Cameco

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December 2, 2010

Mr. Charles Garlow, Attorney-Advisor
OECA, Air Enforcement Division
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW-MC 2242A
Washington D.C. 20460

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

RE: Final Cameco Resources submission in Response to EPA letter dated May 1, 2009, Request to Test and Provide Information Pursuant to the Clean Air Act

Dear Mr. Garlow:

By letter dated January 15, 2010, Crow Butte Resources d/b/a Cameco Resources responded to the above EPA request. Since this submittal, Cameco Resources Senior Management directed a review of the technical merits, the administrative process and the completion of the administrative record. Cameco Resources retained Dr. Janet Johnson of TetraTech to perform a review of the data collected and attempt to use the radon flux calculations that EPA staff recommended to determine emanations from the evaporation ponds. The TetraTech analysis and a summary of the initially supplied data are enclosed.

Conclusions:

A. The flux from the Crow Butte commercial evaporation ponds cannot be accurately calculated using the equations provided by EPA and the results of the data provides no basis for a determination that there is any radon flux emanating from the evaporation ponds at all.

B. The radon flux emanating from the Crow Butte evaporation ponds is not relevant to the public dose estimates. Total radiation dose to members of the public is calculated from all plant sources. Also, members of the public are not permitted in restricted areas of the operations. Any exposure of a member of the public will be negligible based on these measurements at the perimeter of the ponds and are more likely influenced by background radon.

C. Quantifying radon flux is of no usefulness in estimating the dose to workers or members of the public since actual radon monitoring data is available which represents a defensible basis for exposure calculations. Based on historic monitoring of worker exposures, the negligible radon emanation from the sources as a result of the operating facilities is measured and reported to the NRC regularly. The results of which indicate there is no increased risk for worker exposure outside of those areas clearly identified in the process areas of the plant.

In this circumstance, the highly specific EPA request for information, under section 114 of the Clean Air Act, led to a process that yielded data that remains unsuitable to answering the question at hand. In the future, Cameco Resources requests prior deliberation with EPA prior to requests of this type.

This way, appropriate experts can be consulted to frame the date quality objectives in accordance with the 2001 Data Quality Act and the EPA data quality objectives policy.

The attached memorandum will summarize the original data that was submitted to EPA and will show that radon flux emanating from the evaporation ponds will not impact members of the public or significantly increase worker exposure. We have included the memorandum and the original data that was submitted on January 15, 2010 as a single, complete package for purposes of completing the administrative record.

If you have any questions or comments please do not hesitate to call me at (307) 316-7600.

Sincerely,

Josh Leftwich
Director, Radiation Safety and Licensing

Enclosure

CC: NRC- Ron Burrows- Project Manager for Crow Butte
NMA- Katie Sweeney

Report and Data on EPA Requests to Test and Provide Information Pursuant to the Clean Air Act at the Crow Butte Facility, Crawford, NE

December 2, 2010

Cameco

TETRA TECH

3801 Automation Way, Ste. 100
Fort Collins, CO 80525
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Technical Memorandum

To:	Mr. Joe Brister, Cameco Resources	**From:**	Jan Johnson, PhD, CHP, CIH
Company:	Cameco Resources	**Date:**	September 23, 2010
Re:	Evaporation Pond Radon Flux Determination	**Project #:**	114-182083

In response to Environmental Protection Agency (EPA) concerns regarding the flux from evaporation ponds at in situ recovery (ISR) facilities, Cameco measured radon gas and Pb-210 concentrations at the perimeter and specified distances from the edge of the Commercial Evaporation Pond area during the third quarter of 2009. The intent of the exercise was to provide a basis for calculating the flux from the commercial evaporation ponds according to equations derived by Mr. Robert Duraski, EPA Region 8 (Attachment 1). The locations of the detectors as well as the Rn-222 and Pb-210 measurements are provided in Attachment 2.

The radon gas concentrations were measured using alpha track detectors, i.e., model DRNM, supplied by Landauer Inc. Naturally occurring environmental radon gas consists primarily of two isotopes, Rn-222 and Rn-220. Radon-222 is a decay product in the U-238 decay series. Radon-220 is a decay product in the Th-232 decay series. Landauer Inc. Model DRNM detectors include a filter to retard the diffusion of Rn-220 (half-life = 54 seconds) into the sensitive volume resulting in measurement of only Rn-222 concentration, the radon isotope of concern at uranium recovery facilities.[1]

The Pb-210 concentrations in airborne particulates were measured using a RAS air pump with a flow rate of approximately 40 L/m. The filters were exchanged bi-weekly, composited and submitted to Energy Laboratories Inc. (ELI) for analysis. Lead-210 is a decay product of Rn-222.

[1] In contrast to the special measurements conducted for the radon flux project, routine environmental radon measurements at the Crow Butte site perimeter and nearest residences use Landauer Model DRNF detectors that measure both Rn-222 and Rn-220. The use of detectors with Rn-220 filters was specified by the EPA for the special project. Data from routine semi-annual radon measurements are not comparable to the measurements made for the special project because of the different types of detectors used and because the routine environmental measurements encompassed two quarters rather than just the third quarter of 2009.

Pb-210 Concentrations

Lead-210 concentrations are monitored quarterly at eight locations around the site perimeter and nearest residences as part of the Crow Butte routine environmental monitoring program conducted in accordance with NRC License SUA 1534. Four additional air monitoring locations were established for the Evaporation Pond Radon Flux project. The data are shown in the attached Excel spreadsheets (Attachment 2). The spreadsheets show that the Pb-210 concentration at the center of the ponds measured during the third quarter 2009, 1.94E-14 µCi/mL, is lower than the site background concentration for the third quarter 2009, 2.84E-14 µCi/mL. The measured Pb-210 concentration at the north (downwind) edge of the of the evaporation ponds was 8.77E-15 µCi/mL. Measured Pb-210 concentrations at 100 meters and 500 meters north of the evaporation ponds were 8.78 E-15 µCi/mL and 8.79 E-15 µCi/mL, respectively. Annual average Pb-210 background concentrations in the United States range from 5.4E-15 µCi/mL (Hawaii) to 4.1E-14 µCi/mL (Illinois) (NCRP, 1992). There are no average background Pb-210 data published for Nebraska. Lead-210 concentrations in the vicinity of the evaporation ponds are consistent with local and national background values thus have no usefulness in estimating flux from the evaporation ponds

Rn-222 Concentrations

As noted above, Rn-222 concentrations were measured at 19 locations north, east, south, and west of the pond area perimeter (See Attachment 2.) Measurements were made at three different heights, 1 meter, 3 meters, and 5 meters, at the pond area perimeter. Duplicate alpha track detectors were deployed at 1 meter and 5 meter heights at the pond perimeter locations. The eight duplicate detectors were exposed for 45 days. All other detectors were exposed for 93 days. The concentration data are shown in the attached Excel spreadsheets (Attachment 2).

Nearly half of the measurements were below the reporting limit for the laboratory. Therefore, the raw data were used to estimate the actual radon concentrations given in Attachment 2. Two of the three measurements at the east perimeter location were below the method noise, i.e., the numbers of tracks on the exposed detectors were less than the number on the unexposed control. The Rn-222 concentrations, therefore, were determined to be 0 pCi/L.

There is no discernable decreasing gradient in Rn-222 concentrations with distance from the pond perimeter. In fact, the concentration at a distance of 500 meters from the eastern perimeter is the highest measured concentration and there is an increasing gradient with distance from the pond in that direction. That is as expected since the detectors deployed east of the pond area were the closest to the Central Processing Plant (CPP). The highest concentration, 1.3 pCi/L, was measured at a location approximately 100 meters directly downwind of the CPP. Several of the other locations were in well fields or close to well houses.

There is no discernable gradient with height except at the western perimeter of the ponds which is in the least prevalent wind direction. It should also be noted that the ponds are situated at different elevations. Pond 1 is at a higher elevation than Ponds 3 and 4.

The radon concentration data collected during the third quarter of 2009 for the special project are not appropriate for use in determining the flux from the ponds. The influence of the CPP emissions and potential well field emissions make it impossible to determine the concentration attributable to radon flux from the ponds. The background in the vicinity of the ponds is likely to be highly variable, spacially and temporally. It cannot be inferred from measurements at the site background location due the proximity of the ponds to other sources of radon emissions. In addition, there are no comparable site background measurements since the environmental radon measurements are averaged over six months, including winter months when snow cover is likely to reduce background radon levels.

Calculation of Maximum Dose to a Worker in the Vicinity of the Pond

The maximum measured Rn-222 concentration at the pond boundaries, averaged over the 1, 3, and 5 meter high detectors, was 0.46 pCi/L (south perimeter of the ponds). Assuming that the concentration measured during the third quarter of 2009 is representative of the annual average concentration, the estimated dose to a worker spending 100% of his or her working year at that location would be as follows:

Derived Air Concentration (DAC) for Rn-222 with daughters removed = 4E-6 uCi/mL (10CFR20, Appendix B)

Annual dose to a worker at the south perimeter of the ponds:

Dose = (0.46 pCi/L)(1E-3 L/mL)(1E-6 uCi/pCi)(5 rem/y)/(4E-6 uCi/mL)
Dose = 0.6 mrem/year

The DAC for Rn-222 with daughters removed is appropriate for use in this calculation since the exposure point is very close to the point at which the Rn-222 is released to the air. Therefore, few Rn-222 decay products would have built in. Even if the equilibrium factor for radon attributable to pond emissions is assumed to be 0.1, the annual dose under these extreme conditions would be approximately 6 mrem.

Radon decay product concentrations were measured weekly at the pond perimeter from July 16 through October 8, 2009. The highest average measured radon decay product concentration at the edge of the pond was 0.0024 Working Level (WL) (south perimeter). The average background radon decay product concentration during that period was 0.0015 WL. The measured radon decay product concentration results primarily from background and radon emissions from other areas of the plant; however, even if all of the radon decay product concentration is attributed to radon emissions from the pond, the maximum dose to a worker from pond radon emissions at the south perimeter would be as follows:

Dose = Working Level Month (WLM) x 1000 mrem/WLM (NCRP, 2009)
WLM = Working Level x hours of exposure/170 hours per month
Dose = (0.0024 WL x 2000 h/y/170 h/month)(1000 mrem/WLM) = 28 mrem/y

Radon flux from the pond would not contribute significantly to the radiation dose to workers.

Calculation of Dose to Members of the Public

Total radiation doses to members of the public are calculated annually based on the results of routine environmental monitoring. The doses are reported in the second half Semiannual Radiological Effluent and Environmental Monitoring Report. The radon measurements on which the dose calculations are based include all sources from the plant. Therefore, the flux from the pond is not relevant to public dose estimates.

Other Influencing Factors

As noted above, there are several factors that influence the radon concentrations at the pond perimeters other than radon flux from the water in the ponds including the following:

- The ponds are used for evaporation of waste water. Spray evaporation was employed during the time the measurements were taken. This would enhance and perhaps even dominate the perimeter radon concentrations attributable to the pond particularly in the downwind direction.
- The operations of the ISR plant itself result in radon emissions that are measured and have a greater influence on the concentrations at the pond perimeter than flux from the pond itself as demonstrated by the fact that radon concentrations to the east increase with distance from the ponds.
- The ponds are at different elevations, with Pond 1 elevated above the level of Ponds 3 and 4. Therefore flux calculations based on the measurements at the perimeter of the ponds would not be representative of flux from the ponds in general.

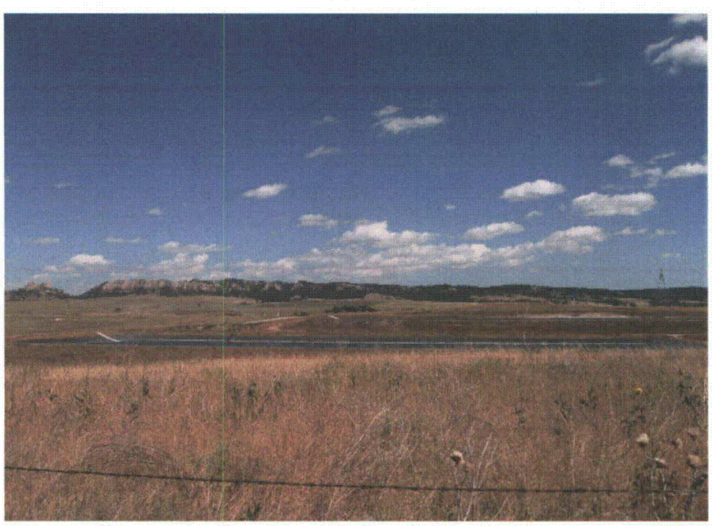

Figure 1: Pond 3 with Pond 1 in the Distance


Figure 2: Northeast Corner of Pond 3

Pond Flux Calculations (EPA Equations)

The EPA flux equations cannot be adequately reviewed without further information regarding their derivation. Several of the parameters used in the derivation are not defined and the definitions confuse flux (pCi/m^2-s) with source term (pCi/s). Had the draft EPA equation memo included an example, the equations would have been easier to follow.

The EPA describes three methods for calculating the flux from the pond based on the distance from the center of the ponds, average wind speed, pond area, detector height, and net measured Rn-222 concentration. Attempts to use the equations to calculate flux based on Crow Butte data showed that the result is extremely sensitive to the assumption with regard to "background" which in this case would include the contributions from the CPP and the well fields. The regional background established during routine environmental monitoring is not relevant since the type of detector used for that purpose is different from the type used for the special project (DRNF vs. DRNM) and the monitoring period included 3rd and 4th quarters rather than just the 3rd quarter. With snow cover, the radon concentrations during the 4th quarter may have been lower than 3rd quarter concentrations. In addition, the established background location is located about 3.5 miles from the site, most likely outside of the naturally mineralized area.

The EPA equations assume a simple laminar flow for the radon, i.e., vertical dispersion is very small compared to horizontal movement of radon, and a circular pond with uniform elevation. These are not reasonable assumptions for the Crow Butte Commercial Evaporation Ponds. The vertical dispersion coefficient at the pond north perimeter for atmospheric stability class D, the most prevalent for the area, is six meters assuming the source is in the center of the ponds. That is greater than the height of the uppermost detector. Atmospheric stability Class D is the most prevalent for the area. Even greater mixing would take place under the less stable Class A, B, and C atmospheric stability conditions. Therefore, it would be expected that just considering dispersion, the concept of calculating flux based on Rn-222 concentration at heights up to 5 meters would not be applicable. It also appears that the EPA draft equations "double count" the measured concentrations at 1 meter and 3 meters. That is, the equations use the total height of each detector in the summation of the flux estimates, rather than the incremental distance between the detectors.

The Crow Butte ponds are rectangular not circular as the equations assume and, as noted above, at different elevations. The equations could be modified to calculate flux from just one rectangular pond but, given the other problems with the assumptions, this would not generate a credible result.

The major flaw in applying the EPA flux equations to the data from the Crow Butte commercial evaporation ponds is the uncertainty in "background" concentrations in the pond area and the fact that nearly half of all of the measurements were below the reporting limit. Therefore, no further site investigations related to estimating radon flux from the ponds based on perimeter radon concentration measurements is warranted.

Conclusions

The flux from the Crow Butte commercial evaporation ponds cannot be accurately calculated using the EPA's equations since the assumptions that underlie the equations are incorrect. In addition, the "background" radon concentration assumption drives the calculation. Due to the contribution of other Crow Butte ISR sources, the radon concentration attributable to the ponds cannot be adequately distinguished from "background".

Quantifying the flux is of no usefulness in estimating the dose to workers or members of the general public since actual radon concentration measurements are available and form a defensible basis for dose calculations. The radon concentrations measured at the pond perimeter demonstrate that the radiation dose to a Crow Butte worker from that source even under the most extreme exposure assumptions would be very small and well within the occupational dose limits. The radon doses to members of the public are influenced to a much greater extent by natural background. The contribution of the radon flux from the pond to the radon concentration at the plant boundaries to which a member of the public might be exposed is likely to be negligible based on the radon measurements made at the pond perimeter.

References

National Council on Radiation Protection and Measurements (NCRP). 1992. Exposure of the Population in the United States and Canada from Natural Background Radiation, NCRP Report No. 94. National Council on Radiation Protection and Measurements. Bethesda, MD 20814. p, 101.

National Council on Radiation Protection and Measurements (NCRP). 2009. Ionizing Radiation Exposure of the Population in the United States. NCRP Report No. 160. National Council on Radiation Protection and Measurements. Bethesda, MD 20814. p, 60.

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ATTACHMENT 1

Diaz.Angelique@epamail.epa.gov
06/03/2009 02:44 PM

To Scott_Bakken@cameco.com
cc Duraski.Robert@epamail.epa.gov, Garlow.Charlie@epamail.epa.gov, Rosnick.Reid@epamail.epa.gov,
bcc
Subject Radon Flux Calculations

History: This message has been forwarded.

Scott,

Please find attached the calculations for determining the radon-222 flux from ISL tailings ponds. The calculations are still considered DRAFT; please forward them on as necessary and provide any corrections, comments, or questions you have to Robert Duraski (303-312-6728) or me.

(See attached file: Radon Flux Calculations, 060109.pdf) (See attached file: Radon Flux Calculation Figures.pdf)

Thank you,
Angelique

Angelique D. Diaz, Ph.D.
Environmental Engineer
Air Program, USEPA/Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Office: 303.312.6344
Fax: 303.312.6064
diaz.angelique@epa.gov[attachment "Radon Flux Calculations, 060109.pdf" deleted by Scott Bakken/Cameco] [attachment "Radon Flux Calculation Figures.pdf" deleted by Scott Bakken/Cameco]

Calculating the Radon-222 Flux from an ISL Pond (DRAFT)

By R. Duraski
June 2, 2009

The following assumes a cylindrical geometry as defined in Figure 1, and five monitors placed at 1, 2, 3, 4, and 5 meters above the pond.

Definitions

ϕ = flux defined as nv (pCi/m^2-s)
n_i – ^{222}Rn activity at height i less background (pCi/m^3)
v_T = ^{222}Rn velocity (m/s)
v_R = ^{222}Rn velocity in the R direction (m/s)
v_z = ^{222}Rn velocity in the z direction (m/s)
θ = angle between $v_R \gg v_z$ (radians)
v_{WR} = windrose velocity (m/s)
Ψ_R = total ^{222}Rn flux along R direction (pCi/s)

$$\Psi_R = \int n v_R dA_R$$

Ψ_z = total ^{222}Rn flux along z direction (pCi/s)

$$\Psi_z = \int n v_z dA_z$$

R = radius of the pond (m)
z_i = height of sample (m)
A_b = area of the pond (m^2)
Δz = extrapolated height (m)

Assumptions

$$\frac{v_z}{v_R} << 1, \Rightarrow v_R \approx v_{WR}, \ \frac{z_{max}}{R} << 1$$

For Method 3 we assume $v_z \approx v_{WR} \sin\theta \approx v_{WR}(\frac{z_{max}}{R})$. This is the vertical velocity a particle leaving the center of the pond must have to "hit" the top detector.

Method 1

In this case the top detector value is at background so we are confident that we have detected the entire plume. The flux from the pond (ϕ_p) is calculated as follows:

$$\phi_p(\frac{pCi}{m^2 s}) = \frac{\sum_{i=1}^{i=5} 2\pi R z_i n_i v_{WR}}{\pi R^2} \qquad \text{Equation 1}$$

Method 2

In this case the top of the detector (n_5) value is greater than background but the gradient is steep enough that we can extrapolate (Figure 2). In this case we calculate the flux from n_1 to n_5 the same as Method 1 and estimate the total flux above n_5 as follows:

$$\Delta\Psi_R = (2\pi R\Delta z)(\frac{n_5}{2})v_{WR} \qquad \text{Equation 2}$$

Δz can be determined mathematically or by graph. For example, in Figure 2, if we extrapolate from n_5 to n=0, the n=0 intercept is at 7 meters, so Δz = 7-5 = 2 m. The $\frac{n_5}{2}$ term is the average activity for Δz, this is:

$n_{ave} = \frac{n_5 + n_\infty}{2}$, $n_\infty = 0$, so $n_{ave} = \frac{n_5}{2}$

So, the flux from the pond, using Method 2 is:

$$\text{\o}_p(\frac{pCi}{m^2 - s}) = \frac{[\sum_{i=1}^{i=5} 2\pi R z_i n_i v_{WR}] + (2\pi R\Delta z)\frac{n_5}{2}v_{WR}}{\pi R^2} \qquad \text{Equation 3}$$

Method 3

In this case the top detector (n_5) value is still greater than background and the gradient is relatively flat indicating high turbulence (Figure 3). If Method 2 were used to extrapolate we could greatly overestimate the radon-222 flux.

In Method 3, the flux along R is calculated using Method 1 and the flux along z as follows:

$$\Psi_z\left(\frac{pCi}{s}\right) = \pi R^2 n_5 v_z \qquad \text{Equation 4}$$

V_z at $n_5 = v_{WR}\sin\theta_5$ (see Figure 4)

$\sin\theta_5 \approx \frac{z_5}{R}$ if $z_5 << R$, therefore,

$$\Psi_z = \pi R^2 n_5 v_{WR}\left(\frac{z_5}{R}\right) \qquad \text{Equation 5}$$

The radon flux from the pond using Method 3 is:

$$\varnothing_p\left(\frac{pCi}{m^2 s}\right) = \frac{\left[\sum_{i=1}^{i=5} 2\pi R z_i n_i v_{WR}\right] + \left[\pi R^2 n_5 v_{WR} \frac{z_5}{R}\right]}{\pi R^2} \qquad \text{Equation 6}$$

To decide when to use Method 3, compare the second terms in Methods 2 and 3 as follows:

$$\frac{\Psi_{Method 2}}{\Psi_{Method 3}} = \frac{2\pi R \Delta z \frac{n_5}{2} v_{WR}}{\pi R^2 n_5 v_{WR} \frac{z_5}{R}} = \frac{\Delta z}{z_5} \qquad \text{Equation 7}$$

If $\Delta z = z = 5$ meters, both Methods predict the same flux. If Δz, using Method 2 is greater than z_5, the turbulence is probably high and Method 3 should be used. To verify that Method 3 works, a higher sample or samples over the pond must be collected.

4x4 Grid Sheet [redacted]

By EPA Region 8 | Date | Job #

Checked by | Date | Project

Subject Figures for Rn Flux Calculations. | Sheet | of

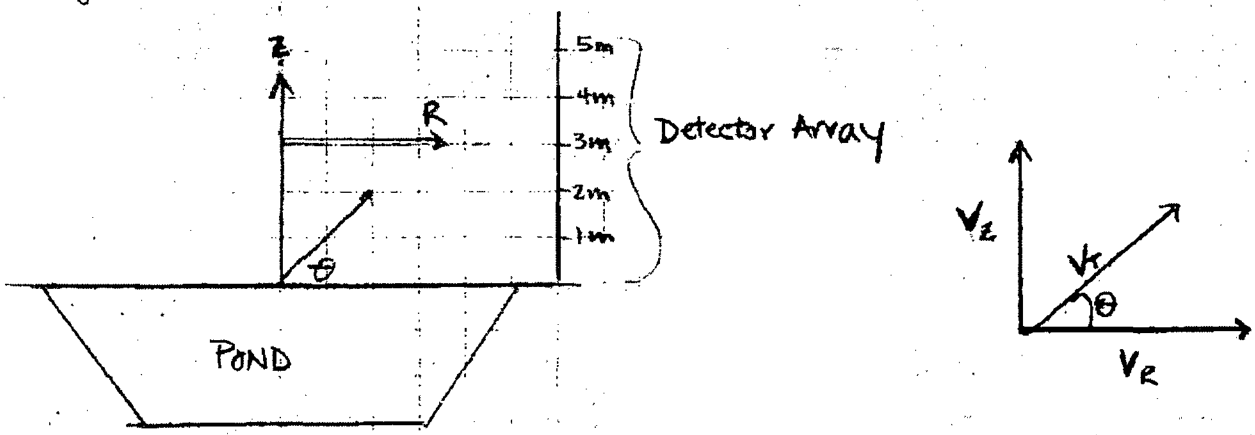

Figure 1 : Pond showing z and R directions and detector array

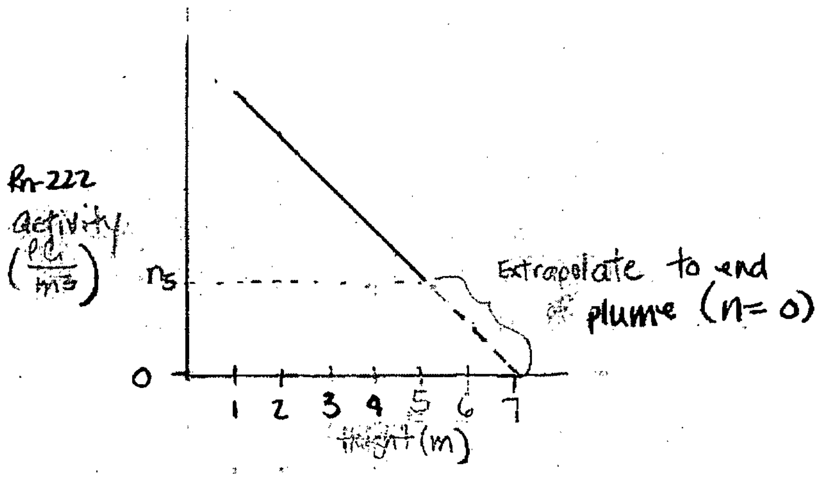

Figure 2: Rn-222 activity versus height. Linear relationship and extrapolation to $n = 0$.

[redacted]

4x4 Grid Sheet

By EPA Region 8 Date Job #

Checked by Date Project

Subject Figures for Rn-Flux Calculations Sheet of

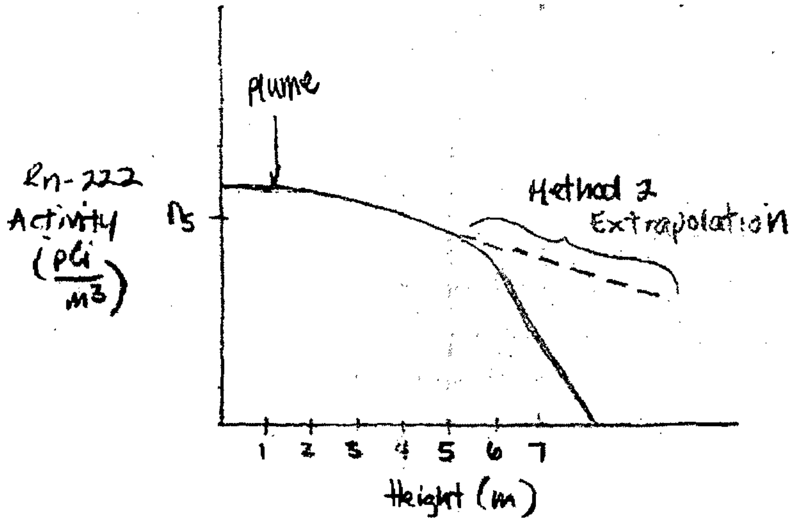

Figure 3: Rn-222 activity versus height, showing relatively flat gradient and how Method 2 extrapolation would result in an over estimation of flux.

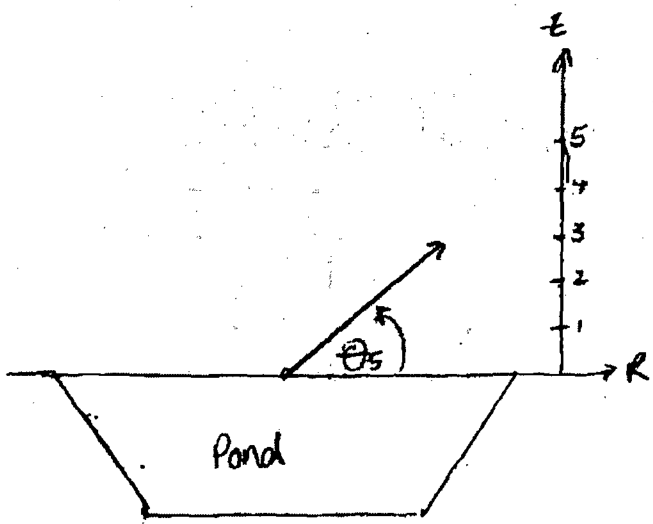

Figure 4: Definition of θ_s

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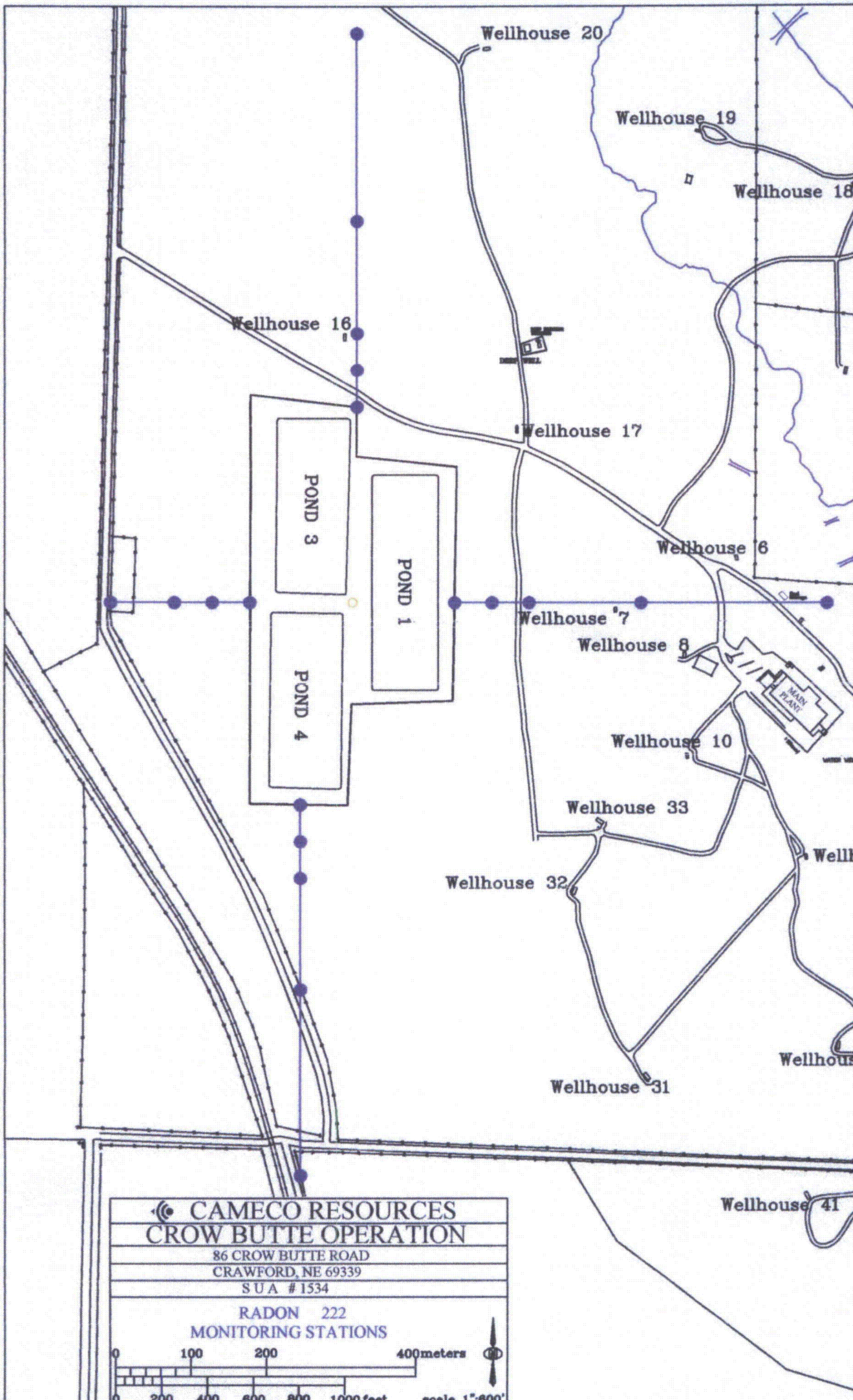
ATTACHMENT 2


Wellhouse 20
Wellhouse 19
Wellhouse 18
Wellhouse 16
Wellhouse 17
POND 3
POND 1
POND 4
Wellhouse 6
Wellhouse 7
Wellhouse 8
MAIN PLANT
Wellhouse 10
Wellhouse 33
Wellhouse 32
Wellhouse 31
Wellhouse 41
CAMECO RESOURCES
CROW BUTTE OPERATION
86 CROW BUTTE ROAD
CRAWFORD, NE 69339
S U A # 1534
RADON 222
MONITORING STATIONS
0 100 200 400 meters
0 200 400 600 800 1000 feet
scale 1":600'

Attachment 2: Cameco Radon - Pond Flux Special Project

Table 2-1: All Landauer Data

Landauer DRNM Detectors

										Calculated	Landauer
90-day test results											
Det. ID	Location	Cal. Fac.	Days	Tracks	Bkg	Area	tracks/mm2	Exposure	Reported Exp.	Conc.	Reported Conc.
		pCi/L-d/tracks/mm^2		total	tks/mm^2	mm^2		pCi/L-d	pCi/L-d	pCi/L	pCi/L
4643584	E-1M-A	na	93	62	2.23	37.2	1.61	<0	<30	0.00	<0.3
4643586	E-3M-A	na	93	80	2.23	37.2	2.09	<0	<30	0.00	<0.3
4643587	E-5M-A	44.5	93	95	2.23	37.2	2.49	11.74	<30	0.13	<0.3
4643603	N-1M-A	44.5	93	99	2.23	37.2	2.60	16.52	<30	0.18	<0.3
4643604	N-3M-A	44.5	93	103	2.23	37.2	2.71	21.31	<30	0.23	<0.3
4643605	N-5M-A	44.5	93	89	2.23	37.2	2.33	4.56	<30	0.05	<0.3
4760593	S-1M-A	37.9	93	76	0.87	37.2	2.02	43.57	44.5	0.47	0.5
4760594	S-3M-A	37.9	93	71	0.87	37.2	1.89	38.48	39.4	0.41	0.4
4760595	S-5M-A	37.9	93	79	0.87	37.2	2.10	46.63	47.6	0.50	0.5
4769372	W-1M-A	37.1	93	82	0.66	37.2	2.19	56.64	57.3	0.61	0.6
4769373	W-3M-A	37.1	93	55	0.66	37.2	1.46	29.71	30.3	0.32	0.3
4769374	W-5M-A	37.1	93	47	0.66	37.2	1.25	21.73	<30	0.23	<0.3
4769405	N-50	37.1	93	75	0.66	37.2	2.00	49.65	50.3	0.53	0.5
4769406	N-100	37.2	93	93	0.66	37.2	2.48	67.79	68.3	0.73	0.7
4769407	N-250	37.2	93	96	0.66	37.2	2.56	70.79	71.3	0.76	0.8
4784856	S-50	37.1	93	55	0.8	37.2	1.46	24.37	<30	0.26	<0.3
4784857	S-100	37.1	93	62	0.8	37.2	1.65	31.36	32.1	0.34	0.3
4784860	N-500	37.1	93	74	0.8	37.2	1.97	43.32	44.1	0.47	0.5
4784861	W-50	37.1	93	39	0.8	37.2	1.03	8.42	<30	0.09	<0.3
4784868	N-500D	37.1	93	74	0.8	37.2	1.97	43.32	44.1	0.47	0.5
4784869	AM-6-EPA	37.1	93	41	0.8	37.2	1.08	10.41	<30	0.11	<0.3
4784870	W-100	37.1	93	90	0.8	37.2	2.40	59.28	60.1	0.64	0.6
4784871	W-185	37.1	93	87	0.8	37.2	2.32	56.29	57.1	0.61	0.6
4784872	E-500	37.1	93	155	0.8	37.2	4.15	124.11	125.2	1.33	1.2
4784873	S-500	37.1	93	59	0.8	37.2	1.56	28.36	<30	0.30	<0.3
4784876	S-250	37.1	93	39	0.8	37.2	1.03	8.42	<30	0.09	<0.3
4784877	E-50	37.1	93	70	0.8	37.2	1.86	39.33	40.1	0.42	0.4
4784878	E-100	37.1	93	79	0.8	37.2	2.10	48.31	49.1	0.52	0.5
4784879	E-250	37.1	93	84	0.8	37.2	2.24	53.30	54.1	0.57	0.6
45-day test results											
4769378	S-5	37.1	45	37	0.66	37.2	0.98	11.76	<30	0.26	<0.7
4769379	W-1	37.1	45	51	0.66	37.2	1.35	25.72	<30	0.57	<0.7
4769380	W-5	37.1	45	26	0.66	37.2	0.68	0.79	<30	0.02	<0.7
4769384	E-1	37.1	45	55	0.66	37.2	1.46	29.71	30.3	0.66	0.7
4769385	E-5	37.1	45	57	0.66	37.2	1.51	31.70	32.3	0.70	0.7
4769386	S-1	37.1	45	75	0.66	37.2	2.00	49.65	50.2	1.10	1.1
4784848	N-1	37.1	45	48	0.65	37.2	1.27	23.11	<30	0.51	<0.7
4784849	N-5	37.1	45	78	0.65	37.2	2.08	53.03	53.6	1.18	1.2

Table 2-2: Detectors Placed at Height Around the Ponds												
DRNM Detectors at the Pond Perimeter												
Det. ID	Location	Cal. Fac.	Days	Tracks	Bkg	Area	tracks/mm2	Exposure	Conc.	Ave by Dir.	Std. Dev.	Std Err.
		pCi/L-d/tracks/mm^2		total	tks/mm^2	mm^2		pCi/L-d	pCi/L			
4643584	E-1M-A	na	93	62	2.23	37.2	1.61	0.00	0.00			
4769384	E-1	37.1	45	55	0.66	37.2	1.46	29.71	0.66			
4643586	E-3M-A	na	93	80	2.23	37.2	2.09	0.00	0.00			
4643587	E-5M-A	44.5	93	95	2.23	37.2	2.49	11.74	0.13			
4769385	E-5	37.1	45	57	0.66	37.2	1.51	31.70	0.70	0.30	0.35	0.16
4643603	N-1M-A	44.5	93	99	2.23	37.2	2.60	16.52	0.18			
4784848	N-1	37.1	45	48	0.65	37.2	1.27	23.11	0.51			
4643604	N-3M-A	44.5	93	103	2.23	37.2	2.71	21.31	0.23			
4643605	N-5M-A	44.5	93	89	2.23	37.2	2.33	4.56	0.05			
4784849	N-5	37.1	45	78	0.65	37.2	2.08	53.03	1.18	0.43	0.45	0.20
4760593	S-1M-A	37.9	93	76	0.87	37.2	2.02	43.57	0.47			
4769386	S-1	37.1	45	75	0.66	37.2	2.00	49.65	1.10			
4760594	S-3M-A	37.9	93	71	0.87	37.2	1.89	38.48	0.41			
4760595	S-5M-A	37.9	93	79	0.87	37.2	2.10	46.63	0.50			
4769378	S-5	37.1	45	37	0.66	37.2	0.98	11.76	0.26	0.55	0.32	0.14
4769372	W-1M-A	37.1	93	82	0.66	37.2	2.19	56.64	0.61			
4769379	W-1	37.1	45	51	0.66	37.2	1.35	25.72	0.57			
4769373	W-3M-A	37.1	93	55	0.66	37.2	1.46	29.71	0.32			
4769374	W-5M-A	37.1	93	47	0.66	37.2	1.25	21.73	0.23			
4769380	W-5	37.1	45	26	0.66	37.2	0.68	0.79	0.02	0.35	0.25	0.11
Observations:												
	No discernable pattern with regard to height above pond level in any direction except W where concentration decreased with height.											
	Highest values for E and N are at 5 meters; highest values for S and W are at 1 meter; however, the S and W directions are the least likely											
	to be influenced by the pond.											

