APPENDIX 10

ENNADAI LAKE
REMEDIATION PROJECT

KUDLIK CONSTRUCTION LTD. MOBILIZATION PLAN

Kudlik Construction Ltd.
ᐃᑲᔪᖅᑎᑦᑎᓂᒃᑯᓐᓂᖅ ᑭᓱᓕᒫᓂᖅ ᐊᔪᕐᓇᖅ

MOBILIZATION PLAN

Ennadai Lake Weather Station Environmental Remediation Project

ENNADAI LAKE, NUNAVUT

Presented to

Public Works and Government Services Canada

Review: August 2013

KUDLIK CONSTRUCTION LTD.
P.O. BOX 727, 1519 FEDERAL ROAD
IQALUIT, NUNAVUT

MOBILIZATION PLAN

Ennadai Lake Weather Station Environmental Remediation Project

ENNADAI LAKE, NUNAVUT

Prepared by :

François Bourassa, P. Eng.
Project Manager
Kudlik Construction Ltd.

August 2013

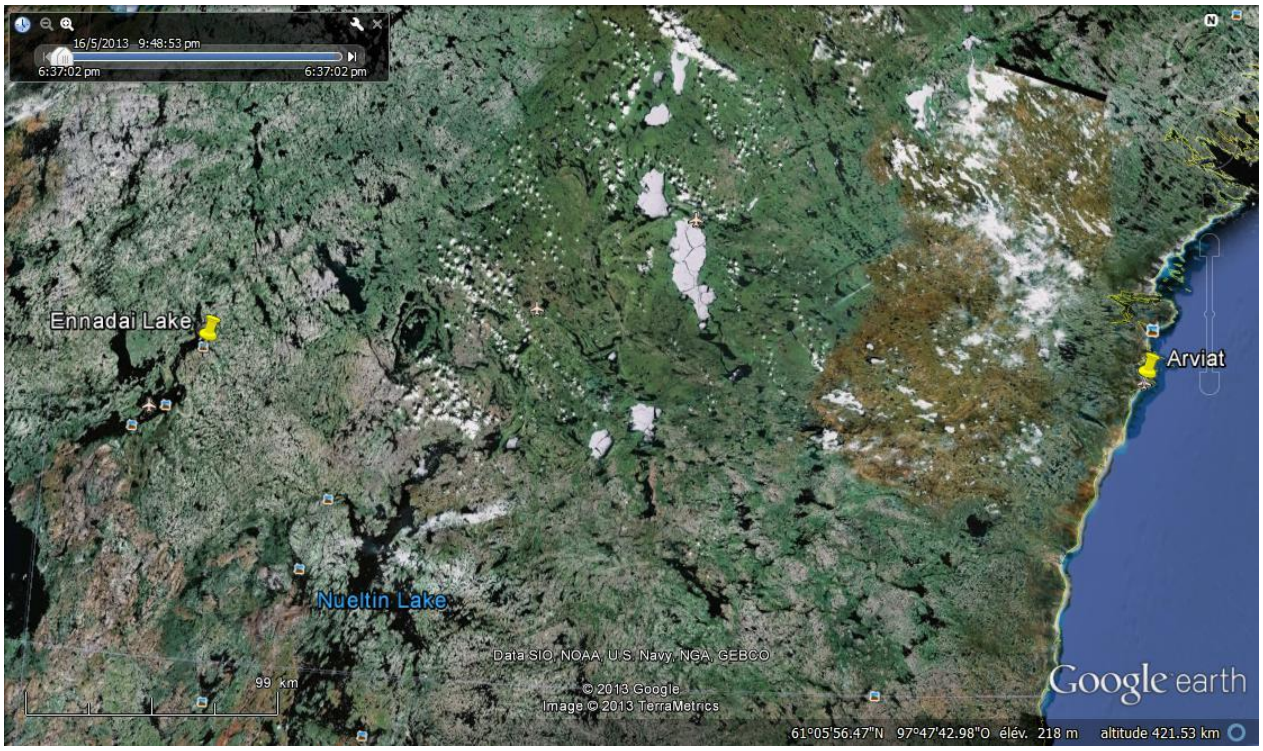
TABLE OF CONTENTS

1. INTRODUCTION

The purpose of this document is to present the mobilization plan elaborated for the environmental remediation of Ennadai Lake weather station located within the Kivalliq region of Nunavut. The site lies approximately 380 km west of Arviat, on the east shore of the north arm of Ennadai Lake.

