

BHP Jimblebar Beneficiation Plant Commissioning Management Plan

7741-A-85070-VD-00034_2
COPP21180-PLN-G-018
Revision 0

28 October 2024

ISSUE	DATE	ISSUE DETAILS	AUTHOR	CHECKED	APPROVED
0	28/10/2024	Issued for Use			

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Table of Holds:

Section(s)	Hold Point Description	Timeframe for removal
4.1.2	High voltage power scope definition to be completed by Engineering.	November 2024
4.1.4	132kV Switchyard expansion scope definition to be completed by Engineering.	November 2024
19.3.2	Update section to detail how moisture will be handled in stockyard once Engineering completes drainage design and provides direction on reclaim strategy.	January 2025
23	Update with Jimblebar Beneficiation Project Change Management Procedure document number.	January 2025
27.2	Purchasing of spares on hold until agreement is defined.	January 2025
30.2	Add document number for Performance Test procedure	January 2025
Appendix A	Update with final RACI table once items marked "TBC" are confirmed.	January 2025

1. Introduction

The Commissioning Management Plan, together with the documents it references, defines how Commissioning will be managed on the project. It complies with the phase requirements of the Major Capital Projects Group Level Document and defines outputs that comply with the requirements of the Investment Process Group Level Document.

The project execution strategy is based on a staged Engineering, Procurement and Construction Management contract (EPCM) for Process and Non-Process infrastructure. Commissioning requirements through each of these separable portions has been broken out throughout this document.

The Commissioning of the Process Facilities will be led by the EPCM Commissioning team as the responsible party to complete stages 2 to 4 of the four stage completions framework. A 3rd party specialist commissioning contractor as agreed between Company and EPCM will be engaged to support the EPCM with the specialist craft labour required to execute this SOW. This approach will incorporate a small BHP Commissioning Owners Team to provide onsite support and governance with specific focus on Tie-in points and integration into the existing Jimblebar facilities.

At the completion of Stage 3 load commissioning works which is defined by the completion of First Production, an End of Startup Certificate (ESC) will be signed by the Project and site operations team. This will allow operations to commence daily operations and maintenance activities. The EPCM will manage Stage 4 Ramp up activities that will conclude with the successful completion of the Performance Test after the plant has reached stable operations at or above 80% of nameplate. Care, Custody and Control (CCC) of the processing facility will be transferred to the Operations team at the completion of the performance test, when all required deliverables have been reviewed approved.

Final Acceptance Certificate (FAC) will be processed once all deliverables are complete which is expected to be within 3 months of Performance Test

The Commissioning Management Plan is a living document and is regularly reviewed and maintained via the project's change management processes.

Note – This document was formerly numbered 77-PLN-00013. This number was superseded by COPP21180-PLN-G-018 mid-way through DPS when the document ownership was transferred to Calibre.

1.1 Purpose

The purpose of this document is to:

- Define the overall commissioning framework for the JBB Project.
- Addresses key interface points with other Project functions, Contractors and Operations and sets out processes for managing these interfaces.
- Outline key requirements of the handover process
- Provides a clear delineation between work packages and commissioning strategy.

This document should be read in conjunction with the Jimblebar Beneficiation Definition and Execution Phases EPCM Scope of Services SOW-1200-G-12275.

1.2 Plant Overview

The proposed location of the new beneficiation plant is North-East of the existing OHP, approximately 380m East of the existing CV105/106 transfer station, refer to Figure 1-1.

Fines produced by the existing Jimblebar Ore Handling Plant (OHP) is stockpiled by the existing yard conveyor, CV106 before it is loaded onto trains and transported to the Port for export. The original design of the existing transfer station between CV105 and CV106 has considered the height required to divert fines onto a new conveyor to feed the beneficiation plant. The transfer station will require a new chute, diverter gate and supporting infrastructure to support the new equipment.

Four conveyors are required to support the new beneficiation plant, one to feed the beneficiation plant with fines feed from CV105 and the others to return beneficiation products to CV106 which feeds onto the existing stockyard operations.

The wet plant is composed of six identical process streams, each comprising of feed bins, low profile belt feeders, wet sizing screens, deslime cyclones and belt filter dewatering. The plant also includes a bypass bin that allows product to bypass the entire beneficiation process and be fed back to CV106 as unchanged fines product.

The tailings facility includes a single 82m diameter on-ground tailings thickener, thickener underflow pumps, tailings disposal tank and tailings disposal pumps. Tailings can be sent to either Swan or DeGrey pits via an overland pipeline. The tailings storage facilities will include a decant pumping arrangement to allow dewatering back to the Beneficiation plant.

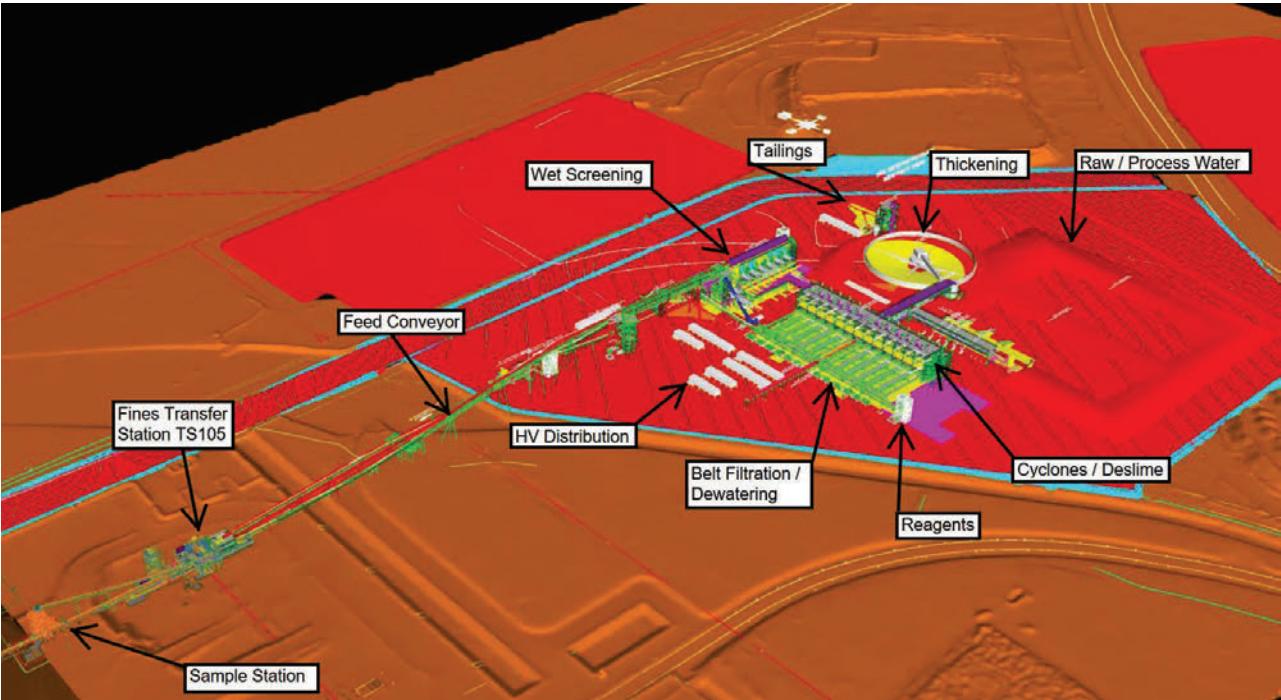


Figure 1-1: Jimblebar Beneficiation Plant Overview

1.3 Structure of the Plan

The document has been developed to expand on the details provided in the JBB Commissioning Execution Strategy. The process requirements of this plan are developed in accordance with MAP Internal Commissioning Standard and the MAP Commissioning External Standard. It aligns with the JBB Project Execution Plan (7731-A-85308-VD-00003) which contains a high level summary of Commissioning activities.

The EPCM will be responsible for the development of the (CEP) COPP21180-PLN-R-001 -JBB Commissioning Execution Plan which will expand on the detail provided in this document. The CEP will provide a detailed roadmap from No Load Commissioning to FAC. The CEP will detail project specific processes, that are aligned with or exceed the requirements of the MAP Commissioning External Standard, and it will then be used as the primary reference document for EPCM commissioning contractors and vendors.

The EPCM Commissioning team will write the project commissioning procedures, inclusive of Stage 0 Factory Acceptance Testing, Stage 1 Construction Verification, Stage 2A Pre Commissioning/Energisation, Stage 2B No Load & Water Commissioning, Stage 3 Startup/Process Commissioning and Stage 4 Ramp Up & Performance Testing requirements. The EPCM will also develop the relevant Control System FAT and Site Commissioning procedures. Collaboration between the EPCM and BHP Technology teams will be required to capture the specific commissioning requirements of the BHP Technology SOW.

All EPCM commissioning procedures and plans will be subject to Company’s approval to ensure alignment with all phases of commissioning and eventual handover to operations.

Table 1-1 to outline key responsibilities across the DPS and execution phases of the project.

Table 1-1: RACI Table

Item	WAMP Commissioning Function	Contractor	Comments
SPS			
Commissioning Execution Strategy	R	I	
Commissioning Handover Strategy	R	I	
Integrated Schedules (Construction, Commissioning & Co-Dependant Project Milestones)	C	R	
Commissioning Sequence	C	R	
Commissioning Estimate	C	R	
Chapter 13 EOP Report	R	C	
DPS			
Commissioning Management Plan (CMP)- L0002	C	R	
Commissioning Handover Plan - L0006	C	R	
Commissioning Execution Plan-L0003	C	R	
List of Commissioning Special Tools-L0004	C	R	
Tie-In Management Plan- L0005	C	R	
Commissioning Sequence and Systemisation (50%)- L0007	C	R	
Level 3 Commissioning Schedule- L0008	C	R	
Asset Tag List-L0009	C	R	
ITR Matrix- L0010	C	R	
RACI-L0013	C	R	
Completions Management Plan- L0014	C	R	
Commissioning Spares List- L0021	C	R	
Performance Testing Plan- L0030	C	R	
Factory Acceptance Test Plan	C	R	
Commissioning class 3 estimate	C	R	
Organisational Chart	C	R	
Factory Acceptance Test Procedure-L0026	C	R	
Ramp up Plan	C	R	
Commissioning Risk Assessment-L0023	C	R	
Execution Documentation			
Commissioning Sequence and Systemisation (50%-100%)- L0007	C	R	
NOE Procedure- L0017	C	R	
Factory Acceptance Test Procedure-L0026	C	R	
Performance Test Procedure- L0031	C	R	

Item	WAMP Commissioning Function	Contractor	Comments
Commissioning Procedures (COMP/COMR)-L0034	C	R	
Commissioning Records (COMRs)-L0032	C	R	
Isolation and Permit Planning	C	R	
Commissioning Work Packs	C	R	
Onsite Engineering Support	C	R	
Stage 5 HSECCOMS	C	R	
Stage 6 HSECCOMS	C	R	
CCMS			
CCMS Administration	C	R	EPCM CCMS
CCMS Systemisation Development	C	R	
CCMS Delineation Drawings	C	R	
CCMS ITR Creation	C	R	Option to utilise Company ITR Templates
CCMS Asset List	C	R	
CCMS Development	C	R	
Digital ITR Strategy	C	R	
CCMS Validation	C	R	
Control System Execution			
Control System Development	C	R	
Control System Site Implementation	C	R	
Construction & Commissioning Phases			
Stage 1 Construction Works	C	R	
Construction Punchlisting	C	R	
Construction Walkdown	C	R	
Stage 2 No Load Commissioning	C	R	
Stage 3 Load Commissioning	C	R	
Stage 4 Ramp Up	C	R	EPCM team responsible - Supported by operations
Performance Test	C	R/A	EPCM accountable for performance test outcome and recording of data. Operations to be in control of Plant, with EPCM providing direction on operating set points.
Commissioning Punch listing	C	R	
Construction Verification (CVC)	C	R	
NOE	C	R	
End of Commissioning Certificate (ECC)	C	R	
End of Start Up Certificate (ESC)	C	R	
Care, Custody and Control Dossiers (CCC)	C	R	

Item	WAMP		Comments
	Commissioning Function	Contractor	
Final Acceptance Certificate (FAC)	C	R	
Redline Drawings	C	R	
Blueline Drawings	C	R	

2. Definitions

2.1 Acronyms & Abbreviations

Acronyms used within this Scope of Services document shall have the meaning given to them by the table below:

Table 2-1: Acronyms and Abbreviations

Abbreviation	Definition
AFC	Approved for Construction
ARM	Active Risk Manager
BEW	Bulk Earth Works
CCC	Care Custody and Control
CCMS	Completions and Commissioning Management System
CCO	Critical Control Observation
CCTV	Closed-Circuit Television
CDRL	Contractor Deliverable Requirements List
CEP	Commissioning Execution Plan
CVC	Construction Verification Certificate
CWA	Commissioning Work Authority
DAS	Delay Accounting System
DESC	Design Criteria
DESD	Design Calculations
DMIRS	Department of Mines, Industry Regulation and Safety
DPS	Definition Phase Study
EDS	Equipment Data Sheet
ELV	Extra Low Voltage
ECC	End of Commissioning Certificate
ESC	End of Startup Certificate
ESP	Engineering Service Provider
EPCM	Engineering, Procurement and Construction Management
EQPL	Equipment List
EXE	Execution Phase
FAC	Facility Acceptance Certificate
FAT	Factory Acceptance Test
FSMP	Functional Safety Management Plan
HAZOP	Hazard and Operability Study