Table 2-3: Radon Data Sorted										
Cameco Radon - 90 day test										
DRNM Detectors										
Det. ID	Location	Cal. Fac.	Days	Tracks	Bkg	Area	tracks/mm2	Exposure	Conc.	Average
	pCi/L-d/tracks/mm^2			total	tks/mm^2	mm^2		pCi/L-d	pCi/L	(pCi/L)
4643584	E-1M-A	na	93	62	2.23	37.2	1.61	0.00	0.00	
4643586	E-3M-A	na	93	80	2.23	37.2	2.09	0.00	0.00	
4643587	E-5M-A	44.5	93	95	2.23	37.2	2.49	11.74	0.13	0.04
4643603	N-1M-A	44.5	93	99	2.23	37.2	2.60	16.52	0.18	
4643604	N-3M-A	44.5	93	103	2.23	37.2	2.71	21.31	0.23	
4643605	N-5M-A	44.5	93	89	2.23	37.2	2.33	4.56	0.05	0.15
4760593	S-1M-A	37.9	93	76	0.87	37.2	2.02	43.57	0.47	
4760594	S-3M-A	37.9	93	71	0.87	37.2	1.89	38.48	0.41	
4760595	S-5M-A	37.9	93	79	0.87	37.2	2.10	46.63	0.50	0.46
4769372	W-1M-A	37.1	93	82	0.66	37.2	2.19	56.64	0.61	
4769373	W-3M-A	37.1	93	55	0.66	37.2	1.46	29.71	0.32	
4769374	W-5M-A	37.1	93	47	0.66	37.2	1.25	21.73	0.23	0.39
4643603	N-1M-A	44.5	93	99	2.23	37.2	2.60	16.52	0.18	
4769405	N-50	37.1	93	75	0.66	37.2	2.00	49.65	0.53	
4769406	N-100	37.2	93	93	0.66	37.2	2.48	67.79	0.73	
4769407	N-250	37.2	93	96	0.66	37.2	2.56	70.79	0.76	
4784860	N-500	37.1	93	74	0.8	37.2	1.97	43.32	0.47	
4784868	N-500D	37.1	93	74	0.8	37.2	1.97	43.32	0.47	
4760593	S-1M-A	37.9	93	76	0.87	37.2	2.02	43.57	0.47	
4784856	S-50	37.1	93	55	0.8	37.2	1.46	24.37	0.26	
4784857	S-100	37.1	93	62	0.8	37.2	1.65	31.36	0.34	
4784876	S-250	37.1	93	39	0.8	37.2	1.03	8.42	0.09	
4784873	S-500	37.1	93	59	0.8	37.2	1.56	28.36	0.30	
4769372	W-1M-A	37.1	93	82	0.66	37.2	2.19	56.64	0.61	
4784861	W-50	37.1	93	39	0.8	37.2	1.03	8.42	0.09	
4784870	W-100	37.1	93	90	0.8	37.2	2.40	59.28	0.64	
4784871	W-185	37.1	93	87	0.8	37.2	2.32	56.29	0.61	
4643584	E-1M-A	na	93	62	2.23	37.2	1.61	0.00	0.00	
4784877	E-50	37.1	93	70	0.8	37.2	1.86	39.33	0.42	
4784878	E-100	37.1	93	79	0.8	37.2	2.10	48.31	0.52	
4784879	E-250	37.1	93	84	0.8	37.2	2.24	53.30	0.57	
4784872	E-500	37.1	93	155	0.8	37.2	4.15	124.11	1.33	
4784869	AM-6-EPA	37.1	93	41	0.8	37.2	1.08	10.41	0.11	
45-Day Radon Concentration Results										
4769378	S-5	37.1	45	37	0.66	37.2	0.98	11.76	0.26	
4769379	W-1	37.1	45	51	0.66	37.2	1.35	25.72	0.57	
4769380	W-5	37.1	45	26	0.66	37.2	0.68	0.79	0.02	
4769384	E-1	37.1	45	55	0.66	37.2	1.46	29.71	0.66	
4769385	E-5	37.1	45	57	0.66	37.2	1.51	31.70	0.70	
4769386	S-1	37.1	45	75	0.66	37.2	2.00	49.65	1.10	
4784848	N-1	37.1	45	48	0.65	37.2	1.27	23.11	0.51	
4784849	N-5	37.1	45	78	0.65	37.2	2.08	53.03	1.18	
Observations - No gradient with distance from the pond.										
Concentrations highest to the east which would be unlikely since the per of time the wind blows from the west is less than										
No observable gradient to the north.										
Prevailing wind is from the S, SSW, SW										

Table 2-4: Pb-210 Concentration for Q3 - Special Radon Project				
Location	**Distance**	**Pb-210 Conc.**	**precision**	
	m	**uCi/mL**	**uCi/mL**	
Center	na	1.94E-14	3.02E-15	
EP North Fence	na	8.77E-15	3.02E-15	
EP North	100	8.78E-15	3.02E-15	
EP North	500	8.79E-15	3.02E-15	
Routine Pb-210 Concentration for Q3 2009				
Location		**Pb-210 Conc.**	**Precision**	
		uCi/mL	**uCi/mL**	
AM-1 (resident)		1.78E-14	2.66E-15	
AM-2		1.25E-14	2.66E-15	
AM-3		1.97E-14	2.68E-15	
AM-4		1.84E-14	2.56E-15	
AM-5 (nearest resident)		2.14E-14	2.86E-15	
AM-6 (background)		2.48E-14	2.60E-15	
AM-8		1.96E-14	3.55E-15	

Table 2-5: Routine Semi-Annual Radon Data - Q3-Q4 2009										
DRNF detectors										
Det. ID	Location	Description	Calibration Factor	Days	Tracks	Area	Background	net tracks	exposure	Conc.
						mm^2	$trks/mm^2$	per mm^2	pCi/L-d	pCi/L
8005	AM-2		37	189	125	37.2	2.51	0.85	31.46	0.17
8006	AB-2		37.1	189	159	37.2	2.51	1.76	65.45	0.35
8008	AM-8	Site Boundary	37	189	131	37.2	2.51	1.01	37.43	0.20
8009	AM-1	Nearest Residence	37	189	116	37.2	2.51	0.61	22.51	0.12
8010	AB-1	Nearest Residence	37.1	189	138	37.2	2.51	1.20	44.51	0.24
8027	AM-3	Permit area boundary	37	189	109	37.2	2.51	0.42	15.54	0.08
8029	AM-4	Permit area boundary	37	189	119	37.2	2.51	0.69	25.49	0.13
8030	AM-6	Control	37	189	124	37.2	2.51	0.82	30.46	0.16
8031	AB-6	Control	37	189	104	37.2	2.51	0.29	10.57	0.06
8032	AM-5	Residence or site boundary	37.1	189	168	37.2	2.51	2.01	74.43	0.39
Routine data are not applicable to the special project data since they are different detectors and include Q4 as well as Q3; Q4 radon concentrations are										
may be lower due to the effect of snow cover.										

CROW BUTTE RESOURCES, INC.

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P.O. Box 169
Crawford, Nebraska 69339-0169

(308) 665-2215 - Office
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Response to EPA Request to Test and Provide Information Pursuant to the Clean Air Act

Appendix B
Test Procedures and Data Collection Requirements (Revised June 26, 2009)

Items #1 through #8 below provide a summary of the test procedures and data collection requirements consistent with Appendix B of the U.S. Environmental Protection Agency's (EPA's) *Request to Test and Provide Information Pursuant to the Clean Air Act* (Test Request) dated May 1, 2009, as amended by *Cameco Resources Suggested Alternatives to Appendix B Test Procedures and Data Collection Requirements* dated June 12, 2009, and the EPA's *Final Modification to the ISL Evaporation Pond Monitoring Requirements, in Response to Cameco Resources' Suggested Alternatives to Appendix B Test Procedures and Data Collection Requirements, June 12, 2009*, dated June 26, 2009.

The number and location of radionuclide monitoring stations deployed during the testing program were consistent with Items #1 and #2 below. Additional information on data collected during the testing program and a description of where information can be found in the attached appendices is provided under Items #3 through #8 below.

1. Place Radtrak® cups with thoron filters along the fenced-area boundary (pond perimeter) in the four cardinal directions and the prevailing wind rose direction. At each sample point, radon cups will be placed at 1, 3, and 5 meters above the ground surface and will remain for 90 days. At the 1 meter and 5 meter sample heights, an additional cup will be placed for analysis of Radon-222 after 45 days. Since the prevailing wind rose direction is also a cardinal direction (south to north), a total of 20 radon cups will be placed at the pond perimeter.

2. Place Radtrak® etch cups with thoron filters in the four cardinal directions and the prevailing wind rose direction at distances 50, 100, 250, and 500 meters from the pond, with the exception of the discussed 500 meter sample to the West, which would require placement on private property. These cups will remain in place for 90 days and be placed approximately 1 meter above the ground surface. Since the prevailing wind rose direction is also a cardinal direction (south to north), this will result in a total of 15 radon cups for analysis of Radon-222 at distances away from the pond.

   For Lead-210 sampling, sample continuously for 90 days at the center of the pond complex, along the pond perimeter in the prevailing wind direction, and at 100 and 500 meters only in the direction of the prevailing wind during July, August, and September at a sampling height of approximately 2 meters. This will result in 4 air stations for analysis of Lead-210.

Radon daughter monitoring, using the Modified Kusnetz Method, shall be conducted once per week during the 90 day Radon-222 analysis. During the weekly monitoring, working levels (WL) should be measured at the pond center (if practicable) and pond perimeter in the four cardinal directions as well as in the direction of the prevailing wind, at the time of sampling, at 50, 100, 250, and 500 meters from the pond, and at the location of the Lead-210 monitors, if the prevailing wind during WL monitoring is different than the placement of Lead-210 monitors. A WL background measurement shall be taken upwind of the pond during the weekly WL monitoring in the prevailing wind direction. All weekly WL monitoring should be conducted at approximately the same time (± 2 hours) of the day to minimize effects of diurnal changes. If at any time during the collection of radon daughter monitoring data EPA determines that sufficient data has been collected from one or more locations to meet the objectives of the testing program, EPA will modify the above-referenced radon daughter monitoring program to reduce and/or eliminate the number and/or frequency of sample points as appropriate.

3. Cameco Resources will attempt to collect Radon-222 and Lead-210 samples continuously at each location for 90 days during the months of July, August, and September 2009.

   Radon-222 samples were collected continuously during a 90-day period starting July 7, 2009, and ending October 8, 2009. Lead-210 samples were also collected over an approximate 90-day period starting July 10, 2009, and ending October 15, 2009. The lead-210 sampling period was extended slightly in an attempt to meet the lower limit of detection (LLD) specified in NRC Reg Guide 4.14.

4. During sample collection and analysis, CR will attempt to meet the lower limits of detection (LLD's) and precision/accuracy specified in NRC Reg Guide 4.14.

   All attempts were made to meet the LLD and precision/accuracy specified in NRC Reg Guide 4.14.

5. For each sample location, Cameco Resources will report the following to EPA:

   a. Sample location

      The locations of radon-222, lead-210 and WL monitoring stations are depicted in the maps provided in Appendices A-1, A-2 and A-3, respectively, under Tab A.

   b. Sample collection date(s)

      Collection dates for the 45-day and 90-day radon-222 samples are included on the Radon Test Detector Log sheets and Landauer Radon Monitoring Reports in Appendix A-1. Collection dates for lead-210 monitoring are provided on

A description of the procedures used for lead-210 sampling are provided in Section 4.2 of the Crow Butte Uranium Project Environmental Manual, included in Appendix B-2. Specific information on sample times, flow rates, and air volumes associated with lead-210 monitoring are provided on the Pond Test Particulate Sampling summary sheets in Appendix A-2.

d. Description of analytical methods

Radtrak® etch cups are analyzed using procedures and methods established by Landauer. Lead-210 samples were analyzed by Energy Laboratories, Inc. using Method E909.0M. Samples collected during WL monitoring were analyzed using Modified Kusnetz method included in Appendix B-2.

e. Description of calibration procedures, as needed

Calibration procedures for the SKC pumps used during lead-210 sampling are described in Section 10.6.2 of the Crow Butte Uranium Project Health Physics Manual included in Appendix B-3. Pump calibration records are also included in Appendix B-3.

Calibration procedures for the pump and alpha scintillation detector and scaler/ratemeter used during sampling and analysis of (Modified Kusnetz) WL measurements are also included in Section 10 of the Health Physics Manual included in Appendix B-3.

f. Description of any unusual releases, including any available data on quantities of radionuclides released, during the testing program

No unusual releases of radionuclides occurred during the testing program.

g. Sampling procedures associated with radon-222 and WL monitoring

Radon-222 sampling procedures are described in Section 4.3 of the Environmental Manual included in Appendix B-2. Procedures for WL monitoring using the Modified Kusnetz method are also provided in Appendix B-2.

h. Radon-222, WL, and lead-210 background values during the monitoring period

Radon-222 background values measured during the monitoring period are identified as Air Monitoring Station No. AM-6 on the 90-day Track Etch Cup Ambient Radon Concentrations summary sheet in Appendix A-1. This station is also identified as AM-6-EPA on the 90-day Landauer Radon Monitoring Report in Appendix A-1.

f. Radium-226 concentrations in the water in the pond complex based on five (5) samples collected over the 90-day sampling period

See Appendix C-3

h. Radon-222 and Lead-210 data collected under the NRC operating license over the 90-day sampling period

Lead-210 data collected during the 90-day sampling period under NRC License #SUA-1534 are provided in Appendix C-4. Radtrak® etch cups used for the purpose of collecting radon-222 data under the NRC license are deployed on a semi-annual (6-month) basis. The radon-222 data from the second half of 2009 are not yet available but will be forwarded to the EPA upon receipt.

g. Historical wind rose data

See Appendix C-5

8. With the exception of Radon-222 data collected and analyzed after 45 days, CBR will attempt to provide a report to the EPA within 30 days following receipt of analytical data after the 90-day sampling program. Radon-222 data obtained after the 45-day period will be forwarded to EPA upon receipt from the analytical laboratory.

As previously communicated to the EPA, the final analytical results of lead-210 monitoring were not received until December 31, 2009. This report is being submitted within the requested 30-day period. Radon-222 data obtained after the 45-day period were forwarded to the EPA on September 16, 2009.

APPENDIX A

A-1 Radon-222 Monitoring Data

- Map of Radon-222 Monitoring Stations
- 45-Day Track Etch Cup Ambient Radon Concentrations Summary Sheet (1 meter / 5 meter)
- 45-Day Radon Test Detector Log
- 45-Day Landauer Radon Monitoring Report
- 90-Day Track Etch Cup Ambient Radon Concentrations Summary Sheet (1 meter / 3 meter / 5 meter)
- 90-Day Radon Test Detector Log
- 90-Day Landauer Radon Monitoring Report

A-2 Lead-210 Monitoring Data

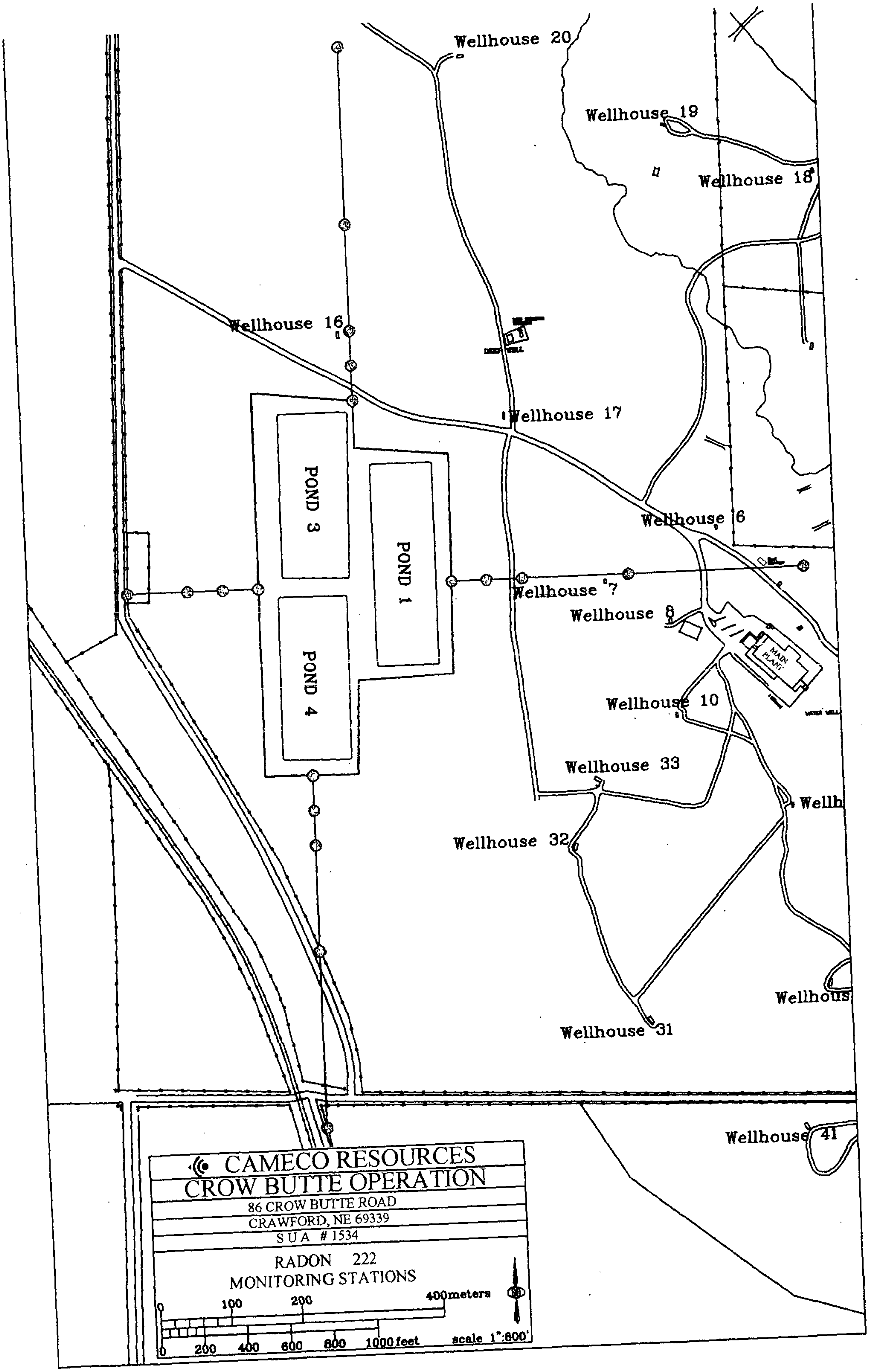
- Map of Lead-210 Monitoring Stations
- Pond Test Particulate Sampling Summary Sheets (Air Volumes Passed through the Sampling Pumps)
- High Volume Air Sampling (Lead-210) Report from Energy Laboratories, Inc.

A-3 Radon Daughter (WL) Monitoring Data

- Map of Working Level Monitoring Stations
- Summary of Weekly Working Level (WL) Data
- Weekly WL Data Sheets

Appendix A-1
Radon-222 Monitoring Data

- Map of Radon-222 Monitoring Stations
- 45-Day Track Etch Cup Ambient Radon Concentrations Summary Sheet (1 meter / 5 meter)
- 45-Day Radon Test Detector Log
- 45-Day Landauer Radon Monitoring Report
- 90-Day Track Etch Cup Ambient Radon Concentrations Summary Sheet (1 meter / 3 meter / 5 meter)
- 90-Day Radon Test Detector Log
- 90-Day Landauer Radon Monitoring Report



Wellhouse 20
Wellhouse 19
Wellhouse 18
Wellhouse 16
Wellhouse 17
POND 3
POND 1
POND 4
Wellhouse 6
Wellhouse 7
Wellhouse 8
MAIN PLANT
Wellhouse 10
Wellhouse 33
Wellh
Wellhouse 32
Wellhous
Wellhouse 31
Wellhouse 41
CAMECO RESOURCES
CROW BUTTE OPERATION
86 CROW BUTTE ROAD
CRAWFORD, NE 69339
SUA # 1534
RADON 222
MONITORING STATIONS
0 100 200 400meters
0 200 400 600 800 1000feet
scale 1":800'

Crow Butte Resources, Inc.

EPA Evaporation Pond Montoring Test

Track Etch Cup Ambient Radon Concentrations

Air Monitoring Station No. *Period: July 7, 2009 to August 21, 2009*

	Gross Count		Average Radon Concentration (pCi/L)	Accuracy (pCi/L)	Percent Effluent Concentration
N-1M-B	48.0	*	0.7	0.10	7.0%
N-5M-B	78.0		1.2	0.14	12.0%
E-1MB	55.0	*	0.7	0.09	7.0%
E-5M-B	57.0	*	0.7	0.09	7.0%
S-1M-B	75.0		1.1	0.13	11.0%
S-5M-B	37.0	*	0.7	0.12	7.0%
W-1M-B	51.0	*	0.7	0.10	7.0%
W-5M-B	26.0	*	0.7	0.14	7.0%

* Concentration is less than indicated value

LLD (pCi/L)	0.2
Effluent Concentration Limit, 10 CFR 20 App B Column 2:	10

RADON TEST DETECTOR LOG

Landauer, Inc.
2 Science Road
Glenwood, IL 60425-1586

Company CROW BUTTE RESOURCES
Address CROW BUTTE PLANT
86 Crow Butte Road P.O. Box 169
Crawford, NE 69339
Phone (308) 665-2215
Contact Rhonda Grantham
Account # 410293

Detector Number	Starting Date Mo	Starting Date Day	Starting Date Yr	Ending Date Mo	Ending Date Day	Ending Date Yr	Detector Location/Comments
4784848	7	7	09	8	21	09	N-1M-B
4784849	7	7	09	8	21	09	N-5M-B
4769384	7	7	09	8	21	09	E-1M-B
4769385	7	7	09	8	21	09	E-5M-B
4769386	7	7	09	8	21	09	S-1M-B
4769378	7	7	09	8	21	09	S-5M-B
4769379	7	7	09	8	21	09	W-1M-B
4769380	7	7	09	8	21	09	W-5M-B
							PLEASE READ ALL CUPS DURING THE
							SAME RUN. Thanks.

Return original copy with detectors. Retain copy for your records.

White - ORIGINAL COPY Yellow - CUSTOMER COPY Page ____ of ____

Form # 137-033

Radon Monitoring Report

CROW BUTTE RESOURCES, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Acct. No. 0410293

SEP 08 2009

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	AREA GROSS COUNT	COUNTED (SQ MM)	BACK GRND	LOT NO.
4769378	DRNM	07-JUL-09	21-AUG-09	* - LESS THAN INDICATED VALUE S-5 M-B CALIB FACT= 37.1 DAYS EXPOSED: 45	* 30.0	* 0.7 ±0.11	37	37.2 A	0.66	T34237
4769379	DRNM	07-JUL-09	21-AUG-09	* - LESS THAN INDICATED VALUE W-1 M-B CALIB FACT= 37.1 DAYS EXPOSED: 45	* 30.0	* 0.7 ±0.09	51	37.2 A	0.66	T34237
4769380	DRNM	07-JUL-09	21-AUG-09	* - LESS THAN INDICATED VALUE W-SM-B W-5m-B CALIB FACT= 37.1 DAYS EXPOSED: 45	* 30.0	* 0.7 ±0.13	26	37.2 A	0.66	T34237
4769384	DRNM	07-JUL-09	21-AUG-09	E-1 M-B CALIB FACT= 37.1 STD DEV= 13.5 DAYS EXPOSED: 45	30.3 ±4.08	0.7 ±0.09	55	37.2 A	0.66	T34237
4769385	DRNM	07-JUL-09	21-AUG-09	E-5 M-B CALIB FACT= 37.1 STD DEV= 13.2 DAYS EXPOSED: 45	32.3 ±4.27	0.7 ±0.09	57	37.2 A	0.66	T34237
4769386	DRNM	07-JUL-09	21-AUG-09	5-1 M-B S-1m-B CALIB FACT= 37.1 STD DEV= 11.5 DAYS EXPOSED: 45	50.2 ±5.80	1.1 ±0.13	75	37.2 A	0.66	T34237
①	②	③	④	⑤	⑥	⑦	⑧			

RESULTS RELATED ONLY TO MONITORS
AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
DRB	A21722	03-SEP-09	25-AUG-09

CROW BUTTE RESOURCES, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

Radon Monitoring Report

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Acct. No. 0410293

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	AREA GROSS COUNT	COUNTED (SQ MM)	BACK GRND	LOT NO.
4784848	DRNM	07-JUL-09	21-AUG-09	* - LESS THAN INDICATED VALUE N-1 M-B CALIB FACT= 37.1 DAYS EXPOSED: 45	* 30.0	* 0.7 ±0.10	48	37.2 A	0.65	T3487
4784849	DRNM	07-JUL-09	21-AUG-09	N-5 M-B CALIB FACT= 37.1 STD DEV= 11.3 DAYS EXPOSED: 45	53.6 ±6.07	1.2 ±0.13	78	37.2 A	0.65	T3487
①	②	③	④	⑤	⑥	⑦	⑧			

RESULTS RELATED ONLY TO MONITORS
AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
DRB	A21722	03-SEP-09	25-AUG-09

Crow Butte Resources, Inc.
EPA Evaporation Pond Montoring Test

Track Etch Cup Ambient Radon Concentrations

Air Monitoring Station No. *Period: July 7, 2009 to October 8, 2009*

	Gross Count		Average Radon Concentration (pCi/L)	Accuracy (pCi/L)	Percent Effluent Concentration
N-1M-A	99.0	*	0.3	0.03	3.0%
N-3M-A	103.0	*	0.3	0.03	3.0%
N-5M-A	89.0	*	0.3	0.03	3.0%
E-1MA	62.0	*	0.3	0.04	3.0%
E-3MA	80.0	*	0.3	0.03	3.0%
E-5M-A	95.0	*	0.3	0.03	3.0%
S-1M-A	76.0		0.5	0.06	5.0%
S-3M-A	71.0		0.4	0.05	4.0%
S-5M-A	79.0		0.5	0.06	5.0%
W-1M-A	82.0		0.6	0.07	6.0%
W-3M-A	55.0		0.3	0.04	3.0%
W-5M-A	47.0	*	0.3	0.04	3.0%
N-50	75.0		0.5	0.06	5.0%
N-100	93.0		0.7	0.07	7.0%
N-250	96.0		0.8	0.08	8.0%
N-500	74.0		0.5	0.06	5.0%
E-50	70.0		0.4	0.05	4.0%
E-100	79.0		0.5	0.06	5.0%
E-250	84.0		0.6	0.07	6.0%
E-500	155.0		1.3	0.10	13.0%
S-50	55.0	*	0.3	0.04	3.0%
S-100	62.0		0.3	0.04	3.0%
S-250	39.0	*	0.3	0.05	3.0%
S-500	59.0	*	0.3	0.04	3.0%
W-50	39.0	*	0.3	0.05	3.0%
W-100	90.0		0.6	0.06	6.0%
W-185	87.0		0.6	0.06	6.0%
AM-6	41.0	*	0.3	0.05	3.0%

* Concentration is less than indicated value

LLD (pCi/L)	0.2
Effluent Concentration Limit, 10 CFR 20 App B Column 2:	10

RADON TEST DETECTOR LOG

Landauer, Inc.
2 Science Road
Glenwood, IL 60425-1586

Company GROW BUTTE RESOURCES
Address CROW BUTTE PLANT
86 Crow Butte Road P.O. Böx 169
Crawford, NE 69339
Phone (308) 665-2215
Contact Rhonda Grantham
Account # 410293

Detector Number	Starting Date			Ending Date			Detector Location/Comments
	Mo	Day	Yr	Mo	Day	Yr	
4769405	7	7	09	10	8	09	N-50
4769406	7	7	09	10	8	09	N-100
4769407	7	7	09	10	8	09	N-250
4784860	7	7	09	10	8	09	N-500
4784861	7	7	09	10	8	09	W-50
4784870	7	7	09	10	8	09	W-100
4784871	7	7	09	10	8	09	W-185
4784856	7	7	09	10	8	09	S-50
4784857	7	7	09	10	8	09	S-100
4784876	7	7	09	10	8	09	S-250
4784877	7	7	09	10	8	09	E-50
4784878	7	7	09	10	8	09	E-100
4784879	7	7	09	10	8	09	E-250
4784872	7	7	09	10	8	09	E-500
4784873	7	7	09	10	8	09	S-500
4784868	7	7	09	10	8	09	N-500-D
4784869	7	7	09	10	8	09	AM-6-EPA
4643603	7	7	09	10	8	09	N-1M-A
4643604	7	7	09	10	8	09	N-3M-A
4643605	7	7	09	10	8	09	N-5M-A
							PLEASE READ ALL CUPS DURING THE
							SAME RUN. Thanks.

Return original copy with detectors. Retain copy for your records.

White - ORIGINAL COPY Yellow - CUSTOMER COPY

Form # 137-033

RADON TEST DETECTOR LOG

Landauer, Inc.
2 Science Road
Glenwood, IL 60425-1586

Company GROW BUTTE RESOURCES
Address CROW BUTTE PLANT
86 Crow Butte Road P.O. Box 169
Crawford, NE 69339
Phone (308) 665-2215
Contact Rhonda Grantham
Account # 410293

Detector Number	Starting Date			Ending Date			Detector Location/Comments
	Mo	Day	Yr	Mo	Day	Yr	
4643584	7	7	09	10	8	09	E-1M-A
4643586	7	7	09	10	8	09	E-3M-A
4643587	7	7	09	10	8	09	E-5M-A
4760593	7	7	09	10	8	09	S-1M-A
4760594	7	7	09	10	8	09	S-3M-A
4760595	7	7	09	10	8	09	S-5M-A
4769372	7	7	09	10	8	09	W-1M-A
4769373	7	7	09	10	8	09	W-3M-A
4769374	7	7	09	10	8	09	W-5M-A
							PLEASE READ ALL CUPS DURING THE
							SAME RUN. Thanks.

Return original copy with detectors. Retain copy for your records.

