WILDLANDS LEAGUE
A chapter of the Canadian Parks and Wilderness Society

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Re: *Wildlands League comments*
Closure Plan proposed amendment #3: DeBeers/Victor Mine
EBR # 012-2628

Our comments on this proposed amendment:

(1) Process: Transparency of documentation.

One of our themes for priority comment at this time, is the ability of an interested party to engage in this decision in an informed manner. We have been surprised at the difficulty that we have encountered in trying to engage in this decision to date, despite our well-known and long involvement as an interested party on this file and the applicability of the Environmental Bill of Rights for interested parties such as ours to review and comment on such decisions:

(a) No supporting materials were posted or linked to the EBR posting of this instrument. It is our opinion and position that, particularly for such technical matters, access to the relevant documents to base such involvement upon should be anticipated and proactively facilitated by the responsible Ministry.

(b) Our early request of MNDM for these materials at the outset of the comment period met with an offer to view the documents in Sudbury or Timmins, requiring a 500-700km trip. It is our opinion and position that this fails to provide reasonable access in the spirit of the EBR, particularly in an age of digital media and when the documents actually originated in the same city as our office. The Ministry also forwarded our request to the proponent at that time.

(c) We received a hardcopy of the Amendment materials, courtesy of the proponent and their consultants (and couriered from Mississauga, 20min from our offices). They were received 4 days before the end of the public comment period provided (October 19th).

(d) Given this unfortunate circumstance, we were forced to propose a November 3rd submission of our more considered comments, to allow reasonable time for review of the significant subject materials. We appreciated that the Ministry recognized the untenable circumstances and accepted this proposal.

(e) The original Closure Plan and/or preceding amendments have similarly not been provided to us, nor made publicly available to our knowledge. It is therefore somewhat difficult for us to appreciate the changes being proposed.

RECOMMENDATION 1 – ***We recommend that the Ministry use this case as an opportunity to proactively consider what "reasonable access" might mean in a contemporary setting, where significant geography and inconvenience to stakeholders, ministry staff, proponents and their consultants can all be easily overcome by establishing standard e-document sharing protocols.***

So, in this context and with the proviso that we were working with a compressed time to work through the materials, and that we have never been provided with the original Closure Plan, we respectfully contribute the remainder of our comments:

(2) Connection to 2013 Mercury Performance Report findings missing.

While the primary theme of this amendment is stockpiling of additional minerock volumes, it does not appear to pick up from the minerock management challenges identified in the recent 2013 Mercury Performance Report, where sulphate release and contributions to methylation of mercury in downstream environments was attributed most likely to minerock stockpiling. That report also very briefly suggested some possible mitigation options. We would expect the Closure Plan, particularly one seeking to stockpile additional volumes of this material, to more fully address these aspects including more carefully assessing and addressing any legacy implications as an integral element of a proposal to expand an activity that has been identified as potentially problematic.

See also below: Theme (7) Comprehensive assessment of site sulphate-loading needed.

RECOMMENDATION 2 **–** ***That the amendment be re-drafted to substantially remedy this identified gap, where minerock contributions to sulphate loadings and mercury methylation over time, including (a) mitigation alternatives, (b) likelihood of success and (c) further contingencies are comprehensively assessed in the context of significant additional stockpiling in this setting.***

(3) Values and figures generally demonstrate a lack of currency/refinement.

We have found that this amended Closure Plan does not contain updates for various information originally generated in the Comprehensive Study Report (CSR). While this is reasonable for certain baseline information, other operational predictions would be appropriately updated with operational knowledge gained from implementation. We would expect that an amended plan at this juncture would make every effort to replace Environmental Assessment assumptions with operational data from the field – in particular for predictions that were initially based on substantial quantitative ranges.

For example, the range of interception of all water reporting to Central Quarry by dewatering effects is still illustrated as 900-5000m3 on figures provided in this Closure Plan material, as it was originally estimated in the CSR. We note that these numbers at the time of the CSR were (a) predictive, (b) indicated a very large range of outcomes (a very significant error), and (c) was based

on processing plant outputs almost 50% less than the volumes alternately presented in this Closure Plan on page 65.

