



OFFSHORE IRON SANDS PROJECT

FEASIBILITY STUDY

PROJECT DEFINITION PLAN

TTRL-01-PLN-00001

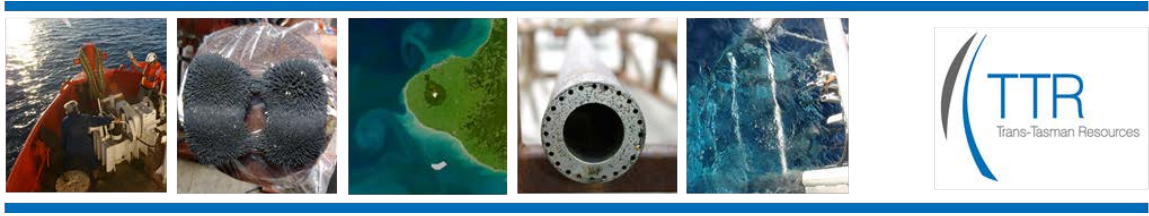
6 May 2014

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TABLE OF REVISIONS

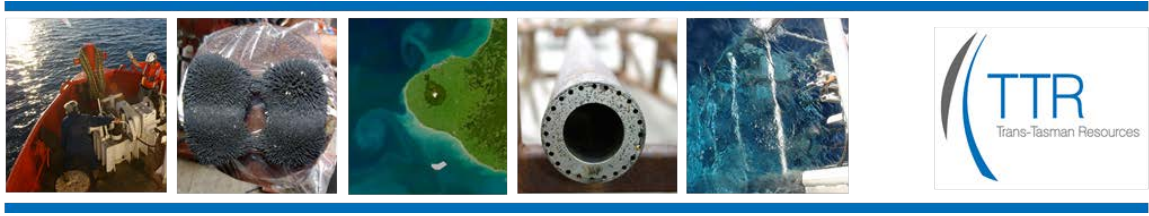
Version	Date	Reason	Author
R0	28/01/2014	For Comment	S.Thompson
R1	06/05/2014	BFS	S.Thompson
R2	20/09/2016	Update	S. Thompson
		Completed	



Feasibility Study Requirements

1 PROJECT STRATEGY

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Bankable Feasibility Study
Industry	<ul style="list-style-type: none"> Key supply and demand drivers Diversity of suppliers and customers Price assumptions Historical and forecast margins 	<ul style="list-style-type: none"> Key supply and demand drivers Revenue growth factors Industry structures Diversity of suppliers and customers Industry cost curve Price assumptions Historical and forecast margins 	<ul style="list-style-type: none"> Key supply and demand drivers Revenue growth factors Industry structures Diversity of suppliers and customers Industry cost curve Forecast project position Price assumptions Historical and forecast margins (Take Off Agreements)
Strategic Alternatives		<ul style="list-style-type: none"> Strategic alternatives including exit / "no-go" option Potential application of staged development 	<ul style="list-style-type: none"> Strategic alternatives including exit / "no-go" option Basis of investment in the opportunity being the best option Potential application of staged development
Exit Strategy		<ul style="list-style-type: none"> Basis of exit strategy 	<ul style="list-style-type: none"> Basis of exit strategy Defined triggers or milestones for exit decision

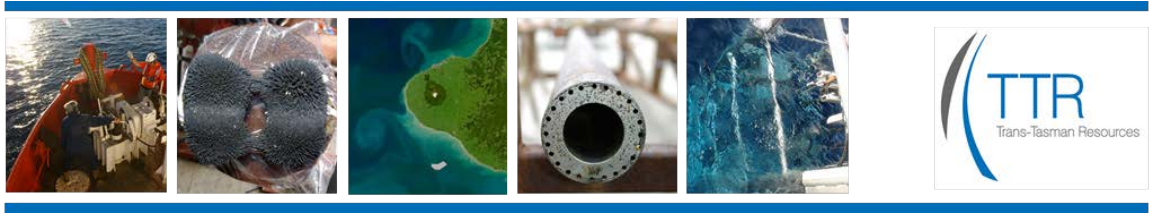


2 PROJECT EXECUTION

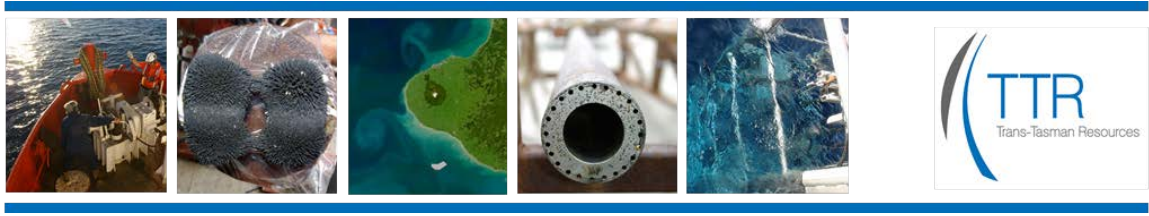
Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Scope	Define and describe the physical scope of the project	Define the physical scope of the project and refer to a control baseline	Define the physical scope of the project and refer to a control baseline. Identify change control procedures to be utilised with scope, cost and time
Project criteria	Outline control quantities, product specification and quality standards to be achieved	Define KPIs, control quantities, product specification and quality standards to be achieved Project Definition Drivers <ul style="list-style-type: none"> Debt/Equity Ratio Requirements IRR EBITDA margins payback 	Define KPIs, control quantities, product specification and quality standards to be achieved Project Definition Drivers <ul style="list-style-type: none"> Debt/Equity Ratio Requirements IRR EBITDA margins Payback Agreed Financial ratio's
Work Breakdown Structure ("WBS")	Develop a WBS for the project during the pre-Feasibility Phase	Develop a WBS for the investment opportunity and use it to produce an integrated control and reporting standard for the Capital Cost Estimate and the project schedule	Develop a WBS for the investment opportunity and use it to produce an integrated control and reporting standard for the Capital Cost Estimate and the project schedule
Execution methodology	Develop the preferred execution methodology and the contracting strategies to deliver the investment opportunity. Present the options and any pre-conditions to selecting an alternative	Develop a Project Execution Plan (PEP) Develop a Project Construction Plan (Include in PEP) Develop a Project Commissioning Plan (Include in PEP) Develop a Project Communications Plan (Include in PEP)	Develop a Project Execution Plan (PEP) Develop a Project Construction Plan Develop a Project Commissioning Plan Develop a Project Communications Plan Define the execution approach and an outline of the procedures to be applied in delivering the project.
Contracting strategies See Section 6		Develop the framework for the contracting strategies for all major supply and construction contracts	Develop and present the contracting strategies in detail for all major supply and construction contracts, with the approach and responsibility for implementation outlined
Risk Management See Section 5			



Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Project organisation See Section 5			
Health and safety See Section 10			
Project personnel See Section 6	Define the roles for key project team members	Outline roles for each project team member.	Outline roles for each project team member. This must include any terms and conditions of employment and outline mobilisation and accommodation issues, including any special staff policies that may impact costs. Key roles should be filled with the names and summary experience of assigned individuals
Quality assurance See Section 6		Develop the framework for the Project Quality Plan. Develop Inspection and Test Plans for the supply and installation for all equipment.	Develop the project quality plan which will include the Inspection and Test Plans for the supply and installation for all equipment.
Planning See Section 6	Prepare schedule. The critical path should be highlighted	Prepare the project control schedule and specifically reference key milestone dates. The critical path should be identified and resources included. Prepare the Basis of Schedule	Prepare the project control schedule and specifically reference key milestone dates. The critical path should be identified and resources included. Any resource levelling undertaken should be described and shown on the schedule. Set out the approach to monitoring, reporting and approving changes to the project control schedule and key milestones. Prepare the Basis of Schedule
Cost Management See Section 6		Prepare the Project control procedures intended to identify deviations from the project plan. (To be included in the PEP) Outline the approach to the management of contingency, escalation, foreign exchange and working capital.	Prepare the Project control procedures intended to identify deviations from the project plan. (To be included in the PEP) Outline the approach to the management of contingency, escalation, foreign exchange and working capital.
Reporting		Develop Plan outlining reporting requirements and include any special requirements set by the TTR Board, or steering committee. (Include in PEP)	Develop a Project Execution Plan detailing project reporting requirements and include any special requirements set by the TTR Board, or steering committee.
Engineering See Section 7			
Procurement and contracts See Section 6	Identify key items of Equipment with long lead times including nominated manufacturers/suppliers and major contracts that need to be let early in the Execution Phase	Outline the procurement and contracting plans that reflect the nominated contracting strategy and identify any non-standard or specific issues. (Include in PEP)	Develop a full procurement and contracting plan.

