

February 26, 2013

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

Semiannual Radiological Effluent and Environmental Monitoring Report Source Materials License # SUA-1534, Docket No. 40-8943

Dear Document Control:

Enclosed please find one copy of the Semiannual Radiological Effluent and Environmental Monitoring Report for the Crow Butte Uranium Project. The report is provided in accordance with License Condition 12.1 of Source Materials License SUA-1534 and 10 CFR Part 40. This report covers the third and fourth quarters of 2012.

If you have any questions concerning the report, please feel free to call me at (307) 316-7568.

Sincerely, CAMECO RESOURCES

Josh Leftwich Director of Radiation Safety and Licensing

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CROW BUTTE URANIUM PROJECT

RADIOLOGICAL EFFLUENT AND ENVIRONMENTAL MONITORING REPORT

For

THIRD AND FOURTH QUARTERS, 2012

USNRC Source Materials License SUA 1534



Second Half 2012 Semiannual Radiological Effluent and Environmental Monitoring Report

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1 WATER QUALITY MONITORING DATA

1.1 Excursion Monitoring

Biweekly excursion monitoring in the shallow aquifer and perimeter monitor wells was continued in Mine Units 2 through 11 during the third and fourth quarters of 2012.

There were no monitor wells on excursion status during the reporting period.

1.2 Water Supply Wells and Surface Water

Summary sheets of quarterly radiological analytical data for the reporting period from all surface waters and water supply wells within one kilometer of the active wellfield boundary are included in Appendix A.

The reported radiological data are within the expected ranges for each well and surface water sampling points. Samples were obtained from all sample locations with the exceptions noted in Appendix A.

2 OPERATIONAL

2.1 **Production Data Summary**

Mining operations continued through the third and fourth quarters of 2012. The average operating production flow rate was 6,244 gpm for the third quarter and 6,711 gpm for the fourth quarter. Injection and production totals from the totalizers and the calculated bleed totals for the reporting period are included in Appendix B.

2.2 Wastewater Summary

The total volume of wastewater discharged to the ponds was 4,127,622 gallons during the third quarter and 2,357,470 gallons during the fourth quarter. Currently, all five evaporation ponds contain wastewater.

Wastewater that is not disposed of in the evaporation ponds is injected down two Deep Disposal Wells. Currently, the wells are operated on a nearly continuous basis and 46,676,907 gallons of



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wastewater was injected into the wells during the second half of 2012. A summary of the total volume of wastewater injected and the average radionuclide content is contained in Appendix D.

2.3 Effluent Release

10 CFR §40.65 requires licensees to report quantities of radionuclides in liquid and gaseous effluent releases to the environment. In the Application for Renewal of Source Materials License SUA-1534, submitted December 1995, Table 7.3(A) presented calculations of the annual radon emissions for the Crow Butte Plant. These calculations assumed a 7.04 x 10^4 Curies/m³ radon release from leaching operations and the radon release calculations for the second half of 2012 use this release rate estimate.

During the third quarter, production occurred at an average flow rate of 6,244 gpm (23,636 lpm). Production was maintained nearly continuously for 92 days during the third quarter with an operating factor of 98.1 %. The production flow for the third quarter results in a calculated radon release of 1,557 Curies. During the fourth quarter, production occurred at an average flow rate of 6,711 gpm (25,404 lpm). Production was maintained nearly continuously for 92 days during the fourth quarter with an operating factor of 100.0%. The production flow for the fourth quarter results in a calculated radon release of 1,706 Curies. Calculations for radon release from production operations are shown in Appendix E.

Additional wells were brought on line during the second half of 2012. Calculations for the start-up of 10.0 acres of a new wellfield are shown in Appendix E. The calculated radon released from start-up of 10.0 acres is 13 Curies.

The total radon emission due to leaching operations from the Crow Butte plant for the second half of 2012 was 3,276 Curies. This calculated release rate is comparable with the releases estimated in CBR's License Renewal Application.

Radon gas is also released from restoration activities. For restoration water that is treated by ion exchange only, the radon concentration is 0.697 μ Ci/l. Of the total restoration production flow it is assumed that 25% of the radon is released through wellfield loss and 10% of the remaining radon is released during pressurized ion exchange treatment. For water that is treated by reverse osmosis, it is assumed that 100% of the remaining radon is released. For water treated by reverse osmosis the radon concentration is 0.470 μ Ci/l after adjusting for wellfield loss and ion exchange loss.

During the second half of 2012, a total of 140,133,024 gallons (530,459,550 l) of restoration water was produced from Mine Units 2, 3, 4, 5, and 6. Based upon an estimated radon concentration of 0.697 μ Ci/l, the total amount of radon in the restoration solution was calculated to be 370 Curies as shown in Appendix E. The estimated release of radon through wellfield loss at 25% of this total was 92 Curies. The plant loss for ion exchange treatment of the restoration water is estimated at



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10% of the remaining radon, or 28 Curies. For water that is treated by reverse osmosis, it is assumed that 100% of the remaining radon is released. For water treated by reverse osmosis the radon concentration is $0.470 \,\mu$ Ci/l after adjusting for wellfield loss and ion exchange loss.

Of the total amount of restoration water produced in the second half of 2012, 84,641,544 gallons (320,402,100 l) of the water was treated by reverse osmosis. The total estimated radon release from reverse osmosis treatment was 151 Curies. An additional 1.0 acres of wellfields were placed into restoration during the second half of 2012. The calculated radon released from start-up of 1.0 acres is 1 Curie. Calculations for the start-up of 1.0 acres of a wellfield placed in restoration are shown in Appendix E.

Based upon the calculations shown in Appendix E, the total estimated semiannual radon emission for the second half of 2012 from restoration activities was 272 Curies. This resulted in a total estimated radon release from the Crow Butte project during the second half of 2012 of 3,548 Curies.

2.4 Restoration

Restoration activities continued in Mine Units 2, 3, 4, 5, and 6 during the second half of 2012. Permeate continued to be injected into Mine Units 2, 3, 4, and 5. An additional RO capacity of 500 GPM was put into service by SERP 12-09, dated October 17, 2012. IX treatment was started in Mine Unit 6 during the second half of 2012. Restoration injection and production totals are included in Appendix B. Restoration injection pressures are included in Appendix C.

3 ENVIRONMENTAL MONITORING

3.1 Air Monitor Stations

Seven air monitoring stations are used to monitor the Crow Butte Plant. Ambient radon-222 concentrations and radionuclide concentrations in air for each monitoring site are listed in Appendix F. All air monitoring results were within expected historical ranges.

3.2 OSL Monitors

Environmental OSL monitors are located at each air monitoring station. The results of the area OSL monitors fall within the expected ranges and are listed in Appendix G.



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3.3 Annual Dose to the Public (2012)

10 CFR 20.1301 requires that each NRC licensee conduct their operations in such a manner that the total effective dose equivalent (TEDE) to members of the public does not exceed 0.1 rem (100 mrem) in a year, and that the dose from external sources in any unrestricted area does not exceed 0.002 rem (2 mrem) in any one hour.

Additionally, 10 CFR 20.1302 requires that each NRC licensee annually show compliance with the above described dose limits by demonstrating one of the following:

1) Show by actual measurement or calculation that the TEDE to the public does not exceed 100 mrem; or

2) Show that the annual average concentrations of radioactive effluents released at the restricted area boundary do not exceed the values in Table 2 of Appendix B to 10 CFR 20 and that the external dose to an individual continuously present in an unrestricted area would not exceed 2 mrem in an hour and 50 mrem in a year.

The Dose to the Public table in Appendix F compares the 2012 annual average concentrations of radioactive effluents from the Crow Butte Project to the 10 CFR 20, Table 2 limits of Appendix B. The table also shows the calculated TEDE at unrestricted area sampling locations (AM-2 – Nearest Downwind Residence) and the Site Area location (AM – 8) assuming a person was continuously in the area for the entire year. As shown in the table, all measured concentrations of radioactive effluents are less than the Table 2 limits of Appendix B, confirming compliance with 10 CFR 20.1302(b)(2)(i) and (ii). Additionally, the calculated TEDE for the two locations confirms compliance with 10 CFR 20.11302(b)(1).

3.4 Stream Sediments

Sediment samples are collected from three locations on Squaw Creek (S-1, S-2, and S-5), two locations on English Creek (E-1, and E-5), and from three impoundments on English Creek (I-3, I-4, and I-5) on an annual basis during the fourth quarter. The results of sediment sampling for 2012 are included in Appendix H.

The concentration of natural uranium at the upper end of English Creek was above the regional background levels. CBR has noted these elevated concentrations in the English Creek drainage during preoperational monitoring, which indicates that these levels are anomalous natural background concentrations. Composite samples obtained from E-1 and E-2 as part of the preoperational sampling program from 1982 through 1986 had average results with elevated natural uranium (3.4 pCi/g) and lead-210 (1.4 pCi/g) when compared with the other surface water sample



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locations. Samples obtained in 1998 before mining operations began in this area showed similar elevated uranium concentrations.

This sample location is in a wetland area in the upper course of English Creek that was dry most of the year due to drought conditions. The area has a large amount of organic matter and low water flows as compared with the other surface water sampling locations for the project. CBR believes that the upper courses of English Creek are an area with reducing conditions that favor deposition of radionuclides. Appendix H contains a trend graph for English Creek sediment sample points since 1998 that shows the elevated uranium concentrations noted in past sediment samples along with a trend graph for Squaw Creek showing the elevated uranium concentrations upstream from the current operation.

Appendix A

Private Well and Surface Water Radiological Monitoring Results

Third and Fourth Quarter, 2012

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CROW BUTTE RESOURCES, INC.

