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June 30, 2009

NWB Files: 1BR-JEN0712
1BR-MAC
1BR-BYR

Our Files: 4517 000 010
4517 000 014
4517 000 037

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RE: Additional Comments Regarding the NWB Defence Construction Canada (DCC) Position Paper on the Regulation of Phenols in the DEW Line Cleanup Project Sites (CAM-1, CAM-5 and PIN-4) Licences

In addition to the letter provided on June 29, 2009, Environment Canada would like to provide further information on behalf of the National Guidelines and Standards Office (NGSO), regarding the position paper prepared by the Environmental Sciences Group (ESG) and submitted by Defence Construction Canada (DCC), entitled *DEW Line Cleanup Project – Phenols in Wastewater*, June 2007.

ESG has provided insufficient information for an opinion to be formed regarding their request that phenols be removed from monitoring and effluent limit conditions. NGSO does not feel that ESG has provided strong enough evidence that phenol poses a minimal risk to aquatic life at this site because the information that they used to justify this position may not reflect arctic conditions.

We suggest that the Nunavut Water Board (NWB) have the proponent collect, and consider, the following information to better assess the environmental risks associated with disposing phenol at this site. NGSO is available to provide comments regarding any new information that is obtained.

ESG argument for removing phenol effluent guideline	NGSO concerns with ESG arguments	NGSO recommendations for further information necessary to properly assess risk
Short half-lives of phenol in soil and water.	ESG, in other situations, has been critical of CCME approaches as not being applicable to Arctic conditions. It is far from clear however whether the studies cited in the position paper reflect arctic conditions (e.g. temperature is never reported). Our concern is that the reported half-lives may be overly optimistic.	ESG to estimate degradation potential <u>at the actual site</u> taking into consideration soil temperature, soil depth, nutrient presence, carbon content of soil and number of bacteria, etc.
Applying a water-based discharge criteria to the land-based effluent discharge that occurs as part of the DLCU is a conservative approach, since the most sensitive receptor to phenols are aquatic organisms.	Insufficient information is presented regarding the toxicity of phenol to terrestrial animals and plants to make this claim. Our concern is that in focusing on aquatic receptors, there has been no attention paid to the effects of dumping phenol (up to 2.44 mg/L) to terrestrial organisms. Are there any terrestrial receptors that might be harmed by disposal of mg/L levels of phenols to land?	ESG can estimate the resulting soil concentration of phenols after dumping and can compare this with Canadian Soil Quality Guidelines (this may be difficult if there is no soil but gravel- but we could also calculate a porewater guideline, using the soil protocol, based on partitioning assumptions between soil and soil pore water). ESG can also use the Canadian Water Quality Guideline for Agricultural Water Uses protocol to try and estimate an irrigation guideline. ESG is also encouraged to find terrestrial guidelines from other jurisdictions.
Contractual requirement to discharge wastewater to land at least 30 m from natural drainage courses and at least 100 m from fish-bearing waters can be considered protective to plant, fish, mammal and human receptors.	This 30 – 100 m distance does not insure that the effluent discharge will not reach a water body or that if it does reach it the effluent concentration will be below the effluent guideline. A concern is that the volume of wastewater to be discharged is never reported and that the ESG reports that phenol has a high potential to leach and contaminate groundwater. The position paper also never indicates whether there is permafrost or groundwater at the site.	ESG should use <u>site specific information</u> (e.g. distance to downstream water body, slope, soil texture and porosity, volume to be discharged, etc.) to model the sub-soil transport of phenol. Only a site-specific evaluation will determine if a distance of 30-100 m manages the risk to water bodies. Does ESG have a good idea of the time of travel from the disposal site to surface water, i.e. can they provide site-specific mass balance assessments?

<p>The maximum phenol concentration in wastewater previously measured at a DEW Line site (2.44 mg/L or 2.44 ppm) falls below the LC50 for freshwater fish and crustaceans (3-7 mg/L)</p>	<p>Our concern is that the guideline exceedances are high (up to 2 orders of magnitude) and dangerously approach a violation of the fisheries act. given that reported maximum concentrations are in the LC50 range for fish and crustaceans (ESG report) what are the consequences of a decision to remove the variable from the water licence, i.e. if the disposal results in adverse effects in the aquatic environment (like fish kills?)</p>	
<p>Remediation for oil and grease will solve the phenol problem as well</p>	<p>ESG reported that 6 of 8 samples of the phenol exceedances also had oil and grease exceedances. They also say that “typically” remediation using a carbon filter also decreased phenol concentrations to below the MAC of 0.020 mg/L.</p>	<p>NWB to get clarification on how effective treating wastewater for oil and grease is for reducing phenol and how often they encounter phenol exceedances and not oil and grease.</p>

Should you have any comments or questions with regards to the foregoing, please feel free to contact me at (867) 975-4631 or by email at carrie.spavor@ec.gc.ca

Yours truly,

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