requirements and other as per discussions with or submission by stakeholders?	Y	From the available information, it is noted that the OHLE was designed and constructed in accordance with Aurizon Network requirements.	- OLIVE DOWNS SPUR & BALLOON LOOP drawing set AUR-Q-0840-nnnn - Site observations	-

SECTION 3 - IS THE COST PRUDENT AND EFFICIENT

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
3.1	Was the project managed effectively with regards to the customer, economic and safety, environmental and sustainability requirements and considerations?	Y	The available information did not allow assessment of this question in the context of OHLE. However, it is understood from other assessor's comments that the overall project was managed effectively.		-
3.2	Was the project managed effectively with regards to schedule and cost	Y	The available information did not allow assessment of this question in the context of OHLE, particularly with a lack of breakdown of the single cost for OHLE works. However, the delivered cost is consistent with industry expectations for works of this nature.	ASSET COST BREAKDOWN UPDATE (version 1)	-
3.3	Was the minimization of whole of life costs considered adequately and other principles defined in the strategic asset management plan?	Y	From the available information, it is noted that the OHLE was designed and constructed in accordance with Aurizon Network requirements.		-
3.4	Was a reasonable procurement methodology and cost competitive procurement process	Y	The available information did not allow assessment of this question in the context of OHLE. However, the delivered cost is consistent with industry expectations for works of this nature.	ASSET COST BREAKDOWN UPDATE (version 1)	-

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
	used to select and complete the project?				
3.5	Do the cost elements of the project benchmark reasonably relative to the scale, nature, cost and complexity of the project?	Y	The delivered cost is consistent with industry expectations for works of this nature.	ASSET COST BREAKDOWN UPDATE (version 1)	-
3.6	Have the works been scheduled and staged to minimise disruption to the operation of users?	Y	The available information did not allow assessment of this question in the context of OHLE.		-

PEMBROKE (CAPEX) – CIVIL AND TRACK ASSESSMENT

The following provides detail of the prudency assessment for Pembroke's capital expenditure:

ASSESSMENT SUMMARY

In accordance with clause 6.3.2, Schedule E of the Aurizon Network The 2017 Undertaking (UT5), was there sufficient demonstration of prudency and efficiency to satisfy:	Prudency of Scope	✓
	Prudency of Standard	✓
	Prudency of Cost	✓
Capital Expenditure Claim (total)		125,177,289
Impact of findings on Claim		-
TOTAL ACCEPTED		125,177,289

Check list	Documentation Type	Name of document
Essential documents		
Y	Project Management Plan	Project Execution Strategy
Y	Breakdown of costs	Asset Cost Breakdown Update
Y	Business Case Justification (IAR)	Bankable Feasibility Study
Y	Commissioning data and completion, acceptance, and handover validations.	Civil and track drawings Bridges Structures Drawings
Y	Completion report	Level Crossing upgrade/installation signed checklist Rail signed completion report
	Other documents	SRS

Details	
Project Name	Olive Downs Rail Loop
Project Type	Prudency Assessment
Pre-Approval	N/A
Asset Description	Rail loop that connects into Goonyella Network
Location(s)	Olive Downs
Expenditure Claimed	125,177,290

PROJECT OVERVIEW

Scope

Track and civil works

- 15 mtpa serviced by a single track bi-directional spur and a single track uni-directional loop (with provision for reverse shunting) plus bad order siding at the TLO
- 60kg/m rail and 28 TAL sleepers. The reduced sleeper spacing locations were identified on site with signs to assist maintainers.
- 300mm minimum ballast depth below sleepers.
- The BOS buffer was observed to have a clear zone between it and the TLO
- Fencing placed on both sides of the track in order to deter larger wildlife, whilst not impinging on the movement of smaller species.

Crossings

- A notable number of crossings for the length of the spur and loop, indicating a robust level of negotiation with affected landowners.
- The use of underpasses is a positive indication of an intent to minimise interactions with train traffic
- Stock crossings were provided with an optimised number of fences, gates and grids to permit the stock owner to facilitate crossings as simply as possible.
- Rubber flangeways were specified and also observed on site

Structures

- Relieving slabs and splay-rails have been specified at bridges
- Bridge piles are consistent across structures, bringing efficiency in construction and maintenance
- Bridges and drainage structures are 300LA consistent with the SRS
- Stairs and landings with handrails have been installed to permit access to the track from the bottom of the bridge abutment.
- No provision has been made to access the bridge bearings for inspection.
- Ballast mats are specified on bridge girders
- Electrical bonding is evident across the handrails on both the access stairs and the bridge handrails. They appear to be bonded back to the OHLE masts
- Abutment drainage has been facilitated with a good number of weep-holes in both the transverse and longitudinal shotcrete faces. Frog-flaps are fitted to the outlets of the weep-holes.

