



# Rio Algom Mining LLC

August 26, 2005

ATTN: Document Control Desk  
Mr. Gary Janosko, Chief  
Fuel Cycle Licensing Branch, NMSS  
Mail Stop T-8-A-33  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

Re: **License SUA-1473, Docket No. 40-8905**  
**Semiannual Effluent Report -1<sup>st</sup> Half 2005**

Dear Mr. Janosko,

In accordance with license condition #19 of the above referenced source material license and the NRC approved *Health Physics and Environmental Programs Manual*, please find attached the first half 2005 Semiannual Report for the Ambrosia Lake facility.

If you have any questions or need additional information, please do not hesitate to call me at (505) 287-8851, extension 205.

Regards,

Peter Luthiger  
Corporate Manager, Radiation  
Safety and Environmental Affairs

Attachment

xc: T. Fletcher  
J. Barto (NRC-MD-License SUA-1473 Docket No. 40-8905)  
file

# RIO ALGOM MINING LLC AMBROSIA LAKE FACILITY

LICENSE SUA-1473

DOCKET 40-8905

## SEMI-ANNUAL EFFLUENT REPORT

1<sup>ST</sup> HALF 2005

August 26, 2005

High Volume Environmental Air Samples  
 1st Half 2005

1st Quarter 2005					Substation	2nd Quarter 2005				
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit		Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	2.6E-18	2.1E-20	2.6E-18	< 1.0		U-nat	4.7E-18	3.1E-19	3.4E-18	< 1.0
Th-230	0.0E+00	3.9E-18	7.0E-18	< 1.0		Th-230	2.2E-17	1.2E-17	1.5E-17	< 1.0
Ra-226	3.1E-18	3.9E-18	1.1E-17	< 1.0		Ra-226	3.4E-18	9.9E-18	3.6E-17	< 1.0
Pb-210	6.3E-16	4.7E-17	7.6E-17	< 1.0		Pb-210	8.4E-16	7.7E-17	2.1E-16	< 1.0

1st Quarter 2005					Section 17 VH 4	2nd Quarter 2005				
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit		Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	2.0E-18	1.6E-20	2.0E-18	< 1.0		U-nat	2.1E-18	1.4E-19	1.7E-18	< 1.0
Th-230	2.2E-18	3.5E-18	4.7E-18	< 1.0		Th-230	3.5E-18	5.7E-18	8.8E-18	< 1.0
Ra-226	1.8E-18	2.9E-18	8.2E-18	< 1.0		Ra-226	7.7E-18	5.7E-18	1.6E-17	< 1.0
Pb-210	4.8E-16	3.5E-17	5.7E-17	< 1.0		Pb-210	4.8E-16	3.6E-17	7.7E-17	< 1.0

High Volume Environmental Air Samples  
1st Half 2005

1st Quarter 2005					Section 30 West VH 6				
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	4.7E-18	3.7E-20	2.3E-18	< 1.0	U-nat	9.8E-18	6.6E-19	3.1E-18	< 1.0
Th-230	9.0E-18	4.8E-18	5.5E-18	< 1.0	Th-230	1.8E-17	1.1E-17	1.5E-17	< 1.0
Ra-226	9.0E-18	4.1E-18	9.0E-18	< 1.0	Ra-226	7.7E-18	5.7E-18	1.6E-17	< 1.0
Pb-210	9.7E-16	5.2E-17	7.6E-17	< 1.0	Pb-210	4.8E-16	3.6E-17	7.7E-17	< 1.0

1st Quarter 2005					North Fence				
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	6.5E-18	5.2E-20	2.3E-18	< 1.0	U-nat	1.7E-17	1.1E-18	3.0E-18	< 1.0
Th-230	1.3E-17	5.5E-18	5.5E-18	< 1.0	Th-230	7.5E-17	1.8E-17	1.6E-17	< 1.0
Ra-226	1.1E-17	4.1E-18	8.3E-18	< 1.0	Ra-226	3.2E-17	1.6E-17	3.6E-17	< 1.0
Pb-210	1.5E-15	5.9E-17	7.6E-17	< 1.0	Pb-210	1.1E-15	6.8E-17	1.4E-16	< 1.0

