


Baffinland Iron Mines LP
Mary River Expansion Stage 3
Definitive Study Report
Section 22 – Operations Readiness

						
2017-05-01	0	Approved for Use	R. Barrette	É. Denommée-Gravel	C. Horan	BIM
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22. Operations Readiness

22.1 Executive Summary

The Operational Readiness (OR) Plan has been developed with the aim of ensuring the safe and expeditious ramp-up of the Mary River Expansion Operations to achieve the forecasted production rate and operational costs.

The OR work conducted to date has identified no fatal flaws from an operational readiness perspective. The OR plan contains a fit for purpose execution strategy for the remaining project lifecycle. Key dimensions of this OR plan included development of the:

- Operating Strategy.
- Maintenance Framework.
- Organisational Charts.
- BIM Headcount and Assumptions.
- OR Work Plan.
- OR Estimate.

Central to the OR Plan is the OR Work Plan (OR Work Packages) which was developed in accordance with the Operations Strategy and Maintenance Framework. These work packages were derived from the known requirements to ensure there is a plan and budget for the execution phase for the Maintenance, Operations, Training (Maintenance and Operations) and Supply Chain and Logistics functions.

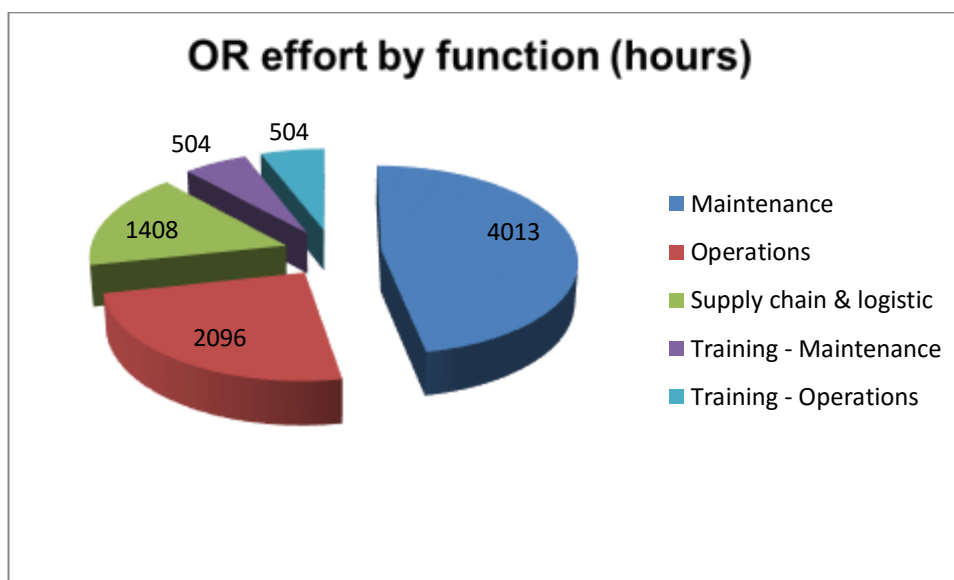


Figure 22-1: OR Effort Estimate

An OR estimate has been developed from base principles to +/- 25% accuracy. The OR estimate has been estimated based on similar project experience, with consideration for the execution strategy and challenges expected with the successful execution for the Mary River Project. The total OR estimate is estimated at \$1,407,000.

Comparisons of the OR needs to the Project and the Commissioning budgets have been conducted to ensure there are no gaps, overlaps or double entries.

A detailed OR Execution Plan will be developed at the commencement of the Execution phase with the continued involvement of the site Management Team, the chosen OEM's, BIM Contractual, O&M Contractors and other relevant Stakeholders.

22.2 Approach to Developing Operational Capabilities

The Mary River mine, Railway and Milne Port sites is a brownfield project with an existing operation, however the OR plan contains requirements of developing a new organisation. This organization will ensure a safe, planned and rapid start-up of these sites, the integration and setup of required systems and infrastructure, the engagement and development of the team, as well as the associated equipment, is capable and operationally ready so that safety, production, cost and quality meet the projects ramp-up operations forecasts. The OR Plan (A22-5) considers the needs of the following functional areas in Figure 22-2 below.



