

# Rio Algom Mining LLC

May 25, 2017

Mr. Varughese Kurian  
United States Nuclear Regulatory Commission  
Two White Flint, Mail Stop T-8F5  
11545 Rockville Pike  
Rockville, MD 20852

Subject: SUA-1473, Docket No. 40-8905, Reporting of Monthly Sampling Results for First Quarter 2017, Rio Algom Mining LLC, Ambrosia Lake Facility

Dear Mr. Kurian:

This letter represents reporting of the first quarter 2017 analytical results from monthly sampling for the following constituents, in accordance with Condition 34.F of SUA-1473:

- Gross alpha, beryllium, and cadmium in well 36-06 KD
- Gross alpha and uranium in well 31-02 TRB-R
- Molybdenum in well 32-45 KD-R

The tables included in this report summarize the sampling results. Bolded results indicate an exceedance of Groundwater Protection Standards (GPS). The path forward for constituents with exceedances of GPSs is to develop Alternate Concentration Limits (ACLs) and amend the License to include these values as described in Rio Algom Mining LLC's (RAML's) letter to NRC dated April 13, 2017.

## Well 36-06 KD

Monthly sampling results from well 36-06 KD show that beryllium and cadmium continue to hover at concentrations near or above the GPS (Table 1). At the time of the original ACL petition, beryllium and cadmium were not present in elevated concentrations. Since the time of the ACL petition (2001), beryllium and cadmium concentrations have increased in a pattern that appears consistent with effects caused by surface reclamation activities. RAML submitted a Corrective Action Plan (CAP) for beryllium and cadmium in 2007 and has been monitoring those two parameters monthly since then. Since the concentrations are not stabilizing below the GPS, RAML has proposed to amend License SUA-1743 to add ACLs for beryllium and cadmium. Until ACLs are granted, monthly monitoring of beryllium and cadmium will continue.

Gross alpha was elevated above the GPS of 56 picocuries per liter (pCi/L) in February and March of 2017 (Table 1). As discussed in more detail in the *Second Half 2015 Groundwater Stability Monitoring Report*, other alpha emitters in the upper bedrock units

have ACLs, and gross alpha in the alluvium has an ACL. Therefore, an ACL for gross alpha for the upper bedrock units will be included in the upcoming license amendment. Until an ACL is approved, 36-06 KD will continue to be monitored monthly for gross alpha.

**Table 1. Beryllium, Cadmium, and Gross Alpha (Corrected) in 36-06 KD**

Date	Well 36-06 KD		
	Beryllium (mg/L)	Cadmium (mg/L)	Gross Alpha (pCi/L)
GPS	0.01	0.01	56
1/23/17	0.0111	0.0053	-320
2/15/17	0.0141	0.0047	180
3/1/17	0.0124	0.0074	180

**Well 31-02 TRB-R**

Monitoring well 31-02 TRB-R is a replacement well which was installed in December 2012. Original well 31-02 TRB was in accelerated monthly monitoring for uranium and gross alpha. When the well was replaced, RAML continued to monitor for those constituents monthly. Since 2013, gross alpha concentrations have exceeded the GPS seven times, including in January and February of 2017 (Table 2). Uranium concentrations have remained below the ACL throughout the first quarter of 2017. As detailed in the *First Half 2016 Groundwater Stability Monitoring Report*, monthly sampling and analysis will continue for gross alpha and uranium in 31-02 TRB-R, pending preparation of a license amendment with proposed modifications to the gross alpha standards in the upper bedrock units. Although uranium is well below the GPS, it is necessary to analyze for uranium in order to subtract the uranium activity from the gross alpha activity. An ACL for gross alpha will be proposed in the upcoming license amendment. Until ACLs are approved, monthly monitoring for gross alpha in 31-02 TRB-R will continue.

**Table 2. Gross Alpha (Corrected) in 31-02 TRB-R**

Date	Well 31-02 TRB-R	
	Gross Alpha (pCi/L)	Uranium (mg/L)
GPS / ACL	21	1.6
1/23/17	240	0.0045
2/16/17	18	0.0062
3/1/17	5.2	0.0044

**Well 32-45 KD-R**

Results for molybdenum are displayed in Table 3. Concentrations in 32-45 KD-R continue to exceed the GPS of 0.06 milligrams per liter (mg/L). Pursuant to Condition 34.F and

Criterion 5D of 40CFR, RAML proposed a CAP to address the exceedances of molybdenum and nitrate in well 32-45 KD-R, as presented in the *First Half 2014 Groundwater Stability Monitoring Report*. Since well 32-45 KD-R is a recently-installed replacement well (replacing well 32-45 KD), RAML will continue monthly monitoring for molybdenum to evaluate apparent stabilization trends in the data. RAML will include an ACL for molybdenum in the Dakota Sandstone in the upcoming License amendment. Nitrate concentrations have dropped below the ACL; and, therefore, nitrate has been removed from the CAP, as presented in the *Second Half 2015 Groundwater Stability Monitoring Report*.

**Table 3. Molybdenum in 32-45 KD-R**

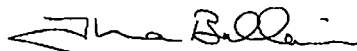
Date	Well 32-45 KD-R
	Molybdenum (mg/L)
<b>GPS</b>	<b>0.06</b>
1/23/17	<b>0.233</b>
2/15/17	<b>0.224</b>
3/1/17	<b>0.207</b>

Monthly sampling results for the wells and constituents presented above will continue throughout 2017 and will be reported in detail in the upcoming *First Half 2017 Semi-Annual Groundwater Stability Monitoring Report*.

An exceedance of the gross alpha ACL of 56 pCi/L was identified at 32-45 KD-R (80 pCi/L) during the semiannual sampling event in February. Resampling was performed on April 4, 2017, within 1 week of the receipt of the results of analysis of the original sample. The gross alpha activity recorded from the resample was 53.2 pCi/L, which is less than the GPS for gross alpha in KD of 56 pCi/L.

Please contact me with any questions.

Sincerely,  
**Rio Algom Mining LLC**



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Site Manager

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