CAM-2, Gladman Point DEW Line Site

SITE CLOSE OUT REPORT

Nunavut Water Board issued Licence:
1BR-GLA0308
Pursuant to Condition Part J, Item 1

Prepared by:
Defence Construction Canada
on behalf of the Department of National Defence
July 2015

Background

The DEW Line was a series of 63 surveillance radar stations built across the Arctic by the United States Air Force in the 1950s to detect Soviet military activity in the Arctic. Of the 42 sites located in Canada, 21 were decommissioned in 1963 and their administration was transferred to the Department of Indian Affairs and Northern Development in 1976, while the remaining 21 sites (including CAM-2) continued to operate until they were decommissioned, between 1989 and 1993, to be replaced by the modernized North Warning System (NWS) radar sites.

The former CAM-2 auxiliary DEW Line station is located within the territory of Nunavut, on the south coast of King William Island, between Simpson Strait and McClintock Bay (68° 40' 09'' N, 97° 48' 33'' W). The CAM-2 site was decommissioned in 1992 following construction of a remotely operated NWS short-range radar site approximately 500 m northwest of the former station.

The DLCU Project was mandated to restore the sites to an environmentally safe condition by demolishing surplus buildings and facilities, removing or treating contaminated soils, remediating landfills, disposing of debris, preventing movement of contaminants into the food chain and performing other activities as needed. The remediation complied with federal and territorial regulations and was completed according to Agreements between DND and Nunavut Tunngavik Inc. (NTI).

Site Assessments and Remedial Design

The Environmental Sciences Group (ESG) and UMA Engineering Ltd. (UMA) completed initial independent environmental studies (Phase II environmental site assessments) of CAM-2 in 1989 and 1990 respectively. These studies provided information on the physical, chemical and environmental conditions at the site, including its infrastructure, landfills, contamination and archaeological features. Both investigations identified chemical contamination that was consistent with conditions found at other DEW Line sites.

Subsequently, UMA and ESG completed a detailed engineering and environmental site investigation at CAM-2 during the summer of 2001 to collect information and data required to complete the final tender drawings and specifications detailing the remediation plan. The investigation identified and assessed soil contaminated with inorganic elements, polychlorinated biphenyls (PCBs) and/or hydrocarbons at several locations, as well as four landfills that required remediation. Detailed information, including analysis of paint, concrete and insulation samples, was recorded for all remaining buildings and structures to determine appropriate disposal requirements.

Locations for the landfarm and engineered landfills required for remediation were identified and assessed.

Final tender drawings and specifications were completed in March 2003. On 25 June 2003, the contract was awarded to Kitnuna Projects Inc. (KPI).

Site Remediation

Remediation activities at CAM-2 began after acquisition of a water use licence from the Nunavut Water Board and a quarry permit and a land use permit from Aboriginal Affairs and Northern Development Canada Land Administration. An application was made to Fisheries and Oceans (DFO) requesting authorization for work that might impact fish habitat. DFO issued a Letter of Advice that stipulated that total suspended solids and turbidity monitoring be performed in near-shore work areas and that results be submitted to DFO.

Remediation work was performed at CAM-2 during the fall of 2003 and the summers of 2004 and 2005. This work included excavation and disposal of contaminated soils and confirmatory sampling of excavation bases; remediation of historical landfills; demolition and disposal of all buildings and facilities; removal and disposal of debris; sampling and disposal of barrel contents; collection of oil, paint and concrete samples; further investigation of identified contaminated soil areas; monitoring of drinking water quality; construction and closure of a non-hazardous waste landfill (NHWL) and a Tier II disposal facility to contain contaminated soil that exceeded DLCU Tier II criteria; operation and closure of a landfarm for treatment of hydrocarbon contaminated soil; collection of confirmatory samples from camp work and storage areas; and collection of preliminary landfill monitoring samples to establish baseline conditions.

Two archaeological features are located at or adjacent to CAM-2. During the remediation work, the contractor marked all known archaeological sites so that they could be avoided.

As the CAM-2 site was not required as part of the NWS, all existing structures were demolished to the top of their concrete foundations, once demolition was complete the areas surrounding the foundations were reshaped so that the top of the gravel was flush with the top of the foundation. Any voids or holes in the surface of the foundations were filled with gravel. Demolition waste was sorted into hazardous and non-hazardous streams and disposed of appropriately.

The NHWL was constructed for disposal of non-hazardous waste, which included Tier I and Type A hydrocarbon-contaminated soil, site debris and non-hazardous demolition waste, bagged insulation containing asbestos, wrapped creosote-treated timbers, and materials painted with PCB-amended paint with PCB concentrations of less than 50 ppm. When placement of debris and waste in the NHWL was complete, a final lift of granular material was placed, compacted and the surface was graded to avoid water ponding and to

minimize infiltration. Following the completion of the landfill closure, groundwater monitoring wells were installed to facilitate monitoring of the landfill performance.