Figure 22-2: OR Plan Functional Considerations

The operating strategy developed by BIM for the expanded operation is shown in Appendix A22-1.

22.2.1 Vision for the BIM Operation

BIM vision is to safely and efficiently identify and develop resources within Baffin Island, unlocking their wealth-generating potential to the benefit of all stakeholders.

BIM is committed to building and operating the Mary River mine and Milne Port in an environmentally and socially responsible manner that will benefit all stakeholders. Particular consideration will be given to the Inuit of the North Baffin region as the project is successfully developed. Our approach is one of caring, hard work, innovation, reliability and teamwork.

The Operations Strategy document describes how this will be achieved in great detail, it can be found in Appendix A23-1.

22.2.2 Operational Readiness Needs

In order to achieve the above vision, the OR plan is focused on providing the following:

- The safe, planned and rapid start-up of the mine and equipment so that production, cost and quality meet the project ramp-up operations forecasts.
- Equipment that is ‘Reliable’ and able to safely perform at expected availability to meet the needs of the Production Schedules and Project Plans. The Maintenance Framework document describes how this will be achieved in great detail and can be found in Appendix A22-2.
- People who are ‘Capable’ with high levels of engagement, empowerment, skills and knowledge to safely meet the needs of the start-up and on-going production. *The organisational charts depict the functional spread of responsibility for the intended BIM organisation while the headcount and assumptions show the number of people in each function. The organisational charts and headcount can be respectively found in Appendix A22-3 and A22-4*
- Systems and processes are ‘Efficient’, operationally ready and in place, deployed to the workforce and ready to ensure that the production requirements of the schedules and plans are met safely, consistently and in full compliance with operating licenses and the values, mission and vision.

Key elements of the OR plan include:

- Operating strategy.
- Organizational philosophy and structure.
- Management of change process.
- Shutdown management and strategy.
- Work management and maintenance system (CMMS).
- Material management.
- Contractor management.
- Maintenance daily management and performance monitoring.
- Drawings and document management.

The OR Team will function as an integrated team within the project. Figure 22-3 below shows the OR Delivery Model to transition the Project into sustainable operations.



Figure 22-3: Integration of Project Commissioning, Operations Readiness and Ramp Up

OR specific work packages and implementation activities are focused on the following areas to prepare BIM in achieving the production increase:

- Management operating systems, business systems, business processes and operating procedures are identified, developed as 'fit for purpose', implemented, understood and used effectively.
- Robust asset management practices are in place, aligned with the Maintenance Framework.
- Appropriate training is provided to Operations and Maintenance, including training material development, implementation, planning and scheduling.
- Supply Chain and Logistics processes such as outbound material logistics, material management strategy and spares cataloguing.
- Commissioning is defined in the Project Execution Plan (PEP).
- Ramp Up is planned as part of the Production Planning.

22.3 Operational Readiness Progress at the End of Definitive Study

During the Definitive Study (DS), the following key activities were completed:

- Operating Strategy.
- Maintenance Framework.
- Organisational Charts.
- BIM Headcount and Assumptions.
- OR Work Plan.

- OR Estimate.

The OR activities progress budget, risk and schedule implementation tracking will be set up at the beginning of the execution phase and continue for the duration of the project until ramp up targets are achieved.

22.4 Operational Readiness Risks Consideration

The OR work conducted to date has identified no fatal flaws from an operational readiness perspective.

22.5 Operational Readiness Work Plan

The OR Work Plan in Appendix A22-5 consist in a work package list that is required to complete the OR component of the Project in execution for the Operations, Maintenance, Training (production and maintenance) and Supply Chain and Logistics functions.