Abbreviation	Definition
HMI	Human Machine Interface
HS&E	Health, Safety, and Environment
HSECCOMS	Health, Safety, Environment, Community, Constructability, Operability, Maintainability, and Sustainability
HV	High Voltage
I/O	Input/Output
ITP	Inspection and Test Plans
ITR	Inspection and Test Records
LA	Layered Audit
LOA	Life of Asset
LV	Low Voltage
MAP	Minerals Australia Projects
MCC	Motor Control Centre
MDR	Manufacturer's Data Records
MOC	Management of Change
NCR	Non-Conformance Report
NPI	Non-Process Infrastructure
P&ID	Piping and Instrumentation Diagram
PCS	Process Control System
PDF	Portable Document Format
PEP	Project Execution Plan
PFD	Process Flow Diagram
PIM	Project Information Management
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
PSD	Particle Size Distribution
PTC	Planned Task Confirmation
PVC	Performance Verification Certificate
QA/QC	Quality Assurance and Quality Control
RACI	Responsible, Accountable, Consulted, Informed
RAMS	Reliability, Availability, Maintainability and Safety
RFI	Request for Information
ROM	Run of Mine
SAP	Systems Applications Products
SAT	Site Acceptance Test
SEP	Standard Engineering Practice
SMPE&I	Structural, Mechanical, Piping, Electrical and Instrumentation
SPEC	Specification
SP	Separable Portion
SPO	SmartPlant Operations

Abbreviation	Definition
SPS	Selection Phase Study
SSE	Senior Site Executive
TQ	Technical Query
TTT	Take Time Talk
TUM	Time Usage Model
VURS	Valid User Requirements Specification
WAIO	Western Australia Iron Ore
WAMP	West Australian Major Projects
WBS	Work Breakdown Structure
WHS	Workplace Health and Safety Act and Regulations
WRAC	Workplace Risk Assessment and Control

2.2 Terms and Definitions

Capitalised terms in this Scope of Services shall have the meaning given to them in clause 1 of the Standard Terms and Conditions and within the definitions table below:

Table 2-2: Definitions

Term	Meaning
Aconex	The Company application used for Project communication and document transfer of technical information.
Commissioning	Commissioning is a sequence of commissioning activities that are categorised across four stages. These span across Factory Acceptance Testing (FAT), Construction Verification Certificate (CVC), no-load commissioning, load (Start-up/Process) commissioning and ramp up.
Company	Means the entity named as such in the Contract Specifics.
Contractor	Means the entity or entities named as such in the Contract Specifics.
CVC Walkdown	A formal visual inspection of specified equipment, subsystem, system, or facility to determine and validate the work and actions items that are incomplete or defective and require rectification. This is required prior to issuing of CVC.
Documentation	Includes but is not limited to software (including source code and object code versions), drawings (including "as built" drawings and Drawings), programmes, simulation results and reports, schedules, manuals, diagrams, graphs, charts, projections, Specifications, procedures, estimates, records, concepts, documents, accounts, plans, formulae, calculations, designs (including structural, mechanical, civil, piping, electrical and instrumentation designs) in any medium (including 2 dimensional and 3 dimensional computer assisted designs), methods, techniques, processes, supplier lists, price lists, customer lists, market research information, correspondence, letters, and papers of every description including all copies of and extracts from them.
Drawings	Means the drawings referred to in this Contract and any other drawings (including modifications of drawings) supplied to the Contractor by the Company or the use of which is approved by the Company for the purposes of performing the Services.
End of Startup Certificate (ESC)	Completion of Stage 3 Load Commissioning (ESC) for each area is achieved by the completion of the ITR nominated in the relevant COMP.

Term	Meaning
First Production	From DR 83 - First Production is considered achieved when 166kt of beneficiated fines within the Process Design Criteria (PDC) DESC-170-G-0000 has been stacked (built) in the Jimblebar Stockyard ready for transport via the Train Load Out (TLO).
Module	An element of the Works that is fabricated and preassembled prior to site installation, typically performed offsite and transported as one unit. Can be interchanged with Preassembled Modules, Smart Module, 3D Frame Module, Preassemblies, Sub Facilities, and flat packed steel.
No Load Commissioning (Stage 2)	<p>Is stage 2 of commissioning where a progression of tests is used to verify that equipment, systems and facilities operate in accordance with the intended design.</p> <p>Includes: energisation of Electrical systems, motor direction tests, equipment run and no-load tests with individual pieces of equipment under local control. Also includes system runs, sequence tests, verification of interlocks under central control and full plant running under central control with water on. No Load Commissioning commences after CVC and finishes with the issue of an End of Commissioning certificate (ECC).</p>
Performance Tests	Performance testing takes place during stage 4 ramp up. It involves a suite of tests designed to demonstrate that each key element of the process flow sheet or facility is capable of performing in line with the design criteria and that the facility can meet the production reliability and availability over more extended timeframes.
Preservation Records	Records maintained by the Contractor of the preservation measures undertaken to ensure that materials, plant and equipment is maintained in an as new condition in accordance with the requirements and procedures specified by the Trade Contractor.
Ramp Up	<p>Ramp Up is the process to transition an asset from start-up to steady state operations.</p> <p>It takes place after completion of Load Commissioning where the facility capacity is incrementally increased and verified until it is at full design production rate.</p> <p>Performance testing is typically completed during ramp up as part of the verification process.</p>
Senior Site Executive	A person appointed Senior Site Executive (SSE) of a construction site under Workplace Health and Safety laws.
SmartPlant Operations	The application used for storing and managing BHPIO Engineering Technical Documentation, Drawings and Data.
Start-up/Process Commissioning (Stage 3)	Commences following the completion of No-Load Stage 2 commissioning and referred to as Stage 3 Commissioning. This coincides with the introduction of process feed and involves the testing of the facilities under load until steady state operations can be demonstrated to have been achieved.
WAIO Governance and Technical Stewardship (GTS)	BHPIO person authorised to manage, co-ordinate and approve the creation, issue and modification of Technical information, Company Standards and SEPs.
Work(s)	Means the physical works to be completed by the Trade Contractors and handed over to the Company under the Trade Contracts as further described in Schedule 1, or if this Contract is a Framework Agreement, in the relevant Work Package Instruction.

3. References

Table 3-1: Reference Documents

Document Number	Document Description
0131420	MAP Commissioning Internal Standard
0154013	MAP Commissioning External Standard
COPP21180-PLN-R-001	JBB Commissioning Execution Plan
SOW-1210-G-12275	JBB EPCM Scope of Services
SOW-1210-G-12236	JBB Scope of Facilities
COPP21180-PLN-R-011	BHP Jimblebar Beneficiation Plant Handover Plan
COPP21180-PLN-R-004	JBB Ramp Up Plan
COPP21180-PLN-R-008	Spares Management Plan
DESC-170-G-00002	JBB Performance Test Criteria
JBENE-PMGT-STR-00001	JBB Project Execution Strategy
77-PLN-00001	JBB PCF Project Execution Strategy
DESC-170-G-00001	JBB Process Design Criteria
VURS-1200-G-12113	JBB Valid User Requirement Specification (VURS)
77-PLN-00019	JBB Operational Readiness Plan
77-PLN-00039	JBB Technology Execution Commissioning Management Plan
COPP21180-GUI-R-002	BHP Jimblebar Beneficiation Plant Smart Completions User Management Guideline
COPP21180-FOR-R-010	BHP Jimblebar Beneficiation Plant Smart Completions New User / User Change Request Form
COPP21180-PLN-Z-001	JBB Plant Operator and Maintainer Training Plan (TRAP)
COPP21180-PLN-Q-002	BHP Jimblebar Beneficiation Plant Document Management Plan
COPP21180-LST-G-022	BHP Jimblebar Beneficiation Plant Execution Estimate Spares List
DESC-170-G-00002	Performance Test Criteria
0139840	Construction Verification and Energisation Guideline
SPR-IHS-SAF-076	HSEC Constructability, Operability, Maintainability & Sustainability Validation
SPR-IHS-SAF-028	WAIO Management of Change Procedure
0136571	Control System Management of Change
SPR-IHS-SAF-060	Safe work on Low Voltage
0124142	Safe Work on High Voltage
0127717	Isolations and Barricading
0127034	Permit to Work
0133778	IOP Shutdown Procedure
0103485	WAIO Bridging and Override Procedure
0158564	WAAP Commissioning Bridge and Override Procedure
0106117	Exclusive Control Setup Checklist
0126137	WAIO Exclusive Control Register Approval Form and Process Flow
FRM-IHS-SAF-113	Exclusive Control Information Sheet

Document Number	Document Description
SEP-93	Functional Safety of Ore Handling and Processing Plant
SEP-88	Creation of General Isolation Requirements
0001260	Controls Systems Management Standard

4. Scope

4.1 Commissioning Scope

The JBB Project is delivered through the following EPCM Packages with Commissioning activities:

4.1.1 Main Processing Facility

The EPCM Contractor will be responsible for design, construction and all Stage 1 to stage 4 testing requirements. Upon completion of CVC, responsibility will be transferred to the EPCM Commissioning team to complete Stages 2 to 4, with assistance from a third party labour provider. The EPCM contractor will maintain responsibility for design deficiencies which are picked up through the commissioning stages.

At completion of required Stage 3 Load Commissioning activities for a defined area and approval of First Production when all requirements of Decision Register 83 have been met, ESC certificates will be signed off for specified areas by the project and the site operations team. This will allow operations to commence daily operations and maintenance activities. The EPCM will manage stage 4 Ramp up activities that will conclude with the successful completion of the Performance Test after the plant has reached stable operations at or above 80% of nameplate. Care, Custody and Control (CCC) of the processing facility will be transferred to the Operations team at the completion of the performance test. The final handover of FAC will be delivered all project documentation has been as-built and handed over.

A small BHP Commissioning Owners Team will support the EPCM Commissioning team with a specific focus on Tie-in points and integration into the existing Jimblebar Facilities.

The Project Tie-in requirements include:

- Transfer Station TS105 (CV105 to CV131);
- Bene Fines Product (CV134 to CV106);
- Raw Water Supply;
- Potable Water Supply;
- Fibre Optic Loop to Pole SH-JM71/572;
- 33kV PDP040 A1 Busbar;
- 33kV PDP040 A3 Busbar;
- Stockyard Drainage Upgrade;
- Plant Controls and Communication integration with IROC;
- EPCM Communications to POP and
- Tails and Decant Road Crossings.

All tie in points are listed in, and will be managed as per the project Shutdown Management Plan (COPP21180-PLN-G-013).

4.1.2 High Voltage Power

The High Voltage Power requirements consist of a 132kV Bay, Switchroom, 33kV Ring Main that will consist of 9 substations and two Tie-in points into the existing 33kV Switchboard PDP040 located in the 132/66/33kV Substation.

The EPCM Commissioning team will be responsible for all stages of commissioning of the tie in to the 132kV and 33kV JBB network and associated Substations. All FAT requirements will remain the responsibility of the EPCM Commissioning team including requirements of an integrated FAT (IFAT) with the plant control system.

Interface Points for HV Scope have been highlighted in Figure 4-1.