White - ORIGINAL COPY Yellow - CUSTOMER COPY

Form # 137-033

Radon Monitoring Report

CROW BUTTE RESRCS, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

RECEIVED
NOV 02 2009
By______

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Acct. No. 0410293

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	AREA GROSS COUNT	COUNTED (SQ MM)	BACK GRND	LOT NO.
4643584	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE E-1M-A CALIB FACT= N/A DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.04	62	37.2 A	2.23	T2718
4643586	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE E-3M-A CALIB FACT= N/A DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.04	80	37.2 A	2.23	T2718
4643587	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE E-5M-A CALIB FACT= 44.5 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.03	95	37.2 A	2.23	T2718
4643603	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE N-1M-A CALIB FACT= 44.5 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.03	99	37.2 A	2.23	T2718
4643604	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE N-3M-A CALIB FACT= 44.5 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.03	103	37.2 A	2.23	T2718
4643605	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE N-5M-A CALIB FACT= 44.5 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.03	89	37.2 A	2.23	T2718
①	②	③	④	⑤	⑥	⑦	⑧			

RESULTS RELATED ONLY TO MONITORS
AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
DRB	A21756	29-OCT-09	14-OCT-09

Radon Monitoring Report

CROW BUTTE RESRCS, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Acct. No. 0410293

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	GROSS COUNT	AREA COUNTED (SQ MM)	BACK GRND	LOT NO.
4760593	DRNM	07-JUL-09	08-OCT-09	S-1M-A CALIB FACT= 37.9 STD DEV= 11.5 DAYS EXPOSED: 93	44.5 ±5.10	0.5 ±0.05	76	37.2 A	0.87	T3421
4760594	DRNM	07-JUL-09	08-OCT-09	S-3M-A CALIB FACT= 37.9 STD DEV= 11.9 DAYS EXPOSED: 93	39.4 ±4.68	0.4 ±0.05	71	37.2 A	0.87	T3421
4760595	DRNM	07-JUL-09	08-OCT-09	S-5M-A CALIB FACT= 37.9 STD DEV= 11.3 DAYS EXPOSED: 93	47.6 ±5.35	0.5 ±0.06	79	37.2 A	0.87	T3421
4769372	DRNM	07-JUL-09	08-OCT-09	W-1M-A CALIB FACT= 37.1 STD DEV= 11.0 DAYS EXPOSED: 93	57.3 ±6.32	0.6 ±0.07	82	37.2 A	0.66	T3423
4769373	DRNM	07-JUL-09	08-OCT-09	W-3M-A CALIB FACT= 37.1 STD DEV= 13.5 DAYS EXPOSED: 93	30.3 ±4.09	0.3 ±0.04	55	37.2 A	0.66	T3423
4769374	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE W-5M-A CALIB FACT= 37.1 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.05	47	37.2 A	0.66	T3423
4769405	DRNM	07-JUL-09	08-OCT-09	N-50 CALIB FACT= 37.1 STD DEV= 11.5 DAYS EXPOSED: 93	50.3 ±5.81	0.5 ±0.06	75	37.2 A	0.66	T3423
①	②	③	④	⑤	⑥	⑦	⑧			

RESULTS RELATED ONLY TO MONITORS
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Q.C. Release	Process No.	Report Date	Date Received
DRB	A21756	29-OCT-09	14-OCT-09

CROW BUTTE RESRCS, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

Radon Monitoring Report

Acct. No. 0410293

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	GROSS COUNT	AREA COUNTED (SQ MM)	BACK GRND	LOT NO.
4769406	DRNM	07-JUL-09	08-OCT-09	N-100 CALIB FACT= 37.2 STD DEV= 10.4 DAYS EXPOSED: 93	68.3 ±7.08	0.7 ±0.08	93	37.2 A	0.66	T34237
4769407	DRNM	07-JUL-09	08-OCT-09	N-250 CALIB FACT= 37.2 STD DEV= 10.2 DAYS EXPOSED: 93	71.3 ±7.27	0.8 ±0.08	96	37.2 A	0.66	T34237
4784856	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE S-50 CALIB FACT= 37.1 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.04	55	37.2 A	0.80	T34871
4784857	DRNM	07-JUL-09	08-OCT-09	S-100 CALIB FACT= 37.1 STD DEV= 12.7 DAYS EXPOSED: 93	32.1 ±4.08	0.3 ±0.04	62	37.2 A	0.80	T34871
4784860	DRNM	07-JUL-09	08-OCT-09	N-500 CALIB FACT= 37.1 STD DEV= 11.6 DAYS EXPOSED: 93	44.1 ±5.12	0.5 ±0.06	74	37.2 A	0.80	T34871
4784861	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE W-50 CALIB FACT= 37.1 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.05	39	37.2 A	0.80	T34871
4784868	DRNM	07-JUL-09	08-OCT-09	N-500-D CALIB FACT= 37.1 STD DEV= 11.6 DAYS EXPOSED: 93	44.1 ±5.12	0.5 ±0.06	74	37.2 A	0.80	T34871
①	②	③	④	⑤	⑥	⑦	⑧			

RESULTS RELATED ONLY TO MONITORS
AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
DRB	A21756	29-OCT-09	14-OCT-09

Radon Mo''oring Report

CROW BUTTE RESRCS, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Acct. No. 0410293

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	GROSS COUNT	AREA COUNTED (SQ MM)	BACK GRND	LOT NO.
4784869	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE AM-6-EPA CALIB FACT= 37.1 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.05	41	37.2 A	0.80	T34871
4784870	DRNM	07-JUL-09	08-OCT-09	W-100 CALIB FACT= 37.1 STD DEV= 10.5 DAYS EXPOSED: 93	60.1 ±6.33	0.6 ±0.07	90	37.2 A	0.80	T34871
4784871	DRNM	07-JUL-09	08-OCT-09	W-185 CALIB FACT= 37.1 STD DEV= 10.7 DAYS EXPOSED: 93	57.1 ±6.12	0.6 ±0.07	87	37.2 A	0.80	T34871
4784872	DRNM	07-JUL-09	08-OCT-09	E-500 CALIB FACT= 37.2 STD DEV= 8.0 DAYS EXPOSED: 93	125.2 ±10.1	1.3 ±0.11	155	37.2 A	0.80	T34871
4784873	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE S-500 CALIB FACT= 37.1 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.04	59	37.2 A	0.80	T34871
4784876	DRNM	07-JUL-09	08-OCT-09	* - LESS THAN INDICATED VALUE S-250 CALIB FACT= 37.1 DAYS EXPOSED: 93	* 30.0	* 0.3 ±0.05	39	37.2 A	0.80	T34871
①	②	③	④	⑤	⑥	⑦	⑧			

RESULTS RELATED ONLY TO MONITORS
AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
DRB	A21756	29-OCT-09	14-OCT-09

Radon Monitoring Report

CROW BUTTE RESRCS, INC.
86 CROW BUTTE ROAD
CRAWFORD, NE 69339

Acct. No. 0410293

LANDAUER

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (800) 528-8327 Facsimile: (708) 755-7048

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/l-days	Avg. Radon Conc. pCi/l	GROSS COUNT	AREA COUNTED (SQ MM)	BACK GRND	LOT NO.
4784877	DRNM	07-JUL-09	08-OCT-09	E-50 CALIB FACT= 37.1 STD DEV= 12.0 DAYS EXPOSED: 93	40.1 ±4.79	0.4 ±0.05	70	37.2 A	0.80	T34871
4784878	DRNM	07-JUL-09	08-OCT-09	E-100 CALIB FACT= 37.1 STD DEV= 11.3 DAYS EXPOSED: 93	49.1 ±5.52	0.5 ±0.06	79	37.2 A	0.80	T34871
4784879	DRNM	07-JUL-09	08-OCT-09	E-250 CALIB FACT= 37.1 STD DEV= 10.9 DAYS EXPOSED: 93	54.1 ±5.90	0.6 ±0.06	84	37.2 A	0.80	T34871

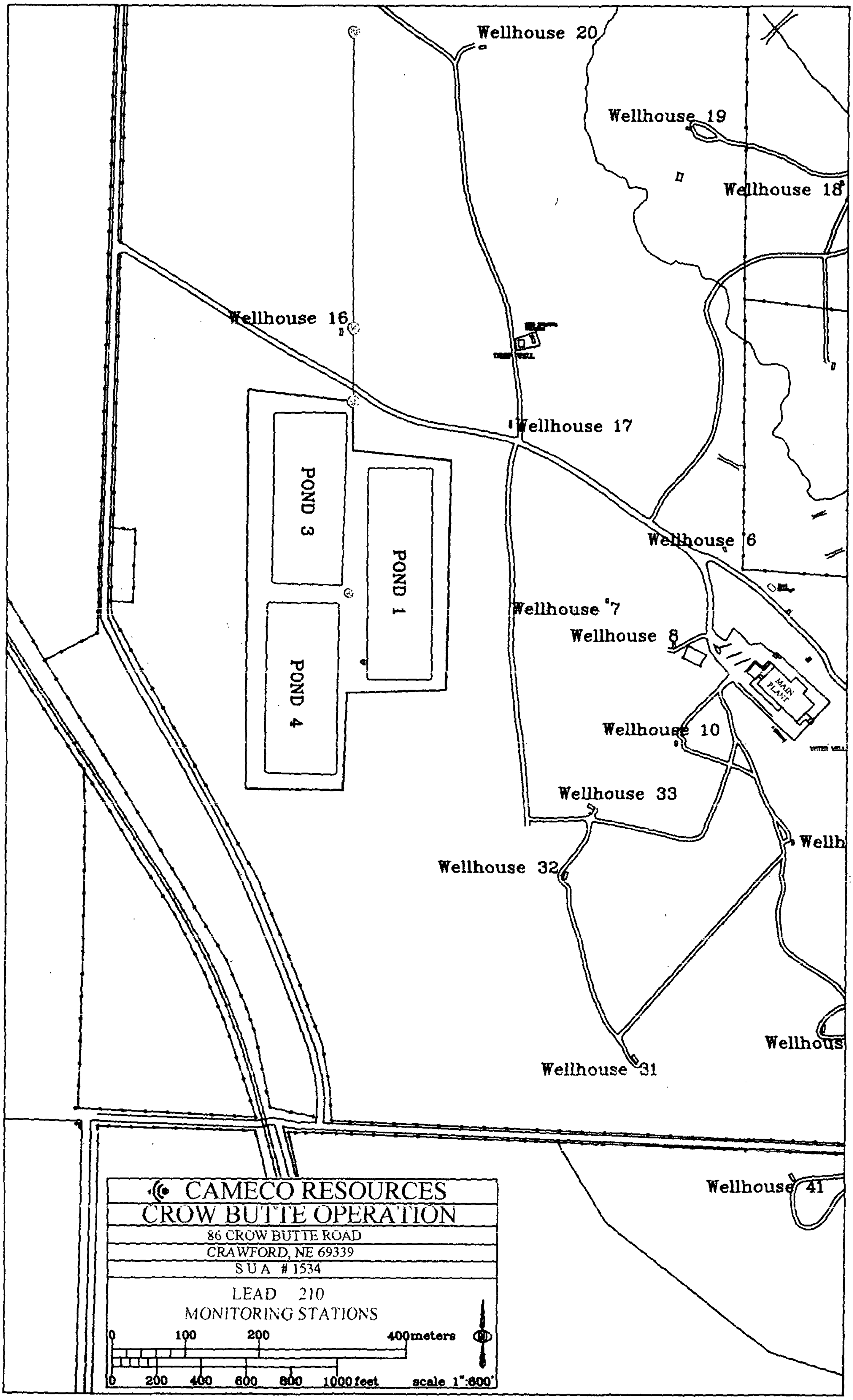
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

RESULTS RELATED ONLY TO MONITORS
AS RECEIVED BY LANDAUER.

Q.C. Release	Process No.	Report Date	Date Received
DRB	A21756	29-OCT-09	14-OCT-09

Appendix A-2
Lead-210 Monitoring Data

- Map of Lead-210 Monitoring Stations
- Pond Test Particulate Sampling Summary Sheets (Air Volumes Passed through the Sampling Pumps)
- High Volume Air Sampling (Lead-210) Report from Energy Laboratories, Inc.



CAMECO RESOURCES
CROW BUTTE OPERATION
86 CROW BUTTE ROAD
CRAWFORD, NE 69339
S U A # 1534

LEAD 210
MONITORING STATIONS

Crow Butte Resources

Pond Test Particulate Sampling

Pond 100m. North

Pump #	Date Time Start	Date Time End	Total Time		Flow Rate		Total Volume	
6	7/10/2009 10:13:00 AM	7/16/2009 1:36:00 PM	8843	*min.*	5.025	*LPM*	44436.1	*Liters*
6	7/16/2009 2:50:00 PM	7/23/2009 10:56:00 AM	9846	*min.*	5.021	*LPM*	49436.8	*Liters*
6	7/23/2009 12:58:00 PM	7/30/2009 10:39:00 AM	9941	*min.*	5.007	*LPM*	49774.6	*Liters*
6	7/30/2009 12:19:00 PM	8/6/2009 1:03:00 PM	10124	*min.*	5.011	*LPM*	50731.4	*Liters*
6	8/6/2009 3:23:00 PM	8/13/2009 12:50:00 PM	9927	*min.*	5	*LPM*	49635.0	*Liters*
6	8/13/2009 2:38:00 PM	8/20/2009 12:27:00 PM	9949	*min.*	4.985	*LPM*	49595.8	*Liters*
6	8/20/2009 1:54:00 PM	8/27/2009 12:58:00 PM	10024	*min.*	4.993	*LPM*	50049.8	*Liters*
6	8/27/2009 1:49:00 PM	9/3/2009 1:24:00 PM	10055	*min.*	5.013	*LPM*	50405.7	*Liters*

Crow Butte Resources

Pond Test Particulate Sampling

6	9/3/2009 3:03:00 PM	9/10/2009 10:56:00 AM	9833	*min.*	5.035	*LPM*	49509.2	*Liters*
6	9/10/2009 2:10:00 PM	9/17/2009 9:54:00 AM	9824	*min.*	4.999	*LPM*	49110.2	*Liters*
6	9/17/2009 11:02:00 AM	9/24/2009 9:38:00 AM	9996	*min.*	4.992	*LPM*	49900.0	*Liters*
6	9/24/2009 10:53:00 AM	10/1/2009 8:21:00 AM	9928	*min.*	5.002	*LPM*	49659.9	*Liters*
2	10/1/2009 11:09:00 AM	10/8/2009 9:19:00 AM	9970	*min.*	4.997	*LPM*	49820.1	*Liters*
2	10/8/2009 11:16:00 AM	10/15/2009 9:56:00 AM	10000	*min.*	5.011	*LPM*	50110.0	*Liters*

Total Volume *692174.4* *Liters*

Crow Butte Resources

Pond Test Particulate Sampling

Pond 500m. North

Pump #	*Date Time Start*	*Date Time End*	*Total Time*		*Flow Rate*	*Total Volume*	
7	7/10/2009 10:03:00 AM	7/16/2009 1:42:00 PM	8859	*min.*	5.038 *LPM*	44631.6	*Liters*
7	7/16/2009 2:56:00 PM	7/23/2009 11:00:00 AM	9844	*min.*	4.993 *LPM*	49151.1	*Liters*
7	7/23/2009 1:05:00 PM	7/30/2009 10:44:00 AM	9939	*min.*	5.009 *LPM*	49784.5	*Liters*
7	7/30/2009 12:11:00 PM	8/6/2009 1:07:00 PM	10136	*min.*	5.006 *LPM*	50740.8	*Liters*
7	8/6/2009 3:27:00 PM	8/13/2009 12:55:00 PM	9928	*min.*	5.002 *LPM*	49659.9	*Liters*
7	8/13/2009 2:44:00 PM	8/20/2009 12:31:00 PM	9947	*min.*	5.001 *LPM*	49744.9	*Liters*
7	8/20/2009 1:59:00 PM	8/27/2009 1:01:00 PM	10022	*min.*	4.998 *LPM*	50090.0	*Liters*
7	8/27/2009 1:54:00 PM	9/3/2009 1:30:00 PM	10056	*min.*	5.005 *LPM*	50330.3	*Liters*

Crow Butte Resources

Pond Test Particulate Sampling

7	9/3/2009 3:07:00 PM	9/10/2009 10:59:00 AM	9832	*min.*	5.013	*LPM*	49287.8	*Liters*
7	9/10/2009 2:20:00 PM	9/17/2009 9:58:00 AM	9818	*min.*	5	*LPM*	49090.0	*Liters*
7	9/17/2009 10:59:00 AM	9/24/2009 9:43:00 AM	10004	*min.*	4.999	*LPM*	50010.0	*Liters*
7	9/24/2009 10:59:00 AM	10/1/2009 8:25:00 AM	9926	*min.*	4.998	*LPM*	49610.1	*Liters*
7	10/1/2009 11:13:00 AM	10/8/2009 9:23:00 AM	9970	*min.*	5.002	*LPM*	49869.9	*Liters*
7	10/8/2009 11:21:00 AM	10/15/2009 10:02:00 AM	10001	*min.*	5.001	*LPM*	50015.0	*Liters*

Total Volume *692015.9* *Liters*

Crow Butte Resources

Pond Test Particulate Sampling

Pond Center

Pump #	Date Time Start	Date Time End	Total Time		Flow Rate	Total Volume	
4	7/10/2009 10:26:00 AM	7/16/2009 1:25:00 PM	8819	*min.*	4.997 *LPM*	44068.5	*Liters*
4	7/16/2009 2:40:00 PM	7/23/2009 10:25:00 AM	9825	*min.*	4.996 *LPM*	49085.7	*Liters*
4	7/23/2009 12:48:00 PM	7/30/2009 10:30:00 AM	9942	*min.*	4.996 *LPM*	49670.2	*Liters*
4	7/30/2009 12:27:00 PM	8/6/2009 12:56:00 PM	10109	*min.*	5.009 *LPM*	50636.0	*Liters*
4	8/6/2009 3:16:00 PM	8/13/2009 12:41:00 PM	9925	*min.*	4.998 *LPM*	49605.1	*Liters*
4	8/13/2009 2:30:00 PM	8/20/2009 12:17:00 PM	9947	*min.*	4.998 *LPM*	49715.1	*Liters*
4	8/20/2009 1:45:00 PM	8/27/2009 12:55:00 PM	10030	*min.*	4.995 *LPM*	50099.9	*Liters*
4	8/27/2009 1:47:00 PM	9/3/2009 1:16:00 PM	10049	*min.*	5.019 *LPM*	50435.9	*Liters*

Crow Butte Resources

Pond Test Particulate Sampling

4	9/3/2009 2:37:00 PM	9/10/2009 10:47:00 AM	9850	*min.*	5.024 *LPM*	49486.4	*Liters*
1	9/10/2009 1:23:00 PM	9/17/2009 9:46:00 AM	9863	*min.*	5.016 *LPM*	49472.8	*Liters*
1	9/17/2009 11:10:00 AM	9/24/2009 9:30:00 AM	9980	*min.*	4.999 *LPM*	49890.0	*Liters*
1	9/24/2009 10:45:00 AM	10/1/2009 8:15:00 AM	9930	*min.*	5.007 *LPM*	49719.5	*Liters*
1	10/1/2009 11:03:00 AM	10/8/2009 9:09:00 AM	9966	*min.*	5.003 *LPM*	49859.9	*Liters*
1	10/8/2009 11:08:00 AM	10/15/2009 9:45:00 AM	9997	*min.*	4.991 *LPM*	49895.0	*Liters*

Total Volume 691640.2 *Liters*

Crow Butte Resources

Pond Test Particulate Sampling

Pond N. Fence

Pump #	Date Time Start	Date Time End	Total Time		Flow Rate		Total Volume	
5	7/10/2009 10:18:00 AM	7/16/2009 1:29:00 PM	8831	*min.*	4.994	*LPM*	44102.0	*Liters*
5	7/16/2009 2:46:00 PM	7/23/2009 10:52:00 AM	9846	*min.*	5.009	*LPM*	49318.6	*Liters*
5	7/23/2009 12:55:00 PM	7/30/2009 10:36:00 AM	9941	*min.*	5.012	*LPM*	49824.3	*Liters*
5	7/30/2009 12:22:00 PM	8/6/2009 1:01:00 PM	10119	*min.*	5.001	*LPM*	50605.1	*Liters*
5	8/6/2009 3:20:00 PM	8/13/2009 12:48:00 PM	9928	*min.*	5	*LPM*	49640.0	*Liters*
5	8/13/2009 2:35:00 PM	8/20/2009 12:21:00 PM	9946	*min.*	4.998	*LPM*	49710.1	*Liters*
5	8/20/2009 1:51:00 PM	8/27/2009 12:56:00 PM	10025	*min.*	5	*LPM*	50125.0	*Liters*
5	8/27/2009 1:48:00 PM	9/3/2009 1:20:00 PM	10052	*min.*	5.015	*LPM*	50410.8	*Liters*

Crow Butte Resources

Pump was found not running

Pond Test Particulate Sampling

5	9/3/2009 3:00:00 PM								*Liters*
4	9/10/2009 1:31:00 PM	9/17/2009 9:52:00 AM	9861	*min.*	5.016	*LPM*		49462.8	*Liters*
4	9/17/2009 11:04:00 AM	9/24/2009 9:36:00 AM	9992	*min.*	4.98	*LPM*		49760.2	*Liters*
3	9/24/2009 10:50:00 AM	10/1/2009 8:18:00 AM	9928	*min.*	5	*LPM*		49640.0	*Liters*
3	10/1/2009 11:06:00 AM	10/8/2009 9:13:00 AM	9967	*min.*	5.006	*LPM*		49894.8	*Liters*
3	10/8/2009 11:14:00 AM	10/15/2009 9:54:00 AM	10000	*min.*	4.994	*LPM*		49940.0	*Liters*
3	10/15/2009 10:48:00 AM	10/22/2009 10:42:00 AM	10074	*min.*	5.017	*LPM*		50541.3	*Liters*

Total Volume 692974.9 *Liters*

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ANALYTICAL SUMMARY REPORT

December 28, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09110129 Quote ID: C1125 - Crow Butte Uranium Project

Project Name: EPA Evap Pond Radon Test Environmental Air

Energy Laboratories, Inc. received the following 4 samples for Crow Butte Resources on 11/4/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09110129-001	Evap Pond Center		11/04/09	Filter	Digestion, Total Metals Lead 210
C09110129-002	Evap Pond-North Fence		11/04/09	Filter	Same As Above
C09110129-003	Evap Pond-100 Meters North		11/04/09	Filter	Same As Above
C09110129-004	Evap Pond-500 Meters North		11/04/09	Filter	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:

Steven E. Carlston
Technical Director

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: EPA Evap Pond Radon Test Environmental Air
REVISED DATE: December 28, 2009
REPORT DATE: December 8, 2009
SAMPLE ID: Evap Pond Center

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09110129-001	^{210}Pb	1.94E-14	3.02E-15	4.94E-15	2.00E-15	6.00E-13	3.23E+00
Air Volume in mLs 6.92E+08							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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LABORATORY ANALYTICAL REPORT

		Revised Date:	12/28/09
Client:	Crow Butte Resources	**Report Date:**	12/08/09
Project:	EPA Evap Pond Radon Test Environmental Air	**Collection Date:**	Not Provided
Lab ID:	C09110129-001	**DateReceived:**	11/04/09
Client Sample ID:	Evap Pond Center	**Matrix:**	Filter

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Lead 210	13	pCi/Filter		3.4		E909.0M	12/06/09 09:34 / dm
Lead 210 precision (±)	2.1	pCi/Filter				E909.0M	12/06/09 09:34 / dm
Lead 210 MDC	3.4	pCi/Filter				E909.0M	12/06/09 09:34 / dm

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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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: EPA Evap Pond Radon Test Environmental Air
REVISED DATE: December 28, 2009
REPORT DATE: December 8, 2009
SAMPLE ID: Evap Pond-North Fence

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09110129-002	^{210}Pb	8.77E-15	3.02E-15	4.94E-15	2.00E-15	6.00E-13	1.46E+00
Air Volume in mLs 6.93E+08							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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LABORATORY ANALYTICAL REPORT

		Revised Date:	12/28/09
Client:	Crow Butte Resources	**Report Date:**	12/08/09
Project:	EPA Evap Pond Radon Test Environmental Air	**Collection Date:**	Not Provided
Lab ID:	C09110129-002	**DateReceived:**	11/04/09
Client Sample ID:	Evap Pond-North Fence	**Matrix:**	Filter

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Lead 210	6.1	pCi/Filter		3.4		E909.0M	12/06/09 09:34 / dm
Lead 210 precision (±)	2.1	pCi/Filter				E909.0M	12/06/09 09:34 / dm
Lead 210 MDC	3.4	pCi/Filter				E909.0M	12/06/09 09:34 / dm

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.

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: EPA Evap Pond Radon Test Environmental Air
REVISED DATE: December 28, 2009
REPORT DATE: December 8, 2009
SAMPLE ID: Evap Pond-100 Meters North

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09110129-003	^{210}Pb	8.78E-15	3.02E-15	4.94E-15	2.00E-15	6.00E-13	1.46E+00
Air Volume in mLs 6.92E+08							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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LABORATORY ANALYTICAL REPORT

Revised Date: 12/28/09
Client: Crow Butte Resources
Report Date: 12/08/09
Project: EPA Evap Pond Radon Test Environmental Air
Collection Date: Not Provided
Lab ID: C09110129-003
DateReceived: 11/04/09
Client Sample ID: Evap Pond-100 Meters North
Matrix: Filter

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Lead 210	6.1	pCi/Filter		3.4		E909.0M	12/06/09 09:34 / dm
Lead 210 precision (±)	2.1	pCi/Filter				E909.0M	12/06/09 09:34 / dm
Lead 210 MDC	3.4	pCi/Filter				E909.0M	12/06/09 09:34 / dm

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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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: EPA Evap Pond Radon Test Environmental Air
REVISED DATE: December 28, 2009
REPORT DATE: December 8, 2009
SAMPLE ID: Evap Pond-500 Meters North

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09110129-004	^{210}Pb	8.79E-15	3.02E-15	4.94E-15	2.00E-15	6.00E-13	1.46E+00
Air Volume in mLs 6.92E+08							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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LABORATORY ANALYTICAL REPORT

		Revised Date:	12/28/09
Client:	Crow Butte Resources	**Report Date:**	12/08/09
Project:	EPA Evap Pond Radon Test Environmental Air	**Collection Date:**	Not Provided
Lab ID:	C09110129-004	**DateReceived:**	11/04/09
Client Sample ID:	Evap Pond-500 Meters North	**Matrix:**	Filter

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Lead 210	6.1	pCi/Filter		3.4		E909.0M	12/06/09 09:34 / dm
Lead 210 precision (±)	2.1	pCi/Filter				E909.0M	12/06/09 09:34 / dm
Lead 210 MDC	3.4	pCi/Filter				E909.0M	12/06/09 09:34 / dm

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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QA/QC Summary Report

Client: Crow Butte Resources
Project: EPA Evap Pond Radon Test Environmental Air

Report Date: 12/28/09
Work Order: C09110129

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E909.0M								Batch: 24351	
Sample ID: C09110129-001AMS	Sample Matrix Spike			Run: PACKARD 3100TR_091206A				12/06/09 09:34	
Lead 210	316	pCi/Filter		85	70	130			
Sample ID: C09110129-001AMSD	Sample Matrix Spike Duplicate			Run: PACKARD 3100TR_091206A				12/06/09 09:34	
Lead 210	338	pCi/Filter		91	70	130	6.7	30	
Sample ID: MB-24351	Method Blank			Run: PACKARD 3100TR_091206A				12/06/09 09:34	
Lead 210	1	pCi/Filter							U
Lead 210 precision (±)	20	pCi/Filter							
Lead 210 MDC	30	pCi/Filter							
Sample ID: LCS-24351	Laboratory Control Sample			Run: PACKARD 3100TR_091206A				12/06/09 09:34	
Lead 210	515	pCi/Filter		96	70	130			

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration

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CLIENT: Crow Butte Resources

Date: *28-Dec-09*

Project: EPA Evap Pond Radon Test Environmental Air

Sample Delivery Group: C09110129

CASE NARRATIVE

REVISED REPORT
This report was revised due to a request by Rhonda Grantham for our best attempt to reach the LLDs specified in USNRC RG 4.14. This report reflects the best data possible with regards to count times and volumes provided and used for the analyses.

PB210 ANALYSIS
The MDC for Pb-210 per RG 4.14 is 1 pCi/L. The current technique can achieve an MDC of about 2 pCi/L to 5 pCi/L if we have sufficient sample to process 1.0 L, and this is reported on a sample specific basis. Please consult with your local regulatory agency prior to using these results for compliance purposes.

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

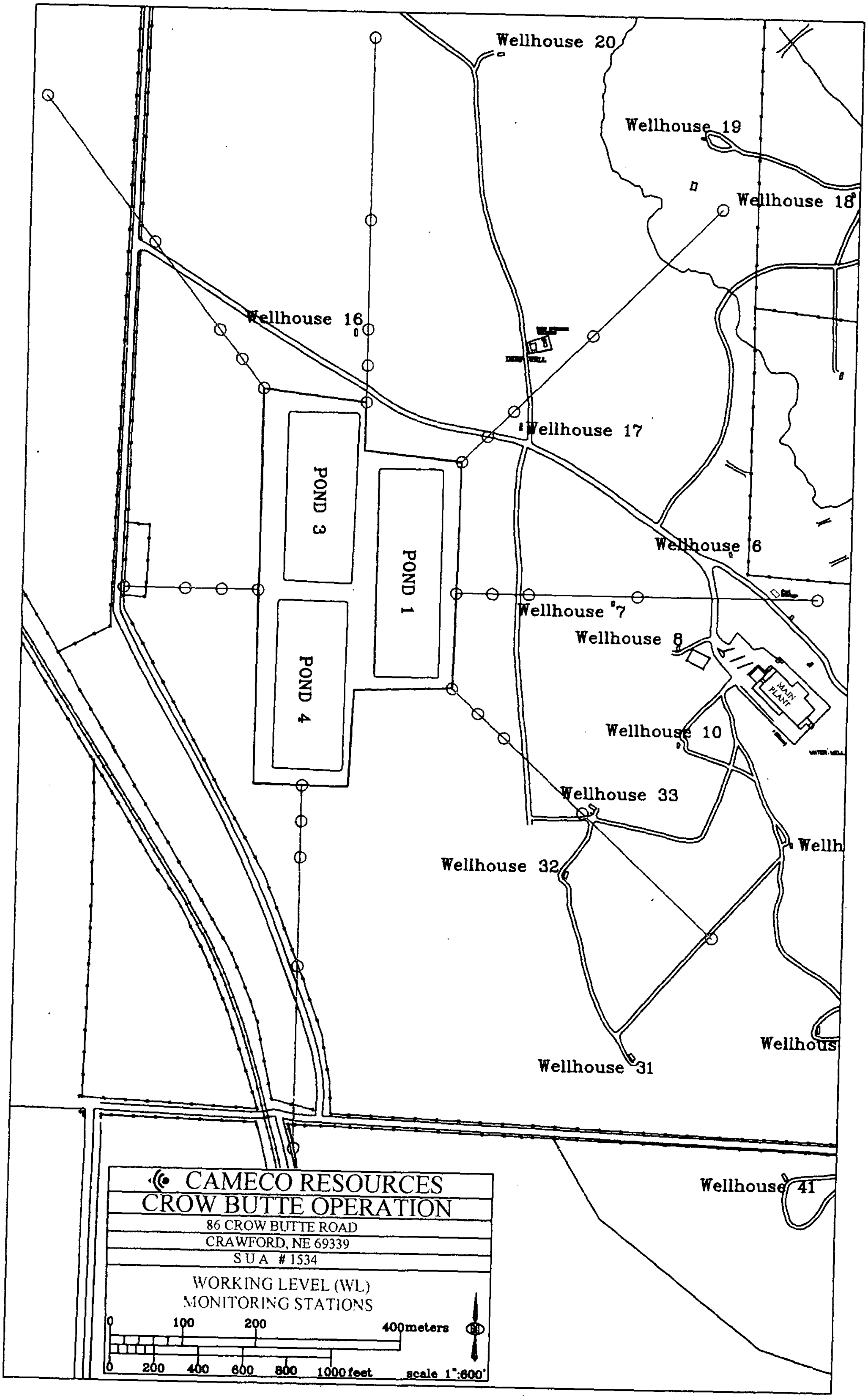
ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Appendix A-3
Radon Daughter (WL) Monitoring Data

- Map of Working Level Monitoring Stations
- Summary of Weekly Working Level (WL) Data
- Weekly WL Data Sheets


Wellhouse 20
Wellhouse 19
Wellhouse 18
Wellhouse 16
Wellhouse 17
POND 3
POND 1
POND 4
Wellhouse 6
Wellhouse 7
Wellhouse 8
MAIN PLANT
Wellhouse 10
Wellhouse 33
Wellhouse 32
Wellhouse 31
Wellhouse 41
CAMECO RESOURCES
CROW BUTTE OPERATION
86 CROW BUTTE ROAD
CRAWFORD, NE 69339
SUA # 1534
WORKING LEVEL (WL)
MONITORING STATIONS
0 100 200 400meters
0 200 400 600 800 1000 feet
scale 1":600'

CAMECO RESOURCES
CROW BUTTE OPERATION

Summary of Weekly Working Level (WL) Monitoring

	16-Jul-09	23-Jul-09	30-Jul-09	06-Aug-09	13-Aug-09	20-Aug-09	27-Aug-09	03-Sep-06	10-Sep-09	17-Sep-09	24-Sep-09	01-Oct-09	08-Oct-09
Perimeter-N	0.001	0.003	0.001	0.002	0.006	0.002	0.002	0.003	0.001	0.001	0.002	0.001	0.001
Perimeter-S	0.002	0.001	0.001	0.002	0.009	0.002	0.004	0.004	0.001	0.001	0.001	0.002	0.001
Perimeter-W	0.0002	0.002	0.001	0.002	0.004	0.002	0.001	0.005	0.001	0.001	0.001	0.001	0.002
Perimeter-E	0.0002	0.001	0.001	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
N-50	0.0004	0.002	0.002		0.004	0.002	0.001		0.001	0.002			
N-100	0.002	0.002	0.001		0.002	0.002	0.001		0.001	0.001			
N-250	0.0002	0.001	0.002		0.005	0.001	0.001		0.001	0.001			
N-500	0.002	0.002	0.001		0.001	0.001	0.001		0.001	0.001			
Air Sta-Center	0.001	0.001	0.001	0.001	0.007	0.003	0.002	0.002	0.001	0.002	0.001	0.003	0.001
Air Sta-Fence	0.001	0.003	0.001	0.002	0.006	0.002	0.002	0.003	0.001	0.001	0.002	0.001	0.001
Air Sta-100M	0.002	0.002	0.001	0.002	0.002	0.002	0.001	0.007	0.001	0.001	0.002	0.001	0.001
Air Sta-500M	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
NW-Fence				0.001									
NW-50				0.002									
NW-100				0.002									
NW-250				0.003									
NW-500				0.001									
S-Fence								0.004			0.001		
S-50								0.003			0.001		
S-100								0.003			0.001		
S-250								0.003			0.003		
S-500								0.002			0.001		
E-Fence												0.001	0.002
E-50												0.001	0.001
E-100												0.001	0.001
E-250												0.001	0.001
E-500												0.001	0.001
Background	0.004	0.002	0.002	0.001	0.003	0.001	0.001	0.001	0.001	0.001	0.001	N/M	0.002

EPA Moni[illegible]ites
Working Level (WL[illegible] [illegible]easurements

Wind direction

Calm

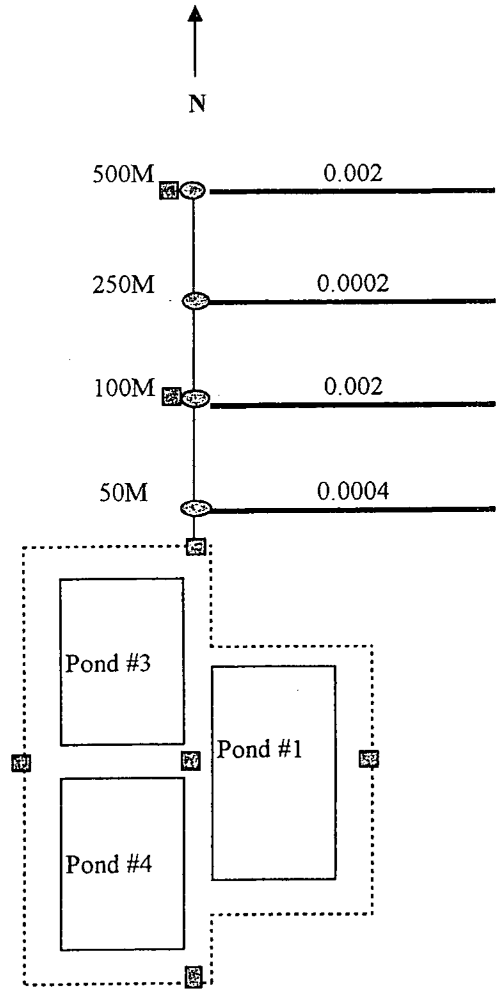
Date: 7/16/2009

Time: 7:30 a.m.

Sampler: Tyree

B. Pres.: 30.12

Weather: Calm, clear skies



North: 0.001

South: 0.002

West : 0.0002

East : 0.0002

Center: 0.001

100M: 0.002

500M: 0.002

Background: 0.004 (500M South)

Pond sprayers were operating during the testing.