RMAR

- The RMAR's have dedicated drainage and are typically Type 2.
- Where they cross the outlets of transverse track drainage, it is done with a 60mm deep GRP causeway.

Design Considerations

- AZJ Standard drawings were stipulated
- Type Approval of new products was by AZJ
- AZJ undertook the 50% and detail design, ensuring design consistency.
- RPEQ certification was by experienced AZJ employees familiar with the CQCN requirements and these signatories appear to have been involved throughout the entire design process.
- The SRS was reviewed by a significant number of AZJ stakeholders
- A large number of design drawings is a positive sign of quality communication. It shows an intent to transmit the most information clearly, without making drawings cluttered or omitting information due to space constraints
- No assets of an exotic nature could be identified
- A wagon profiler was specified and also observed on site
- A DED was specified in the SRS (position to be confirmed) and observed on site immediately up-chain of the TLO
- Crew change pads were mentioned in the SRS but were not able to be observed on site.
- RCBC sizes were optimised by variation, which will lead to maintenance efficiencies over their lifespan.
- Five conforming tenders were considered from quality contractors.
- The use of Jukes Todd, a competent and respected advisory service (later acquired by Turner & Townsend)

On site findings and other considerations

A summary of on-site findings include:

1. For obvious reasons, an air-gap has been provided in the OHLE at the TLO. It was noted that no air-gap was provided at the Winchester Downs Quarry Access Road Crossing CH0.480km. Instead, the OHLE was raised. It was suggested the height indicator on this crossing is incorrect. The SRS suggests a Type 1 road train of 4.3m maximum height. The signage should be checked and corrected if found to be inaccurate.
2. At the outlet of transverse track drainage (e.g. CH8.210km) some erosion on the downstream toe of the GRP apron was observed. This was evidenced by the toe of the apron being exposed. With sufficient time and flow, it is likely the apron will eventually be undermined due to the transportation of material from beneath it. This will impact the integrity of the apron, particularly when subjected to vehicle loadings. Possible remedies include extending the GRP apron further downstream or placing geotextiles and rock-pitching downstream.
3. The frog-flaps fitted to the transverse weep-holes on the bridge abutments may experience damage due to debris, in high-flow scenarios. The condition of these outlets should be monitored for damage and potential blockage over time to avoid a build-up of hydrostatic pressure in the abutments.
4. Beneath the bridge spans, rock armour has been placed around the abutments and some of the piers but not all piers appeared to be fully armoured. The spillways between the piers are also unarmoured. To avoid long-term erosion and silt issues, it may be prudent to place geotextiles and rock in these areas, whilst it is still readily available locally.
5. It was interesting to note the OHLE mast attached directly to the side of the headstock of the bridge at CH0.730km. An alternative solution of the mast on its own pier placed directly in the bed of the waterway would presumably be cost prohibitive.
6. In the zone between the BOS buffer and the TLO, a chamber was observed indicating buried services were present. It is important that any maintenance activities or future assets remain outside this zone.

Other considerations include:

1. The 1 in 16 RH tangential turnout at CH12.044km appears to direct loaded trains over the diverge leg. Whether this will give rise to long term maintenance issues is unclear. In practice any design speed limitations imposed due to a diverge movement are unlikely to be realised because of the anticipated traffic speeds.
2. Some inconsistencies in design lives and also in design speeds were identified between the Bankable Feasibility Study (BFS) and the SRS
3. It was noted that the temporary access road impacts upon the original design intent of the permanent railway assets. Once the permanent access road is constructed, the temporary access road is to be removed and remediated to the original design intent.

Completion Summary

In this section the assessment of prudency and efficiency of the scope, standard and cost of capital works is summarised. The summary is split into three sub-sections addressing each area assessed. Namely:

- **Section 1** considers whether the **scope** prudent and efficient,
- **Section 2** considers whether the **standard** is prudent and efficient, and finally
- **Section 3** considered whether the **cost** is prudent and efficient

SECTION 1 - IS THE SCOPE PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
1.1	Does the project align with proposed design	Y	The project aligns with the proposed design	Rail Civil SOW and Contract Price Connecting Infra scope of works EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC drawings Site observations	
1.2	Have there been any additional submissions, requests, or consultations to the QCA that have not been addressed appropriately?	Y	All the documents provided to QCA are listed in SharePoint. From the available information, it is noted that the sufficient documents have been submitted to QCA	-	
1.3	Is there a reasonable expectation of the demand for capacity to support the project?	Y	The track and civil works appear to have been designed and delivered with future-proofing requirements included.	Connecting Infra scope of works EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) Site observations	

SECTION 2 - IS THE STANDARD PRUDENT AND EFFICIENT?