High Volume Environmental Air Samples  
 1st Half 2005

1st Quarter 2005					Mill Diversion	2nd Quarter 2005				
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	
U-nat	5.6E-18	4.5E-20	2.3E-18	< 1.0	U-nat	1.7E-17	1.1E-18	2.9E-18	< 1.0	
Th-230	3.4E-16	2.0E-17	5.5E-18	1.7	Th-230	2.4E-16	2.6E-17	1.4E-17	1.2	
Ra-226	1.9E-17	4.8E-18	9.0E-18	< 1.0	Ra-226	2.1E-17	1.2E-17	3.0E-17	< 1.0	
Pb-210	9.0E-16	5.0E-17	7.6E-17	< 1.0	Pb-210	1.1E-15	7.4E-17	1.6E-16	< 1.0	

Soil

Location: Substation				Location: Mill Diversion			
Date: Jun-05				Date: Jun-05			
Sample Media: Soil				Sample Media: Soil			
Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)	Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)
U-nat	6.4E-07	1.2E-08	3.4E-08	U-nat	2.3E-06	4.4E-08	3.4E-08
Th-230	7.4E-07	5.0E-07	7.0E-07	Th-230	6.8E-06	1.0E-06	6.0E-07
Ra-226	2.2E-07	6.0E-07	1.1E-06	Ra-226	4.3E-06	7.0E-07	1.0E-06
Pb-210	0.0E+00	1.7E-06	6.6E-06	Pb-210	0.0E+00	2.6E-06	9.9E-06

Location: Section 30 West VH6				Location: North Fence			
Date: Jun-05				Date: Jun-05			
Sample Media: Soil				Sample Media: Soil			
Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)	Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)
U-nat	1.3E-05	2.5E-07	3.4E-08	U-nat	1.2E-06	2.3E-08	3.4E-08
Th-230	4.8E-06	8.0E-07	6.0E-07	Th-230	5.9E-06	1.0E-06	7.0E-07
Ra-226	7.1E-06	1.0E-06	1.1E-06	Ra-226	3.6E-06	7.0E-07	1.1E-06
Pb-210	2.0E-06	3.2E-06	1.2E-05	Pb-210	0.0E+00	2.7E-06	1.1E-05

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Ambrosia Lake Facility

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Docket Number 40-8905

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Soil

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Location: Section 17 VH 4  
Date: Jun-05  
Sample Media: Soil

Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)
U-nat	6.8E-06	1.3E-07	3.4E-08
Th-230	9.9E-07	6.0E-07	7.0E-07
Ra-226	1.9E-06	6.0E-07	1.1E-06
Pb-210	7.5E-07	2.1E-06	7.9E-06

Sediment

Location: P-0 Date: June 2005 Sample Media: Sediment				Location: P-1 Date: June 2005 Sample Media: Sediment			
Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)	Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)
U-nat	8.4E-06	3.4E-07	3.4E-08	U-nat	1.3E-05	5.3E-07	3.4E-08
Th-230	3.4E-06	8.0E-07	7.0E-07	Th-230	2.7E-05	1.8E-06	6.0E-07
Ra-226	7.4E-06	1.0E-06	1.1E-06	Ra-226	6.8E-06	9.0E-07	1.0E-06
Pb-210	0.0E+00	2.9E-06	1.1E-05	Pb-210	0.0E+00	2.6E-06	1.0E-05

  

Location: P-2 Date: June 2005 Sample Media: Sediment				Location: P-3 Date: June 2005 Sample Media: Sediment			
Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)	Nuclide	Conc. (uCi/g)	Error (uCi/g)	LLD (uCi/g)
U-nat	1.1E-06	4.5E-08	3.4E-08	U-nat	1.4E-06	5.7E-08	3.4E-08
Th-230	5.4E-07	5.0E-07	6.0E-07	Th-230	7.0E-07	6.0E-07	7.0E-07
Ra-226	2.0E-06	6.0E-07	1.1E-06	Ra-226	1.0E-06	4.0E-07	1.0E-06
Pb-210	0.0E+00	2.2E-06	9.1E-06	Pb-210	1.2E-06	2.5E-06	9.4E-06



Vegetation

Location: Substation Date: June 2005 Sample Media: Vegetation				Location: Mill Diversion Date: June 2005 Sample Media: Vegetation			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)	Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	8.1E-05	3.1E-06	6.1E-05	U-nat	1.6E-04	6.1E-06	6.1E-05
Th-230	6.8E-06	9.0E-04	1.5E-03	Th-230	1.5E-03	1.3E-03	1.7E-03
Ra-226	7.4E-04	8.0E-04	2.3E-03	Ra-226	1.2E-03	9.0E-04	2.5E-03
Pb-210	2.7E-04	5.8E-03	2.0E-02	Pb-210	0.0E+00	5.0E-03	1.7E-02

  