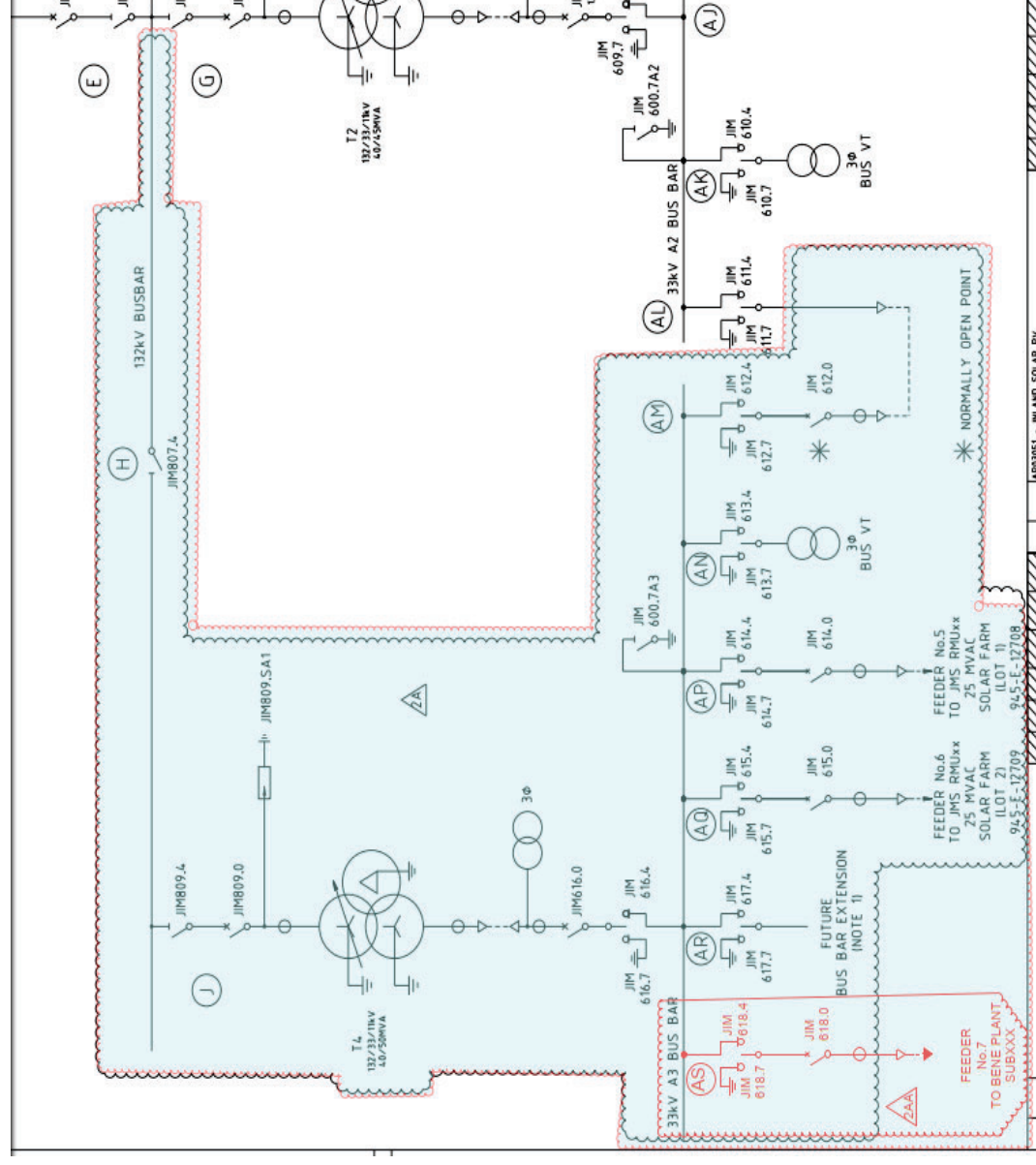


Figure 4-1: HV Interface Points

4.1.3 Technology

The technology systems for the beneficiation plant, which shall form part of an overall integrated technology system as part of the wider Jimblebar network, are outlined in Table 4-1. Further details of the Scope and the responsibility for each element of the scope are outlined in the JBB Technology User Requirements (VURS-1200-E-00027).

Table 4-1: Technology Scope

Scope Area	Scope Summary
Process Control Network (WP100)	Extension of the existing Jimblebar Process Control Network (PCN) to the proposed JMB Bene plant area and associated tailings storage facilities, to support operations.
Wired Networks (WP201)	Extension of the APAC and OPSNET wired and wireless networks to the proposed JMB Bene plant area, to support operations.
Hosting (WP202)	Expansion of existing Jimblebar Hosting & Storage hardware to accommodate JBB requirements.
LTE Wireless Network (WP302)	Wireless LTE network expansion to facilitate JBB Tailing Storage Facility instrumentation communication back to JBB PCN.
Digital radio System (DRS) (WP303)	Expansion of the existing Digital Radio System to encompass JBB process plant and TSF. This is inclusive a leaky feeder system required to facilitate DRS within JBB thickener vault.
Production & Enterprise Systems (WP501 & WP502)	Extension of existing Jimblebar technology systems/services to the proposed JMB Bene plant area, as well as implementation of new systems/services due to the introduction of the JMB Bene plant and associated tailings storage facilities.
Access Control (WP601)	Cardax Access control panels for all new JBB buildings.
CCTV (WP602)	CCTV to be added for JBB as follows: 18 new cameras for JBB substation access points. 27 new cameras for process control on OPSNET.
IROC & TROC Integration (WP603 & WP604)	Installation of workstations at the existing IROC control centres in Perth and Malaga to enable remote operation of JBB. Modification of existing TROC remote monitoring tools to cover JBB installed equipment.

4.1.4 33kV Switchboard Expansion

The Project will supply and install a new 33kV Bus Section to PDP040, and an additional transformer and switchgear in the existing 33kV switchyard.

This scope was originally meant to be executed as part of a separate project (Inland Solar Power Project), but this was deferred, so will now be completed by the EPCM. At time of writing (May 2024) the installation, tie-in and commissioning scope for this work is currently being investigated, planned and priced by the EPCM. Further detail will be added in future revisions of this document when this work is completed.

5. Commissioning Strategy

The Commissioning Strategy has been divided into 2 execution strategies:

1. Process Plant – Stage 2 and 3 of Commissioning will be executed by the EPCM. At the completion of stage 3 load commissioning (which is defined by the completion of First Production) BHP operations teams will commence daily operations and maintenance activities. The EPCM will manage stage 4 ramp up activities that will conclude with the successful completion of the Performance Test and Ramp up to 100% nameplate. Care, Custody and Control (CCC) of the processing facility will be transferred to the Operations team at the completion of stage 4.
2. Technology - BHP Technology team will be responsible for all Commissioning activities outlined in the JBB Technology Valid User Requirement Specification (VURS-1200-E-00027) and Technology Project Execution Plan (77-PLN-00038). Technology Handover requirements will be captured in the JBB Handover Plan and will follow the Technology Transfer to Operations Process (TTO).

6. Commissioning Structure and System Breakdown

The project scopes have been divided into separate milestones to allow the early handover of equipment packages from the EPCM to operations. The overarching philosophy behind each CCC handover point will be detailed in the BHP Jimblebar Beneficiation Plant Handover Plan - COPP21180-PLN-R-011.

The Equipment FAC and CCC packages are listed below

Table 6-1: FAC Packages

Package Description	Package No.
Civil Works - Concrete and Earthworks	1
Dry Inflow and Outflow System	2
Wet Processing Plant	3
Tailings Disposal	4
Power Distribution and Control Systems	5
Technology and Control	6

Table 6-2: CCC Packages

Package No.	Package Description	Handover Desc.	System Reference
1	Civil Works- Concrete and Earthworks	Bulk Earth Works and Drainage	1481-05
		Raw Water Reservoir	1481-10
		Bene Storage Facilities	1481-15
		Roads, Drains and Carparks	1491-05
2	Dry Inflow and Outflow System	Fines Transfer Station TS105 (Modifications)	1461-05
		Bene Feed Conveyor CV131 (Incl Shuttle)	1461-10
		Bene Product Conveyor CV133	1461-15
		Bene Stockyard Feed Conveyor CV134	1461-16
		Bene Sample Conveyor CV160	1461-25
		Bene Sample Station SSB160	1461-30
		Fines Yard Conveyor CV106 (Upgrade)	1461-40
		Fines Stockyard (Upgrade)	1461-50
		Substation SUB414	1492-25
3	Wet Processing Plant	Wet Screening	1462-05
		Wet Screening Bypass Bin BN001	1462-06
		Wet Screening Building	1462-07
		Pipe Rack	1462-08
		Bene Desliming	1462-10
		Bene Desliming Building	1462-11
		Bene Dewatering	1462-15
		Bene Dewatering Building	1462-16
		Bene Filter Product Conveyor CV132	1462-18
		Bene Thickeners	1462-20

Package No.	Package Description	Handover Desc.	System Reference
		LP Process Water	1464-05
		HP Process Water	1464-06
		Raw Water	1464-10
		Gland Water	1464-15
		Potable Water	1464-16
		Service Water	1464-17
		Fire Water	1464-18
		Plant Air	1464-20
		Reagents	1464-25
		Substation SUB415	1492-26
		Substation SUB415	1492-27
		Substation SUB416	1492-28
		Substation SUB417	1492-29
		Substation SUB417	1492-30
		Substation SUB418	1492-31
		Substation SUB418	1492-32
		Substation SUB419	1492-33
4	Tailings Disposal	Tailings and Decant Return Water Pipelines	1463-05
		Tailings Storage Facility	1463-10
5	Power Distribution and Control Systems	132kV Power Supply	1492-04
		33kV Electrical Distribution	1492-05
6	Technology and Control	Control, Signalling and Communications	1492-15
		Technology Systems	1492-20

7. Commissioning Sequence and Schedule

7.1 Commissioning Sequence

The commissioning sequence has been developed to be the key driver of the construction schedule to ensure early access to key equipment is received to streamline the commissioning stages. The below table shows the proposed load commissioning sequence that has been developed. The energisation sequence will be detailed in the JBB Commissioning Execution Plan - COPP21180-PLN-R-001.

Table 7-1: Commissioning Sequence

Area No.	Process	Stage 2 No Load/Water Commissioning Sequence Number	System
1	NPI	1	Facilities
2	Power	2	Substations and Switchyard
3	Process Auxiliaries	3	Plant Air
		4	Raw Water
		5	Gland Water

Area No.	Process	Stage 2 No Load/Water Commissioning Sequence Number	System
4	Fines Bypass	6	Fire Water
		7	Process Water
		8	Transfer Station
		9	CV131
		10	Bene Bypass
		11	CV132
		12	CV133
		13	CV160
5	Reagents	14	Flocculant Plant
6	Stream 1	15	Wet Screening
		16	Rougher Cyclone Stream 1
		17	Cleaner Cyclone Stream 1
		18	Dewatering Stream 1
		19	Thickener
		20	Tailings
		21	CV134
7	Stream 2	22	Rougher Cyclone Stream 2
		23	Cleaner Cyclone Stream 2
		24	Dewatering Stream 2
8	Sampling	25	Bene Sample Station

7.2 Commissioning Schedule

The commissioning schedule is an integrated component of the JBB EXE Schedule for the whole project. The schedule will be linked to key commissioning milestones which are aligned with the Table 7-2 below. Note that these forecast dates are based on the current schedule dates in June 2024.

Table 7-2: Key Milestones

Milestones	Dates
Process Plant- Construction Completion	Q4 2027
Stage 2 Commissioning Complete	Q1 2028
Stage 3 Commissioning Complete	Q2 2028
Stage 4 Commissioning Complete	Q3 2028
First Production	Q1 2028
Ramp Up to 80%	Q2 2028
Performance Test Complete	Q3 2028
Ramp up to 100%	Q3 2028
CCC to Operations	Q3 2028
Final Acceptance Certificate (FAC)	Q4 2028

8. Commissioning Budget

The Commissioning budget has been developed collaboratively by the EPCM and BHP OT through the study phases. Below is a summary of what has been included in the estimate. For full details of what is included refer to the JBB Basis of Estimate (77-EST-00001).

8.1 BHP Commissioning Costs

The BHP OT Commissioning team's role in JBB will be performing Governance and interface management to support the EPCM Commissioning Team. As a result the majority of the cost is for the personnel on the team. This will include:

- One full time Commissioning Principal for the entire length of JBB.
- One part time Commissioning Manager and Commissioning Specialist distributed across all WAMP projects for the entire length of JBB.
- Two site based Commissioning Supervisors from start of Commissioning on site, until end of Ramp Up.

In addition to the OT costs above, the project has allowed budget for support from the existing Operations team during Commissioning and Ramp Up.

8.2 EPCM Commissioning Costs

The EPCM Commissioning estimate is based on inclusion of the following costs:

- EPCM Team consisting of full time Commissioning Manager, 2 x Superintendents, Completions Lead, Completions Administrator and FHN and Turnover Coordinator, 2 x Process Engineers, 2 x Electrical Engineers, 2 x Mechanical Engineers 1 x Controls Lead, 4 x Controls Engineers, 2 x Communications Engineers and a Vendor and Spares Coordinator.
- 3rd party costs include Commissioning Superintendents, Commissioning Supervisors, Commissioning Technicians, Permit Officers, office and cribbing facilities, vehicles and commissioning tooling and equipment.
- Spares coordination & preservation will be managed by the EPCM Vendor and Spares Coordinator and works will be undertaken by commissioning technicians post CVC. (preservation prior to CVC is to be undertaken by the SMPEI Contractor and has been included in the SMPEI scope)
- Plant & Tooling for commissioning has been included in the 3rd party budget estimate and includes an allowance for specialised tooling along with hand tooling and equipment. Personal tools have been included in hourly rates.
- Vendor support for training and commissioning activities is contained in the relevant vendor packages.

Within the estimate these costs are broken down as follows:

- EPCM Commissioning costs are assigned to WBS – 9214-05 - EPCM Commissioning Labour & Equip
- 3rd Party Commissioning costs are assigned to WBS – 9214-10 - Third Party Commissioning Labour & Equip

8.3 Commissioning Estimate Basis

The commissioning estimate has been reviewed and a benchmark comparison completed as part of the development of the overall JBB Project estimate to build the basis of the estimate. Full details of benchmarking process including the details of the projects used for comparison are included in the JBB Basis of Estimate (77-EST-00001). This process included:

- An estimation of commissioning spares based on vendor pricing and recommended spares list, which was then rationalised based on past experience.
- An assessment of commissioning labour requirements against the schedule duration
- Testing productivity norms.

