BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 200 - 1121 Centre St NW Calgary, Alberta Canada T2E 7K6
Telephone (403) 250-5185 Fax (403) 250-5330

BGC Project Memorandum

To:	**Kitikmeot Inuit Association**	**Project No.:**	**0454-002-05 & 06**
Attention:	**Geoff Clark**	**cc:**	**Luigi Toretti**
From:	**Marc Adams**	**Date:**	**March 28, 2011**
Subject:	**Doris North Project – Review of Windy Camp and Patch Lake Facility Closure Plans**		

1.0 INTRODUCTION

BGC Engineering Inc. (BGC) has been retained by the Kitikmeot Inuit Association (KIA) to review documents prepared by Hope Bay Mining Ltd. (HBML) for the Hope Bay Mining Project. HBML is a wholly-owned subsidiary of Newmont Mining Corporation (Newmont).

On March 11, 2011, BGC received a request from Mr. Luigi Torretti, Senior Environment Officer for the KIA, to review the following studies:

"*Hope Bay Project Windy Camp Final Closure Plan*", prepared by SRK Consulting (SRK) for HBML and dated January 2011 (Windy Camp Closure Plan).

"*Hope Bay Project Patch Lake Facility Final Closure Plan*", prepared by SRK Consulting (SRK) for HBML and dated January 2011 (Patch Lake Closure Plan).

Collectively, these studies are herein referred to as "the Closure Plans". Separate reference to each individual plan will be as identified above. Collectively, Windy Camp and the Patch Lake Facility will be referred to as "the Sites".

The KIA is the land owner upon which the Doris North Project is being constructed. This review was undertaken to identify issues that could potentially pose a risk to Inuit Owned Land (IOL).

2.0 BACKGROUND DETAILS

The Closure Plans were prepared in response to the requirements under the NWB Type B Water Licence No. 2BE-HOP0712 (the Water Licence) issued to HBML by the Nunavut Water Board (NWB, or the Board).

As described in the Closure Plans, the Sites are part of the Hope Bay Regional Exploration Project. These facilities are located in the West Kitikmeot Region of Nunavut, approximately 160 km southwest of Cambridge Bay, on Inuit-owned land administered by KIA. Windy Camp was used as an exploration camp that included housing for personnel, office space, workshop facilities, fuel storage and core storage. The Patch Lake Facility was used as a maintenance yard and workshop for exploration drilling. Tank farms have also historically been located at two locations within this facility.

The Closure Plans describe how the Sites will be permanently closed and reclaimed. The overall closure objective is stated to be to establish chemically and physically stable site conditions, which would ensure no adverse impacts to bird, aquatic, terrestrial and human life. Post closure care and maintenance, including monitoring, is included in the Closure Plan, to gain assurance that these conditions are met.

Interim closure methods to be implemented during temporary or indefinite shutdown of the Sites are described in the "*Closure & Reclamation Plan for the Hope Bay Regional Exploration Project, Nunavut*" prepared by Hope Bay Mining Ltd. and Lawrence J. Connell, P.Eng., dated September 2007 (Closure & Reclamation Plan). This document was also used for reference in the review of the Closure Plans.

It should be noted that, according to the Closure Plans, temporary shutdown measures were implemented since the time of a temporary shutdown that occurred in October 2008.

Three additional studies are included in both the Closure Plans as appendices, as follows:

- (Issued for Review) "*Evaluation of Risk and Remedial Options for Contaminated Soil at Patch Lake Facility and Windy Lake Camp, Hope Bay Gold Project, Nunavut*", prepared by EBA Engineering Consultants for the Newmont Mining Corporation and dated October 2010 (*Remedial Options*).
- "*Hope Bay Gold Project: Phase II Environmental Site Assessment of Patch Lake Workshop, Windy Camp, and Boston Soil Treatment Area*", prepared by WESA Inc. for SRK Consulting (Canada) Inc. and dated 2009 (*Phase II ESA*).
- "*Hope Bay Gold Project: Derivation of Risk-Based Hydrocarbon Remediation Criteria for Patch Lake Workshop and Windy Camp*", prepared by WESA Inc., for SRK Consulting (Canada) Inc. and dated 2009 (*Derivation of Risk-Based Criteria*).

