

**CAMECO RESOURCES,
CROW BUTTE OPERATION**



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P.O. Box 169
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**(308) 665-2215
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June 28, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

ATTN: Document Control Desk, 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

Re: Source Materials License SUA-1534
Docket No. 40-8943
Commercial Evaporation Pond #1 Liner Leak

Dear Deputy Director:

On June 1, 2011, routine evaporation pond monitoring results of Cameco Resources, Crow Butte Operation (CBO) Commercial Evaporation Pond #1, water level readings from the north middle underdrain indicated a potential pond liner leak. A sample was collected from the underdrain and analyzed for alkalinity, chloride, 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 liner leak potentially existed in Commercial Evaporation Pond #1.

Mr. Ronald Burrows was notified by voicemail and email of the liner leak on June 1, 2011. As required by License Condition 12.3, this report provides analytical data, monitoring results, mitigative actions, and the results of those actions as required in the permit.

Upon confirmation of the liner leak, CBO began weekly sampling of the north middle underdrain. These samples were analyzed for alkalinity, chloride, conductivity, sodium, and sulfate. Attachment #1 contains copies of the Weekly Evaporation Pond Underdrain Analysis Forms and the analytical results from the CBO laboratory. Samples were obtained on June 1, 8, 15, and 22, 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 #1 at the fenced restricted area boundary. The samples were obtained and analyzed for the indicator analytes on June 1, 8, 15, and 22, 2011, to ensure that there was no indication of

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**CAMECO RESOURCES,
CROW BUTTE OPERATION**



Deputy Director
June 28, 2011
Page 2 of 2

leakage in the secondary liner. Analytical results were consistent with historical sampling results and are contained in Attachment #2.

Upon confirmation of the potential liner leak, CBO began lowering the level of Commercial Evaporation Pond #1 by pumping water to Commercial Evaporation Pond #4. Concurrently, an immediate visual inspection of the pond liner was performed. Initial efforts to locate the potential leak were unsuccessful. The level of the pond was lowered .6 feet from a level of 2' to a level of 1.4' in the first week of transfer. The level in the north middle underdrain rose only .1' during this week, indicating that the leak may be above the water line. Subsequent visual inspection of the liner revealed a small abrasion at approximately 1.7' was causing the leak. CBO placed a fusion weld bead over the abrasion to temporarily patch the hole. On June 22, 2011, Colorado Linings placed a permanent patch over the temporary repair. Since the pond level was lowered, the north middle underdrain readings have remained steady at 1.3'.

CBO is currently pursuing a plan of action to clean up several Commercial Pond underdrains. The procedure includes pumping the affected underdrain until it is dry. The underdrain is then purged with clean water to lower the concentration of the indicator parameters. The Pond #1 north middle underdrain will be included in this action plan.

Attachment #3 contains copies of the Commercial Pond Inspection Forms for the period of June 1-June 22, 2011. Weekly analysis of the underdrain contents will continue until CBO is confident that all leaks have been located and repaired.

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

Larry Teahon
SHEQ Manager

Enclosures: As Stated

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

Attachment #1

Commercial Evaporation Pond #1 Underdrain Analysis

1-Jun-11

SM/LT/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 1 NM	3250	66,652	147,700	6493	45,066

8-Jun-11

SMLT/MO

	<u>Alk</u> mg/L	<u>Cl</u> mg/L	<u>Cond</u> μmhos	<u>SO₄</u> mg/L	<u>Na</u> mg/L
Pond 1 NM	3100	68,779	146,500	6273	46,460

15-Jun-11

SMLTMO

	<u>Alk</u> mg/L	<u>Cl</u> mg/L	<u>Cond</u> µmhos	<u>SO₄</u> mg/L	<u>Na</u> mg/L
Pond 1 NM	3300	71,615	148,300	6534	46,776

24-Jun-11

SMLT/MO

	<u>Alk</u> mg/L	<u>Cl</u> mg/L	<u>Cond</u> µmhos	<u>SO₄</u> mg/L	<u>Na</u> mg/L
Pond 1 NM	4020	72,324	150,100	6863	47,717

Attachment #2

Pond Monitor Well CPM-1 and CPM-2 Analysis

2-Jun-11

SMLT/MO

	<u>Alk</u> mg/L	<u>Cl</u> mg/L	<u>Cond</u> umhos	<u>SO₄</u> mg/L	<u>Na</u> mg/L
Commercial Pond Monitor #1	202	8.0	460	14	16
Commercial Pond Monitor #2	187	5.8	430	14	14

8-Jun-11

SMLT/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	200	8.8	460	14	16
Commercial Pond Monitor #2	186	5.9	430	14	14

15-Jun-11

SMLT/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	202	8.3	460	15	16
Commercial Pond Monitor #2	186	5.8	430	15	15

24-June-11

SM/LT/

	<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	202	8.6	460	15	16
Commercial Pond Monitor #2	187	5.9	430	15	14