The remediation project was awarded to Kudlik Construction Ltd. in May 2013. In September 2013, heavy equipments, camp facilities, material and all consumables will be delivered by sealift to Arviat. All equipment, material and consumables required to achieve the remediation project will be transported by CAT train during the winter 2014 from Arviat to Ennadai Lake.

Figure 1: Site location



2. MOBILIZATION STRATEGY

The overland mobilization from Arviat was studied and found feasible. Two visits were done in the area between Arviat and Ennadai Lake in order to determine the best route to follow. Some experienced local people were met and confirmed that overland mobilizations have been done lately in the same area.

2.1 PRE-MOBILIZATION ACTIVITIES

Most of the equipment and materials required to achieve the contract activities will be transported by the sealift from Iqaluit to Arviat. Additional equipment and supplies will be also shipped out of Montreal to Arviat on September 2013 sealift.

A pre-mobilization crew will be sent to Arviat for sealift arrival. The equipment and supplies will be unloaded at the beach landing area and transported to the staging area located one kilometer east of the runway. The equipment will be prepared and organized for the winter overland mobilization.

Figure 2: Staging area in Arviat

2.2 MOBILIZATION

The first crew will be sent to Arviat at the beginning of March 2014 in order to open and mark the route. The Henik Lake camp will be used as the intermediate camp and a winter camp will be installed at Ennadai Lake. About 2 weeks will be required to open the trail and get both camp facilities operational. The runways at Henik Lake and Ennadai Lake will be plowed and a support crew will be sent to each camps. The support crews will include a cook / medic, a mechanic and a wildlife monitor. The CAT Train between Arviat and Ennadai Lake will be initiated. The mobilization activities will be performed on 24 hours per day. For most of the equipment to be transported, we anticipate that each back and forth trip between Arviat and Ennadai Lake will be completed within 65 hours. About 40 trips will be required to transport all supplies and equipment. Considering that we are using 3 tractors pulling 2 sleighs most of the time, the mobilization from Arviat to Ennadai Lake should be completed within 6 weeks. This schedule includes 5 days for time lost due to weather conditions or mechanical breakdowns.

Four crews of three drivers will be assigned to operate the 3 Challengers. Each crew will do half of the road and wait for the next crew at the intermediate camp or at the winter camp in Ennadai Lake. A fifth crew will be assigned on the fourth challenger to do the trail maintenance and bring some fuel and supplies to the intermediate camp.

2.3 FUEL MANAGEMENT

A total of 976 drums of arctic diesel, which represents about 200,000 litres, will be delivered to Arviat and transported to Ennadai Lake to cover the project activities. The fuel for mobilization activities will be supplied by Eskimo Lumber Supplies out of Arviat. A 4,500 litres dyke tank will be installed at the staging area in Arviat and used to refill the Challenger tanks. This tank will be refilled on a regular basis by the fuel truck supplier. A second dyke tank will be installed at the intermediate camp and will be refilled from a mobile tank which will be transported regularly from Arviat. A third dyke tank will be installed at the Ennadai Lake camp. This tank will be refilled from drums transported during the CAT train.

A total of 4,920 litres of gasoline and 6,560 litres of Jet A aviation fuel will also be transported to Ennadai Lake in 205 litres drums. The gasoline will mainly be used for snowmobile, ATVs and small tools. All barrels will be transported to Ennadai Lake fuel storage area.

2.4 SCHEDULE

The Gant chart schedule presented in Appendix 1 includes the pre-mobilization and the mobilization activities.

3. EQUIPMENT AND MATERIAL

All materials and equipments will be transported on sleighs pulled by tractors. A total of 11 steel sleighs were fabricated for this purpose. Four (4) tractors CAT Challenger 855-D equipped with 36'' wide tracks will be used to pull the sleighs. One tractor is equipped with a 4 metres wide adjustable blade and a 25 metric tons winch. A snow groomer attachment was fabricated in order to maintain the route in good conditions. Two Hagglund off road vehicles will be used for the trail development and as emergency vehicle at both camps. The below listed equipment will be sent by the September sealift in Arviat.

