

**CAMECO RESOURCES,
CROW BUTTE OPERATION**



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April 7, 2011

Mr. Keith I McConnell, Deputy Director
Decommissioning and Uranium Recovery Licensing Directorate
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
Mailstop T8-F5
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Source Materials License SUA-1534
Docket No. 40-8943
Commercial Evaporation Pond #3 Potential Liner Leak

Dear Mr. McConnell:

On March 9, 2011 routine evaporation pond monitoring results of Cameco Resources - Crow Butte Operation (CBO) Commercial Evaporation Pond #3, water level readings from the southeast underdrain indicated a potential pond liner leak. This was discovered when the data was reviewed on March 10, 2011. A sample was collected from the underdrain and analyzed for chloride, alkalinity, conductivity, sodium, and sulfate. The results of this sample indicated that the concentration of the indicator analytes in the underdrain were similar to the pond contents. Based upon these results, it was determined that a potential liner leak existed in Commercial Evaporation Pond #3.

Mr. Ron Burrows of the Nuclear Regulatory Commission (NRC) was notified by voicemail and email on March 10, 2011 of the potential liner leak as required by License Condition 12.3. As required by License Condition 12.3, this report provides analytical data, monitoring results, mitigative actions, and the results of those actions.

Upon confirmation of the potential liner leak, CBO sampled the southeast underdrain contents. These samples were analyzed for alkalinity, chloride, sodium, conductivity, and sulfate. Attachment #1 contains copies of the Weekly Evaporation Pond Underdrain Analysis Forms and the analytical results from the CBO laboratory on samples obtained March 10 and 17, 2011.

In addition to weekly analysis of the underdrain, CBO obtained non-routine samples from pond monitor wells CPM-1 and CPM-2. CPM-1 and CPM-2 are completed in the first aquifer and are located down gradient of Commercial Evaporation Pond #3 at the fenced restricted area boundary. The samples were obtained and analyzed for the indicator analytes on March 10 and 17 to ensure that there was no indication of leakage in the secondary liner. Analytical results were consistent with historical sampling results and are contained in Attachment #2.

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April 7, 2011
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Upon confirmation of the potential liner leak, CBO began lowering the level of Commercial Evaporation Pond #3 using the Pond Water Treatment circuit to draw down the pond level. Concurrently, an immediate visual inspection of the pond liner was performed. Initial efforts to locate the leak were unsuccessful. The level of the pond was lowered from 8.3' to 8.0' in the first week following indications of a potential liner leak. In the subsequent weeks, the pond level has been lowered to 7.7'. In weekly monitoring of the underdrain level, the level has remained at .6' since the initial notification until March 30, 2011 when the underdrain level actually dropped to .5'. CBO has performed a number of visual inspections of the Pond#3 liner since March 10th and have been unable to locate any breach or tear in the upper liner. CBO will continue to monitor the underdrain level and inspect the upper liner for tears.

The slight rise in the underdrain level observed in the March 9th sample appears to be an anomaly. This rise did not continue in subsequent weeks and no tear or breach has been identified in the upper liner. In accordance with NRC Source Materials License SUA-1534, License Condition 11.4, weekly sampling of the underdrain for alkalinity, chloride, sodium, conductivity, and sulfate was discontinued on March 17, 2011.

Attachment #3 contains copies of the Commercial Pond Inspection Forms for the period of March 9, 2011 to April 6, 2011.

If you have any questions or require any further information, please do not hesitate to call me at (308) 665-2215 ext 114.

Sincerely,
CAMECO RESOURCES
CROW BUTTE OPERATION

A handwritten signature in cursive script that reads "Larry Teahon".

Larry Teahon
SHEQ Manager

Enclosures: As Stated

cc: Mr. Ronald Burrows – NRC
CBO File
ec: CR - Cheyenne

Attachment #1

Commercial Evaporation Pond #3 Underdrain Analysis

10-Mar-2011

SMLT/MO

	<u>Alk</u>	<u>Cl</u>	<u>Cond</u>	<u>SO₄</u>	<u>Na</u>
	mg/L	mg/L	µmhos	mg/L	mg/L
Pond 3 SE	3500	66,652	141,000	6304	43,127

17-Mar-2011

SMLT/MO

	<u>Alk</u>	<u>Cl</u>	<u>Cond</u>	<u>SO₄</u>	<u>Na</u>
	mg/L	mg/L	µmhos	mg/L	mg/L
Pond 3 SE	4440	64,524	140,600	6160	45,248