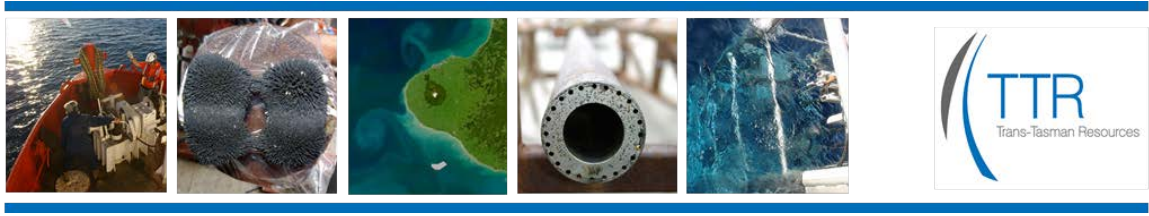


Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Construction	State the general approach to construction. Include in PEP	Develop the outline of a Construction Plan. Include in PEP	Develop a full Construction Plan addressing construction procedures to be adopted, the approach to construction, safety policies and procedures, HR and IR policies and procedures, responsibilities of each party, the approach to logistics, temporary facilities and services, security and access, staff, quality, field engineering, completion and handover for commissioning processes, and specific construction issues.
Pre-commissioning and commissioning	State the general approach to pre-commissioning, commissioning and handover .	Develop the framework for the commissioning plan. (Include in the PEP)	Develop a full Commissioning Plan defining the approach to be adopted, responsibilities during pre-commissioning and commissioning, methodology, handover points and the level of commissioning during pre-commissioning and commissioning, and shutdown and tie activities where applicable. Define the responsibility and basis of the Project Delivery Team and operations groups during ramp-up and handover, including budget allocations, schedules and milestones. The handover criteria for all the components of the project should also be defined
Operations	Not required at the pre-Feasibility Phase	Address roles and responsibilities of operational personnel during implementation, including the approach to spare parts, pre-production and start up. (Include in PEP)	Develop a Operational Plan addressing roles and responsibilities of operational personnel during implementation, including the approach to spare parts, pre-production and start up.
Environmental See Section 11			
Risk See Section 5	Identify any recognised Execution Phase major risks or potential project "killers" and propose potential mitigation concepts.	Identify any recognised Execution Phase major risks or potential project "killers" and propose potential mitigation concepts.	Identify any recognised Execution Phase major risks or potential project "killers" and propose potential mitigation concepts.
Geotechnical See Section 3			



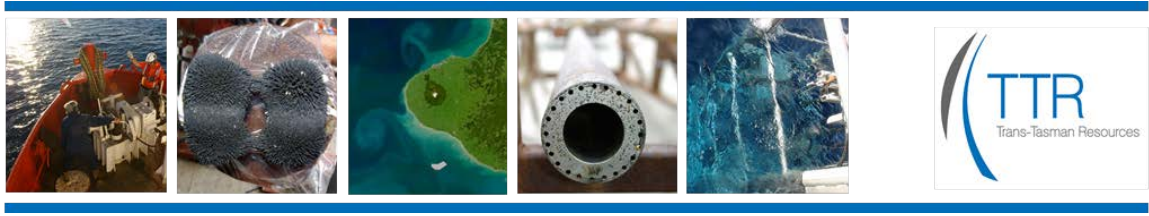
3 RESOURCE/PRODUCT

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Resource Definition	Inferred (JORC)	Indicated (JORC)	Indicated (JORC)
Ore Reserve	N/A	Probable (JORC)	Probable (JORC)
Product Specification	Specify the product standard to be achieved	Specify the product standard to be achieved. Specify Test work and protocols.	Specify the product standard to be achieved. Specify Test work and protocols.
Mine Planning/Scheduling	Incorporate an analysis of short, medium and long-term trends Ensure that prepared forecasts are checked against forecasts from authoritative sources external to TTR	Incorporate an analysis of short, medium and longer term trends Ensure that prepared forecasts are checked against forecasts from authoritative sources external to TTR Prepare a detailed analysis of the key drivers for consumption Identify the drivers of the demand cycles and make an assessment of the factors resulting in historic highs and lows Develop Short, Medium and Long Term Mine Plans	Incorporate an analysis of short, medium and longer term trends Ensure that prepared forecasts are checked against forecasts from authoritative sources external to TTR Prepare a detailed analysis of the key drivers for consumption Identify the drivers of the demand cycles and make an assessment of the factors resulting in historic highs and lows Develop Short, Medium and Long Term Mine Plans Include an assessment of the credibility of the sources of the forecasts



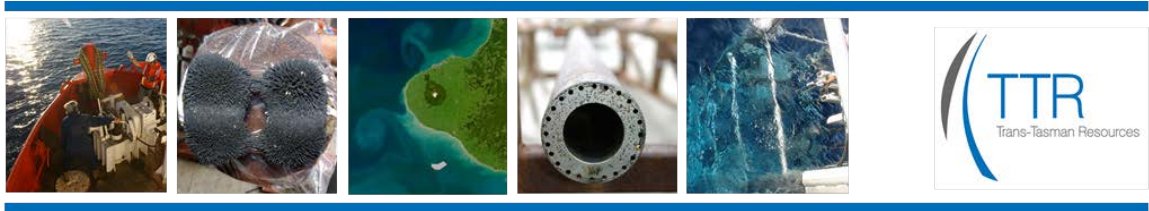
4 MARKETING

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Marketing strategy	Propose a marketing strategy in relation to product, volume, market share, growth potential, price and promotion to customers	Present a marketing strategy in relation to product, volume, market share, growth potential, price and promotion to customers <ul style="list-style-type: none"> - Identify entry and competitive strategies and the likely reaction of competitors - Identify product characteristics through sinter pot and pelletising tests. 	Develop a marketing plan detailing a marketing strategy in relation to product, volume, market share, growth potential, price and promotion to customers Identify entry and competitive strategies and the likely reaction of competitors Forecast sales for base, high and low scenarios along with associated probabilities, substantiated by demand/supply forecasts and competitor analysis
Pricing strategy	Present any standard and non-standard pricing strategies developed	Develop and present any standard and non-standard pricing strategies Explain the impact of significant increases in market share on existing pricing	Develop and present any standard and non-standard pricing strategies Explain the impact of significant increases in market share on existing pricing
Customers	Identify major customers including an analysis of typical product quality, quantity and price parameters	Identify major customers including an analysis of typical product quality, quantity and price parameters Investigate and note any special behaviour characteristics, particularly in revenue forecasts	Identify major customers including an analysis of typical product quality, quantity and price parameters Investigate and note any special behaviour characteristics, particularly in revenue forecasts
Marketing contacts and contracts		Identify any contracts or agency agreements proposed to be adopted for the marketing of outputs	Identify any contracts or agency agreements proposed to be adopted for the marketing of outputs
Revenue forecasts	Forecast the revenues from sales, based on: demand and supply forecasts, marketing strategy, proposed product mix, and expected working capital requirements. (Include in Financial Model)	Forecast the revenues from sales, based on: demand and supply forecasts, marketing strategy, proposed product mix, and expected working capital requirements. (Include in Financial Model)	Forecast the revenues from sales, based on: demand and supply forecasts, marketing strategy, proposed product mix, and expected working capital requirements. Quantify the sensitivity of revenues to changes in market scenarios and product specification (Include in Financial Model)



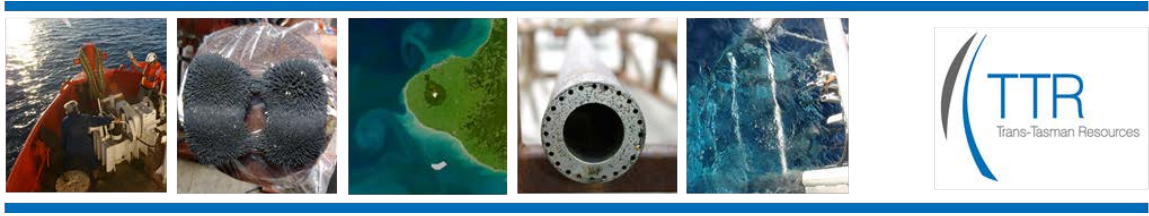
5 RISK MANAGEMENT

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Policies, procedures and management systems	Present a Risk Management framework	Present a Risk Management system. (Include in PEP)	Develop a detailed Risk Management Plan.
Risk Assessment	Assessment of risk through a risk workshop involving all relevant specialists.	Assessment of risk through an independently facilitated risk workshop. Present a Risk Assessment report, including risk register and project risk profile.	Assessment of investment risk through an independently facilitated risk workshop A Risk Assessment report, including risk register and risk profile Final estimates of gross exposure and net exposure in monetary terms Commentary on exit strategies and any restrictions resulting from entering into long-term commitments with third parties