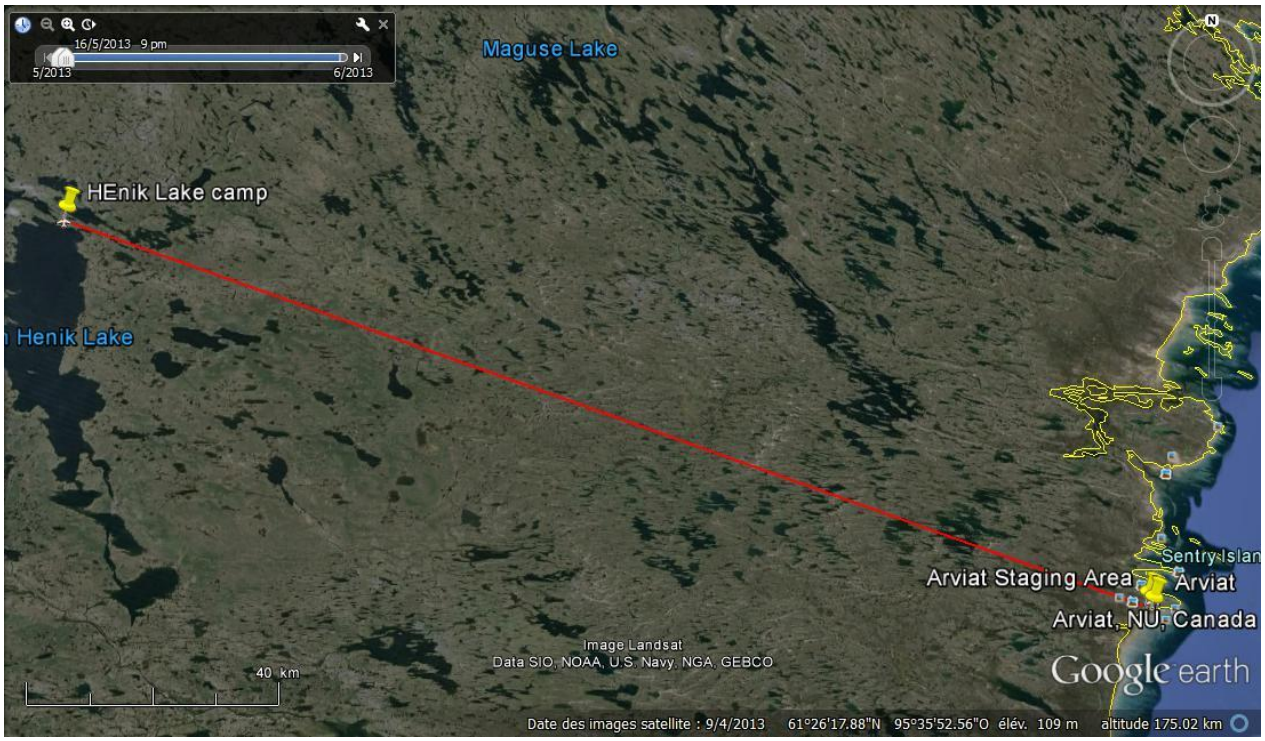
Equipments List		
Qty	**Description**	
2	ATV	Honda foreman 500
2	ATV	Gator 855
1	Bulldozer	Komatsu D-65
1	Compactor	HAM 3205
976	Drums	Diesel
24	Drums	Gasoline
32	Drums	Jet A
1	Excavator	PC 300 LC-6 + 3 buckets
1	Foldable building	Habitaflex
1	Groomer	For trail maintenance
2	Hagglund	off road vehicles
1	Loader	WA-320 + bucket & forks
48	Marine container	20'x8'x8'
2	Marine container	40'x8'x8'
2	Off-road dump truck	Komatsu HM300-2
1	Pickup crew cab	F350 4x4, diesel
1	Screener	Vibro Screen
2	Snowmobile	Bombardier Skandic
11	Steel sleighs	--
4	Tractor	Challenger 855 D
3	Tank 4,500 litres	Aboveground horizontal dyke tank ULC-S653
2	Tank 23,000 litres	ISO tank

4. MOBILIZATION ROUTE

Two visits were done in order to determine the best route between Arviat and Ennadai Lake. The first visit was done by helicopter on May 22, 2013. The route that goes by the Ducker Lake system and the Kognak river was investigated. The Cullaton lake old mine site was visited and found a good location for an intermediate camp. However, the Kognac River area nearby the Watterson and the Hicks Lake is covered with large boulders and seems not appropriate for a CAT train route.