Crow Butte Resources

Pond Radon Test- Week One

Radon Daughters **7/16/2009** **Sampler: Tyree**

Sample Time 5 min. SKC# A Background 1.33 CPM
Count Time 3 min. Calibration 4.7 LPM Counter EF (DPM/CPM) 1.97

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	7:53	7:58	9:07	9:10	16	4	4.00	70	90	23.5	0.004
(South 500 Meters)											
Center of pond	8:06	8:11	9:12	9:15	6	4	0.67	62	106	23.5	0.0005
North pond fence	8:16	8:21	9:19	9:22	8	4	1.33	59	112	23.5	0.001
West pond fence	8:24	8:29	9:26	9:29	5	4	0.33	58	114	23.5	0.0002
South pond fence	8:32	8:37	9:30	9:33	11	4	2.33	54	122	23.5	0.002
East pond fence	8:40	8:45	9:35	9:38	5	4	0.33	51	128	23.5	0.0002
50 meters north	8:48	8:53	9:39	9:42	6	4	0.67	47	136	23.5	0.0004
100 meters north	8:55	9:00	9:46	9:49	12	4	2.67	47	136	23.5	0.002
250 meters north	9:03	9:08	9:55	9:58	5	4	0.33	48	134	23.5	0.0002
500 meters north	9:19	9:24	10:11	10:14	11	4	2.33	48	134	23.5	0.002

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3836
Efficiency: 51%
CPM/DPM: 1.97

Barometric Pressure: 30.12
Wind: calm
Wind direction: calm
Weather Conditions: clear
Plant Operations: N/A

EPA M or Sites

Working Level (WL) Measurements

Date: 7/23/2009

Time: 7:49 a.m.

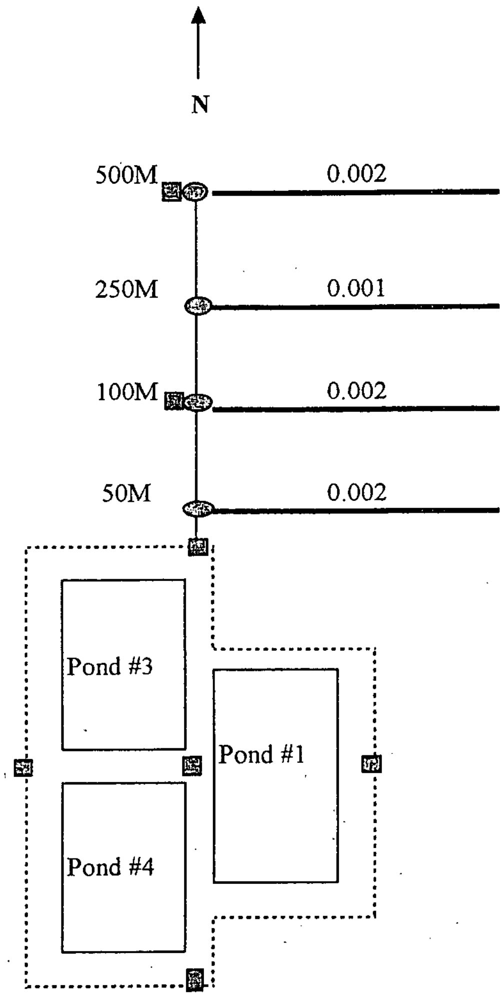
Sampler: Tyree

B. Pres.: 29.91

Weather: Calm, clear skies

Wind direction

Calm



North: 0.003

South: 0.001

West : 0.002

East : 0.001

Center: 0.001

100M: 0.002

500M: 0.002

Background: 0.002 (500M South)

Pond sprayers were operating during the testing.

Crow Butte Resources

Pond Radon Test- Week Two

Radon Daughters **7/23/2009** **Sampler: Tyree**

Sample Time 5 min. SKC# A Background 0.33 CPM

Count Time 3 min. Calibration 4.7 LPM Counter EF (DPM/CPM) 1.94

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	7:50	7:55	9:15	9:18	5	1	1.33	81	74	23.5	0.002
(South 500 Meters)											
Center of pond	8:03	8:08	9:20	9:23	4	1	1.00	73	85	23.5	0.001
North pond fence	8:12	8:17	9:24	9:27	10	1	3.00	68	94	23.5	0.003
West pond fence	8:20	8:25	9:29	9:32	9	1	2.67	65	100	23.5	0.002
South pond fence	8:28	8:33	9:33	9:36	5	1	1.33	61	108	23.5	0.001
East pond fence	8:36	8:41	9:38	9:41	7	1	2.00	58	114	23.5	0.001
50 meters north	8:44	8:49	9:42	9:45	8	1	2.33	54	122	23.5	0.002
100 meters north	8:51	8:56	9:46	9:49	12	1	3.67	51	128	23.5	0.002
250 meters north	8:58	9:03	9:50	9:53	6	1	1.67	48	134	23.5	0.001
500 meters north	9:05	9:10	9:57	10:00	10	1	3.00	48	134	23.5	0.002

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (131009)
Detector: SAC R5 (601536)
Calibration Date: 8/13/2008

Source: 5261-04
Source DPM: 7550
CPM: 3890
Efficiency: 52%
CPM/DPM: 1.94

Barometric Pressure: 29.91
Wind: calm
Wind direction: calm
Weather Conditions: clear
Plant Operations: N/A

EPA M. .or Sites
Working Level (WL) Measurements

Date: 7/30/2009

Time: 7:55 a.m.

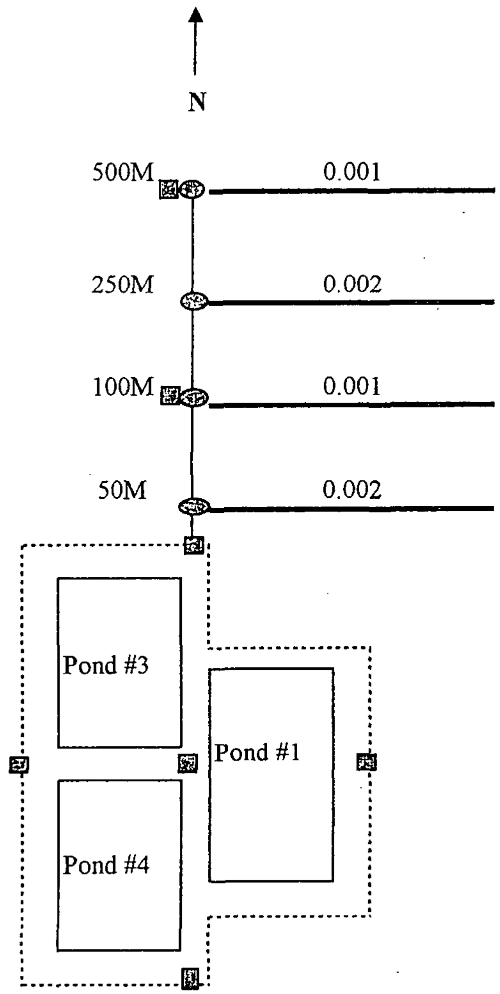
Sampler: Tyree

B. Pres.: 30.03

Weather: Calm, clear skies

Wind direction

Calm



North: 0.001

South: 0.001

West : 0.001

East : 0.001

Center: 0.001

100M: 0.001

500M: 0.001

Background: 0.002 (500M South)

Pond sprayers were operating during the testing.

Crow Butte Resources

Pond Radon Test- Week Three

Radon Daughters **7/30/2009** **Sampler: Tyree**

Sample Time	5 min.	SKC# A		Background	0.33 CPM
Count Time	3 min.	Calibration 4.7	LPM	Counter EF (DPM/CPM)	1.93

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background (South 500 Meters)	7:57	8:02	9:03	9:06	7	1	2	62	106	23.5	0.002
Center of pond	8:10	8:15	9:08	9:11	7	1	2	54	122	23.5	0.001
North pond fence	8:22	8:27	9:14	9:17	5	1	1	48	134	23.5	0.001
West pond fence	8:31	8:36	9:19	9:22	6	1	2	44	142	23.5	0.001
South pond fence	8:39	8:44	9:26	9:29	6	1	2	43	144	23.5	0.001
East pond fence	8:48	8:53	9:36	9:39	8	1	2	44	142	23.5	0.001
50 meters north	9:09	9:14	10:15	10:18	7	1	2	62	106	23.5	0.002
100 meters north	9:16	9:21	10:19	10:22	5	1	1	59	112	23.5	0.001
250 meters north	9:24	9:29	10:23	10:26	8	1	2	55	120	23.5	0.002
500 meters north	9:32	9:37	10:27	10:30	7	1	2	51	128	23.5	0.001
500 meters east	9:44	9:49	10:33	10:36	8	1	2	45	140	23.5	0.001

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3913
Efficiency: 52%
CPM/DPM: 1.93

Barometric Pressure: 30.03
Wind: calm
Wind direction: calm
Weather Conditions: clear
Plant Operations: N/A

EPA Monito[illegible]ites

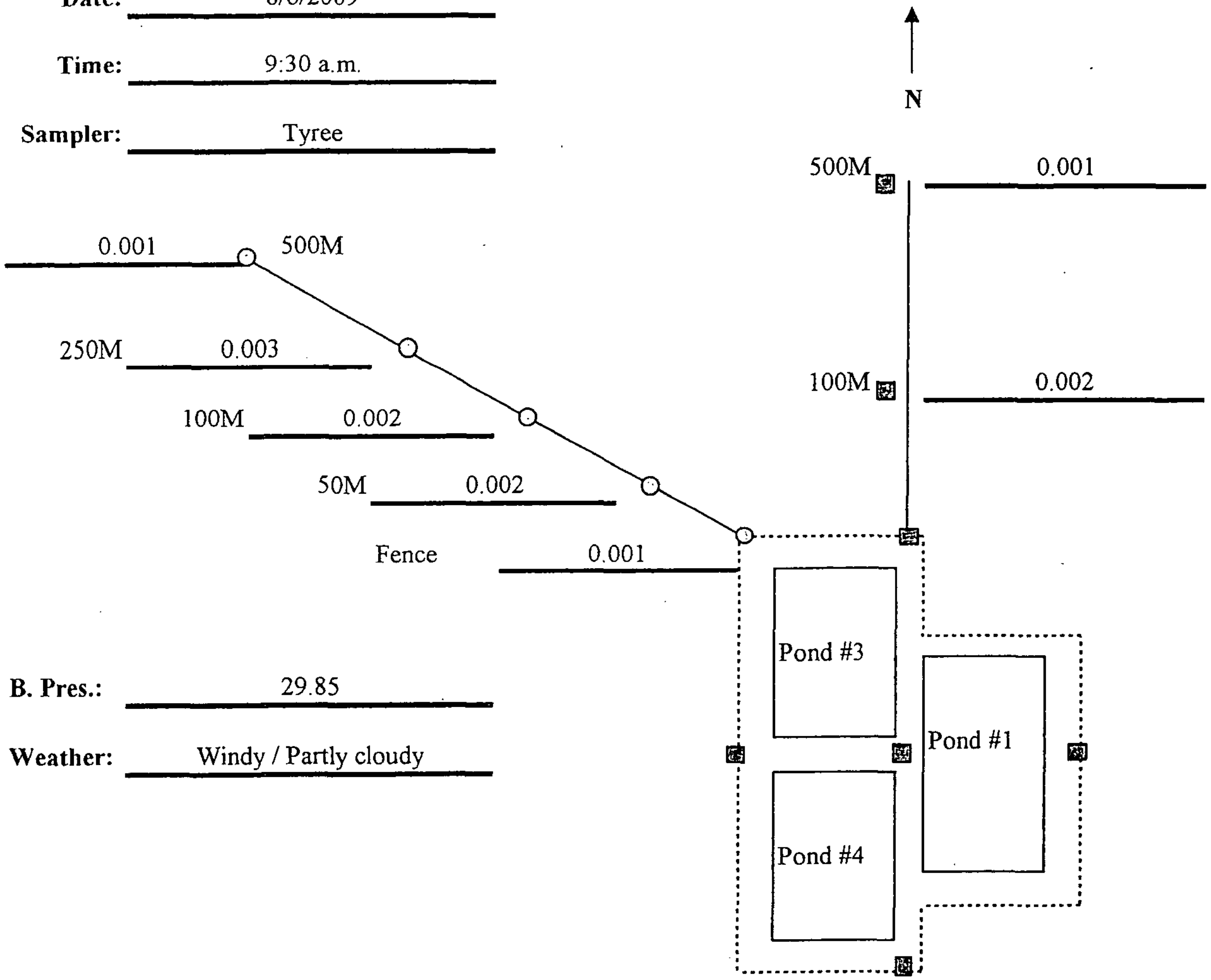
Working Level (WL) Measurements

Date: 8/6/2009

Time: 9:30 a.m.

Sampler: Tyree

Wind direction



B. Pres.: 29.85

Weather: Windy / Partly cloudy

North: 0.002

South: 0.002

West : 0.002

East : 0.002

Center: 0.001

100M: 0.002

500M: 0.001

Background: 0.001 (500M Southeast)

Crow Butte Resources

Pond Radon Test- Week Four

Radon Daughters **8/6/2009** **Sampler: Tyree**

Sample Time 5 min. AC# 2 Background 0.67 CPM
Count Time 3 min. Calibration 5.0 LPM Counter EF (DPM/CPM) 1.98

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	9:43	9:48	11:07	11:10	5	2	1	80	75	25	0.001
(South-East)											
Center of pond	9:57	10:02	11:11	11:14	5	2	1	70	90	25	0.001
North pond fence	10:08	10:13	11:15	11:18	9	2	2	63	104	25	0.002
West pond fence	10:16	10:21	11:23	11:26	9	2	2	63	104	25	0.002
South pond fence	10:24	10:29	11:27	11:30	10	2	3	59	112	25	0.002
East pond fence	10:32	10:37	11:31	11:34	10	2	3	55	120	25	0.002
100 meters north	10:41	10:46	11:35	11:38	13	2	4	50	130	25	0.002
500 meters north	10:51	10:56	11:40	11:43	7	2	2	45	140	25	0.001
North/West Fence	11:55	12:00	13:20	13:23	6	2	1	81	74	25	0.001
North/West 50 meters	12:02	12:07	13:24	13:27	9	2	2	78	78	25	0.002
North/West 100 meters	12:09	12:14	13:28	13:31	8	2	2	75	83	25	0.002
North/West 250 meters	12:17	12:22	13:32	13:35	12	2	3	71	89	25	0.003
North/West 500 meters	12:26	12:31	13:36	13:39	4	2	1	66	98	25	0.001
East 500 meters	12:37	12:42	13:39	13:42	9	2	2	58	114	25	0.002

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3818
Efficiency: 51%
CPM/DPM: 1.98

Barometric Pressure: 29.85
Wind: Strong
Wind direction: South-East
Weather Conditions: Partly cloudy
Plant Operations: N/A

EPA M 'or Sites

Working Level (WL) Measurements

Date: 8/13/2009

Time: 7:45 a.m.

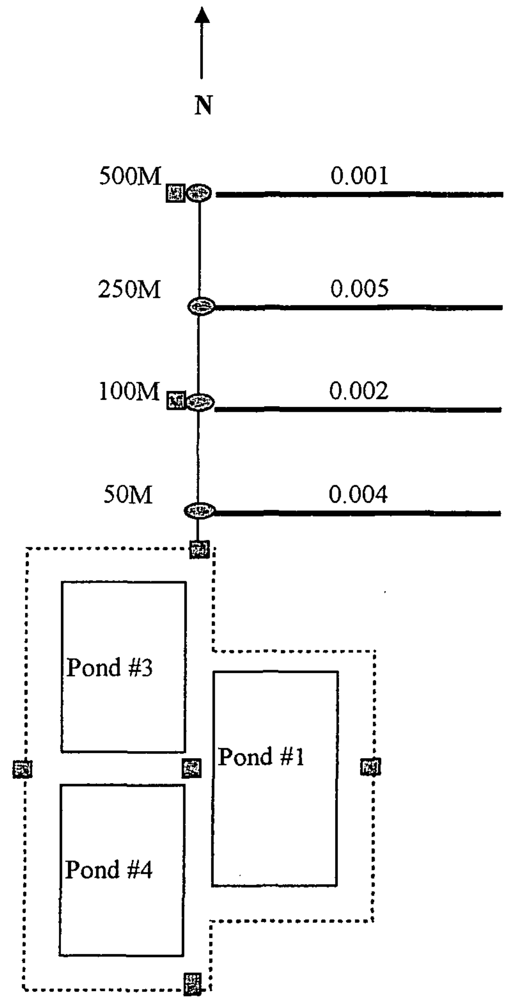
Sampler: Tyree

B. Pres.: 29.85

Weather: Calm, clear skies

Wind direction

Calm



North: 0.006

South: 0.009

West : 0.004

East : 0.003

Center: 0.007

100M: 0.002

0.001

500M: 0.001

Background: .034 / .003 (500M South)

Pond sprayers were operating during the testing.

Crow Butte Resources

Pond Radon Test- Week Five

Radon Daughters **8/13/2009** **Sampler: Tyree**

Sample Time 5 min. AC# 2 Background 0.67 CPM

Count Time 3 min. Calibration 5.0 LPM Counter EF (DPM/CPM) 1.96

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	7:49	7:54	9:13	9:16	99	2	32	80	75	25	0.034
(South 500 Meters)											
Center of pond	8:07	8:12	9:17	9:20	28	2	9	66	98	25	0.007
North pond fence	8:18	8:23	9:21	9:24	29	2	9	59	112	25	0.006
West pond fence	8:26	8:31	9:25	9:28	22	2	7	55	120	25	0.004
South pond fence	8:34	8:39	9:29	9:32	46	2	15	51	128	25	0.009
East pond fence	8:43	8:48	9:34	9:37	17	2	5	47	136	25	0.003
50 meters north	8:52	8:57	9:41	9:44	21	2	6	45	140	25	0.004
100 meters north	8:59	9:04	9:49	9:52	14	2	4	46	138	25	0.002
250 meters north	10:10	10:15	11:24	11:27	20	2	6	70	90	25	0.005
500 meters north	10:20	10:25	11:29	11:32	7	2	2	65	100	25	0.001
500 meters east	10:32	10:37	11:33	11:36	15	2	4	57	116	25	0.003
South 500 Meters	10:43	10:48	11:37	11:40	15	2	4	50	130	25	0.003

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3853
Efficiency: 51%
CPM/DPM: 1.96

Barometric Pressure: 29.85
Wind: calm
Wind direction: calm
Weather Conditions: clear
Plant Operations: N/A
Pond Sprayers: on

EPA M[illegible]r Sites
Working Level (WL) Measurements

Date: 8/20/2009

Time: 8:21 a.m.

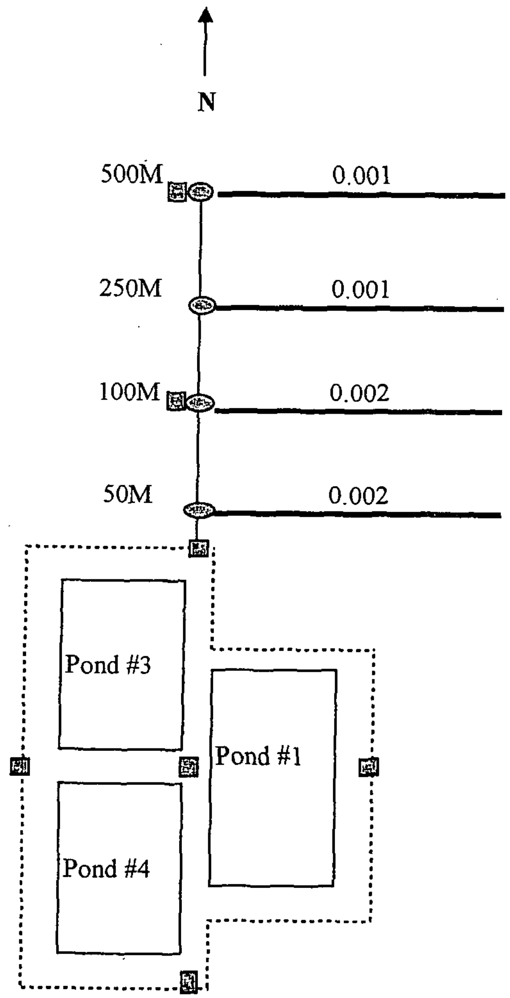
Sampler: Tyree

B. Pres.: 30.00

Weather: Calm, clear skies

Wind direction

Calm



North: 0.002

South: 0.002

West : 0.002

East : 0.001

Center: 0.003

100M: 0.002

500M: 0.001

Background: 0.001 (500M South)

Pond sprayers were off during the testing.

Crow Butte Resources

Pond Radon Test- Week Six

Radon Daughters **8/20/2009** **Sampler: Tyree**

Sample Time	5 min.	AC# 2			Background	1.00 CPM
Count Time	3 min.	Calibration 5.0	LPM		Counter EF (DPM/CPM)	1.99

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	8:21	8:26	9:48	9:51	6	3	1	83	71	25	0.001
(South 500 Meters)											
Center of pond	8:37	8:42	9:52	9:55	13	3	3	71	89	25	0.003
North pond fence	8:49	8:54	9:56	9:59	10	3	2	63	104	25	0.002
West pond fence	8:58	9:03	10:00	10:03	13	3	3	58	114	25	0.002
South pond fence	9:06	9:11	10:04	10:07	10	3	2	54	122	25	0.002
East pond fence	9:15	9:20	10:08	10:11	6	3	1	49	132	25	0.001
50 meters north	9:24	9:29	10:12	10:15	11	3	3	44	142	25	0.002
100 meters north	9:32	9:37	10:19	10:22	11	3	3	43	144	25	0.002
250 meters north	9:58	10:03	11:08	11:11	7	3	1	66	98	25	0.001
500 meters north	10:06	10:11	11:12	11:15	6	3	1	62	106	25	0.001
500 meters east	10:15	10:20	11:17	11:20	10	3	2	58	114	25	0.002

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument:	2000 (136919)	Source:	5261-04	Barometric Pressure:	30.00
Detector:	SAC R5 (RN012488)	Source DPM:	7550	Wind:	calm
Calibration Date:	5/4/2009	CPM:	3787	Wind direction:	calm
		Efficiency:	50%	Weather Conditions:	clear
		CPM/DPM:	1.99	Plant Operations:	N/A
				Pond Sprayers:	on

EPA M r Sites
Working Level (WL) Measurements

Date: 8/27/2009

Time: 10:30 a.m.

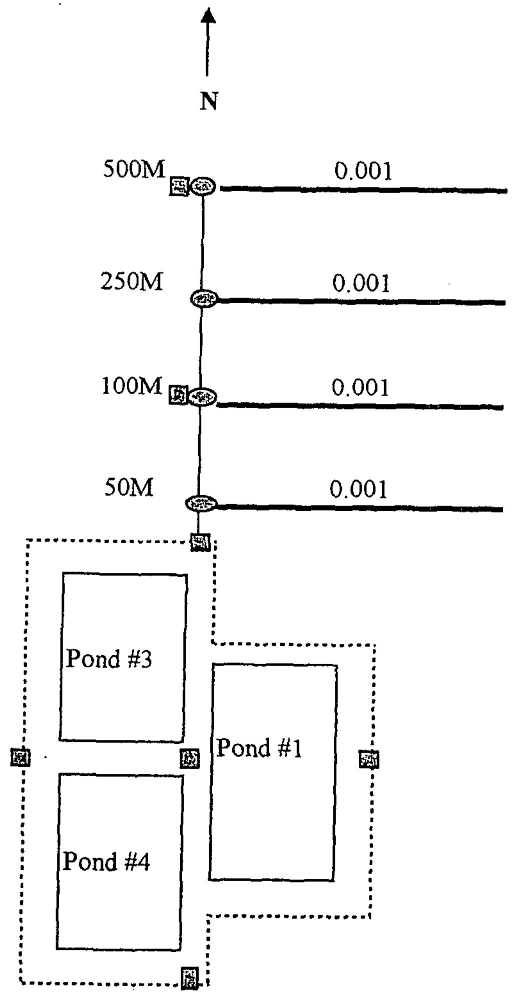
Sampler: Dyer

B. Pres.: 30.09

Weather: Calm and Sunny

Wind direction

Calm



North: 0.002

South: 0.004

West : 0.001

East : 0.001

Center: 0.002

100M: 0.001

500M: 0.001

Background: 0.001 (500M South)

Pond sprayers were on during the testing.

Crow Butte Resources

Pond Radon Test- Week Seven

Radon Daughters **8/27/2009** **Sampler: Dyer**

Sample Time	5 min.	SKC A		Background	1.00 CPM
Count Time	3 min.	Calibration 4.6	LPM	Counter EF (DPM/CPM)	1.94

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	8:02	8:07	8:59	9:02	7	3	1	53	124	23	0.001
(South 500 Meters)											
Center of pond	8:44	8:49	9:58	10:01	8	3	2	70	90	23	0.002
North pond fence	8:12	8:17	9:03	9:06	11	3	3	47	136	23	0.002
West pond fence	8:20	8:25	9:07	9:10	8	3	2	43	144	23	0.001
South pond fence	8:27	8:32	9:50	9:53	13	3	3	79	76	23	0.004
East pond fence	8:34	8:39	9:54	9:57	6	3	1	76	82	23	0.001
50 meters north	9:12	9:17	10:02	10:05	7	3	1	46	138	23	0.001
100 meters north	9:18	9:23	10:10	10:13	6	3	1	48	134	23	0.001
250 meters north	9:25	9:30	10:14	10:17	6	3	1	45	140	23	0.001
500 meters north	9:32	9:37	10:19	10:22	7	3	1	43	144	23	0.001
500 meters east	9:41	9:46	10:28	10:31	32	3	10	43	144	23	0.006

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3888
Efficiency: 51%
CPM/DPM: 1.94

Barometric Pressure: 30.09
Wind: calm
Wind direction: calm
Weather Conditions: clear
Plant Operations: N/A
Pond Sprayers: on

EPA Moni' Sites

Working Level (WL) Measurements

Date: 9/3/2009

Time: 1230

Sampler: Tyree

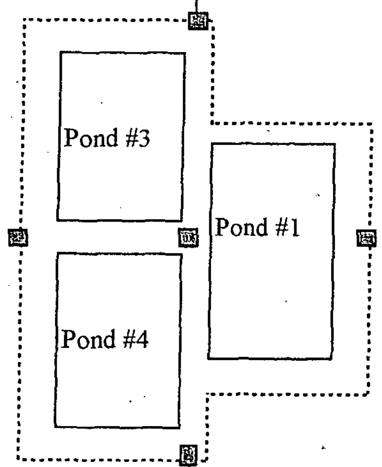
B. Pres.: 30

Weather: Clear

N

Wind direction

500M	0.001	**Background**
100M	0.007	



Center: 0.002

North: 0.003

South: 0.004

West : 0.005

East : 0.001

50M	0.003
100M	0.003
250M	0.003
500M	0.002

The pond sprayers were on during the sampling.

Crow Butte Resources

Pond Radon Test- Week Eight

Radon Daughters **9/3/2009** **Sampler: Tyree**

Sample Time	5 min.	AC 2			Background	1.33 CPM
Count Time	3 min.	Calibration 5.0	LPM		Counter EF (DPM/CPM)	2.05

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	12:57	13:02	14:19	14:22	8	4	1	78	78	25	0.001
(North 500 Meters)											
100 meters north	13:06	13:11	14:23	14:26	25	4	7	73	85	25	0.007
Center of pond	14:35	14:40	15:29	15:32	12	4	3	50	130	25	0.002
North pond fence	13:13	13:18	14:29	14:32	13	4	3	72	87	25	0.003
West pond fence	13:23	13:28	14:33	14:36	23	4	6	66	98	25	0.005
South pond fence	13:31	13:36	14:37	14:40	21	4	6	62	106	25	0.004
East pond fence	14:24	14:29	15:25	15:28	10	4	2	57	116	25	0.001
50 meters south	13:37	13:42	14:41	14:44	17	4	4	60	110	25	0.003
100 meters south	13:44	13:49	14:51	14:54	17	4	4	63	104	25	0.003
250 meters south	13:52	13:57	14:55	14:58	16	4	4	59	112	25	0.003
500 meters south	14:03	14:08	14:59	15:02	12	4	3	52	130	25	0.002
500 meters east	14:45	14:50	15:34	15:37	14	4	3	45	140	25	0.002

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3674
Efficiency: 49%
CPM/DPM: 2.05

Barometric Pressure: 30.00
Wind: Breezy
Wind direction: North
Weather Conditions: clear
Plant Operations: N/A
Pond Sprayers: on

EPA M[illegible]r Sites
Working Level (WL) Measurements

Date: 9/10/2009

Time: 1:00 p.m.

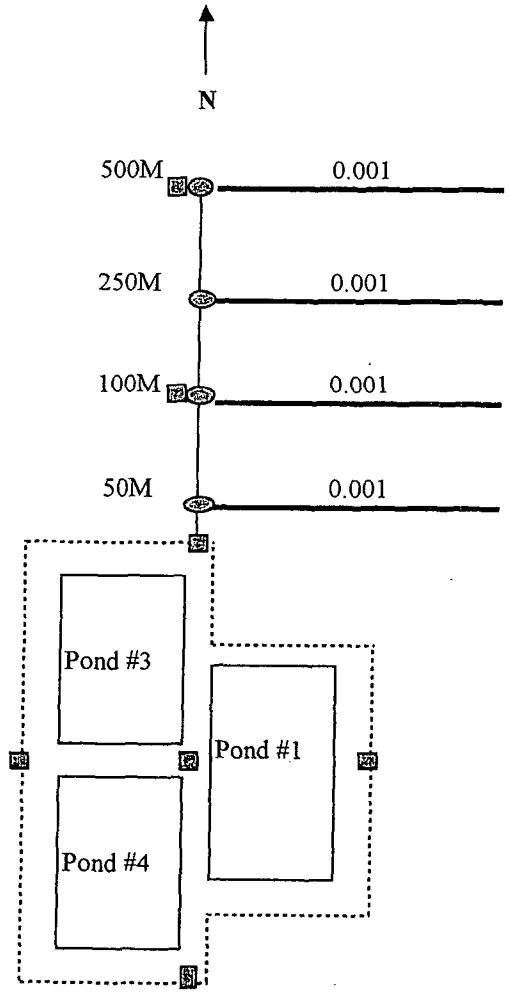
Sampler: Tyree

B. Pres.: 30.09

Weather: Calm and Sunny

Wind direction

Calm



North: 0.001

South: 0.001

West : 0.001

East : 0.001

Center: 0.001

100M: 0.001

500M: 0.001

Background: 0.001 (500M South)

Pond sprayers were on during the testing.

Crow Butte Resources

Pond Radon Test- Week Nine

Radon Daughters **9/10/2009** **Sampler: Tyree**

Sample Time 5 min. AC# 2 Background 1.33 CPM
Count Time 3 min. Calibration 5.0 LPM Counter EF (DPM/CPM) 1.96

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	13:11	13:16	14:35	14:38	8	4	1	80	75	25	0.001
(South 500 Meters)											
Center of pond	13:21	13:26	14:39	14:42	8	4	1	74	84	25	0.001
North pond fence	13:29	13:34	14:43	14:46	6	4	1	70	90	25	0.001
West pond fence	13:37	13:42	14:47	14:50	7	4	1	66	98	25	0.001
South pond fence	13:45	13:50	14:51	14:54	6	4	1	62	106	25	0.001
East pond fence	13:52	13:57	14:55	14:58	6	4	1	59	112	25	0.001
50 meters north	14:00	14:05	14:59	15:02	7	4	1	55	120	25	0.001
100 meters north	14:07	14:12	15:03	15:06	9	4	2	52	128	25	0.001
250 meters north	14:16	14:21	15:07	15:10	7	4	1	47	136	25	0.001
500 meters north	14:24	14:29	15:13	15:16	8	4	1	45	140	25	0.001
500 meters east	14:33	14:38	15:22	15:25	17	4	4	45	140	25	0.002

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 5261-04
Source DPM: 7550
CPM: 3853
Efficiency: 51%
DPM/CPM 1.96

Barometric Pressure: 30.03
Wind: calm
Wind direction: calm
Weather Conditions: clear
Plant Operations: N/A
Pond Sprayers: on

EPA M[illegible]or Sites
Working Level (WL) Measurements

Date: 9/17/2009

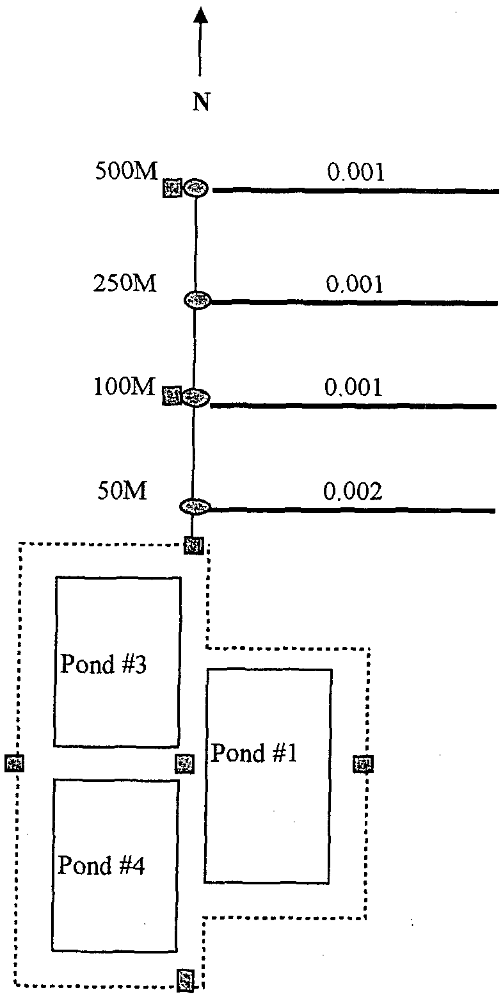
Time: 1230

Sampler: Tyree

B. Pres.: 30.06

Weather: Slight breeze / Clear

Wind direction



North: 0.001

South: 0.001

West : 0.001

East : 0.001

Center: 0.002

100M: 0.001

500M: 0.001

Background: 0.001 (500M South)

Crow Butte Resources

Pond Radon Test- Week Ten

Radon Daughters **9/17/2009** **Sampler: Tyree**

Sample Time 5 min. AC# 2 Background 1.33 CPM
Count Time 3 min. Calibration 5.0 LPM Counter EF (DPM/CPM) 1.98

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	12:32	12:37	13:57	14:00	8	4	1	81	74	25	0.001
(South 500 Meters)											
Center of pond	12:42	12:47	14:01	14:04	10	4	2	75	83	25	0.002
North pond fence	12:54	12:59	14:05	14:08	6	4	1	67	96	25	0.001
West pond fence	13:02	13:07	14:11	14:14	8	4	1	65	100	25	0.001
South pond fence	13:09	13:14	14:16	14:19	8	4	1	63	104	25	0.001
East pond fence	13:16	13:21	14:20	14:23	7	4	1	60	110	25	0.001
50 meters north	13:24	13:29	14:25	14:28	11	4	2	57	116	25	0.002
100 meters north	13:30	13:35	14:29	14:32	7	4	1	55	120	25	0.001
250 meters north	13:37	13:42	14:33	14:36	9	4	2	52	128	25	0.001
500 meters north	13:44	13:49	14:37	14:40	7	4	1	49	132	25	0.001
500 meters east	13:54	13:59	14:44	14:47	41	4	12	46	138	25	0.007

Comments: Back hoe digging going on in the area of the 500 meters east sample.

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 616-88
Source DPM: 7350
CPM: 3713
Efficiency: 51%
DPM/CPM 1.98

Barometric Pressure: 30.06
Wind: calm
Wind direction: South
Weather Conditions: clear
Plant Operations: N/A
Pond Sprayers: off

EPA Mor · Sites
Working Level (WL) Measurements

Date: 9/24/2009

Time: 1220

Sampler: Tyree

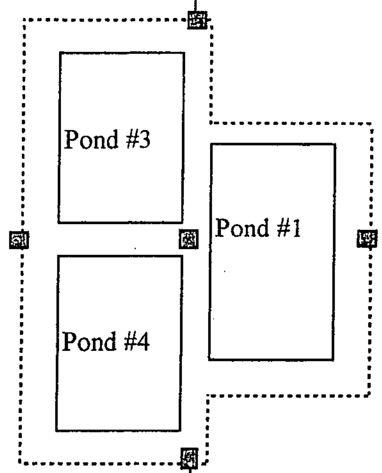
B. Pres.: 30.09

Weather: Partly cloudy and windy

Wind direction ↓

N ↑

500M	0.001	**Background**
100M	0.002	



Center: 0.001

50M	0.001
100M.	0.001
250M	0.003
.500M	0.001

North: 0.002

South: 0.001

West : 0.001

East : 0.001

Pond sprays were off.