The commissioning Budget and final forecast cost will be progressively updated by the EPCM as project information becomes available including

- Detailed Commissioning Schedule
- Completion of Engineering and systemisation activities to accurately assess total numbers of tagged equipment to be tested.
- Contractor schedule of rates
- Tooling and test equipment requirements
- Vendor Charge out Rates and Durations

- Assessment of cost of spares from Suppliers

9. Commissioning Procedures

The ownership of each commissioning deliverable has been defined in section 1.3 with the document map in Figure 9-1 outlining high level responsibilities between the EPCM (Green) and the BHP Owner's Team (Blue). All reference documents have been outlined in Table 3-1.

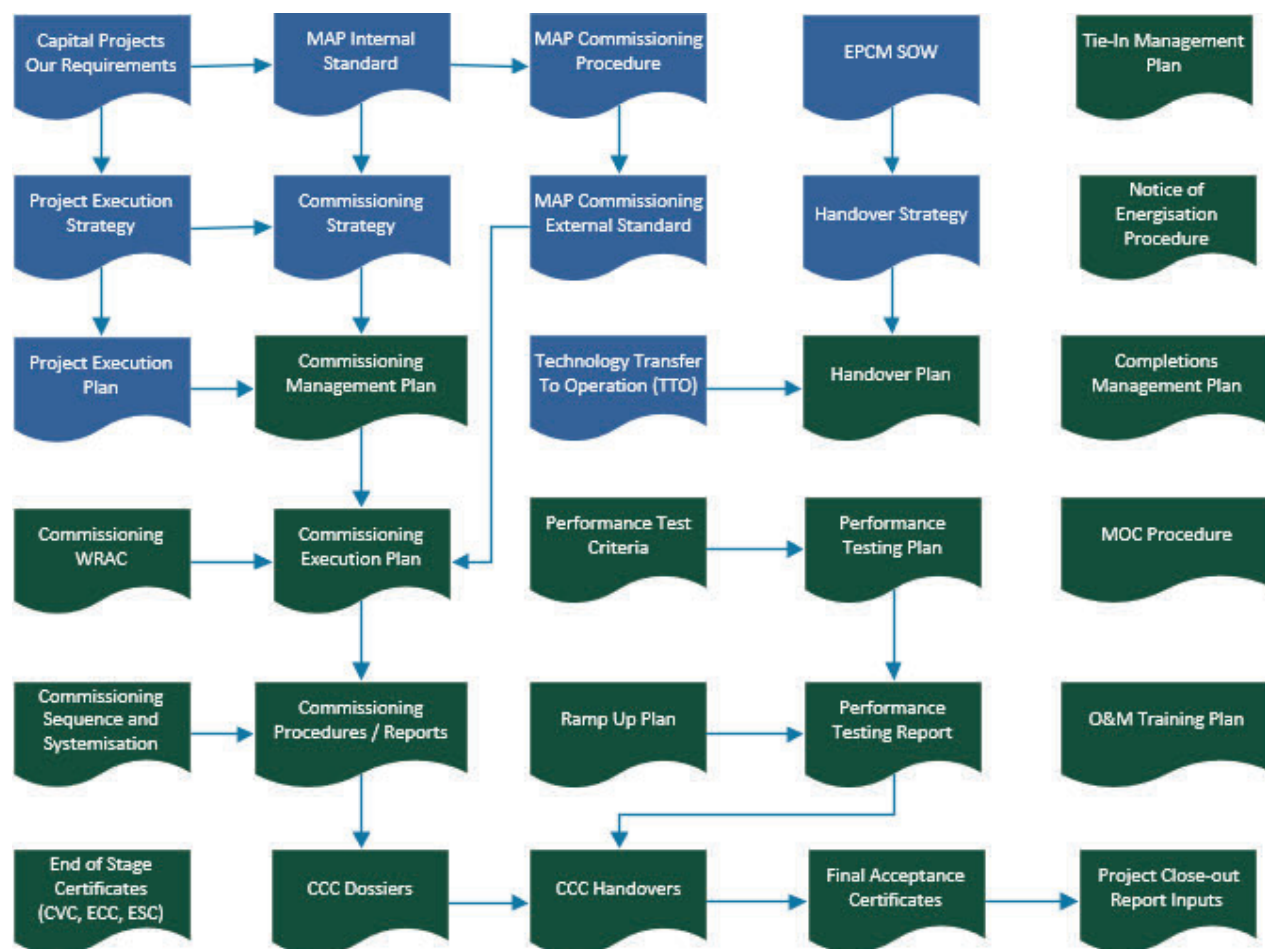


Figure 9-1: Document Interface

10. HSEC Management

Commissioning activities shall comply with the JBB Risk Management Plan (COPP21180-PLN-G-003) and EPCM Health and Safety Management Plan (COPP21180-PLN-K-001).

At start of Ramp Up (as defined in Section 19) the Site Senior Executive (SSE) will transfer from the EPCM back to BHP. From this point onwards the JBB project works will align with BHP WAIO HSEC management procedures. Full details of SSE transfer are included in the JBB Project Execution plan (COPP21180-PLN-G-001).

A more detailed summary of HSEC Management during Commissioning is included in the JBB Commissioning Execution Plan (COPP21180-PLN-R-001).

11. Statutory Compliance

The Commissioning Team will assist other functional groups with requirements for Works Approvals, Compliance reports, Commissioning reports, Dust Control verification etc.

Regulations

Refer to Health and Safety Management Plan (COPP21180-PLN-K-001) for applicable Legal and other requirements.

Certification

Certification in accordance with various Regulations will be provided as per the following examples:

- Electrical: In accordance with Statutory Electrical Record Management Procedure SPR-HIS-SAF-075
- Classified Plant: Requirements will comply with BHP Classified Plant Management 0002131. Evidence of this shall be provided as part of the Construction Verification documentation and will be a pre-requisite requirement of the Construction Verification process.
- Functional Safety: The Contractor shall ensure that all functional safety requirements are based on MAP Functional Safety Guidelines 0163360. It is expected that all functional safety validation and verification processes will be completed by the EPCM before handover to BHP Operations team.

High Voltage Network Operator

WAIO Utilities Network Authority is the Network Operator and takes ownership of all the HV assets when this project is completed. BHP OT will coordinate with Network Operations who will be responsible for the HV energisation and operation of the equipment. HV Network operation will also be involved during CVC walkdowns and commissioning of the HV facilities. A High Voltage Design Submission (0145974) must be prepared, and approval of this submission shall be pre-requisite to the Construction Verification Certificate. The HV design submission will be the responsibility of the EPCM.

Environmental

All commissioning work shall be carried out in compliance with the Health and Safety Management Plan (COPP21180-PLN-K-001) and the Works approval conditions

All commissioning requirements of the Works Approval will be complied with and included in the relevant plans, including approval from the EPA (Environmental Protection Authority) before start of the load commissioning if required.

Chemical

All chemicals that are brought to site must be assessed, submitted and approved for use before being brought onto Site. Any hazardous substances not approved in the WAIO ChemAlert system must not be brought onto Site. A valid Australian Safety Data Sheet (SDS) must remain with the approved product.

Functional Safety

Functional safety systems will be installed, tested and commissioned as per the Jimblebar Beneficiation Plant Functional Safety Management Plan (PREP-170-E-00002).

12. Risk

12.1 Material Risks

Project risks will be managed using BHP's online risk management tool ARM (Active Risk Manager). Material risks are risk events with a maximum foreseeable loss (MFL) is \geq Level 4, as defined in BHP's Risk Management Global Standard (GRIA-GSTD-00003). The following material risks are introduced to the project during JBB Commissioning in ARM:

- Energisation of Equipment
- Release of Stored Energy
- Uncontrolled Release of Tailings
- Engulfment within the Tailing pit
- Discharge of hazardous materials into the environment
- Plant does not achieve production requirements (financial risk)
- Poor Operational Readiness

- Persons falling into water

ARM also includes material risks that are common to all stages of construction.

12.2 Commissioning Risk Assessment Workshops

Commissioning Workplace Risk Assessment Control (WRAC) workshops will be held before the start of commissioning activities on site. The WRAC will form the basis of the Job Hazard Analysis (JHA's) being utilised by the EPCM Commissioning team. Some of the key risks that will be considered within the WRAC are as follows:

- Ore introduction
- Material handling systems
- Electrical Systems
- Classified plant
- Inadequate change management
- Stored energy (high pressure deluge systems, water systems)
- Exposure to hydrocarbons (fuel systems), chemicals (disinfection)
- Schedule pressures and deadlines
- Temporary and permanent changes that are not uncommon during commissioning
- Late design changes
- Dealing with unexpected equipment/system performance

13. Change Management

Change management during commissioning is covered by the JBB Commissioning Execution Plan (COPP21180-PLN-R-001).

Change management for works that impact existing BHP assets such as tie-ins will be the responsibility of the JBB BHP OT using the existing process detailed in BHP WAIO Management of Change procedure (SPR-IHS-SAF-028).

14. Communications

For communications across the JBB project, key documents have been prepared as follows:

- Stakeholder Management Plan 77-PLN-00009

This document provides details regarding key internal and external stakeholders across the project. EPCM contractors will be required to include a communication plan within their commissioning execution plan.

14.1 Key Communications Objectives

Key project commissioning-related communication will be shared with relevant groups as necessary to seek an open communicative style on the project. The key purpose of the communication is to keep stakeholders informed with relevant information and updates regarding the project activities.

14.2 Key Communications Processes

Meetings

Meetings for commissioning will be detailed in the Commissioning Execution Plan (COPP21180-PLN-R-001)

Bulletin Notifications

Some key communication will be by Bulletin Notification example including High Risk test activities, Shutdowns and outages, Notice of Energisation (NoE), CCC, Safety Bulletins, Management of Change activities. Bulletin notification will be distributed at pre-start meetings and placed on notice boards where deemed necessary.

Aconex (Project Management Software)

All correspondence that has potential commercial impact, involves review/workflow/approval/transmittal of documentation, or requires traceability shall be communicated using the Aconex.

15. Commissioning Resources and Organisation

15.1 Organisation

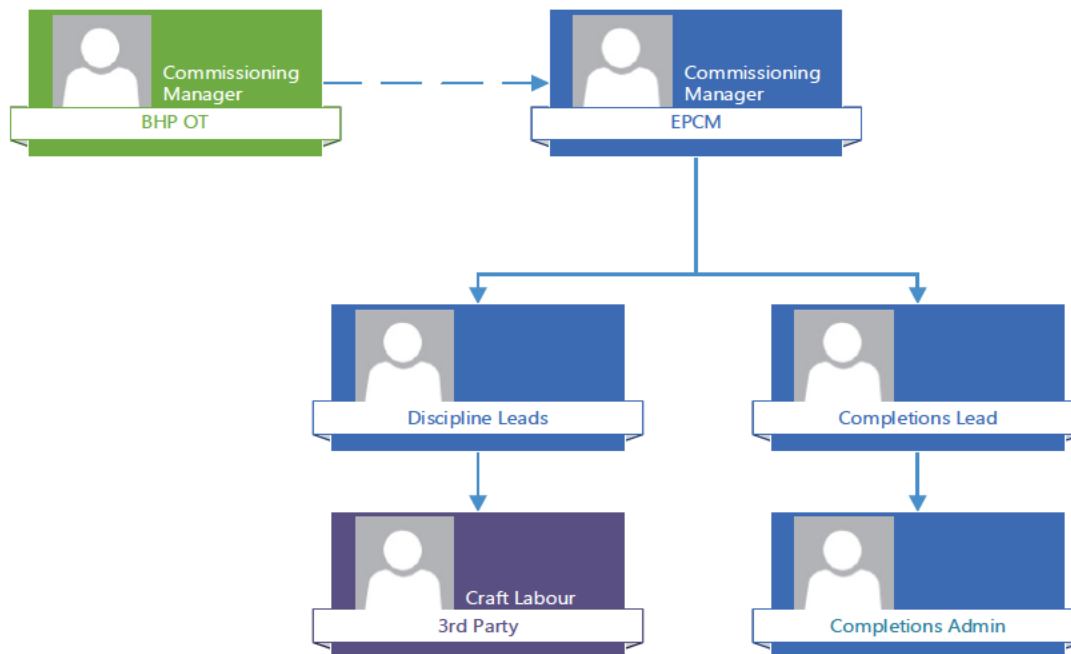


Figure 15-1: Organisational Chart

15.2 Commissioning Resources

Operations Support

Refer to Section 24 for details of Operations involvement in Commissioning and Ramp up.

EPCM Resources

Engineering support will be provided by the EPCM design team as required. The EPCM will maintain their responsibility for the design until CCC handover.