The second visit was done by plane on June 20, 2013. A route used for previous CAT train mobilizations was investigated and found feasible. The Henik Lake Camp, belonging to Eskimo Lumber Supply, will be used as an intermediate camp. The route section from Arviat to the Henik Lake camp, as shown on Figure 3, represents about 200 kilometers. The terrain is mainly flat with the presence of trees patches starting about 60 kilometers before Henik Lake. The elevation gain from Arviat is about 180 meters. This section has been used on a few occasions for overland mobilization.

Figure 3: Route section 1, Arviat to Henik Lake



The second route section, as presented on Figure 4, represents about 225 kilometers. It reaches an elevation of 340 meters at the kilometer 40, on the north side of the Grey Hills.

The rest of the route is mainly flat with some occasional hills. Some boulders sections are present but can be avoided. Two major lakes needs to be crossed; the Henik Lake and the Hicks Lake. Previous overland mobilizations have been done in this area.

Figure 4: Route section 1, Henik Lake – Ennadai Lake

5. CAMP FACILITIES

5.1 ARVIAT

No camp will be required in Arviat. The local hotel facilities will be used during mobilization. The staging area will be located at about 2.5 kilometers south of town and will be accessible by road.

5.2 HENIK LAKE

The existing facilities belonging to Eskimo Lumber Supplies, as showed on Figure 5, will be used to support our operations. In addition, a camp for 8 peoples made out of marine containers, as shown on Figure 6, will be transported and installed beside their facilities. The camp includes 8 individual rooms, a kitchen, a laundry room, a washroom with toilets and a shower. If necessary, room modules can be added to the camp. All facilities were made out of insulated marine containers especially fitted for rugged conditions. All camp rooms are heated with electric baseboard and have their own thermostat for temperature control.

The washroom includes a shower, a sink and one electric incinerating toilet. The kitchen comes with all cooking devices, appliances and a sink. The dining room is adjacent to the kitchen.

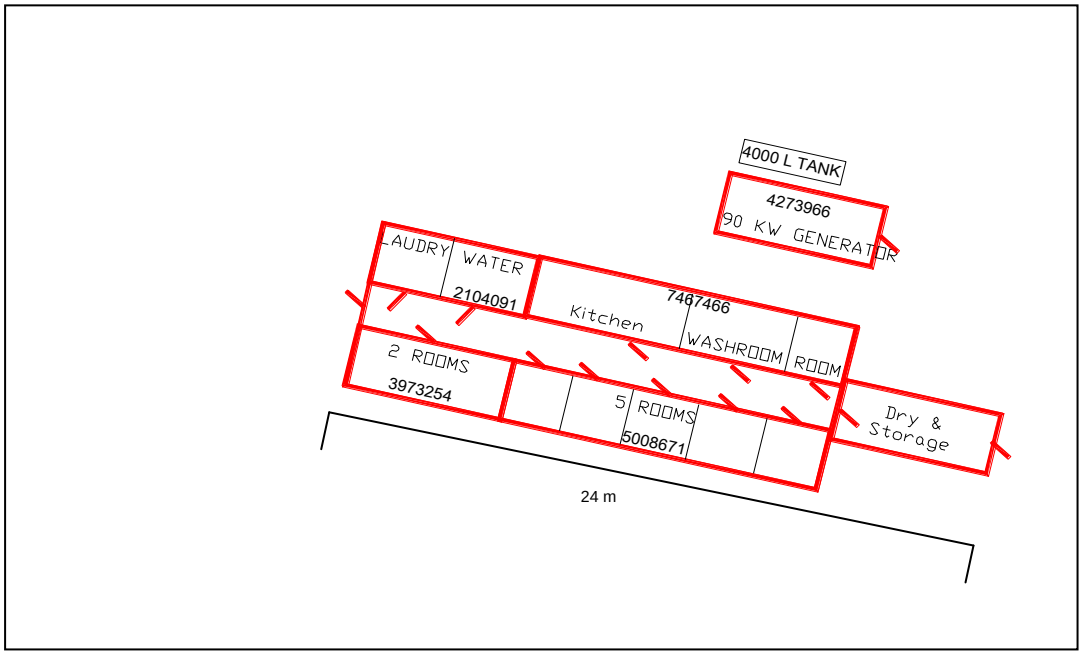
The camp is powered with a 90 kw diesel generator connected to a 4,000 litres stationary dyke tank. A 250 kw backup generator will be available until the end of the mobilization.