Crow Butte Resources

Pond Radon Test- Week Eleven

Radon Daughters **9/24/2009** **Sampler: Tyree**

Sample Time 5 min. AC# 2 Background 1.33 CPM
Count Time 3 min. Calibration 5.0 LPM Counter EF (DPM/CPM) 1.96

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background	12:22	12:27	13:43	13:46	8	4	1	77	81	25	0.001
(North 500 Meters)											
North 100 meters	12:30	12:35	13:47	13:50	11	4	2	73	85	25	0.002
South 500 meters	12:38	12:43	13:51	13:54	8	4	1	69	92	25	0.001
South 250 meters	12:47	12:52	13:55	13:58	17	4	4	64	102	25	0.003
South 100 meters	12:54	12:59	13:59	14:02	9	4	2	61	108	25	0.001
South 50 meters	13:00	13:05	14:22	14:25	8	4	1	78	78	25	0.001
Pond-South fence	13:06	13:11	14:26	14:29	6	4	1	76	82	25	0.001
Pond-West fence	13:13	13:18	14:30	14:33	7	4	1	73	85	25	0.001
Pond-North fence	13:21	13:26	14:34	14:37	12	4	3	69	92	25	0.002
Pond-Center	13:30	13:35	14:38	14:41	9	4	2	64	102	25	0.001
Pond-East fence	14:03	14:08	14:54	14:57	10	4	2	47	136	25	0.001
East 500 meters	14:12	14:17	15:01	15:04	12	4	3	45	140	25	0.002

Comments:

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 616-88
Source DPM: 7350
CPM: 3742
Efficiency: 51%
DPM/CPM 1.96

Barometric Pressure: 30.09
Wind: Breezy
Wind direction: North
Weather Conditions: Partly Cloudy
Plant Operations: N/A
Pond Sprayers: off

EPA Monitor Sites
Working Level (WL) Measurements

Date: 10/1/2009

Time: 1220

Sampler: Tyree

B. Pres: 29.80

Weather: Partly cloudy and windy

Center: 0.003

100M: 0.001

500M: 0.001

Background: N/A

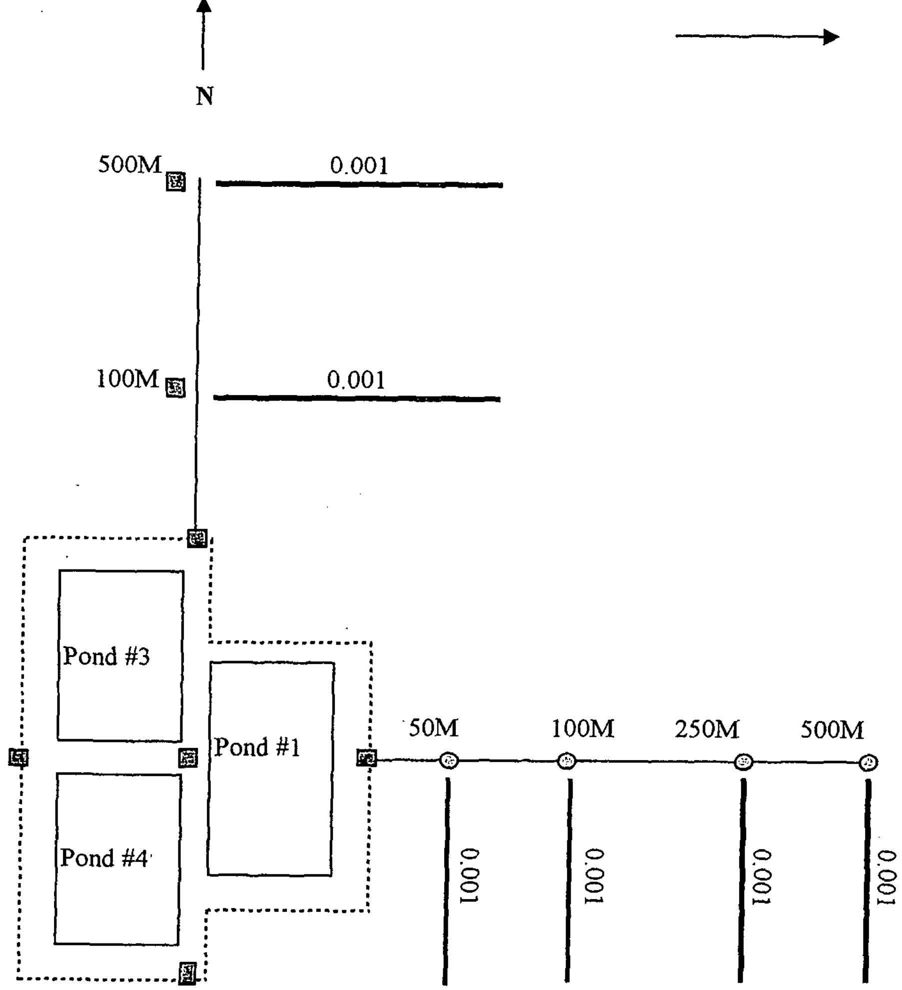
North: 0.001

South: 0.002

West : 0.001

East : 0.001

Wind direction



Crow Butte Resources

Pond Radon Test- Week Twelve

Radon Daughters **10/1/2009** **Sampler: Tyree**

Sample Time 5 min. SKC A Background 0.67 CPM
Count Time 3 min. Calibration 4.6 LPM Counter EF (DPM/CPM) 1.98

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Center of Pond	12:19	12:24	13:46	13:49	10	2	3	83	71	23	0.003
Pond North fence	12:28	12:33	13:50	13:53	5	2	1	78	78	23	0.001
Pond West fence	12:35	12:40	13:54	13:57	4	2	1	75	83	23	0.001
Pond South fence	12:42	12:47	13:58	14:01	9	2	2	72	87	23	0.002
Pond East fence	12:49	12:54	14:02	14:05	5	2	1	69	92	23	0.001
East 50 meters	12:57	13:02	14:06	14:09	5	2	1	65	100	23	0.001
East 100 meters	13:04	13:09	14:14	14:17	5	2	1	66	98	23	0.001
East 250 meters	13:12	13:17	14:18	14:21	4	2	1	62	106	23	0.001
East 500 meters	13:21	13:26	14:22	14:25	5	2	1	57	116	23	0.001
North 100 meters	13:29	13:34	14:26	14:29	5	2	1	53	124	23	0.001
North 500 meters	13:37	13:42	14:30	14:33	6	2	1	49	132	23	0.001

Comments:

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 616-88
Source DPM: 7350
CPM: 3703
Efficiency: 50%
DPM/CPM 1.98

Barometric Pressure: 29.77
Wind: Windy
Wind direction: West
Weather Conditions: Partly Cloudy
Plant Operations: Transferring DF-6 to eluation tank
Pond Sprayers: off

EPA Monitor Sites
Working Level (WL) Measurements

Date: 10/8/2009

Time: 12.5

Sampler: Tyree

B. Pres: 29.94

Weather: Breezy and cloudy

Center: 0.001

100M: 0.001

500M: 0.001

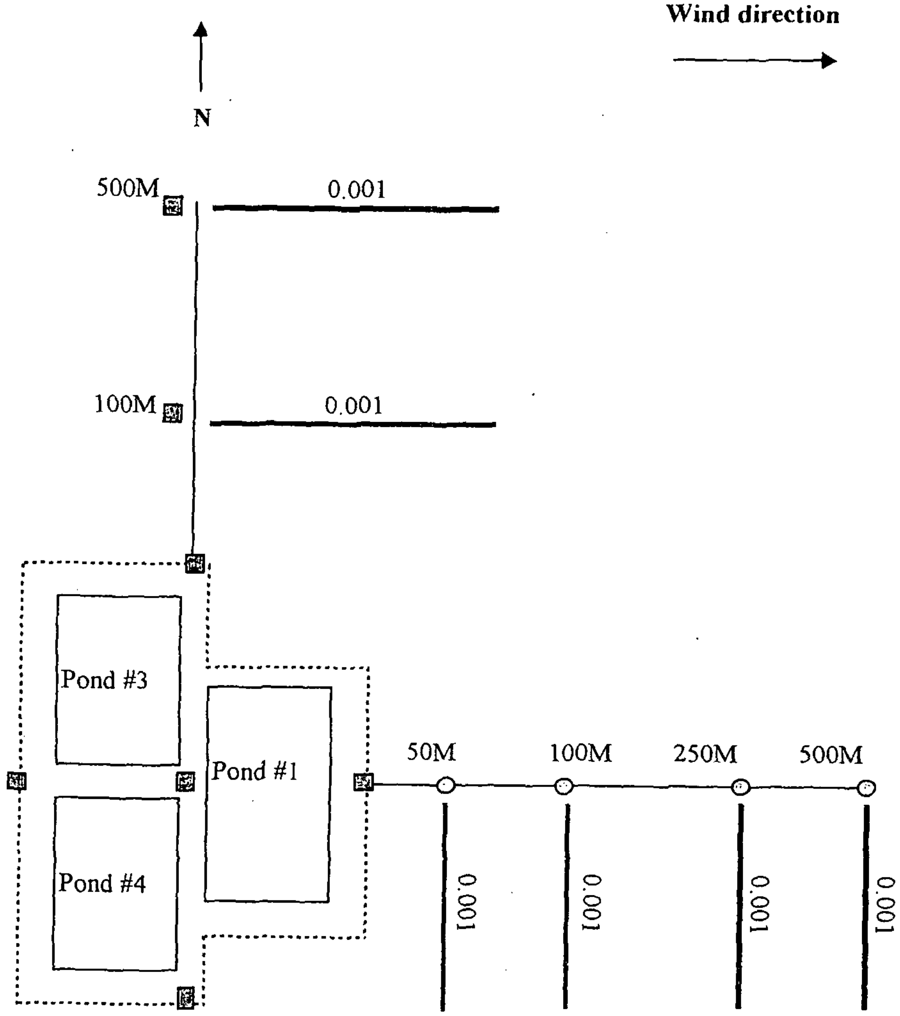
Background: .002 (185 M)

North: 0.001

South: 0.001

West : 0.002

East : 0.002



Crow Butte Resources

Pond Radon Test- Week Thirteen

Radon Daughters **10/8/2009** **Sampler: Tyree**

Sample Time 5 min. SKC A Background 1.00 CPM
Count Time 3 min. Calibration 4.6 LPM Counter EF (DPM/CPM) 1.99

Location	Time On	Time Off	Count Start	Count Stop	Total Count	3 min. BKG	CPM	Elapsed Time	Time Factor	Air Volume	Working Level Concentration
Background (185 m. west)	12:42	12:47	14:11	14:14	7	3	1	85	68	23	0.002
Center of Pond	12:55	13:00	14:16	14:19	7	3	1	77	81	23	0.001
Pond North fence	13:04	13:09	14:20	14:23	7	3	1	72	87	23	0.001
Pond West fence	13:13	13:18	14:24	14:27	9	3	2	67	96	23	0.002
Pond South fence	13:25	13:30	14:28	14:31	5	3	1	59	112	23	0.001
Pond East Fence	13:35	13:40	14:32	14:35	11	3	3	53	124	23	0.002
North 100 meters	13:46	13:51	14:36	14:39	6	3	1	46	138	23	0.001
North 500 meters	13:58	14:03	14:47	14:50	7	3	1	45	140	23	0.001
East 50 meters	14:23	14:28	15:13	15:16	6	3	1	46	138	23	0.001
East 100 meters	14:32	14:37	15:21	15:24	7	3	1	45	140	23	0.001
East 250 meters	14:40	14:45	15:29	15:32	8	3	2	45	140	23	0.001
East 500 meters	14:49	14:54	15:38	15:41	6	3	1	45	140	23	0.001

Comments:

Working Level Concentration=(CPM X EF)/(Vol X TF)

Instrument: 2000 (136919)
Detector: SAC R5 (RN012488)
Calibration Date: 5/4/2009

Source: 616-88
Source DPM: 7350
CPM: 3697
Efficiency: 50%
DPM/CPM 1.99

Barometric Pressure: 29.94
Wind: Breezy
Wind direction: West
Weather Conditions: Cloudy
Plant Operations: Belt filter running
Stripping IX-8
Pond Sprayers Off

APPENDIX B

B-1 Description of Monitoring Equipment

- SKC Universal Sampling Pump Operating Instructions
- Landauer Radtrak® Long-Term Monitoring Specifications Sheet

B-2 Description of Sampling Procedures

- Section 4, Air Monitoring Program, Crow Butte Uranium Project Environmental Manual
- Radon Daughter (Modified Kusnetz) Sampling and Analysis Procedure

B-3 Description of Calibration Methods and Calibration Sheets

- Section 10, Radiological Laboratory Programs, Crow Butte Uranium Project Health Physics Manual
- SKC Pump Calibration Records

Appendix B-1
Description of Monitoring Equipment

- SKC Universal Sampling Pump Operating Instructions
- Landauer Radtrak® Long-Term Monitoring Specifications Sheet

Operating Instructions

Universal Sample Pump

Catalog No. 224-PCXR8

SKC Inc.
863 Valley View Road
Eighty Four, PA 15330

Form #37713 Rev 0804

Performance Profile

Flow Range: .... 1000 to 5000 ml/min (UL Listed model)
(5 to 500 ml/min requires adjustable low flow holder)

Weight: .... 33 oz (936 gm)

Dimensions: .... 5.1 x 4.7 x 1.9 in (13 x 11.9 x 4.8 cm)

Compensation Range: .... 1000 to 2500 ml/min at 40 inches water back pressure
3000 ml/min at 35 inches water back pressure
4000 ml/min at 20 inches water back pressure
5000 ml/min at 10 inches water back pressure

Typical Back Pressure of Sampling Media ***(inches water)***

Flow Rate (L/min)	1.0	1.5	2.0	2.5	3.0
Filter/Pore Size (µm)					
25-mm MCE, 0.8	6	9	12	15	18
25-mm MCE, 0.45	14	22	28	35	40
37-mm MCE, 0.8	2	3	4	5	6
37-mm PVC, 5.0	1	1	2	2	2.5

Compare the information in this table to pump compensation range to determine appropriate applications.

Flow Control: .... Holds constant flow to ± 5% of the set point

Run Time: .... **Battery:** 8 hrs minimum at 4000 ml/min and 20 inches water back pressure
Dependent on media used. *See Table 1.*
Mains Adapter: 9999 minutes (6.8 days). Pump will shut off as run time cannot exceed timer range (see *Time Display* on page 3).

Flow Indicator: .... Built-in rotameter with 250-ml division; scale marked at 1, 2, 3, 4, and 5 L/min

Power Supply: .... 6.0-V plug-in NiCad battery pack, rechargeable, 2.0-Ah capacity

Charging Time: .... ≤ 6 hrs with PowerFlex charger

Intrinsically Safe: .... UL Listed for: Class I, Division 1 and 2, Groups A, B, C, D; Class II, Division 1 and 2, Groups E, F, G; and Class III. Temperature Code T3C.
MSHA-approved models available. Contact SKC.
ATEX-approved models available. Contact SKC.

Temperature: ....**Operating:** .....-4 F to 113 F (-20 C to 45 C)
Storage: ....-40 F to 113 F (-40 C to 45 C)
Charging: ......41 F to 113 F (5 C to 45 C)

(!) ***Protect sample pump from weather when in use outdoors.***

Operating Humidity: .... 0 to 95% Relative

Multiple-tube Sampling:..... Built-in constant pressure regulator allows user to take up to four simultaneous tube samples at different flow rates up to 500 ml/min each using optional adjustable low flow holder.

RFI/EMI Shielding: .... Complies with requirements of EN 55022, FCC Part 15 Class B, EN 50082-1; frequency range of the radiated susceptibility test was 27 MHz to 1000 MHz.

Flow and
Low Battery Fault: .... If the pump is unable to compensate due to excessive back pressure or if a low battery condition exists, the pump enters fault. During fault, the pump shuts down, the LCD indicates a flow or low battery fault, timing functions pause, and time display is retained.

Battery Test: .... LCD shows battery condition prior to sampling.

Time Display: .... LCD shows sampler run time in minutes for sampling period elapsed time, pump run time, or total elapsed time including delayed start time. 1 to 9999 minutes (6.8 days). Pump will shut off at 9999 minutes. To reset, restart the pump.

Timing Accuracy: .... ± 0.05% (± 45 seconds per day)

Timed Shutdown: .... Allows user to select minutes of operation before automatic shutdown. Timed shutdown maximum is 9999 minutes (6.8 days).

Delay On: .... Allows user to select minutes to delay test up to 9999 minutes (6.8 days).

Intermittent Sampling: .... Programmable to allow user to extend short-term samples over an extended period of time to meet Time-Weighted Average (TWA) requirements with a reduced number of samples. Elapsed time maximum is 9999 minutes (6.8 days), at which time the sample pump shuts down.

CE marked

ATEX-approved models available

MSHA-approved models available

UL Listed
See UL Certificate on page 30

Table 1. Pump Run Time in Hours with NiCad Battery

Following are typical run times achieved when using a fully charged Nickel-Cadmium (NiCad) battery pack. Data is sorted by type of sample media. All run times are listed in hours. Results obtained using a new pump and new fully charged battery. Pump performance may vary.

Mixed Cellulose (MCE) filter, 0.8-µm pore size

	Filter Diameter	
Flow Rate (L/min)	37 mm	25 mm
2.0	24.1	16.3
2.5	21.4	14.5
3.0	19.1	11.0
3.5	17.8	10.7
4.0	15.4	**
4.5	14.6	**

Polyvinyl Chloride (PVC) filter, 5.0-µm pore size

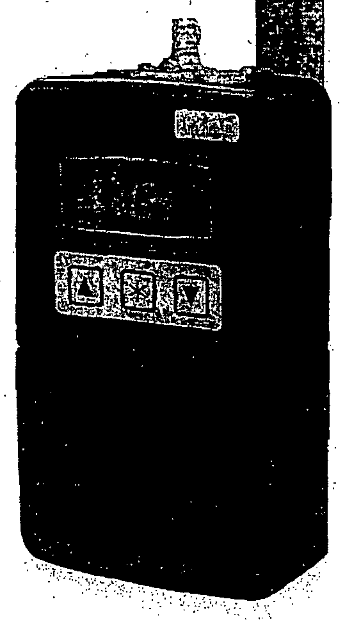
	Filter Diameter	
Flow Rate (L/min)	37 mm	25 mm
2.0	31.6	21.7
2.5	27.7	24.0
3.0	27.0	18.6
3.5	22.8	16.4
4.0	19.4	16.2
4.5	19.0	14.6

** Filter back pressure exceeded pump capability during testing.

Note *Increases in back pressure during sampling due to buildup of sample on the filter can decrease battery life.*

SKC

AirChek® XR5000



Operating Instructions

Flow Range: 1000 to 5000 ml/min (5 to 500 ml/min requires optional low flow adapter kit)

Compensation Range: 5000 ml/min at 10 inches water back pressure
4000 ml/min at 20 inches water back pressure
2000 ml/min at 50 inches water back pressure

Typical Back Pressure of Sampling Media (inches water)

Flow Rate (L/min)	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0
Filter/Pore Size (µm)								
25-mm MCE/0.8	6	9	12	15	18	21	25	31
25-mm MCE/0.45	14	22	28	35	40	44	50	63
37-mm MCE/0.8	2	3	4	5	6	7	9	11
37-mm PVC/5.0	1	1	2	2	2.5	3	3	4
37-mm, polycarbonate/0.45	4	6	8	10	12	15	17	21
25-mm MCE/0.45 microvacuum	21	31	40	48	59	69	79	100
37-mm Teflon/1.0	7.5	11	14.5	19	22	26	30	40

Compare the information in this table to pump compensation range to determine appropriate applications.

Flow Compensation System: Patented* isothermal closed loop flow sensor

Accuracies:
Timing: 1 min/mo at 25 C
Flow Rate: ± 5% of set-point after calibration to desired flow

Battery Charge Level Indicator: Icon displays on LCD at full, mid, low charge, imminent low battery fault, and low battery fault.

Temperature Range:
Operating: 32 to 113 F (0 to 45 C)
Charging: 32 to 113 F (0 to 45 C)
Storage: -4 to 95 F (-20 to 35 C)

Typical Run Time†:

XR5000 Model	2 L/min	5 L/min
High-power Li-Ion	40 hrs	22 hrs
Standard Li-Ion	20 hrs	11 hrs
Alkaline	18 hrs	8 hrs

† Using a 37-mm 0.8-µm MCE filter

For extended run times, the pump may be operated while attached to the charger.

Timer Display Range: 1 to 9999 minutes (6.8 days). If run time exceeds 6.8 days, timer display rolls over.

Flow Fault: If pump is unable to compensate for > 15 seconds due to excessive back pressure, the pump stops and holds run time display. Auto-restart is attempted every 15 seconds up to 5 times.

** U.S. Patent No. 5,892,160*

Low Battery Fault: 15 seconds to sleep

Auto-off: 5 minutes of inactivity

Battery Pack: *(model dependent)*
High-power Li-Ion (4 cell), rechargeable, 7.4 V, 4.4-Ah capacity, 32.6 Wh (Cat. No. P85004 for UL Listed pump)
or
Standard Li-Ion (2 cell), rechargeable, 7.4 V, 2.2-Ah capacity, 16.3 Wh (Cat. No. P85002 for UL Listed pump)
or
Alkaline (6 cell), disposable, size AA, 1.5 V (nominal), Cat. No. P75715 - not UL Listed for intrinsic safety

Battery Recharge Time: *(with SKC-approved charger)*
Standard Li-Ion (2 cell): approximately 4 hrs
High-power Li-Ion (4 cell): approximately 8 hrs

Size:
High-power Li-Ion and alkaline models: 5.5 x 3 x 2.3 in (14 x 7.6 x 5.8 cm)
Standard Li-Ion model: 4.3 x 3 x 2.3 in (10.9 x 7.6 x 5.8 cm)

Weight:
High-power Li-Ion: 21 oz (0.6 kg)
Standard Li-Ion model: 16 oz (0.45 kg)
Alkaline model: 17 oz (0.48 kg)

Case: Anti-static plastic

RFI/EMI Shielding: CE marked for RFI/EMI protection

Approvals: cULus LISTED for use in hazardous locations. Models that are UL Listed for intrinsic safety contain the cULus LISTED logo on the label. These models must be used with battery pack Cat. No. P85004 or P85002 to maintain the UL intrinsic safety listing.

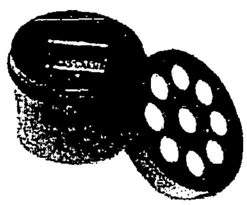
Cautions:

- **For safe operation in hazardous locations, ensure the pump label contains the cULus LISTED logo and the battery pack label contains Cat. No. P85004 or P85002. Use of any other battery pack (including alkaline) or device to power the pump voids the UL Listing for intrinsic safety.**
- **Use only the charger and battery packs designed for the AirChek XR5000 pump to ensure reliable performance. Failure to do so voids any warranty.**
- **Use only SKC-approved parts to ensure reliable performance and to maintain the UL Listing for intrinsic safety. Failure to do so voids any warranty.**
- **Failure to follow warnings and cautions voids any warranty.**

Radtrak® Long-Term Radon Monitoring

Radtrak is an alpha-track radon gas detector designed to monitor radon exposure for three months to one year to obtain a long-term average concentration over time. Landauer service includes the Radtrak detector, comprehensive analysis, and a confidential report of the findings. Radtrak can be packaged for indoor or outdoor area monitoring or personnel monitoring.

Landauer is the leader and pioneer in radon gas detection and monitoring service. Since 1954, our scientists have been involved with the development of radiation monitoring services for nuclear research centers and laboratories, hospitals, medical and dental offices, universities, and other industries where radiation might be present. This experience and technology have been incorporated into Landauer's highly accurate Radtrak radon detector using our exclusive Track-Etch® process. Radtrak radon detectors are used by the Environmental Protection Agency, the National Institutes of Health, the American Lung Association, and many other government and professional organizations.



Radtrak measures the average radon concentration at the location of the detector during the monitoring period. The alpha-track detector has, inside the plastic housing, a radiosensitive element that records alpha particle emissions (alpha tracks) from the natural radioactive decay of radon.

When the detector is returned to Landauer's laboratory, the alpha tracks are counted using computer-assisted image analysis equipment. The number of alpha tracks along with the deployment time period provides the basis for calculating the average radon concentration. The report with the radon gas measurement, reported in picocuries per liter of air (pCi/l), is mailed within seven to ten days after receipt of detector.

Thoron Proof Filter

Upon request, a detector can be fitted with a thoron proof filter that provides measurement of Rn 222 only.

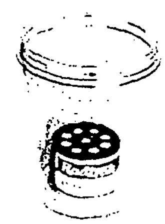
Technical Specifications

- The radiosensitive element is a CR-39 (allyl diglycol carbonate) based, passive alpha-track detector.
- The CR-39 is enclosed in a plastic housing composed of electrically conducting material with filtered openings to permit diffusion of radon gas only.
- Minimum level of detection is 30 pCi/l days i.e., 0.33 pCi/l based on 90 days.
- Detectors, before, during or after exposure, should not be in locations that exceed a temperature of 160°F (70°C).
- Radtrak detectors are packaged in film-foil bags that meet Military specification MIL-B-131, Class 1 to prevent exposure prior to use.
- A metallic label is provided for each detector to seal the filtered openings following the exposure period to minimize subsequent exposure to radon during the return shipment to Landauer's laboratory.
- Each detector is identified by a unique serial number laser engraved on the CR-39, printed and bar coded on the outside of Radtrak, and the film-foil bag.

Indoor Use

Monitoring indoors requires placing the detector in an upright position on a flat surface, or it may be hung from a joist or ceiling with the detector's hanger strip included with the shipment. The U.S. Environmental Protection Agency recommends the detector be placed in the lowest lived-in level of the home. It should be placed in a room that is used regularly but not a kitchen or bathroom. States or other organizations may have differing recommendations. Contact your state agency if you have a question regarding placement.

Outdoor Use



For monitoring outdoors, the detector is fastened to the bottom of a clear plastic cup. The cup is then installed inside a protective canister that has been attached to a post or other location. The protective canisters are sold separately.

Personnel Monitoring

The personnel monitor comes with a clip that easily attaches to the detector and securely fastens to clothing.

For more information on radon, refer to the U.S. Environmental Protection Agency's publication "A Citizen's Guide to Radon" at http://www.epa.gov/iaq/radon/pubs/citguide.html or contact your state department of health.

Appendix B-2
Description of Sampling Procedures

- Section 4, Air Monitoring Program, Crow Butte Uranium Project Environmental Manual
- Radon Daughter (Modified Kusnetz) Sampling and Analysis Procedure

4 AIR MONITORING PROGRAM

4.1 Introduction and Purpose

The environmental surveillance program includes routine monitoring and analysis of air samples within the permitted areas and surrounding environs to ensure compliance with federal, state, and company rules, regulations, policies and permits. The air monitoring programs are designed to provide maximum surveillance for environmental control and are based on many years of monitoring experience in conjunction with guidance and suggested practices from regulatory agencies. The following sections present a discussion of the environmental air monitoring programs including monitoring methodology and the types of sampling to be performed.

The environmental air monitoring program is based on the guidance provided in NRC Regulatory Guide 4.14, *Radiological Effluent and Environmental Monitoring at Uranium Mills*. There are two distinct phases of the environmental air monitoring programs.

4.1.1 Preoperational Air Monitoring

Preoperational monitoring is performed as a part of the site characterization process. Preoperational sampling establishes baseline air quality in the license area and the immediate vicinity, which provides the basis for comparing operational monitoring data. NRC recommends that at least 12 months of preoperational data be collected before operations begin. Operational monitoring must then be performed at the same locations as preoperational monitoring. Sampling locations are selected during site characterization based on a number of considerations including:

- Average meteorological conditions (e.g., wind speed, wind direction, atmospheric stability);
- Prevailing wind direction;
- Site boundaries nearest to sources of radioactive materials; Direction of the nearest occupiable structure; and
- Location of the estimated maximum concentrations of radioactive materials.

NRC guidance recommends preoperational air particulate and radon samples at a minimum of three locations at the site boundary. In addition, if there are any residences or occupiable structures within 10 km of the site, sampling is recommended at the structure with the highest predicted airborne concentration. Sampling is also recommended at or near at least one structure where the predicted dose exceeds 5 percent of the standard contained in 40 CFR Part 190 (i.e., greater than 1.25 mrem per year to the whole body from all sources with exposure to radon gas and its daughters excepted). Finally, the guide recommends sampling at a remote location that represents background conditions.

Note that preoperational monitoring is performed as part of site licensing activities and is coordinated with NRC during these efforts. The monitoring recommended in Regulatory Guide 4.14 may be modified to meet site-specific requirements in consultation with the NRC staff.

4.1.2 Operational Air Monitoring

Operational monitoring is performed to ensure that the facility is being constructed and operated correctly. This is accomplished by comparing the operational monitoring data with preoperational data to determine whether operations are having an impact on air quality. During operational monitoring, operational data is analyzed and compared with preoperational data. NRC guidance recommends continuous air particulate and radon samples at the locations selected for preoperational monitoring.

In addition to air particulate and radon gas monitoring during operations, NRC also recommends that facilities perform stack sampling if yellowcake dryers are so equipped. The vacuum dryers installed at Crow Butte are zero emission dryers with no stack and therefore do not require this type of sampling.

In order to ensure reliable data, the air monitoring program specifies the following procedures that must be followed:

- Air particulate sampling is performed according to the instructions contained in Section 4.2. This air sampling determines the activity in ambient air of particulate radioactive material that could potentially be released by a uranium recovery facility during operations. Specifically, monitoring may be performed for natural uranium, thorium-230, radium-226, and lead-210. The specific list of analytes is determined during licensing by the NRC and is selected based on site-specific background characteristics.

- Monitoring for radon-222 is performed according to the instructions contained in Section 4.3. Radon gas is typically released by solution uranium mines at various stages in the process. Radon gas is ubiquitous in nature at varying concentrations, so accurate monitoring must be performed to determine any environmental impacts from operations.

4.1.3 Quality of Measurements

The accuracy of monitoring data is critical to ensure that the air monitoring program precisely reflects air quality in each phase of the program. Regulatory Guide 4.14 specifies the following lower limits of detection (LLD):

Radionuclides	LLD (μCi/ml)
Natural Uranium	1×10^{-16}
Thorium-230	1×10^{-16}
Radium-226	1×10^{-16}
Radon-222	2×10^{-10}
Lead-210	2×10^{-15}

4.2 Air Particulate Monitoring

Airborne particulate sampling is performed at the locations specified in the NRC License. The CBO License requires monitoring for at least 2 weeks of every month that the yellowcake dryer is in operation. However, CBO has instituted continuous monitoring at these sites as a best management practice.

The airborne particulates are collected on the inlet filter of a regulated vacuum pump on a Type A/E 47 mm glass fiber filter paper. The low volume air samplers employed are the Eberline RAS-1 system or equivalent that consists of a vacuum pump, an airflow regulator, a rotameter-type airflow indicator, and filter paper holder. The samplers are placed in protective enclosures that provide protection from the elements while allowing unimpeded sampling of the ambient air.

Clean filters are installed in the filter holder at the beginning of the sampling period. The pump flow rate is adjusted, if necessary and the required information (i.e., start time and date, flow rate, sampler name) are recorded on the Sampling Record. The filter replacement schedule is determined based on the dust loading at a particular location. In general, samplers can run for one to two weeks without a significant reduction in the flow rate due to dust loading. If sampling records indicate that dust loading at a particular sampling location is affecting the flow rate, the filter replacement frequency may need to be increased.

As each filter is removed at the end of the sampling period, the filter should be folded in half with the exposed surface to the inside to retain the solid material deposited on the filter. It is important to ensure that the filter is not damaged during removal in order that particulate matter retained on the filter is not lost. The exposed filter is placed in a sample envelope that is stored in an appropriate container by sample location. The necessary information (i.e., stop time and date, flow rate, sampler name, comments) is recorded on the Sampling Record.
At the end of the calendar quarter, the composite filter samples are submitted to the contract laboratory for radiometric analysis using standard Chain of Custody Procedures. The filters are composited according to location. The composite samples are analyzed for the concentrations of natural uranium, radium-226, and lead-210. The actual volume of air filtered at each station for the quarter is also forwarded to the contract laboratory with the filters.

The flow rate on the RAS-1 pumps is calibrated at six-month intervals in order to ensure the accuracy of the volume of air sampled. The calibration is accomplished following the instructions contained in Volume IV, *Health Physics Manual.*

The results of air particulate monitoring are recorded in the environmental record system for use by the EHS Department staff to determine trends at particular locations and to analyze potential impacts from site operations. These results are also included in the Semiannual Radiological Effluent and Environmental Monitoring Report submitted to the NRC. The analytical results should be reviewed to ensure that NRC quality requirements discussed in Section 3.1.5 are met.

4.3 Radon Gas Monitoring

Radon-222 is monitored continuously at the environmental monitoring locations. Monitoring is performed using Landauer RadTrak detectors. These detectors are an alpha-track radon gas detector using Landauer's Track-Etch® process and are designed to monitor radon exposure for three months to one year. Landauer service includes the RadTrak detector and a comprehensive analysis.

The RadTrak radon detectors are supplied in aluminum bags to prevent radon exposure before deployment. The detectors should not be stored or deployed in any area in which the temperature may exceed 160°F. There is no low temperature limit.

After opening the aluminum bag to remove and deploy the detector, the Data Sheet provided with the detectors must be filled in with the serial number, date installed and the location information. Remove the top of the detector field canister, located at the air monitor station, and place the detector in the canister facing down. The canister may be placed at any desired height, but is typically 3 to 6 feet from the ground to prevent undue influence from radon emanation from the soil at the sample location. It is advisable to place the canister in a location that is safe from tampering or animal damage. When the detector is in place, replace the canister top.

At the end of the monitoring period, fill in the removal date on the Data Sheet for each detector as it is removed from the detector canister. Place a gold adhesive seal, which is provided with the shipment, over all of the holes on the top of the detector. This will effectively stop the monitoring period. Any unusual conditions encountered should also be noted on the Data Sheet. Replace the detector that has been removed with a new detector.

Stack the exposed detectors and return them to the aluminum bag for shipment back to Landauer. Fold the open end of the aluminum bag several times and seal with tape or staples. If the aluminum bag is misplaced, the cups may be wrapped in aluminum foil for shipment. Include a copy of the Data Sheet with the detectors when they are returned to Landauer for analysis.

The results of radon monitoring are recorded in the environmental record system for use by the EHS Department staff to determine trends at particular locations and to analyze potential impacts from site operations. These results are also included in the Semiannual Radiological Effluent and Environmental Monitoring Report submitted to the NRC. The analytical results should be reviewed to ensure that NRC quality requirements are met.

Note that Landauer does not provide the LLD on the analytical result report. The LLD for Track-Etch® detectors is a function of the exposure time and the area of the cup that is analyzed by Landauer. The LLD should be determined in consultation with Landauer before monitoring is performed. If the LLD is above the NRC requirements from Regulatory Guide 4.14, it may be reduced by either employing a longer sampling time or requesting that Landauer analyze a larger portion of the Track-Etch® cup.

Radon Daughter (Modified Kusnetz)

Sampling and Analysis Procedure

1.1 Background

Radon (^{222}Rn) is a noble gas. As such, it is not effectively trapped or retained by filters. However, as radon decays, several of its radioactive daughters are alpha-emitting particles. These radioactive particles may be filtered using normal particulate filtering techniques and counted for alpha activity. When counting for radon daughters, the airborne concentration is referred to as a working level (WL). A working level is defined as any combination of short-lived radon daughters (^{218}Po, ^{214}Pb, ^{214}Bi and ^{214}Po), without regard to equilibrium, which will result in the emission of 1.3×10^5 MeV of alpha energy per liter of air. One WL is also defined as the potential alpha energy present in a liter of air containing 100 pCi each of the short-lived radon daughters.

