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Operation and Maintenance Manual

Sewage, Solid Waste Disposal & Waste Handling Facilities

CAM-D DEW Line Environmental Remediation

SIMPSON LAKE, NUNAVUT

Presented to

Indian and Northern Affairs (INAC)

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Operation and Maintenance Manual

Sewage, Solid Waste Disposal & Waste Handling Facilities

CAM-D DEW Line Environmental Remediation

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TABLE OF CONTENTS

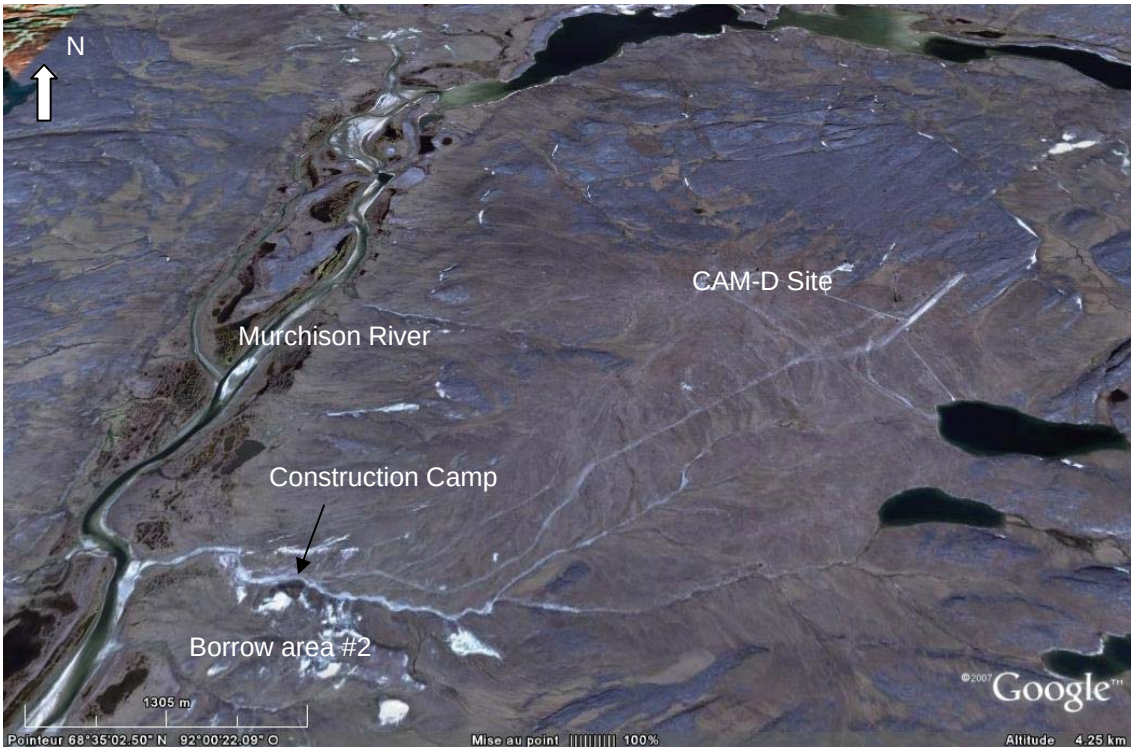
1. INTRODUCTION

CAM-D is located in the middle of the Boothia Peninsula (Nunavut), approximately 4.5 km south of Simpson Lake and approximately 120 km southwest of Taloyoak (Spence Bay) in Nunavut (Figure 1). The remediation project was awarded to Kudlik Construction Ltd. in December 2008. In August 2009, heavy equipments, camp facilities, material and all consumables were delivered by sealift to Shepherd Bay, located about 100 km northwest of CAM-D. All equipment, material and consumables required to achieve the remediation project at CAM-D was transported by CAT train during the spring 2010 from Shepherd Bay to CAM-D. In order to achieve the different cleanup activities included in the scope of work of the CAM-D Environmental Site Remediation, a construction camp was established nearby the Murchison River, located 4 kilometres southwest of the CAM-D DEW Line Station (Figure 2). The first cleanup season was started in July 2010 and was completed in October 2010.

The purpose of this document is to present the operation and maintenance manual for the camp waste water, the solid waste management and the waste handling facilities for the CAM-D DEW Line site remediation project. The O&M manual for the waste water plant was already presented to INAC. However, in order to fulfill the conditions of the water licence amendment No.1, the management of the solid wastes generated on site and the operation of the waste handling facility are also presented in this document.

