



Mackenzie Valley Land and Water Board
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FILE NUMBER: MV2011L2-0004

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Remarks:

Request for review and comments on proposed changes to the Surveillance Network Program (SNP)

- Enclosures
- As requested
- For your information
- For your comment
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Elaine Briere - MVLWB

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Cc: 'Tyree Mullaney'; Kathy Racher - WLWB; Wilson, Anne [Edm]
Subject: MV2011L2-0004- De Beers Snap Lake - proposed changes to the SNP Trout ELS test
Attachments: Dist list January 30.pdf; 02-01-2013 ELS Testing in the Water License FINAL.pdf; MV2011L2-0004 - Snap Lake - rwf ltr - request change ELS test Jan2013.pdf

Please see the attached request from De Beers and associated review letter. The request can also be found on our website in the 'Items For Review'.

The proposed change refers to the Surveillance Network Program (SNP) annexed to the water licence, specifically SNP02-20: Sampling Parameters. Please submit any comments you have regarding the proposed change by **March 11, 2013**.

Thanks you and have a great day!

Marc Casas

Regulatory Officer

Mackenzie Valley Land and Water Board

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Phone (867) 669-0506
FAX (867) 873-6610

February 1, 2013

File: MV2011L2-0004

Distribution List

Dear Sir/Madam:

**Request for Comment
Surveillance Network Program (SNP) – Proposed Change
De Beers Canada Inc. - Mining and Milling, Snap Lake**

The proposed change to the SNP is now available for viewing online. To access this document on our website, please go to www.mvlwb.com under "Items for Review", De Beers Snap Lake. The Mackenzie Valley Land and Water Board will use your comments in its evaluation of the proposal.

Your comments should be submitted using the attached excel work sheet by **March 11, 2013**. If you have any questions or concerns regarding this request, please contact me at (867) 766-7466 or email mcasas@mvlwb.com.

Please note: in accordance with Mackenzie Valley Land and Water Board policy, late comments will not be accepted.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Marc Casas", written over a horizontal line.

Marc Casas
Regulatory Officer

Copied to: Northwest Territories Métis Nation - copy of document

January 2nd, 2013

File:S115

Willard Hagen
MVLWB
P.O. Box 279
Fort Resolution, NT.
X0E 0M0

Dear Mr. Hagen,

**Re: Snap Lake Mine Water Licence MV2011L2-0004 –
Rainbow Trout Early Life Stage (ELS) Toxicity Testing**

When the Snap Lake Mine's Water Licence was renewed earlier in 2012, a new requirement for chronic toxicity testing at the diffuser stations in Snap Lake was added to the Surveillance Network Program (SNP) Annex to the Water Licence. In addition to the chronic toxicity tests with invertebrate and algal species that are currently performed twice yearly on water samples from the three diffuser stations, an early life stage (ELS) toxicity test with Rainbow Trout is now to be performed once per year as well. The specified ELS toxicity test is an embryo/alevin/fry (EAF) test that has an expected duration of approximately 70 days (and possibly longer depending on the rate of fish development), and will therefore require weekly collection and shipment of large volumes of Snap Lake water for at least 10 consecutive weeks. There are a number of logistical concerns associated with performing this test, which we describe below.

We wish to advise the Board that Rainbow Trout ELS toxicity testing will commence in 2013. It was not possible to perform this testing in 2012, as sample collection could not be done under safe conditions. At this time we would also request that the Board give consideration to replacing the currently specified EAF test with a shorter duration test.

-
- 1 Environment Canada (1998) describes three options for the Rainbow Trout ELS test: an E (embryo) test that assesses embryo viability during a 7-d exposure from fertilization, an EA (embryo-alevin) test that lasts approximately 30 days, from fertilization until 50% of control fish have hatched; and, an EAF (embryo-alevin-fry) test that lasts approximately 70 days, from fertilization until 30 days after 50% of the surviving control alevins exhibit swim-up behaviour.
 - 2 Environment Canada. 1998. Biological Test Method: Toxicity Tests Using Early Life Stages of Salmonid Fish (Rainbow Trout). Environmental Protection Series, Report EPS 1/RM/28 Second Edition. Method Development and Application Section, Environmental Technology Centre, Ottawa, ON, Canada.



The EAF test is the longest duration of three options for the Environment Canada (1998) Rainbow Trout ELS test. The EAF test involves exposing newly fertilized embryos to Snap Lake water for approximately 70 days as they develop, hatch as alevins, absorb their yolk sacs, and develop into fry. The EAF test lasts for 30 days after at least 50% of control fish show swim-up behaviour (i.e., absorb their yolk sac and begin feeding). This test requires daily renewal of test solutions, using water samples that are collected weekly. The volume of water to be collected and shipped each week is 120 L. The EAF test will require consistent (i.e., same day of week) weekly water sample collection at the diffuser stations for at least 10 consecutive weeks. Sampling for the EAF test therefore requires a three-month period of safe access to the Snap Lake diffuser stations, either during winter when ice cover is solid or during the open-water summer period.

There are field safety concerns associated with both ice-cover and open-water sampling at Snap Lake, but the concerns are greater for winter sampling where poor ice conditions exist adjacent to the diffuser stations. Conducting the EAF test during winter is also not recommended because of the high likelihood that water samples would freeze in transit, making them unacceptable for use in the toxicity test. Therefore, the EAF test would need to be conducted during the open-water period from July to September, with weekly sample collection beginning as soon as safe open-water conditions have been established and continuing for approximately 10 consecutive weeks.

