CAMECO RESOURCES,
CROW BUTTE OPERATION

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June 26, 2014

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

Source Materials License SUA-1534
Docket No. 40-8943
Commercial Evaporation Pond #4 Potential Liner Leak

Dear Deputy Director:

On May 28, 2014 routine evaporation pond monitoring results of Cameco Resources - Crow Butte Operation (CBO) Commercial Evaporation Pond #4, water level readings from the north middle and northeast underdrains indicated a potential pond liner leak. A sample was collected from each effected underdrain and analyzed for alkalinity, chloride, conductivity, sodium, and sulfate. The samples were analyzed in the CBO laboratory on May 29, 2014, 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 #4.

When the lab results were obtained, Mr. Ron Burrows of the Nuclear Regulatory Commission (NRC) was notified by voicemail on May 29, 2014 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.

When the liner leak was detected, CBO began pumping the north middle and northeast underdrains. Samples were collected from these underdrains when sufficient volume was present during the weekly inspection. Both impacted underdrains were sampled on May 29, June 6, June 11, and June 25. The north middle underdrain was sampled on June 18. All samples were analyzed for alkalinity, chloride, conductivity, sodium, and sulfate. The results for these samples are included in Attachment #1.

FSME21

In addition to analysis of the underdrain, CBO obtained 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 #4 at the fenced restricted area boundary. The samples were obtained and analyzed for the indicator analytes on May 28, 2014; and June 4, 11, 18, and 25, 2014 to ensure that there was no indication of leakage in the secondary liner. Analytical results, contained in Attachment #2, were consistent with historical sampling results indicating no breach in the secondary liner.

Upon confirmation of the potential liner leak, CBO began lowering the level of Commercial Evaporation Pond #4 by transferring the contents to Commercial Evaporation Pond #1 to draw down the pond level. Because the water level was very low in this pond (<1'), a small volume pump had to be used for the transfer, which slowed the transfer process. At the time the potential leak was detected, the pond level was essentially at the toe of the liner where the steep sloped sides of the pond intersect with the pond floor. Between May 28 and June 18, 65' of pond floor liner (measured from the toe of the pond to the water line) was exposed. The liner was inspected immediately after the potential leak was detected, and has been subsequently inspected as more liner has been exposed. To date, no breach in the liner has been identified. CBO is consulting with Colorado Linings to determine a method of testing the integrity of the exposed liner.

Attachment #3 contains copies of the Commercial Pond Inspection Forms for the period of May 28, 2014 to June 25, 2014.

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

Larry Teahon
SHEQ Manager

Enclosures: As Stated

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

Attachment #1

Commercial Evaporation Pond #1 Underdrain Analysis

5/29/2014

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
Pond 4 North Middle Underdrain	4609	517	14430	3304	634
Pond 4 North East Underdrain	13827	667	39400	9638	1839

6/6/2014

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
Pond 4 North Middle Underdrain	3368	558	11790	2587	539
Pond 4 North East Underdrain	12231	858	35700	8512	1561

6/11/2014

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
Pond 4	32794	2175	87200	22970	4510
Pond 4 North Middle Underdrain	3900	542	13180	2681	548
Pond 4 North East Underdrain	4963	750	16690	3407	605

6/18/2014

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
Pond 4	41835	2375	107200	31710	7245
Pond 4 North Middle Underdrain	4432	544	14720	3069	780

6/25/2014

Sample ID	Cl mg/L	ALK = CaCO3	COND microseimen/cm	Na mg/L	SO4 mg/L
Pond 4	22690	1325	59800	15110	3280
Pond 4 North Middle Underdrain	4875	550	15740	3482	644
Pond 4 North East Underdrain	9218	925	23690	5312	838

Attachment #2

Pond Monitor Well CPM-1 and CPM-2 Analysis

5-28-14

MO/LT

	Alk	Cl	Cond	SO4	Na
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	203	11.0	461	13.00	16.75
Commercial Pond Monitor #2	186	6.2	421	12.90	14.14

6-4-14

MO/LT

	Alk	Cl	Cond	SO4	Na
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	199	10.9	463	13.48	15.61
Commercial Pond Monitor #2	184	5.9	423	12.99	14.54

6-11-14

MO/LT

	Alk	Cl	Cond	SO4	Na
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	201	10.6	454	12.79	14.96
Commercial Pond Monitor #2	185	6.0	413	13.03	13.48

6-18-14

MO/LT

	Alk	Cl	Cond	SO4	Na
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	200	11.2	454	14.99	15.79
Commercial Pond Monitor #2	184	5.8	412	14.50	14.34

6-25-14

MO/LT

	Alk	Cl	Cond	SO4	Na
	mg/L	mg/L	umhos	mg/L	mg/L
Commercial Pond Monitor #1	200	10.5	460	12.21	15.43
Commercial Pond Monitor #2	184	5.8	419	11.93	14.67

Attachment #3

Commercial Pond Inspection Forms

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	7.6				
	*FREEBOARD	9.4				
	NE UNDERDRAIN	3				
	NM UNDERDRAIN	2				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	1				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	0				
POND # 3 Depth = 17.5 feet	POND LEVEL	10.9				
	*FREEBOARD	6.6				
	NE UNDERDRAIN	6	639 us	10.2		
	NM UNDERDRAIN	20	7.91 ms	7.9		
	NW UNDERDRAIN	20	43.04 ms	9.8		
	SE UNDERDRAIN	1				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	2.41 as	10.6		
POND # 4 Depth = 17.5 feet	POND LEVEL	11-10				
	*FREEBOARD	16.5				
	NE UNDERDRAIN	33	12.30 ms	16.5		
	NM UNDERDRAIN	18	13.61 us	14.4		
	NW UNDERDRAIN	8	16.83 us	18.2		
	SE UNDERDRAIN	10	84.20 ms	18.6		
	SM UNDERDRAIN	6	4893 us	14.3		
	SW UNDERDRAIN	12	6.42 ms	18.2		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 10.9
**EAST FREEBOARD: 4.1
EAST UNDERDRAIN: 0
WEST LEVEL: 6.4
**WEST FREEBOARD: 8.6
WEST UNDERDRAIN: 0

REMARKS: Hot out!