It should be noted that these additional reports were reviewed as to content relating to the subject facilities, Windy Camp and the Patch Lake Facility.

3.0 COMMENTS AND DISCUSSION

The following sections summarize comments with respect to specific areas of the Closure Plans. BGC's comments are presented in *italic text* in order to distinguish them from details summarized from the Plan.

3.1. Chemicals of Potential Concern and Potential Sources

Phase II ESA

It is noted that the stated objectives of the Phase II ESA study all relate to the assessment of petroleum hydrocarbons (PHC). However, the ESA study did include some limited sample analysis for other chemicals of potential concern (COPC), including metals, polycyclic aromatic hydrocarbons (PAH), and trichloroethene (TCE). The focus of the Phase II ESA at the Windy Camp was reported to be the former fuel tank farm, former soil treatment facility (between Windy Lake and the tank farm) and an area near the workshop where significant spills and contaminant releases had previously been reported. Other small areas of surface staining were also noted to be evident at the fuel tanks associated with buildings. Investigation of the Patch Lake Facility within the Phase II ESA included drainage courses, former workshop, laydown yard, former and current fuel storage areas and areas of noted surface staining.

BGC considers the following as COPC for typical facilities such as those identified at the Sites:

- *PHC´s – from storage and handling facilities as well as equipment leaks.*
- *Metals – concentrated in incinerator ash, adsorbed in soil or sediment at waste water treatment outfall, or leached from rock core.*
- *Solvents (e.g. chlorinated solvents) – from storage, handling (both fresh and used) and use in maintenance.*
- *Hydraulic fluids – from storage and handling as well as equipment leaks.*
- *Glycols or other antifreeze liquids – from storage, handling (both fresh and used) and use in equipment and maintenance.*
- *Dioxins and furans – from incomplete combustion of waste within the incinerator, residing within incinerator ash or deposited downwind of the incinerator.*
- *PAH´s – within PHC or within Incinerator ash due to incomplete combustion.*
- *Nutrients – within wastewater and absorbed within soil or sediment at waste water outfall. Also possible within any soluble blasting residue within rockfill created by blasting.*

While it is agreed that PHC appears to be the COPC handled in the largest volumes at the Sites, several of the other COPC listed above are more recalcitrant and can persist for longer periods in the environment.

It is not clear from the Phase II ESA whether all of the above COPC have been addressed in other studies not available for review by BGC. In addition to the above listing of typical COPC associated with such facilities, it is not clear whether a review of usage and inventory records was undertaken at the Sites to further identify COPC. This review might include both

types of materials brought to the site, and potentially a reconciliation of quantities supplied against quantities dispensed/recycled/disposed.

It is noted that 2008 environmental site assessments are mentioned within the Phase II ESA; however, they were not appended or summarized within the Closure Plans or appendices.

Some reference is made to releases and spills in various documents – including a reference to "significant spills and releases" within the Phase II ESA. However, it is unclear how records of these incidents were used in setting the scope of the Phase II ESA. It is identified that surface stained areas were considered in identifying areas for investigation. However, since regrading activity might limit the usefulness of visual inspection in identifying spill sites, the use of spill or release records is considered useful in supplementing this approach.

Some of the volume estimates of impacted soil appear low given the information that suggests material handling issues (e.g. "significant spills"). However, the methodology for estimating the impacted soil volumes is not fully described to allow assessment of the volume estimates.

In addition, an oil water separator was mentioned in the 2007 Closure & Reclamation Plan, but is only mentioned in the Final Closure Plans as a component of closure equipment. It should be confirmed that there was no oil-water separator as a permanent facility for closure within the Closure Plans.

Derivation of Risk Based Criteria

The Derivation of Risk-Based Criteria study reportedly compared the soil analytical results from the Phase II ESA to CCME Canada-Wide Standards for PHC´s in Soil and Canadian Soil Quality Guidelines for residential/parkland sites, in order to identify COPC to be carried forward for further assessment. Those COPC carried forward from this screening for the Windy Camp site were three PHC fractions (F1, F2 and F3). COPC carrying through the screening for the Patch Lake Facility were three PHC fractions (F2, F3 and F4), as well as four metals (chromium, copper, nickel and zinc). However, following this screening, only PHC fractions were brought forward for further assessment. Review of the inorganic parameters was noted to be beyond the scope of the study.