The main OR work packages are outlined below:

- Operations:
 - ♦ Management of change.
 - ♦ Operating plans/task lists.
 - ♦ Upload data into CMMS.
 - ♦ Operating WI's and procedures (SOPs).
- Maintenance:
 - ♦ Equipment registers and functional locations.
 - ♦ Criticality assessment of new equipment and processes.
 - ♦ Equipment maintenance strategies, plans, tasks lists and BOMs.
 - ♦ Maintenance procedures and WI's.
 - ♦ Data uploaded into CMMS.
 - ♦ Maintenance metrics and reports for new equipment.
 - ♦ Spare part philosophy.
 - ♦ Spare part and tooling assessment.
- Training:
 - ♦ Training planning and scheduling.
 - ♦ Training material development and implementation.

- Supply Chain and Logistics:
 - ♦ Material management strategy.
 - ♦ Outbound material logistics.
 - ♦ Spare parts cataloguing.

At the outset of the DS, an OR core team will be mobilized to the Project Team under the direction of the Mary River Project Manager and a part time OR Manager. To ensure suitable focus and ownership of OR activities during the Execution Phase, the OR Team will comprise of OR contractors supported by a range of part time specialists from BIM Operations and Support Departments. This mix allows the OR Team to flex as required to meet the needs of the OR Work Plan.

22.6 OR Schedule

To be developed in Execution.

22.7 OR Estimate

An OR budget has been estimated, at the work package level, for the OR costs during the Project Life. The work has been validated by both the project and BIM OR manager. This approach has identified approximately 2,13 person years of work to complete the OR execution from Detailed Engineering to the end of pre-commissioning, estimated at 2 years. A blended all-inclusive hourly rate of CAD\$ 165 per/hour rate for OR contractors. The resulting OR Budget by functional area is listed in Table 22-1 below.

Table 22-1: OR Estimate by Functional Area

Function	Hours (OR Contractor)
Maintenance	4013
Operations	2096
Supply chain & logistic	1408
Training - Maintenance	504
Training - Operations	504
Total effort (h)	8525
Cost per hour	165
Total cost (\$)	\$ 1 407 000
Services and Supplies	\$ -
Contingency (included in overall Project)	\$ -
Grand Total	\$ 1 407 000

22.7.1 Estimate Basis and Assumptions

The following assumption have been made in the OR estimate.

- OR estimate is zero based, reflecting the identified an agreed work packages from the DS.

- OR estimate is based on DS information available.
- OR estimate does not include OR capital cost items.
- Vendor labour for commissioning, ramp-up support and training is included in the Project Budget.
- Maintenance and Operations labour for commissioning is included in the Commissioning Budget.
- Construction trade labour and supervision for commissioning and ramp-up activities is included in the Commissioning Budget.
- Start-up and ramp-up management and execution costs is excluded from the OR budget. This cost would be covered under OPEX.
- Operations, Maintenance and other people hired by BIM, not directly involved in the development of OR work, are budgeted for in the OPEX Budget, not the OR Budget.
- People who are working on the development and implementation of OR activities that are included in the OR Work Plan are budgeted for in the OR estimate.
- Operations and maintenance planning and development of procedures and work instructions for the Railway system will be developed by the Rail operation and maintenance contractor. Cost is included in the Project Budget.
- Maintenance planning and the development of procedures and work instructions for the heavy mining equipment (HME) will be developed by the HME maintenance contractor. Cost is included in the Project Budget.
- There is no cost included in the OR estimate for the training material development and implementation for the site services and accommodations since the Project will expand with identical equipment (same as existing).
- Training material development and implementation for the Mine bulk material handling system modifications is included in the OR estimate.
- Training material development and implementation for the Port bulk material handling system (from car unloading to ship loader) is included in the Project Budget.
- Training material development and implementation for the Railway system operation and maintenance and the HME maintenance is included in the Project Budget.
- Operations labour, accommodation and travel expenses for attendance at training and or between hire and start of operations are included in OPEX.
- Capital purchases of systems, tools and equipment required for the BIM to operate are included in the Project Budget. Labour for spare parts cataloging is included in the OR estimate.

