Environment Canada Environnement Canada

Canada

ENVIRONMENT CANADA'S INTERVENTION ON THE JERICHO DIAMOND MINE WATER LICENCE RENEWAL

Nunavut Water Board

Kugluktuk, NU

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Environmental Protection Operations

Nov. 30- Dec. 1st, 2011

Overview

- Mandate
- Technical comments:
  1. Effluent and water quality
  2. Monitoring
  3. Landfarming
  4. Closure & reclamation
- Conclusion

Mandate

- The primary relevant legislation and standards administered or adhered to by EC which influenced the content of this submission are:
  - *Canadian Environmental Protection Act* (CEPA);
  - *Department of the Environment Act;*
  - Section 36(3) of the *Fisheries Act* – Pollution Prevention Provisions; and
  - *Migratory Birds Convention Act* and *Migratory Bird Regulations*.

Effluent Quality Criteria

- Shear has not suggested any changes to the existing effluent quality criteria.
- EC agrees with the proposal to maintain existing licence limits with the exception of criteria for nitrate (NO3-N), nitrite (NO2-N), chloride, and total dissolved solids (TDS).
- We would also recommend the addition of Total Extractable Hydrocarbons as a regulated parameter.
- Suggested changes are shown in the table below (shaded cells).

Changes to EQCs

Parameter (mg/L except pH)	Expiring Licence		Recommended by EC	
	Grab	MAC	Grab	MAC
Total Dissolved Solids	4000	2000	*	*
Chloride	1000	500	*	*
Nitrate-N	56	28	40	20
Nitrite-N	5	2.5	2	1
Oil and Grease	5	3	**	**
Total Extractable Hydrocarbons	-	-		3

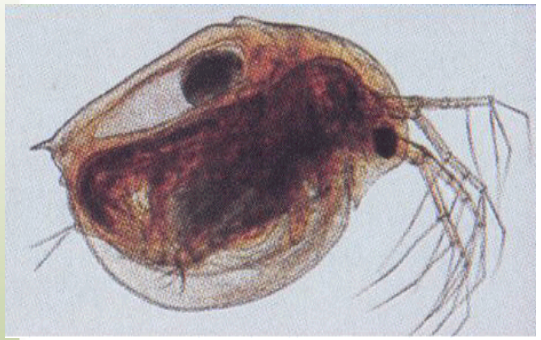
* Monitor rather than regulate

**Include if camp wastes are directed to the PKCA

Mixing Zone

- Dilution calculations are based on concentrations at the Lake C3 outlet (JER-AEM-08) – using the assumption that the mixing zone encompasses all of Lake C3
- The original assessment was based on no chronic effects beyond 200 m of the point where Stream C3 enters Lake C3.
- EC acknowledges that Shear will continue to monitor water quality at 200 m from Stream C3 during discharge, and supports use of the data from this site (JER-AEM-06) to validate and/or update modelling.

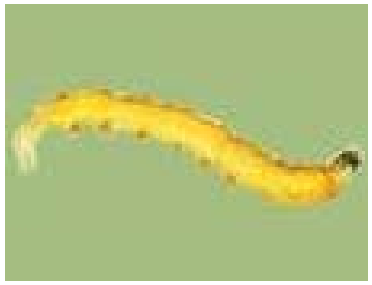
Toxicity Testing

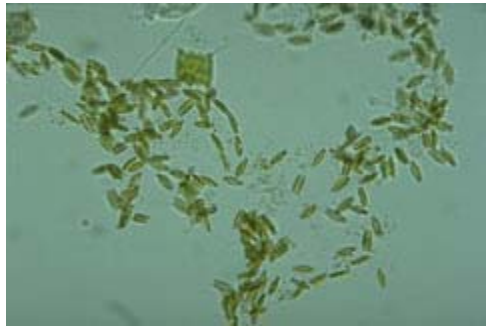


Chronic Toxicity Testing

- Previous chronic toxicity testing has been done on samples taken from the edge of the mixing zone in Lake C3
- EC recommends Part G of the water licence be modified to require *Ceriodaphnia* and algal chronic toxicity be conducted on 100% strength PKCA effluent once prior to discharge and a second time prior to completion of discharge.
- Testing 100% strength effluent will be more useful for determining whether receiving environment impacts are potentially of concern.

Aquatic Effects Monitoring





Aquatic Effects Monitoring

- EC would like to see an integrated plan which includes details of the sampling program and explicitly describes the study design, statistical tests which will be used, and QA/QC protocols.
- EC recommends that Shear conduct sampling and reference site investigations as proposed, with the goal to refine the AEMP and submit a revised study design document within two years of licence issuance.

Aquatic Effects Monitoring – Plume Delineation

- EC recommends that a plume delineation study be done late in the discharge season, which examines the extent and behaviour of the plume in 3 dimensions.

- Water quality objectives should be stated, and comparisons drawn for where they are expected to be met in Lake C3 (based on tracer concentrations).

Hydrocarbon Contamination

- Shear has presented preliminary plans for the management and treatment of contaminated soils and materials.
- EC identified a number of comments and concerns with the plans:
  - If not using a sump to segregate contaminated snow and ice, treatment of contaminated liquids as meltwater in the landfarm;
  - How birds will be deterred from landing on water ponded in the landfarm;
  - Disposal of recovered hydrocarbons.

Hydrocarbon Contamination

- EC recommends that a revised plan for the management and disposal of hydrocarbon-contaminated materials be submitted within 12 months of licence issuance.

Closure and Reclamation

Closure and Reclamation
Open Pit Fill Rate

- Environment Canada questions the estimated fill time of 20 years for the open pit, and whether or not there is groundwater seepage into the pit.

- EC acknowledges Shear's commitment to re-evaluate the pit fill rate by April 2012 and looks forward to reviewing the revised Plan and pit fill rate when available.

Closure and Reclamation
Open Pit Water Quality

- EC has concerns related to the impacts of pit wall weathering and the introduction of blast residues and poor quality water from the PKCA on pit water quality.
- EC acknowledges Shear's commitment to re-model the pit water quality.
- if the remodeling identifies new contaminants of concern, EC recommends the Proponent revise their Closure Plan to include options for treating these contaminants.
- EC requests the Proponent commit to a timeline for delivering its pit water quality re-modeling.

Draft Water Licence

- EC would appreciate if the NWB circulated a draft version of the new license for stakeholder review prior to finalizing the terms and conditions of the license.

Questions?