Similarly, the extent that plans initially proposed have been implemented or not should be currently reflected in all of the language and figures associated with an amendment being submitted at this time, also in keeping with the proponent's desire for a "living document" (Letter of Transmittal, James Kirby for DeBeers).

For example, Figure 5.8 still refers to water sources for winter roads as planned sources. Were they used or not? Implementation progress should be accurately documented to the extent possible if a dynamic document is to remain useful to the purpose.

These are only examples. While the Closure Plan as provided contains many apparent updates (e.g. such as Table 4.4, presenting 2014 vintage hydrogeological refinements), it also contains many discrepancies, and missed opportunities for updating. The selective pattern for updating was not discernable to us.

RECOMMENDATION 3 - ***We would expect a more comprehensive updating of all operational realities and gained information through any amendment opportunity. We recommend a general redrafting of this amendment to accurately reflect all currently understood values and operational decisions, such that the document is maintained in as updated a state as possible over time. Any persistent gaps / large ranges of assumptions should be flagged for priority refinement, including such commitment and outline of how this would occur.***

(4) Expansion implications a reasonable consideration to legacy planning.

While it is understood that no plans have been finalized, it would be appropriate to the purpose of this Plan to have a reasonable discussion of the implications of expansion, given the substantial amount of planning currently going into making that happen.

RECOMMENDATION 4 – ***We recommend that a discussion of expansion potential and implications be included in this Plan. Such discussion should characterize, to the extent possible, the likelihood and nature of ongoing use of the site as it pertains to any extended life of the processing plant, likely points of intersection between offsite developments and Victor, and then appropriately detail what the implications of such extension might present to the closure activities and timelines of this Plan.***

(5) Current mercury monitoring inadequate as a basis for ongoing operational, closure, and expansion monitoring.

Water quality station locations - While the mapped monitoring station locations may not represent all of the monitoring that is occurring, their layout raises questions even for the single project application originally intended. For example, the upstream (US) locations for both Granny Creeks appear to be located downstream of the flow augmentation inflow points, and also within the zone of drawdown from the pit dewatering and therefore do not necessarily represent the natural water quality baseline of the US waters. Now that additional site life is anticipated, and an additional mine located in close proximity, this monitoring scheme should reasonably be examined against the purposes of both these extensions, as well as the ultimate closure of Victor itself (with or without such extended life).

Current mercury monitoring program experiencing increasing data gaps – as evidenced in the recent 2013 Mercury Performance Report, the mercury program is experiencing an increasing number of data gaps and other irregularities (including reported filtered mercury values higher than unfiltered) over time. This is a concurrent trend occurring alongside the increased scrutiny of the loadings from activities and stockpiling on the site. It is not clear to us how a reasonable investigation, understanding, and provision of reliable closure planning around such issues can be undertaken in the absence of reasonably complete monitoring data.

Sediment and Benthic compartment mercury sampling needed – Additionally, with the advent of monitoring results that indicate a known impact of the operation on mercury in these creeks it is reasonable to expand monitoring to include other compartments useful to understanding the exact nature of the impacts, and their likely persistence, having direct relevance on both expansion and closure planning. Sediment and benthic monitoring is a key gap, given the baseline mercury and the activity-stimulated methylation context at hand. The monitoring currently being reported for mercury considers only the fish and water in the receiving waters of the mining drainage, but sediment and benthic communities play a very important role to the mercury transactions at hand, and to being able to observe them.