The camp communication devices are located in the kitchen and include a satellite phone, a VHF radio and a wireless internet system. A *Bgan* satellite terminal will be kept at the camp as backup communication system. Phone numbers, radio frequency and email addresses will be listed in the health and safety plan.

The owner of the Henik Lake Camp and Kudlik Construction LTD will address the licence conditions to make sure that these additions will be included in the regulatory conditions outlined for this site.

Figure 5: Henik Lake camp

Figure 6: Camp addition at Henik Lake

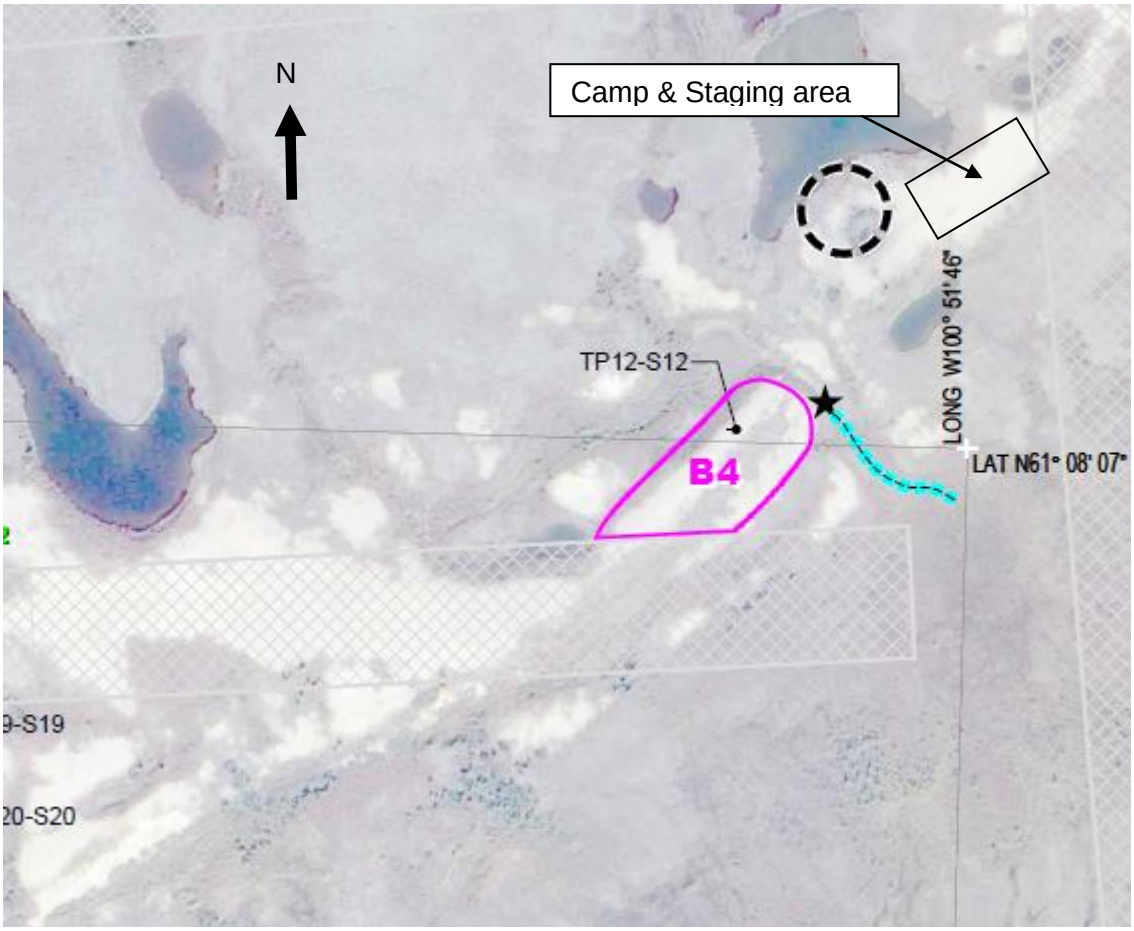


5.3 ENNADAI LAKE

5.3.1 Winter camp

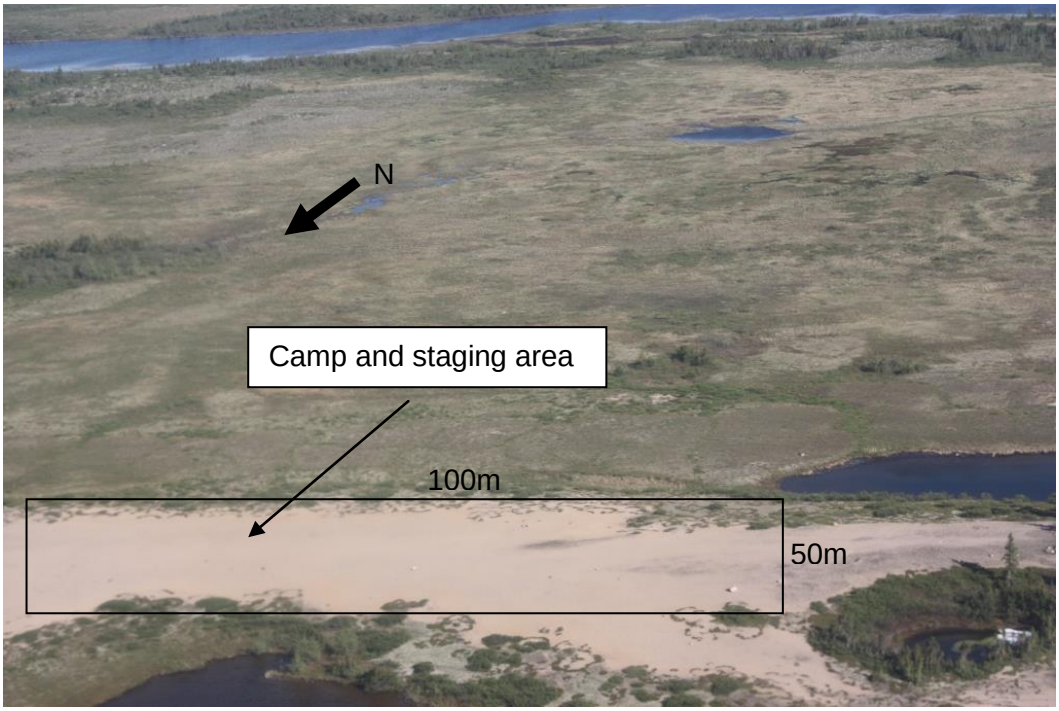
A winter camp will be installed on the flat area located north-east from the borrow area "B4" as presented on the figures 7 and 8. This area is wide enough to be used also as staging area and for summer camp. The winter camp will be part of the summer camp and will be removed only at the end of the demobilization.

Figure 7: Camp and staging area location



The winter camp will be made out of marine containers, as described in the previous section. The camp will be powered by a 45 KW generator connected to a 4500 litres fuel dyke tank. A 250 KW generator will be available as for backup.

Figure 8: Camp and staging area location



5.3.2 Summer camp

The following sections describe the camp facilities in details.