PRIVATE WELL AND SURFACE WATER RADIOLOGICAL MONITORING RESULTS

Third Quarter, 2012

SAMPLE ID	DATE SAMPLED	URANIUM mg/l	URANIUM µCi/ml	RADIUM-226 pCi/l	RADIUM-226 precision ±
Well #8	09/11/12	0.0161	1.10E-08	ND	0.14
Well #11) w	ell Off-Sample No	t Available	
Well #12	09/11/12	0.0038	2.60E-09	ND	0.09
Well #26	08/10/12	0.0084	5.70E-09	ND	0.09
Well #28	09/11/12	0.0062	4.20E-09	ND	0.07
Well #41	08/10/12	0.0064	4.40E-09	ND	0.06
Well #61	07/27/12	ND	ND	3.1	0.35
Well #63	08/10/12	0.0139	9.40E-09	ND	0.09
Well #66	07/27/12	0.0211	1.40E-08	ND	0.11
Well #125	08/10/12	0.0061	4.10E-09	ND	0.08
Well #129	08/31/12	0.0066	4.50E-09	ND	0.07
Well #131	08/10/12	0.0047	3.20E-09	ND	0.09
Well #133	08/10/12	0.0092	6.20E-09	0.21	0.12
Well#134	08/31/12	0.0090	6.10E-09	ND	0.12
Well #135	08/31/12	0.0180	1.20E-08	ND	0.11
Well #138	08/10/12	0.0207	1.40E-08	0.28	0.13
Well #140	09/11/12	0.0112	7.60E-09	ND	0.09
Well #435	08/10/12	0.0069	4.70E-09	ND	0.12
Drinking Water Well	08/10/12	0.0059	4.00E-09	ND	0.12
Well #38	08/10/12	0.0031	2.10E-09	ND	0.09
Well #445	08/31/12	0.0128	8.70E-09	ND	0.09
Stream S-1	09/25/12	0.0076	5.10E-09	0.32	0.14
Stream S-2	09/25/12	0.0051	3.50E-09	ND	0.12
Stream S-5			Dry	.	· · · · ·
Stream E-1	09/25/12	0.0361	2.50E-08	0.4	0.2
Stream E-5	09/25/12	0.0044	3.00E-09	ND	0.1
Impoundment I-3			Dry	L	l
Impoundment I-4			Dry		
Impoundment I-5	09/25/12	0.0125	8.40E-09	ND	0.1
Reporting Limit		0.0003	2.00E-10	0.2	-

ND-Not detected at the reporting limit

CROW BUTTE RESOURCES, INC.

PRIVATE WELL AND SURFACE WATER RADIOLOGICAL MONITORING RESULTS

Fourth Quarter, 2012

SAM PLE ID	DATE SAMPLED	URANIUM mg/l	URANIUM µCi/ml	RADIUM-226 pCi/l	RADIUM-226 precision ±
Well #8	11/07/12	0.0160	1.10E-08	0.4	0.2
Well #11	11/02/12	0.0090	6.10E-09	ND	0.2
Well #12	11/07/12	0.0042	2.90E-09	ND	0.1
Well #26	10/12/12	0.0085	5.70E-09	ND	0.1
Well #28	11/07/12	0.0064	4.40E-09	0.4	0.2
Well #41	11/02/12	0.0064	4.40E-09	ND	0.1
Well #61	10/12/12	ND	ND	4.0	0.3
Well #63	11/01/12	0.0181	1.20E-08	0.2	0.08
Well #66	10/12/12	0.0240	1.60E-08	0.5	0.1
Well #125	11/02/12	0.0058	3.90E-09	0.3	0.2
Well #129	11/07/12	0.0067	4.50E-09	ND	0.1
Well #131	10/12/12	0.0047	3.20E-09	ND	0.1
Well #133	11/02/12	0.0092	6.20E-09	ND	0.2
Well #134	11/01/12	0.0096	6.50E-09	0.4	0.1
Well #135	11/01/12	0.0183	1.20E-08	ND	0.08
Well #138	11/02/12	0.0183	1.20E-08	0.5	0.2
Well #140	11/07/12	0.0115	7.80E-09	0.3	0.2
Well #435	11/02/12	0.0054	3.60E-09	ND	0.08
Drinking Water Well	11/02/12	0.0061	4.20E-09	ND	0.1
Well #38	11/01/12	0.0042	2.90E-09	ND	0.1
Well #445	10/12/12	0.0137	9.30E-09	ND	0.1
Stream S-1	11/01/12	0.0040	2.70E-09	0.2	0.1
Stream S-2	11/01/12	0.0042	2.80E-09	0.2	0.1
Stream S-5			Dry		
Stream E-1	11/01/12	0.2070	1.40E-07	0.5	0.1
Stream E-5	11/01/12	0.0072	4.80E-09	0.2	0.09
Impoundment I-3			Dry		
Impoundment I-4			Dry		
Impoundment I-5	11/01/12	0.0196	1.30E-08	0.3	0.1
Reporting Limit		0.0003	2.00E-10	0.2	-

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ND-Not detected at the reporting limit

Appendix B

Plant Production and Waste Totals

Third and Fourth Quarter, 2012

WASTE VOLUME						
Third Quarter 2012						
TOTALIZER	PLANT TO PONDS	PLANT TO DDW 1 & 2	RESTORATION TO DDW	CLEAN WATER INTO PLANT	DDW TOTAL INJECTED	TRUCKS TO POND
July	1,345,210	4,395,881	3,092,627	668,128	7,488,508	6,150
August	1,406,770	4,216,570	2,933,608	641,058	7,150,178	44,902
September	1,269,490	3,806,225	2,571,353	523,747	6,377,578	55,100
TOTAL GAL. EOQ	4,021,470	12,418,676	8,597,588	1,832,933	21,016,264	106,152

TOTAL 3rd QTR VOLUME DISCHARGED TO WASTE PONDS =	4,127,622 GALLONS
TOTAL 3rd QTR VOLUME DISCHARGED TO DEEP WELL=	21,016,264 GALLONS
TOTAL 3rd QTR VOLUME DISCHARGED TO WASTE PONDS + DPWELL =	25,143,886 GALLONS
TOTAL 3rd QTR VOLUME WF BLEED FROM WELLFIELDS=	23,204,801 GALLONS

WELLFIELD BLEED			
Third Quarter 2012			
MONTH	July	August	September
BLEED	1.7%	1.9%	1.7%

PLANT FLOW	
Third Quarter 2012	
AVERAGE OPERATING FLOW RATE=	6,244 GPM EOQ
TOTAL GALLONS PRODUCED=	827,265,270 GALLONS EOQ
TOTAL GALLONS INJECTED=	810,825,124 GALLONS EOQ

	TOTAL GALS.	TOTAL GALS.	HOURS IN	HOURS IN	AVERAGE	AVERAGE	AVERAGE	HRS. DOWN
	PRODUCED	INJECTED	MONTH	PRODUCTION	PROD. GPM	COM INJ GPM	REST INJ GPM	TIME
Prev. YTD	1,723,016,390	1,688,718,855	4,368	4,363	6,574	6,444	499	5
July	299,463,223	293,722,132	744	744	6,708	6,580	365	C
August	261,438,284	255,814,944	744	736	5,857	5,731	350	8
September	266,363,763	261,288,048	720	687	6,166	6,048	367	33
EOQ TOTAL	827,265,270	810,825,124	2,208	2,167	6,244	6,120	360	41
YTD TOTAL	2,550,281,660	2,499,543,979	6,576	6,530	6,464	6,335	453	46

	TOTAL MUII	TOTAL MUIII	TOTAL MUIV	TOTAL MUV	TOTAL MUVI	MUII BLEED	MUIII BLEED	MUIV BLEED	MUV BLEED	MUVI BLEED
	GALS PRODUCED	TO WASTE	TO WASTE	TO WASTE	TO WASTE	TO WASTE				
Prev. YTD	19,482,532	2 32,358,186	32,874,855	17,463,399	49,280,222	565,180	-5,806,482	11,367,540	10,415,348	4,356,420
July	3,559,204	3,695,239	3,469,074	1,512,098	7,722,315	1,543,851	-1,819,436	2,138,289	1,026,909	792,350
August	3,402,941	2,615,282	3,586,568	1,574,553	7,789,311	1,507,178	-1,741,071	2,396,771	790,362	574,622
September	3,286,107	2,635,561	3,618,164	1,422,595	7,348,073	966,326	-1,034,835	1,711,365	854,089	677,749
EOQ TOTAL	10,248,252	8,946,082	10,673,806	4,509,246	22,859,699	4,017,355	-4,595,342	6,246,425	2,671,360	2,044,721
YTD TOTAL	29,730,784	41,304,268	43,548,661	21,972,645	72,139,921	4,582,535	-10,401,824	17,613,965	13,086,708	6,401,141

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	TOTAL BRINE	TOTAL PERM	COMM BLEED	
	GALS PRODUCED	GALS PRODUCED	TO RO FEED	
Prev. YTD	19,620,429	67,374,983	(
July	3,068,260	9,136,130		
August	2,909,241	7,553,231	(
September	2,546,986			
EOQ TOTAL	8,524,487	23,035,973	(
YTD TOTAL	28,144,916		(

WASTE VOLUME						
Fourth Quarter 2012						
	PLANT TO	PLANT TO	RESTORATION	CLEAN WATER	DDW TOTAL	TRUCKS TO
TOTALIZER	PONDS	DDW 1 & 2	TO DDW	INTO PLANT	INJECTED	POND
October	638,670	4,833,950	2,678,330	404,326	7,512,280	57,000
November	709,160	4,699,531	3,518,054	440,904	8,217,585	51,000
December	888,440	4,514,810	5,415,968	583, 793	9,930,778	13,200
TOTAL GAL. EOQ	2,236,270	14,048,291	11,612,352	1,429,023	25,660,643	121,200

TOTAL 4th QTR VOLUME DISCHARGED TO WASTE PONDS =	2,357,470 GALLONS
TOTAL 4th QTR VOLUME DISCHARGED TO DEEP WELL=	25,660,643 GALLONS
TOTAL 4th QTR VOLUME DISCHARGED TO WASTE PONDS + DPWELL =	28,018,113 GALLONS
TOTAL 4th QTR VOLUME WF BLEED FROM WELLFIELDS=	26,467,890 GALLONS

WELLFIELD BLEED

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Fourth Quarter 2012			
MONTH	October	November	December
BLEED	1.7%	2.1%	2.4%