Sediment not only represents a key compartment for the storage of mercury and a hot spot of the transformation of mercury into methyl mercury in aquatic systems (Benoit et al 2003) but can also play a paramount role in the bioavailability and the bioaccumulation of mercury for aquatic biota (Jackson,1988; Parkman and Meili, 1993; Tremblay et al 1996; Boudou and Ribeyre 1997). In order to monitor the evolution of mercury concentrations in both inorganic and organic forms in the sediment of the receiving waters during and after mining operations, and the contribution of the sediment to the bioavailability of mercury, the proponent should adopt an integrated approach by incorporating a sediment quality assessment to the mercury program. This assessment should conform to the Ontario sediment quality assessment guidelines (MOE, 2008), including chemical, ecotoxicological and biological (benthic communities) assessment of the rivers and fens affected by direct and indirect discharge from the mining activities. The soft bottoms and depositional areas (accumulative areas) in the receiving waters should be assessed by methodologies such as the SQT (Chapman, 1996). Chemical analyses should also include environmental parameters known to influence the bioavailability of mercury in the sediment: TOC, Mn and Fe oxides, sulfides, % sand (Jackson et al 1988; Tremblay et al 1996; Grapentine et al 2003a,b).

Because in situ benthic communities (macro-invertebrates) are at the basis of the food chain in river systems and are an integrative biological response not only to mercury, but to all potential perturbations (Chapman et al 1991), they represent a key biological compartment in assessing environmental impacts of the mining activities. Sediment acute and chronic toxicity to selected benthic invertebrates should also be assessed by standard ecotoxicological tests performed in controlled conditions (survival/growth/reproduction tests) (Chapman, 1995). We are not aware if the existing benthic sampling includes mercury analysis or not. If so, then these data should be reported in the Mercury Performance Reports. If not, then this compartment would be a logical addition to the mercury monitoring program and should be reported alongside the other mercury findings.

RECOMMENDATION 5 **–** ***We recommend that (a) every effort be made to avoid data gaps going forward, (b) analysis acknowledge the importance of data gaps to any***

conclusions being made, (c) adding additional water sampling stations at strategic frequency along the creeks relative to site storages be considered, and (d) sampling be expanded to include the sampling of Sediment and Benthic compartments which can contribute additional analytical value and data quality

(6) Assessment of legacy effects of all surfaced material

The Closure Plan appears generally weak in terms of detailing the assessment of ongoing storage of stockpiled and contained materials, and in the context of rationalizing proposed closure activities. Perhaps the most proximate example is the sulphate-loading potential (highlighted below in (7)), but a more comprehensive screening of parameters for each stockpiled material would be reasonable, in the context of linking parameters to the sensitivities of the site and watershed context. Given the obvious limiting factor of mercury for example, potential mobilization of mercury and sulphate from muskeg stockpiles, and the potential availability of Fe and Mn oxides from PK and minerock would be worth understanding. We would expect a more exploratory set of practical questions to be considered for such extensive legacy storage.

For example: Muskeg stockpiles – what state of drying can be expected for these materials, after the proposed storage period? Has stockpile design taken into account the 20-30m edge-effect noted elsewhere in the documentation (Bioherm edge vs bioherm drainage, and exposed edge of peat along Nayshkootayaouw R.)? Is it reasonable to expect that this material will be intact and play the remedial roles expected of it? Stockpile shape and height would seem to be very important to these answers. For example, is the long narrow stockpile along the airstrip better drained than others?

Also – has any study/assessment occurred looking at the adequacy of 100-200m muskeg buffers for mitigating various parameters carried in runoff from stockpiles? In addition to TSS ? Other mitigation measures?

RECOMMENDATION 6 – ***We would recommend a more thorough and critical assessment of potential for legacy issues associated with the large volumes and landscape-changing nature of the various stockpiles being left on the surface of this site.***

(7) Comprehensive assessment of sulphate-loading to creeks specifically required

As identified in (2), we have noted an apparent and significant disconnect between the mine-rock sulphate-loading story described in the 2013 Mercury Performance Report, and the central theme of expanding the footprint and volume of minerock storage in this amendment. In the Performance Report, it is sulphate-loading from the existing mine rock stockpiles that is being attributed to increases in MeHg in the North East Fen, and in the body burden of fish in the adjacent NGC.