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
2.1	Does the standard reflect the current demand and likely future capacity levels and type of traffic?	Y	The civil & track works appear to be adequate to meet the current and future capacities.	Rail Civil SOW and Contract Price Connecting Infra scope of works EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC drawings Site observations	
2.2	Is the standard consistent with the asset management objectives?	Y	The civil and track works appear to be of a standard consistent with the asset management objectives. They are consistent with the scoping and SRS requirements.	Connecting Infra scope of works Rail Civil SOW and Contract Price EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	
2.3	Is the standard consistent with the requirements of established Rail Industry and Aurizon Standard Civil Specifications s?	Y	The standard appears to be consistent with Aurizon and industry standard civil specifications	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) Connecting Infra scope of works IFC's Site observations	
2.4	Is the standard of works consistent with having regard for the requirements of Australian design and construction standards (including RPEQ or equivalent sign off)? If not, have the appropriate risk assessments and	Y	Aurizon made a significant contribution to the project delivery including key certification stages in the scoping and design process. Australian Standards have been stipulated throughout the design.	EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) IFC's	

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
	verification processes been implemented in the development of the standard				
2.5	Is the standard consistent with the operational requirements and other as per discussions with or submission by stakeholders?	Y	The civil and track works appear to be of a standard consistent with operational requirements. Stakeholder consultation appears to have been extensive and effective.	IFC's EF00082 Olive Downs PRI_Variations Register EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) Site observations	

SECTION 3 - IS THE COST PRUDENT AND EFFICIENT

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
3.1	Was the project managed effectively with regards to the customer, economic and safety, environmental and sustainability requirements and considerations?	Y	The civil and track works appear to have been managed effectively in all regards.	Rail Civil SOW and Contract Price Connecting Infra scope of works EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) Asset Cost Breakdown Update (version 1)	
3.2	Was the project managed effectively with regards to schedule and cost	Y	The track and civil works appear to have been managed effectively, designed to a nominal standard without excess and delivered with an intent to optimise. Although some temporary works costs may seem higher than expected, it is noteworthy to be reminded this project was delivered during a pandemic.	EF00082 Olive Downs PRI_Variations Register Rail Civil SOW and Contract Price Connecting Infra scope of works EF00082_Olive Downs PRI_SRS_(v1.0_Authorised)	
3.3	Was the minimization of whole of life costs considered adequately and other principles defined in the strategic asset management plan?	Y	The track and civil works appear to have been designed and constructed to minimise whole of life costs.	Asset Cost Breakdown Update (version 1) Rail Civil SOW and Contract Price Connecting Infra scope of works EF00082_Olive Downs PRI_SRS_(v1.0_Authorised) Site observations	
3.4	Was a reasonable procurement methodology and cost competitive	Y	The track and civil works appear to have been procured in a reasonable manner.	Asset Cost Breakdown Update (version 1) CP6001 - Approved Tender List Authorisation	

Item No.	Question	Response (Y/N)	Comments/Findings	Source	Impact to claim
	procurement process used to select and complete the project?				
3.5	Do the cost elements of the project benchmark reasonably relative to the scale, nature, cost and complexity of the project?	Y	Track and civil works appear to benchmark reasonably well to the scale and nature of the works, considering the volatility over the past four years.	Asset Cost Breakdown Update (version 1) Site observations	
3.6	Have the works been scheduled and staged to minimise disruption to the operation of users?	Y	Track and civil works appear to have minimised disruption to Aurizon and it's customers.	Connecting Infra diagrams Connecting Infra scope of works Site observations	

