Baffinland Iron Mines Corporation
Mary River Project

Type A Water Licence:

Attachment 3: Project Wide Documents

Document Number	Date:	Reviewed By:
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Baffinland Iron Mines Corporation

1. Attachment 3: Project Wide

1.1 Documents

1.1.1 Introduction

1.1.1.1 Description and Overview

The Mary River Project is located on north Baffin Island, in the Nunavut Territory, in the Canadian arctic. One aspect of the Project that is required is obtaining a Nunavut Water Board (NWB) Type A water licence to operate. In order to do this, a water Licence application needs to be completed and submitted to the Board so that they can exercise their powers under the Nunavut Waters Nunavut Surface Rights Tribunal Act (NWNSRTA or Act) and the Northwest Territories Water Regulations (NTWR or Regulations). As part of the application process there are certain engineering deliverables that need to be submitted. This document gives an outline of the engineering deliverable documents that fall under the heading Project Wide Documents.

1.1.1.2 Scope

The scope of this element of the Project includes all Project Wide Documents which form part of the Attachment 3 and principally include:

1.1.1.2.1 Design Criteria:

- Design Basis - Environmental Design Basis;
- Design Basis - Incinerator;
- Design Basis - Waste Management;
- Design Basis - Wastewater Treatment (Oily Water);
- Design Basis - Potable Water Treatment Plant;
- Design Basis - Sewage Treatment Plant; and
- Design Criteria - Fuel Storage and Distribution System.

1.1.1.2.2 Technical Specifications:

- Technical Specification - Fuel Storage and Distribution System;
- Technical Bid Evaluation - Wastewater Treatment System (Oily Water);
- Technical Specification - Wastewater Treatment Plant (Oily Water); and
- Technical Specification -Temporary and Permanent Accommodation and Facilities.

1.2 Additional Information

Commitment 251 from "Commitments from Technical Meeting (Iqaluit, October 18, 20, 2011):

"Provide the equation for the 200 year return period flow and the list of peak flow equations identified in the DEIS as the design flow for the railway crossings.

Commitment Response:

The peak flow equations have remained unchanged. The equations for various return periods are as follows:

- Q2 = 1.1 x A0.79;
- Q5 = 1.7 x A0.77;
- Q10 = 2.0 x A0.76;
- Q25 = 2.6 x A0.75;
- Q100 = 3.5 x A0.73; and
- Q200 = 3.9 x A0.73.

Given the regional data available, the return period equations are considered appropriate for catchments ranging in size from 0.5 km2 to 1000 km^2.

2. Document List

Document Title	Document Number	Description/Key Findings
Design Basis-Environmental Design Basis	H337697-6170-07-122-0001	The purpose of this document is to record the environmental design basis for the engineering design of the Mary River Project being developed by Baffinland Iron Mines (BIM). These environmental standards must be met by the Project and should be fully addressed when developing the relevant engineering design criteria. These environmental design criteria are based on commitments made in the Draft Environmental Impact Statement (EIS) 01/20/2011) and the baseline studies associated. The document lists all relevant reference documents and the Project-specific environmental standards are further detailed. These include air emissions, occupational health and safety standards for air emissions and dust in the workplace, noise, vibration, water, wastes, dredged material placement, habitat protection, storage facilities, terrestrial environment, marine environment and other Project-specific design standards.