Attachment #2

Pond Monitor Well CPM-1 and CPM-2 Analysis

10-Mar-2011

SM/LT/MO

	<u>Alk</u>	<u>Cl</u>	<u>Cond</u>	<u>SO₄</u>	<u>Na</u>
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	201	8.0	450	13	15
Commercial Pond Monitor #2	184	6.7	420	13	14

17-Mar-2011

SM/LT/MO

	<u>Alk</u>	<u>Cl</u>	<u>Cond</u>	<u>SO₄</u>	<u>Na</u>
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	198	7.4	450	14	16
Commercial Pond Monitor #2	185	6.0	430	14	14

Attachment #3

Commercial Pond Inspection Forms

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CAMECO RESOURCES/CROW BUTTE OPERATION
WEEKLY EVAPORATION POND UNDERDRAIN ANALYSIS

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet	POND # 1	POND LEVEL	*			
		*FREEBOARD				
		NE UNDERDRAIN	0			
		NM UNDERDRAIN	1			
		NW UNDERDRAIN	1			
		SE UNDERDRAIN	0			
		SM UNDERDRAIN	0			
		SW UNDERDRAIN	9	66.7 ms	2.2	
Depth = 17.5 feet	POND # 3	POND LEVEL	8.3			
		*FREEBOARD	9.2			
		NE UNDERDRAIN	3			
		NM UNDERDRAIN	3			
		NW UNDERDRAIN	14	50.7 ms	1.1	
		SE UNDERDRAIN	7	75.8 ms	1.8	
		SM UNDERDRAIN	2			
		SW UNDERDRAIN	1			
Depth = 17.5 feet	POND # 4	POND LEVEL	*			
		*FREEBOARD				
		NE UNDERDRAIN	37	89.9 ms	2.7	
		NM UNDERDRAIN	59	92.3 ms	2.8	
		NW UNDERDRAIN	21	91.2 ms	2.1	
		SE UNDERDRAIN	46	89.2 ms	2.1	
		SM UNDERDRAIN	54	89.8 ms	2.4	
		SW UNDERDRAIN	58	92.7 ms	1.9	

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	*
**EAST FREEBOARD:	
EAST UNDERDRAIN:	/
WEST LEVEL:	*
**WEST FREEBOARD:	
WEST UNDERDRAIN:	0

REMARKS: * Snow on lines
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: Peltor
DATE: 3-9-11

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CAMECO RESOURCES/CROW BUTTE OPERATION
WEEKLY EVAPORATION POND UNDERDRAIN ANALYSIS

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet	POND # 1	POND LEVEL	4.1			
		*FREEBOARD	12.9			
		NE UNDERDRAIN	0			
		NM UNDERDRAIN	1			
		NW UNDERDRAIN	1			
		SE UNDERDRAIN	0			
		SM UNDERDRAIN	0			
		SW UNDERDRAIN	8	164.5 ms	2.4	
Depth = 17.5 feet	POND # 3	POND LEVEL	8.0			
		*FREEBOARD	9.5			
		NE UNDERDRAIN	3			
		NM UNDERDRAIN	2			
		NW UNDERDRAIN	14	52.4 ms	1.7	
		SE UNDERDRAIN	7	79.8 ms	1.7	
		SM UNDERDRAIN	2			
		SW UNDERDRAIN	1			
Depth = 17.5 feet	POND # 4	POND LEVEL	10.5			
		*FREEBOARD	11.0			
		NE UNDERDRAIN	37	91.1 ms	2.7	
		NM UNDERDRAIN	58	92.7 ms	2.6	
		NW UNDERDRAIN	21	92.6 ms	2.0	
		SE UNDERDRAIN	46	90.6 ms	2.3	
		SM UNDERDRAIN	53	90.8 ms	2.3	
		SW UNDERDRAIN	58	91.3 ms	2.0	

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	9.5
**EAST FREEBOARD:	5.5
EAST UNDERDRAIN:	1
WEST LEVEL:	9.4
**WEST FREEBOARD:	5.6
WEST UNDERDRAIN:	0

REMARKS: Took underdrain sample SE pond 4 + pond 3 cont. sampled CPM 1 + CPM 2
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: B. Boss
DATE: 3/16/11