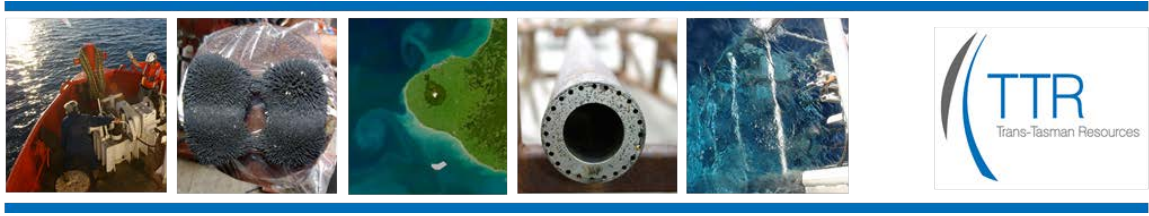
6 PROCUREMENT AND CONTRACTING

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Project Procurement Plan	Propose a framework for the contracting strategies for all major supply and construction contracts. Include Procurement Plan in PEP	Develop the framework for the contracting strategies for all major supply and construction contracts. Detail the appropriate relationships and contract approaches for each type of purchased goods or outsourced service Identify suitable suppliers Qualify selected Suppliers Prepare RFQs and RFPs Incorporate the procurement plan into project control schedule and specifically reference key milestone dates	Develop and present the contracting strategies in detail for all major supply and construction contracts, with the approach and responsibility for implementation outlined Detail the appropriate relationships and contract approaches for each type of purchased goods or outsourced service Identify suitable suppliers Qualify selected Suppliers Prepare RFQs and RFPs Evaluating RFQs and RFP. Incorporate the procurement plan into project control schedule and specifically reference key milestone dates
Terms and Conditions and Contract Suite	Propose a T&C's framework Select Standard Form of Contract	Develop the Standard Terms and Conditions Select Standard Form of Contract	Develop the Standard Terms and Conditions Develop Project Contract Suite
Contract management Plan	Propose a T&C's framework Select Standard Form of Contract	Develop the Standard Terms and Conditions Develop Project Contract Suite Develop the Contract Management Plan <ul style="list-style-type: none"> Contract information Strategies to ensure supplier(s) deliver the goods or services in accordance with contractual obligations Strategies to manage supplier performance Contract administration systems(including price and product variations) Outline the approach to the management of contingency, escalation, foreign exchange and working capital.	Develop the Standard Terms and Conditions Develop Project Contract Suite Develop the Contract Management Plan <ul style="list-style-type: none"> Contract information Strategies to ensure supplier(s) deliver the goods or services in accordance with contractual obligations Strategies to manage supplier performance Contract administration systems(including price and product variations) Outline the approach to the management of contingency, escalation, foreign exchange and working capital.

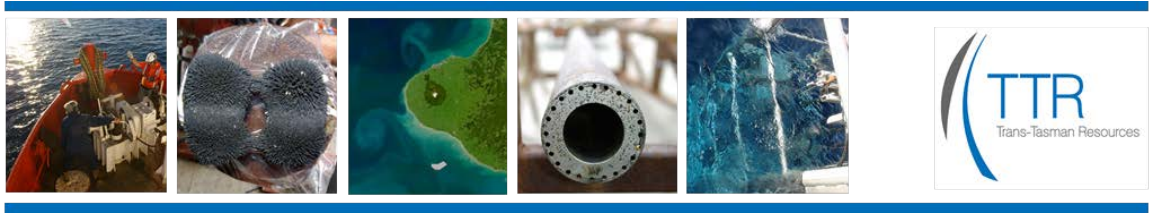


7 ENGINEERING

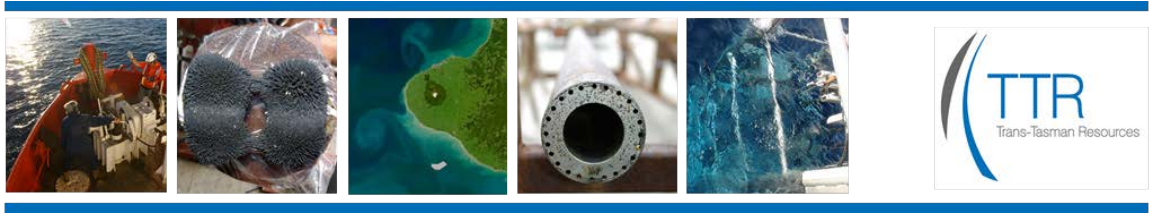
Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Strategy	State the recommended approach to engineering including identification of requirements for specialist input, workflows, engineering tools, modelling, data acquisition, detailing, the application of technologies, standards to be adopted and the engineering resource requirement	<p>Identify the parties to be responsible for providing and performing engineering works, the standards to be adopted, quality assurance, and any technical issues requiring particular expertise</p> <p>Develop the outline of an engineering plan outlining required levels of definition and associated workflows.</p> <p>Outline the approach to the preparation of Engineering Deliverables.</p>	Identify the parties to be responsible for providing and performing engineering works, the standards to be adopted, quality assurance, and any technical issues requiring particular expertise Develop the outline of an engineering plan outlining required levels of definition and associated workflows. Outline the approach to the preparation of Engineering Deliverables.
Basis of design	<p>A scope of design which will define the minimum design requirements and technical specification for all development work during the pre-Feasibility Phase:</p> <ul style="list-style-type: none"> • Site conditions • Safety parameters identified and provided for in the scope of design • Environmental constraints included in the scope of design 	<p>A developed scope of design which will define the minimum design requirements and technical specification for all development work during the Feasibility Phase:</p> <ul style="list-style-type: none"> • Site conditions • Safety parameters identified and provided for in the scope of design • Environmental constraints included in the scope of design 	<p>A developed scope of design which will define the minimum design requirements and technical specification for all development work during the Feasibility Phase:</p> <ul style="list-style-type: none"> • Site conditions • Safety parameters identified and provided for in the scope of design • Environmental constraints included in the scope of design
Process deliverables	<ul style="list-style-type: none"> • Water and mass balance • Process flow diagram • Preliminary GA and sections for Integrated vessel, and processing plant. • Preliminary Equipment list – mechanical, electrical and instrumentation, etc. • Preliminary selections of major Equipment items • Preliminary performance specifications for packaged plants and utilities 	<p>Verified Deliverables</p> <ul style="list-style-type: none"> • Process flow diagram • Preliminary GA and sections for Integrated vessel, and processing plant. • Dynamic Operational Model (Process, Mining, Vessel & External support systems). • Equipment list – mechanical, electrical and instrumentation, etc. • Specifications and data sheets for all major Equipment • Final selections of major mechanical Equipment items • Single line electrical diagrams • Preliminary Process control configuration and preliminary functional specifications • Preliminary Performance specifications for modularised equipment c/w utilities 	<p>Verified Deliverables</p> <ul style="list-style-type: none"> • Process flow diagram • Final GA and sections for Integrated vessel, and processing plant. • Detailed Integration of Equipment on Marine Platform. • Dynamic Operational Model (Process, Mining, Vessel & External support systems) • Finalised Equipment list – mechanical, electrical and instrumentation, etc. • Specifications and data sheets for all major Equipment • Final selections of major mechanical Equipment items • Single line electrical diagrams • Process control configuration and functional specifications • Performance specifications for modularised equipment c/w utilities



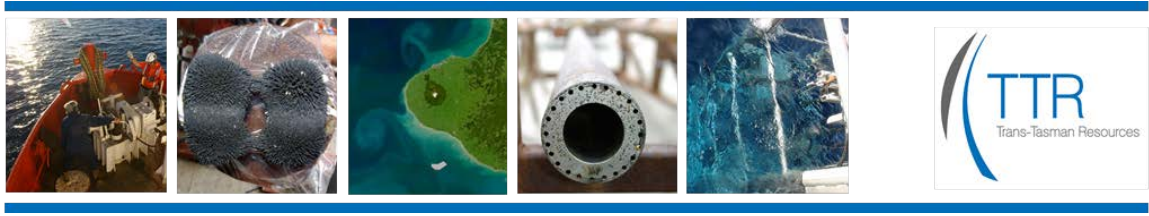
Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Integrated Mining Vessel Design	Integrated Mining Vessel Concept Preliminary GA	<ul style="list-style-type: none"> • List of Long Lead Items • Process CAPEX Estimate (Factored & Budget Quotes) • Process OPEX Estimate (Factored) Class Notation Approval in Principle Design Package, which will include but not be limited to the following: <ul style="list-style-type: none"> • General arrangement • Stability assessment • Main cross section • Mooring winch spec • Outline spec • Risk assessment • Electrical Single line diagram • Power load balance Approval in Principle from Classification Society	<ul style="list-style-type: none"> • Piping Construction Drawings • Structural Fabrication Drawings • 3d Layout and GA models • Mass and energy balance computer simulations • Process simulation models • Equipment plot plans • Utility flow diagrams • Preliminary process hazards analysis documentation • Preliminary process operating manuals • List of Long Lead Items • Process CAPEX Estimate (Quotes) • Process OPEX Estimate (Quotes) Vessel Detail Design <ul style="list-style-type: none"> • Vessel specification • GA arrangement plan • General design drawings • Hull and construction • Accomodation • Final Calculations for stability, weight and speed/power • Midship section • Typical construction plans • Bridge control and nautical equipment details • Mech calc. and Slamming Analyses • Electrical drive systems details • LV Electrical supply System Details. • HV supply distribution System Details • Arrangement drawings for vessel equipment and outfitting • Electrical installation • Electrical load balance