The Tier II Disposal Facility, designed to contain contaminated soil that exceeded DLCU Tier II criteria. The design of this facility was based on the characteristics of the contaminants in the soils, the geothermal properties of the area and the local permafrost regime. Permafrost provides the primary containment barrier — both the Tier II-contaminated soil in the facility and the wet, silty gravel perimeter berms were designed to be continuously frozen — and a geomembrane liner provides secondary containment. Closure of this facility included placement and compaction of the final cover of the landfill; this cover was graded to promote drainage away from the landfill. Following closure of the Tier II Soil Disposal Facility, groundwater monitoring wells and thermistor strings were installed to facilitate monitoring of the facility's performance.

The six previously existing landfills at CAM-2 required remediation. The Station Landfill, West Landfill North, West Landfill Central, West Landfill South and USAF Landfill were regraded. The Airstrip Landfill was partially excavated in the areas deemed to be unstable because of grade and proximity to the marine environment; confirmatory testing was conducted in excavated areas as appropriate. The excavation was backfilled with granular material, compacted and then graded to match the existing ground surfaces.

Contaminated soil was excavated at several areas. Excavated soils were disposed of in the Tier II Disposal Facility or the NHWL as appropriate. Confirmatory testing was performed in excavated areas as required to ensure that no contamination remained. Type B hydrocarbon-impacted soils were treated in the on-site landfarm, which was closed at the end of the 2005 field season when the soil met remediation criteria. An additional 50 cm of granular material was placed and compacted to provide a cover on the landfarm. The surface area was graded to a minimum slope of 2-4% to promote surface water run-off. Groundwater wells that were installed around the perimeter of the landfarm were cut-off and backfilled with grout.

Granular materials from nine of fourteen borrow areas at CAM-2 were used for final landfill cover, intermediate landfill cover, sand bedding, grading and backfilling.

Several disturbed areas were reshaped to blend with the surrounding terrain. These included contaminated soil excavations, debris areas, areas at which structures had been removed, landfill areas, borrow areas, roadways and the remediation contractor camp site.

A temporary PCB storage area was established for the storage of materials with PCB concentrations greater than 50 ppm, as required by the PCB Regulations under the Canadian Environmental Protection Act, 1999 (CEPA, 1999). This area housed containers of material painted with PCB-amended paint from the demolition work and soils with PCB concentrations greater than 50 ppm. The storage area was decommissioned when all PCB-contaminated materials had been removed from the site for destruction.

A total of 29 barrels from various places on the site were moved to temporary barrel storage areas located at the Southeast Apron and the Beach Area before being moved to a storage area at the Upper Beach Area for sorting and processing. The barrel contents were sampled and analyzed and the results were measured against the DLCU barrel disposal criteria to determine the appropriate disposal method. The empty barrels were cleaned and crushed or shredded and the debris was placed in the NHWL.

All cleanup work on the site was complete on 16 September 2005. Contractor demobilization included the dismantling and removal from the site of all vehicles and equipment, remaining fuel, supplies and construction camp, clean up of the site, and transportation of labour from the site. Upon removal of the construction camp, the contractor graded the area to match the surrounding terrain and ensured positive drainage. Demobilization and removal of hazardous waste occurred in 2005. The final certificate of completion for the project was issued on 31 October 2005.

Summary of Remaining Items

At CAM-2, soil with hydrocarbon concentrations exceeding 2,500 ppm at depths of 0.5 m or more was left in place, covered with a minimum of 0.5 m of clean fill in accordance with the Environmental Working Group (EWG) guidance. In accordance with the DLCU Protocol, Tier I-level lead- and PCB-contaminated soils were left in stable locations, covered with a minimum of 0.3 m of clean fill, when there was confirmation that no Tier II-contaminated soil was present at depth.

Monitoring Program

DND has committed to post-cleanup monitoring of remediated and newly constructed landfills to ensure that environmental objectives continue to be met. The monitoring program is contained within the 1998 NTI/DND Cooperation Agreement. Monitoring of the CAM-2 landfills took place in 2006, 2007, 2008, 2009, 2010 and 2012 and is scheduled for 2015, 2020 and 2030. After year 25 (2030). The EWG will review the results of each monitoring event and provide recommendations to the DND/NTI Steering Committee.

Conclusion

The remediation of the CAM-2 DEW Line site at Gladman Point, NU, was completed in 2005. Several isolated areas of contaminated soil remain in situ, at depth in accordance with agreed to protcols. Two constructed landfills and four previously existing landfills remain at the site. A monitoring program is underway with the next scheduled events planned for 2015, 2020, and 2030. As a result of the work completed as part of the DLCU Project, the site has been restored to an environmentally safe condition.