Sleeping Quarters - 12 Barge Containers (20') converted into 2 Bedrooms Facilities: Since 2009, all units are carefully made in-house by Kudlik's team in order to meet all construction/safety codes and contractual specs requirements. These units have been largely used by our company (more than 60 units have been produced so far) and are greatly appreciated for their single occupancy, comfort, great soundproofing, stability under strong winds and simple installation/levelling/winterizing requirements. Each unit have:

- 1 common entrance door leading to a small porch of 4'x3' equipped with a light, 1 smoke detector and 1 ABC fire extinguisher ;
- 1 access door and 1 window (31''x30'', Egress Canada) per room;
- 1 single bed, 1 bed table, 1 shelf and 1 wardrobe per room;
- 1 ceiling light, 1 bed light, 1 double electric outlet and 1 electric space heater (1000 watts) per room;
- 1 smoke detector and 1 ABC fire extinguisher per room;
- insulated outside walls and sound proof division between the 2 bedrooms;
- painted plywood finish inside (walls, ceiling and floor);
- 6,5 m^2 of floor area and 15 m^3 of air space per room.

From past experience on 2 remote sites, these units made of standard container are really easy to manoeuvre, install and level, and are barely indestructible. This allows to quickly install the camp and keeps its footprint to a minimum as seen on the pictures below.

Complete camp for 33 (single occupancy) with a ~30 x ~40 m footprint – CAMD, Simpson Lake

Furthermore, when a temporary camp is needed, these units just have to be plugged to a standard portable generator and are ready to use. Being finished with plywood, all available space inside units can be used to carry material and equipment during the mob/demob, the same way we do with standard containers. This allows us to reduce the volume of material brought to site compared to a normal camp with construction trailers.