Location: Section 30 West VH6 Date: June 2005 Sample Media: Vegetation				Location: North Fence Date: June 2005 Sample Media: Vegetation			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)	Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	9.5E-05	3.6E-06	6.1E-05	U-nat	6.8E-05	2.6E-06	6.1E-05
Th-230	1.5E-04	1.0E-03	1.6E-03	Th-230	8.2E-04	1.2E-03	1.7E-03
Ra-226	2.0E-03	1.0E-03	2.4E-03	Ra-226	1.6E-03	1.0E-03	2.5E-03
Pb-210	8.6E-04	4.8E-03	1.7E-02	Pb-210	0.0E+00	5.2E-03	2.0E-02

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Vegetation

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Location: Section 17 VH 4  
Date: June 2005  
Sample Media: Vegetation

Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	1.9E-04	7.2E-06	6.1E-05
Th-230	4.2E-04	1.5E-03	2.3E-03
Ra-226	9.3E-04	8.0E-04	2.3E-03
Pb-210	0.0E+00	4.9E-03	1.7E-02

Environmental Gamma Radiation

Date: 1st Quarter 2005  
Sample Media: Gamma (TLD)

Date: 2nd Quarter 2005  
Sample Media: Gamma (TLD)

<u>Location</u>	<u>Rate (mRem/qtr)</u>	<u>Error (mRem/qtr)</u>
Substation	0	1.1
Mill Diversion	23	1.4
Section 30W VH6	11	2.4
North Fence	6	0.8
Section 17 VH4	0	0.6

<u>Location</u>	<u>Rate (mRem/qtr)</u>	<u>Error (mRem/qtr)</u>
Substation	0	2.4
Mill Diversion	20	3.9
Section 30W VH6	9	1.8
North Fence	0	1.1
Section 17 VH4	0	1.1

Notes:

- 1 - Values represent net values after subtraction of control dosimeter.
  - 2 - Errors represent the 95% confidence interval based on the standard error of the mean.
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Environmental Radon

Date: 1st Quarter 2005  
Sample Media: Track Etch

Date: 2nd Quarter 2005  
Sample Media: Track Etch

<u>Location</u>	<u>Rate pCi/L</u>	<u>Error pCi/L</u>
Substation	0.4	0.1
Mill Diversion	2.4	0.3
Section 30W VH6	2.6	0.3
North Fence	3.1	0.3
Section 17 VH4	0.9	0.2

<u>Location</u>	<u>Rate pCi/L</u>	<u>Error pCi/L</u>
Substation	1	0.1
Mill Diversion	Missing	
Section 30W VH6	2.2	0.1
North Fence	2.7	0.2
Section 17 VH4	0.8	0.1

\* Mill Diversion Radon-Track Etch was not found at sample site.  
Historically, the previous four quarters have averaged 3.3 pCi/L.

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Hydrological Monitoring Report Form  
 Ambrosia Lake, New Mexico  
 Section 4 Monitor Wells (DP-71)  
 Page 1

Monitoring Well	Date	Depth To Water (feet)	Total Depth (feet)	Specific Conduct.	Temp. (C)	pH	Var. H2O	Cl mg/l	NO3(N) mg/l	SO4 mg/l	TDS mg/l
MW-1	10-Mar-05		38.97				Dry				
MW-2	DESTROYED										
MW-3	08-Mar-05		37.80				Dry				
MW-4	08-Mar-05		35.80				Dry				
MW-5	08-Mar-05		38.78				Dry				
MW-6	08-Mar-05		38.55				Dry				
MW-7	07-Mar-05		38.75				Dry				
MW-8	07-Mar-05		38.74				Dry				
MW-9	07-Mar-05		38.70				Dry				
MW-10	07-Mar-05		39.37				Dry				
MW-11	07-Mar-05		36.00				Dry				
MW-12	08-Mar-05		14.32				Dry				
MW-13	08-Mar-05		29.50				Dry				
MW-14	07-Mar-05		47.55				Dry				
MW-15	07-Mar-05		39.83				Dry				
MW-16	10-Mar-05		37.80				Dry				
MW-17	07-Mar-05		43.52				Dry				
MW-18	07-Mar-05		57.23				Dry				
MW-19	07-Mar-05	46.82	48.45	5420	14.9	7.1	0.00	750.0	12.1	1790	3890
MW-20	07-Mar-05		51.23				Dry				
MW-21	07-Mar-05		52.18				Dry				
MW-22	07-Mar-05	33.60	36.95	5690	15.0	7.3	0.00	181.0	177.0	2690	4330
MW-23	08-Mar-05	41.80	42.00				Insuff H2O				
MW-24	08-Mar-05	50.30	50.35				Insuff H2O				
MW-25	08-Mar-05		29.75				Dry				
MW-26	08-Mar-05	35.25	35.30				Insuff H2O				
MW-27	08-Mar-05		28.00				Dry				
MW-28	08-Mar-05		32.65				Dry				
MW-29	08-Mar-05	29.13	29.40				Insuff H2O				
MW-30	09-Mar-05		41.20				Dry				
MW-31	08-Mar-05		50.72				Dry				