PLANT FLOW	
Fourth Quarter 2012	
AVERAGE OPERATING FLOW RATE=	6,711 GPM EOQ
TOTAL GALLONS PRODUCED=	889,025,957 GALLONS EOQ
TOTAL GALLONS INJECTED=	872,741,396 GALLONS EOQ

	TOTAL GALS.	TOTAL GALS.	HOURS IN	HOURS IN	AVERAGE	AVERAGE	AVERAGE	HRS. DOWN
	PRODUCED	INJECTED	MONTH	PRODUCTION	PROD. GPM	COM INJ GPM	REST INJ GPM	TIME
Prev. YTD	2,550,281,660	1,688,718,855	6,576	6,530	6,464	6,444	499	46
October	293,983,905	288,511,285	744	744	6,586	6,463	365	0
November	289,594,031	284,185,340	720	720	6,704	6,578	555	0
December	305,448,022	300,044,772	744	744	6,842	6,721	694	0
EOQ TOTAL	889,025,957	872,741,396	2,208	2,208		6,588	538	0
YTD TOTAL	3,439,307,617	2,561,460,251				4,860	474	46

	TOTAL MUI	TOTAL MUIII	TOTAL MUIV	TOTAL MUV	TOTAL MUVI	MUII BLEED	MUIII BLEED	MUIV BLEED	MUV BLEED	MUVI BLEED
	GALS PRODUCED	TO WASTE	TO WASTE	TO WASTE	TO WASTE	TO WASTE				
Prev. YTD	29,730,784	41,304,268	43,548,661	21,972,645	72,139,921	565,180	-5,806,482	11,367,540	10,415,348	4,356,420
October	3,576,726	2,972,541	3,748,135	1,437,709	7,788,489	1,088,478	-901,470	1,422,240	850,993	778,619
November	3,457,886	3,233,839	7,880,816	4,583,194	8,153,345	736,099	-1,141,192	1,323,638	1,727,876	666,380
December	3,456,478	4,003,824	11,928,670	8,212,901	8,461,386	979,567	-1,656,649	2,467,427	2,646,050	645,079
EOQ TOTAL	10,491,090	10,210,204	23,557,621	14,233,804	24,403,220	2,804,144	-3,699,311	5,213,305	5,224,919	2,090,078
YTD TOTAL	40,221,874	51,514,472	67,106,282	36,206,449	96,543,141	3, 369, 324	-9,505,793	16,580,845	15,640,267	6,446,498

	TOTAL BRINE	TOTAL PERM	COMM BLEED		
	GALS PRODUCED	GALS PRODUCED	TO RO FEED	1	
Prev. YTD	28,144,916	90,410,956	C		
October	2,678,330	5,867,882	c	· · · · · · · · · · · · · · · · · · ·	
November	3,518,054	13,351,145	C		
December	5,415,968	22,249,705	c		
EOQ TOTAL	11,612,352	41,468,732	C		
YTD TOTAL	39,757,268		C		