**CAMECO RESOURCES/CROW BUTTE OPERATION
WEEKLY EVAPORATION POND UNDERDRAIN ANALYSIS**

COMMERCIAL PONDS	UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet POND # 1	POND LEVEL	4.1			
	*FREEBOARD	12.4			
	NE UNDERDRAIN	0			
	NM UNDERDRAIN	1"			
	NW UNDERDRAIN	1"			
	SE UNDERDRAIN	0			
	SM UNDERDRAIN	0			
	SW UNDERDRAIN	8"	65.3 ms	2.7	
Depth = 17.5 feet POND # 3	POND LEVEL	8.0			
	*FREEBOARD	9.5			
	NE UNDERDRAIN	3"			
	NM UNDERDRAIN	3"			
	NW UNDERDRAIN	14"	53.1 ms	2.8	
	SE UNDERDRAIN	7"	83.2 ms	3.2	
	SM UNDERDRAIN	2"			
	SW UNDERDRAIN	1"			
Depth = 17.5 feet POND # 4	POND LEVEL	6.4			
	*FREEBOARD	11.1			
	NE UNDERDRAIN	37"	103.3	8.2	
	NM UNDERDRAIN	57"	89.6	4.0	
	NW UNDERDRAIN	20"	101.2	6.1	
	SE UNDERDRAIN	46"	93.4	4.6	
	SM UNDERDRAIN	54"	92.8	2.9	
	SW UNDERDRAIN	58"	97.1	2.1	

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 9.4'
**EAST FREEBOARD: 5.6
EAST UNDERDRAIN: 1
WEST LEVEL: 9.3'
**WEST FREEBOARD: 5.7
WEST UNDERDRAIN: 0

REMARKS: Very windy!
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: Pelton
DATE: 3-23-11

**CAMECO RESOURCES/CROW BUTTE OPERATION
WEEKLY EVAPORATION POND UNDERDRAIN ANALYSIS**

COMMERCIAL PONDS	UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet POND # 1	POND LEVEL	4.1'			
	*FREEBOARD	12.9'			
	NE UNDERDRAIN	0			
	NM UNDERDRAIN	1			
	NW UNDERDRAIN	1			
	SE UNDERDRAIN	0			
	SM UNDERDRAIN	0			
	SW UNDERDRAIN	9"	73.6 ms	5.6	
Depth = 17.5 feet POND # 3	POND LEVEL	7.7'			
	*FREEBOARD	9.8'			
	NE UNDERDRAIN	4			
	NM UNDERDRAIN	6	1264 ms	3.3	
	NW UNDERDRAIN	12	604 ms	4.7	
	SE UNDERDRAIN	6	86.1 ms	5.0	
	SM UNDERDRAIN	3			
	SW UNDERDRAIN	5			
Depth = 17.5 feet POND # 4	POND LEVEL	6.3			
	*FREEBOARD	11.2			
	NE UNDERDRAIN	37"	100.4 ms	6.3	
	NM UNDERDRAIN	54"	89.0 ms	6.0	
	NW UNDERDRAIN	21"	77.2 ms	6.4	
	SE UNDERDRAIN	38"	103.9 ms	6.9	
	SM UNDERDRAIN	53°	93.7 ms	4.9	
	SW UNDERDRAIN	40°	101.9 ms	5.9	

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 9.4'
**EAST FREEBOARD: 5.6'
EAST UNDERDRAIN: 1
WEST LEVEL: 9.3'
**WEST FREEBOARD: 5.7'
WEST UNDERDRAIN: 0

REMARKS: Very windy!
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: Petton
DATE: 3-30-11

**CAMECO RESOURCES/CROW BUTTE OPERATION
WEEKLY EVAPORATION POND UNDERDRAIN ANALYSIS**

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet POND # 1	POND LEVEL	4.1'				
	*FREEBOARD	12.9				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	4				
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	8	75.1 ms	5.7		
Depth = 17.5 feet POND # 3	POND LEVEL	7.6				
	*FREEBOARD	9.9				
	NE UNDERDRAIN	3				
	NM UNDERDRAIN	5				
	NW UNDERDRAIN	11	61.5 ms	5.4		
	SE UNDERDRAIN	8	87.2 ms	5.6		
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	4				
Depth = 17.5 feet POND # 4	POND LEVEL	6.3				
	*FREEBOARD	11.2				
	NE UNDERDRAIN	38	103.1 ms	7.0		
	NM UNDERDRAIN	53	101.0 ms	5.5		
	NW UNDERDRAIN	18	104.2 ms	6.9		
	SE UNDERDRAIN	35	105.7 ms	7.4		
	SM UNDERDRAIN	52	97.5 ms	6.0		
	SW UNDERDRAIN	5	99.1 ms	7.1		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 9.4
**EAST FREEBOARD: 56
EAST UNDERDRAIN: 1
WEST LEVEL: 9.3'
**WEST FREEBOARD: 5.7'
WEST UNDERDRAIN: 0

REMARKS: Done monthly
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: Delton
DATE: 4-6-11