Note --> A negative variance indicates a decrease in the depth to water level from the previous reading.

Hydrological Monitoring Report Form  
 Ambrosia Lake, New Mexico  
 Section 4 Monitor Wells (DP-71)  
 Page 1

Monitoring Well	Date	Depth To Water (feet)	Total Depth (feet)	Specific Conduct.	Temp. (C)	pH	Var. H2O	Cl mg/l	NO3(N) mg/l	SO4 mg/l	TDS mg/l
MW-1	19-May-05		37.69				Dry				
MW-2	DESTROYED						Dry				
MW-3	19-May-05		38.92				Dry				
MW-4	19-May-05		35.82				Dry				
MW-5	19-May-05		38.81				Dry				
MW-6	19-May-05		38.63				Dry				
MW-7	19-May-05		38.81				Dry				
MW-8	19-May-05		38.75				Dry				
MW-9	19-May-05		38.80				Dry				
MW-10	19-May-05		39.20				Dry				
MW-11	19-May-05		33.69				Dry				
MW-12	19-May-05		18.35				Dry				
MW-13	20-May-05		28.54				Dry				
MW-14	19-May-05		47.55				Dry				
MW-15	19-May-05		39.80				Dry				
MW-16	19-May-05		37.78				Dry				
MW-17	19-May-05		43.55				Dry				
MW-18	19-May-05		57.33				Dry				
MW-19	23-May-05	46.82	48.48	4600	17.0	8.0	0.00	680.0	10.1	1800	4470
MW-20	19-May-05		51.23				Dry				
MW-21	19-May-05		52.18				Dry				
MW-22	23-May-05	33.60	36.92	4870	16.4	8.0	0.00	167.0	158.0	2680	4440
MW-23	20-May-05	41.80	42.00				Insuff H2O				
MW-24	20-May-05	50.30	50.34				Insuff H2O				
MW-25	19-May-05		29.86				Dry				
MW-26	19-May-05		35.40				Dry				
MW-27	20-May-05		28.50				Dry				
MW-28	20-May-05		32.68				Dry				
MW-29	20-May-05	29.21	29.47				Insuff H2O				
MW-30	20-May-05		41.23				Dry				
MW-31	19-May-05		50.73				Dry				

Note → A negative variance indicates a decrease in the depth to water level from the previous reading.

Treated Mine Discharge Water

Sample: Treated Mine Water

Date: 1st Quarter 2005

Location	Uranium			Radium-226 (soluble)			Radium-226 (insoluble)		
	Conc. (mg/L)	Error (mg/L)	LLD (mg/L)	Conc. (pCi/L)	Error (pCi/L)	LLD (pCi/L)	Conc. (pCi/L)	Error (pCi/L)	LLD (pCi/L)
P-8	1.63	0.05	0.0005	2.87	0.4	0.4	2.51	0.3	0.3
P-10	1.57	0.05	0.0005	2.45	0.4	0.4	2.5	0.4	0.5
P-12	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-14	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-16	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-18	dry	dry	dry	dry	dry	dry	dry	dry	dry

Sample: Treated Mine Water

Date: 2nd Quarter 2005

Location	Uranium			Radium-226 (soluble)			Radium-226 (insoluble)		
	Conc. (mg/L)	Error (mg/L)	LLD (mg/L)	Conc. (pCi/L)	Error (pCi/L)	LLD (pCi/L)	Conc. (pCi/L)	Error (pCi/L)	LLD (pCi/L)
P-8	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-10	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-12	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-14	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-16	dry	dry	dry	dry	dry	dry	dry	dry	dry
P-18	dry	dry	dry	dry	dry	dry	dry	dry	dry

Mine water treatment discharge subject to NPDES permit limitations at outfall location.

Limits: Total Uranium = 4 mg/L (max); soluble Ra-226 = 10 pCi/L (max); total Ra-226 = 30 pCi/L (max)