1.2 Modified Kusnetz Method

The Modified Kusnetz Method involves obtaining a sample with a low flow sampler (such as a breathing zone sampler) and analyzing the gross alpha contamination deposited on the filter after a specified decay time. A correction factor is applied based upon the decay time that allows accurate determination of the radon daughter concentration based on the radon decay scheme. The Modified Kusnetz method requires the following equipment:

- A battery powered pump with an airflow rate meter (i.e., rotometer) calibrated for a flow rate of 2 liters per minute (LPM). A breathing zone (lapel) sampler (0 to 5 lpm) such as a GilAir or equivalent is typically used;

- Filter holder with cap cover to protect filter before and after sampling. If caps are not available, a zip lock plastic bag or other suitable container may be used.

NOTE: Do not place more than one filter holder in a bag.

- Gelman Type A/E glass fiber filter rated at 99.98% efficient, or 0.45-micron membrane filter.

NOTE: The pump must be calibrated to the type of filter used.

- Sample holding envelopes, when applicable;

- Alpha scintillation detector and scaler/ratemeter, or equivalent.

- Check Source: Thorium-230 with a known activity to be used as an alpha source for instrument reliability check.

- Data Recording Form.

1.3 Modified Kusnetz Prerequisites

Pump Operability: Inspect the sampling pump for operability i.e., the battery is fully charged, the sampler has a current calibration, and there are no tubing-to-filter holder connection or tubing-to-pump leaks.

Leak Test: Assemble the pump tubing and filter holder. Turn on the pump and observe the flow rate on the flow rate meter. The air flow rate with the filter in place should be the same as the flow rate indicated on the calibration tag. If it is not, adjust the flow rate until the correct rate is obtained. A leak test may be performed by placing the palm of the hand over the filter holder (*MAKE SURE the hand or glove is clean*) for about 5 seconds and observe the flowrate. It should drop to zero. If it doesn't, leakage is indicated. Check the pump to tubing connection, the tubing, and the tubing to filter holder connection. Repeat the leak test. If leakage is still indicated use a different piece of tubing and repeat the test.

Filters: Make sure the filter holders have filters in them and are capped or placed in individual containers. Use a marking pen to note sample location on the container.

Data Recording Forms: Make sure you have an appropriate radon daughter sampling form.

1.4 Modified Kusnetz Sampling Procedure

Place filter holder with clean filter installed onto the end of the plastic tubing.

Turn the pump on and record the start time and the sample location on the sampling form.

Collect a 5 minute air sample. Turn the pump off and record the end time and any unusual conditions on the sampling form.

Remove the filter holder with the sample from the tubing, record cap number on sampling form or place sample in a suitable container marked with the sample location.

Proceed to the next sample location and repeat sampling procedure.

1.5.1 Modified Kusnetz Sample Analysis

Radon daughter samples are analyzed using the Modified Kusnetz method. Samples are collected on fiberglass or membrane filters using a lapel sampler or equivalent pump pulling a minimum of 2 liters per minute. Samples are collected for exactly five minutes, resulting in a 10 liter sample.

The sample filter is allowed to decay between 40 and 90 minutes after the end of collection before counting. After 40 minutes, only alpha particles from the decay of Po-214 are counted because virtually all of the Po-218 (3.05 minute half-life) has decayed.

The sample is counted with a scaler rate meter and an alpha scintillation detector at a count time determined by the RSO as adequate to meet the LLD requirements of 0.03 WL. The resulting gross counts are divided by the count time to arrive at a count rate (cpm).

Working levels are derived by dividing the count rate, minus background, by the product of the counter efficiency, the volume of air sampled, and the time factor. Calculation is according to the following formula:

$$\text{Working Level (WL)} = \frac{\text{Sample cpm - background cpm}}{(\text{Eff})(\text{Vol})(\text{TF})}$$

where:

cpm = Counts per minute (Sample – background)

Eff = Instrument counting efficiency

Vol = Total air volume pumped through filter (flow rate in liters x sample time in minutes)

TF = Time factor

The time factor (TF) is dependent on the time elapsed between end of sampling and the beginning of counting. These time factors are determined as shown in Table 1 and should be based on the midpoint of the elapsed time between sample collection and the time in counting. The time factor is based on the assumption that equilibrium existed between Po-218, Pb-214, and Bi-214 at the time of sampling. The time factor relates dpm per liter of air from 40 to 90 minutes after sampling to the decay activity that would be present from an initial concentration of 1 WL.

Table 1

Modified Kusnetz Time Factors

Minutes	Factor	Minutes	Factor	Minutes	Factor
40	150	57	116	74	84
41	148	58	114	75	83
42	146	59	112	76	82
43	144	60	110	77	81
44	142	61	108	78	78
45	140	62	106	79	76
46	138	63	104	80	75
47	136	64	102	81	74
48	134	65	100	82	73
49	132	66	98	83	71
50	130	67	96	84	69
51	128	68	94	85	68
52	126	69	92	86	66
53	124	70	90	87	65
54	122	71	89	88	63
55	120	72	87	89	61
56	118	73	85	90	60

Appendix B-3
Description of Calibration Methods and Calibration Sheets

- Section 10, Radiological Laboratory Programs, Crow Butte Uranium Project Health Physics Manual
- SKC Pump Calibration Records

10 RADIOLOGICAL LABORATORY PROGRAMS

10.1 Purpose

Crow Butte Operation (CBO) uses various types of field survey and laboratory counting instruments to determine concentrations of radioactive material and radiation levels. These surveys are conducted in order to meet the requirements contained in 10 CFR Part 20. This chapter sets forth the requirements and instructions for operating these survey and counting systems and for performing routine radiological instrument checks and calibrations to ensure that instrument indications are accurate. This chapter also contains instructions for ensuring that samplers used to determine concentrations of radioactive material in air are functioning properly.

10.2 Definitions

Definitions of terms used in this section are found in the Glossary contained in Appendix A.

10.3 Instrument Calibration

10.3.1 Vendor Calibration

The manufacturer or a qualified accredited vendor shall calibrate portable survey instruments, counter/scalers, mass flow meters and/or dry cell calibrators, and calibration sources. Calibration will be performed as recommended in ANSI N323 and ANSI N323A. The ANSI standard requires that radiation detection instruments be performance tested on an annual basis to verify that they continue to meet operational and design requirements. Instruments must be tested for range, sensitivity, linearity, detection limit, and response to overload. The specific calibration requirements for various types of instrument are given in the following sections.

10.3.1.1 Linear and Digital Readout Instruments

Linear readout instruments with a single calibration control for all scales shall be adjusted at the point recommended by the manufacturer. Instruments with calibration controls for each scale must be adjusted on all scales. After adjustment, the instrument must be checked near the end points (approximately 20% and 80% of full scale).

10.3.1.2 Logarithmic Readout Instruments

Logarithmic readout instruments normally have two or more adjustments. The instrument must be adjusted for each scale as recommended by the manufacturer. After adjustment, the instrument must be checked at a minimum of one point on each decade.

10.3.1.3 Surface Contamination Measurement Instruments

Alpha and beta-gamma detection instruments usually consist of a count rate meter and a separate detector. The electronics and the detector may be calibrated together or separately. The detector should be calibrated with the radionuclide to be detected, if possible, or with radionuclides of similar energies. When the instrument is calibrated as an integral unit, a minimum of one point on each scale is calibrated up to approximately 6 x 10^4 dpm/100 cm^2. When calibrated separately, the count rate meter is calibrated with an electronic pulser. Exchange of detectors is allowed if the response to a calibrated check source is within the range of acceptable counts for the original probe and check source as discussed in Section 10.4.1.2.

10.3.1.4 Radioactive Calibration Sources

Calibration sources that are used to determine instrument operating parameters such as high voltage setting, reliability factor, and efficiency must be calibrated annually by the manufacturer. Depending on the half-life of the radionuclide used for the source, decay correction may also be necessary during use to ensure accuracy. Decay correction of sources is discussed in further detail in Section 10.4.2.6.

10.3.1.5 Calibration Records

The calibration vendor shall provide a record of all calibration, maintenance, repair, or modification. Calibration records will be filed with all previous records for the same instrument. In addition, each instrument will be labeled with the following information:

- Date of most recent calibration;
- Initials of calibrator;
- Date that primary calibration is again required;
- Special use or limitations (if applicable);
- Serial number of the instrument.

10.3.1.6 Calibration Frequency

Calibration frequency is annual or at the frequency recommended by the manufacturer, whichever is more frequent. Where instruments are subjected to extreme operational conditions, hard usage, multi-shift use, or corrosive environments, the RSO should consider increasing the calibration frequency. The calibration vendor should provide the as-found calibration condition for each instrument. If greater than 10% of the instruments are out of calibration when received by the calibration vendor, consideration should be given to increasing the calibration frequency.

10.3.2 On-Site Calibration

On site calibration of air samplers is performed using procedures found in Section 10.6. Regulated air samplers (Eberline RAS-1 or equivalent) and high volume air samplers are calibrated semiannually or at the manufacturer's recommended frequency, whichever is more frequent. Breathing zone samplers are calibrated daily during use. With the exception of breathing zone samplers, air samplers should be labeled with the date of calibration, correction factors (if applicable), and initials of the calibrator. This information is recorded on the daily calibration sheet for the breathing zone samplers.

10.4 Functional Tests

Functional tests are performed at the mine site to ensure that an instrument is acceptable for use. The functional tests are checks that are often qualitative and consider the physical condition of the instrument (e.g., battery condition) and response of the instrument to a radioactive source. These checks are compared to the known response of the instrument after the most recent calibration to ensure instrument accuracy.

10.4.1 Initial Instrument Checks

Initial instrument checks are performed initially after receipt of the instrument from the calibration vendor. The results of these initial instrument checks are recorded and are used to ensure that a system continues to operate in as-received condition until the next scheduled calibration. These functional tests are also performed after any repair or if the response of the instrument to a known source is questioned.

10.4.1.1 Instrument Reliability Factor

The instrument reliability factor (RF) will indicate whether an instrument is operating properly within the statistical limits of counter reliability. The reliability factor is determined initially after receiving the appropriate type of instrument from the calibration vendor. The reliability factor should also be determined for an instrument that has not been in service for an extended period or for an instrument that has a daily source check count that falls outside the acceptable range. Determine the reliability factor as follows:

- Perform ten 1-minute counts of a source of known activity. Record the total counts for each measurement (C_1 through C_{10}).
- Determine the average (C_{ave}) of the ten 1-minute counts:

$$C_{ave} = \frac{(C_1 + C_2 + \ldots C_{10})}{10} \left(\text{or } \frac{\Sigma C}{n} \right)$$

- Calculate the sum of the squares (SS) as follows:

Subtract the average counts (C_{ave}) from each of the ten measurements and square each difference. Add together the ten results (each will be a positive number).

$$SS = (C_1 - C_{ave})^2 + (C_2 - C_{ave})^2 + \ldots(C_{10} - C_{ave})^2$$

- Calculate the observed standard deviation (S_n):

$$Sn = \sqrt{\frac{SS}{n-1}}$$

Where: SS = Sum of the Squares
n = Number of Observations (10)

- Calculate the theoretical standard deviation (σ_n):

$$\sigma_n = \sqrt{C_{ave}}$$

Where: C_{ave} = Average source count rate

- Calculate the resulting reliability factor (RF):

$$RF = \frac{\text{observed standard deviation}}{\text{theoretical standard deviation}} = \frac{S_n}{\sigma_n}$$

- The reliability factor should be between 0.64 and 1.22. This implies that the instrument is operating reliably. A reliability factor between 0.50 and 0.64 or 1.22 and 1.40 will be investigated by the RSO. A reliability factor less than 0.50 or greater than 1.40 is unsatisfactory and the instrument will be removed from service.

10.4.1.2 Acceptable Range

The acceptable range should be determined for an instrument each time that the reliability factor is determined as discussed in Section 10.4.1.1. The acceptable range will allow a quick determination that the daily source count performed in accordance with Section 10.4.2.6 for a specific instrument is within satisfactory limits. Note that the daily source count must be performed using the same calibrated source that was used to determine the reliability factor. Determine the acceptable range as follows:

- Determine the average source counts (C_{ave}) for the source (see Section 10.4.1.1).
- Determine the lower limit of the acceptable range by multiplying the average source counts (C_{ave}) by 0.80.

Lower acceptable counts = C_{ave} x 0.80

- Determine the upper limit of the acceptable range by multiplying the average source counts (C_{ave}) by 1.20.

Upper acceptable counts = C_{ave} x 1.20

- Record the upper and lower limits of the acceptable range for the instrument on the appropriate instrument daily check form.

10.4.1.3 High Voltage Plateau

The instrument high voltage plateau will indicate whether or not the high voltage applied to the instrument detector is set at the appropriate point for maximum sensitivity with minimal influence from background radiation levels. The high voltage plateau is performed initially after receiving the appropriate type of instrument from the calibration vendor. The purpose of this high voltage plateau is to confirm the high voltage selected by the calibration vendor is appropriate. A secondary purpose is to ensure that the setting was not affected by shipment of the instrument. A high voltage plateau should also be performed on an instrument when a new detector is installed or when there is a noticeable degradation in instrument performance as indicated by the daily functional tests. Performance problems would include a decrease in the instrument efficiency over time or erratic results indicated by a daily source check count that falls outside the acceptable range determined in Section 10.4.1.2. Perform the high voltage plateau as follows:

NOTE: This section contains general instructions for performing a high voltage plateau. Consult the appropriate instrument technical manual for specific instructions.

- Check that the power is OFF and that the high voltage setting is set at 0 or a setting where no counts are detected. Ensure that the detector is connected to the instrument with the proper cable.
- Insert an appropriate calibrated radiation source in the sample counting position.
- Turn the power switch and the HV switch (if appropriate) to ON.

- Slowly increase the high voltage until counts begin to register on the instrument. This is the counting threshold.
- Starting at the nearest even volt increment above the counting threshold, take one to two minute counts for every 0.5 HV increment until the counts start to increase. For each data point, plot the total counts (or count rate) versus the high voltage setting. (Smaller HV increments may be used if necessary to produce a smoother curve).
- Draw a smooth curve through the data points. A region should be indicated where very little change in count rate occurs with successive changes in the high voltage. This region is the high voltage plateau.
- Repeat the previous steps without a source in the counting position. Plot the data on the same graph that the source data was plotted on.
- The operating high voltage should be chosen to be in the middle of the high voltage plateau but not in the area of the background curve where source counts are increasing exponentially. The operating high voltage is chosen to optimize sensitivity and efficiency.
- The chosen high voltage should be compared with the high voltage setting selected by the calibration vendor. Any significant differences between these two high voltage settings should be investigated by the RSO.

10.4.1.4 Lower Limit of Detection (LLD)

The instrument lower limit of detection (LLD) is the smallest concentration of radioactive material that has a 95 percent probability of being detected. The LLD will determine whether the instrument and counting procedures are capable of detecting the presence of radioactive material below the allowable regulatory limits (i.e., allowable air concentrations or removable activity concentrations). The LLD is a determination of sensitivity for a measurement system and is not intended to be calculated for individual samples.

If the LLD is at or above the allowable limit, adjustments will be made to reduce it to an acceptable level. Typically, the counting system LLD should be 10 percent of the allowable limit. In no case should the LLD be above 50% of the allowable limit. Increasing the sample count time, increasing the sample volume, or reducing background levels will lower the LLD.

The LLD is determined initially after receiving the instrument from the calibration vendor. LLD should also be determined for an instrument that has not been in service for an extended period or for an instrument that has required repairs or a high voltage plateau.

Determine the LLD for air, liquid, or solid samples as follows:

$$\text{LLD} = \frac{3 + (4.65\ S_b)}{(3.7 \times 10^4)\ EVYe^{-\lambda t}}$$

Where:

LLD	=	Lower Limit of Detection (µCi/ml or µCi/g)
S_b	=	the standard deviation of the background count rate (cps)
3.7×10^4	=	the number of disintegrations per second per µCi (dps/µCi)
E	=	the counting efficiency (counts per disintegration)
V	=	sample volume (milliliters or gram)
Y	=	the fractional chemical yield (if applicable)
λ	=	Decay constant for the particular radioisotope
t	=	Time elapsed between sample collection and counting

For determining the LLD for radon daughters, do not use the factor to change units from dps to µCi (3.7×10^4). Determine the LLD in dpm/liter. Then, use the correction factor discussed in NRC Regulatory Guide 8.30 to correct from dpm/liter to Working Levels (WL).

Determine the LLD for surface contamination samples as follows:

$$\text{LLD} = \frac{3 + (4.65 S_b)}{(3.7 \times 10^4)\ EAYe^{-\lambda t}}$$

Where:

LLD	=	Lower Limit of Detection (µCi per unit area)
S_b	=	the standard deviation of the background count rate (cpm)
3.7×10^4	=	the number of disintegrations per second per µCi (dps/µCi)
E	=	the counting efficiency (counts per disintegration)
A	=	area sampled, usually 100 cm^2
Y	=	the fractional chemical yield (if applicable)
λ	=	Decay constant for the particular radioisotope
t	=	Time elapsed between sample collection and counting

The result in µCi/area may be converted to dpm using the conversion of 2.22×10^6 dpm/µCi. This equation may also be used to determine the LLD for direct measurements with a portable instrument (i.e., total surface contamination). If a rate meter is used, t = instrument response time (i.e., 1 to 10 seconds).

10.4.1.5 Minimum Detectable Concentration (MDC)

As noted in section 10.4.1.4, LLD is the determination of sensitivity for a measurement system and is not intended to be calculated for individual samples. Minimum detectable concentration (MDC) is a measurement of the detection sensitivity for a single sample based on sampling and counting parameters and should be calculated to ensure adequate sensitivity is achieved for each sample.

MDC is calculated using the following formula:

$$MDC = \frac{2.71 + 3.29\,(R_b \times T_g\,(1 + T_g/T_b))^{1/2}}{E\,F\,K\,T_s\,T_b}$$

Where:

MDC	=	Minimum Detectable Concentration (µCi/ml)
R_b	=	background count rate (counts per minute)
T_g	=	sample count time (minutes)
T_b	=	background count time (minutes)
E	=	the filter efficiency
F	=	sample flow rate (milliliters per minute)
K	=	calibration factor to convert counts per minute into activity, (cpm/dpm) X 2.22 E+6 dpm/µCi
T_s	=	duration of sample collection (minutes)

10.4.2 Instrument Checks

Regulatory Guide 8.30 specifies requirements for routine maintenance and calibration of radiological surveys instruments. Regulatory Guide 8.30 also references the standards contained in ANSI N323-1978, *Radiation Protection Instrumentation Test and Calibration*. ANSI is in the process of a major revision of this Standard that will result in three separate Standards that apply to radiological instrumentation. The first revision, ANSI-N323A-1997, *Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments*, was incorporated in this Chapter. Where conflicts arise between Regulatory Guide 8.30 and the ANSI Standard, the Regulatory Guide recommendations have been followed.

10.4.2.1 Calibration Verification

Any survey or counting equipment in use shall have a current calibration sticker in place. Calibration stickers shall be checked as scheduled in Section 10.4.3 before use of these instruments. Calibration date and due date will be recorded on the appropriate form.

Air samplers shall have a current calibration sticker in place. Calibration stickers shall be checked each day before use of these regulated air samplers. Breathing zone samplers do not require calibration stickers if they are calibrated before each use. Calibration results will be recorded on the appropriate form.

10.4.2.2 Physical Check

Before each use, all instruments and samplers shall be inspected for physical condition. The inspection should include determining whether there are any loose or damaged knobs, buttons, cables, or connectors. Meter movements or displays should be inspected for damage. Instrument cases should be inspected for dents or corrosion. Probes should be inspected for damage such as punctured or deformed probes or probe windows.

An instrument that has any physical damage should not be placed in service. Repairs shall be made and documented.

10.4.2.3 Battery/High Voltage Check

The battery check is performed to determine the condition of the instrument's batteries. This check is important to ensure that there is sufficient voltage being supplied to the detector and the instrument circuitry. The battery check will be performed in accordance with the instructions contained in the appropriate instrument technical manual. If the battery check is unsatisfactory, refer to the technical manual for instruction for replacement of batteries and repeat the check. If results are still not satisfactory, remove the instrument from service until repairs can be made. Repairs shall be made and documented.

High voltage checks shall be performed in accordance with the appropriate instrument technical manual. The purpose of the high voltage check is to ensure that the proper voltage is being applied to the detector. The high voltage setting is provided by the instrument calibration vendor on the calibration certificate or is determined by performing a high voltage plateau.

10.4.2.4 Response Source Check

The response source check is made to ensure that the instrument in use will respond to a known source of radiation. The response check does not result in determination of efficiency or the instrument correction factor. The response check is typically performed before each use and indicates that the instrument has not sustained damage that would prevent it from detecting radiation. An example of a response check would be checking an alpha contamination survey meter at a restricted area access point with a check source.

Perform a response source check as follows:

- Determine background radiation level. Background must be low enough to allow a measurable response to the source being used.
- Ensure that the instrument is on the appropriate scale for the activity of the source in use.
- Ensure that the instrument audible device is on (if applicable).
- Slowly move the instrument detector towards the source and observe for an increase in the audible response and/or visual indicator reading.
- If the instrument has a large area probe (e.g., Ludlum 43-5 alpha detector with 50 cm^2 surface area), ensure that the detector responds to the check source through its entire active surface area.

10.4.2.5 Background Measurement

Background measurements for radiation survey instruments are performed as scheduled in Section 10.4.3. Local background may need to be determined before a particular use, such as performing a gamma radiation survey for characterization of potential contamination. Perform this type of background measurement as follows:

- Place the instrument in the lowest scale and press the reset button (if applicable).
- Allow adequate time for the instrument reading to stabilize.
- Record the instrument reading and compare it to previous background readings.

Background measurements for scaler type instruments are used to evaluate the radiation level in the area where the instrument is located. High background radiation levels will affect the sensitivity of scaler type instruments and will adversely affect the lower limit of detection (LLD). Perform a background determination on a scaler type instrument as follows:

- Ensure that the sample tray or holder is clean (if applicable). The detector and sample holder geometry should be in the same configuration as that which will be used when counting samples.
- Select the desired counting time. The selected time must be consistently used thereafter to perform the source count and the sample and/or smear counting operations. Since the counting time directly affects the instrument's LLD, it must be long enough to obtain the desired LLD, but should be short enough to be practical.
- Count the background for the selected time period and record the total counts measured.
- Repeat the background measurement a number of times. A guideline is the count time x the number of measurements should equal 20 minutes or ten measurements, whichever is less.
- Calculate the average background reading (C_b) in counts per minute (cpm):

$$\overline{C_b} = \frac{\frac{C_1}{t} + \frac{C_2}{t} + .. \frac{C_{10}}{t}}{n}$$

Where: C_1 through C_{10} = Total counts for each background measurement;
t = Counting time;
n = Number of measurements made.

- Record the average background reading, the count time, and the number of counts.

10.4.2.6 Determination of Efficiency and Correction Factor

Instrument efficiency (E) is determined to check instrument performance when measured with a source of known activity of a particular radioisotope. A correction factor (CF) is determined that allows conversion of instrument cpm to disintegrations per minute (dpm) and is the inverse of the known efficiency (i.e., 1/E).

Determine the instrument efficiency as follows using a source of known activity:

- Correct the source activity for decay (if necessary) as follows:

$$A = A_o e^{-\lambda t} \quad ; \quad \lambda = \frac{\ln(2)}{T_{1/2}}$$

Where:
- A = Present source activity in dpm;
- A_o = Initial source activity at time of assay;
- λ = Decay constant for source radioisotope;
- t = Time elapsed since initial source assay (hours);
- $T_{1/2}$ = Source radioisotope half life (in hours);
- $\ln(2)$ = Natural logarithm of 2 (approximately 0.693).

- Count the source for the same period of time as used in the background measurement (see Section 10.4.2.5).
- For surface contamination survey probes, place the probe face down against the active side of the source. For an Eberline AC-3 or Ludlum 43-5 alpha probe, perform three counts, one on each third of the probe face (i.e., toe, center, and heel). Determine the average of the three counts to use in determining efficiency and correction factor. For smaller probes such as the Ludlum 43-65, perform one source count in the center of the probe.
- Record the total counts, divide by the counting time period, and subtract the background cpm to calculate the efficiency (E) using the following formula:

$$E = \frac{\text{Net cpm Measured}}{\text{Actual Source Activity (decay corrected)}} = \frac{\text{cpm}}{\text{dpm}}$$

Where: Net cpm = Total measure source cpm – Background ($\overline{C_b}$)

- Calculate the corresponding correction factor (CF):

$$CF = \frac{1}{\text{Efficiency (E)}} = \frac{dpm}{cpm}$$

- Record the calculated efficiency and correction factor on the appropriate form.
- Compare the source counts with the acceptable range for the specific instrument and source as discussed in Section 10.4.1.2. If the source counts do not fall within the acceptable range, do not place the instrument in service and notify the RSO.

The instrument dpm Factor may be determined for contamination survey instruments to correct the indicated cpm to dpm per 100 cm^2. This factor is typically determined for instruments that are used for performing total surface contamination surveys since the action levels and regulatory limits are expressed in units of dpm/100 cm^2. Determine the dpm factor as follows:

- Divide 100 by the effective surface area of the probe face to obtain the multiplier that will convert the results into dpm/100 cm^2. The effective surface area of the probe will always be listed in the instrument technical manual. For example, the effective surface area of the Eberline AC-3 alpha scintillation probe is 59 cm^2 so the multiplier for the AC-3 is 1.7. The effective surface area for the Ludlum 43-5 and the 43-65 probes is 50 cm^2 so the multiplier for both probes is 2.0. Multiplying this number by the correction factor will obtain the dpm factor. The dpm factor will correct indicated cpm to dpm/100 cm^2.

10.4.3 Instrument Check Schedules

Routine checks of radiation survey and counting instruments are made to ensure that the instrument is responding accurately and is in proper condition for field use. This section provides the check schedule for each type of instrument based on the guidance contained in Regulatory Guide 8.30. General instructions for performing these checks are contained in Sections 10.4 and 10.4.2. Specific instructions for performing these checks on each instrument are contained in the appropriate instrument technical manual.

10.4.3.1 Radiation Survey Instruments

Radiation survey type instruments include the Ludlum Model 3 Gamma Survey Meter and the Ludlum Model 19 microR Meter or equivalent. These instruments require the following checks at the noted frequency:

- Physical check – Daily when in use (Section 10.4.2.2);
- Battery Check (if applicable) – Daily when in use (Section 10.4.2.3);
- Response source check – Daily when in use (Section 10.4.2.4);
- Calibration verification – Daily when in use (Section 10.4.2.1);
- Background measurement – Daily when in use, as required (Section 10.4.2.5).

10.4.3.2 Surface Contamination Instruments

Surface contamination instruments are used to measure alpha and beta-gamma surface contamination levels and include the Ludlum Model 2241 Ratemeter/Scaler Survey Meter. These instruments require the following checks at the noted frequency:

- Response source check – Before each use (Section 10.4.2.4)
- Battery Check (if applicable) – Daily when in use (Section 10.4.2.3)
- High Voltage Check (if applicable) – Daily when in use (Section 10.4.2.3);
- Calibration verification check – Daily when in use (Section 10.4.2.1);
- Background measurement – Daily when in use, as required (Section 10.4.2.5);
- Determination of efficiency/correction factor – Daily when in use (Section 10.4.2.6).
- Determination of instrument reliability factor – Initially after calibration (Section 10.4.1.1).

10.4.3.3 Scaler Type Instruments

Scaler type instruments are used to analyze the alpha contamination on air filters and loose surface contamination ("smear") samples. These instruments consist of a detector and a scaler and include the Ludlum Model 2000 Scaler or equivalent. These instruments require the following checks at the noted frequency:

- Physical check – Daily when in use (Section.10.4.2.2);
- Battery Check (if applicable) – Daily when in use (Section 10.4.2.3);
- High Voltage Check (if applicable) – Daily when in use (Section 10.4.2.3);

- Calibration verification check – Daily when in use (Section 10.4.2.1);
- Background measurement – Daily when in use (Section 10.4.2.5);
- Determination of efficiency/correction factor – Daily when in use (Section 10.4.2.6);
- Determination of instrument reliability factor – Initially after calibration, after repair or if instrument response is questionable (Section 10.4.1.1);
- Determination of lower limit of detection – Initially after calibration, after repair or if instrument response is questionable (Section 10.4.1.4);
- High voltage plateau – Initially after calibration, after repair or if instrument response is questionable (Section 10.4.1.3).

10.4.3.4 Alpha Survey Meters

Alpha survey meters are used to measure alpha surface contamination levels on skin and equipment and include a ratemeter such as the Eberline RM-19 and the Ludlum Model 12 or 177 Frisker or equivalent. These instruments require the following checks at the noted frequency:

- Response source check – Before each use (Section 10.4.2.4)
- Battery Check (if applicable) – Weekly (Section 10.4.2.3)
- High Voltage Check (if applicable) – Weekly (Section 10.4.2.3);
- Calibration verification check – Weekly (Section 10.4.2.1);
- Background measurement – Weekly (Section 10.4.2.5);
- Determination of efficiency/correction factor – Weekly (Section 10.4.2.6).
- Determination of instrument reliability factor – Initially after calibration (Section 10.4.1.1).

10.4.4 Beta Calibration

Periodic beta detector calibration checks should be performed using aged yellowcake (i.e., at least 4 months old). The calibration should be performed at the surface and at 2 cm (approximately one inch) from the surface of the yellowcake source.

Surface measurement (used if contacting yellowcake):

- Place the axis of the detector on the surface of the aged yellowcake source.
- Perform closed shield and open shield measurements and obtain the difference between the two measurements (this is the observed dose rate)

- Calculate the CF_{sur} using an actual surface dose rate of 150 mrem/hr (from NRC Regulatory Guide 8.30, Appendix C).

$$CF_{sur} = \frac{150 \text{ mrem/hr}}{\text{Observed dose rate (mR/hr)}}$$

- Multiply all surface beta survey responses by CF_{sur} to obtain actual dose rate

Two-centimeter measurement (used if yellowcake will not be directly contacted):

- Place the axis of the detector at 2 cm (approximately one inch) from the surface of the yellowcake
- Perform closed and open shield measurements and obtain the difference
- Calculate the CF_{2cm} using an actual dose rate at 2 cm of 75 mrem/hr (from NRC Regulatory Guide 8.30, Appendix C).

$$CF_{2cm} = \frac{75 \text{ mrem/hr}}{\text{Observed dose rate (mR/hr)}}$$

- Multiply all survey responses measured at 2 cm or greater from the source by this CF_{2cm} to obtain the actual dose rate.

10.5 Potential Detection Problems

In the course of performing instrument checks and reviewing records, the RSO or designee will be aware of the following observations that may indicate a detection problem:

- Background drift in a continuous direction, either up or down;
- Alpha background rates greater than 1.0 cpm;
- A calculated LLD that is greater than 50 percent of the appropriate regulatory limit;
- A ratemeter instrument that does not zero;
- A battery check that does not respond;
- Reliability factors greater than 1.40 or less than 0.50;
- A daily response source check that does not fall within ± 20 percent of the calculated mean.

If any of the potential problems listed above are noted, the RSO or designee will remove the instrument from service and investigate until the source of the problem can be determined and corrected.

10.6 Air Sampler Calibration

Calibration of field flow rate measurement instruments (typically rotameters) is performed by comparing the flow rate measured by the field instrument with the flow rate measured by a primary standard instrument or a properly calibrated secondary standard instrument. Primary measurements generally involve a direct measurement of the volume based on the physical dimensions of an enclosed space, such as a "frictionless" piston meter (i.e., soap film flowmeter or dry cell calibrator). Secondary standards are reference instruments or meters that trace their calibration to a primary standard, such as a mass flow meter.

Calibration should be performed semiannually as recommended in Regulatory Guide 8.30 or at the manufacturer's recommended frequency, whichever is shorter. Calibration should be performed with air filters in place to properly account for the reduction in flow due to solid material deposited on the filter.

The following instructions apply to the use of the specified calibration technique for any type of sampler. Volumes and flow rates will vary depending on the type of sampler, ranging from low flow rates for lapel samplers to high flow rates for high volume area samplers.

10.6.1 Calibration Using the Soap Film Technique

The soap film technique involves using a graduated buret and a soap solution to measure the volume of air drawn through the buret during a measured time. The pump is started and connected to the buret, which is then dipped into a soap solution to form a bubble. The bubble will move along the buret. The time that it takes the bubble to move between volume graduations is measured, resulting in an indicated flow rate that is corrected to liters per minute (LPM). This measurement is then compared to the volume indicated by the air meter on the sampler. The comparison results in a correction between the indicated and the actual flow rate.

- Turn the pump to be calibrated on and run it for at least five minutes before calibration.

- Materials required: Appropriate size graduated buret (bubble tube), soap solution, filter holder, filters, and stopwatch.
- Rinse the buret with soap solution to wet the surfaces.
- Install an in-line filter holder between the buret and the pump.
- Use an appropriate filter for the type of sampler to be calibrated.
- With the pump on and attached to the filter and buret, dip the base of the buret into the soap solution until a bubble forms in the buret. Allow several individual bubbles to reach the top of the bubble tube before beginning the calibration to assure that the glass is sufficiently lubricated.
- Using a stopwatch, measure and record the time it takes the bubble to travel a specified volume in the buret. Lapel samplers are generally calibrated based on the time it takes the bubble to move 1 L. Perform this operation at least three times.
- Adjust the pump to move the desired volume of air per minute Do not adjust the rotometer after calibration. Adjustment of the rotometer during normal use will require the pump to be re-calibrated.
- Document each calibration on the bubble tube calibration log including the flow setting, date the calibration was performed and initials of the person performing the calibration.

10.6.2 Calibration Using a Dry Cell Calibrator

A dry cell calibrator is a primary air flow calibrator that is a variation on the wet cell technique. The calibrator consists of a flow cell using a near-frictionless piston to measure the volume of air pumped. The flow cell is made of dimensionally stable borosilicate glass with a sensing encoder. The cell dimensions and crystal timing device are NIST traceable which allows use of the unit as a primary standard. Depending on the design flow rates, these units may be used for low and high flow samplers.

- Turn the pump to be calibrated on and run it for at least five minutes before calibration.

- Connect the calibrator to the sampling pump with the provided hose and a filter holder containing the correct filter.

- Turn the dry cell calibrator on and complete the startup sequence specified in the operating manual.

- After the sampler flow rate has stabilized, begin recording flow readings. The dry cell calibrator is programmed to take ten consecutive readings to determine an average flow rate.
- Adjust the pump to move the desired volume of air per minute (e.g., 2 LPM for lapel samplers and 55 LPM for RAS samplers). Do not adjust the rotometer after calibration. Adjustment of the rotometer during the survey will require the pump to be re-calibrated.

- Document each calibration and label the RAS air pumps with volume setting, date the calibration was performed and initials of the person performing the calibration. Since the lapel samplers are calibrated daily a calibration label is not applied to the pump.

10.6.3 Calibration Using a Linear Mass Flow Meter

Linear mass flow meters may be used to calibrate sampling pumps. The linear mass flow meter measures the differential temperature of a gas drawn through a heated capillary tube and is considered a secondary standard.

- Assemble the mass transducer in-line downstream of the filter element.

- Connect the vacuum gauge and install a clean filter in the filter holder.

- Connect the transducer to the flow meter with the patch cord supplied.

- Check the wiring, then plug the meter into a 110 VAC outlet and turn the meter ON. Allow 20 to 30 minutes to warm up to operating temperature.

- Zero the flow meter readout.

- Turn the sampler pump on and allow five minutes to warm up.

- Adjust the flow as indicated by the rotometer to the values given on the air sampling pump calibration data sheet. At each flow setting, record the flow indicated by the digital mass flow meter and the reading on the vacuum gauge.

- Complete the information and calculations on the calibration data sheet.

- Remove the Mass Transducer and vacuum gauge and reconnect the filter.