Document Title	Document Number	Description/Key Findings
Design Basis- Incinerator	H337697-4060-07-109-0001	The purpose of this document is to record the design basis for the incinerator of the Mary River Project being developed by Baffinland Iron Mines (BIM). Emission regulations must be met by the Project and should be fully addressed when developing the incinerator. The document establishes a threshold for contaminants based on Federal objectives, the Northwest Territories (NWT) criteria, the Nunavut guidelines, the Canada Wide Standards (CWS), and the World Health Organization (WHO) guidelines. Operational, mechanical and electrical design requirements are also addressed.
Design Basis- Waste Management	H337697-4060-07-109-0002	The purpose of this document is to record the design basis for waste management facilities of the Mary River Project being developed by Baffinland Iron Mines (BIM). The infrastructure necessary to manage the wastes is: storage facility, landfill, landfarm, hazardous/medical waste storage facility and waste oil treatment/recovery facility. For each of these infrastructures, the corresponding laws and regulations and design requirements are detailed.
Design Basis for Wastewater Treatment – Oily Water	H337697-4000-10-109-0003	This document is a design basis that will be used for the two new wastewater treatment plants (WWTP) that will support the mine. These new systems will therefore be designed to accommodate the expected flows of wastewater from the various mine camps for both the construction and operation phases. Nunavut territorial guidelines, Canadian federal guidelines and the latest codes and standards were followed in the design criteria. This design criteria provides the basis for the engineering design of the wastewater treatment plants. The WWTP will be required to treat wastewater generated from vehicle maintenance and wash Facilities (i.e. truck wash, equipment and floor wash down water). The treated water shall be recycled and reused for wash down water, or discharged. The separated waste oil will be stored in a local tank. Periodically, the oil will be drained and sent for disposal. Currently there is an existing wastewater treatment system at the Milne Port site as the Project is in the preliminary stages of development. The Milne Port oil water separator is an FII “flow and plug” oil absorption system manufactured by Filter Innovations. This WWTP has recently been upgraded and as a result the existing system capacity is sufficient for Milne Inlet site and no new WWTP is required at Milne Port. Design Parameters for the new wastewater treatment systems

Document Title	Document Number	Description/Key Findings
		are discussed in this document. The average vehicle wash wastewater was considered and specific design basis values were chosen from these. Wastewater generation rates of vehicle and equipment wash flow rates for construction and operation phases at the Mine site and at Steensby were used to determine average wastewater flow rate, peak wastewater flow rate and minimum settling tank retention time. Guidelines have been used for the treated wastewater effluent quality including but not limited to: • Metal Mining Effluent Regulations (MMER) • Guidelines: Industrial Waste Discharges in Nunavut (GIWDN) - prepared by the Department of Sustainable Development Environmental Protection Service – Nunavut.
Design Basis – Potable Water Treatment Plant	H337697-4000-10-109-0001	This Design Criteria provides the basis for the engineering design of the Potable Water Treatment Plants, at Milne Port, Mine Site, Steensby Port, Mid-Way Camp, Ravn River Camp, Mid-Rail Camp, Cockburn Lake Tunnels Area, and Cockburn South Camp. There is some existing potable water treatment equipment at Mary River Camp, Milne Inlet Camp, Steensby Camp and Mid-Rail Camp. Fresh water supplied to all four camps was treated with filtration and UV disinfection. Given that no chlorination is used for primary or secondary disinfection, the proposed new potable water systems will replace the existing systems. The new potable water systems will consist of system feed supply pumps, chemically assisted filtration system to remove suspended particulate, and disinfection of treated water prior to consumption. Potable water will be discharged to a product tank (supplied by others); from here water will be distributed to different areas. Potable water will be pumped to the accommodation building for use as drinking water, showers, toilets, sinks and kitchen areas. At more remote areas, potable water will be trucked from the treatment plant into local potable water storage tanks. Beside the information presented above, this document shows information relating to potable water consumption, plant personnel, feed water composition, and the main water quality parameters of the all raw water sources.