We note that in the April 4, 2012 Reasons for Decision that accompanied the Water Licence renewal, the use of a shorter ELS test duration was considered by Environment Canada and Aboriginal Affairs and Northern Development Canada (AANDC). However, the longer EAF test duration was selected in part because of concern about being able to define a decision criterion for moving from a shorter to a longer test duration and also because of incidences of toxicity in chronic tests performed in the laboratory on samples from the Snap Lake diffuser stations, as noted from the 2010 Aquatic Effects Monitoring Program (AEMP) annual report. There were a number of occurrences of toxicity reported for toxicity tests performed in the laboratory in 2010; however, these have not been persistent nor have they increased in frequency or magnitude. Table 1 shows a summary of the 2011 Snap Lake diffuser station laboratory toxicity results, for which there was only one incidence of toxicity (reduced Ceriodaphnia reproduction). Results for 2012 diffuser station toxicity test results will be provided as part of the 2012 AEMP report; a preliminary review indicates that they were similar to 2011.

The SNP Annex to the Water Licence specifies that all analyses are to be performed by laboratories that are accredited by the Canadian Association for Laboratory Accreditation (CALA). According to the laboratory directory on the CALA website (www.cala.ca), there are several private laboratories accredited to perform the 7-day trout embryo ELS test but no private or government laboratories maintain accreditation for either of the longer duration ELS tests.





We request that the Board consider modifying the SNP Annex to the Water Licence to allow De Beers to conduct a shorter duration Rainbow Trout ELS test, replacing the 70-d EAF test with the 7-d trout embryo viability test. We note that the Diavik Diamond Mine is currently conducting the 7-d trout embryo viability test as part its toxicity testing requirements.

Aside from concerns regarding the laboratory accreditation requirements, there are significant challenges associated with collecting and shipping the sample volumes required for the EAF test. If there were a problem with sample delivery midway through the test (e.g., flights delayed or cancelled due to weather or mechanical problems), then that test could be rendered invalid and there would not be enough time remaining in the safe open-ice period to re-start the 10-week sample collection process. This would leave us unable to comply with the SNP testing requirements.

Should you have any questions, comments or require further clarification, please do not hesitate to contact me at (867) 767-8646 or email me at the following address: Alexandra.Hood@debeerscanada.com

Sincerely,

Alexandra Hood
Permitting and Environmental Superintendent

Cc:	M. Morapeli	DBC1
	D. Raymond	DBC1
	D. White	SLEMA
	M. Casas	MVLWB
	T. Covey	AANDC





Attachments:



A DIVISION OF DE BEERS CANADA INC.
300, 5102 – 50TH AVENUE, YELLOWKNIFE, NT, X1A 3S8
TEL 1 (867) 766-7300 FAX 1 (867) 766-7347
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Table 1 Chronic Toxicity Test Results for Water Samples Collected at Diffuser Stations in Snap Lake in 2011

Station Location and Sample Collection Date	<i>Ceriodaphnia dubia</i> (Water Flea)				<i>Pseudokirchneriella subcapitata</i> (Alga)	
	Survival		Fecundity		72-h Growth	
	LC50 (%) (95% CL)	LC25 (%) (95% CL)	IC50 (%) (95% CL)	IC25 (%) (95% CL)	IC50 (%) (95% CL)	IC25 (%) (95% CL)
SNP 02-20d (April 26, 2011)	>100 (nc)	>100 (nc)	>100 (nc)	>100 (nc)	>91 (nc)	>91 (nc)
SNP 02-20e (April 10, 2011)	>100 (nc)	>100 (nc)	>100 (nc)	>100 (nc)	>91 (nc)	>91 (nc)
SNP 02-20f (April 10, 2011)	>100 (nc)	>100 (nc)	>100 (nc)	>100 (nc)	>91 (nc)	>91 (nc)
SNP 02-20d (September 11, 2011)	>100 (nc)	>100 (nc)	>100 (nc)	71 (nc - >100)	>91 (nc)	>91 (nc)
SNP 02-20e (September 11, 2011)	>100 (nc)	>100 (nc)	>100 (nc)	>100 (nc)	>91 (nc)	>91 (nc)
SNP 02-20f (September 11, 2011)	>100 (nc)	>100 (nc)	>100 (nc)	>100 (nc)	>91 (nc)	>91 (nc)

95% CL = 95% confidence limits associated with each point estimate.

LC50 = median lethal concentration; the concentration of sample estimated to be lethal to 50% of the test organisms.

LC25 = the concentration of sample estimated to be lethal to 25% of the test organisms.

IC50 = the inhibiting concentration for a 50% effect; the concentration of sample estimated to cause a 50% reduction in growth or fecundity of the test organisms.

IC25 = the inhibiting concentration for a 25% effect; the concentration of sample estimated to cause a 25% reduction in growth or fecundity of the test organisms.

nc = not calculable; % = percent; > = greater than; h = hour.

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Yellowknives Dene First Nation (Dettah)	Eddie Sangris	Chief	(867)873-5969; esangris@ykdene.com ;
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