It is our perspective that sulphate-loading needs to be assessed more generally across the entire site, as all materials and groundwater being excavated and dewatered from this pit are all many times higher than the surface strata, and the receiving surface water. The scale of this differential needs to be illustrated to properly understand the implications of all of this material being juxtaposed onto the exceedingly sulphate-limited (and mercury rich) environment where it is being left. See Fig 1. (below) to see the magnitude of this difference. Additionally, it is also important to also remember that background surface water concentrations of sulphate in this area are 100x less than the average for North

American rivers (20mg/L: Livingstone 1963). That is the context in which the microbial communities that methylate mercury are currently limited.

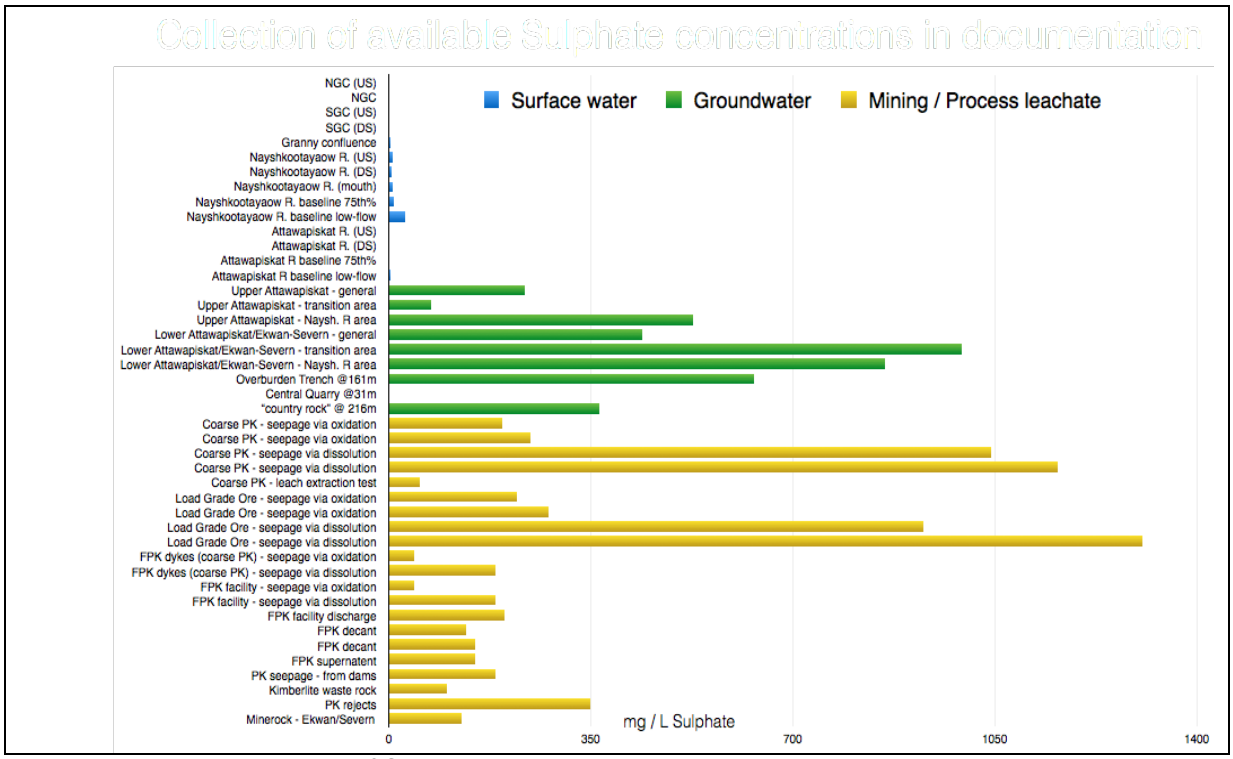

Fig. 1 *– A simple collection of Sulphate background levels and material leaching / seepage testing values. Note the magnitude of the differential between values sourced from the surface waters (blue) vs the subsurface (green and yellow). Mining activities are responsible for "daylighting" the latter into an extremely sulphate-limited surface environment.*

How much of this material is stockpiled, how it oxidizes and weathers over time, and where and how it is drained, is important to these receiving environments. This logic also extends to the FPK facility, through operational life, and into the future.