Document Title	Document Number	Description/Key Findings
Design Basis - Sewage Treatment Plant	H337697-4000-10-109-0002	This Design Criteria provides the basis for the engineering design of the Sewage Treatment Plants (STPs), at Milne Port, Mine Site, Steensby Port, Mid-Way Camp, Ravn River Camp, Mid-Rail Camp, Cockburn Lake Tunnels Area, Cockburn South Camp. There are existing STPs at Mary River Camp and Milne Inlet Camp. The proposed new sewage water treatment systems will be added onto the existing systems (modular) to expand the treatment requirements during construction phase, and then demobilized to meet the capacity required for operations phase. Sewage will be generated at the accommodation facilities which will be pumped to the equalization tank. Sewage from remote locations may be collected locally in holding tanks, then, trucked to the main STPs equalization tank for treatment. The new STPs will consist of an equalization tank, a treatment to remove total suspended solids (TSS), reduce biochemical oxygen demand (BOD5) and stabilize biosolids, and a disinfection of treated water prior to discharge. STPs effluent will be discharged by pump to an outfall at the site or drawn by pump in the case of re-use for toilet flushing. The STP will be designed to meet peak daily sewage production while operating 24 hours/day and 365 days/year. Sludge stabilization has been included in the design requirement for the STP. Sludge from the STP will undergo sufficient stabilization to meet pathogen reduction and vector attraction reduction requirements; such that it may either be disposed of by incineration or local land fill. Beside the information presented above, this document shows information relating to sewage characteristics and generation rates, plant personnel, sewage composition, discharge/outfall locations, storage or polishing pond considerations, and treated sewage effluent quality.
Design Criteria- Fuel Storage and Distribution System	H337697-0000-50-122-0002	This document establishes the basis of design for the fuel systems for the Mary River Project. Its purpose is to define the engineering standards and practices to be followed in the execution of the Fuel Systems Design and associated engineering activities. It describes the minimum requirements that will be taken into consideration during the design, selection and fabrication of all fuel system components. Application of the criteria and best practice engineering shall help deliver the following Project objectives:

Document Title	Document Number	Description/Key Findings
		• Safe operations; • Uniformity of equipment and materials; • Uniformity of design documentation; • High level of piping equipment reliability; • Fit to purpose request; • Economic equipment; • Economic spares holding; • Compliance with statutory and code related requirements; • Compliance with statutory environmental requirements; and • Compliance with specified process performance parameters and local operating conditions. The document lists the applicable documents and the relevant design parameters. Each of the components of the fuel storage and distribution system is then further developed.
Technical Specification-Fuel Storage and Distribution System	H337697-CM138	These documents specify the technical specification for fuel storage and distribution relative to the Mary River site. They address the following aspects: environmental protection, geotextiles, site grading, excavating trenching and backfilling, geomembrane, aggregates, corrected maximum dry density, concrete formwork, concrete reinforcement, cast-in-place concrete, metal fabrications, board insulation, valves, petroleum products, oil water separator and oil storage tank aboveground. For each of the above, both products and execution are described.
Technical Bid Evaluation Wastewater Treatment System (Oily Water)	H337697-PM403-50-104-0001	Technical Bid Evaluation for the Wastewater Treatment System (Oily Water)
Technical Specification Wastewater Treatment Oily Water/PM403 - Equipment Specification	H337697-PM403	This document addresses the equipment specifications for wastewater treatment at the Mary River Project site. These include: settling tank/sump, chemical addition system, media filters, activated carbon filters, cartridge/bag filters, oil/water separator, air compressor systems, tanks and containers. Pumps, valves and piping, mechanical, electrical, instrumentation and control, structural, painting, health,

Document Title	Document Number	Description/Key Findings
		safety, environment and community requirements are documented. The relevant regulations, standards and codes are listed and the equipment shall comply with their latest versions. Assembly and testing, shipping, construction, commissioning and operator training, spare parts and quality assurance are other topics addressed in this document.
Temporary and Permanent Accommodation Facilities -Technical Specification	H337697-CA702	This package addresses the equipment specifications for the temporary Camps and permanent Camps at the Mary River Project site. It is broken down into several aspects: construction and accommodation facilities, potable and sewage water treatment, and waste incinerators. For each of these, the design requirements are detailed. The relevant regulations, standards and codes are listed and the equipment shall comply with their latest versions. Electrical, instrumentation and control, structural, architectural, sound level and vibration, painting, HSEC, and performance requirements are documented. Assembly and testing, shipping, construction, commissioning and operator training, spare parts and quality assurance are other topics addressed. Equipment Data sheets have been included for potable water treatment plant, sewage treatment plant and incinerator.
Site Conditions	H337697-S003120	A description of expected site conditions.