- Set the rotometer to the appropriate setting for normal use. The mass flow meter reading is the value of the actual flow rate in standard liters per minute (SLPM) with the rotometer set at the appropriate setting. Enter this value on the air sampling pump calibration data sheet.

- Remove the vacuum gauge.

10.6.4 Adjustment for Pressure and Temperature

Many variables affect the accuracy of air sampling measurements. Two of these are temperature and pressure variations. USNRC Regulatory Guide 8.25 states that corrections to the measured flow rate should be made if there are differences exceeding five percent in either the absolute pressure or absolute temperature between the calibration situation and the sampling situation.

Differences in the absolute pressure are common when calibration is performed at a different altitude (and thus a different air pressure) than that at which the instrument will be used. An example of this would be the calibration of a secondary standard at sea level and then use to calibrate rotameters at a higher elevation. Differences in pressure may be evaluated by comparing the barometric pressure readings at the calibration location with those at the sampling location.

Similarly, differences in temperature between the calibration location and the sample location will adversely affect accuracy of flow meters. Since calibrations are generally made at room temperature (i.e., approximately 72°F), corrections should be made to account for sampling conditions if the ambient temperature is expected to exceed the five percent limit. Based on absolute temperature, five percent of a calibration temperature of 72°F would correspond to an ambient temperature less than 45°F and greater than 98°F.

The following equation should be used to adjust sample volume to calibration conditions:

$$V_c = V_s\left(\frac{P_s}{P_c}\right)\left(\frac{T_c}{T_s}\right)$$

Where: Vc = Volume under calibration conditions (m^3)
Vs = Volume under field sampling conditions (m^3)
Pc = Absolute pressure during calibration (mm Hg)
Ps = Absolute pressure during sampling (mm Hg)
Tc = Absolute temperature during calibration (°K)
Ts = Absolute temperature during sampling (°K)

and °K = °C + 273 or
°K = [(°F – 32)/1.8] + 273

mm Hg = in. of water x 1.87

10.7 Sample Analysis Procedures

10.7.1 Analyzing Area Airborne Uranium Samples

Uranium airborne particulate samples are determined by counting alpha emissions using a scaler ratemeter or equivalent. The scaler is used with an alpha detector such as a Ludlum 43-10, Ludlum 218, Eberline SAC-R5, or equivalent. Some detectors, such as the Eberline SAC-R5, require the use of scintillation paper to detect alpha activity. The following general instructions apply regardless of the type of detector used. The analyst should review the specific manufacturer's instruction manual to ensure familiarity with the detector operating requirements.

NOTE: Samples must age for 24 to 48 hours after sampling to allow decay of short-lived radionuclides.

- Ensure the counting instrument is properly calibrated and checked.
- Before counting filter sample, make sure zinc sulfide paper (if necessary) is clean.
- Count the background for the sample count time determined by the RSO as necessary to meet LLD requirements.

- Divide the net background counts by the count time and record background cpm on the sampling form.
- Place the sample filter in the detector.
- Count the sample for the sample count time determined by the RSO as necessary to meet LLD requirements. Record the net counts on the sampling form.
- Divide the net counts by the count time and record the sample cpm on the sampling form.
- Subtract the background cpm from the sample cpm and record the result on the sampling form.
- Calculate uranium activity in μCi/ml as follows:

$$\mu\text{Ci/ml Uranium} = \frac{(\text{cpm}_S - \text{cpm}_B)(4.5\text{E}^{-7}\ \mu\text{Ci/dpm})}{(\text{E})(\text{V})}$$

Where:	cpm_S	=	Sample count rate
	cpm_B	=	Background count rate
	E	=	Instrument efficiency (cpm/dpm)
	V	=	Sample volume (ml)

- Record the calculated activity on the sampling form.

NOTE: *If glass fiber filters are used, filter self-absorption must be considered (see Section 10.7.5.*

10.7.2 Analyzing Breathing Zone Samples

Because breathing zone samples are typically collected over relatively short durations (i.e., less than a full work shift) it is necessary to utilize longer count times for both background and the sample in order to achieve the desired LLD. It should be noted that Regulatory Guide 8.25 recognizes that breathing zone samples may not be able to detect 10% of the appropriate DAC but that such samples are still acceptable for measuring potential uranium exposure to workers. Breathing zone samples are counted in accordance with Section 10.7.1 above, with the following additions:

- Ensure that the instrument background is as low as possible by cleaning the instrument before counting the sample.

- Both background and sample count times should of an adequate duration to achieve the LLD. Count times for breathing zone samples may be one hour instead of the typical shorter durations for higher volume samples.

10.7.3 Radon Daughter Counting Procedure (Modified Kusnetz)

Radon daughter samples are analyzed using the modified Kusnetz method. Samples are collected on fiberglass or membrane filters using a lapel sampler or equivalent pump pulling a minimum of 2 liters per minute. Samples are collected for exactly five minutes, resulting in a 10 liter sample.

The sample filter is allowed to decay between 40 and 90 minutes after the end of collection before counting.. After 40 minutes, only alpha particles from the decay of Po-214 are counted because virtually all of the Po-218 (3.05 minute half-life) has decayed.

The sample is counted with a scaler rate meter and an alpha scintillation detector at a count time determined by the RSO as adequate to meet the LLD requirements of 0.03 WL. The resulting gross counts are divided by the count time to arrive at a count rate (cpm).

Working levels are derived by dividing the count rate, minus background, by the product of the counter efficiency, the volume of air sampled, and the time factor. Calculation is according to the following formula:

$$\text{Working Level (WL)} = \frac{\text{Sample cpm - background cpm}}{(\text{Eff})\,(\text{Vol})\,(\text{TF})}$$

where:

cpm	=	Counts per minute (Sample – background)
Eff	=	Instrument counting efficiency
Vol	=	Total air volume pumped through filter (flow rate in liters x sample time in minutes)
TF	=	Time factor

The time factor (TF) is dependent on the time elapsed between end of sampling and the beginning of counting. These time factors are determined as shown in the following table and should be based on the midpoint of the elapsed time between sample collection and the time in counting. The time factor is based on the assumption that equilibrium existed between Po-218, Pb-214, and Bi-214 at the time of sampling. The time factor relates dpm per liter of air from 40 to 90 minutes after sampling to the decay activity that would be present from an initial concentration of 1 WL.

Modified Kusnetz Time Factors

Minutes	Factor	Minutes	Factor	Minutes	Factor
40	150	57	116	74	84
41	148	58	114	75	83
42	146	59	112	76	82
43	144	60	110	77	81
44	142	61	108	78	78
45	140	62	106	79	76
46	138	63	104	80	75
47	136	64	102	81	74
48	134	65	100	82	73
49	132	66	98	83	71
50	130	67	96	84	69
51	128	68	94	85	68
52	126	69	92	86	66
53	124	70	90	87	65
54	122	71	89	88	63
55	120	72	87	89	61
56	118	73	85	90	60

10.7.4 Analyzing Smear Samples

Smear samples are taken to quantify the amount of removable contamination present on a surface or object as described in Chapter 5. Following sample collection, smears are analyzed using a scaler rate meter and an alpha scintillation detector as follows.

- Ensure the counting instrument is properly calibrated and checked.
- Count for at least 1 minute on a laboratory scaler and alpha scintillation detector. Record the average counts per minute (cpm).
- Subtract the background count rate from the smear count rate (cpm). Convert the result from cpm to dpm (disintegrations per minute) by multiplying the net cpm of the smear results by the correction factor (1/Efficiency of the counting system).
- Properly record the survey results.

10.7.5 Filter Self Absorption Calculation

Regulatory Guide 8.25 requires that counting results be corrected for self-absorption of radiation by the filter collection media would reduce the count rate by more than 5 percent. The following comparison should be made as necessary as determined by the RSO. The self-absorption is determined using the following formula:

$$\% \text{ Self Absorption} = \frac{C_2 - C_3}{2C_1+C_2-C_3} \times 100$$

where: C_1 = cpm on front of filter
C_2 = cpm on back of filter
C_3 = cpm on front of filter covered by new filter of the same type

The three counts should be performed as quickly as possible at a count time of one minute. The calculated uranium activity must be adjusted if the filter self-absorption is determined to be greater than 5 percent. For example, if the calculated activity is 5.0 E^{-11} µCi/ml and the filter self-absorption is 15 percent, the actual activity is (5.0 E^{-11})(1.15) = 5.75E^{-11} µCi/ml.

10.8 Records

10.8.1 Calibration Records

The calibration vendor will provide a certificate of calibration for all instruments. These calibration certificates will be maintained by the RSO on file for that instrument. Records of repairs completed by the calibration vendor will also be maintained in the instrument file.

Documentation of calibration of air samplers performed on site will be maintained. This documentation will be maintained by the RSO in the sampler file.

10.8.2 Instrument Check Records

Records of instrument checks including all daily checks and initial checks will be maintained in a format determined by the RSO. These records will be readily available and in a format that will allow the RSO to review the records for the types of potential problems discussed in Section 10.5.

10.8.3 Record Retention

All records of instrument calibration and checks will be retained until NRC License termination. The RSO will be responsible for record retention.

07/10/09 07:08 AM
25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/10/09 07:08 AM
5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.993	4.993	01	4.341	4.341
4.994	4.994	02	4.345	4.343
4.995	4.994	03	4.345	4.344
5.004	4.997	04	4.352	4.346
4.999	4.997	05	4.348	4.346
4.994	4.997	06	4.345	4.346
4.992	4.996	07	4.341	4.345
4.997	4.996	08	4.345	4.345
4.999	4.996	09	4.348	4.346
5.000	4.997	10	4.348	4.346

07/10/09 07:08 AM
25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Granthom/Teahon

DATE 7/10/09

PUMP # AC-4

TASK Pond Pb-210 - Initial Deployment

07/10/09 07:13 AM
26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
002	5.002	01	4.341	4.341
997	5.000	02	4.337	4.339
4.990	4.996	03	4.333	4.337
4.995	4.996	04	4.337	4.337
4.994	4.996	05	4.337	4.337
4.992	4.995	06	4.333	4.336
4.994	4.995	07	4.337	4.336
4.989	4.994	08	4.333	4.336
4.998	4.995	09	4.341	4.337
4.993	4.994	10	4.333	4.336

07/10/09 07:14 AM
26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Rhonda Grantham/Larry Teahon

DATE 7/10/09

PUMP # AC-5

TASK Pond Pb-210 - Initial Deployment

26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/10/09 07:18 AM
26.5C 662mmHg

.. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/10/09 07:18 AM
26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.024	5.024	01	4.352	4.352
5.026	5.025	02	4.356	4.354
5.022	5.024	03	4.352	4.353
5.028	5.025	04	4.356	4.354
5.023	5.025	05	4.352	4.354
5.028	5.025	06	4.356	4.354
5.026	5.025	07	4.356	4.354
5.028	5.026	08	4.356	4.355
5.016	5.025	09	4.348	4.354
5.024	5.025	10	4.360	4.354

07/10/09 07:18 AM
26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME GRAntham/Teahan

DATE 7/10/09

PUMP # ~~AC-B~~ RD ~~A6~~ AC-6

TASK Pond Pb-210 - Initial Deployment

26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/10/09 07:22 AM

26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.036	5.036	01	4.364	4.364
5.048	5.042	02	4.376	4.370
5.039	5.041	03	4.368	4.369
5.041	5.041	04	4.368	4.369
5.038	5.040	05	4.368	4.369
5.033	5.039	06	4.360	4.367
5.035	5.039	07	4.364	4.367
5.037	5.038	08	4.364	4.367
5.037	5.038	09	4.364	4.366
5.031	5.038	10	4.360	4.366

07/10/09 07:22 AM

26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Grantham/Teahon

DATE 7/10/09

PUMP # AC-7

TASK Pond Pb-210 - Initial Deployment

24.5C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/16/09 07:35 AM

24.5C 665mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.713	4.713	01	4.129	4.129
4.711	4.712	02	4.129	4.129
4.708	4.711	03	4.125	4.128
4.704	4.709	04	4.121	4.126
4.701	4.707	05	4.121	4.125
4.699	4.706	06	4.117	4.124
4.698	4.705	07	4.117	4.123
4.696	4.704	08	4.117	4.122
4.698	4.703	09	4.117	4.122
4.693	4.702	10	4.113	4.121

07/16/09 07:35 AM

24.5C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 7-16-09

PUMP # SKC - A

Radon Daughter Samples

TASK Pond Radon Test week #1

25.5C 664mmHg
Vol. Flow Vol. Average # Samples Std. Flow Std. Average
===
07/16/09 02:18 PM
25.5C 664mmHg
Vol. Flow Vol. Average # Samples Std. Flow Std. Average
===
07/16/09 02:18 PM
25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.963	4.963	01	4.329	4.329
4.963	4.963	02	4.337	4.333
4.960	4.962	03	4.325	4.330
4.964	4.963	04	4.329	4.330
4.986	4.967	05	4.348	4.334
4.996	4.972	06	4.356	4.337
5.008	4.977	07	4.368	4.342
5.021	4.983	08	4.380	4.347
5.046	4.990	09	4.399	4.352
5.049	4.996	10	4.411	4.358

07/16/09 02:19 PM
25.5C 664mmHg
Vol. Flow Vol. Average # Samples Std. Flow Std. Average
===

NAME Tyrell

DATE 7-16-09

PUMP # AC-4

TASK Pond radon test. Week #1

```
 23.5C    665mmHg
 Vol. Flow    Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
07/16/09        02:09 PM
 2ʌ OC    665mmHg
 '  . Flow    Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
07/16/09        02:09 PM
 24.0C    665mmHg
 Vol. Flow    Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
  4.983          4.983          01         4.376          4.376
  4.985          4.984          02         4.376          4.376
  4.986          4.985          03         4.376          4.376
  4.985          4.985          04         4.376          4.376
  4.984          4.985          05         4.376          4.376
  4.988          4.985          06         4.380          4.377
  5.028          4.991          07         4.415          4.382
  5.055          4.999          08         4.439          4.389
  5.054          5.005          09         4.439          4.395
  5.040          5.009          10         4.423          4.398
07/16/09        02:09 PM
 24.0C    665mmHg
 Vol. Flow    Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
```

NAME Tyree

DATE 7-16-09

PUMP # AC-5

TASK Pond Radon pump walk #1

25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/16/09 02:21 PM

25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/16/09 02:21 PM

25.5C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.024	5.024	01	4.384	4.384
5.021	5.023	02	4.380	4.382
5.022	5.022	03	4.380	4.381
5.020	5.022	04	4.384	4.382
5.023	5.022	05	4.380	4.382
5.019	5.022	06	4.376	4.381
5.019	5.021	07	4.376	4.380
5.028	5.022	08	4.392	4.382
5.018	5.022	09	4.376	4.381
5.016	5.021	10	4.376	4.380

07/16/09 02:21 PM

25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyra

DATE 7-16-09

PUMP # AC-6

TASK Pond radon test wek #1

25.0C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/16/09 02:13 PM
25.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.039	5.039	01	4.407	4.407
5.037	5.038	02	4.399	4.403
5.041	5.039	03	4.411	4.406
5.037	5.039	04	4.399	4.404
4.992	5.029	05	4.360	4.395
4.970	5.019	06	4.341	4.386
4.951	5.010	07	4.325	4.377
4.950	5.002	08	4.325	4.371
4.943	4.996	09	4.317	4.365
4.972	4.993	10	4.345	4.363

07/16/09 02:13 PM
25.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 7-16-09

PUMP # AC-7

TASK Pond Radon test week #1

24.5C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/23/09 07:06 AM

24.5C 660mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/23/09 07:06 AM

24.5C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.693	4.693	01	4.082	4.082
4.690	4.692	02	4.078	4.080
4.681	4.688	03	4.070	4.077
4.674	4.685	04	4.066	4.074
4.679	4.683	05	4.070	4.073
4.676	4.682	06	4.066	4.072
4.672	4.681	07	4.062	4.071
4.671	4.680	08	4.062	4.070
4.673	4.679	09	4.066	4.069
4.674	4.678	10	4.066	4.069

07/23/09 07:06 AM

24.5C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyrell

DATE 7.23.09

PUMP # SKC - A

Radon Daughter Samples

TASK Pond Radon test week 2

25.0C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/23/09 11:28 AM

25.0C 660mmHg

Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.961	4.961	01	4.309	4.309
4.971	4.966	02	4.317	4.313
4.983	4.972	03	4.329	4.318
5.007	4.981	04	4.348	4.326
5.002	4.985	05	4.345	4.330
5.001	4.988	06	4.345	4.332
4.997	4.989	07	4.341	4.333
4.999	4.990	08	4.341	4.334
5.012	4.993	09	4.345	4.336
5.030	4.996	10	4.360	4.338

07/23/09 11:28 AM

25.0C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyree

DATE 7-23-09

PUMP # AC-4

TASK Pond Radon test week #2

25.5C   660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/23/09   11:45 AM
25.5C   660mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
.035	5.035	01	4.364	4.364
5.012	5.024	02	4.345	4.355
5.016	5.021	03	4.348	4.352
4.989	5.013	04	4.325	4.346
5.001	5.011	05	4.337	4.344
5.008	5.010	06	4.341	4.343
5.008	5.010	07	4.341	4.343
5.018	5.011	08	4.352	4.344
5.013	5.011	09	4.345	4.344
5.018	5.012	10	4.352	4.345

07/23/09   11:45 AM
25.5C   660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyrell

DATE 7-23-09

PUMP # AC-5

TASK Pond Radon test week #2

23.5C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/23/09 11:13 AM

23.5C 660mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.010	5.010	01	4.372	4.372
5.014	5.012	02	4.376	4.374
5.009	5.011	03	4.372	4.373
5.000	5.008	04	4.364	4.371
5.003	5.007	05	4.368	4.370
4.999	5.006	06	4.364	4.369
5.003	5.005	07	4.368	4.369
5.010	5.006	08	4.372	4.370
5.010	5.007	09	4.372	4.370
5.009	5.007	10	4.372	4.370

07/23/09 11:14 AM

23.5C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyrol

DATE 7-23-09

PUMP # AC-6

TASK Pond Radon test week #2

26.0C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/23/09 11:40 AM

26.0C 660mmHg

[illegible]. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
[illegible]024	5.024	01	4.356	4.356
5.030	5.027	02	4.352	4.354
5.011	5.022	03	4.337	4.348
5.010	5.019	04	4.337	4.346
4.989	5.013	05	4.317	4.340
5.003	5.011	06	4.329	4.338
5.001	5.010	07	4.329	4.337
5.007	5.009	08	4.333	4.336
5.008	5.009	09	4.333	4.336
5.004	5.009	10	4.333	4.336

07/23/09 11:40 AM

25.5C 660mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyree

DATE 7-23-09

PUMP # AC-7

TASK Pond Radon test week 2

24.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/30/09 07:02 AM
24.5C 663mmHg

.. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/30/09 07:03 AM
24.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.713	4.713	01	4.117	4.117
4.708	4.711	02	4.113	4.115
4.701	4.707	03	4.109	4.113
4.696	4.705	04	4.105	4.111
4.698	4.703	05	4.105	4.110
4.693	4.702	06	4.101	4.108
4.691	4.700	07	4.098	4.107
4.696	4.700	08	4.105	4.107
4.689	4.698	09	4.098	4.106
4.684	4.697	10	4.094	4.105

07/30/09 07:03 AM
24.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrcl

DATE 7-30-09

PUMP # SKC-A

TASK WA9 / Pond Radon test

26.5C 662mmHg

Vol. Flow Vol. Average # Samples Std. Flow Std. Average

07/30/09 11:22 AM

26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.035	5.035	01	4.372	4.372
5.043	5.039	02	4.376	4.374
5.019	5.032	03	4.356	4.368
5.018	5.029	04	4.356	4.365
4.994	5.022	05	4.337	4.359
5.009	5.020	06	4.348	4.358
4.995	5.016	07	4.337	4.355
4.994	5.013	08	4.337	4.352
4.992	5.011	09	4.325	4.349
4.992	5.009	10	4.333	4.348

07/30/09 11:22 AM

26.5C 663mmHg

Vol. Flow Vol. Average # Samples Std. Flow Std. Average

NAME Tyrac(?)

DATE 7-30-09

PUMP # AC-4

TASK Pond Radon test week #3

26.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/30/09 11:25 AM

2ᶠ 0C 663mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.011	5.011	01	4.348	4.348
5.011	5.011	02	4.348	4.348
5.009	5.010	03	4.348	4.348
5.010	5.010	04	4.348	4.348
5.018	5.012	05	4.356	4.350
5.009	5.011	06	4.348	4.349
4.981	5.007	07	4.329	4.346
4.983	5.004	08	4.325	4.344
4.989	5.002	09	4.329	4.342
4.989	5.001	10	4.329	4.341

07/30/09 11:25 AM

26.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 7-30-09

PUMP # AC-5

TASK Pond Radon test week #3

26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/30/09 11:19 AM

26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

07/30/09 11:19 AM

26.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.041	5.041	01	4.384	4.384
5.037	5.039	02	4.380	4.382
5.011	5.030	03	4.356	4.373
5.006	5.024	04	4.352	4.368
5.013	5.022	05	4.360	4.366
4.988	5.016	06	4.329	4.360
4.989	5.012	07	4.337	4.357
4.995	5.010	08	4.337	4.354
5.007	5.010	09	4.348	4.354
5.019	5.011	10	4.364	4.355

07/30/09 11:20 AM

26.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrad

DATE 7-30-09

PUMP # AC-6

TASK Pond Radon test week #3

[illegible]

26.0C 662mmHg

Vol. Flow Vol. Average # Samples Std. Flow Std. Average

==

07/30/09 11:12 AM

2[illegible] OC 663mmHg

[illegible]. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.039	5.039	01	4.376	4.376
5.045	5.042	02	4.388	4.382
5.021	5.035	03	4.364	4.376
5.023	5.032	04	4.368	4.374
5.007	5.027	05	4.352	4.370
5.000	5.023	06	4.348	4.366
5.002	5.020	07	4.348	4.363
4.975	5.014	08	4.325	4.359
4.970	5.009	09	4.321	4.355
4.979	5.006	10	4.321	4.351

07/30/09 11:12 AM

26.0C 663mmHg

Vol. Flow Vol. Average # Samples Std. Flow Std. Average

==

NAME Tyrell

DATE 7-30-09

PUMP # AC-7

TASK Pond Radon test week #3

24.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.957	4.957	01	35.569	35.57

08/06/09 09:27 AM
0C 659mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.999	4.999	01	35.860	35.86
5.004	5.002	02	35.892	35.88
4.998	5.000	03	35.795	35.85
5.002	5.001	04	35.828	35.84
4.996	5.000	05	35.795	35.83
5.002	5.000	06	35.892	35.84
4.995	4.999	07	35.795	35.84
5.010	5.001	08	35.892	35.84
5.005	5.001	09	35.925	35.85
4.998	5.001	10	35.795	35.85

08/06/09 09:28 AM
24.0C 659mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrau

DATE 8-6-09

PUMP # AC-2

TASK Pond radon test week 4

25.0C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.995	4.995	01	35.666	35.67

08/06/09 01:48 PM
. 0C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.992	4.992	01	35.601	35.60
5.012	5.002	02	35.731	35.67
5.015	5.006	03	35.763	35.70
4.990	5.002	04	35.569	35.67
4.992	5.000	05	35.601	35.65
4.992	4.999	06	35.601	35.64
5.006	5.000	07	35.698	35.65
5.014	5.002	08	35.795	35.67
4.985	5.000	09	35.601	35.66
4.985	4.998	10	35.601	35.66

08/06/09 01:49 PM
25.0C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-6-09

PUMP # AC-4

TASK Pond Radon test week #4

25.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.972	4.972	01	35.375	35.38

08/06/09 01:54 PM

5C 657mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.970	4.970	01	35.440	35.44
4.989	4.980	02	35.504	35.47
5.001	4.987	03	35.601	35.52
5.010	4.993	04	35.666	35.55
5.017	4.997	05	35.698	35.58
5.015	5.000	06	35.698	35.60
5.011	5.002	07	35.666	35.61
4.986	5.000	08	35.472	35.59
4.987	4.999	09	35.537	35.59
5.017	5.000	10	35.698	35.60

08/06/09 01:54 PM

25.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-6-09

PUMP # AC-5

TASK Pond Radon test week #4

25.0C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
3.901	3.901	01	27.809	27.81

08/06/09 01:51 PM
.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.964	4.964	01	35.375	35.38
4.980	4.972	02	35.504	35.44
5.006	4.983	03	35.698	35.53
5.005	4.989	04	35.666	35.56
5.010	4.993	05	35.731	35.59
5.007	4.995	06	35.763	35.62
5.027	5.000	07	35.828	35.65
5.033	5.004	08	35.925	35.69
5.004	5.004	09	35.666	35.68
4.979	5.002	10	35.537	35.67

08/06/09 01:52 PM
25.0C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrer

DATE 8-6-09

PUMP # AC-7

TASK Pond Radon test week #4

24.0C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.009	5.009	01	35.828	35.83

08/06/09 01:46 PM
2[illegible]5C 658mmHg

V[illegible] Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.004	5.004	01	35.795	35.80
5.015	5.010	02	35.860	35.83
5.012	5.010	03	35.860	35.84
4.990	5.005	04	35.698	35.80
4.991	5.002	05	35.698	35.78
4.980	4.999	06	35.569	35.75
4.987	4.997	07	35.601	35.73
5.009	4.999	08	35.763	35.73
5.011	5.000	09	35.828	35.74
5.005	5.000	10	35.731	35.74

08/06/09 01:47 PM
24.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-6-2009

PUMP # AC-6

TASK Pond test Radon week #4

24.0C 659mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.951	4.951	01	35.537	35.54

08/13/09 07:20 AM
0C 659mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.963	4.963	01	35.601	35.60
4.956	4.960	02	35.569	35.59
4.950	4.956	03	35.504	35.56
4.947	4.954	04	35.504	35.54
4.947	4.953	05	35.504	35.54
4.947	4.952	06	35.504	35.53
4.959	4.953	07	35.569	35.54
4.952	4.953	08	35.472	35.53
4.946	4.952	09	35.440	35.52
4.948	4.952	10	35.440	35.51

08/13/09 07:21 AM
24.5C 659mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-13-2009

PUMP # AC-2

TASK Pond Radon test week #5

25.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.007	5.007	01	35.763	35.76

08/13/09 01:19 PM

.0C 658mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.012	5.012	01	35.795	35.80
4.983	4.998	02	35.569	35.68
4.985	4.993	03	35.601	35.66
5.001	4.995	04	35.698	35.67
5.007	4.998	05	35.763	35.69
5.003	4.999	06	35.731	35.69
5.012	5.000	07	35.795	35.71
5.012	5.002	08	35.795	35.72
4.979	4.999	09	35.537	35.70
4.983	4.998	10	35.569	35.69

08/13/09 01:20 PM

25.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrell

DATE 8-13-09

PUMP # AC-4

TASK Pond radon test week 5

25.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.014	5.014	01	35.731	35.73

08/13/09 01:24 PM

5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.016	5.016	01	35.763	35.76
4.989	5.003	02	35.569	35.67
4.997	5.001	03	35.634	35.66
4.989	4.998	04	35.569	35.63
5.016	5.001	05	35.698	35.65
5.013	5.003	06	35.731	35.66
4.987	5.001	07	35.537	35.64
4.989	5.000	08	35.569	35.63
4.989	4.998	09	35.569	35.63
4.990	4.998	10	35.569	35.62

08/13/09 01:24 PM

25.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-13-09

PUMP # AC-5

TASK Pond Radon test week #5

24.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
3.632	3.632	01	25.965	25.97

08/13/09 01:14 PM

[illegible]0C 658mmHg

[illegible]. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.963	4.963	01	35.440	35.44
4.960	4.962	02	35.407	35.42
4.962	4.962	03	35.472	35.44
4.976	4.965	04	35.537	35.46
4.975	4.967	05	35.537	35.48
5.002	4.973	06	35.698	35.52
5.002	4.977	07	35.698	35.54
4.998	4.980	08	35.698	35.56
5.001	4.982	09	35.698	35.58
5.006	4.985	10	35.731	35.59

08/13/09 01:14 PM

25.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrаа

DATE 8-13-09

PUMP # AC-6

TASK Pond radon test week 5

25.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.974	4.974	01	35.504	35.50

08/13/09 01:21 PM

' 0C 658mmHg

V... Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.977	4.977	01	35.537	35.54
5.001	4.989	02	35.698	35.62
4.999	4.992	03	35.634	35.62
5.000	4.994	04	35.634	35.63
4.995	4.994	05	35.601	35.62
4.995	4.995	06	35.666	35.63
4.993	4.994	07	35.601	35.62
5.030	4.999	08	35.860	35.65
5.023	5.002	09	35.860	35.68
5.001	5.001	10	35.634	35.67

08/13/09 01:22 PM

25.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-13-09

PUMP # AC-7

TASK Pond Radon test week #5

25.5C   662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.981	4.981	01	35.731	35.73

08/20/09   07:11 AM
5C   662mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.976	4.976	01	35.634	35.63
4.995	4.986	02	35.828	35.73
4.990	4.987	03	35.731	35.73
4.986	4.987	04	35.763	35.74
4.987	4.987	05	35.763	35.74
5.010	4.991	06	35.925	35.77
5.017	4.994	07	35.989	35.80
5.012	4.997	08	35.957	35.82
5.012	4.998	09	35.892	35.83
5.010	5.000	10	35.860	35.83

)8/20/09   07:12 AM
25.5C   662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 8-20-09

PUMP # AC-2

TASK Pond radon test week #6

26.5C 661mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.048	5.048	01	36.086	36.09

08/20/09 01:26 PM
5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.040	5.040	01	35.957	35.96
5.022	5.031	02	35.828	35.89
4.991	5.018	03	35.666	35.82
4.998	5.013	04	35.731	35.80
4.990	5.008	05	35.601	35.76
4.971	5.002	06	35.537	35.72
4.965	4.997	07	35.440	35.68
4.995	4.997	08	35.698	35.68
4.989	4.996	09	35.666	35.68
4.986	4.995	10	35.569	35.67

08/20/09 01:26 PM
26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyrue

DATE 8-20-09

PUMP # AC-4

TASK Pond Radon test week #6

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.016	5.016	01	36.022	36.02

08/20/09 01:19 PM

.0C 662mmHg

l. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.012	5.012	01	35.989	35.99
5.010	5.011	02	35.989	35.99
4.986	5.003	03	35.828	35.94
4.984	4.998	04	35.795	35.90
5.006	5.000	05	35.957	35.91
5.011	5.002	06	35.925	35.91
4.984	4.999	07	35.731	35.89
4.997	4.999	08	35.828	35.88
5.009	5.000	09	35.989	35.89
5.002	5.000	10	35.828	35.89

08/20/09 01:19 PM

25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyree

DATE 8-20-09

PUMP # AC-5

TASK Pond radon test week #6

26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.037	5.037	01	36.054	36.05

08/20/09 01:29 PM

´ 0C 662mmHg

. ı. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.034	5.034	01	36.054	36.05
5.015	5.025	02	35.892	35.97
5.014	5.021	03	35.892	35.95
4.984	5.012	04	35.666	35.88
4.996	5.009	05	35.698	35.84
4.993	5.006	06	35.731	35.82
4.993	5.004	07	35.698	35.80
4.968	5.000	08	35.504	35.77
4.965	4.996	09	35.472	35.73
4.971	4.993	10	35.537	35.71

08/20/09 01:30 PM

26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Daman Tyrell

DATE 8-20-09

PUMP # AC-6

TASK Pond Radon test week #6

24.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.434	4.434	01	32.012	32.01

08/27/09 07:13 AM
5C 664mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.655	4.655	01	33.597	33.60
4.652	4.654	02	33.564	33.58
4.647	4.651	03	33.532	33.56
4.644	4.650	04	33.532	33.56
4.643	4.648	05	33.500	33.55
4.642	4.647	06	33.500	33.54
4.641	4.646	07	33.500	33.53
4.638	4.645	08	33.467	33.52
4.634	4.644	09	33.435	33.51
4.632	4.643	10	33.435	33.51

08/27/09 07:13 AM
24.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 8/27/09

PUMP # SKC-A

TASK Pond Radon WH9

08/27/09 01:23 PM
25.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.003	5.003	01	35.989	35.99

0f [illegible]/09 01:23 PM
2[illegible].0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.005	5.005	01	35.989	35.99
4.995	5.000	02	35.925	35.96
5.005	5.002	03	35.957	35.96
4.999	5.001	04	35.892	35.94
5.052	5.011	05	36.345	36.02
5.049	5.018	06	36.313	36.07
5.056	5.023	07	36.313	36.10
5.029	5.024	08	36.183	36.11
5.010	5.022	09	36.022	36.10
4.993	5.019	10	35.925	36.09

08/27/09 01:24 PM
25.5C 664mmHg

NAME T. Dyer

DATE 8/27/09

PUMP # AC-4

TASK Pond radon test #7

08/27/09 01:26 PM
25.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.948	4.948	01	35.666	35.67

08/27/09 01:26 PM
25.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.950	4.950	01	35.601	35.60
5.016	4.983	02	36.022	35.81
5.056	5.007	03	36.377	36.00
5.050	5.018	04	36.313	36.08
5.045	5.023	05	36.248	36.11
5.028	5.024	06	36.151	36.12
5.002	5.021	07	35.989	36.10
5.003	5.019	08	35.989	36.09
5.001	5.017	09	35.957	36.07
4.996	5.015	10	35.925	36.06

08/27/09 01:27 PM
25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 8/27/09

PUMP # AC-5

TASK Pond radon test #1

```
08/27/09          01:28 PM
 25.5C    664mmHg
 Vol. Flow     Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
  4.950          4.950           01         35.537         35.54
0f  `7/09          01:28 PM
 2 .5C    663mmHg
 Vol. Flow     Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
  4.990          4.990           01         35.892         35.89
  5.011          5.001           02         36.054         35.97
  5.018          5.006           03         36.022         35.99
  5.012          5.008           04         36.054         36.01
  5.018          5.010           05         36.054         36.02
  5.017          5.011           06         36.022         36.02
  5.010          5.011           07         35.989         36.01
  5.015          5.011           08         36.022         36.01
  5.014          5.012           09         36.022         36.01
  5.022          5.013           10         36.119         36.03
08/27/09          01:28 PM
 25.5C    664mmHg
 Vol. Flow     Vol. Average   # Samples   Std. Flow   Std. Average
=================================================================
```

NAME T. Dyer

DATE 8/27/09

PUMP # AC-6

TASK Pond radon test #7

08/27/09 01:34 PM
26.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.955	4.955	01	35.569	35.57

08/27/09 01:35 PM
[illegible]C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.962	4.962	01	35.569	35.57
4.978	4.970	02	35.634	35.60
5.021	4.987	03	35.925	35.71
5.023	4.996	04	35.957	35.77
5.028	5.002	05	35.989	35.81
4.994	5.001	06	35.795	35.81
4.972	4.997	07	35.634	35.79
5.024	5.000	08	36.086	35.82
5.026	5.003	09	35.989	35.84
5.026	5.005	10	35.989	35.86

08/27/09 01:35 PM
26.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 8/27/09

PUMP # AC-7

TASK Pond radon test #7

24.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.990	4.990	01	36.022	36.02

0^ '03/09 11:45 AM

.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.992	4.992	01	36.022	36.02
4.987	4.990	02	35.989	36.01
5.005	4.995	03	36.119	36.04
5.007	4.998	04	36.151	36.07
5.015	5.001	05	36.216	36.10
4.992	5.000	06	35.989	36.08
4.992	4.999	07	36.022	36.07
4.989	4.997	08	35.957	36.06
5.002	4.998	09	36.054	36.06
5.015	5.000	10	36.151	36.07

09/03/09 11:45 AM

24.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyrell

DATE 9-3-09

PUMP # AC-2

TASK Pond Radon test.