Appendix C

Wellfield Injection Pressures

Third and Fourth Quarter, 2012

				WELLFIELD	hird Quarter 201					
	WE UP	USE #3	WELC	USE #4		USE#5	WE HO	USE #6	WF HO	
	AVERAGE	MAXIMUM	AVERAGE			MAXIMUM				MAXIMUN
				MAXIMUM			AVERAGE	MAXIMUM	AVERAGE	
July	45	53	51	58	41	91	45	52	29	37
August	44	54	49	59	37	46	45	55	28	38
September	55	65	59	68	48	55	55	61	39	44
AVERAGE	48	65	53	68	42	91	48	61	32	44
		USE #8		USE #9		USE #10	WF HO		WF HOL	
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUN
July	38	44	37	44	30	36	0	0	4	6
August	38	60	35	44	29	38	0	8	4	5
September	49	56	46	51	39	48	25	40	3	10
AVERAGE	42	60	39	51	32	48	8	40	4	10
	WE HO	USE #13	WE HO	USE #14	WF HO	USE #15	WF HO	ISE #16	WF HOL	USF #17
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMU
huhu									· · · · ·	
July	0	0	47	59	0	0	0	2	4	5
August	0	2	46	57	0	0	0	2	4	5
September	0	2	56	64	0	2	1	2	4	7
AVERAGE	0	2	49	64	0	2	0	2	4	7
		USE #18		USE #19	WF HO		WF HO		WF HOL	
										,
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMU
July	39	46	0	0	13	24	77	84	73	74
August	50	57	0	0	5	20	74	86	73	74
September	35	48	1	28	23	69	74	80	87	92
AVERAGE										
AVERAGE	41	57	0	28	14	69	75	86	77	92
		USE #23	<u> </u>	USE #24		USE #25		JSE #26	WF HO	-
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMU
July	84	92	81	82	93	95	80	80	94	96
August	81	92	81	82	93	97	81	93	93	94
	85		i		93				· · ·	· · · · · · · · · · · · · · · · · · ·
September		92	91	95		95	91	96	91	96
AVERAGE	83	92	84	95	92	97	84	96	93	96
	WF HO	U\$E #28	WF HO	USE #29	WF HO	USE #30	WF HO	USE #31	WF HO	USE #32
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMU
July	75	81	83	89	78	86	53	59	58	66
-	i									
August	78	87	69	94	72	86	51	67	49	69
September	71	92	66	89	67	82	43	58	45	64
AVERAGE	74	92	73	94	72	86	49	67	51	69
	WE HO	USE #33	WEHO	USE #34	WE HO	USE #35	WE HO	JSE #36	WE HO	USE #37
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE					
						MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMU
July	62	69	91	92	92	94	90	93	90	92
August	61	86	91	93	92	95	90	92	91	93
September	55	68	88	94	86	94	87	92	89	95
AVERAGE	59	86	90	94	90	95	89	93	90	95
		USE #38	WF HO	USE #39	WF HO	USE #40	WF HO	USE #41	WF HO	USE #42
	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMU
July	89	96	83	90	89	92	92	94	93	96
August	89	92	83	86	90	92	87	95	89	96
September	86		80	84	87	92	88	93	91	96
-										
AVERAGE		92				92	89	95	91	96
	88	92 96	80	90	89					
			82	90 USE #44		USE #45		USE #46		JSE #46A
		96	82				WF HO		WF HOL	
luly	WF HO AVERAGE	96 USE #43 MAXIMUM	82 WF HO AVERAGE	USE #44 MAXIMUM	WF HO AVERAGE	MAXIMUM	WF HO AVERAGE	MAXIMUM	WF HOL AVERAGE	MAXIMU
	WF HO AVERAGE 95	96 USE #43 MAXIMUM 98	82 WF HO AVERAGE 94	USE #44 MAXIMUM 96	WF HO AVERAGE 94	MAXIMUM 98	WF HO AVERAGE 88	MAXIMUM 89	WF HOL AVERAGE 93	MAXIMU 94
August	WF HO AVERAGE 95 89	96 USE #43 MAXIMUM 98 95	82 WF HO AVERAGE 94 90	USE #44 MAXIMUM 96 96	WF HO AVERAGE 94 90	MAXIMUM 98 96	WF HO AVERAGE 88 88	MAXIMUM 89 89	WF HOL AVERAGE 93 94	MAXIMU 94 95
August September	WF HO AVERAGE 95	96 USE #43 MAXIMUM 98	82 WF HO AVERAGE 94	USE #44 MAXIMUM 96	WF HO AVERAGE 94	MAXIMUM 98	WF HO AVERAGE 88	MAXIMUM 89	WF HOL AVERAGE 93	MAXIMU 94
August September	WF HO AVERAGE 95 89	96 USE #43 MAXIMUM 98 95	82 WF HO AVERAGE 94 90	USE #44 MAXIMUM 96 96	WF HO AVERAGE 94 90	MAXIMUM 98 96	WF HO AVERAGE 88 88	MAXIMUM 89 89	WF HOL AVERAGE 93 94	MAXIMU 94 95
August September	WF HO AVERAGE 95 89 90 91	96 USE #43 MAXIMUM 98 95 95 96	82 WF HO AVERAGE 94 90 90 90 91	USE #44 MAXIMUM 96 96 96	WF HO AVERAGE 94 90 90 90 91	MAXIMUM 98 96 96	WF HO AVERAGE 88 88 85 85 87	MAXIMUM 89 89 90	WF HOL AVERAGE 93 94 91 93	MAXIMU 94 95 96
August September	WF HO AVERAGE 95 89 90 91 91 WF HO	96 USE #43 MAXIMUM 98 95 96 96 98 USE #47	82 WF HO AVERAGE 94 90 90 91 WF HOL	USE #44 MAXIMUM 96 96 96 96 USE #47A	WF HO AVERAGE 94 90 90 91 WF HO	MAXIMUM 98 96 96 98 USE #48	WF HO AVERAGE 88 88 85 85 87 WF HO	MAXIMUM 89 89 90 90 JSE #49	WF HOL AVERAGE 93 94 91 93 WF HO	MAXIMU 94 95 96 96 USE #50
August September AVERAGE	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM	82 WF HO AVERAGE 94 90 90 90 91 WF HOU AVERAGE	USE #44 MAXIMUM 96 96 96 96 95 JSE #47A MAXIMUM	WF HO AVERAGE 94 90 90 91 WF HO AVERAGE	MAXIMUM 98 96 96 98 USE #48 MAXIMUM	WF HO AVERAGE 88 85 85 87 WF HO AVERAGE	MAXIMUM 89 90 90 USE #49 MAXIMUM	WF HOL AVERAGE 93 94 91 93 WF HO AVERAGE	MAXIMU 94 95 96 96 USE #50 MAXIMU
August September AVERAGE July	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96	82 WF HO AVERAGE 94 90 90 91 WF HOI AVERAGE 55	USE #44 MAXIMUM 96 96 96 96 JSE #47A MAXIMUM 59	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91	MAXIMUM 98 96 96 98 USE #48 MAXIMUM 92	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91	MAXIMUM 89 90 90 USE #49 MAXIMUM 95	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91	MAXIMU 94 95 96 96 USE #50 MAXIMU 92
August September AVERAGE July August	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96	82 WF HO AVERAGE 94 90 90 90 91 WF HOU AVERAGE	USE #44 MAXIMUM 96 96 96 96 95 JSE #47A MAXIMUM	WF HO AVERAGE 94 90 90 91 WF HO AVERAGE	MAXIMUM 98 96 96 98 USE #48 MAXIMUM 92 93	WF HO AVERAGE 88 85 85 87 WF HO AVERAGE	MAXIMUM 89 90 90 USE #49 MAXIMUM	WF HOL AVERAGE 93 94 91 93 WF HO AVERAGE	MAXIMU 94 95 96 96 USE #50 MAXIMU
August September AVERAGE July August	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96	82 WF HO AVERAGE 94 90 90 91 WF HOI AVERAGE 55	USE #44 MAXIMUM 96 96 96 96 JSE #47A MAXIMUM 59	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91	MAXIMUM 98 96 96 98 USE #48 MAXIMUM 92	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91	MAXIMUM 89 90 90 USE #49 MAXIMUM 95	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91	MAXIMUI 94 95 96 96 USE #50 MAXIMUI 92
August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95	82 WF HO AVERAGE 94 90 90 91 WF HOI AVERAGE 55 55 54 53	USE #44 MAXIMUM 96 96 96 96 96 SE #47A MAXIMUM 59 58 58 57	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 86	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 93	WF HO AVERAGE 88 88 85 87 WF HO AVERAGE 91 92 89	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 95 93	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 89	MAXIMU 94 95 96 96 USE #50 MAXIMU 92 94 94
August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95	82 WF HO AVERAGE 94 90 90 91 WF HOU AVERAGE 55 55 54 53 54	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 96 95 95 55 58 57 59	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 91 86 89	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93	WF HO AVERAGE 88 88 85 87 WF HO AVERAGE 91 92 89 91	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 95 93 93	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 89 90	MAXIMU 94 95 96 05 #50 MAXIMU 92 94 94
August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 95 95 95	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 55 54 53 54 53 54 WF HO	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 95 95 59 58 57 59 USE #52	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 86 89 WF HO	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93 92 93	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 95 93 95 USE #54	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 91 91 91 91 89 90 WF HOL	MAXIMU 94 95 96 USE #50 MAXIMU 92 94 94 94 USE #55
August September AVERAGE July July August September AVERAGE	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 96 USE #51 MAXIMUM	82 WF HO AVERAGE 94 90 90 90 91 WF HO AVERAGE 55 54 54 WF HO AVERAGE	USE #44 MAXIMUM 96 96 96 96 98 87 8 8 8 58 59 58 57 59 USE #52 MAXIMUM	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 86 89 WF HO AVERAGE	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93 USE #53 USE #53	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE	MAXIMUM 89 90 90 95 95 93 95 95 95 95 95 95 95 95 95 95	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 93 WF HOL AVERAGE 91 91 91 91 91 91 89 90 WF HOL AVERAGE	MAXIMU 94 95 96 96 USE #50 MAXIMU 92 94 94 94 94 94 94 USE #55 MAXIMU
August September AVERAGE July August September AVERAGE	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 95 95 95	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 55 54 53 54 53 54 WF HO	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 95 95 59 58 57 59 USE #52	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 86 89 WF HO	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93 92 93	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 93 93 95 USE #54	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 91 91 91 91 89 90 WF HOL	MAXIMU 94 95 96 USE #50 MAXIMU 92 94 94 94 USE #55
August September AVERAGE July August September AVERAGE	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 96 USE #51 MAXIMUM	82 WF HO AVERAGE 94 90 90 90 91 WF HO AVERAGE 55 54 54 WF HO AVERAGE	USE #44 MAXIMUM 96 96 96 96 98 87 8 8 8 58 59 58 57 59 USE #52 MAXIMUM	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 86 89 WF HO AVERAGE	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93 USE #53 USE #53	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE	MAXIMUM 89 90 90 95 95 93 95 95 95 95 95 95 95 95 95 95	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 93 WF HOL AVERAGE 91 91 91 91 91 91 89 90 WF HOL AVERAGE	MAXIMU 94 95 96 96 USE #50 MAXIMU 92 94 94 94 94 94 94 USE #55 MAXIMU
August September AVERAGE July August September AVERAGE July Luly August	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 91 WF HO AVERAGE 91	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 96 USE #51 MAXIMUM 93	82 WF HO AVERAGE 94 90 90 90 90 91 WF HO AVERAGE 55 54 53 54 84 WF HO AVERAGE 92	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 847A MAXIMUM 59 58 57 59 USE #52 USE #52 MAXIMUM 93	WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 91 91 86 89 WF HO AVERAGE 91 91 92	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93 USE #53 USE #53 MAXIMUM 94	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 95 93 95 USE #54 MAXIMUM 71	WF HOL AVERAGE 93 94 91 93 WF HO AVERAGE 91 91 91 92 93 WF HO AVERAGE 91 89 90 WF HO AVERAGE 70 68	MAXIMU 94 95 96 USE #50 MAXIMU 92 94 94 94 USE #55 MAXIMU 79
August September AVERAGE July August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 91 91 92 88	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 95 95 95 95 95 96 USE #51 MAXIMUM 93 93 94	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 91 89 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 96 96 92 94 94 94 94 94 94 94 94 94 94 94 94 94
August September AVERAGE July August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 91 92 88 90	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 96 USE #51 MAXIMUM 93 94 92 94	82 WF HO AVERAGE 94 90 90 90 91 WF HO AVERAGE 55 55 54 53 54 WF HO AVERAGE 92 92	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 96 95 85 85 57 59 USE #52 USE #52 MAXIMUM 93 94	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 91 86 89 WF HO AVERAGE 91 92 92	MAXIMUM 98 96 98 USE #48 MAXIMUM 92 93 92 93 92 93 USE #53 MAXIMUM 94 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72	MAXIMUM 89 90 90 USE #49 MAXIMUM 95 95 95 USE #54 MAXIMUM 71 92	WF HOL AVERAGE 93 94 91 93 WF HO AVERAGE 91 91 91 92 93 WF HO AVERAGE 91 89 90 WF HO AVERAGE 70 68	MAXIMU 94 95 96 96 USE #50 MAXIMU 92 94 94 94 94 USE #55 MAXIMU 81
August September AVERAGE July August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 83 90 91 WF HO AVERAGE 91 WF HO AVERAGE 91 92 88 90 WF HO	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 95 95 95 95 95 95 95 95 95 95 95	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 96 96 92 94 94 94 94 94 94 94 94 94 94 94 94 94
August September AVERAGE July August September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 91 92 88 90	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 96 USE #51 MAXIMUM 93 94 92 94	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 96 96 92 94 94 94 94 94 94 94 94 94 94 94 94 94
August September AVERAGE July August September AVERAGE July September AVERAGE	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 83 90 91 WF HO AVERAGE 91 WF HO AVERAGE 91 92 88 90 WF HO	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 95 95 95 95 95 95 95 95 95 95 95 95	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 96 96 92 94 94 94 94 94 94 94 94 94 94 94 94 94
August September AVERAGE July August September AVERAGE July August September AVERAGE	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 83 90 91 WF HO AVERAGE 91 92 88 90 WF HO AVERAGE 90 WF HO AVERAGE 70	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 96 95 96 USE #51 MAXIMUM 93 94 92 94 USE #55 MAXIMUM 82	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 USE #50 92 94 94 94 94 94 94 94 94 94 94 94 94 94
August September AVERAGE July August September AVERAGE July August September AVERAGE July August Aug	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 91 92 88 90 WF HO AVERAGE 70 74	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 96 95 96 95 96 USE #51 MAXIMUM 93 94 92 94 92 94 92 94 USE #55 MAXIMUM 82 77	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 USE #50 92 94 94 94 94 94 94 94 94 94 94 94 94 94
July August September AVERAGE July July August September AVERAGE July Luly August September July September AVERAGE July August September	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 83 90 91 WF HO AVERAGE 91 WF HO AVERAGE 91 92 88 90 WF HO AVERAGE 70 74 72	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 95 96 95 96 USE #51 MAXIMUM 93 94 92 94 USE #55 MAXIMUM 82 77 77 84	82 WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 55 54 53 54 WF HO AVERAGE 92 92 88	USE #44 MAXIMUM 96 96 96 96 96 96 96 96 96 95 85 85 59 USE #47A MAXIMUM 93 93 93 92	WF HO AVERAGE 94 90 91 WF HO AVERAGE 91 96 91 86 89 WF HO AVERAGE 91 86 89 WF HO AVERAGE 92 92 88	MAXIMUM 98 96 98 98 USE #48 MAXIMUM 92 93 92 93 USE #53 MAXIMUM 94 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 USE #50 92 94 94 94 94 94 94 94 94 94 94 94 94 94
August September AVERAGE July August September AVERAGE July August September AVERAGE July August Aug	WF HO AVERAGE 95 89 90 91 WF HO AVERAGE 94 89 90 91 WF HO AVERAGE 91 92 88 90 WF HO AVERAGE 70 74 72 73	96 USE #43 MAXIMUM 98 95 96 98 USE #47 MAXIMUM 96 96 95 96 95 96 USE #51 MAXIMUM 93 94 94 92 94 USE #55 MAXIMUM 82 77 84	82 WF HO AVERAGE 94 90 90 90 90 90 90 AVERAGE 92 92 88 90 90	USE #44 MAXIMUM 96 96 96 96 96 95 85 #47A MAXIMUM 59 58 57 59 USE #52 USE #52 MAXIMUM 93 94 94 92 94	WF HO AVERAGE 94 90 90 91 WF HO AVERAGE 91 91 86 89 WF HO AVERAGE 92 92 88 90	MAXIMUM 98 96 96 98 USE #48 MAXIMUM 92 93 92 93 92 93 USE #53 MAXIMUM 94 95 95 95 95	WF HO AVERAGE 88 85 87 WF HO AVERAGE 91 92 89 91 WF HO AVERAGE 69 72 70	MAXIMUM 89 89 90 90 USE #49 MAXIMUM 95 93 95 USE #54 MAXIMUM 71 92 75	WF HOL AVERAGE 93 94 91 93 WF HOL AVERAGE 91 91 93 WF HOL AVERAGE 91 93 WF HOL AVERAGE 90 WF HOL AVERAGE 70 68 61	MAXIMU 94 95 96 96 96 96 96 94 94 94 94 94 94 94 94 94 94 94 94 94
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Appendix D