It is unclear how the COPC identified in the Phase II ESA were initially screened, as only a summary table of those being carried forward was provided in the Derivation of Risk Based Criteria study. Also, a reference was not supplied regarding other studies to address the other COPC that were identified (chromium, copper, nickel and zinc).

While sediment and lake sampling is mentioned, it is unclear if these studies were intended to address the Sites or were generic studies of lake quality in the region. Sediment sampling in close proximity to Site sources (e.g. waste water treatment outfalls or precipitation runoff outfalls) was not identified.

The groundwater pathway for the protection of aquatic life was excluded due to lack of observed exceedances. This pathway should still be considered as Site changes during

closure and remediation may result in changed groundwater conditions. The post closure groundwater monitoring program should be scoped to address this issue.

It is noted in the section regarding ecological (non-human) receptors that "since no federal departments were involved in this report, the ERE framework has not been used." It should be confirmed that other stakeholders concur that the Ecological Risk Evaluation (ERE) Framework under the Federal Contaminated Sites Action Plan should not be applied to the Sites.

Remedial Options

The Remedial Options study states that the primary contaminant of concern at both sites is PHC. The scope of this study reportedly included review of previous studies including the final closure plans and the Phase II ESAs conducted for the Camp site (as well as the Patch Lake site). Metals are mentioned within the conceptual site model (CSM) when discussing background conditions and as potential liberated COPC during PHC remediation for the Sites, as well as being identified as a COPC for Patch Lake Facility areas. PHC are identified as COPC within the CSM for both sites. Remedial objectives and remedial options for the identified metals impacted soils do not appear to be considered further.

It is unclear where metals (identified in previous studies as COPC) are to be addressed, in terms of development of remedial options. The Remedial Options study does not address these COPC´s that were identified in the Phase II ESA.

It is again noted that no reference is made within the text to other studies that may have considered the additional COPC´s that BGC has identified earlier in this memo. A Phase II Screening Assessment study by SRK Consulting (Canada) Inc. is listed in the references of this study. However, no details on this study were available for review to determine if this study is the Phase II ESA conducted by WESA for SRK or is another study not attached for review. As such, some important COPC´s do not seem to have been addressed in the current report.

Final Closure Plan

The Closure Plan identifies within its scope remediation of hydrocarbon contaminated soils. A Phase 3 ESA is also identified, for the purposes of further delineating and quantifying hydrocarbon impacted soils to be remediated and to gather information to assist in this remediation. Closure approaches for contamination of metals and other potential COPC are not identified in the Closure Plans.

As other COPC (beyond PHC) appear to have been dropped prior to or during the attached supporting studies (Phase II ESA, Derivation of Risk Based Criteria and Remedial Options studies), the remediation of these COPC´s are not addressed in the Closure Plans.

Some reference has been made to other studies (e.g. SRK Phase II Screening Assessment), but these studies were not available for review by BGC.

Recommendations With Regard to COPC

Following are recommendations related to COPC, for the consideration of KIA:

- *All studies used in assessing COPC should be identified clearly and made available for review. If the Closure Plans and appended reports are all that is to be relied upon, they do not appear to address all COPC for the Sites.*
- *All potential sources of contamination should be clearly identified for the Sites, and all relevant COPC assessed for each source area.*
- *The method of assessing each COPC should be presented clearly.*
- *The derivation of remediation criteria should present all COPC from all potential sources and explain how each is either dropped from consideration or brought forward for identification of criteria.*
- *The assessment of sediment and surface water quality should address quality adjacent to the Sites specifically, with regional studies applied for background.*
- *All COPC assessed but identified to not require remediation should be identified clearly.*
- *All COPC identified for remediation should be considered for remedial options.*
- *KIA should consider if more rigorous ecological assessment should be applied to the Sites, including but not limited to the Ecological Risk Evaluation Framework developed by Environment Canada and the Department of Fisheries and Oceans.*

3.2. Remediation Criteria

Site specific remediation criteria have been proposed in both the Derivation of Risk Based Criteria study and the Remedial Options study. As noted previously, these remediation criteria are limited to PHC. Other COPC that have been previously discussed are not addressed.