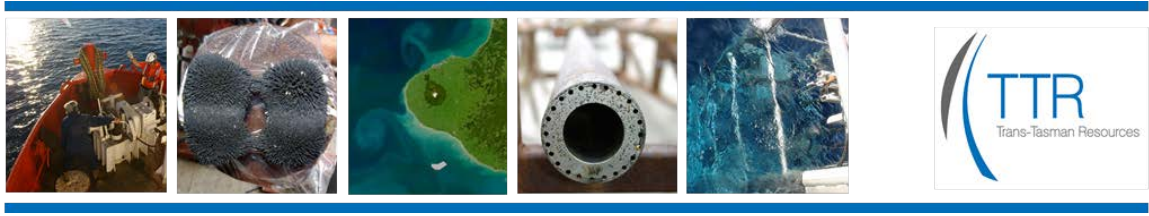
Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Trans-ShippingVessel Design	Trans-shipment Vessel Concept	<p>Trans-shipment Vessel Concept</p> <p>Preliminary GA</p>	<ul style="list-style-type: none"> • Final G.A. of Elec inst vessel • System diagrams for all engine room and ship's piping • Vessel Tender Documentation • Vessel Build Schedule <p>Class Notation</p> <p>Approval in Principle Design Package, which will include but not be limited to the following:</p> <ul style="list-style-type: none"> • General arrangement • Stability assessment • Main cross section • Mooring winch spec • Outline spec • Risk assessment • Electrical Single line diagram • Power load balance <p>Approval in Principle from Classification Society</p> <p>Vessel Detail Design</p> <ul style="list-style-type: none"> • Vessel specification • GA arrangement plan • General design drawings • Hull and construction • Accomodation • Final Calculations for stability, weight and speed/power • Midship section • Typical construction plans • Bridge control and nautical equipment details • Mech calc. and Slamming Analyses • Electrical drive systems details • LV Electrical supply System Details.



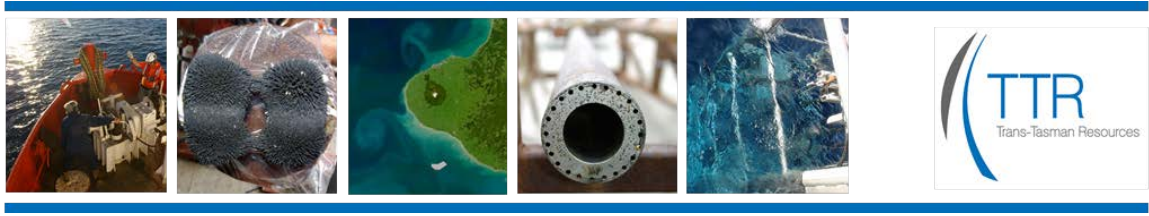
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Mining System Crawler	Define the crawler concept for a 6500-8000tph mining system.	<p>Basis of Design for a 8000tph mining system.</p> <p>Define a single or double crawler system.</p>	<ul style="list-style-type: none"> • HV supply distribution System Details • Arrangement drawings for vessel equipment and outfitting • Electrical installation • Electrical load balance • Final G.A. of Elec inst vessel • System diagrams for all engine room and ship's piping • Vessel Tender Documentation • Vessel Build Schedule <hr/> <p>Detail Design for a 8000tph single crawler mining system.</p> <ul style="list-style-type: none"> • GA Drawing of Crawler • Detail Design of Crawler: Structural and Mechanical Detail Drawings. • Finite Element Analyses • Electrical System Details • Hydraulic System Details • Control System Details • Mass Estimate & CoG of Crawler • Crawler Specification • Crawler System Description • List of Long Lead Items • Construction and Operating Documentation • Construction Schedule • Crawler CAPEX Estimate • Crawler OPEX Estimate •
Mining System. LARS	<p>Define the LARS and Mooring for the crawler concept for a 6500-8000tph mining system</p> <ul style="list-style-type: none"> • Produce Initial Layout of LARS and Mooring for Space allocation on Vessel. 	<p>Define the Basis of Design for the LARS and Mooring for a 8000tph mining system.</p> <ul style="list-style-type: none"> • Define a single or double crawler system. • Produce Updated Layout of LARS together with Estimated Masses and CoGs 	<p>Detail Design of the LARS and Mooring</p> <ul style="list-style-type: none"> • Detail Design of LARS: Structural and Mechanical Detail Drawings. • Finite Element Analyses



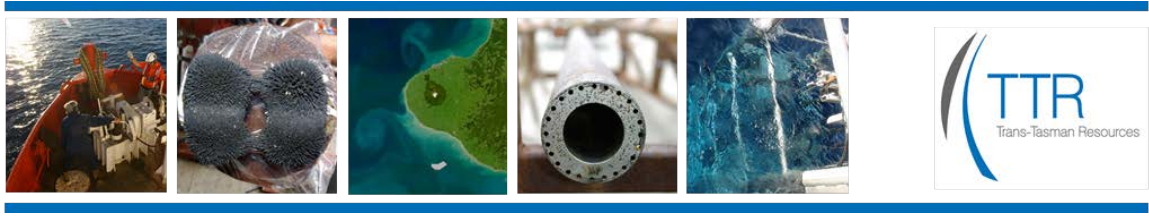
Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
		<ul style="list-style-type: none"> • Produce Initial Foundation Loads • Determination of Mooring System specification and Classification Reqt.s • Layout of Mooring System (aft). • Layout of Mooring System (fwd). 	<ul style="list-style-type: none"> • Electrical System Details • Hydraulic System Details • Control System Details • Mass Estimate & CoG of LARS • LARS Specification • LARS System Description • List of Long Lead Items • Construction and Operating Documentation • Construction Schedule • LARS CAPEX Estimate • LARS OPEX Estimate
Mooring	Determination of Mooring System specification	<ul style="list-style-type: none"> • Determination of Mooring System specification and Classification Reqt.s • Layout of Mooring System (aft). • Layout of Mooring System (fwd). • Mooring CAPEX Estimate (+20/-15%) • Mooring OPEX Estimate (+20/-15%) 	<ul style="list-style-type: none"> • Design of Mooring Winch, Drive, Spooling, Tension Control and Band Brakes. • Design of Fairleader. • Design of Bend Sheaves. • Design of Electrical System. • Design of Control System. • Design of Hydraulic System. • Winch G.A.s. • Winch Detail Drawings. • Fairleader G.A. • Fairleader Detail Drawings. • F.E.A. of Winch and Fairleader. • Electrical Detail Drawings, Schedule and Equipment Schedule. • Control Functional Specification. • Control Detail Drawings Schedule and Equipment Schedule. • Mooring CAPEX Estimate (±10%) • Mooring OPEX Estimate (±10%)



Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Tailings Disposal System	<ul style="list-style-type: none"> Identify a feasible Tailings Disposal System Initial Layout and Space Allocations on Vessel. 	<ul style="list-style-type: none"> Determination of Tailings Disposal System Specification and Classification Reqt. Initial Layout and Space Allocations on Vessel. Integration with Vessel design Tailings Disposal System Execution Schedule Tailings Disposal System CAPEX Tailings Disposal System OPEX 	<ul style="list-style-type: none"> Design of Electrical System Design of Control System. Design of Hydraulic System. Design of sliding piece and hull adaptation Design of overboard pipe Design of gantries and winches Design of nozzle Design Sliding piece G.A. Sliding piece Detailed drawings Hull adaptation G.A. Hull adaptation detailed drawings Design F.E.A. of Hull Adaptation Overboard pipe G.A Overboard pipe detailed drawings Gantries and winches G.A. Gantries and winches detailed Nozzle G.A Nozzle detailed drawings Schedule and Equipment Schedule Tailings Disposal System Execution Schedule Tailings Disposal System CAPEX Tailings Disposal System OPEX
Power Generation	Present a preliminary Power Generation solution.	Detail a Power Generation Solution capable of <ul style="list-style-type: none"> Leading a A fuel supply agreement that will provide the lowest long term bunkered cost to the project for IFO 180/380 HFO. Delivered to the FPSO, operating off the Taranaki coast. Providing A power generation configuration that will deliver the lowest cost/Kwh Delivering A 80Mw power generation configuration that can be supplied and installed for less than NZ\$ 90m 	Detail a Power Generation Solution capable of <ul style="list-style-type: none"> Leading a A fuel supply agreement that will provide the lowest long term bunkered cost to the project for IFO 180/380 HFO. Delivered to the FPSO, operating off the Taranaki coast. Providing A power generation configuration that will deliver the lowest cost/Kwh