Deep Disposal Well Injection Radiological Data

Third and Fourth Quarter, 2012

Crow Butte Uranium Mine Deep Disposal Well #1 Injection Radiological Data

Month	Total Gallons Injected	Average Natural Uranium (mg/l)	Total Natural Uranium Injected (mg)	Total Natural Uranium Injected (μCi)	Average Radium-226 (pCi/l)	Total Radium-226 Injected (μCi)
July-12	5,615,358	2	4.25E+07	2.88E+04	593	1.26E+04
August-12	5,290,499	4	8.01E+07	5.42E+04	568	1.14E+04
September-12	4,598,394	4	6.96E+07	4.71E+04	712	1.24E+04
October-12	5,688,878	3	6.46E+07	4.37E+04	794	1.71E+04
November-12	6,458,651	5	1.22E+08	8.28E+04	1,110	2.71E+04
December-12	8,157,401	4	1.24E+08	8.36E+04	828	2.56E+04
Totals	35,809,181		5.03E+08	3.40E+05		1.06E+05

Crow Butte Uranium Mine Deep Disposal Well #2 Injection Radiological Data

Month	Total Gallons Injected	Average Natural Uranium (mg/l)	Total Natural Uranium Injected (mg)	Total Natural Uranium Injected (μCi)	Average Radium-226 (pCi/l)	Total Radium-226 Injected (μCi)
July-12	1,873,150	1	7.09E+06	4.80E+03	895	6.35E+03
August-12	1,859,679	1	7.04E+06	4.77E+03	836	5.88E+03
September-12	1,779,184	1	6.73E+06	4.56E+03	896	6.03E+03
October-12	1,823,402	1	6.90E+06	4.67E+03	894	6.17E+03
November-12	1,758,934	2	1.33E+07	9.02E+03	824	5.49E+03
December-12	1,773,377	2	1.34E+07	9.09E+03	1,370	9.20E+03
Totals	10,867,726		5.45E+07	3.69E+04		3.91E+04

Appendix E

Radon Release Calculations

Third and Fourth Quarter, 2012

		Radon E	ffluent Releas	se Calculation	(Product	tion and S	tartup)			
		Т	hird Quarter 2012	Radon Release fro	om Leaching	g Operations:				
Curies/M3	Production Flow (liters)	Radon-222 Decay Constant	Operating Days	Operating Factor	M3/liter conversion	Hours/Day Conversion	Minutes/Hour Conversion	Total Radon Release from Leaching		
7.04E-04	23,636	0.72	92	98.1%	0.001	24	60	1,557		
Fourth Quarter 2012 Radon Release from Leaching Operations:										
								Total Radon		
Curies/M3	Production Flow (liters)	Radon-222 Decay Constant	Operating Days	Operating Factor	M3/liter conversion	Hours/Day Conversion	Minutes/Hour Conversion	Release from Leaching		
7.04E-04	25.404	0.72	92	100.0%	0.001	24	60	1,706		
			Second Half	2012 Radon Rele	ase From St	artup:				
	Curies/M3	Total Acres of New Wellfield	Meter3/Acre Conversion	Orebody Thickness (meters)	Porosity			Total Radon Release from Startup		
	7.04E-04	10.0	4,074	1.52	0.29			13		
		Tota	l Estimated Rad	on Release from	Production	:		3,276		
		Ra	don Effluent]	Release Calcu	lation (R	estoration	l)			
			Second Half 2	012 Radon Releas	e From Res	toration:				
	Total									
	Restoration Flow (liters)	Microcuries/liter	Curies/Microcurie	Production Potential						
_	530,459,550	0.697	1.00E-06	370						
	Wellfie	ld Loss (25% of Pro	duction Potential):					92		
lon	Exchange Loss	10% of Production 1	Potential minus Well	field Loss):				28		
Rever	se Osmosis Loss	s (100% of remaining	activity at 0.470 mic	rocuries/liter)				151		
		Total Reverse Osmosis Flow (liters)	Microcuries/liter	Curies/Microcurie						
		320,402,100	0.470	1.00E-06						
		Seco	ond Half 2012 Rad	Ion Release From	Startup of N	lew Restorati	o n :			
		Total Acres of	Meter3/Acre	Orebody Thickness			······································	Total Radon Release from		
	Curies/M3	New Wellfield	Conversion	(meters)	Porosity			Startup		
L	7.04E-04	1.0	4074	1.52	0.29			1		
		Total	Estimated Rade	on Release from	Restoratio	n:		272		
		Total Est	imated Rado	n Release, Sec	ond Half	2012:		3,548		

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Appendix F

Environmental Air Monitoring Results

Third and Fourth Quarter, 2012

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Crow Butte Resources, Inc.

Crow Butte Uranium Project

Track Etch Cup Ambient Radon Concentrations

Air Monitoring Station No.

Period: June 29, 2012 to January 2, 2013

	Gross Count	Average Radon Concentration (x 10 ⁻⁹ μCi/ml)	Accuracy (x 10 ⁻⁹ µCi/ml)	Percent Effluent Concentration
AM-1	175.0	0.4	0.03	4.0%
AM-2	267.0	0.9	0.06	9.0%
AM-3	198.0	0.5	0.04	5.0%
AM-4	152.0	0.4	0.03	4.0%
AM-5	300.0	1.0	0.06	10.0%
AM-6	331.0	1.3	0.07	13.0%
AM-8	165.0	0.5	0.04	5.0%
AB-1 (AM-1 Duplicate)	212.0	0.6	0.04	6.0%
AB-2 (AM-2 Duplicate)	255.0	0.8	0.05	8.0%
AB-6 (AM-6 Duplicate)	300.0	1.1	0.06	11.0%
LLD (x 10 ⁻⁹ µCi/ml)				0.2
Effluent Concentration Lin	nit, 10 CFR 20 A	pp B Column 2:		10

Crow Butte Resources Crow Butte Uranium Project

			Perimete	er Air Monitor	ing Stations			
	Result	Precision <u>+</u>	Result	Precision <u>+</u>	RL	10 CFR Pt 20	Effluent	% Effluent
Analyte	pCi/filter	pCi/filter	uCi/ml	uCi/ml	uCi/ml	Effluent Limit	Class	Concentration
			1	Chird Quarter 2	012			
AM-1 [Samp]	le Air Volume	6,190,139 lite	rs					
Lead 210	134.0	7.3	2.E-14	1.E-15	2.E-15	6.E-13	Day	3.33
Radium 226	0.3	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	<0.3		<1E-16		1.E-16	9.E-14	Year	0.00
AM-2 [Samp	le Air Volume	6,482,331 lite	rs]					
Lead 210	17.8	3.4	3.E-15	5.E-16	2.E-15	6.E-13	Day	0.50
Radium 226	< 0.3		<1E-16		1.E-16	. 9.E-13	Week	0.00
Uranium	0.4		<1E-16		1.E-16	9.E-14	Year	0.00
AM-3 [Samp	le Air Volume	5,907,150 lite	rs					
Lead 210	369.0	23.0	6.E-14	4.E-15	2.E-15	6.E-13	Day	10.00
Radium 226	0.4	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.4		<1E-16		1.E-16	9.E-14	Year	0.00
AM-4 [Samp]	le Air Volume	6,490,229 lite	rs]					
Lead 210	139.0	7.6	2.E-14	1.E-15	2.E-15	6.E-13	Day	3.33
Radium 226	0.3	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.3		<1E-16		1.E-16	9.E-14	Year	0.00
AM-5 [Samp]	le Air Volume	6,256,253 lite	rs]					
Lead 210	133.0	7.6	2.E-14	1.E-15	2.E-15	6.E-13	Day	3.33
Radium 226	0.6	0.2	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.5		<1E-16		1.E-16	9.E-14	Year	0.00
AM-6 [Samp	le Air Volume	5,789,301 lite	rs]					
Lead 210	128.0	7.2	2.E-14	1.E-15	2.E-15	6.E-13	Day	3.33
Radium 226	0.3	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	<0.3		<1E-16		1.Ē-16	9.E-14	Year	0.00
AM-8 (Samp	le Air Volume	6,122,114 lite	rs]					
Lead 210	69.6 ·	6.3	1.E-14	1.E-15	2.E-15	6.E-13	Day	1.67
Radium 226	0.5	0.8	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.4		<1E-16		1.E-16	9.E-14	Year	0.00

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Perimeter Air Monitoring Stations