The site generally drains into the two flanking creeks before being discharged to the Nayshkootayauw R. The undertaking of assessing the loadings to each of these creeks is a critical framework for understanding the impacts of these surface-loadings. Limiting the assessment to the scope of a single adjacent fen, such as was undertaken by the proponent and reported in the 2013 Mercury Monitoring Report (AMEC 2014), is <u>not</u> adequate.

<u>RECOMMENDATION 7</u> – ***An integrated assessment of <u>all</u> sulphate loadings (and any other parameters of interest) from the site to each of the creeks is necessary, including the role of decant from the current tailings facility (and the planned future additional cell(s)), using current processing facility throughput. Closure scenarios are the obvious adjunct to these scenarios, with the removal of subsurface diversion and the onset of full precipitation effects upon the rehabilitated quarry pond as fish habitat – and all assessed over appropriate time scales. Such assessment would also logically provide for any additional monitoring design necessary.***

The future potential extension of the facility use is of course very important to how this Closure Plan functions as well, we would expect that cumulative effects from this additional use would be clearly incorporated into any environmental assessment framework for extension operations.

(8) FPK Facilty water balance a key module in the needed drainage assessment

The position that the proponent takes with respect to the PPK facility, that drainage from the facility "*will not have a detrimental effect on biological life or habitat*", and " *the PK deposit and/or process water will not result in any significant contamination of the site waters*" seem unreasonably categorical to us given: (a) the absence of clear support provided to that position, (b) that the recent NEF sulphate assessment undertaken by the proponent that concluded that sulphate loading from stockpiles was the most likely culprit for elevated methylmercury found to date in NGC, and (c) that the PK material (with perhaps more expedient mobility influences such as a shallow and expansive surface expression, intrinsically fine particle composition, and both operational and precipitation hydraulic influences) is similarly materially high in sulphate seepage potential (relative to background levels).

In a very sulphate-limited environment like the receiving creeks of this site, with a ready supply of inorganic mercury, the influences to mercury methylation constitute a contamination risk with significant likelihood, and troubling consequences given the mercury levels in the food chain in the NGC and downstream. To us, these risks also need to be fairly understood in terms of temporal, geographic, and food chain scales before being able to discount these risks in the terms used.

Currently, a significant amount of decant that drains from the FPK facility into the Central Quarry Pond is short-circuited into the pit dewatering, eventually reporting to the Attawapiskat River in the discharge water unremarked. When dewatering ceases, presumably these aquifers will no longer be intercepting, and, based on the expressed plans to connect the pond to creek for fish habitat purposes, the bulk of this drainage will instead freely flow to NGC. Whether or not this facility is continued to be used for processing the proposed Tango deposit, the implications for overflow drainage from the facility to the fish habitat also has the potential for ongoing indirect contamination of fish habitat though stimulating methylation conditions for resident mercury. The rehabilitation measures of linking the Central Quarry directly to NGC may also prove to be a vector for mercury mobilization. All of these risks deserve careful assessment with respect to potential legacy effects of these storages.

To what extent the ongoing drainage from this expansive facility contributes and might continue to contribute enough sulphate to stimulate methylation in NGC to-date appears to be an unasked question. As illustrated above, what seems extremely relevant is the high differential between the extremely low sulphate levels in the semi "perched" environment above the marine sediment aquitard, and all materials and groundwater brought to surface from depths below, inclusive of materials of kimberlite composition. Study may find that ongoing drainage from this facility may even provide the highest potential for sulphate loading to the NGC environment. But in any case this potential certainly needs to be evaluated alongside the minerock stockpiles already identified as a contributor.