The EPCM requirements will include the responsibility for technical deliverables including the following:

- Data required for CCMS population (systemised equipment lists etc.)
- Systemisation of plant
- Control System Factory Acceptance Test procedures and FAT witness
- Control System Site Acceptance Test Procedures review and attendance
- HV & Power commissioning procedure development and coordination
- Attendance of FAT testing for all procured equipment
- Substation FAT procedures review and FAT witness
- Integrated FAT procedure review and attendance of testing. This should cover testing of all substation components and devices, and their communications to the control system
- Load Commissioning and Performance Test Support

- Technical input for plant Ramp up and Optimisation
- Review and approval of as built documentation and software
- Review of Contractor Handover deliverables
- Inputs into compilation of CCC deliverables

Trade Level Support

The EPCM shall allow for the provision of sufficient competent commissioning personnel to manage the commissioning, ramp up, and performance testing phases of the project. The EPCM will also include provision for supply of the plant & equipment to support these phases.

15.3 Specialist Contractors

The EPCM commissioning team will source specialist contractor personnel. The role of the specialist contractor will be outlined within a scope of services document to be written during the early execution phase.

The primary responsibility will be to provide specialist commissioning craft labour positions to assist the EPCM Commissioning team.

15.4 Vendor Participation and Support

Equipment Vendors will undertake an important role in the JBB commissioning. In many cases their attendance will be necessary to ensure that full warranty is maintained and statutory obligations are met on the vendor supplied plant and equipment. They also play a key control in limiting schedule delays during the execution of commissioning.

The EPCM contractor will be responsible for identification and management of the Vendors required for their scope of commissioning including schedule and arranging site access, transport and accommodation.

16. Roles, Responsibilities and Accountabilities / RACI

Under the EPCM Commissioning model the BHP Commissioning Owners team will provide the following positions.

Commissioning Manager/Lead

Key responsibilities include:

- Development of deliverables as described in Section 1.3
- Support EPCM in the development, review and signoff on all commissioning deliverables
- Factory Acceptance Test attendance and witness points
- Review of EPCM CCMS database – ITR matrix, Systemisation, subsystem scope drawings
- Review and approval of commissioning schedule
- Interface between operations and EPCM
- Field Leadership
- Supporting EPCM & operations interface during ramp up and performance testing.

A full Commissioning RACI will be produced is included in Appendix A.

17. Interface Management

Figure 17-1 clarifies responsibilities for the major activities at each Commissioning Stage, and the specifies the handover points between owners. Details of external interfaces are included in within this plan. Details of the EPCM Contractor's internal interfaces (Construction, Procurement, Engineering etc.) are covered in the Commissioning Execution Plan (COPP21180-PLN-R-001).

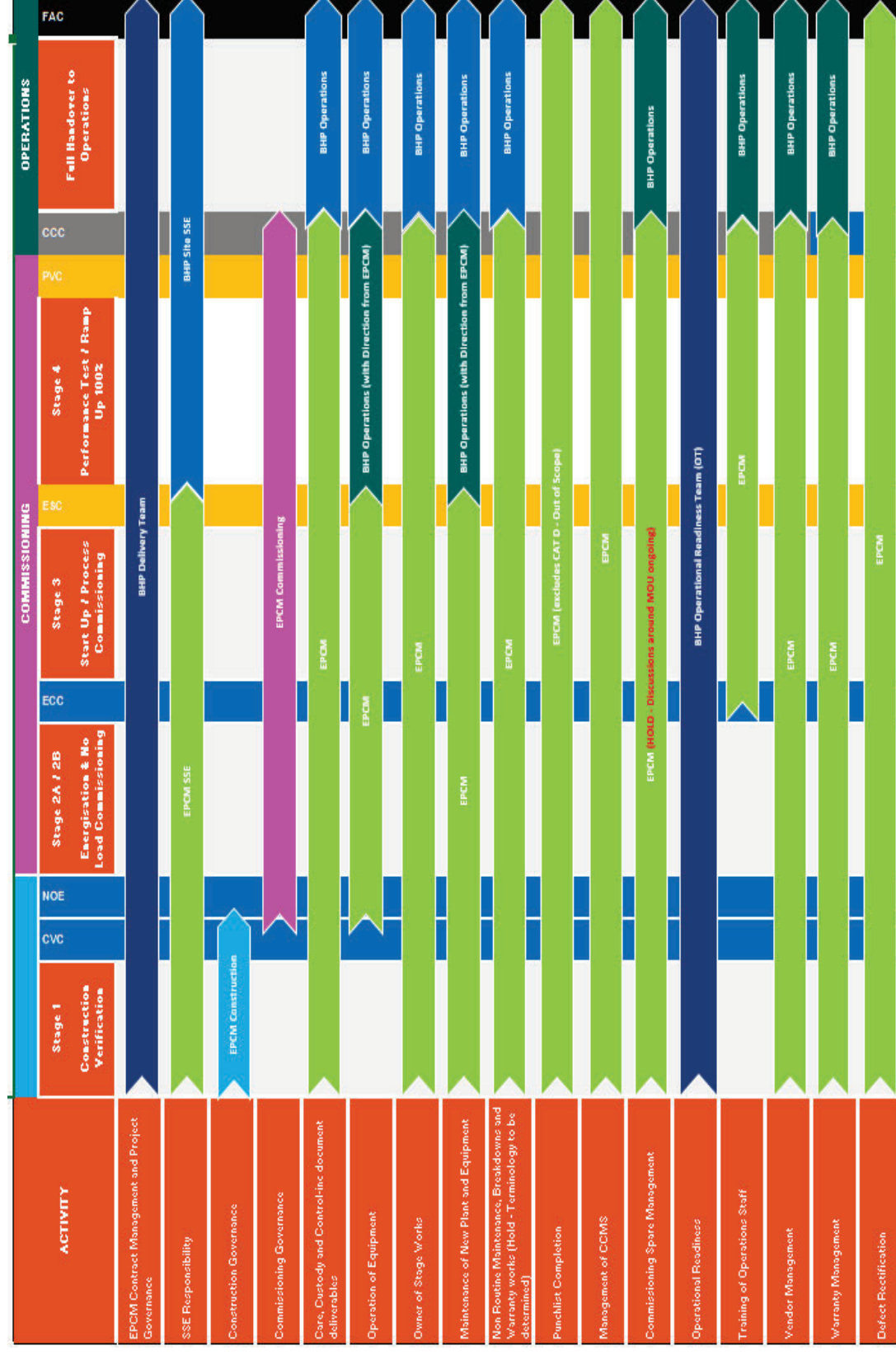


Figure 17-1: JBB Responsibility Matrix

17.1 BHP Operations

The existing Operations teams at Jimblebar will have several significant interfaces with JBB project team to be managed during Commissioning as outlined below. These interfaces will be managed by the JBB OT, with support from the EPCM.

Additional details regarding these interfaces can be found in the Operations Readiness Plan (77-PLN-00019) & Ramp Up Plan (COPP21180-PLN-R-004).

17.1.1 Fixed Plant Maintenance (FPM)

The following activities will require interfacing with the existing JMB FPM team:

- Permits for isolation of existing brownfield equipment
- Several opportunities have been identified for FPM team to be involved in the project prior to First Production, such as Condition Monitoring and HVAC support.
- Handover and energisation of HV assets will require interface with the FPM electrical team.
- Provision of Electrical and Mechanical maintenance resources from First Production onwards.

17.1.2 Production

The production team control both the upstream (OHP) and downstream (stacker) ore handling interfaces with JBB. The key commissioning activities relating to these interfaces will be:

- Modification and tie-in to existing transfer station TS105.
- Authorisation to provide Ore to JBB via TS105 after completion of ECC.
- Ramp Up planning taking place during DPS and EXE.
- Collaboration to ensure JBB product is on spec. and it is stacked in the correct location.
- Provision of Operators, Supervisors and Process Engineers from First Production onwards.

17.1.3 Labs

The majority of JBB samples during Load Commissioning and Ramp Up will be delivered to the Jimblebar Lab for preparation, and then sent to the Newman Analytics Hub (NAH) for analysis. The NAH will then provide sample analysis results through BHP's Sample Manager system, typically within 24 hours of receiving the sample.

Some additional sampling and analysis using external lab facilities will be required for Load Commissioning, Ramp Up and Performance Testing. This will be detailed in the Commissioning Execution Plan (COPP21180-PLN-R-001)

17.1.4 Infrastructure & Services (I&S, formerly NPI)

Handover and energisation of HV assets will require interface with the I&S electrical team.

17.1.5 Mining

In order to receive the ore required for testing by the Performance Test Criteria (DESC-170-G-00002), this ore will need to be included in the 2-year mine plan and coordinated with the JMB Mining team. This advanced planning is to enable the mining team to forecast any additional plant or resources to manage stockpiling and haulage at the ROM, and to adjustment to their proposed mining locations to supply the ore. This engagement commenced during DPS, and will continue through EXE.

During Commissioning and Ramp Up the frequency of this engagement will increase to ensure the JBB team are made aware of what ore to expect based on the most up to date short term planning and events on site.

17.1.6 IROC

The Integrated Remote Operations Centre (IROC) controls existing WAIO plants from Perth, and the same will be done for JBB once it is handed over. In order for the IROC Controllers to gain familiarity with JBB, they will attend site and work with the JBB Commissioning team for 10 weeks during Commissioning & Ramp Up.

Once this period is complete, the IROC controllers will transition back to their Perth location. Once operating remotely, they will interface with the site Commissioning team via DRS (Digital Radio System) and through the SCADA. As Ramp up progresses control of the plant will gradually transition from the site Commissioning team to the remote IROC team.

17.1.7 Control System Engineering

Control System Engineering support for JBB will be provided by two site-based Control System Engineers, and a remote (Perth based) 24/7 controls support team. The site-based Control System Engineers will participate in JBB Commissioning and Ramp Up to gain familiarity with the new system. The 24/7 team will attend site during Ramp Up to learn the plant from the site-based Control System Engineers.

As Ramp up progresses ownership of Control System changes will gradually transition from the site Controls Commissioning team to the BHP Control Systems Engineers and 24/7 support team.

17.1.8 Warehouse & Logistics

The BHP Warehouse & Logistics team will take ownership of all spares associated with JBB. The JBB Commissioning team will need to interface with this team for the following activities:

- Handover of all Insurance, Capital and Operating spares procured by the EPCM, as defined in Section 27.
- Handover of left over Commissioning spares at CCC.
- Withdrawal of Operating spares if required for repairs not covered by Commissioning spares.

17.2 Technology

Execution of Technology scope will be a mix of EPCM and BHP Technology team responsibilities. The breakdown of these responsibilities is captured within the JBB Technology Valid User Requirement Specification (VURS-1200-E-00027) and Technology Project Execution Plan (77-PLN-00038).

Handover of Technology scope is the BHP Technology teams responsibility. Requirements will be captured in the JBB Handover Plan and will follow the Technology Transfer to Operations (TTO) process as defined and supplied by BHP Technology.

18. Equipment Preservation

Preservation of equipment will be the responsibility of the SMPE&I Contractor until CVC of the related equipment, the EPCM will then take ownership until Care, Custody and Control (CCC) has been transferred or as per the requirements detailed within the contract.

The EPCM will submit a preservation procedure (quality requirement) for each piece of relevant equipment in their care and custody up until handover to the Company. Activities required under this plan will be uploaded and tracked in the project CCMS and shall be a requirement of contractor handover. These activities and documentation shall be audited by the BHP Completions Lead on a regular basis. The EPCM will be prompted to use CCMS generated preservation test sheets to ensure equipment is fully preserved on/off site and to ensure that Warranty provisions under the Contract are not affected.

19. Commissioning Stages, Toll Gates and Handover Processes

19.1 Overview

The Commissioning Stages, Toll Gates and Turnover and Handover Processes for the JBB Project will be structured to comply with the MAP Commissioning Procedure 0173044 and MAP Commissioning External Standard 0154013.

Full detail of the Toll Gates and Handover process are covered in the Handover Plan (COPP21180-PLN-R-007).

19.2 Commissioning Stages

JBB Commissioning will be completed using a four-stage framework as shown in Figure 19-1. Details of the activities, start points, milestones and completion criteria for each stage are included in the Commissioning Execution Plan (COPP21180-PLN-R-001).