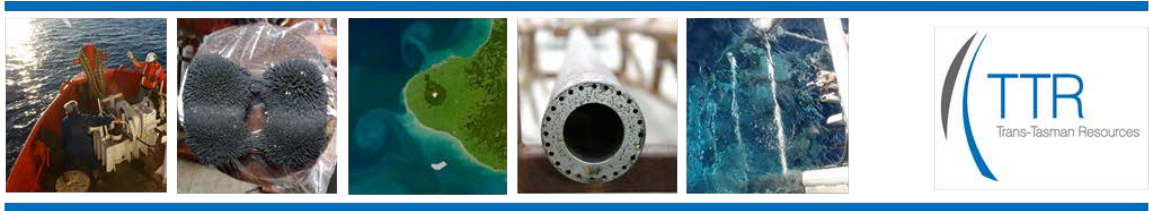


Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
		<ul style="list-style-type: none"> GA Identify and layout auxiliary support services 	<ul style="list-style-type: none"> Delivering A 80Mw power generation configuration that can be supplied and installed for less than NZ\$ 90m GA Identify and layout auxiliary support services
Desalination Plant	Present a solution for a Desalination Plant Concept 30,000 cubic meters/ day	Detail a solution for a Desalination Plant Concept 30,000 cubic meters/ day GA	Detail a Desalination Solution capable of" <ul style="list-style-type: none"> Producing 30,000 cubic meters/day GA of Intergrated solution Identify and layout auxiliary support services
Value improving practices	Identify a range of relevant value improvement practices including, but not limited to: <ul style="list-style-type: none"> Technology selection Leadership and team building Class of plant quality Customised standards and specifications Waste minimisation Lessons learned and best practices 	Address value improvement opportunities identified during the pre-feasibility phase.	Address value improvement opportunities identified during the pre-feasibility and feasibility (Lite) phases. Develop value improvement practices including, but not limited to: <ul style="list-style-type: none"> Design capacity Process simplification Process reliability modelling Predictive maintenance Constructability review



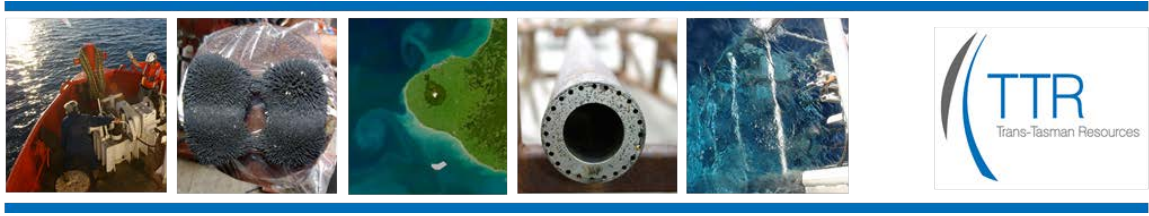
8 HUMAN RESOURCES

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Human resources assessment	High Level evaluation of the skills required and available to execute and operate the planned project.	<p>Detail the skills required to execute and operate the planned project.</p> <p>Present a organisational model, the respective roles, reporting relationships etc.</p> <p>(Include in PEP)</p>	<p>Detailed assessment of skills required and available to execute and operate the planned project.</p> <p>Survey and evaluate the sources of human resources available</p> <p>Present a organisational model, the respective roles, reporting relationships etc.</p> <p>Address the recruitment and training strategy, existing and required special issues</p> <p>Summarise the conditions of employment for each role, which will form the basis of operating cost estimates, including issues such as current labour/union agreements</p> <p>Statutory obligations and/or requirements pertaining to the employment of personnel, both local and expatriate,</p> <p>Address local country practice</p> <p>Address international best practice</p>

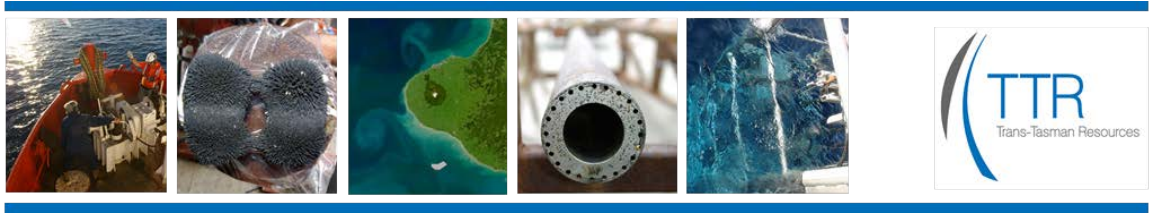


9 OPERATIONS MANAGEMENT

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Operating Philosophy	State the operating philosophy.	Develop the overall operating philosophy covering all aspects of the operation, including the use of contractors and the principles of operating excellence	Develop the overall operating philosophy covering all aspects of the operation, including the use of contractors and the principles of operating excellence
Organisation	Report on the likely structure of the operations management group to be developed Indicate the possible structure of external providers, and state the ratios of labour, supervision and administration to workforce Outline the organisation development program (if greenfields project) to cover recruitment, induction, training and operations	Develop the structure of the operations management group to production team level to show responsibilities and authority over operational aspects. The structure of external providers (transport, etc.) must be shown. State the organisation development program to cover recruitment, induction, training and roles in commissioning	Develop the structure of the operations management group to production team level to show responsibilities and authority over operational aspects. The structure of external providers (transport, etc.) must be shown. State the organisation development program to cover recruitment, induction, training and roles in commissioning
Personnel	Include a scheduled breakdown by vocation of the proposed operating workforce	Complete a manning schedule showing the required timing of each position on the proposed operating workforce Adequate provisions, based on survey data, must be allowed and stated for the following and should be provided as separate and identifiable allowances: Leave (planned and unplanned) Non-wage on costs Lost time due to industrial relations Training replacement and retraining	Complete a manning schedule showing the required timing of each position on the proposed operating workforce Adequate provisions, based on survey data, must be allowed and stated for the following and should be provided as separate and identifiable allowances: Leave (planned and unplanned) Non-wage on costs Lost time due to industrial relations Training replacement and retraining
Operating cycle	State the proposed shift and leave cycles and the impact of these cycles on productivity, lost time and costs	State the shift and leave cycles and demonstrate the impact of the cycles on: productivity, ability to attract the workforce, lost time, and costs	State the shift and leave cycles and demonstrate the impact of the cycles on: productivity, ability to attract the workforce, lost time, and costs
Maintenance	State provisions for specialised maintenance and other external providers and provide an outline of the maintenance development program in accordance with TTR's maintenance standards	State provisions for specialised maintenance and other external providers and provide an outline of the maintenance development program in accordance with TTR's maintenance policies	State provisions for specialised maintenance and other external providers and provide an outline of the maintenance development program in accordance with TTR's maintenance policies
Transport	Include a forecast of transport and logistics requirements, both inputs and outputs, with a cost basis developed for the investment opportunity	Include a forecast of transport and logistics requirements , both inputs and outputs, with a demonstrated method and cost basis developed for the project. In particular, the historic performance of the existing transport system should be demonstrable to ensure the inventory holding criteria is validated	Include a forecast of transport and logistics requirements, both inputs and outputs, with a demonstrated method and cost basis developed for the project. In particular, the historic performance of the existing transport system should be demonstrable to ensure the inventory holding criteria is validated

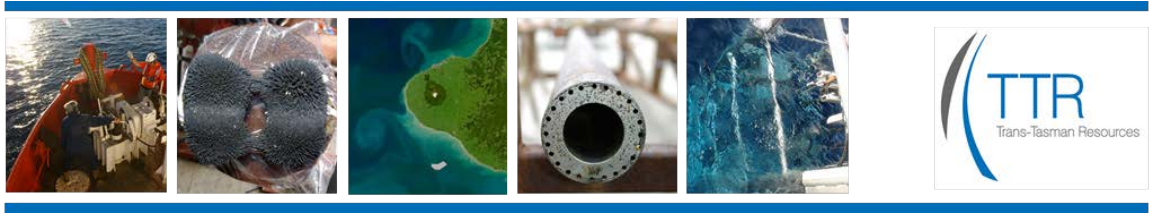


Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
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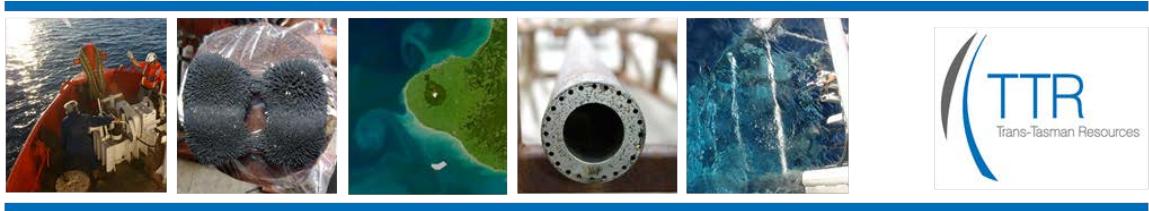
10 HEALTH AND SAFETY