B. RFI REGISTER

RFI #	Project Reference (i.e. Document name or reference)	Type of RFI D=Document request Q= Information	Request		Submitted date	Submitted by:	Pembroke Response		RFI Status and Close out details	
			Documents Requested/Query	Reasoning			Date	Comment	Close out Date	Comment
1			Drawings or a description of the 2 No. PSC bridges installed including substructure and superstructure	To gain a better understanding of the installed assets	29/1/24	Bryan Mower	5/02/2024	AUR-Q-0840 - Bridges Structures IFC complete - added to the data file	2/09/2024	closed by BM
2			Drawings or a description of the sleeper types and spacing	To gain a better understanding of the installed assets	29/1/24	Bryan Mower	5/02/2024	Description on Page 11 of System Requirements	2/09/2024	closed by BM
3			Drawings or a description of the formation, width, depth, material, any geosynthetics and if available, the volumes	To gain a better understanding of the installed assets	29/1/24	Bryan Mower	5/02/2024	Description on Page 14 of System Requirements	2/09/2024	closed by BM
4			Describe the turnout connecting to the Aurizon network	To gain a better understanding of the installed assets	29/1/24	Bryan Mower	5/02/2024	Connecting infra diagrams and scope of works added to data file	2/06/2024	closed by BM
5			Drawings or a description of the RMAR and any significant infrastructure	To gain a better understanding of the installed assets	29/1/24	Bryan Mower	5/02/2024	Description on Page 16 of System Requirements	2/09/2024	closed by BM
6			Were any significant temporary works required that contributed to the cost (e.g. turkey nests, large borrow pits, major haul routes)	To gain a better understanding of the scope of works and basis of costing	31/1/24	Bryan Mower	5/02/2024	No. To be disussed site visit		
7			Confirmation that the Olive Downs loop will be electrified as per private connecting infrastructure application of December 2023, and not deferred as per other earlier documentation	To gain a better understanding of the scope of works and basis of costing	31/01/2024	Peter Hogan	5/02/2024	The spur and loop were fully electrified and operational by 15th Decemebr 2023. See electrical infrastructure on the system requirment diagrams	27/02/2024	closed
8			Drawings or a description of the OHLE equipment and structures associated with the Olive Downs loop	To gain a better understanding of the scope of works and basis of costing	31/01/2024	Peter Hogan	5/02/2024	PRI Civil e.g. page 4.	27/02/2024	closed
9			Project Management Plan or other documentation which provides information on establishment and management of budget and schedule baselines.		1/02/2024	Clara Owen			27/02/2024	closed
10			Handover documentation/Test Reports (random selection)		2/02/2024	Clara Owen			27/02/2024	closed
11			A copy of the EIS and Appendices	To gain an understanding of assessed impacts and measures to mitigate / avoid assessed impacts.	30/01/2024	Clement McAteer	5/02/2024	All EIS docuuments are available at https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/completed-projects/olive-downs-project/eis-documents	27/02/2024	closed
12			Business case/investment justification		27/02/2024	Vidhya Thayananthan			28/02/2024	closed
13			Further breakdown of Private Infrastructure tab costs which sum to $123.7m. You have provided the PRI amount of $60m in the asset cost breakdown file (tab PMT Cert Aug 2023). We would like to understand what the remaining $63.7m is built up of/how the $60m from the PMT cert tab ties in to the Private Infrastructure tab.		27/02/2024	Vidhya Thayananthan			5/03/2024	Closed - updated breakdown provided
14			For the executiong of OHLE works, how were the contractors sourced, who won it, what was the bidding process, a breakdown of the cost (at least of materials, labour, project management).		27/02/2024	Peter Hogan			5/03/2024	closed

C. LIST OF DOCUMENTS PROVIDED

The following is a list of all documents provided by Pembroke for this assessment:

Initial submission

- Olive Downs Complex – Private Connecting Infrastructure Application: Olive Downs Rail Loop
- Project plan and budget – annexure A
- Olive Downs Spur and Loop Location
- Olive Downs Spur and Loop Schematic
- Connection Infrastructure Diagrams

Civil Works Management Plans

- Issue for construction (IFC) drawings
- Construction Management Plan
- Project Execution Plan
- Inclusion and Diversity Plan
- Project Emergency Response Plan
- Safety and Health Management Plan
- Traffic Management Plan
- Community and Stakeholder Engagement Plan
- Quality Management Plan

Scope of works and standard documents

- PRI Civil package Management Team
- System Requirements Specification (SRS)
- Bankable Feasibility Study
- Project Execution Strategy

Cost documents

- Asset Cost Breakdown Update (version 2)
- Approved Tender List Authorisation
- Olive Downs PRI Variations Register
- Rail Civil Scope of Works and Contract Price

Environment documents

- Reponses to submissions received on draft EIS – Appendix A
- Environmental Management Plan
- Impact avoidance and minimisation
- Proponents commitments

Quality Assurance

- Level Crossing QA
- Rail Re-stress QA
- Turnout QA

ARCADIS Design & Consultancy for natural and built assets

IMPROVING QUALITY OF LIFE.