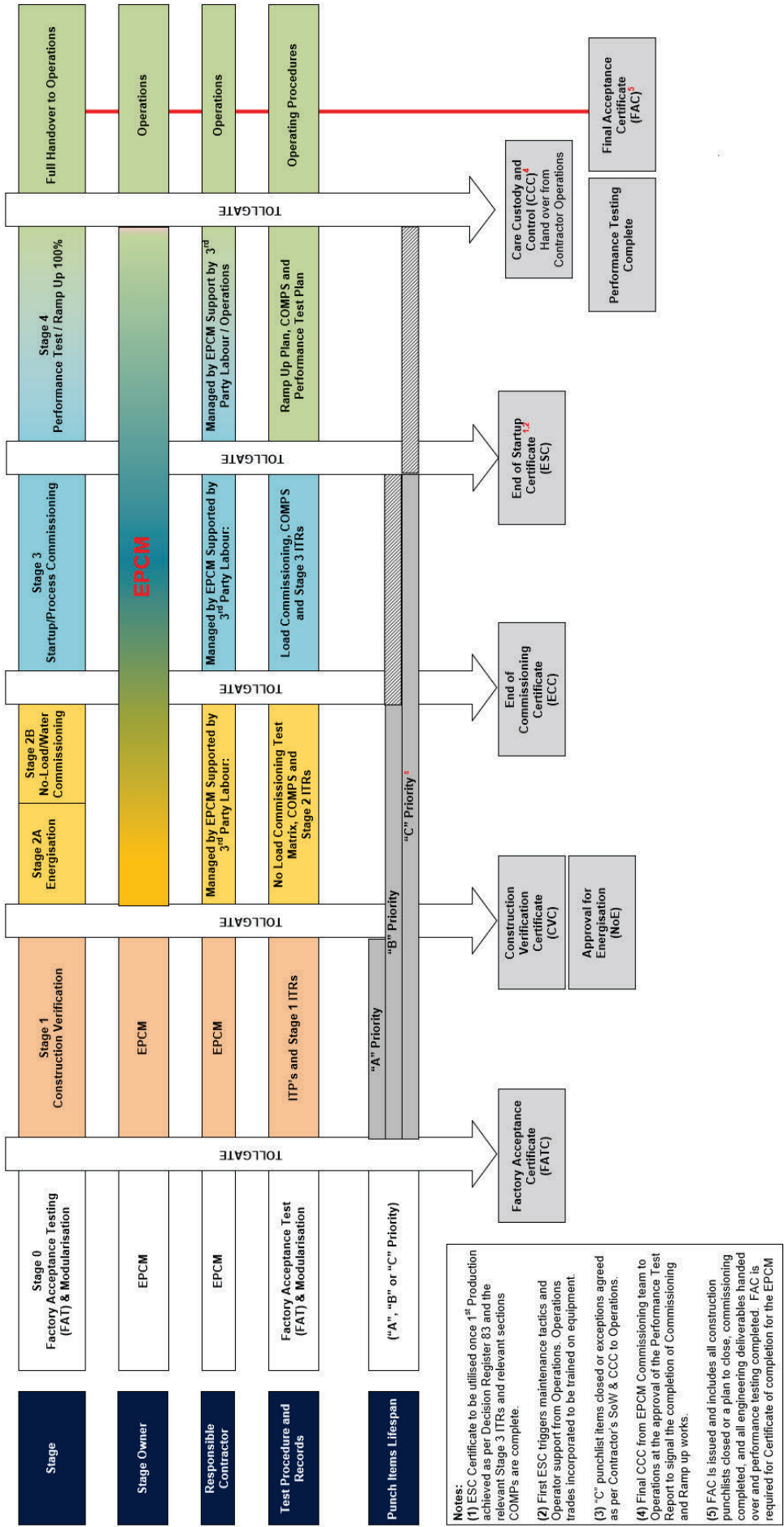


Figure 19-1: JBB Completions Framework

19.3 End of Startup Certificate (ESC)

Completion of Stage 3 Startup / Load Commissioning for each area is achieved by the completion of the ITR nominated in the relevant COMP. The sign off of ESC and First production (as defined in section 19.3.1 and 19.3.2) will trigger the following:

- Commencement of JBB Operations personnel responsible for Operation and Maintenance of the plant.
- SSE transfers from EPCM back to BHP.
- Start of Stage 4 Ramp Up.

19.3.1 First Production Definition

First Production is considered achieved when 166kt of beneficiated fines within the Process Design Criteria (PDC) DESC-170-G-0000 has been stacked (built) in the Jimblebar Stockyard ready for transport via the Train Load Out (TLO).

19.3.2 First Production Requirements

Before any Beneficiated Ore can be loaded through the Jimblebar TLO a Certificate of Analysis (COA) will need to be provided outlining that the Processed Ore is within the Transportable Moisture Limit (TML) and Dust Extinction Moisture (DEM) Limits. During early stages of JBB production a verification process will be undertaken confirm that the new drainage system and reclaim philosophy function as designed and that 100% beneficiated product will not cause problems during rail movements or shipping due to being reclaimed with excess moisture. Early beneficiated product will be stockpiled to dead, and then blended with non-beneficiated fines on the live stockpile to mitigate the risk of excess moisture until the drainage design verification process is complete. Details of this process will be included in the Ramp Up Plan (COPP21180-PLN-R-004). Further definition will be provided in the Commissioning Execution Plan, JBB Ramp Up Plan and Load Commissioning Procedures.

Sampling of the Beneficiated product will take place from the new sample station (SSB160) with all samples sent to the designated offsite laboratory to provide the TML and DEM values. The frequency of the sampling to be completed will be further outlined in the Commissioning Execution Plan and Ramp up Plan.

Stockpile Management for Beneficiated Ore during Load Commissioning will be outlined in the JBB Ramp Up Plan.

19.4 Care, Custody and Control

CCC Handover dossiers will be provided to BHP OT and BHP Operations as soon as all requirements are completed in order to allow for early review and approval of the documents. BHP OT and OR will have 10 days from submission to review the documentation and return signed. On completion of all Stage 4 Test requirements and acceptance of the Performance Verification Certificate (PVC), the digital handover dossiers containing the required CCC deliverables shall be transmitted to BHP OT, BHP OR and BHP Operations for acceptance. Upon verification that the dossiers meet the deliverable requirements BHP will sign a CCC Certificate. This certificate transfers the custody of the Plant from the EPCM to Operations. Refer to the JBB Handover Plan (COPP21180-PLN-R-007) for more detailed information on CCC deliverables and handover requirements.

20. Punch-list Management

The JBB Completions Management Plan (COPP21180-PLN-R-003) and Punch Listing Procedure (COPP21180-PRO-R-004) define the methodology for creating, managing, and completing punch list items on the project.

21. Completions Management

Completions for JBB will be managed by the EPCM. The Completions and Commissioning Management System (CCMS) used with Smart Completions (SC) from Hexagon.

A summary of Completions strategy is included in the JBB Commissioning Execution Plan (COPP21180-PLN-R-001). Full details of Completions Management is contained in the JBB Completions Management Plan (COPP21180-PLN-R-003).

22. Progress and Cost Management, Tracking and Reporting

22.1 Progress Management, Tracking and Reporting

Progress Management

Approved key project documentation will form the baseline for progress and cost for commissioning activities. Progress baseline will be as per the approved execution schedule and any approved contractor schedules that include commissioning activities.

Tracking and Reporting

The project will use CCMS for tracking and management of Construction Verification and Commissioning activities. Performance will be measured by actual reported progress in CCMS. Weekly and monthly reporting of actual commissioning progress against budget / forecast will be conducted by the EPCM.

Where progress is behind budget / forecast, or where cost is above budget / forecast, Project Controls will provide appropriate status reports and advise Management who will address problem areas with other parties to ensure mitigations are in place and satisfactory progress / cost status recovered.

Progress tracking will be measured using the inbuilt CCMS features including the subsystem completion report and skyline based on completed test records. Regular reporting of actual commissioning progress against plan will be conducted by the EPCM. Full details of how Commissioning progress will be tracked and reported in line with the rest of JBB project are included in Project Controls and Assurance Plan (COPP21180-PLN-G-005).

22.2 Cost Management, Tracking and Reporting

Cost baseline for the Commissioning team will be as per the approved project budget. The EPCM Commissioning team performing commissioning activities will manage cost against approved project budgets.

Weekly and monthly tracking and reporting of forecast and actual commissioning cost performance against budget will be conducted by the EPCM.

23. Commissioning As-Built

Change management of design drawings and documents is critical to a safe and successful commissioning and handover of the project. The management of as-built drawings will comply with the Company SEP-57.

The Construction Contractor governed by the EPCM shall be responsible for compiling and maintaining a set of Master Drawings for all Electrical drawings (including logic drawings, block diagrams), P&ID's and Structural/Mechanical/Civil as required. Any deviation from the "approved for construction" (AFC) design shall be marked up, checked and signed by the EPCM Engineer. This process will be detailed in the Jimblebar Beneficiation Project Change Management Procedure (TBA - HOLD) The master drawings and documents with markup changes will be handed over the time of the CCC. All changes on the IFC drawings before CVC will be marked up in red, and subsequent changes during commissioning in blue by the team in control of the system.

The management and hand-over of the "electronic" copies will be in accordance with BHP Jimblebar Beneficiation Plant Document Management Plan (COPP21180-PLN-Q-002).

Following the completion of CCC the EPCM shall backdraft the as built drawings.

3D Model

EPCM will assume responsibility for updating and maintaining the 3D model up until the CCC certificate is submitted to Operations for approval.

Composite Services

All Composite services shall be surveyed and mapped into a CSM database as per WAIO document SEP-54. The EPCM Site Manager is responsible to ensure that Composite Services records are maintained as current and progressively keep a project database updated. The CSM files shall be handed over to Operations as part of the CCC Deliverables and shall be fed into the WAIO database prior to Final acceptance by operations.

24. Operations Participation

Operations involvement in the planning, commissioning, handover, performance testing and ramp-up phases of the project is critical for ensuring that maximum value is realised from the project investment and the plant successfully transitions into a successful sustainable operating business. A key strategy for the JBB project is to have operations involved in the load commissioning & ramp up, triggered by the completion of first production. This early involvement will allow the operations team to gain experience in managing the day to day operations of the plant with a full project commissioning workforce still onsite.

In addition to operations involvement from first production onwards, operations personnel will be seconded into the Project team to provide HV Switching and isolation support. Additional resources may also be requested from site maintenance teams to assist with commissioning activities such as HVAC maintenance, condition monitoring and radiation safety management. This support will be agreed via an MOU to be written and signed off in DPS.

The interface between the Commissioning team and the Operations team will start during the Study phases and will gradually increase through to Execution, handover and ramp-up. An Operations Readiness team has been appointed to provide the communication conduit between the Project and the Operation group. Successful management of the interface with the Operations group is fundamental to Commissioning success and will address the dual roles of Operations as a participant in and the customer of the Commissioning process.

The Operations Readiness team will ensure that BHP Operations obligations as outlined here are regularly communicated, aligned and tracked with the Operations team.

25. Documentation

Documentation for Commissioning is detailed in the Commissioning Execution Plan (COPP21180-PLN-R-003).

26. Training

Training is provided for all unique equipment and the detailed training requirements for JBB are documented in the Training Plan (COPP21180-PLN-Z-001). Commissioning will have input into training material however the planning and co-ordination is the responsibility of the Operational Readiness team.

Operations familiarisation prior to commencement of Ramp Up will be detailed in the JBB Operational Readiness Plan (77-PLN-00019) and Training Plan (COPP21180-PLN-Z-001).

The training will be co-ordinated with the Crew Development Officers (CDO), manufacturers/ vendors, and the engineering service provider (ESP). The training requirements detailed within the operations readiness plan will be developed to align with the following:

- WAIO Technical Training Standard (document number 0123642)
- WAIO Technical Training Execution (document number 0139527)
- WAIO Technical Training Development Fundamentals (document number 0149672)

In addition to the training provided to Operations and maintenance personnel, all project training requirements will be managed by the EPCM supported by the Owners team. Expected Training requirements will be

- Site Specific Training Modules
- Project Induction
- Commissioning Induction
- Isolation Training Requirements

27. Spares

27.1 Commissioning Spares

Commissioning Spares are the spare parts deemed likely to fail or need replacement during commissioning. Each equipment manufacturer will supply a recommended Commissioning Spares list for consideration as part of their tender.

The availability of the Commissioning Spares is critical in preventing unforeseen schedule delays during commissioning due to equipment failure. At the end of the project all remaining commissioning spares will be transferred to the JBB Operations group. All required spares are documented and priced by the EPCM in the BHP Jimblebar Beneficiation Plant Execution Estimate Spares List (COPP21180-LST-G-022).

A Spares Management Plan (COPP21180-PLN-R-008) will be developed by the EPCM to:

- Identify how/where/when spares will be transferred to and stored and preserved at site.
- Mitigate against commissioning spares not being in an acceptable condition to be transferred to Operations
- Ensure that spares have been correctly preserved and that the preservation history and future requirements are transferred to the Operations warehouse team
- Identify a process to catalogue each item and transfer it to the operations (warehouses) at the completion of commissioning activities

The Contractor shall be responsible for identification, procurement, management and preservation of all Commissioning Spares until Handover to Operations. It will be a requirement for Contractor to submit a Commissioning Spares List to BHP for approval.

The Contractor will manage the spares as per their approved Materials Logistics Plan which will include barcode (or similar) tracking, stocktake and preservation and storage as per manufacturers recommendations. They shall also maintain a list/register of Spares that are utilised and re-order any high-risk items.

The Contractor shall work with the BHP operations team to perform a stocktake of the remaining spares immediately prior to CCC Handover, and the spares will be catalogued by the BHP and transferred to the Company Stores.