Attachment #3

Commercial Pond Inspection Forms

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

*WJ
6/1/11*

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet POND # 1	POND LEVEL	17.2 2.0				
	*FREEBOARD	15.0				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	14	110.3 ms	11.5		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	2				
	SW UNDERDRAIN	9	83.5 ms	12.2		
Depth = 17.5 feet POND # 3	POND LEVEL	11.2				
	*FREEBOARD	6.3				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	4				
	NW UNDERDRAIN	10	66.2 ms	10.1		
	SE UNDERDRAIN	3				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	52.1 us	10.0		
Depth = 17.5 feet POND # 4	POND LEVEL	5.6				
	*FREEBOARD	11.9				
	NE UNDERDRAIN	17	101.9 ms	12.1		
	NM UNDERDRAIN	14	106.0 ms	10.2		
	NW UNDERDRAIN	9	108.1 ms	13.3		
	SE UNDERDRAIN	27	103.5 ms	13.0		
	SM UNDERDRAIN	13	100.1 ms	10.3		
	SW UNDERDRAIN	18	106.0 ms	12.3		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.2
**EAST FREEBOARD:	4.8
EAST UNDERDRAIN:	0
WEST LEVEL:	9.8
**WEST FREEBOARD:	5.2
WEST UNDERDRAIN:	0

REMARKS: Done Monthly + Pond Contents
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: B. Bass
DATE: 6/1/11

WJ
6/8/11

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	1.4			
		*FREEBOARD	15.6			
		NE UNDERDRAIN	0			
		NM UNDERDRAIN	15	110.4 ms	12.8	
		NW UNDERDRAIN	5			
		SE UNDERDRAIN	0			
		SM UNDERDRAIN	2			
		SW UNDERDRAIN	9	84.2 ms	12.5	
Depth = 17.5 feet	POND # 3	POND LEVEL	11.2			
		*FREEBOARD	6.3			
		NE UNDERDRAIN	4			
		NM UNDERDRAIN	4			
		NW UNDERDRAIN	10	61.8 ms	10.4	
		SE UNDERDRAIN	3			
		SM UNDERDRAIN	3			
		SW UNDERDRAIN	6	522 us	11.8	
Depth = 17.5 feet	POND # 4	POND LEVEL	5.7			
		*FREEBOARD	11.8			
		NE UNDERDRAIN	17	102.4 ms	12.8	
		NM UNDERDRAIN	4	106.9 ms	10.9	
		NW UNDERDRAIN	11	110.2 ms	13.9	
		SE UNDERDRAIN	33	104.9 ms	13.3	
		SM UNDERDRAIN	13	106.7 ms	10.7	
		SW UNDERDRAIN	18	113.6 ms	13.6	

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.1
**EAST FREEBOARD:	4.9
EAST UNDERDRAIN:	0
WEST LEVEL:	9.7
**WEST FREEBOARD:	5.3
WEST UNDERDRAIN:	0

REMARKS:
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: B. Bass / R. Peltov
DATE: 6/8/11

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

WJ
6/15/11

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
Depth = 17 feet POND # 1	POND LEVEL	1.6				
	*FREEBOARD	15.4				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	15	111.2 ms	12.9		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	2				
	SW UNDERDRAIN	9	84.9 ms	12.7		
Depth = 17.5 feet POND # 3	POND LEVEL	11.1				
	*FREEBOARD	6.4				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	4				
	NW UNDERDRAIN	10	62.4 ms	10.5		
	SE UNDERDRAIN	3				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	530 us	11.0		
Depth = 17.5 feet POND # 4	POND LEVEL	5.8				
	*FREEBOARD	11.7				
	NE UNDERDRAIN	9	102.8 ms	13.9		
	NM UNDERDRAIN	10	127.1 ms	13.8		
	NW UNDERDRAIN	12	112.5 ms	11.2		
	SE UNDERDRAIN	12	185.3 ms	13.6		
	SM UNDERDRAIN	14	102.2 ms	10.9		
	SW UNDERDRAIN	19	113.9 ms	13.8		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.1
**EAST FREEBOARD:	4.9
EAST UNDERDRAIN:	0
WEST LEVEL:	9.7
**WEST FREEBOARD:	5.3
WEST UNDERDRAIN:	0

REMARKS:
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: B. Bass / R. Pelton
DATE: 6/15/11

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

*W.V
6/22/11*

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY μmhos/cm	LAB RESULTS μmhos/cm
Depth = 17 feet POND # 1	POND LEVEL	1.5'				
	*FREEBOARD	15.5'				
	NE UNDERDRAIN	0"				
	NM UNDERDRAIN	15"	110.2 ms	13.0		
	NW UNDERDRAIN	5"				
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	1"				
	SW UNDERDRAIN	9"	85.3 ms	12.9		
Depth = 17.5 feet POND # 3	POND LEVEL	10.9'				
	*FREEBOARD	6.6'				
	NE UNDERDRAIN	4"				
	NM UNDERDRAIN	5"				
	NW UNDERDRAIN	10"	62.9 ms	10.8		
	SE UNDERDRAIN	3"				
	SM UNDERDRAIN	4"				
	SW UNDERDRAIN	6"	526 us	11.6		
Depth = 17.5 feet POND # 4	POND LEVEL	6.1'				
	*FREEBOARD	11.4'				
	NE UNDERDRAIN	7"	104.1 ms	14.9		
	NM UNDERDRAIN	10"	109.9 ms	14.8		
	NW UNDERDRAIN	11"	119.2 ms	11.8		
	SE UNDERDRAIN	14"	104.7 ms	13.9		
	SM UNDERDRAIN	14"	102.8 ms	11.8		
	SW UNDERDRAIN	19"	117.7 ms	16.0		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.1
**EAST FREEBOARD:	4.9
EAST UNDERDRAIN:	0
WEST LEVEL:	9.8
**WEST FREEBOARD:	5.2
WEST UNDERDRAIN:	0

REMARKS: <i>Windy</i>
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: <i>B. Bass</i>
DATE: <i>6/22/11</i>