RL – Reporting Limit

uCi/ml – microuries per milliliter

pCi/filter – picocuries per filter

Crow Butte Resources Crow Butte Uranium Project

Analyte	Result	Precision <u>+</u>	Result	er Air Monitor Precision <u>+</u>	RL	10 CFR Pt 20	Effluent	% Effluent
Analyte	pCi/filter	pCi/filter	uCi/ml	uCi/ml	uCi/ml uCi/mł		Class	Concentration
			F	ourth Quarter 2	2012			
AM-1 [Samp]	le Air Volume	6,584,909 lite	rs]					
Lead 210	120.0	5.7	2.E-14	9.E-16	2.E-15	6.E-13	Day	3.33
Radium 226	0.3	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	<0.3		<1E-16		1.E-16	9.E-14	Year	0.00
AM-2 [Samp	le Air Volume	6,591,462 lite	rs					
Lead 210	139.0	6.4	2.E-14	5.E-16	2.E-15	6.E-13	Day	3.33
Radium 226	<0.3		<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.4		<1E-16		1.E-16	9.E-14	Year	0.00
AM-3 [Samp]	le Air Volume	6,359,539 lite	rs]					
Lead 210	115.0	5.5	2.E-14	9.E-16	2.E-15	6.E-13	Day	3.33
Radium 226	<0.3		<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	<0.3		<1E-16		1.E-16	9.E-14	Year	0.00
AM-4 [Sampl	le Air Volume	6,504,532 lite	rs]					
Lead 210	129.0	5.9	2.E-14	9.E-16	2.E-15	6.E-13	Day	3.33
Radium 226	0.4	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.4		<1E-16		1.E-16	9.E-14	Year	0.00
AM-5 [Sampl	le Air Volume	6,595,507 lite	rs]					
Lead 210	129.0	5.8	2.E-14	9.E-16	2.E-15	6.E-13	Day	3.33
Radium 226	0.3	0.1	<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	0.3		<1E-16		1.E-16	9.E-14	Year	0.00
AM-6 [Sampl	le Air Volume	6,655,020 lite	rs]					
Lead 210	131.0	5.9	2.E-14	9.E-16	2.E-15	6.E-13	Day	3.33
Radium 226	<0.3		<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	<0.3		<1E-16		1.E-16	9.E-14	Year	0.00
AM-8 (Sampl	le Air Volume	7,070,811 lite	rs]					
Lead 210	79.1	4.7	1.E-14	7.E-16	2.E-15	6.E-13	Day	1.67
Radium 226	<0.3		<1E-16		1.E-16	9.E-13	Week	0.00
Uranium	<0.3		<1E-16		1.E-16	9.E-14	Year	0.00

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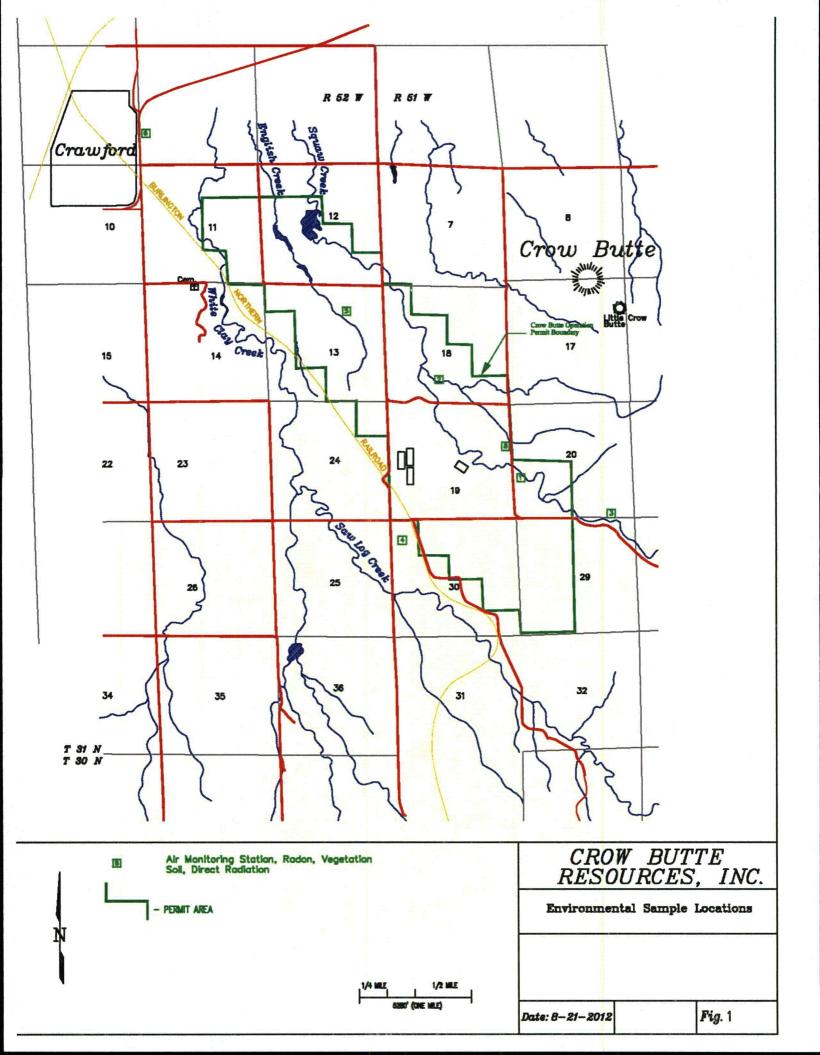
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Perimeter Air Monitoring Stations

RL – Reporting Limit

uCi/ml – microuries per milliliter

pCi/filter – picocuries per filter



			Average		
Monitoring		Average Concentration/Annual	Concentration/Annual Gamma Dose	10 CFR 20 App. B, Table 2	Dose to the Public
_					mrem/yr ¹
Location/Parameter		<u>Gamma Dose</u>	Above Background	<u>Values</u>	<u>mren/yr</u>
<u>AM-6</u>	Uranium (µCi/ml)	2.E-16		9.E-14	
Background	Radium-226 (µCi/ml)	1.E-16		9.E-13	
	Lead-210 (µCi/ml)	2.E-14		6.E-13	
	Radon-222 (µCi/ml)	6.E-10		1.E-08	
	Gamma (mrem/yr)	36.0			
	TEDE (mrem/yr)				Background
<u>AM-1</u>	Uranium (µCi/ml)	2.E-16	0	9.E-14	0.00
Residence	Radium-226 (µCi/ml)	1.E-16	0	9.E-14	0.00
Restuence	Lead-210 (μ Ci/ml)	2.E-14	0	6.E-13	0.00
	Radon-222 (µCi/ml)	3.E-10	0	1.E-08	0.00
		30	0		0.00
	Gamma (mrem/yr) TEDE (mrem/yr)	50	U		0.00
	TEDE (mrenvyr)				0.00
<u>AM-2</u>	Uranium (µCi/ml)	3.E-16	1.E-16	9.E-14	0.06
Nearest Downwind Residence	Radium-226 (µCi/ml)	1.E-16	0	9.E-13	0.00
	Lead-210 (µCi/ml)	2.E-14	0	6.E-13	0.00
	Radon-222 (µCi/ml)	6.E-10	0	1.E-08	0.00
	Gamma (mrem/yr)	37	1.0		1.00
	TEDE (mrem/yr)				1.06
AM-3	Uranium (µCi/ml)	2.E-16	0	9.E-14	0.00
Permit Area Boundary	Radium-226 (µCi/ml)	1.E-16	0 0	9.E-13	0.00
i et ille Al ea Boundary	Lead-210 (μ Ci/ml)	3.E-14	1.E-14	6.E-13	0.83
	Radon-222 (μ Ci/ml)	4.E-10	0	1.E-08	0.00
	Gamma (mrem/yr)	34	0		0.00
	TEDE (mrem/yr)	-	v		0.83
<u>AM-4</u>	Uranium (µCi/ml)	2.E-16	0	9.E-14	0.00
Permit Area Boundary	Radium-226 (µCi/ml)	1.E-16	0	9.E-13	0.00
	Lead-210 (µCi/ml)	2.E-14	0	6.E-13	0.00
	Radon-222 (µCi/ml)	4.E-10	0	1.E-08	0.00
	Gamma (mrem/yr)	25.0	0		0
	TEDE (mrem/yr)				0.00
AM-5	Uranium (µCi/ml)	2.E-16	0	9.E-14	0.00
Residence	Radium-226 (µCi/ml)	1.E-16	0	9.E-13	0.00
	Lead-210 (µCi/ml)	2.E-14	0	6.E-13	0.00
	Radon-222 (µCi/ml)	8.E-10	2.E-10	1.E-08	1.00
	Gamma (mrem/yr)	36	0		0
	TEDE (mrem/yr)	•••	Ť		1.00
	United Ct 1	251/	0	0514	0.00
<u>AM-8</u>	Uranium (µCi/ml)	2.E-16	0	9.E-14	0.00
Site Boundary	Radium-226 (μ Ci/ml)	1.E-16	0	9.E-13	0.00
	Lead-210 (µCi/ml)	2.E-14	0	6.E-13	0.00
	Radon-222 (µCi/ml)	4.E-10	0	1.E-08	0.00
	Gamma (mrem/yr)	45	9.0		9.00
	TEDE (mrem/yr)				9.00

2012 DOSE TO PUBLIC CALCULATIONS

Notes:

Total Effective Dose Equivalent (mrem/yr)

One or more of the Lower Limits of Detection (LLD) used to determine average concentration.

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TEDE

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Dose from radionuclides ($1 \frac{\text{Avg concentration above background in } \mu Ci/ml$) * 50 mrem 10 CFR 20 AppB, Table 2 value in $\mu Ci/ml$

Appendix G

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Environmental OSL Monitoring Results

Third and Fourth Quarter, 2012

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Crow Butte Resources Crow Butte Uranium Project Perimeter Air Monitoring Stations

Location	Exposure of Dosimeter (mrems ambient dose equivalent)		Net Cumulative Totals									
	Gross	Gross Net		Year to Date	Permanent							
07/01/2012 - 09/30/2012												
Transient Control		0.0	Q3	2012								
Deploy Control	30.6	0.0										
AM-1	35.1	4.6	4.6	21.8	151.5							
AM-2	38.4	7.9	7.9	27.4	155.9							
AM-3	38.4	7.9	7.9	24.0	167.9							
AM-4	37.0	6.4	6.4	18.8	125.1							
AM-5	35.9	5.3	5.3	28.0	167.2							
AM-6	39.2	8.7	8.7	27.4	155.6							
AM-8	40.2	9.6	9.6	31.7	203.8							

Gamma Exposure Results

mrem - millirems

AM-1 air sampling locations

Minimum Detectable Dose = 0.1 mrems ambient dose equivalent

Crow Butte Resources Crow Butte Uranium Project Perimeter Air Monitoring Stations

