CAMECO RESOURCES,
CROW BUTTE OPERATION

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January 27, 2020

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Attn: Document Control Desk Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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

Dear Document Control:

On January 2, 2020 routine evaporation pond monitoring results of Cameco Resources - Crow Butte Operation (CBO) Commercial Evaporation Pond #1, water level readings from the northwest underdrain indicated a potential pond liner leak. A sample was collected from the affected underdrain and analyzed for alkalinity, chloride, conductivity, sodium, and sulfate. The sample was analyzed in the CBO laboratory on January 2, 2020 and these results 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 #1.

When the lab results were obtained, Mr. Tom Lancaster of the Nuclear Regulatory Commission (NRC) was notified by phone on January 2, 2020 of the potential liner leak as required by License Conditions 11.1.6 and 11.2.1. As required by License Conditions 11.1.6 and 11.2.1, this report provides analytical data, monitoring results, mitigative actions, and the results of those actions.

Samples were collected from the northwest underdrain during the weekly inspections. The impacted underdrain was sampled on January 2, 8, 15, and 22, 2020. All samples were analyzed for alkalinity, chloride, conductivity, sodium, and sulfate. The results for these samples are included in Attachment #1. Weekly sampling of the underdrain contents will continue for two weeks following the repair of the upper liner.

Upon confirmation of the potential liner leak, CBO began lowering the level of Commercial Evaporation Pond #1 by transferring the contents to Commercial Evaporation Pond #4 to draw down the pond level. The level was lowered from approximately 4.6' on January 2, 2020, to 3.8'

NMSS20

on January 22, 2020. The underdrain level reading has consistently been 1.3', since January 8, 2020 indicating that the pond level had been lowered to a point that the potential liner leak should be exposed above the pond contents water level. Environmental conditions (cold temperatures and snow drifted on the pond liner) slowed CBO's initial response. The liner was inspected after the leak was detected, but the northwest side of the pond where the leak was suspected to be located was not visible due to snow cover. Because of the weather conditions, the transfer to Pond 4 did not begin until January 7, 2020. On January 20, 2020, a failed patch in the upper liner was discovered immediately above the impacted underdrain.

CBO plans to remove the failed patch and replace it with a new patch. The work will be completed by trained site personnel. The weather will play a significant role in the completion timeline. The site still needs to lower the water level in Pond 1 by transferring contents to Pond 4 in order to provide sufficient freeboard below the failed patch to perform the necessary work. Also, the site will need favorable weather conditions (moderate temperatures and a snow and frost free liner) in order to complete the work. The site anticipates that the repairs can be completed in the next couple weeks, assuming weather conditions are favorable.

Attachment #2 contains copies of the Commercial Pond Inspection Forms for the period of January 2, 2020 to January 22, 2020.

If you have any questions or require any further information, please do not hesitate to call me at (308) 665-2215 ext 117.

Sincerely,
CAMECO RESOURCES
CROW BUTTE OPERATION

Walter D. Nelson
SHEQ Coordinator

Enclosures: As Stated

cc: Mr. Ron Burrows – NRC
CBO File

ec: CBO File

Attachment #1

Commercial Evaporation Pond #1 Underdrain Analysis

1/2/2020

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
POND 1	18,082	2475	61,800	16010	3471
POND 1 NORTH WEST UNDERDRAIN	17,727	2300	60,400	14960	3174

1/8/2020

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
POND 1	19,854	2625	65,000	17790	3948
POND 1 NORTH WEST UNDERDRAIN	15,599	1875	50,000	12850	2497

1/16/2020

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
POND 1	21,981	2600	66,400	16300	3832
POND 1 NORTH WEST UNDERDRAIN	16,308	1875	51,200	12050	2288

1/23/2020

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
POND 1	19,145	2325	59,500	14420	3286
POND 1 NORTH WEST UNDERDRAIN	15,599	1825	50,500	11660	2707

Attachment #2

Commercial Pond Inspection Forms

WD

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
POND # 1 Depth = 17 feet	POND LEVEL	Snow				
	*FREEBOARD	Snow				
	NE UNDERDRAIN	2"				
	NM UNDERDRAIN	2"				
	NW UNDERDRAIN	11"	45.74 ms	2.3°		
	SE UNDERDRAIN	1"				
	SM UNDERDRAIN	1"				
	SW UNDERDRAIN	3"				
POND # 3 Depth = 17.5 feet	POND LEVEL	Snow				
	*FREEBOARD	Snow				
	NE UNDERDRAIN	4"				
	NM UNDERDRAIN	6"	6.20 ms	6.0°		
	NW UNDERDRAIN	4"				
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	3"				
	SW UNDERDRAIN	5"				
POND # 4 Depth = 17.5 feet	POND LEVEL	Snow				
	*FREEBOARD	Snow				
	NE UNDERDRAIN					
	NM UNDERDRAIN	2"				
	NW UNDERDRAIN					
	SE UNDERDRAIN					
	SM UNDERDRAIN	2"				
	SW UNDERDRAIN					