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass-Pelton

DATE: 5-28-14

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	7.8				
	*FREEBOARD	9.2				
	NE UNDERDRAIN	.5				
	NM UNDERDRAIN	6	921 µs	7.0		
	NW UNDERDRAIN	1				
	SE UNDERDRAIN	3				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	4				
POND # 3 Depth = 17.5 feet	POND LEVEL	10.8				
	*FREEBOARD	6.7				
	NE UNDERDRAIN	6	691 µs	10.7		
	NM UNDERDRAIN	21	8.67 ms	8.4		
	NW UNDERDRAIN	20	44.18 ms	8.2		
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	11.70 ms	10.9		
POND # 4 Depth = 17.5 feet	POND LEVEL	<1 T-12				
	*FREEBOARD	16.5				
	NE UNDERDRAIN	3				
	NM UNDERDRAIN	7	515 µs	16.2		
	NW UNDERDRAIN	8	1540 µs	20.2		
	SE UNDERDRAIN	17	24.87 ms	20.9		
	SM UNDERDRAIN	5	14.24 ms	19.8		
	SW UNDERDRAIN	12	7.12 ms	20.1		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.9
**EAST FREEBOARD:	4.1
EAST UNDERDRAIN:	0
WEST LEVEL:	6.5
**WEST FREEBOARD:	8.5
WEST UNDERDRAIN:	0

REMARKS:
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: B. Bass / R. Pelton
DATE: 6.4.14

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	10.3				
	*FREEBOARD	6.7				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	2				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	2				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	10.7				
	*FREEBOARD	6.8				
	NE UNDERDRAIN	6	6.53 us	10.4		
	NM UNDERDRAIN	21	8.44 ms	8.0		
	NW UNDERDRAIN	20	43.10 ms	7.9		
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	10.60 ms	10.7		
POND # 4 Depth = 17.5 feet	POND LEVEL	LT-35				
	*FREEBOARD	16.5				
	NE UNDERDRAIN	1				
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	8	1250 us	19.6		
	SE UNDERDRAIN	17	23.33 ms	20.1		
	SM UNDERDRAIN	5				
	SW UNDERDRAIN	13	13.22 ms	19.2		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 10.9
**EAST FREEBOARD: 4.1
EAST UNDERDRAIN: 0
WEST LEVEL: 6.5
**WEST FREEBOARD: 8.5
WEST UNDERDRAIN: 0

REMARKS:
Cool - windy done monthly

*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass - Relton
DATE: 10-11-14

Rev 1

CAMECO RESOURCES/CROW BUTTE OPERATION
WEEKLY EVAPORATION POND UNDERDRAIN ANALYSIS

W3

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
POND # 1 Depth = 17 feet	POND LEVEL	8.4				
	*FREEBOARD	8.6				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	2				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	2				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	10.5				
	*FREEBOARD	7.0				
	NE UNDERDRAIN	6	6.91 ms	10.5		
	NM UNDERDRAIN	21	8.56ms	8.1		
	NW UNDERDRAIN	21	44.07ms	7.9		
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	9.03 ms	10.7		
POND # 4 Depth = 17.5 feet	POND LEVEL	17-6.5				
	*FREEBOARD	16.5				
	NE UNDERDRAIN	1				
	NM UNDERDRAIN	6	13.47 ms	16.4		
	NW UNDERDRAIN	8	12.60 ms	19.8		
	SE UNDERDRAIN	17	24.01 ms	20.1		
	SM UNDERDRAIN	5				
	SW UNDERDRAIN	12	13.55	19.2		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.8
**EAST FREEBOARD:	4.2
EAST UNDERDRAIN:	0
WEST LEVEL:	6.4
**WEST FREEBOARD:	8.6
WEST UNDERDRAIN:	0

REMARKS:
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: 6-18-19
DATE: B. Bass / R. Pelton

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	8.3				
	*FREEBOARD	8.7				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	2				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	2				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND #3 Depth = 17.5 feet	POND LEVEL	10.3				
	*FREEBOARD	7.2				
	NE UNDERDRAIN	6	6.86 ms	11.2		
	NM UNDERDRAIN	21	8.51 ms	8.6		
	NW UNDERDRAIN	21	44.17 ms	8.3		
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	5				
POND #4 Depth = 17.5 feet	POND LEVEL	<1 T-65				
	*FREEBOARD	16.5				
	NE UNDERDRAIN	2				
	NM UNDERDRAIN	2				
	NW UNDERDRAIN	6	1241 ms	20.3		
	SE UNDERDRAIN	17	22.91 ms	20.9		
	SM UNDERDRAIN	5				
	SW UNDERDRAIN	12	12.26 ms	20.2		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	10.7
**EAST FREEBOARD:	4.3
EAST UNDERDRAIN:	0
WEST LEVEL:	6.3
**WEST FREEBOARD:	8.7
WEST UNDERDRAIN:	0

REMARKS:

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: B. Bass / R. Pelton

DATE: 6/25/14