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
H&S Assessment	Evaluate, compare and rank the health and safety risks associated with the project	<p>Identify applicable Health and Safety Regulatory Framework.</p> <p>Present a more detailed qualitative health and safety Risk Assessment (e.g. Address specifics such as Equipment selection, construction, transportation etc.)</p> <p>Identify all risk control and mitigation measures required for the project to achieve the indicated level of health and safety risk, as this information must be used to establish the basis of design within the project. This information will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> • A record of assumptions used in the assessment • A record of the process systems used to control or mitigate hazards, and the performance requirements they must meet • The emergency response, evacuation, and rescue/treatment philosophy for the project 	<p>Identify applicable Health and Safety Regulatory Framework.</p> <p>Develop a H&S Management Plan</p> <p>Identify all risk control and mitigation measures required for the project to achieve the indicated level of health and safety risk, as this information must be used to establish the basis of design within the project. This information will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> • A record of assumptions used in the assessment • A record of the process systems used to control or mitigate hazards, and the performance requirements they must meet • The emergency response, evacuation, and rescue/treatment philosophy for the project
H&S management and monitoring	Describe intended plans for: <ul style="list-style-type: none"> (i) Activities and systems for managing risks to personnel, the environment and the community (ii) Monitoring and measurement plans (iii) Community liaison and stakeholder engagement plans 	<p>Detail intended plans for:</p> <ul style="list-style-type: none"> (i) Activities and systems for managing risks to personnel, the environment and the community (ii) Monitoring and measurement plans (iii) Community liaison and stakeholder engagement plans <p>Review and update the schedule and resources required for the development of the H&S management system</p>	<p>Review and update the schedule and resources required for the development of the H&S management and monitoring system</p> <p>Ensure that H&S, procedures and targets are established for significant risks, key activities and processes</p> <p>Confirm all stakeholder commitments have been met/addressed or included in the H&S management plan</p>
Safety Case		<p>Develop the framework for a detailed safety case that will identify any hazards having the potential to cause multiple fatalities of persons on or near the installation; describe how the hazards will be controlled; and describe the safety management system to be put in place to ensure that the controls are effectively and consistently applied.</p>	<p>Develop a detailed safety case and submit it to the High Hazards Unit for approval. In the safety case any hazards to safety must be identified and control measures implemented and a emergency response plan must be developed.</p>



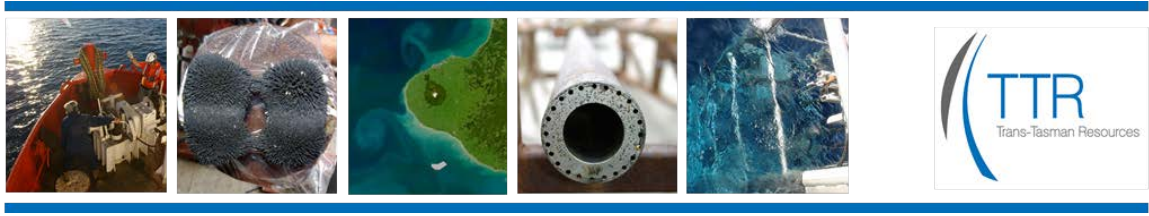
11 ENVIRONMENTAL

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Environmental Assessment	Evaluate, compare and rank the Environmental risks associated with the project	Develop the framework for a Environmental Management Plan (Include in PEP)	Develop a Environmental Management Plan Identify all risk control and mitigation measures required for the project to achieve the indicated level of Environmental risk, as this information must be used to establish the basis of design within the project. This information will include, but not necessarily be limited to: <ul style="list-style-type: none"> • A record of assumptions used in the assessment • An indication of the sensitivity of the assessment results to principal assumptions • A record of the process systems used to control or mitigate hazards, and the performance requirements they must meet • The emergency response, evacuation, and rescue/ treatment philosophy for the investment opportunity • Include an updated summary of the Risk Assessment and risk register
Environmental management and monitoring	Describe intended plans for: <ol style="list-style-type: none"> Activities and systems for managing risks to personnel, the environment and the community Monitoring and measurement plans Community liaison and stakeholder engagement plans 	Detail intended plans for: <ol style="list-style-type: none"> Activities and systems for managing risks to personnel, the environment and the community Monitoring and measurement plans Community liaison and stakeholder engagement plans 	Detail intended plans for: <ol style="list-style-type: none"> Activities and systems for managing risks to personnel, the environment and the community Monitoring and measurement plans Community liaison and stakeholder engagement plans Review and update the emissions management and monitoring plans, based on final design criteria and plans
Closure Plan		Develop the framework for a decommissioning, closure and rehabilitation plan for the project. (Include in PEP)	Complete and cost a decommissioning, closure and rehabilitation plan for the project.

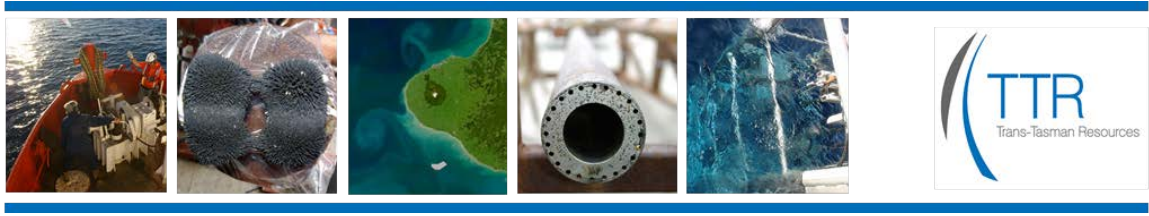


12 CAPITAL COST ESTIMATE

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Accuracy of estimate	<p>Develop a Capital Cost Estimates for the project that is targeted within an accuracy of $\pm 30\%$</p> <p>Develop the Basis of Estimate, including references to the relevant source of quantity and cost data, and the scope of work</p>	<p>Develop a Capital Cost Estimate for the investment opportunity that is targeted within an accuracy of $+25\% -10\%$</p> <p>Develop the Basis of Estimate, including references to the relevant source of quantity and cost data, and the scope of work (Include in PEP)</p>	<p>Develop a Capital Cost Estimate for the investment opportunity that is targeted within an accuracy of $\pm 10\%$</p> <p>Develop the full Basis of Estimate, including references to the relevant source of quantity and cost data, and the scope of work</p>
Structure of estimate	<p>Structure capital cost items in a manner consistent with the WBS developed, and ensure pre-production cost estimates are separated from commissioning cost estimates.</p> <p>A summary of the Capital Cost Estimate should be included in the body of the pre-feasibility report, with any detailed estimates to be presented in Appendices to the pre-feasibility report</p>	<p>Structure capital cost items in a manner consistent with the WBS prepared, and ensure pre-production costs separated from commissioning cost estimates</p>	<p>Structure capital cost items in a manner consistent with the WBS prepared, and ensure pre-production costs separated from commissioning cost estimates</p>
Working capital	<p>Include estimated working and sustaining calculated values, Develop an Equipment replacement schedule and capital requirements to replace this Equipment. Where useful working life is not an appropriate basis for this schedule, identify and explain the methodology used</p>	<p>Provide calculated values for working and sustaining capital, checked against benchmarks, as well as percentages of annual revenue and of capital cost, respectively</p> <p>Develop an Equipment replacement schedule and capital requirements to replace this Equipment</p>	<p>Provide calculated values for working and sustaining capital, checked against benchmarks, as well as percentages of annual revenue and of capital cost, respectively</p> <p>Develop an Equipment replacement schedule and capital requirements to replace this Equipment,</p>
Contingency	<p>Include a contingency allowance and clearly state the methodology for calculating or arriving at the allowance</p>	<p>Include a contingency allowance and clearly state the methodology for calculating or arriving at the allowance.</p> <p>The calculation of contingency must include:</p> <ol style="list-style-type: none"> i. Growth allowances ii. Design factors iii. Provisional quantities 	<p>Include a contingency allowance and clearly state the methodology for calculating or arriving at the allowance.</p> <p>It is critical that the calculation of contingency clearly states the inclusion of:</p> <ol style="list-style-type: none"> i. Growth allowances ii. Design factors iii. Provisional quantities