- All first fills are covered under the Project budget.

22.7.2 Estimate Summary Tables

Table 22-2: OR Estimate – Area Level (L3)

Level 2 OR Functions	Level 3 Area	Effort (h)
Maintenance	General	410
Maintenance	Mine	401
Maintenance	Port	2975
Maintenance	Rail	228
Operations	General	160
Operations	Mine	296
Operations	Port	1560
Operations	Rail	80
Supply chain & logistic	General	320
Supply chain & logistic	Mine	32
Supply chain & logistic	Port	1056
Supply chain & logistic	Rail	0
Training - Maintenance	Mine	264
Training - Maintenance	Port	160
Training - Maintenance	Rail	80
Training - Operations	Mine	264
Training - Operations	Port	160
Training - Operations	Rail	80

Table 22-3: OR Estimate – Sub Area Level (L4)

Level 2 OR Functions	Level 3 Area	Level 4 Sub area	Effort (h)
Maintenance	General	General	410
Maintenance	Mine	Camp accommodations extension	35
Maintenance	Mine	HME fleet and workshop	123
Maintenance	Mine	Primary crushing and stacking	243
Maintenance	Port	Camp accommodations extension	80
Maintenance	Port	Car dumper system	193
Maintenance	Port	Dock no. 2	42
Maintenance	Port	Reclaimer and shiploader	1194
Maintenance	Port	Secondary crushing and screening	829
Maintenance	Port	Site services	215
Maintenance	Port	Stacking	422
Maintenance	Rail	Railway, rolling stocks and workshop	228
Operations	General	General	160
Operations	Mine	Bulk material handling system	200
Operations	Mine	HME fleet and workshop	96
Operations	Port	Car dumper system	280
Operations	Port	Reclaimer and shiploader	400

Level 2 OR Functions	Level 3 Area	Level 4 Sub area	Effort (h)
Operations	Port	Secondary crushing and screening	520
Operations	Port	Site services	80
Operations	Port	Stacking	280
Operations	Rail	Railway, rolling stocks and workshop	80
Supply chain & logistic	General	General	320
Supply chain & logistic	Mine	Bulk material handling system	32
Supply chain & logistic	Mine	HME fleet and workshop	0
Supply chain & logistic	Port	Car dumper system	144
Supply chain & logistic	Port	Reclaimer and shiploader	400
Supply chain & logistic	Port	Secondary crushing and screening	336
Supply chain & logistic	Port	Site services	0
Supply chain & logistic	Port	Stacking	176
Supply chain & logistic	Rail	Railway, rolling stocks and workshop	0
Training - Maintenance	Mine	Bulk material handling system	104
Training - Maintenance	Mine	General	160
Training - Maintenance	Mine	HME fleet and workshop	0
Training - Maintenance	Port	Bulk material handling system	0
Training - Maintenance	Port	General	160
Training - Maintenance	Port	Site services	0
Training - Maintenance	Rail	General	80
Training - Maintenance	Rail	Railway, rolling stocks and workshop	0
Training - Operations	Mine	Bulk material handling system	104
Training - Operations	Mine	General	160
Training - Operations	Mine	HME fleet	0
Training - Operations	Port	Bulk material handling system	0
Training - Operations	Port	General	160
Training - Operations	Port	Site services	0
Training - Operations	Rail	General	80
Training - Operations	Rail	Railway, rolling stocks and workshop	0

22.8 Reference Documents

Document Number	Title	Revision	Date	Appendix Number
H353004-00000-800-084-0003	Operating Strategy	0	11/4/2017	A22 - 1
H353004-00000-800-084-0002	Maintenance Framework	0	11/4/2017	A22 - 2
H353004-00000-100-146-0001 AP0C	Organisational Chart	N/A	12/4/2017	A22 - 3
H353004-00000-800-066-0001	Head Count and Assumptions	0	11/4/2017	A22 - 4
H353004-00000-100-146-0001 AP0E	OR Work Plan	N/A	10/4/2017	A22 - 5