Derivation of Risk Based Criteria

After initial screening against the Canada-Wide Standards for PHC, WESA proposes higher remediation criteria to apply to the identified F1, F2, F3 and F4 generic criteria exceedances at the Sites, using approaches that include the following:

- The most stringent of applicable pathway-specific criteria are applied, excluding pathways deemed to be inapplicable to the Sites.

- The applicability of the toxicity information to the northern species is cited, for further evaluation using professional judgment.
- The "smallness of the impacted areas relative to the vastness of the un-impacted surrounding land" is cited, for further evaluation using professional judgment.

F1 exceedances do not persist beyond the pathway-specific screening (at Windy Camp); therefore, the further assessment methods are not applied. Higher criteria are then proposed for the F2 PHC fraction related to the 50th percentile rather than the 25th, based on professional judgment. Higher criteria are then proposed for the F3 and F4 PHC fractions, based on professional judgment. The proposed criteria for post-closure land use are as follows: F1 – 210 µg/g; F2 – 260 µg/g; F3 – 1,300 µg/g; and F4 – 5,600 µg/g.

BGC notes that pathway-specific screening of criteria are proposed for the Sites. However, it should be noted that exclusion of non-applicable pathways, rather than use of minimum criteria based on all pathways, requires ongoing management to confirm that these pathways remain inapplicable in the future. For example, exploration camps or other facilities including enclosed buildings may be considered for development at the Sites in the future. It is not clear how the restrictions to future use arising from pathway specific criteria may limit aboriginal use of the land in the future.

The study identifies that the toxicity data used in generation of the generic criteria is not necessarily applicable to species at the site. However, it is not fully explained why the species present at the site might be considered less sensitive to the COPC (thereby justifying higher criteria) rather than more sensitive.

The study further cites the "smallness of the land relative to the vastness of the un-impacted surrounding land" as a consideration when applying professional judgment to raise the criteria. However, it is not clear if two factors have been fully considered in this assessment, as follows: cumulative effects from numerous other similar sites across the north; and, sites across the north are often sited in similar settings (e.g. near shore for access considerations, on relatively level land) and therefore preferentially impact the particular ecosystems associated with these settings.

Remedial Options

While the Remedial Options study recognizes the site-specific criteria generated within the Derivation of Site-Specific Criteria study, it proposes higher remediation criteria than that identified in the WESA study. The proposed remediation objectives for post-closure land use are as follows: F1 – 350 µg/g; F2 – 330 µg/g (within 30 m of lakeshore)/800 µg/g (beyond 30 m from lakeshore); F3 – 10,300 µg/g; F4 – 18,500 µg/g; and Total PHC – 30,000 µg/g. References are provided to hydrocarbon remediation protocols and remediation criteria developed for other sites. It is stated that these remediation criteria are equally protective of the environment as the WESA criteria.

BGC cannot evaluate the applicability of the proposed remediation criteria with available information. There is insufficient information to determine whether the results of the cited studies can be transferred to the subject site. It is noted that reasons cited again include "the vastness of the un-impacted surrounding land." As noted with respect to the comments on the Derivation of Risk-Based Criteria study, based on this limited statement, this approach does not appear to take into account cumulative effects or the ecological similarity of the many exploration sites in the north.

Final Closure Plan

No remediation criteria are presented in the Final Closure Plan, although three sets of criteria have been identified in the supporting studies provided in appendices, as noted above: generic CCME Canada-Wide Standards for PHC in Soil, site-specific risk-based criteria derived by WESA, or modified criteria from other northern studies presented by EBA.

It is not clear which of the three remediation criteria presented in the supporting studies for petroleum hydrocarbon impacts in soil is to be applied to remediation, or whether some other set of criteria is to be proposed. As noted in previous comments, other COPC identified within the supporting studies (certain metals in soil) have not been addressed beyond identifying exceedances of generic criteria. Also as noted in previous comments, BGC is uncertain whether other COPC have been assessed in documents not available for review, or whether they are not considered.