	Exposure o	f Dosimeter	t dose Net Cumulative Totals									
Location		nbient dose alent)										
	Gross	Net	Calendar Quarter	Year to Date	Permanent							
10/01/2012 - 12/31/2012												
Transient Control		0.0	Q4	2012								
Deploy Control	27.5	0.0										
AM-1	35.2	7.8	7.8	29.6	159.3							
AM-2	36.9	9.5	9.5	48.1	176.6							
AM-3	37.8	10.3	10.3	34.3	178.2							
AM-4	33.6	6.2	· 6.2	25.0	131.3							
AM-5	35.9	8.4	8.4	36.4	175.6							
AM-6	36.5	9.0	9.0	36.4	164.6							
AM-8	40.6	13.1	13.1	44.8	216.9							

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Gamma Exposure Results

mrem – millirems

AM-1 air sampling locations

Minimum Detectable Dose = 0.1 mrems ambient dose equivalent

Appendix H

Sediment Monitoring Results

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Third and Fourth Quarter, 2012



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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

 Client:
 Crow Butte Resources

 Project:
 Annual Sediment Samples 2012

 Lab ID:
 C12110476-001

 Client Sample ID:
 Stream E-5

Revised Date: 02/20/13 Report Date: 12/18/12 Collection Date: 11/01/12 DateReceived: 11/09/12 Matrix: Sediment

Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
0.7	mg/kg-dry		0.3		SW6020	11/27/12 23:22 / cp
0.5	pCi/g-dry		0.2		SW6020	11/27/12 23:22 / cp
0.5	pCi/g-dry		0.2		E909.0	12/15/12 01:09 / eli-cs
0.1	pCi/g-dry				E909.0	12/15/12 01:09 / eli-cs
0.2	pCi/g-dry				E909.0	12/15/12 01:09 / eli-cs
0.7	pCi/g-dry		0.04		E903.0	12/04/12 10:26 / trs
0.08	pCi/g-dry				E903.0	12/04/12 10:26 / trs
0.04	pCi/g-dry				E903.0	12/04/12 10:26 / trs
0.5	pCi/g-dry		0.3		E908.0	11/28/12 10:17 / dmf
0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
0.3	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
	0.7 0.5 0.1 0.2 0.7 0.08 0.04 0.5 0.2	0.5 pCi/g-dry 0.5 pCi/g-dry 0.1 pCi/g-dry 0.2 pCi/g-dry	0.7 mg/kg-dry 0.5 pCi/g-dry 0.1 pCi/g-dry 0.2 pCi/g-dry 0.2 pCi/g-dry 0.7 pCi/g-dry 0.08 pCi/g-dry 0.04 pCi/g-dry 0.5 pCi/g-dry 0.2 pCi/g-dry	0.7 mg/kg-dry 0.3 0.5 pCi/g-dry 0.2 0.5 pCi/g-dry 0.2 0.1 pCi/g-dry 0.2 0.1 pCi/g-dry 0.2 0.7 pCi/g-dry 0.04 0.08 pCi/g-dry 0.04 0.04 pCi/g-dry 0.3 0.2 pCi/g-dry 0.3 0.2 pCi/g-dry 0.3	Result UnitsQualifiersRLQCL0.7mg/kg-dry0.30.5pCi/g-dry0.20.5pCi/g-dry0.20.1pCi/g-dry0.20.2pCi/g-dry0.40.2pCi/g-dry0.040.3pCi/g-dry0.040.4pCi/g-dry0.30.5pCi/g-dry0.30.2pCi/g-dry0.3	Result Units Qualifiers RL QCL Method 0.7 mg/kg-dry 0.3 SW6020 0.5 pCi/g-dry 0.2 SW6020 0.5 pCi/g-dry 0.2 SW6020 0.5 pCi/g-dry 0.2 SW6020 0.5 pCi/g-dry 0.2 SW6020 0.1 pCi/g-dry E909.0 E909.0 0.2 pCi/g-dry E909.0 E909.0 0.7 pCi/g-dry E909.0 E903.0 0.7 pCi/g-dry E903.0 E903.0 0.4 pCi/g-dry E903.0 E903.0 0.5 pCi/g-dry E903.0 E908.0 0.2 pCi/g-dry E908.0 E908.0

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

	Prepared by Casper, WY Branch	Revised Date:	02/20/13
Client:	Crow Butte Resources	Report Date:	12/18/12
Project:	Annual Sediment Samples 2012	Collection Date:	11/01/12
Lab ID:	C12110476-002	DateReceived:	11/09/12
Client Sample ID:	Impoundent I5	Matrix:	Sediment

Analyses	 Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL			#*************************************			- 10. - 10.	*
Uranium	10.0	mg/kg-dry		0.3		SW6020	11/27/12 23:25 / cp
Uranium, Activity	6.8	pCi/g-dry		0.2		SW6020	11/27/12 23:25 / cp
RADIONUCLIDES							
Lead 210	0.7	pCi/g-dry		0.2		E909.0	12/15/12 03:14 / eli-cs
Lead 210 precision (±)	0.1	pCi/g-dry				E909.0	12/15/12 03:14 / eli-cs
Lead 210 MDC	0.2	pCi/g-dry				E909.0	12/15/12 03:14 / eli-cs
Radium 226	0.4	pCi/g-dry		0.03		E903.0	12/04/12 10:26 / trs
Radium 226 precision (±)	0.06	pCi/g-dry				E903.0	12/04/12 10:26 / trs
Radium 226 MDC	0.03	pCi/g-dry				E903.0	12/04/12 10:26 / trs
Thorium 230	0.3	pCi/g-dry		0.3		E908.0	11/28/12 10:17 / dmf
Thorium 230 precision (±)	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
Thorium 230 MDC	0.3					E908.0	11/28/12 10:17 / dmf

Report Definitions:

RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Revised Date: 02/20/13 Report Date: 12/18/12 Client: **Crow Butte Resources** Project: Annual Sediment Samples 2012 Collection Date: 11/01/12 DateReceived: 11/09/12 Lab ID: C12110476-003 Matrix: Sediment Client Sample ID: Stream S2

				MCL/			
Analyses	Result	Units	Qualifiers	RL	QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.7	mg/kg-dry		0.3		SW6020	11/27/12 23:38 / cp
Uranium, Activity	0.5	pCi/g-dry		0.2		SW6020	11/27/12 23:38 / cp
RADIONUCLIDES							
Lead 210	0.6	pCi/g-dry		0.2		E909.0	12/15/12 05:19 / eli-c:
Lead 210 precision (±)	0.1	pCi/g-dry				E909.0	12/15/12 05:19 / eli-c:
Lead 210 MDC	0.2	pCi/g-dry				E909.0	12/15/12 05:19 / eli-c:
Radium 226	0.3	pCi/g-dry		0.04		E903.0	12/04/12 10:26 / trs
Radium 226 precision (±)	0.06	pCi/g-dry				E903.0	12/04/12 10:26 / trs
Radium 226 MDC	0.04	pCi/g-dry				E903.0	12/04/12 10:26 / trs
Thorium 230	<0.2	pCi/g-dry	U	0.2		E908.0	11/28/12 10:17 / dmf
Thorium 230 precision (±)	0.1	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
Thorium 230 MDC	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf

Report Definitions:

RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration MCL - Maximum contaminant level. ND - Not detected at the reporting limit. U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY BranchRevised Date:02/20/13Client:Crow Butte ResourcesReport Date:12/18/12Project:Annual Sediment Samples 2012Collection Date:11/01/12Lab ID:C12110476-004DateReceived:11/09/12Client Sample ID:Steam S1Matrix:Sediment

Analyses	Result	linite	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
	nesun	Units	Quanners			monrou	Analysis Date / Dy
METALS - TOTAL							
Uranium	1.1	mg/kg-dry		0.3		SW6020	11/27/12 23:41 / cp
Uranium, Activity	0.7	pCi/g-dry		0.2		SW6020	11/27/12 23:41 / cp
RADIONUCLIDES							
Lead 210	0.5	pCi/g-dry		0.2		E909.0	12/15/12 07:24 / eli-cs
Lead 210 precision (±)	0.1	pCi/g-dry				E909.0	12/15/12 07:24 / eli-cs
Lead 210 MDC	0.2	pCi/g-dry				E909.0	12/15/12 07:24 / eli-cs
Radium 226	0.3	pCi/g-dry		0.03		E903.0	12/04/12 10:26 / trs
Radium 226 precision (±)	0.05	pCi/g-dry				E903.0	12/04/12 10:26 / trs
Radium 226 MDC	0.03	pCi/g-dry				E903.0	12/04/12 10:26 / trs
Thorium 230	0.3	pCi/g-dry		0.2		E908.0	11/28/12 10:17 / dmf
Thorium 230 precision (±)	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
Thorium 230 MDC	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY BranchRevised Date:02/20/13Client:Crow Butte ResourcesReport Date:12/18/12Project:Annual Sediment Samples 2012Collection Date:11/01/12Lab ID:C12110476-005DateReceived:11/09/12Client Sample ID:E1 & E2 CompositeMatrix:Sediment

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	36.1	mg/kg-dry		0.3	1	SW6020	11/27/12 23:44 / cp
Uranium, Activity	24.5	pCi/g-dry		0.2		SW6020	11/27/12 23:44 / cp
RADIONUCLIDES							
Lead 210	1	pCi/g-dry		0.2		E909.0	12/15/12 09:29 / eli-ca
Lead 210 precision (±)	0.1	pCi/g-dry			a (1997)	E909.0	12/15/12 09:29 / eli-cs
Lead 210 MDC	0.2	pCi/g-dry				E909.0	12/15/12 09:29 / eli-c:
Radium 226	0.6	pCi/g-dry		0.03	1	E903.0	12/04/12 12:07 / trs
Radium 226 precision (±)	0.07	pCi/g-dry			1	E903.0	12/04/12 12:07 / trs
Radium 226 MDC	0.03	pCi/g-dry				E903.0	12/04/12 12:07 / trs
Thorium 230	<0.2	pCi/g-dry	U	0.2		E908.0	11/28/12 10:17 / dmf
Thorium 230 precision (±)	0.1	pCi/g-dry			- Sec. []	E908.0	11/28/12 10:17 / dmf
Thorium 230 MDC	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration MCL - Maximum contaminant level. ND - Not detected at the reporting limit. U - Not detected at minimum detectable concentration