References:

- CAM-2, GLADMAN POINT, ENVIRONMENTAL DISCLOSURE REPORT, 2013
- CAM-2, GEOTECHNICAL INVESTIGATION AND PRELIMINARY LANDFILL DESIGN REPORT, UMA 2002
- CAM-2, ENVIRONMENTAL WORKING GROUP REPORT FOR NUNAVUT 2003
- CAM-2 LANDFILLS AND DEBRIS AREAS, ESG, FEBRUARY 2002
- CAM-2 CONTAMINATED SOILS - HYDROCARBON INVESTIGATIONS, ESG MARCH 2002
- CAM-LANDFILLS AND DEBRIS AREAS, ESG, RMC, 2002
- CAM-2 CONFIRMATORY SAMPLING REPORT, ESG 2005
- DEW LINE SITE GLADMAN POINT CAM-2, NTI TECHNICAL REPRESENTATIVE REPORT TO NTI, SINNANI, 2001
- DND/NTI COOPERATION AGREEMENT, 1998
- ENVIRONMENTAL CLEAN-UP STUDY OF 21 DEW LINE SITES IN CANADA, ESG 1991
- ENVIRONMENTAL STUDY OF ELEVEN DEW LINE SITES, VOLUME ONE, ESG 1993
- ENVIRONMENTAL WORKING GROUP REPORT, 1998
- ADDENDUM TO THE ENVIRONMENTAL WORKING GROUP REPORT, 1999

Appendix A
Abandonment and Restoration Plan
CAM-2, Gladman Point (NWB5GLA0308)

UMA Engineering Ltd.
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Calgary, Alberta T2N 3S3
T 403.270.9200 F 403.270.0399 www.uma.aecom.com

January 23, 2006 File Name: CAM-2 (3.6)

Phyllis Beaulieu
Manager, Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Ms. Beaulieu:

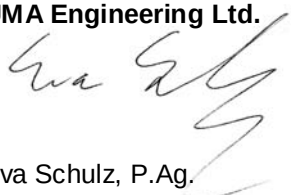
Re: Abandonment and Restoration Plan: Water Use License NWB5GLA0308

UMA Engineering Ltd. is submitting the attached *Abandonment and Restoration Plan* as per the requirements of Part I in water use license NWB5GLA0308. The plan is being submitted on behalf of Defence Construction Canada and the Department of National Defence.

We trust the information provided is sufficient for meeting the requirements of the license. Please feel free to contact the undersigned if you require any further information.

Sincerely,

UMA Engineering Ltd.



Eva Schulz, P.Ag.
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EMS:mm

Encl. Abandonment and Restoration Plan - CAM-2, Gladman Point (NWB5GLA0308)

cc: Philip Warren, DCC

ABANDONMENT AND RESTORATION PLAN – CAM-2, GLADMAN POINT (NWB5GLA0308)

The main objective of the DEW Line Clean Up Project is to restore the sites to an environmentally safe and aesthetically natural condition. In order to meet this objective, clean up plans are prepared and a contractor is hired to remediate the site as per the engineering design and specifications. The contractor is required to clean up all of the areas in which their activities took place and restore the site to as natural a state as practical. The following sections provide a summary of the closure activities that will occur at the completion of the CAM-2 site clean up.

Demolition: Upon the completion of the demolition work, the contractor removes any remaining debris and leaves the work site clean. Building sites and all areas affected by demolition work are graded to match the existing terrain. The areas surrounding remaining concrete and timber foundations are reshaped so that the top of the gravel is flush with the top of the foundation. Any voids or holes in the surface of the foundation are filled with gravel. At the CAM-2 site, all buildings and structures were demolished.

Contaminated Soil Excavation: In areas of contaminated soil excavation, the excavations are filled with granular material, compacted and graded to match the existing ground surface. The restoration in these areas is completed in an on-going process as each contaminated soil area excavation is finished.

Landfarm Closure: At the conclusion of landfarm operations, additional granular material is placed and compacted to provide a cover. The surface area is graded to a minimum slope of 2-4% to promote surface water run-off. Groundwater wells installed around the perimeter of the landfarm are cut-off and backfilled with grout.

Non-Hazardous Waste Landfill: A final lift of granular material is placed, compacted and the surface graded to avoid water ponding and minimize infiltration at the completion of landfill operations. Following completion of the landfill closure, groundwater monitoring wells are installed to facilitate monitoring of the landfill performance. The landfill monitoring plan for this site was submitted to the NWB in March 2005.

Tier II Soil Disposal Facility: Placement and compaction of the final cover of the landfill also includes grading to promote drainage away from the landfill. Following closure of the Tier II Soil Disposal Facility, groundwater monitoring wells and thermistor strings are installed to facilitate monitoring of the facility's performance. Details of the monitoring plan are provided in the March 2005 submission.

Contractor Demobilization: Contractor demobilization includes the dismantling and removal from the site of all vehicles and equipment, remaining fuel, supplies and construction camp, clean up of the site, and transportation of labour from the site. Upon removal of the construction camp, the contractor grades the area to match the surrounding terrain and to ensure positive drainage. Contractor demobilization typically coincides with the annual sea-lift.