Recommendations With Regard to Remediation Criteria

Following are recommendations related to remediation criteria, for the consideration of KIA:

- *Aboriginal land uses and practices should be explicitly considered in the development of remediation criteria. The use of generic pathway-specific criteria or site-specific criteria should be examined to confirm they support these uses and practices.*
- *Further detail is needed to confirm that the approaches to identifying pathway-specific criteria and site-specific criteria are applicable to the Sites. In particular, more detail describing how the referenced studies are applicable to the Sites should be presented.*
- *The remediation criteria selected for the Sites should be presented clearly.*

3.3. Closure Approaches

Remedial Options

The Remedial Options study presents and assesses the following treatment methods to address PHC impacts in soil:

- In Situ Methods

  - Bioremediation
  - In Situ Chemical Oxidation
  - In Situ Enhanced Bioremediation
- Ex Situ Remedial Options
  - Excavation and Landfill Disposal
  - Landfarming
  - Biopiles

Options excluded for various reasons are also presented, including: surfactant soil washing, in situ bioventing, monitored natural attenuation, and on-site disposal facility.

The above remedial options were assessed in part based on the volumes of soil identified by available data and the remediation criteria presented by EBA from other northern studies.

It is noted that the above assessments were done based on soil volumes derived from remediation criteria with which BGC has outstanding questions. It is uncertain whether the assessment results may change if impacted volumes related to other remediation criteria were applied.

It is further unclear whether the selected remedial option(s) may change if remediation of soils impacted by other COPC is necessary. For example, it has been noted that results of assessment of nutrient impacts have not been made available. Should nutrient impacted soils be present, their use in landfarming application with the PHC impacted soil might be considered.

Risk of various aspects of remediation options (e.g. permafrost degradation, amendment addition to enhance bioremediation, bioremediation limitations for highly impacted soils) is cited in the evaluation of remedial options. However, it is unclear if methods to mitigate those risks were considered, or if remedial options with these risks present were rejected without that further consideration.

Disposal of soil impacted with F3 and F4 at the Camp Doris landfill is identified as an option. However, it is unclear whether the landfill has been designed for this type of disposal, and whether leachability testing of the impacted soil is proposed to confirm its acceptability at that facility.

The conclusions and recommendations of this study do not clearly identify a recommended remedial option. It is noted that consultation with affected stakeholders is recommended to select a remedial option. In addition, a risk assessment related to potential remediation options may be suggested to convey potential future risks to stakeholders, such as the KIA.

Final Closure Plans

Closure activities identified in the Final Closure Plans are as follows:

Windy Camp

- Construction of Temporary Sedimentation Berm
- Phase 3 ESA
- Remediation of Hydrocarbon Contaminated Soils
- Decommissioning and Reclamation of Fuel Storage Area
- Collection and Disposal of Hazardous Wastes
- Demolition of Remaining Site Structures
- Collection and Disposal of Non-Hazardous Waste
- Core Relocation to Permanent Storage Facility
- Remediation of Permafrost Degraded Areas
- Site Recontouring, Drainage Control and Site Revegetation
- Post Closure Monitoring

Patch Lake Facility

- Phase 3 ESA
- Removal of Empty Core Boxes
- Demolition of Secondary Containment Facility
- Remediation of Hydrocarbon Contaminated Soils
- Stabilization of Tank Farm Spoil Piles
- Remediation of Permafrost Degradation Areas
- Site Revegetation and Drainage Control
- Post Closure Monitoring

Three tasks above are related to hydrocarbon contaminated soils: the sedimentation berm (Windy Camp only), Phase 3 ESA, and the remediation of the soils. Reclamation of the Fuel Storage Area (Windy Camp) and Demolition of the Secondary Containment Facility (Patch Lake) have some relevance to this broader remediation process, as the fuel storage areas are included in the impacted areas of the Sites.

Sedimentation Berm

It is difficult to assess the sedimentation berm aspect as background information leading to the identification of closure component is not provided. Broad design considerations and details are provided, but the process of determining the need and alignment of this aspect is not presented, nor are operational details on the facility (maintenance, performance evaluation).

COPC

No background is provided within the Closure Plans regarding the screening and elimination process that addressed other COPC. The justification for absence of remediation actions for other COPC cannot therefore be evaluated.

Demolition of Secondary Containment Facility

The word "either" in the first sentence of this section in the Patch Lake Closure Plan suggests more than one approach to addressing contaminated materials is being presented. However, no alternative approach to remediation is presented.