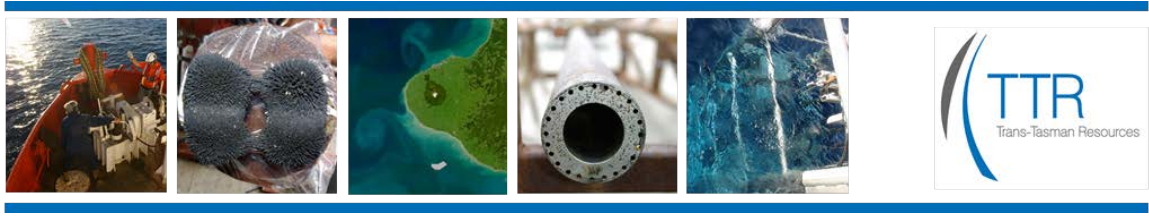


Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Range Analysis	Develop the estimate to represent the most likely case and describe realistic downside/upside scenarios	Develop the estimate to represent the most likely case and the downside/upside case scenarios (i.e. P10/P90 scenarios)	Develop the estimate to represent the most likely case and the downside/upside case scenarios (i.e. P10/P90 scenarios)
Sources of cost data	Identify sources of cost data, e.g.: Previous pre-feasibility reports for similar projects Benchmarked estimate data Equipment vendors Bulk material suppliers Specialist project estimating consultants	Detail sources of cost data, e.g.: Previous pre-feasibility reports for similar projects Benchmarked estimate data Equipment vendors Bulk material suppliers Specialist project estimating consultants	Detail sources of cost data, e.g.: Previous pre-feasibility reports for similar projects Benchmarked estimate data Equipment vendors Bulk material suppliers Specialist project estimating consultants



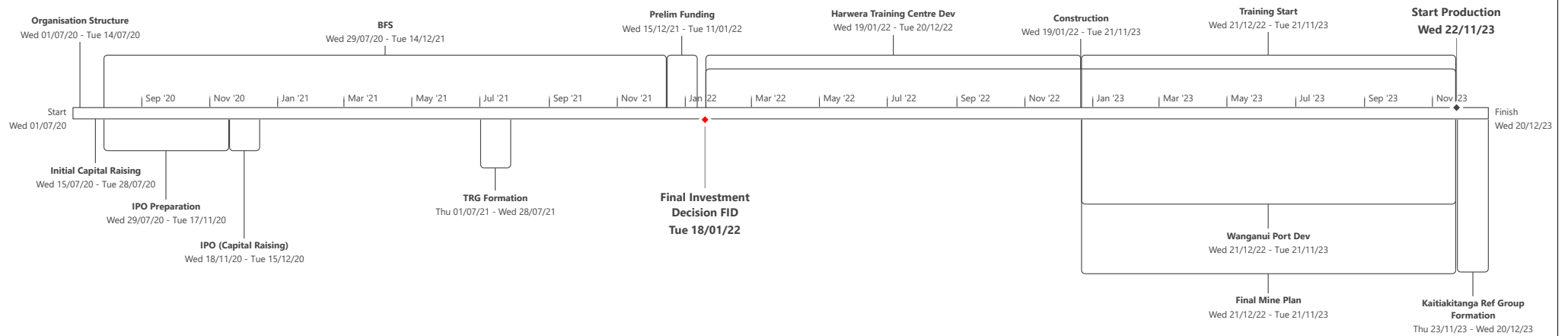
13 OPERATING ESTIMATE

Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Minimum level of detail	<p>Fixed operating costs</p> <p>Labour costs – An assessment of staffing requirements and unit labour costs based on the operating philosophy of the project.</p> <p>Fixed overheads calculated and benchmarked to similar projects where possible</p> <p>Variable operating costs</p> <p>Consumables – Rates of consumption for production facilities and services/utilities to based on factorised costs or unit usage rates with supply costs based on budget quotations</p> <p>Fuel – Based on consumption rates derived from model or industry norms.</p> <p>Maintenance costs – Maintenance costs should be calculated based on preliminary Equipment selections and conceptual facilities design and benchmarked to similar projects</p>	<p>Fixed operating costs</p> <p>Labour costs – Present the detailed assessment of staffing requirements and unit labour costs based on the operating philosophy of the facilities by each category of staff and labour and by proposed operating area or department. Unit labour costs should include the base salary plus all other allowances</p> <p>Fixed overheads – Calculate these costs and break them into: labour related costs, administrative related costs, marketing/sales, management fee (or joint venture cost where applicable)</p> <p>Variable operating costs</p> <p>Fuel– Base on consumption rates derived from model work</p> <p>Operating and maintenance consumables – Base these rates on unit usage rates and supply costs on multiple budget quotations</p> <p>Maintenance, consumables and spares – Calculate maintenance, consumables and spares costs and benchmark them to similar projects where possible. Base these on levels and costs recommended by the selected vendors for the relevant plant and Equipment and through industry standard factors for items/plant areas where specific data is not available</p>	<p>Fixed operating costs</p> <p>Labour costs – Present the detailed assessment of staffing requirements and unit labour costs based on the operating philosophy of the facilities by each category of staff and labour and by proposed operating area or department. Unit labour costs should include the base salary plus all other allowances.</p> <p>Fixed overheads – Calculate these costs and break them into: labour related costs, administrative related costs, marketing/sales, management fee (or joint venture cost where applicable)</p> <p>Variable operating costs</p> <p>Fuel– Base on consumption rates derived from model work</p> <p>Operating and maintenance consumables – Base these rates on unit usage rates and supply costs on multiple budget quotations</p> <p>Maintenance, consumables and spares – Calculate maintenance, consumables and spares costs and benchmark them to similar projects where possible. Base these on levels and costs recommended by the selected vendors for the relevant plant and Equipment and through industry standard factors for items/plant areas where specific data is not available</p>