27.2 Operating, Capital, Insurance and Critical Spares

Spares are broken up into the categories defined below:

- Operating Spares – Minor spare parts worth less than \$0.5m.
- Capital Spares – Major spare parts that are typically required to be installed replacement parts over the life of the asset, worth more than \$0.5m.
- Insurance Spares – Major spare parts that not expected to be installed as a replacement over the life of the asset, but held to ensure continuity of production in case of unexpected breakdown, worth more than \$0.5m.

In addition to these categories, spares may also be classified as Critical Spares - parts which, if not held in stock, would result in a residual risk rating >90. Note a critical spare can be either Capital, Insurance or Operating.

The EPCM will obtain lists of vendor recommended Operational, Capital and Insurance Spares and supply these to the Company for approval. Company Operations Readiness team will review and approve the final list of spares to be procured by the Contractor. The Contractor will be responsible for the procurement of these spares.

The OR team will work closely with the Company and Contractor Engineering teams to ensure alignment between the specified equipment, catalogue details and asset management data in the Company spares cataloguing platform SAP. Some capital and insurance spares will be purchased by BHP as part of major procurement packages (HOLD).

Occasionally during commissioning and ramp up phases the plant will experience failure to equipment that is not immediately available to the project. In this case the project will have the ability to leverage off the network of Company Operations stores, firstly in the Pilbara region and secondly from the broader network of Minerals Australia sites. Availability of equipment at short notice would be subject to business risk and priority.

28. Materials, Supplies and First Fills

28.1 Water Supply

Commissioning plant water will be sourced from the Raw Water Pipeline post tie-in activities scheduled to be completed prior to commissioning commencing.

Potable water will need to be sourced from an external provider prior to any planned plant tie-ins. Flushing and disinfection requirements will be outlined in the Commissioning Execution Plan.

The quantities of potable water requirements will be further defined in DPS and outlined in the Commissioning Execution Plan.

28.2 Ore Feed

Ore infeed to the plant will be via transfer station TS105 and will be activated by a diverter gate to supply fines ore onto belt CV131. Specific feed requirements to enable load commissioning will be developed during the early execution phase of the project and will require approval from the site operations team. These details will be captured in the Jimblebar Beneficiation Project Ramp Up Plan (COPP21180-PLN-R-004).

During load commissioning there will be a mixture of beneficiated ore (Wet Ore) and Non- beneficiated ore (dry ore) that will be sent to the stockyard. This blended ore will require specific daily management during commissioning to ensure stockpile grade is not compromised. The load Commissioning procedures that will be developed in early execution will detail the projects plan of how to manage the blended ore which will include operations endorsement.

28.3 Reagents

First fill of BASF M10 Flocculant will be ordered and undertaken by the Jimblebar Operations Process Engineers and Operational Readiness Trainer with assistance from the EPCM commissioning team once the NOE for the Flocculant plant has been issued. This will allow for the Operations team to undertake training and complete the necessary SWP creation during the completion of the First Fill. The commissioning manager will inform the Process Engineer of the impending NoE a minimum of 2 weeks prior to the approval.

A Flocculant dosing rate of 90g/t and a baseline minimum volume of the Flocculant Tank will be initially calculated at 25% volume and will be monitored throughout commissioning to determine final setpoint.

The first fill procurement process will serve as a foundation for on-going operational supplies. Lessons learned during commissioning will be used to refine procurement processes, supplier relationships, and inventory management. The Operations Process Engineer will have a key role in monitoring consumption rates and adjusting procurement plans as required to ensure continued availability of reagents throughout the plant's operational life.

28.4 Other Consumables

The major consumables that will be supplied by the EPCM for commissioning include:

- Oils - In addition to the first fill requirements that will be completed by the SMPEI Contractors, commissioning top-up and 200 hour first oil change requirements will be undertaken by the EPCM Commissioning team. Wherever possible EPCM to engage with the Operations/ maintenance team to perform this work. Possible alternative strategies include:
 - Construction Contractor buys all
 - Company buys all and free issues to EPCM
 - Contractor buys all at BHP commercial rates (and/or invoices paid by Project-BHP/Company)The overall Project strategy for procurement and distribution of oils is to be finalised
- Greases- As per lubrication schedule
- Transformer Oils
- Lube oil Filters for first change-out and to replace those that are becoming fouled
- HVAC filters for first change-out and to replace those that are becoming fouled
- SF6 gas for GIS Switchgear to replace commissioning testing consumptions
- Fuses and breaker spares for each type of equipment
- Cable ties and other Electrical consumables
- Low speed coupling fasteners to replace (single use) fasteners if coupling require re-alignment or are otherwise are disconnected during commissioning
- HSE equipment
 - Personal Danger Tags,
 - Out Of Service Tags,
 - Commissioning, Construction and Operations Custody (Ownership) Tags
- Stickers
- Isolation locks as defined in WAIO Permit to Work procedure 0127034
- Lockboxes

Detailed consumable requirements will be assessed by the EPCM during early execution phase of the project. Where existing preferred suppliers are in place such as for lubricants (BP) the Project will leverage off those for procurement. Certain consumables will be obtained from the suppliers of major equipment packages in conjunction with the spares requirements.

28.5 Special Tools

The EPCM and specialist commissioning contractor will provide the test equipment requirements for the project. Equipment may be included in the overall day rate of technicians. Their scope of work includes:

- Rental of commissioning tools and test equipment
- HV specialist services and test equipment
- Commissioning IPADs (Supplied by BHP)

Exact requirements of special tools and test equipment will be further defined in late DPS and early execution once all equipment vendors have been defined. A cost has been included in the project estimate for the allowance of special tools and test equipment

The Company will provide three 20 foot containers for the storage of tooling and test equipment for the duration of the project.

28.6 Other

Other material resources that will be required throughout Commissioning include the following:

- Vehicles including Utes and minibuses
- Office Space
- Technician's cribbing rooms
- Instrument calibration hut
- Permit hut(s)
- Large tools, cranes, EWPs from Implementation Contractors
- Scaffolding

29. Sampling

Sampling requirements and regime are detailed in the Commissioning Execution Plan (COPP21180-PLN-R-001). Additional information regarding activity specific sampling will also be detailed in the JBB Ramp Up Plan (COPP21180-PLN-R-004) and Performance Test Criteria (DESC-170-G-00002).

30. Acceptance and Performance Testing

30.1 Acceptance Testing

Once the Facilities reach steady state operation a series of load commissioning tests shall be conducted to prove the capability of the plant and equipment against the Project Design Criteria and various specifications EDSs, SPECS, VURS, FUSPs etc. The EPCM Contractor Commissioning Team is responsible for developing the load commissioning procedures (COMPs) and completing all stage 3 load commissioning tests.

The development of these procedures will commence during DPS and be approved for use prior to site commissioning works commencing.

Once testing is complete the Contractor shall compile the results and supporting documentation into a Commissioning Report (COMR), to be reviewed and approved as a pre-requisite for the End of Startup Certificate (ESC).

30.2 Performance Testing

Performance testing of the plant will be carried out to the extent that individual components of the Facilities are capable of continuously operating to the requirements of the design criteria and specifications and to establish that all procurement package performance warranties specified are satisfied. For the majority of the Process Infrastructure the Load commissioning procedures will include a gradual ramp up of process feed until the individual items of plant and equipment in each subsystem, multiple subsystems (Systems) and Facility itself reaches 100% capacity.

The EPCM will develop the below procedures and will maintain responsibility and accountability for the successful completion of the performance test.

- Performance Test Criteria (DESC-170-G-00002)
- Performance Test Procedure (Document number TBC)
- Ramp Up Plan (COPP21180-PLN-R-004)

All monitoring and data recording during performance testing will be the responsibility of the EPCM with the operations team responsible for the day to day operations and maintenance of the plant.

Data trends will be compiled by the EPCM from the JBB SCADA to verify that the plant is meeting the requirements of the Performance Test Criteria (DESC-170-G-00002).

Details of plant downtime will be recorded using the Company's Delay Accounting System (DAS). This data will be used to confirm that the plant is meeting the plant availability criteria as specified by BHP's Time Usage Model (TUM).

Dashboards to allow stakeholders outside of the Commissioning team to visualise plant performance shall be created in Power BI or an equivalent data reporting system by the EPCM prior to start of Load Commissioning.

Details of the trends and dashboards to be produced for Performance Testing will be included in the JBB Performance Test procedure (Document number TBC).

Once Performance testing is complete the Contractor shall compile the above data, trends, test results and supporting documentation into a Performance Test report. Performance Testing shall be deemed complete when this report has been approved by the Company.

30.2.1 BHP operations obligations for performance testing

The expected obligations of the BHP site operations team are:

- The provision of electrical power and water
- The provision of all plant operators that have been assessed and authorized as competent
- Supply of operating and maintenance consumables
- Execution of planned maintenance activities
- Regular feed of ore to the plant that is within the design specification in quality and volume
- Suspension of any activities that may affect plant performance. (Modular shutdowns, maintenance activities)
- Material Grade as described in Performance Test Criteria (DESC-170-G-00002)
- Maintain Delay Accounting System (DAS) and operator logs

30.2.2 EPCM obligations for performance testing

The EPCM will maintain responsibility and control of the plant until completion of performance testing. This will include the following:

- Ownership of the Performance Test Plan
- Management, planning and direction for all personnel involved in the performance test
- Recording of all performance test data
- Supply of personnel to support operations with breakdown assistance and control systems alarms
- Documenting and recording all test results to submit as part of FAC
- Arranging for vendor representatives to be present as necessary
- Arranging for engineering support and necessary test equipment
- Running of daily meetings with Company operations team

30.3 Final Acceptance of Facilities

Final Acceptance of each Area is achieved with a Final Acceptance Certificate and is the last of the Toll Gates in the Completions Process as depicted in the Handover Process.

Final Acceptance takes place after completion of performance test and the Ramp-up of the plant to 100% capacity as the plant goes into full production. All CCC remaining outstanding deliverables (which have been agreed to at the time of the signing of the CCC) will have been completed and signed off including:

- Outstanding Project (engineering) documentation.
- Closure of all TQ's
- Close-out of remaining Cat C punch list items.
- Completion of Project approved Cat D punch list items.
- Removal of any temporary contractor equipment.
- As-built blackline drafting of all drawings.
- Handover of remaining commissioning spares.
- Submission of Performance Test Report

Upon successful handover to the BHP site operations team the CCMS FAC template will be signed by both Company and Contractor representatives and uploaded into the project CCMS database. This requirement will be further defined in the project Handover Plan.

31. Production Impacts and Ramp Up

31.1 Production Impacts

Tie-in outages will be managed within the windows for existing infrastructure shutdowns to ensure minimal possible impact to production. At the completion of construction tie-ins, no-load and load commissioning activities will be performed as applicable, these activities may also have an impact on production.

A Tie-In management plan will be developed during early execution phase and be endorsed by the BHP Site Operations representative.

Minimising disruption to existing production operations during the commissioning phase is critical to the project. To achieve this, a detailed Ramp Up Plan will be developed, outlining all necessary steps and procedures to ensure a smooth transition and integration of new systems. This plan will be shared and reviewed in workshop with both BHP OT and Operations to get initial feedback, and ensure transparency and collaboration throughout the process.

31.2 Ramp-up

A period of ramp up occurs after Stage 3 Load Commissioning is complete, where the plant ramps the ore supply to its full capacity over a sustained period, verified by completion of Performance Testing.

The potential operational impacts and associated controls to mitigate these impacts during load commissioning, ramp up and performance testing will be detailed within the JBB Ramp Up Plan (COPP21180-PLN-R-004). The following key items will be detailed in the Ramp Up Plan.

- a) The Ramp Up Plan will include a comprehensive timeline, highlighting key milestones and checkpoints. This will ensure that all stakeholders are aware of the project's progress and any critical dates that may impact production.
- b) An in-depth assessment of potential impacts on existing production will be conducted. Mitigation strategies will be developed and implemented to minimize these impacts. This includes bypassing the wet plant wherever feasible to avoid interruptions to ongoing operations.
- c) Regular updates and coordination meetings will be scheduled with all stakeholders. This ensures that everyone is informed of the project's status and any potential impacts on production, fostering a collaborative approach to problem-solving.

- d) The Ramp Up Plan will include detailed contingency plans to address any unforeseen issues that may arise. These plans will outline specific actions to be taken to mitigate any adverse effects on production, ensuring a quick and efficient response to any challenges.

By adhering to this detailed Ramp Up Plan, the project aims to ensure a smooth commissioning process with minimal impact on existing production operations. The below Figure 31-1 shows an overview of the expected ramp up of the plant.