Figure 1: Localization Map

Figure 2: Construction Camp localization



2. SEWAGE TREATMENT AND DISPOSAL

2.1 SYSTEM DESCRIPTION

The waste waters generated from the camp activities are treated with a waste water plant brought on site. The "Bionest" waste water treatment unit operation and maintenance manual is presented in Appendix 1.

The waste water generated from the kitchen is sent through a grease trap located at the back of the building (Figure 4) and then, to the pumping station which sending all camp waste waters into the septic tank of the treatment plant.

2.2 TREATED WATER DISCHARGE

The waste waters are treated to meet the project waste water discharge criteria and released onto tundra. As per water license agreement, the treated effluent is tested once per month and at the beginning and at the end of each construction season. The discharge point, as indicated in the Figure 3, is located at 60 meters away from the unnamed river, in relatively flat area covered with tundra. The treated water is discharged onto the tundra at an average rate of 4.16 L/min, which is not enough to create erosion.

The discharge point is visited on a daily basis to verify any signs of erosion or disturbance. In the case where disturbance would be observed, the discharge point can be relocated easily. Erosion protection devices are available on site and can be installed quickly. No erosion or ponding water was observed at the discharge point during the first construction season.

2.3 SLUDGE DISPOSAL

The solids are accumulated in the septic tank of the treatment unit during each construction season. The septic tank has a holding capacity of 9,000 litres. When the season is ending, the treatment unit is shut down and the sludge is emptied from the septic tank. The anticipated sludge volume produced during one construction season is 4 cubic meters.

Two lined lagoons were built nearby the treatment plant, as shown in Figure 4. The lagoons as-built drawing is presented in the Appendix 2. These lagoons are used to

contain the waste water in the event that the treatment plant must be temporary shut down. The lagoons were designed to contain the camp waste water during a complete week, which represents about 21,000 litres. These lagoons are also used to treat the sludge removed from the unit septic tank, as explained in the shut down procedure (Appendix 1). According to the analytical results, the sludge will be disposed into the project landfill or containerized and shipped out to the appropriate treatment facility. As specified in the contract, the sludge can be disposed into the onsite non-hazardous landfill if the following criteria are met:

Arsenic	< 30 ppm
Cadmium	< 5 ppm
Chromium	< 250 ppm
Cobalt	< 50 ppm
Copper	< 100 ppm
Lead	< 500 ppm
Mercury	< 2 ppm
Nickel	< 100 ppm
Zinc	< 500 ppm
PCB'S	< 50 ppm