RECOMMENDATION 7 – ***Recognizing that runoff from this facility involves the exposure of slurry transport water, pore water, and gained precipitation to a relatively high sulphate-producing material spread thinly across a very large area of***

exposure, we recommend that a careful water balance for any decommissioning and/or extended use of the FPK facilty is necessary, that can feed directly into the creek loading assessments identified above, including:

(a) the precipitation addition gained from the construction of the second cell,

(b) any possibility of continued usage beyond the cessation of Victor under-draining, which currently is apparently responsible for an poorly defined, but likely significant volume of decant diversion,

(c) the effects and phasing of the planned cell closure-draining of any stored decant to the quarry and NGC receivers, and

(d) the legacy effects over time of precipitation-driven drainage from these facilities into the central quarry, once it has been transformed into a fish habitat asset, connected with NGC as proposed in this Plan.

(8) Ongoing reliance on Attawapiskat assimilative capacity.

There is a general default reliance on the Attawapiskat River to assimilate any problematic concentrations generated by the mine activities. We have seen this in:

(a) 2013 proposal to pre-dilute wellfield discharge - the proposed contingency to pre-dilute wellfield discharge further if it exceeds chloride parameters.

(b) Sulphate contingency – The same is true of sulphate where, in the CSR 2007, it is suggested that any problematic sulphate levels could instead be pumped to the Attawapiskat, and that in fact much of the FPK facility decant (to some, apparently still unknown amount) would report subsurface to the wellfield in any case.

(c) Minerock runoff diversion – Now, though not discussed in this Closure Plan, the recent 2013 Mercury Performance Report (AMEC 2014) similarly identifies collection and re-distribution of minerock stockpile runoff to the Attawapiskat River as a mitigation strategy.

This situation is very concerning to us, particularly when considering cumulative operational effects, as well as cumulative legacy effects of industrial activity in this watershed. Of specific potential concern is sulphate-loading. While the volumes of dewatering discharge are relatively small vs the volume of the receiving waters of the Attawapiskat, the concentration of sulphate for example is relatively very high versus background levels. We have not seen any assessment of the potential for these contributions to affect methylation balances downriver. From the evidence, the proponent / agencies seem to have taken the position that generic direct aesthetic guidelines are sufficient to protect against this risk.

Further, at some point mechanical diversion will not reasonably constitute an ongoing mitigation alternative, and in-situ drainage will take over. Both sets of risks deserve appropriate assessment over relevant timeframes.

RECOMMENDATION 8 ***- This Closure Plan should provide clear description of how the transition from any temporary mechanical diversion to the Attawapiskat River will occur, and detail risks and contingencies for the site absent such modalities, including any necessary assessments and monitoring. Notably, this includes the***

removal of subsurface diversions currently provided by pit dewatering and currently influencing the FPK Facility runoff.

(9) Additional detailed-specific comments:

- 4.3.2 Surface Water Quality. It is not clear when these water quality characterizations provided occurred, or if they include current data.

- Table 4-1: Which North Granny Creek station is being used? What vintage is this data? This important information is not present on this table.

- Table 4-3: Why are notations for mercury (and other parameters) at the top of a range being indicated with a "<" when the bottom of the range is not? This would not logically appear to be a detection range indication.

- Pg 61 – indicates a maximum pit depth of 280m. We have not encountered this figure elsewhere in the documentation to date. Is this an error, or a previous plan, or is this being maintained as some kind of operational contingency?

- Pg 82 – it is indicated here that Cell#2 of the FPK Facility will be constructed of coarse PK, as mine waste rock is limited. This seems to contradict the very purpose of this amendment – to find homes for additional mine waste rock… Further explanation would be useful, particularly given the further statement of a 2009 design decision also factoring in (without further information) on Pg 85.

- Pg 83 – mention of a third cell of the FPK facility, as well as a South drainage ditch to SGC. Perhaps these artifacts of earlier plans? Or are these operational elements still being proposed? As presented in this document, we find such references confusing.

- Pg 83 – Figure 5-15 referenced here does not seem to contain the described detail?

- Pg 137 – 6.2 Progressive rehabilitation schedule – notes closure of cell #1 of the FPK facility, but does not list Cell #2 in the schedule?

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