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	Snow
**EAST FREEBOARD:	Snow
EAST UNDERDRAIN:	2"
WEST LEVEL:	Snow
**WEST FREEBOARD:	Snow
WEST UNDERDRAIN:	1"

REMARKS: Monthly, No Sprays
potential leak in Pond 1

*COMMERCIAL POND FREEBOARD = 5 FT MIN

** R&D POND FREEBOARD = 3 FT MIN

SAMPLER: W. Nelson

DATE: 1/2/20

WD

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
POND # 1 Depth = 17 feet	POND LEVEL	9.5'*				
	*FREEBOARD	12.5'				
	NE UNDERDRAIN	1"				
	NM UNDERDRAIN	5"				
	NW UNDERDRAIN	16"	46.9ms	2.0°		
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	1"				
	SW UNDERDRAIN	3"				
POND # 3 Depth = 17.5 feet	POND LEVEL	Snow				
	*FREEBOARD	Snow				
	NE UNDERDRAIN	4"				
	NM UNDERDRAIN	8"	6.18m	5.3°		
	NW UNDERDRAIN	4"				
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	3"				
	SW UNDERDRAIN	4"				
POND # 4 Depth = 17.5 feet	POND LEVEL	3.6'*				
	*FREEBOARD	13.9'				
	NE UNDERDRAIN					
	NM UNDERDRAIN	2"				
	NW UNDERDRAIN					
	SE UNDERDRAIN					
	SM UNDERDRAIN	3"				
	SW UNDERDRAIN					

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	Snow
**EAST FREEBOARD:	Snow
EAST UNDERDRAIN:	2"
WEST LEVEL:	Snow
**WEST FREEBOARD:	Snow
WEST UNDERDRAIN:	0"

REMARKS:

*Windy, No sprays

*COMMERCIAL POND FREEBOARD = 5 FT MIN

** R&D POND FREEBOARD = 3 FT MIN

SAMPLER: W. Nelson

DATE: 1/8/20

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
POND # 1 Depth = 17 feet	POND LEVEL	3.8'				
	*FREEBOARD	13.2'				
	NE UNDERDRAIN	2"				
	NM UNDERDRAIN	5"				
	NW UNDERDRAIN	16"	49.91 ms	2.0°		
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	1"				
	SW UNDERDRAIN	3"				
POND # 3 Depth = 17.5 feet	POND LEVEL	Snow				
	*FREEBOARD	Snow				
	NE UNDERDRAIN	3"				
	NM UNDERDRAIN	8"	6.119 ms	4.9°		
	NW UNDERDRAIN	4"				
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	3"				
	SW UNDERDRAIN	5"				
POND # 4 Depth = 17.5 feet	POND LEVEL	4.5'				
	*FREEBOARD	13.0'				
	NE UNDERDRAIN					
	NM UNDERDRAIN	2"				
	NW UNDERDRAIN					
	SE UNDERDRAIN					
	SM UNDERDRAIN	3"				
	SW UNDERDRAIN					

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: Snow
**EAST FREEBOARD:
EAST UNDERDRAIN: 2"
WEST LEVEL: Snow
**WEST FREEBOARD:
WEST UNDERDRAIN: 0"

REMARKS: No sprays

*COMMERCIAL POND FREEBOARD = 5 FT MIN

** R&D POND FREEBOARD = 3 FT MIN

SAMPLER: W. Nelson

DATE: 1/15/20

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
POND # 1 Depth = 17 feet	POND LEVEL	3.8'				
	*FREEBOARD	13.2'				
	NE UNDERDRAIN	2"				
	NM UNDERDRAIN	5"				
	NW UNDERDRAIN	16"	51.8 ms	1.50		
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	1"				
	SW UNDERDRAIN	2"				
POND # 3 Depth = 17.5 feet	POND LEVEL	9.1'				
	*FREEBOARD	8.4'				
	NE UNDERDRAIN	3"				
	NM UNDERDRAIN	9"	60.26ms	4.6°		
	NW UNDERDRAIN	4"				
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	4"				
	SW UNDERDRAIN	5"				
POND # 4 Depth = 17.5 feet	POND LEVEL	4.4'				
	*FREEBOARD	13.1'				
	NE UNDERDRAIN					
	NM UNDERDRAIN	2"				
	NW UNDERDRAIN					
	SE UNDERDRAIN					
	SM UNDERDRAIN	4"				
	SW UNDERDRAIN					

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	Snow
**EAST FREEBOARD:	Snow
EAST UNDERDRAIN:	2"
WEST LEVEL:	Snow
**WEST FREEBOARD:	Snow
WEST UNDERDRAIN:	0"

REMARKS: No Sprays

*COMMERCIAL POND FREEBOARD = 5 FT MIN

** R&D POND FREEBOARD = 3 FT MIN

SAMPLER: W. Nelson

DATE: 1/22/20