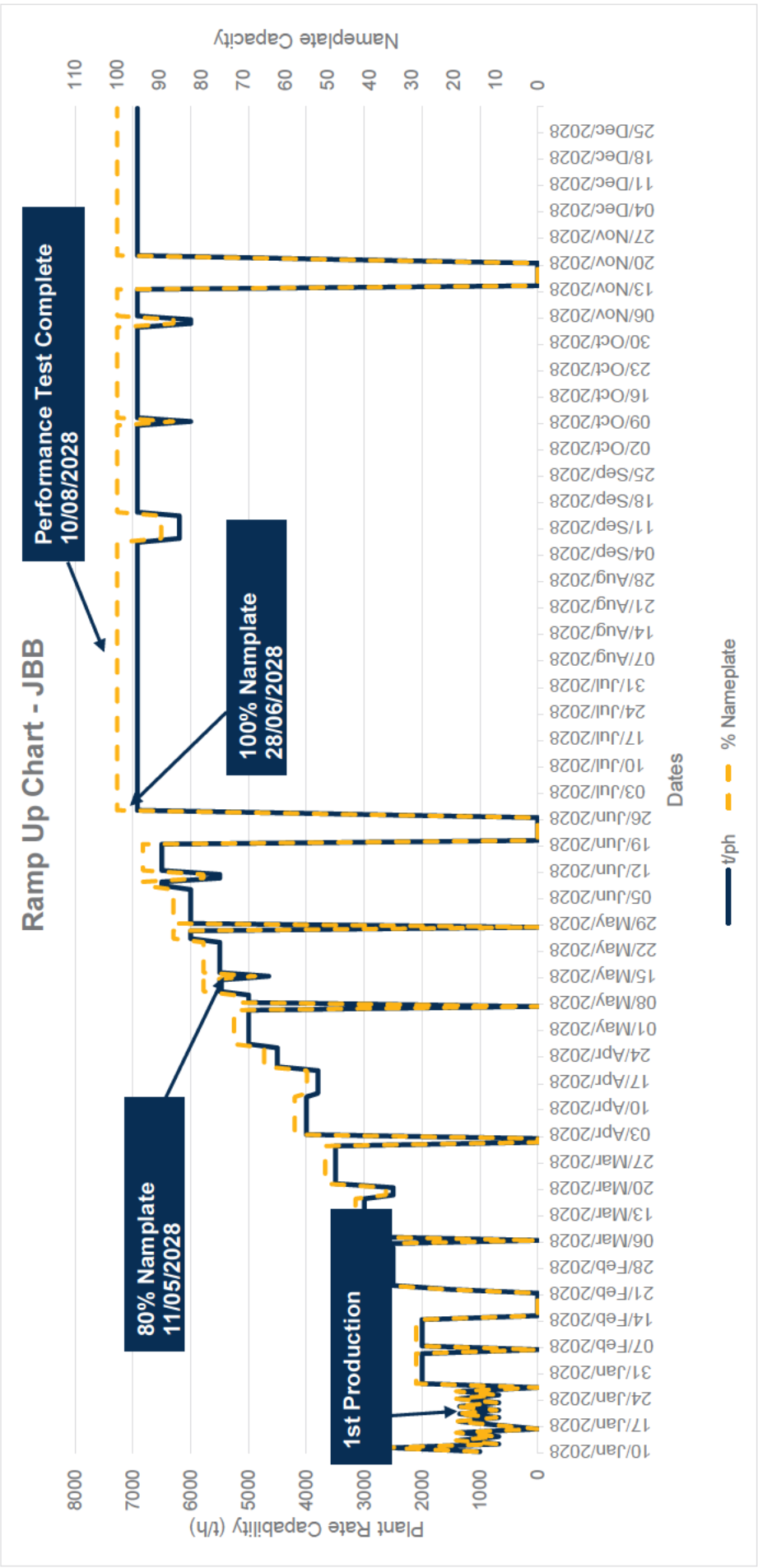


Figure 31-1: Ramp Up Curve

32. Success Factors and KPIs

Commissioning management objectives and KPIs will be aligned to the overall project objectives and KPIs.

32.1 Success Factors

The ultimate success factor of JBB commissioning is the safe, high-quality handover of each Area in accordance with the schedule and budget, and successful ramp-up of the plant as per the Ramp Up Plan.

Success Factors consist of the following elements:

- Safety – Safe Delivery of the Project, incident, and injury free
- Schedule – Maintaining First Production, Ramp Up and Performance Test Complete dates
- Cost – Complete Handover within allotted budget

32.2 KPIs

The Commissioning Team's KPIs are based around the following:

- Safety
 - TRIFR for all commissioning and ramp up activities in accordance with project KPI
 - Field Leadership activities as per site targets.
- Schedule
 - First Production date achieved.
 - Ramp Up dates achieved.
 - Performance Test Complete date achieved.
 - CCC handover delivered within scheduled timeframes
- Cost
 - FTE Headcount maintained.
 - Commissioning costs not exceeding project budget.

Appendix A Commissioning RACI

Stage 0 – DPS, PCF & FAT

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
1	SSE for JBB Area			R / A	
2	Commissioning Management Plan	R / A	C		Approval by BHP OT
3	Commissioning Execution Plan	R / A	C		Approval by BHP OT
4	Handover Plan	R / A	R	C	Approval by BHP OT & Operations
5	FAT procedure approval	R / A	C		
6	FAT attendance	R / A	C		Confirm who is attending for EPCM & OT
7	FAT report review & approval	R / A	C		
8	EPCM Office CVC & Commissioning	R / A	C		
9	CCMS instance ownership and management	R / A	C		
10	Operations scope Completions management	R / A	I		EPCM to complete Completions documentation for work completed by Operations.
11	Training plan	R / A	C		
12	Ramp up plan	R / A	C	C	
13	Performance test criteria	R / A	C		
14	Systemisation	R / A	C		
15	ITR matrix & assignment	R / A	C		
16	Purchase of Opex spares	TBC	TBC	TBC	
17	Purchase of Capex & insurance spares	TBC	TBC	TBC	
18	Purchase of Commissioning spares	TBC	TBC	TBC	

Stage 1 – Construction

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
1	SSE for JBB Area	R / A	I	I	Confirmed SSE transfer will be completed pre-mobilisation.
2	HV Isolations & permits	R	C	R / A	Refer item 6 of TNCS - "Operations will provide all HV personnel". Need to review against SOS or update estimate.
3	Brownfield permits	R	C	R / A	
4	Greenfield permits	R	I	R / A	Part of TNCS was to remove all EPCM permitting for commissioning
5	Tie-in / shutdown planning	R	R / A	C	
6	CVC walkdown organisation	R / A	C	I	
7	CVC walkdown attendance	R / A	C	I	BHP OT will be invited, but attendance is not mandatory for walk to proceed.
8	CVC compilation	R / A	I		
9	CVC sign off	R / A	I		
10	Punchlist management	R / A	I		
11	ITR sign off	R / A	I		
12	ITP sign off	R / A	I		
13	Radiation Safety Officer	C	I	R / A	Need to confirm with Ops via MOU. Uncertain weather Ops will have sufficient capacity.
14	IROC & TROC Installation	I	I	R / A	
15	Setup and maintenance of Tetra Radio	R / A	I	I	EPCM / SMPEI contractor, not commissioning team. Will need to consult with Technology team to get channels assigned.
16	First fills	R / A	I	I	SMPEI contractor as part of CVC
17	Temporary energisation of HVAC & L&SP in switchrooms	R / A	I	I	
18	Maintenance of HVAC	A		R	Action to confirm via MOU
19	Storage and preservation of spares	R / A	I		Need to confirm what warehousing plan is. Could we possibly hand over early?
20	Preservation of installed equipment	R / A	I		Preservation module to be included in CCMS. Ensure this is clearly included in SMPEI scope and pricing schedule.
21	Boundary isolation definition	R / A	C		Currently not contemplated in BHP procedures.
22	Permits within JBB SSE boundary	R / A	I		

Stage 2 – No-Load Commissioning

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
1	SSE for JBB Area	R / A	I	I	
2	Coordinate Ore feed availability for S3	R	R / A	R	
3	Coordinate Dead stockpile location for S3	R	R / A	R	
4	3rd Party Commissioning labour engagement	R / A	C		
4	3rd Party Commissioning HR / IR management	R / A	C		
5	3rd Party Commissioning labour on site management & supervision	R / A	C		
6	3rd Party Commissioning labour timing decision	R / A	C		
7	NOE compilation and distribution	R / A	I	I	
8	NOE sign off - greenfield	R / A	I		
9	NOE sign off - brownfield	R / A	C	R	
10	HV NOE compilation, sign off & distribution	R	I	R / A	Need to discuss CCC at NOE
11	HV isolations & permits	R	I	R / A	Need to determine what level EPCM will be allowed to isolate. 6.6kV?
12	Brownfield permits	R	I	R / A	Part of TNCS was to remove all EPCM permitting for commissioning
13	Greenfield permits	R	I	R / A	Part of TNCS was to remove all EPCM permitting for commissioning
14	ECC Compilation	R / A	C	I	
15	ECC Sign off	R / A	R	R	Operations sign off to confirm JBB can operate with ore
16	Ready for Load Certificate (or similar)	R	R	R / A	
17	IROC & TROC Commissioning	I	I	R / A	Not control of plan, will be operated locally until ramp up is complete
18	Control system changes	R / A	I		
19	Management of Change	R / A	C		

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
20	Storage and preservation of spares	R / A	I		Need to confirm what warehousing plan is. Could we possibly hand over early?
21	Preservation of installed equipment	R / A	I		
22	Second fills	R / A	I	I	CCMS & SAP record.
23	Condition Monitoring	A	C	R	Continues through subsequent stages, will be covered in Ops Support MOU.

Stage 3 – Load Commissioning

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
1	SSE for JBB Area	R / A	I	I	
2	Control of JBB run time	R / A	I	I	Defined & agreed by ramp up plan
3	Operation	R / A			Up to sign off of First production.
4	Maintenance	R / A	I	I	Up to sign off of First production.
5	First production confirmation	R	R / A	C	
6	ITR sign off	R / A	I		
7	COMP sign off	R / A	I		
8	Equipment repairs & replacements	R / A	I	I	
9	Coordination with Production team	R / A	C	R	
10	ESC Compilation	R / A	I		
11	ESC Sign off	R	R / A	C	
12	Control system changes	R / A	I	I	Need to define what triggers and MOC/TQ
13	Bridges & over-ride management	R / A	I	I	EPCM intending to use their own B&OR procedure

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
14	Management of Change	R / A	C	I	
15	Operations equipment training & familiarisation	R	R / A	R	EPCM responsible for training plan and vendor coordination.
16	Operations control system training & familiarisation	R	R / A	R	Need to define timing within training plan.
17	IROC & TROC Commissioning	I	C	R / A	
18	Storage and preservation of spares	R / A	I		Need to confirm what warehousing plan is. Could we possibly hand over early?
19	Preservation of installed equipment	R / A	I		Up to sign off of First production.
20	Blueline completion, review and submission	R / A	C		
21	Ops readiness deliverable		R / A	C	Training plan & spares only from EPCM? TBC via TQ
22	Verification supplied ore feed is in line with PTC requirements	C	R / A	C	

Stage 4 – Ramp Up

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
1	SSE for JBB area	I	I	R / A	Revert to WAIO Processes at start of Ramp up.
2	Performance testing management & documentation	R / A	I	I	
3	Performance test sign off	R	R / A	C	
4	CCC walkdown attendance	R	R / A	R	
5	CCC compilation and presentation	R / A	R / A	I	CCC is intended to be progressive, with PT completion noted as an exception. Ops readiness & technology deliverables within CCC.
6	CCC sign off	R	R / A	R	

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
7	Ramp up sign off	R	R / A	I	
8	FAC compilation and presentation	R / A	I	I	
9	FAC sign off	R / A	R / A	R	
10	Operations	C	I	R / A	
11	Maintenance	C	I	R / A	
12	Sampling	A	I	R	
13	Dictating of operating parameters	R / A	I	C	
14	Trouble shooting	R / A	C	C	
15	Non-business as usual repairs or replacements	R / A	C	R	EPCM accountable, but can use maintenance resources.
16	Clean up	R / A		R	EPCM accountable, but can use operational resources.
17	Shutdown planning & coordination	R	C	R / A	
18	Coordination with Production team	R / A	C	R	
19	Control system changes (PLC & SCADA)	R / A	C	R	
20	Configuration files & software backup handover	R / A	R / A	R	Calibre responsible for PLC & SCADA BHP OT responsible for technology config files etc.
21	Management of Change - Project	R / A	C	I	Need to define delineation between project change and operational change.
22	Management of Change - Operations	C	C	R / A	Need to define delineation between project change and operational change.
23	IROC & TROC testing	C	I	R / A	
24	3rd Party Commissioning labour management & Supervision	R / A	C		
25	Storage and preservation of spares	R / A	I	R	Intend for spares to be handed over progressively.
26	Maintenance & cleaning of EPCM offices	R / A			Up to handover of offices
27	EPCM office Handover	R / A	C	R	Need to confirm that Commissioning team will stay in local JBB office, and no new facility required for duration of commissioning & ramp up.
28	Disposal of excess materials	R / A		C	Consult with Operations team if they want to retain anything
29	Transport of commissioning spares & remediation of laydown area			R / A	For discussion
30	Verification that supplied ore feed is in line with PTC & ramp up requirements	C	R / A	C	

No.	Activity	EPCM	BHP OT	BHP Operations	Comment
31	Functional safety management	R / A	C	R	EPCM accountable but can use BHP resources.