Remediation of Contaminated Soils

The Remediation of Contaminated Soils section is approximately two paragraphs in length in both Closure Plans. In situ remediation of hydrocarbon impacted soils is to be implemented "where appropriate". It is assumed the "where appropriate" determination will be made based on the final selected remediation criteria, the available site data, and the results of the Phase 3 ESA being proposed. Details on the in situ approach being proposed are not provided, nor is the reasoning as to why this type of approach was selected above the other options identified in the attached Remedial Options study.

BGC cannot fully assess the proposed remediation approach, as insufficient detail has been provided. "In situ remediation of hydrocarbon impacted soils where appropriate" does not provide enough detail to allow the approach to be assessed for its ability to reach remediation goals. Indeed, remediation goals are not specifically identified.

Granting the identified PHC impacts, a detailed plan identifying the specific approach proposed to remediate these impacts. Should insufficient detail be available to identify a specific approach, a defined methodology should be presented as follows: identifying remediation objectives; identifying data gaps; proposed actions to address information gaps; a selection methodology for determining the appropriate remediation approach based on the completed data set; implementation plan details, and a description of the level of performance monitoring and confirmatory sampling to complete remediation at the Sites.

No remediation approach is identified for the metals impacted soils identified in the background section of the Patch Lake Facility Closure Plan. Again, the assessment of other COPC was not presented, and no other COPC were therefore identified for remediation.

Within the Patch Lake Closure Plan, disposal of F3 and F4 impacted soil at a designated landfill facility is proposed. It should be noted that additional characterization of these soils may be needed to confirm they can be disposed at any selected facility. Also confirmation is needed that the landfill is appropriately designed and permitted to store such wastes.

Waste Management

The "Doris North Waste Management and Hazardous Waste Management plans" are identified to address methods of waste management within the Closure Plans. However, these plans were not included within this review.

It is noted that "options" are identified for disposal of the liner from the Fuel Storage Area Reclamation. A proposed approach would be preferred in a final closure plan, or a specific methodology for selecting the approach to be implemented. This comment is applicable to other areas where specifics of the proposed approach are lacking.

Incinerator ash is identified within the collection and disposal of non-hazardous waste. However, it is unclear if this material has been characterized to confirm the environmental quality for appropriate disposal.

Drainage Control and Revegetation

Drill hole sealing is identified within the Drainage Control sections of the Closure Plans. However, drill holes were not identified within earlier documents as being present at the Windy Camp and Patch Lake Facility. This aspect of closure has therefore not been presented in detail in any supporting documentation. It is unclear if these facilities are in fact present at the Sites. If present, it is further unclear if consideration to preferential migration pathways (to protect groundwater resources) or permafrost degradation has been considered in the decommissioning actions for these drill holes.

Appropriate revegetation is identified in the Closure Plans. There is insufficient detail regarding the type of revegetation proposed, or the confirmatory monitoring that will be undertaken to assess performance of the revegetation effort.

Schedule

More detail on the frequency and scope of post closure monitoring is needed. The scope of monitoring during the remediation phase, and the full scope and frequency of overall monitoring is not presented in either the Post-Closure Monitoring section or the Schedule section of the Closure Plans.

The Tables of Concordance for Final Closure Plan for the two Sites identify that the restoration works are to be completed by Licence expiration (June 30, 2012 for both Sites). It is unclear if the remediation aspect of the Closure Plans will be completed by this deadline. Considering the approaches identified, the schedule of meeting remediation goals has some uncertainty. Further commitment to a schedule of remediation should be identified to explain how this Licence Condition will be met. It is noted that the Schedule table within the Patch

Lake Closure Plan identified completion by Summer 2013, which is beyond the Licence expiry date.

Cost Estimates

The cost estimates provided do not clearly identify the remediation goals or the specific soil remediation method selected – so it is unclear what approach has been used for cost estimation. Also, as noted earlier, it is unclear if all COPC not included in the Closure Plan have been addressed – so the completeness of the remediation costs cannot be assessed.

References

The Reference Section of the Closure Plans only identifies the three studies attached in appendices. As noted earlier, these attached studies do not appear to fully document the process of screening and addressing all COPC for the Sites.

It is therefore unclear where these other COPC have been assessed.