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Client:

Project:

Lab ID:

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Crow Butte Resources Annual Sediment Samples 2012 C12110476-006 Client Sample ID: Impoundment I4

Revised Date: 02/20/13 Report Date: 12/18/12 Collection Date: 11/01/12 DateReceived: 11/09/12 Matrix: Sediment

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	16.1	mg/kg-dry		0.3		SW6020	11/27/12 23:46 / cp
Uranium, Activity	10.9	pCi/g-dry		0.2		SW6020	11/27/12 23:46 / cp
RADIONUCLIDES							
Lead 210	1.6	pCi/g-dry		0.2		E909.0	12/15/12 11: 3 4 / eli-c
Lead 210 precision (±)	0.1	pCi/g-dry				E909.0	12/15/12 11:34 / eli-c
Lead 210 MDC	0.2	pCi/g-dry				E909.0	12/15/12 11:34 / eli-c
Radium 226	0.1	pCi/g-dry		0.03		E903.0	12/04/12 12:07 / trs
Radium 226 precision (±)	0.04	pCi/g-dry				E903.0	12/04/12 12:07 / trs
Radium 226 MDC	0.03	pCi/g-dry				E903.0	12/04/12 12:07 / trs
Thorium 230	<0.2	pCi/g-dry	U	0.2		E908.0	11/28/12 10:17 / dmf
Thorium 230 precision (±)	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
Thorium 230 MDC	0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf

Report Definitions:

RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration MCL - Maximum contaminant level. ND - Not detected at the reporting limit. U - Not detected at minimum detectable concentration

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Client:

Project:

Lab ID:

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Crow Butte Resources Annual Sediment Samples 2012 C12110476-007 Client Sample ID: Impoundment I3

Revised Date: 02/20/13 Report Date: 12/18/12 Collection Date: 11/01/12 DateReceived: 11/09/12 Matrix: Sediment

Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
19.1	mg/kg-dry		0.3		SW6020	11/27/12 23:49 / cp
12.9	pCi/g-dry		0.2		SW6020	11/27/12 23: 4 9 / cp
2.2	pCi/g-dry		0.2		E909.0	12/15/12 13: 3 9 / eli-cs
0.1	pCi/g-dry				E909.0	12/15/12 13:39 / eli-cs
0.2	pCi/g-dry				E909.0	12/15/12 13:39 / eli-cs
0.6	pCi/g-dry		0.03		E903.0	12/04/12 12:07 / trs
0.07	pCi/g-dry				E903.0	12/04/12 12:07 / trs
0.03	pCi/g-dry				E903.0	12/04/12 12:07 / trs
0.4	pCi/g-dry		0.2		E908.0	11/28/12 10:17 / dmf
0.2	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
0.2	pCi/g-dry				E908.0	11/28/1 <mark>2</mark> 10:17 / dmf
	19.1 12.9 2.2 0.1 0.2 0.6 0.07 0.03 0.4 0.2	Result Units 19.1 mg/kg-dry 12.9 pCi/g-dry 0.1 pCi/g-dry 0.2 pCi/g-dry 0.6 pCi/g-dry 0.7 pCi/g-dry 0.8 pCi/g-dry 0.9 pCi/g-dry 0.4 pCi/g-dry 0.2 pCi/g-dry 0.3 pCi/g-dry 0.4 pCi/g-dry 0.2 pCi/g-dry 0.2 pCi/g-dry 0.2 pCi/g-dry	19.1 mg/kg-dry 12.9 pCi/g-dry 0.1 pCi/g-dry 0.2 pCi/g-dry 0.2 pCi/g-dry 0.6 pCi/g-dry 0.07 pCi/g-dry 0.03 pCi/g-dry 0.4 pCi/g-dry 0.2 pCi/g-dry	19.1 mg/kg-dry 0.3 12.9 pCi/g-dry 0.2 2.2 pCi/g-dry 0.2 0.1 pCi/g-dry 0.2 0.1 pCi/g-dry 0.2 0.2 pCi/g-dry 0.3 0.6 pCi/g-dry 0.03 0.07 pCi/g-dry 0.03 0.07 pCi/g-dry 0.2 0.4 pCi/g-dry 0.2 0.2 pCi/g-dry 0.2	19.1 mg/kg-dry 0.3 12.9 pCi/g-dry 0.2 2.2 pCi/g-dry 0.2 0.1 pCi/g-dry 0.2 0.2 pCi/g-dry 0.3 0.2 pCi/g-dry 0.3 0.6 pCi/g-dry 0.03 0.07 pCi/g-dry 0.03 0.03 pCi/g-dry 0.2 0.4 pCi/g-dry 0.2 0.2 pCi/g-dry 0.2	19.1 mg/kg-dry 0.3 SW6020 12.9 pCi/g-dry 0.2 SW6020 2.2 pCi/g-dry 0.2 SW6020 0.1 pCi/g-dry 0.2 E909.0 0.1 pCi/g-dry E909.0 0.2 pCi/g-dry E909.0 0.6 pCi/g-dry E903.0 0.07 pCi/g-dry E903.0 0.03 pCi/g-dry E903.0 0.03 pCi/g-dry E903.0 0.4 pCi/g-dry E903.0 0.4 pCi/g-dry E903.0 0.2 pCi/g-dry E903.0 0.4 pCi/g-dry E903.0 0.2 pCi/g-dry E903.0

Report Definitions:

RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration

MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Revised Date: 02/20/13 Report Date: 12/18/12 Client: **Crow Butte Resources** Annual Sediment Samples 2012 Collection Date: 11/01/12 **Project:** Lab ID: C12110476-008 DateReceived: 11/09/12 Matrix: Sediment Client Sample ID: Stream S5

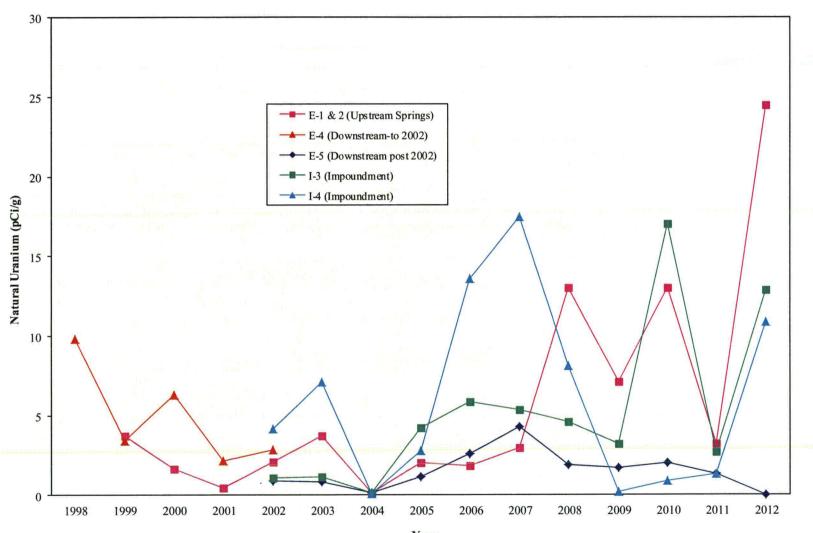
Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.7	mg/kg-dry		0.3		SW6020	11/27/12 23:51 / cp
Uranium, Activity	0.5	pCi/g-dry		0.2		SW6020	11 /2 7/12 23:51 / cp
RADIONUCLIDES							
Lead 210	0.4	pCi/g-dry		0.2		E909.0	12/15/12 15:44 / eli-cs
Lead 210 precision (±)	0.1	pCi/g-dry				E909.0	12/15/12 15:44 / eli-ca
Lead 210 MDC	0.2	pCi/g-dry				E909.0	12/15/12 15:44 / eli-cs
Radium 226	0.4	pCi/g-dry		0.03		E903.0	12/04/12 12:07 / trs
Radium 226 precision (±)	0.06	pCi/g-dry				E903.0	12/04/12 12:07 / trs
Radium 226 MDC	0.03	pCi/g-dry				E903.0	12/04/12 12:07 / trs
Thorium 230	0.2	pCi/g-dry		0.2		E908.0	11/28/12 10:17 / dmf
Thorium 230 precision (±)	0.1	pCi/g-dry				E908.0	11/28/12 10:17 / dmf
Thorium 230 MDC	0.2	pCi/g-ciry				E908.0	11/28/12 10:17 / dmf

Report Definitions:

RL - Analyte reporting limit. QCL - Quality control limit. MDC - Minimum detectable concentration

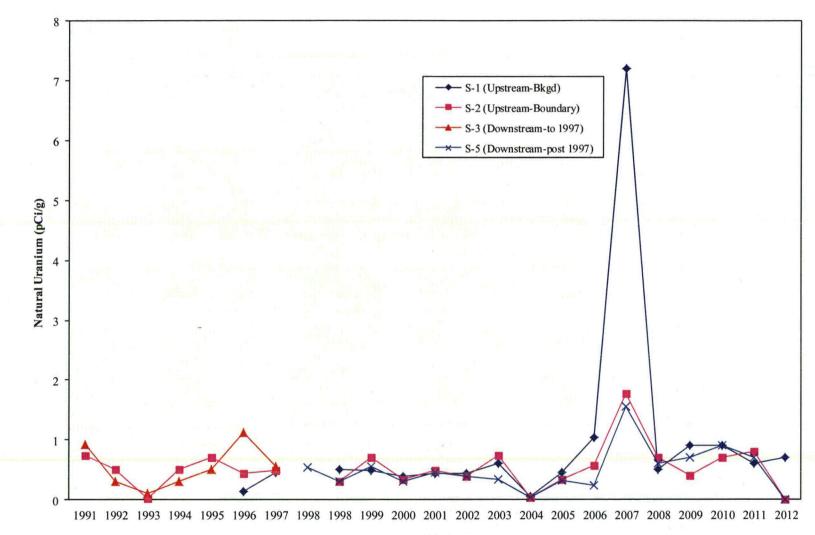
MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

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English Creek Sediment Uranium Concentration

Year



Squaw Creek Sediment Uranium Concentration

Year