Figure 3: Site Topographic Map

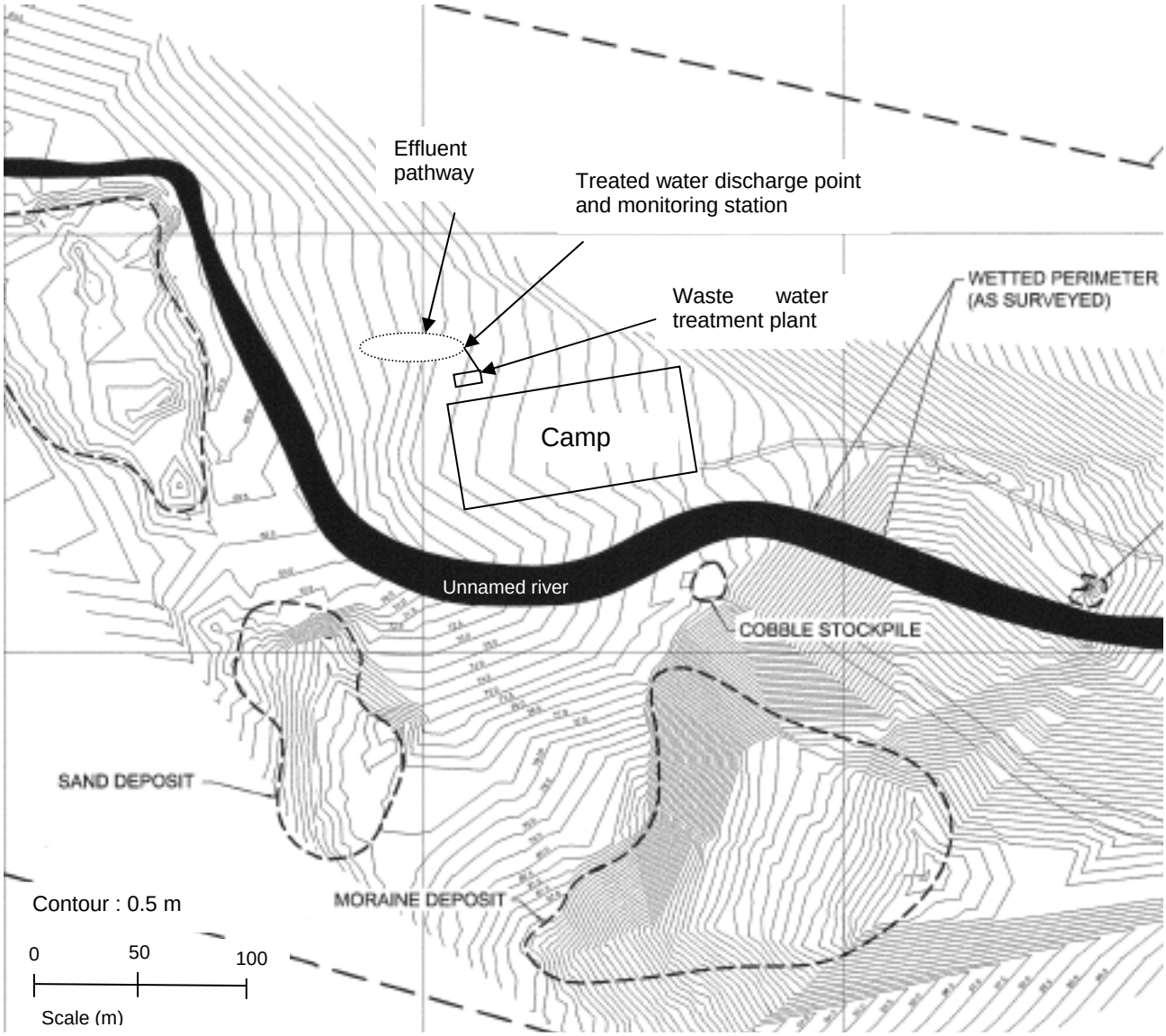


Figure 4: Waste Water Treatment Plant

3. SOLID WASTE DISPOSAL

3.1 DISPOSAL FACILITY DESCRIPTION

The non-hazardous solid wastes generated from the project activities are disposed in the project landfill. The non-hazardous waste landfill was designed by AECOM and built by Kudlik Construction Ltd in July 2010. The construction drawings are attached in the Appendix 3 and a picture of the landfill dated from August 2010 is presented in Figure 5. The landfill is located on the old DEW Line site, about 4 kilometres north-east from the camp.

Figure 5: Project non-hazardous landfill

3.2 OPERATION AND MAINTENANCE PROCEDURES

The domestic wastes generated from the camp operation are incinerated on site and incombustible wastes are disposed into the project landfill. Ashes produced from the incinerator are collected in drums and analyzed to determine if they can be disposed

into the non-hazardous landfill or they need to be shipped off-site for treatment and final disposal.

The landfill is operated as per contract specifications:

- Place non-hazardous waste in the designated area in uniform horizontal lists between and against the berms. The thickness of each waste lift is to be such that all voids within the waste can be filled with intermediate cover. The maximum thickness of each waste lift is to not exceed 0.5 meter.

- Place intermediate cover to a maximum loose thickness of 150 mm over each layer of no-hazardous material or as required to infill voids within the waste layer and compact with the random action or tracked equipment.

- Final cover to consist of 1.0 meter of Type 2 granular fill compacted to 95% of Maximum Dry Density.

- Four monitoring wells to be installed around the perimeter of the landfill to monitor groundwater quality.

3.3 RUNN-OFF DIVERSION

The following design aspects in regard to water run off were considered for the non-hazardous waste landfill construction:

- Landfill to be constructed above natural ground level.

- Prior to the placement of non-hazardous waste, perimeter berms will be constructed to divert surface run-off away from the landfill. Berms to be 14.0 meters wide at the base and 3.0 meters high with a 3:1 slope.

- Final cap to be constructed with a 3% grade to promote drainage and eliminate standing water.

4. WASTE HANDLING FACILITY

No waste handling facilities was required to perform the project activities. The contaminated soils were containerized directly on each excavation site and the hazardous wastes from building demolitions were containerized on demolition site. The buried debris excavation was started in September 2010. Due to very soft ground conditions, it was found that it is more practical to sort debris directly in the excavation than hauling them on a waste handling facility.

HDPE liner (60 mil) was brought on site and if during the last remediation season it appears that a waste handling facility is require, a surface of appropriated dimensions will be prepared and the liner will be installed.

APPENDIX 1
Bionest O&M Manual

APPENDIX 2
Sewage lagoons as-built drawing

APPENDIX 3
Project Landfill Drawing