Recommendations With Regard to Closure Approaches

Following are recommendations related to closure approaches, for the consideration of KIA:

- *The following information is needed to evaluate the remediation aspect of the Closure Plans:*
  - *More detailed descriptions of the implementation plan for remediation of contaminated soils, both for PHC contamination and other COPC whose assessment has not been presented.*
  - *A description of the remediation objectives for all COPC, the resultant volumes of soil/groundwater/etc. to be remediated, and both costs and schedules specifically related to these remediation objectives and associated volumes.*
    - *As mentioned previously, it should be confirmed clearly in the Closure Plans how the identified remediation objectives for COPC relate to the Sites and that they are protective of the aboriginal use of the land.*
  - *The appropriateness of the proposed landfill for disposal of contaminated soil from the Sites.*
  - *More detail regarding the closure and post-closure monitoring programs associated with remediation, and contingency plans identified to address unanticipated results.*
- *Beyond remediation of contamination, more detail should be provided to evaluate the proposed closure activities:*
  - *The proposed approach to remediate the typically difficult task of permafrost degraded areas. How is this to be achieved? How will other regrading and contouring be accomplished without further degrading permafrost?*
  - *The monitoring program for all aspects of closure must be presented in detail so that its ability to confirm effectiveness and address uncertainty can be determined.*
- *The presented Closure Plans identify a great deal of uncertainty regarding the Sites and how closure is to progress. This uncertainty does not seem appropriate in a "final" closure plan.*

3.4. Miscellaneous Comments

A Phase 3 ESA is already proposed within the Closure Plans, to delineate the hydrocarbon impacted soils. Should additional studies not be available to confirm the process of assessing and screening the other COPC identified in this review, this Phase 3 ESA could be expanded to further assess these COPC.

Other sites were assessed or referenced within the Closure and Reclamation Plan and the appended studies to the final Closure Plans. It was assumed that these other sites (e.g. exploration drill sites) were not being considered in the review of the cited Closure Plans, and are addressed in other plans.

Minor technical details requiring correction:

- *Several references to other Closure Plan sections are mis-referenced within Section 3.4 of the Windy Camp Closure Plan.*
- *Some QA/QC issues were identified within the Phase II ESA. However, the exceedances of acceptable relative percent differences do not appear to be fully resolved. No clear statement was made that the consultant considers the data reliable based on the results of the QA/QC program.*

Recommendations

Following are other recommendations for the consideration of KIA:

- *Should information not be available to address all COPC in the Closure Plans, the Phase 3 ESA proposed for 2011 should be expanded beyond PHC delineation to obtain this data.*

4.0 SUMMARY & CONCLUSIONS

The overall closure objective is stated to be to establish chemically and physically stable site conditions, which would ensure no adverse impacts to bird, aquatic, terrestrial and human life.

In general, three major aspects of the Closure Plans were discussed in detail within this review:

- COPC´s and Potential Sources
- Remediation Criteria
- Closure Approach

A number of questions arose during review of the Closure Plans based on these major aspects. These questions might be summarized as follows:

- Identification of potential sources of environmental impacts, and the assessment of COPC associated with those sources, were not fully addressed within the documents provided as part of the Closure Plans.
- Remediation criteria were not presented clearly, including the following:
    - How the identified criteria were selected.
    - Remediation criteria for all COPC, not just PHC.
    - Remediation volumes based on identified criteria, and approaches developed for identified criteria, volumes, and all COPC.
    - Explicit acknowledgment that aboriginal constraints and needs should be provided in the selection of remediation criteria.
- The presented closure approaches lacked sufficient detail to assess their ability to meet the closure objective for the Sites. In addition, contingency plans are not identified, should closure or remediation actions not proceed according to plan.

Summary Recommendation

- It is recommended that outstanding issues identified in this review be resolved in the finalization of the Closure Plans.

5.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of the Kitikmeot Inuit Association. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

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Yours sincerely,

BGC ENGINEERING INC.
per:

[Original signed by:]

B. Marc Adams, M. Sc., P. Eng. (AB, NS)
Senior Geotechnical Engineer

Reviewed by:

[Original signed by:]

James W. Cassie, M.Sc., P. Eng.
Senior Geoenvironmental Engineer

Reviewed by:

[Original signed by:]

Holger Hartmaier, M. Eng., P.Eng.
Senior Geotechnical Engineer