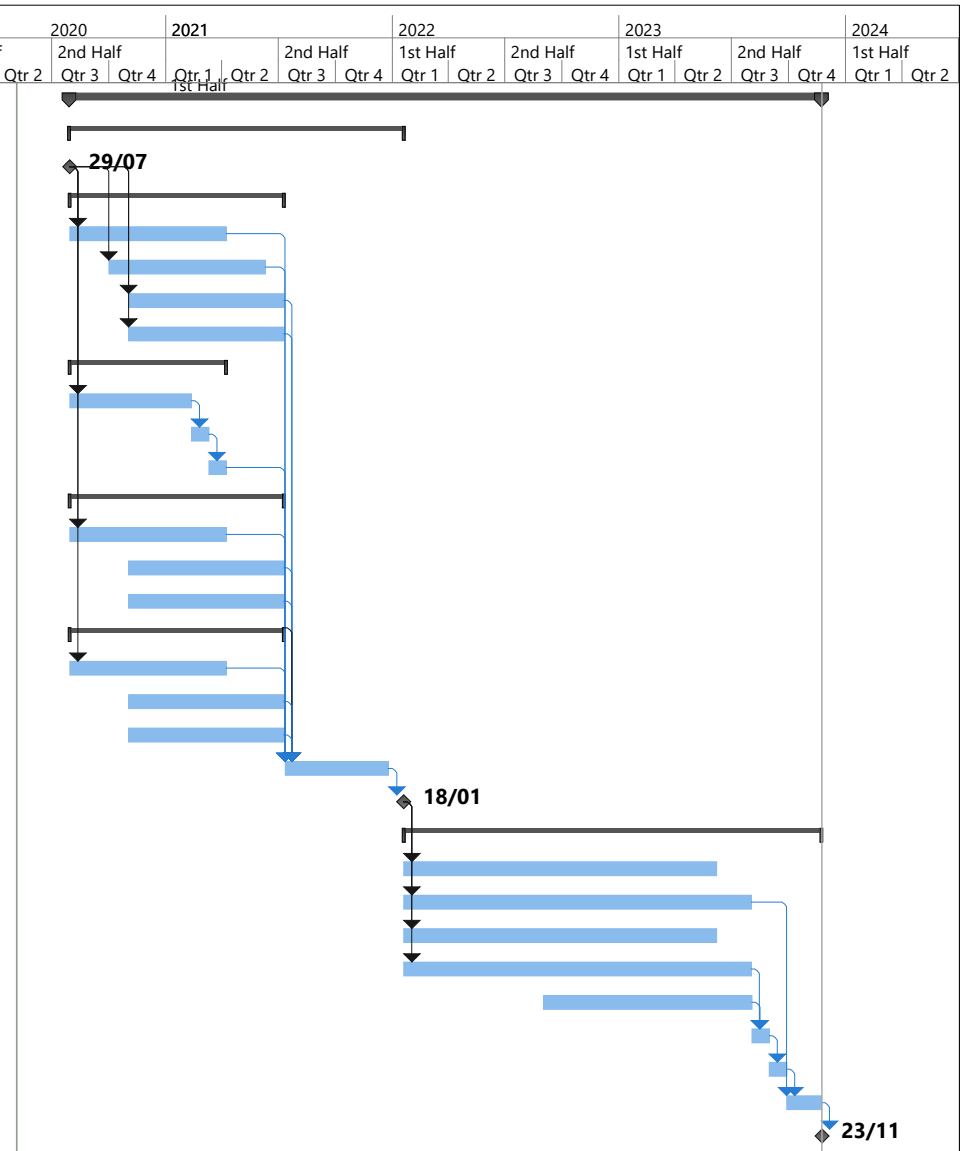


Project Element	Pre-feasibility Study	Bankable Feasibility Study - Intermediate	Definitive Bankable Feasibility Study
Accuracy of estimates	<p>Develop operating cost estimates with a targeted accuracy of $\pm 30\%$ and include a description for the basis of the estimate</p> <p>The estimate should be expressed in the functional currency of the investment opportunity, which should be the same as for the capital cost</p> <p>Operating costs should be expressed in real terms, i.e. before the effect of inflationary assumptions resulting from the timing of when costs are expected to be incurred. An assessment of the impact of escalation assumptions will form part of the financial analysis</p> <p>Provide a definition of costs between capital and operating costs, sufficient to allow a preliminary financial evaluation to be undertaken</p> <p>Ensure that:</p> <p>Fixed operating cost estimates can be used as a direct input to the financial model.</p> <p>Variable operating cost estimates are expressed in costs per unit of output, and shows unit rates, in a format that can be used as a direct input to the financial model.</p>	<p>Develop operating cost estimates with a targeted accuracy of $\pm 20\%$ -10% and develop a basis of estimate (Include in PEP)</p> <p>Provide a detailed definition of cost, sufficient to allow an accurately defined financial evaluation to be undertaken</p>	<p>Develop operating cost estimates with a targeted accuracy of $\pm 10\%$ and develop a Basis of Estimate.</p> <p>Provide a detailed definition of cost, sufficient to allow an accurately defined financial evaluation to be undertaken</p>
Sources of cost data	<p>Identify sources of cost data, e.g.: Budget Quotes</p> <p>Current operating data</p> <p>Benchmarked data</p> <p>Equipment vendors</p> <p>Bulk material suppliers</p> <p>Specialist project estimating consultants</p>	<p>Identify and detail sources of cost data, e.g.:</p> <p>Current operating data</p> <p>Benchmarked data</p> <p>Equipment vendors</p> <p>Bulk material suppliers</p> <p>Specialist project estimating consultants</p>	<p>Identify and detail sources of cost data, e.g.:</p> <p>Current operating data</p> <p>Benchmarked data</p> <p>Equipment vendors</p> <p>Bulk material suppliers</p> <p>Specialist project estimating consultants</p>

South Taranaki Bight Project High Level Plan R2



ID	Task Mode	Task Name	Duration	Start	Finish	2020		2021		2022		2023		2024	
						f	2nd Half	Qtr 1	Qtr 2	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
1		Offshore Ironsands Project	866 days	Wed 29/07/20	Wed 22/11/23										
2		BFS	385 days	Wed 29/07/20	Tue 18/01/22										
3		BFS Study Commences	1 day	Wed 29/07/20	Wed 29/07/20										
4		Mining System Design	247 days	Thu 30/07/20	Fri 09/07/21										
5		Crawler	9 mons	Thu 30/07/20	Wed 07/04/21										
6		LARS	9 mons	Thu 01/10/20	Wed 09/06/21										
7		Mooring	9 mons	Mon 02/11/20	Fri 09/07/21										
8		Mining Vessel Basic Design	36 wks	Mon 02/11/20	Fri 09/07/21										
9		Process Plant Design	180 days	Thu 30/07/20	Wed 07/04/21										
10		Detailed Design	7 mons	Thu 30/07/20	Wed 10/02/21										
11		Market Enquiry	1 mon	Thu 11/02/21	Wed 10/03/21										
12		Market Evaluation	1 mon	Thu 11/03/21	Wed 07/04/21										
13		Vessel Auxiliary Plant	247 days	Thu 30/07/20	Fri 09/07/21										
14		Power Generation	9 mons	Thu 30/07/20	Wed 07/04/21										
15		Desalination Plant	9 mons	Mon 02/11/20	Fri 09/07/21										
16		FSO	9 mons	Mon 02/11/20	Fri 09/07/21										
17		Support Services	247 days	Thu 30/07/20	Fri 09/07/21										
18		Support Vessels	9 mons	Thu 30/07/20	Wed 07/04/21										
19		Helicopter	9 mons	Mon 02/11/20	Fri 09/07/21										
20		Infrastructure	9 mons	Mon 02/11/20	Fri 09/07/21										
21		BFS Estimate	6 mons	Mon 12/07/21	Fri 24/12/21										
22		Final Investment Decision FID	1 wk	Wed 12/01/22	Tue 18/01/22										
23		Construction and Commissioning	481 days	Wed 19/01/22	Wed 22/11/23										
24		FSO Detailed Design	18 mons	Wed 19/01/22	Tue 06/06/23										
25		FSO Construction	20 mons	Wed 19/01/22	Tue 01/08/23										
26		Mining Vessel Detailed Design	18 mons	Wed 19/01/22	Tue 06/06/23										
27		Mining Vessel Construction	20 mons	Wed 19/01/22	Tue 01/08/23										
28		Process Plant Installation	12 mons	Thu 01/09/22	Wed 02/08/23										
29		Vessel Commissioning	1 mon	Thu 03/08/23	Wed 30/08/23										
30		Process Plant Dry Commissioning	1 mon	Thu 31/08/23	Wed 27/09/23										
31		Process Plant Wet Commissioning	2 mons	Thu 28/09/23	Wed 22/11/23										
32		Project Complete	1 day	Thu 23/11/23	Thu 23/11/23										



Project: Full High Level Project
Date: Wed 06/05/20

Task		Inactive Task		Manual Summary Rollup		External Milestone	
Split		Inactive Milestone		Manual Summary		Deadline	
Milestone		Inactive Summary		Start-only		Progress	
Summary		Manual Task		Finish-only		Manual Progress	
Project Summary		Duration-only		External Tasks			

ID	WBS	Task Name	Duration	Start	Finish	2021								2022				2023				2024	
						1st Half		2nd Half		1st Half		2nd Half		1st Half		2nd Half		1st Half		2nd Half			
						Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
1	STB011	STB Project	906 days?	Wed 01/07/20	Wed 20/12/23																		
2	STB011.1	Organisation Structure	2 wks	Wed 01/07/20	Tue 14/07/20																		
3	STB011.2	Initial Capital Raising	2 wks	Wed 15/07/20	Tue 28/07/20																		
4	STB011.3	IPO Preparation	4 mons	Wed 29/07/20	Tue 17/11/20																		
5	STB011.4	IPO (Capital Raising)	1 mon	Wed 18/11/20	Tue 15/12/20																		
6	STB011.5	BFS	18 mons	Wed 29/07/20	Tue 14/12/21																		
7	STB011.6	TRG Formation	1 mon	Thu 01/07/21	Wed 28/07/21																		
8	STB011.7	Prelim Funding	1 mon	Wed 15/12/21	Tue 11/01/22																		
9	STB011.8	Final Investment Decision FID	1 wk	Wed 12/01/22	Tue 18/01/22																		
10	STB011.9	Construction	24 mons	Wed 19/01/22	Tue 21/11/23																		
11	STB011.10	PCEMP Monitoring Pgm	24 mons	Wed 19/01/22	Tue 21/11/23																		
12	STB011.11	Harwera Training Centre Dev	12 mons	Wed 19/01/22	Tue 20/12/22																		
13	STB011.12	Training Start	12 mons	Wed 21/12/22	Tue 21/11/23																		
14	STB011.13	Wanganui Port Dev	12 mons	Wed 21/12/22	Tue 21/11/23																		
15	STB011.14	Final Mine Plan	12 mons	Wed 21/12/22	Tue 21/11/23																		
16	STB011.15	Start Production	1 day	Wed 22/11/23	Wed 22/11/23																		
17	STB011.16	Kaitiakitanga Ref Group Formation	1 mon	Thu 23/11/23	Wed 20/12/23																		

Project: STB Project High Level
Date: Wed 06/05/20

Task		Inactive Task		Manual Summary Rollup		External Milestone	
Split		Inactive Milestone		Manual Summary		Deadline	
Milestone		Inactive Summary		Start-only		Progress	
Summary		Manual Task		Finish-only		Manual Progress	
Project Summary		Duration-only		External Tasks			