- *Ablution, Latrine, Laundry Facilities and Dry Room - 5 converted Barge Containers:* For the same reason as the sleeping quarters, barge containers will be used for ablution, latrine, laundry and dry room facilities. All these insulated units are customised with electrical and water inlet/outlet according to the camp size needs and can be quickly set up for use. Furthermore, these units will be placed together minimizing the water pipe network to install. Finally, only heavy duty and easy to repair material, and equipment adapted to the northern conditions are used to fabricate the facilities and we also carry spare parts for each item. In addition, all systems and piping are easily accessible for maintenance or repair.

The following pictures show typical details of our facilities, note that no mirror appears on some pictures as breakable items are always installed on site after the sealift transportation.

Typical 5 showers / 1 corner wash basin container with: 1 x 2000 watts x 250 cfm ceiling fan heater, dressing room, ventilation and marine light in each shower, 3 x 60 gallons hot water tank, 1 smoke detector and 1 fire extinguisher.

Typical 5 toilets / 2 urinals / 6 wash basins container with: 1 x 2000 watts x 250 cfm ceiling fan heater, 1 x 60 gallons hot water tank, 2 paper towel distributors, ventilation in each toilet and marine light in each toilet, 1 smoke detector and 1 fire extinguisher.

Typical 6 washers/dryers container with: 1 x 2000 watts x 250 cfm ceiling fan heater, 1 x 60 gallons hot water tank, 1 smoke detector and 1 fire extinguisher.

Typical dry room container with: 2 x 2000 watts x 250 cfm ceiling fan heater, 1 x 60 gallons hot water tank, 6 wash basins, 2 paper towel distributor, 1 smoke detector and 1 fire extinguisher.

Easily accessible wastewater outlet and piping

- *Kitchen, Lunch Room & Recreation Facilities – 1 converted Barge Container (40') and 1 foldable Habitaflex Shelter:* Again, the kitchen and all related equipment will be secured inside a converted 8 x 40 feet barge container. With customised electrical and water inlets/outlets, which will allow for a quick and easy set up once on site. In summary, our standard 8 x 40 feet kitchen are equipped with the following equipment and appliances:

    - 1 access door and 1 pass-thru;
    - 1 walk-in insulated 6' x 7' fridge and 1 walk-in insulated 6' x 7' freezer;
    - 1 water treatment system to get potable water for cooking;
    - 2 standard ovens with a regular 30" fan hood above each;
    - 1 electric frying griddle 24" x 19" with 30" regular fan hood above;
    - 1 electric fryer with 28" stainless fan hood equipped with approved halon fire extinguisher system;
    - 1 commercial microwave;
    - 1 commercial meat slicer;
    - 1 x 60 gallons hot water tank;
    - 1 commercial stainless steel wash basin 28"x72";
    - Plasticized plywood wall finish in kitchen, fridge and freezer;
    - 2 x 2000 watts x 250 cfm ceiling fan heater

The following pictures show typical appliances lay-out and details inside the kitchen:

Complete, efficient and fully functional kitchen fitted inside an 8'x40' barge container

The walk-in fridge (6'x7') and freezer (6'x7') are installed at the back of the kitchen and the compressor units are easily accessible for repair and maintenance

The kitchen equipped with 2 separated openings on the side: 1 to serve food and 1 to bring back the dirty dishes, will be placed against and attached to the dining room with a small wooden access hall/corridor in between. This area is useful to store dry food and supplies.

The dining room and recreation facilities would consist of a 20 x 39 feet folding shelter made by Habitaflex (www.habitaflex.com). Due to the limitation of the container to create large surface areas, such foldable shelter will generate a spacious living space of 780 square feet. Once folded, the shelter has the same size as a 40' barge container and it takes about half a day to level and unfold. The natural pine wood board interior finish and high ceiling make this shelter a comfortable and pleasant living environment for the workers.

Aerial view of kitchen/hall/dining room/ recreational complex and partial view of dining room at CAM-D

Inside view of recreational room side at CAM-D and view of 20' long Habitaflex once folded

The complex kitchen/dining room/ recreation area is shown on Figure 2 in Appendix 1.

- *Main Camp Electrical Power:* 2 generators of 250 kW each will be used alternatively to power the main camp. These units, made by Kudlik Construction in 2009 comes in the same barge containers and are equipped to power the average consumption and peak of each camp needs. The following pictures show typical generator and electrical distribution containers.

Typical 250 kW generator with associated electrical distribution container