26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.024	5.024	01	35.957	35.96

09/03/09 01:54 PM
[illegible].0C 663mmHg

[illegible]. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.027	5.027	01	35.989	35.99
5.026	5.027	02	35.989	35.99
5.023	5.025	03	35.957	35.98
5.025	5.025	04	35.989	35.98
5.025	5.025	05	35.989	35.98
5.031	5.026	06	36.022	35.99
5.022	5.026	07	35.957	35.98
5.023	5.025	08	35.957	35.98
5.021	5.025	09	35.957	35.98
5.021	5.024	10	35.957	35.98

09/03/09 01:55 PM
26.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 9/3/09

PUMP # RC-4

TASK Pond Radon test #8

26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.029	5.029	01	35.989	35.99

09/03/09 01:53 PM
0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

09/03/09 01:53 PM
26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.030	5.030	01	36.022	36.02
5.028	5.029	02	35.989	36.01
5.032	5.030	03	36.022	36.01
5.029	5.030	04	35.989	36.01
5.031	5.030	05	36.022	36.01
5.022	5.029	06	35.957	36.00
5.028	5.029	07	35.989	36.00
5.028	5.029	08	35.989	36.00
5.022	5.028	09	35.957	35.99
5.030	5.028	10	36.022	36.00

09/03/09 01:53 PM
26.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 9/3/09

PUMP # AC-5

TASK Pond Radon test # 8

25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.043	5.043	01	36.151	36.15

09/03/09 01:49 PM

.5C 662mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.050	5.050	01	36.216	36.22
5.050	5.050	02	36.216	36.22
5.051	5.050	03	36.280	36.24
5.045	5.049	04	36.183	36.22
5.023	5.044	05	36.022	36.18
5.026	5.041	06	36.054	36.16
5.024	5.038	07	36.022	36.14
5.024	5.037	08	36.086	36.13
5.032	5.036	09	36.086	36.13
5.022	5.035	10	36.022	36.12

09/03/09 01:49 PM

25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 9/3/09

PUMP # AC-6

TASK Pond radon test # 8

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.021	5.021	01	36.022	36.02

09/03/09 01:44 PM

: 5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.017	5.017	01	35.989	35.99
5.021	5.019	02	36.022	36.01
5.005	5.014	03	35.892	35.97
5.012	5.014	04	35.957	35.97
5.016	5.014	05	35.957	35.96
5.010	5.014	06	35.925	35.96
5.012	5.013	07	35.989	35.96
5.012	5.013	08	35.957	35.96
5.008	5.013	09	35.925	35.96
5.013	5.013	10	35.957	35.96

09/03/09 01:44 PM

25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME T. Dyer

DATE 9/3/09

PUMP # AC-7

TASK Pond Radon test # 8

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.075	5.075	01	36.507	36.51

09/10/09 12:54 PM

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.069	5.069	01	36.410	36.41
5.074	5.072	02	36.442	36.43
5.053	5.065	03	36.313	36.39
5.026	5.056	04	36.119	36.32
5.005	5.045	05	35.957	36.25
4.999	5.038	06	35.925	36.19
4.986	5.030	07	35.828	36.14
4.978	5.024	08	35.763	36.09
4.987	5.020	09	35.828	36.07
4.986	5.016	10	35.828	36.04

09/10/09 12:55 PM

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyrer

DATE 9/10/09

PUMP # AC 1

TASK Pond Radon WK #9

24.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

09/10/09 11:37 AM
0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.009	5.009	01	36.151	36.15

09/10/09 11:37 AM
24.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

09/10/09 11:37 AM
24.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.997	4.997	01	36.022	36.02
5.004	5.001	02	36.119	36.07
5.001	5.001	03	36.086	36.08
4.984	4.997	04	35.989	36.05
5.006	4.998	05	36.151	36.07
4.995	4.998	06	36.054	36.07
4.990	4.997	07	35.957	36.05
5.001	4.997	08	36.054	36.05
4.995	4.997	09	35.989	36.05
4.990	4.996	10	35.957	36.04

09/10/09 11:37 AM
24.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9/10/09

PUMP # AC#2

TASK Pond Radon Wk#9

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.065	5.065	01	36.377	36.38

09/10/09 12:57 PM

[illegible].0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.067	5.067	01	36.410	36.41
5.070	5.069	02	36.410	36.41
5.017	5.051	03	35.989	36.27
5.020	5.044	04	35.989	36.20
5.001	5.035	05	35.860	36.13
4.992	5.028	06	35.795	36.08
5.004	5.024	07	35.892	36.05
4.995	5.021	08	35.828	36.02
5.000	5.019	09	35.860	36.00
4.992	5.016	10	35.795	35.98

09/10/09 12:57 PM

25.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9/10/09

PUMP # AC 4

TASK Pond Radon WK#9

25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.021	5.021	01	36.119	36.12

09/10/09 11:42 AM
25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.011	5.011	01	36.054	36.05
5.019	5.015	02	36.119	36.09
4.994	5.008	03	35.925	36.03
4.991	5.004	04	35.892	36.00
4.989	5.001	05	35.828	35.96
4.983	4.998	06	35.860	35.95
5.013	5.000	07	36.022	35.96
5.012	5.002	08	36.054	35.97
4.991	5.000	09	35.892	35.96
4.986	4.999	10	35.828	35.95

09/10/09 11:43 AM
25.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9/10/09

PUMP # AC# 6

TASK Pond Radon WE#9

24.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.852	4.852	01	34.955	34.96

09/10/09 11:40 AM

[illegible]5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.004	5.004	01	35.989	35.99
5.008	5.006	02	36.086	36.04
5.002	5.005	03	36.054	36.04
5.008	5.006	04	36.086	36.05
5.003	5.005	05	36.054	36.05
4.982	5.001	06	35.892	36.03
4.983	4.999	07	35.892	36.01
5.004	4.999	08	36.054	36.01
5.001	5.000	09	36.054	36.02
5.000	5.000	10	36.022	36.02

09/10/09 11:41 AM

24.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9/10/09

PUMP # AC#7

TASK Pond Rmden WE#9

24.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
3.655	3.655	01	26.418	26.42

09/17/09 10:21 AM
5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.963	4.963	01	35.828	35.83
4.958	4.961	02	35.795	35.81
4.984	4.968	03	35.957	35.86
4.995	4.975	04	36.119	35.92
5.008	4.982	05	36.183	35.98
5.003	4.985	06	36.119	36.00
5.002	4.988	07	36.151	36.02
5.029	4.993	08	36.280	36.05
5.027	4.997	09	36.345	36.09
5.020	4.999	10	36.216	36.10

09/17/09 10:21 AM
24.5C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Damon Tyree

DATE 9-17-09

PUMP # AC-1

TASK Pond Radon Week #10

24.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.968	4.968	01	35.860	35.86

09/17/09 12:19 PM
.5C 664mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.962	4.962	01	35.795	35.80
4.971	4.967	02	35.860	35.83
5.006	4.980	03	36.119	35.92
5.007	4.987	04	36.151	35.98
5.008	4.991	05	36.151	36.02
5.028	4.997	06	36.280	36.06
5.030	5.002	07	36.248	36.09
5.006	5.002	08	36.119	36.09
5.005	5.003	09	36.119	36.09
4.989	5.001	10	36.022	36.09

09/17/09 12:19 PM
24.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-17-09

PUMP # AC-2

TASK Pond Radon Week #10

25.0C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
3.633	3.633	01	26.192	26.19

09/17/09 10:24 AM
0C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.900	4.900	01	35.343	35.34
4.903	4.902	02	35.310	35.33
4.937	4.913	03	35.634	35.43
4.962	4.926	04	35.763	35.51
4.966	4.934	05	35.795	35.57
4.989	4.943	06	35.989	35.64
5.027	4.955	07	36.216	35.72
5.037	4.965	08	36.345	35.80
5.041	4.974	09	36.313	35.86
5.039	4.980	10	36.313	35.90

09/17/09 10:24 AM
25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-17-09

PUMP # AC-4

TASK Pond Radon Neck #10

25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.883	4.883	01	35.116	35.12

09/17/09 10:28 AM
.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.990	4.990	01	35.957	35.96
4.605	4.798	02	33.176	34.57
5.014	4.870	03	36.119	35.08
5.079	4.922	04	36.604	35.46
5.010	4.940	05	36.022	35.58
5.014	4.952	06	36.119	35.67
5.036	4.964	07	36.216	35.74
5.058	4.976	08	36.377	35.82
5.055	4.985	09	36.345	35.88
5.061	4.992	10	36.442	35.94

09/17/09 10:28 AM
25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-17-09

PUMP # AC-6

TASK Pond Radon week #10

26.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
3.649	3.649	01	26.192	26.19

09/17/09 10:30 AM
 0C 664mmHg

V... Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.033	5.033	01	36.151	36.15
5.010	5.022	02	35.989	36.07
5.006	5.016	03	35.957	36.03
4.983	5.008	04	35.795	35.97
4.985	5.003	05	35.860	35.95
5.009	5.004	06	35.957	35.95
4.982	5.001	07	35.828	35.93
4.987	4.999	08	35.795	35.92
4.988	4.998	09	35.860	35.91
5.010	4.999	10	35.989	35.92

09/17/09 10:30 AM
26.0C 665mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-17-09

PUMP # AC-7

TASK Pond Radon week #10

24.5C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.982	4.982	01	35.828	35.83

09/24/09 12:11 PM

[illegible].0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.982	4.982	01	35.828	35.83
4.980	4.981	02	35.828	35.83
4.996	4.986	03	35.957	35.87
5.007	4.991	04	36.022	35.91
4.999	4.993	05	35.957	35.92
5.002	4.994	06	35.989	35.93
5.002	4.995	07	35.989	35.94
5.002	4.996	08	35.989	35.94
5.002	4.997	09	35.989	35.95
5.004	4.998	10	36.054	35.96

09/24/09 12:12 PM

25.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-24-09

PUMP # AC-2

(Sample pump)

TASK Pond Radon Week #11

25 .5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.983	4.983	01	35.828	35.83

09/24/09 10:28 AM

.5C 664mmHg

..l. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.969	4.969	01	35.731	35.73
4.993	4.981	02	35.925	35.83
5.021	4.994	03	36.119	35.93
5.008	4.998	04	36.022	35.95
4.995	4.997	05	35.925	35.94
5.001	4.998	06	35.957	35.95
4.994	4.997	07	35.925	35.94
4.990	4.996	08	35.892	35.94
5.024	5.000	09	36.151	35.96
5.005	5.000	10	35.989	35.96

09/24/09 10:28 AM

25 .5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-24-09

PUMP # AC-3

TASK Pond Radon Week #11

25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.989	4.989	01	35.892	35.89

09/24/09 10:23 AM

5C 664mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.994	4.994	01	35.860	35.86
4.990	4.992	02	35.892	35.88
4.994	4.993	03	35.925	35.89
4.986	4.991	04	35.860	35.88
5.016	4.996	05	36.086	35.92
5.018	5.000	06	36.086	35.95
5.021	5.003	07	36.119	35.98
5.018	5.005	08	36.086	35.99
5.020	5.006	09	36.119	36.00
5.016	5.007	10	36.086	36.01

09/24/09 10:23 AM

25.5C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-24-09

PUMP # AC-1

TASK Pond Radon week #11

25.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.059	4.059	01	29.231	29.23

09/24/09 10:20 AM

[illegible].0C 664mmHg

[illegible]. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.010	5.010	01	36.086	36.09
4.991	5.001	02	35.957	36.02
4.981	4.994	03	35.892	35.98
4.986	4.992	04	35.925	35.97
4.990	4.992	05	35.957	35.96
5.005	4.994	06	36.054	35.98
5.002	4.995	07	36.054	35.99
5.006	4.996	08	36.054	36.00
5.007	4.998	09	36.086	36.01
5.006	4.998	10	36.054	36.01

09/24/09 10:21 AM

25.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-24-09

PUMP # AC-7

TASK Pond Radon Week #11

25.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.002	5.002	01	36.086	36.09

09/24/09 10:18 AM
0C 664mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.992	4.992	01	35.957	35.96
5.002	4.997	02	36.054	36.01
5.000	4.998	03	36.022	36.01
5.000	4.999	04	36.022	36.01
4.999	4.999	05	36.022	36.02
4.999	4.999	06	36.022	36.02
5.003	4.999	07	36.054	36.02
5.009	5.001	08	36.086	36.03
5.003	5.001	09	36.054	36.03
5.008	5.002	10	36.086	36.04

09/24/09 10:19 AM
25.0C 664mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 9-24-09

PUMP # AC-6

TASK Pond Radon Week #1

24.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.625	4.625	01	33.015	33.02

10/01/09 11:03 AM
5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.609	4.609	01	32.918	32.92
4.610	4.610	02	32.918	32.92
4.608	4.609	03	32.918	32.92
4.609	4.609	04	32.918	32.92
4.603	4.608	05	32.885	32.91
4.605	4.607	06	32.885	32.91
4.605	4.607	07	32.885	32.90
4.601	4.606	08	32.853	32.90
4.603	4.606	09	32.885	32.90
4.601	4.605	10	32.853	32.89

10/01/09 11:04 AM
24.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10/1/09

PUMP # SKC-A

TASK Pond Radon Sampling week #12

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
3.706	3.706	01	26.644	26.64

10/01/09 10:49 AM
.0C 658mmHg

l. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.995	4.995	01	35.892	35.89
5.045	5.020	02	36.248	36.07
5.015	5.018	03	36.054	36.06
5.019	5.019	04	36.086	36.07
4.997	5.014	05	35.925	36.04
4.992	5.011	06	35.763	35.99
4.992	5.008	07	35.892	35.98
4.986	5.005	08	35.828	35.96
4.989	5.003	09	35.795	35.94
4.997	5.003	10	35.860	35.93

10/01/09 10:50 AM
23.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10/1/09

PUMP # AC-1

TASK Pond Radon week # 12

24.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.986	4.986	01	35.601	35.60

10/01/09 10:59 AM
5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.005	5.005	01	35.731	35.73
4.994	5.000	02	35.666	35.70
4.991	4.997	03	35.634	35.68
5.026	5.004	04	35.892	35.73
4.997	5.003	05	35.698	35.72
4.992	5.001	06	35.634	35.71
4.994	5.000	07	35.666	35.70
4.990	4.999	08	35.634	35.69
4.994	4.998	09	35.731	35.70
4.991	4.997	10	35.634	35.69

10/01/09 10:59 AM
24.5C 657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10/1/09

PUMP # AC-2

TASK Pond Radon Week #12

657mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.998	4.998	01	35.860	35.86

10/01/09 10:54 AM
5C 657mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.996	4.996	01	35.860	35.86
4.987	4.992	02	35.731	35.80
4.988	4.990	03	35.795	35.80
5.009	4.995	04	35.957	35.84
5.016	4.999	05	35.925	35.85
5.009	5.001	06	35.957	35.87
5.016	5.003	07	35.989	35.89
5.011	5.004	08	35.957	35.90
5.009	5.005	09	35.892	35.90
5.016	5.006	10	35.925	35.90

10/01/09 10:54 AM
23.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10/1/09

PUMP # AC-3

TASK Pond radon week #12

23.0C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.013	5.013	01	35.957	35.96

10/01/09 10:51 AM
5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.025	5.025	01	36.054	36.05
5.022	5.024	02	36.086	36.07
5.000	5.016	03	35.925	36.02
4.999	5.012	04	35.860	35.98
4.999	5.009	05	35.860	35.96
5.003	5.008	06	35.892	35.95
4.988	5.005	07	35.795	35.92
4.997	5.004	08	35.795	35.91
4.994	5.003	09	35.795	35.90
4.995	5.002	10	35.860	35.89

10/01/09 10:52 AM
23.5C 658mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10/1/09

PUMP # AC-7

TASK Pond Radon week # 12

23.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.627	4.627	01	33.403	33.40

10/08/09 11:50 AM
.5C 662mmHg

l. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.607	4.607	01	33.273	33.27
4.611	4.609	02	33.306	33.29
4.602	4.607	03	33.209	33.26
4.602	4.606	04	33.209	33.25
4.597	4.604	05	33.176	33.23
4.594	4.602	06	33.112	33.21
4.594	4.601	07	33.176	33.21
4.594	4.600	08	33.176	33.20
4.598	4.600	09	33.209	33.21
4.591	4.599	10	33.144	33.20

10/08/09 11:50 AM
23.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10-8-2009

PUMP # SKC-A
Sample pump

TASK Pond Radon testing week 13

24.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.957	4.957	01	35.731	35.73

10/08/09 10:19 AM
 0C 662mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.962	4.962	01	35.763	35.76
4.981	4.972	02	35.892	35.83
5.000	4.981	03	36.022	35.89
5.016	4.990	04	36.151	35.96
5.005	4.993	05	36.086	35.98
4.982	4.991	06	35.957	35.98
4.990	4.991	07	36.022	35.98
4.995	4.991	08	35.989	35.99
4.992	4.992	09	35.989	35.99
4.988	4.991	10	35.957	35.98

10/08/09 10:19 AM
24.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10-8-2009

PUMP # AC-1

TASK Pond radon week #13

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.966	4.966	01	35.989	35.99

10/08/09 10:13 AM

.0C 663mmHg

.. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.959	4.959	01	35.860	35.86
4.976	4.968	02	36.054	35.96
4.989	4.975	03	36.119	36.01
5.008	4.983	04	36.280	36.08
5.048	4.996	05	36.507	36.16
5.060	5.007	06	36.636	36.24
5.053	5.013	07	36.604	36.29
5.024	5.015	08	36.345	36.30
5.007	5.014	09	36.216	36.29
4.981	5.011	10	36.086	36.27

10/08/09 10:13 AM

23.0C 663mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10-8-2009

AC-2

TASK Pond Radon Week 13

23.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.976	4.976	01	35.925	35.93

10/08/09 10:15 AM
5C 662mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.988	4.988	01	36.022	36.02
4.992	4.990	02	36.054	36.04
5.036	5.005	03	36.345	36.14
5.013	5.007	04	36.183	36.15
5.008	5.007	05	36.151	36.15
5.005	5.007	06	36.119	36.15
4.969	5.002	07	35.860	36.10
4.976	4.998	08	35.925	36.08
4.973	4.996	09	35.957	36.07
4.981	4.994	10	35.957	36.06

10/08/09 10:15 AM
23.5C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10-8-2009

PUMP # AC-3

TASK Pond Radon week #13

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.969	4.969	01	35.860	35.86

10/08/09 10:17 AM
[illegible].0C 662mmHg

[illegible]. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
4.977	4.977	01	35.860	35.86
4.986	4.982	02	35.925	35.89
4.983	4.982	03	35.925	35.90
5.007	4.988	04	36.086	35.95
5.014	4.993	05	36.151	35.99
5.007	4.996	06	36.086	36.01
5.010	4.998	07	36.151	36.03
5.008	4.999	08	36.086	36.03
5.004	5.000	09	36.054	36.04
5.016	5.001	10	36.151	36.05

10/08/09 10:18 AM
24.0C 662mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10-8-2009

PUMP # AC-7

TASK Pond radw week 13

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.060	5.060	01	36.410	36.41

10/15/09 10:39 AM
0C 661mmHg

. Flow	Vol. Average	# Samples	Std. Flow	Std. Average
5.052	5.052	01	36.345	36.35
5.046	5.049	02	36.313	36.33
5.039	5.046	03	36.248	36.30
5.023	5.040	04	36.151	36.26
5.002	5.032	05	35.989	36.21
4.998	5.027	06	35.957	36.17
4.998	5.023	07	35.957	36.14
5.002	5.020	08	35.989	36.12
5.003	5.018	09	35.989	36.10
5.003	5.017	10	35.989	36.09

10/15/09 10:39 AM
24.0C 661mmHg

Vol. Flow	Vol. Average	# Samples	Std. Flow	Std. Average

NAME Tyree

DATE 10-15-09

PUMP # AC-3

TASK Pond Radon test

APPENDIX C

C-1 Summary of Data Collected at the Chadron Municipal Airport Weather Station

- Daily High, Low and Average Air Temperature
- Dew Point
- Humidity (%)
- Daily Wind Direction and High, Low and Maximum Wind Gust

C-2 Summary of the Data Collected from Pond Complex

- Weekly temperature of the discharge water to the pond complex
- Weekly surface water temperature from each pond
- Weekly freeboard data on each pond
- Weekly average discharge rate (gpm) to the pond complex
- Weekly average volume in acre feet (AF) of water in each pond
- Weekly Pond Inspection Sheets

C-3 Summary of Water Chemistry of Pond Complex

- Summary sheet of the ten samples collected
- Analytical Reports for five Pond Composite Samples from Energy Laboratories, Inc.
- Analytical Reports for five Pond Discharge Samples from Energy Laboratories, Inc.

C-4 Environmental Air Samples Collected Under NRC Operating License During the 90-day Sampling Period

- Map of Air Monitoring Station Locations
- High Volume Air Sampling Report from Energy Laboratories, Inc.

C-5 Historical Wind Rose Data

- Section 2.5.6 Local Meteorological Station, Crow Butte Uranium Project, Application and Supporting Environmental Report for USNRC Commercial Source Material License, September 1987

Appendix C-1
Summary of Data Collected at the Chadron Municipal Airport Weather Station

- Daily High, Low and Average Air Temperature
- Dew Point
- Humidity (%)
- Daily Wind Direction and High, Low and Maximum Wind Gust

Weather Station
Chadron Municipal Airport (KCDR)
42.7°N 103.1°W
Chadron, Nebraska 69337

	TEMPERTURE (°F)			DEW POINT (°F)	HUMIDITY (%)			WIND (mph)			
DATE	AVE.	MAX.	MIN.	AVE.	AVE.	MAX.	MIN.	DIRECTION	MIN.	MAX.	MAX. GUST
7/1/2009	71	85	56	56	67	90	43	WNW	5	24	32
7/2/2009	73	86	60	57	73	97	48	E	7	22	28
7/3/2009	67	75	58	60	81	97	64	NNE	4	18	22
7/4/2009	67	77	57	57	72	93	50	NNE	6	12	17
7/5/2009	66	82	50	53	68	100	36	SSE	3	12	16
7/6/2009	70	86	53	56	64	93	34	S	6	26	33
7/7/2009	72	88	55	54	59	86	31	NNE	7	29	39
7/8/2009	74	93	54	56	66	100	31	SSW	11	26	33
7/9/2009	68	83	52	49	57	89	25	ESE	5	15	18
7/10/2009	74	88	59	52	65	93	36	NE	5	47	66
7/11/2009	74	85	62	61	74	93	55	E	12	30	38
7/12/2009	77	90	64	55	55	73	36	ESE	7	18	23
7/13/2009	78	94	62	62	59	87	30	S	11	33	45
7/14/2009	70	87	53	54	58	97	18	WNW	10	21	33
7/15/2009	66	83	48	47	59	86	31	SSW	4	13	20
7/16/2009	70	84	56	53	56	80	31	NE	7	25	36
7/17/2009	68	85	50	50	60	89	30	ENE	6	18	30
7/18/2009	67	88	45	48	57	93	21	SE	4	13	17
7/19/2009	79	98	59	51	44	73	14	SW	5	22	32
7/20/2009	69	87	51	52	53	75	30	NNE	11	32	39
7/21/2009	65	86	44	44	56	93	18	W	5	15	22
7/22/2009	72	92	52	48	48	77	18	SE	5	20	25
7/23/2009	77	97	57	51	48	80	16	SSE	6	17	22
7/24/2009	72	89	55	50	56	80	31	ENE	9	22	28
7/25/2009	75	93	56	50	52	83	20	E	5	17	21
7/26/2009	75	92	57	49	48	77	19	W	5	29	39
7/27/2009	73	86	60	54	66	97	34	W	7	28	36
7/28/2009	68	77	59	58	67	97	36	NW	3	10	15
7/29/2009	58	68	48	55	71	93	48	WNW	8	18	25
7/30/2009	60	77	43	41	57	93	21	WSW	6	16	23
7/31/2009	67	88	46	46	55	93	16	WNW	7	26	35

Weather Station
Chadron Municipal Airport (KCDR)
42.7°N 103.1°W
Chadron, Nebraska 69337

	TEMPERTURE (°F)			DEW POINT (°F)	HUMIDITY (%)			WIND (mph)			
DATE	AVE.	MAX.	MIN.	AVE.	AVE.	MAX.	MIN.	DIRECTION	MIN.	MAX.	MAX. GUST
8/1/2009	64	86	42	40	55	96	14	W	7	21	30
8/2/2009	74	98	50	42	41	71	11	W	8	23	31
8/3/2009	75	96	53	50	51	84	17	WSW	6	43	61
8/4/2009	70	86	53	54	66	97	35	E	6	48	62
8/5/2009	71	85	57	57	69	93	44	SE	6	20	26
8/6/2009	70	82	70	62	65	78	51	SSW	13	28	38
8/7/2009	Data Not Available							SSE	6	9	51
8/8/2009								N	6	14	38
8/9/2009								WNW	6	17	32
8/10/2009								WSW	4	7	N/A
8/11/2009								SSW	4	8	N/A
8/12/2009	79	96	62	46	42	72	12	WSW	3	8	N/A
8/13/2009	77	101	52	49	50	89	11	SSW	8	21	29
8/14/2009	72	84	60	56	58	84	32	SE	8	33	43
8/15/2009	70	86	53	54	61	93	29	NW	5	36	47
8/16/2009	63	76	50	44	58	93	23	WSW	7	15	26
8/17/2009	62	77	47	45	54	83	25	WNW	6	17	22
8/18/2009	65	85	45	48	59	86	31	S	7	23	29
8/19/2009	66	78	53	50	59	89	28	NNW	10	30	43
8/20/2009	63	78	48	46	53	80	25	NW	11	24	35
8/21/2009	61	79	42	42	56	89	23	SE	4	10	18
8/22/2009	76	97	55	50	46	67	24	S	12	22	36
8/23/2009	78	91	64	59	59	81	37	S	12	26	33
8/24/2009	76	88	64	57	55	81	29	NW	10	22	28
8/25/2009	70	80	60	58	71	97	45	SSE	3	10	13
8/26/2009	69	82	56	56	66	93	39	SE	4	18	22
8/27/2009	72	91	52	54	62	100	23	S	4	10	18
8/28/2009	66	80	51	46	56	83	28	N	7	20	25
8/29/2009	62	77	46	48	63	93	33	ENE	6	15	21
8/30/2009	68	78	57	47	58	72	43	SSE	13	21	28
8/31/2009	69	80	58	48	53	67	39	S	17	24	33

Weather Station
Chadron Municipal Airport (KCDR)
42.7°N 103.1°W
Chadron, Nebraska 69337

	TEMPERTURE (°F)			DEW POINT (°F)	HUMIDITY (%)			WIND (mph)			
DATE	AVE.	MAX.	MIN.	AVE.	AVE.	MAX.	MIN.	DIRECTION	MIN.	MAX.	MAX. GUST
9/1/2009	74	93	55	49	51	83	18	SSW	8	21	28
9/2/2009	70	87	53	51	57	86	27	NW	6	17	25
9/3/2009	66	82	50	49	61	86	35	NE	5	16	21
9/4/2009	65	84	45	49	67	100	34	S	7	18	22
9/5/2009	71	85	57	53	60	86	34	S	13	26	35
9/6/2009	75	89	60	54	58	84	31	S	13	25	32
9/7/2009	78	93	62	54	52	84	20	S	7	18	24
9/8/2009	69	87	50	53	57	84	29	N	9	24	29
9/9/2009	63	79	57	46	66	93	39	S	7	24	30
9/10/2009	73	92	53	54	54	86	21	S	7	25	31
9/11/2009	66	78	53	40	44	68	19	NNE	8	28	38
9/12/2009	59	66	51	48	67	89	44	WSW	5	18	21
9/13/2009	65	77	53	50	68	89	46	SSE	19	33	44
9/14/2009	75	90	60	51	49	78	19	S	14	33	43
9/15/2009	72	91	52	52	55	89	21	SE	4	15	20
9/16/2009	67	86	47	48	57	93	20	SE	3	13	18
9/17/2009	65	85	44	45	55	89	20	S	7	20	29
9/18/2009	67	84	49	44	49	77	20	S	11	23	30
9/19/2009	67	83	51	41	41	59	22	S	13	31	38
9/20/2009	68	85	51	43	57	93	20	W	12	39	53
9/21/2009	53	59	47	44	60	80	40	NW	12	24	35
9/22/2009	55	63	47	39	55	77	33	NNW	8	23	30
9/23/2009	56	65	46	36	61	86	36	NNE	7	16	22
9/24/2009	58	70	45	42	64	86	42	ENE	6	20	24
9/25/2009	53	68	37	41	62	92	31	SSW	3	8	10
9/26/2009	63	88	38	37	49	85	12	WSW	6	17	22
9/27/2009	54	70	38	30	43	66	20	NW	11	26	36
9/28/2009	48	66	30	20	41	69	13	SE	5	15	20
9/29/2009	63	79	47	30	32	42	22	S	18	37	47
9/30/2009	63	82	44	41	58	93	23	SW	13	36	49
10/1/2009	47	54	39	33	54	76	32	WNW	24	39	54

Weather Station
Chadron Municipal Airport (KCDR)
42.7°N 103.1°W
Chadron, Nebraska 69337

	TEMPERTURE (ºF)			DEW POINT (ºF)	HUMIDITY (%)			WIND (mph)			
DATE	AVE.	MAX.	MIN.	AVE.	AVE.	MAX.	MIN.	DIRECTION	MIN.	MAX.	MAX. GUST
10/2/2009	43	58	27	24	46	69	23	WNW	15	37	48
10/3/2009	40	59	21	20	52	84	20	N	6	14	21
10/4/2009	42	48	36	32	74	86	62	E	9	18	23
10/5/2009	43	51	35	39	76	96	56	N	9	20	26
10/6/2009	44	58	30	29	59	89	28	WNW	13	28	37
10/7/2009	46	63	28	28	62	89	34	NNW	11	26	33
10/8/2009	37	41	33	30	74	89	59	NE	4	13	16
10/9/2009	30	40	20	28	78	92	64	NNE	9	24	31
10/10/2009	21	31	11	10	62	76	47	W	6	16	21
10/11/2009	25	28	22	17	78	88	68	ESE	8	18	22
10/12/2009	29	33	24	21	76	88	63	NE	6	12	20
10/13/2009	37	41	32	28	76	82	70	SSE	12	23	29
10/14/2009	50	67	33	35	70	96	44	SSW	8	23	28
10/15/2009	47	64	29	31	65	96	34	W	5	24	32
10/16/2009	46	64	28	36	63	96	30	WNW	8	26	33
10/17/2009	48	72	23	27	56	92	19	SW	6	15	20
10/18/2009	60	83	37	31	43	73	13	WSW	8	26	32
10/19/2009	46	56	35	34	74	92	55	NE	5	16	21
10/20/2009	40	44	36	36	92	100	83	NNE	9	17	22
10/21/2009	40	44	35	34	86	92	79	NNE	9	16	21
10/22/2009	37	46	27	33	73	92	53	ENE	2	9	12
10/23/2009	44	58	30	32	61	92	30	W	5	18	24
10/24/2009	47	60	34	37	68	92	43	WNW	11	23	29
10/25/2009	36	42	30	34	83	92	73	NW	9	25	32
10/26/2009	42	58	26	25	60	92	27	SW	10	21	25
10/27/2009	45	57	32	27	59	86	32	W	8	17	25
10/28/2009	33	34	32	30	87	92	82	N	12	23	30
10/29/2009	30	33	26	30	84	92	75	N	12	22	26
10/30/2009	28	41	15	22	74	85	63	W	16	32	38
10/31/2009	44	55	33	32	70	85	54	WSW	8	18	22

Appendix C-2
Summary of the Data Collected from Pond Complex

- Weekly temperature of the discharge water to the pond complex
- Weekly surface water temperature from each pond
- Weekly freeboard data on each pond
- Weekly average discharge rate (gpm) to the pond complex
- Weekly average volume in acre feet (AF) of water in each pond
- Weekly Pond Inspection Sheets

CROW BUTTE RESOURCES, INC.

86 Crow Butte Road
P.O. Box 169
Crawford, Nebraska 69339-0169

(308) 665-2215
(308) 665-2341 - FAX

Date	Temperatures ^{0}C				Freeboard (feet)			Volume (AF)			Ave Flow
Sampled	Pond #1	Pond #3	Pond #4	Discharge	Pond #1	Pond #3	Pond #4	Pond #1	Pond #3	Pond #4	GPM
07/09/09	28.3	27.7	26.8	24.7	7.6	7.5	12.9	35.42	37.66	13.66	13.9
07/16/09	27.1	28.4	26.3	25.5	7.7	7.7	13.0	34.96	36.72	13.24	18.9
07/23/09	29.4	30.0	28.7	22.0	7.7	7.8	13.1	34.96	36.26	12.82	19.1
07/30/09	25.0	23.4	23.0	22.0	7.5	7.9	13.0	35.88	35.79	13.24	21.8
08/06/09	23.8	21.8	24.5	26.0	7.6	8.1	12.9	35.42	34.86	13.66	35.7
08/13/09	27.1	24.4	29.9	24.0	7.8	8.3	12.7	34.50	33.90	14.50	15.4
08/20/09	20.1	19.8	20.2	25.0	7.9	8.5	12.5	34.04	33.01	15.33	15.5
08/27/09	26.7	29.3	25.6	28.0	7.9	8.6	12.3	34.04	32.55	16.17	15.7
09/03/09	24.1	21.9	22.7	26.0	8.0	9.0	12.6	33.58	30.72	14.91	15.4
09/10/09	23.8	22.3	24.7	25.0	8.2	8.9	12.1	32.67	31.18	17.04	18.1
09/17/09	21.4	19.9	21.0	26.0	8.3	9.4	11.9	32.67	28.91	17.90	19.7
09/24/09	16.4	16.8	15.6	24.0	8.4	9.5	12.0	31.77	28.46	17.47	17.8
10/01/09	20.6	18.3	19.8	25.0	8.4	9.5	12.0	31.77	28.46	17.47	20.1
10/08/09	9.4	7.0	8.4	19.5	8.3	9.5	12.0	32.21	28.46	17.47	19.4
10/15/09	9.2	6.1	6.6	26.0	8.2	9.6	12.0	32.67	27.97	17.47	19.6

7/9

CROW BU[illegible] RESOURCES, INC.
WEEKLY EVAPORATI[illegible] 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	9.4'		28.3 °c		
	*FREEBOARD	7.6'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	7	72.3 ms	14.7		
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	9	90.9 ms	16.7		
POND # 3 Depth = 17.5 feet	POND LEVEL	10.0'		27.7 °c		
	*FREEBOARD	7.5'				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	7	20.1 ms	12.6		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	7	510 us	13.8		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.6'		26.8 °c		
	*FREEBOARD	12.9'				
	NE UNDERDRAIN	16	98.9 ms	19.5		
	NM UNDERDRAIN	19	103.6 ms	15.0		
	NW UNDERDRAIN	20	110.8 ms	20.4		
	SE UNDERDRAIN	21	95.8 ms	21.0		
	SM UNDERDRAIN	30	96.8 ms	15.4		
	SW UNDERDRAIN	58	122.3 ms	19.8		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	8.2'
**EAST FREEBOARD:	6.8'
EAST UNDERDRAIN:	0"
WEST LEVEL:	8.4'
**WEST FREEBOARD:	6.6'
WEST UNDERDRAIN:	2.5"

REMARKS: Plant Waste 24.75 °c

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass / Pelton

DATE: 7/9/09

W-
7/21

CROW BUTTE RESOURCES, INC.
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	9.3'		27.1		
	*FREEBOARD	7.7'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	6	69.7mS	14.8		
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	1	64.4mS	16.8		
POND # 3 Depth = 17.5 feet	POND LEVEL	9.8'		28.4		
	*FREEBOARD	7.7'				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	6	19.6mS	12.4		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	517 uS	13.7		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.5'		26.3		
	*FREEBOARD	13.0'				
	NE UNDERDRAIN	17	99.5 mS	21.6		
	NM UNDERDRAIN	20	102.6 mS	17.5		
	NW UNDERDRAIN	17	121.6 mS	23.9		
	SE UNDERDRAIN	20	94.2 mS	21.6		
	SM UNDERDRAIN	31	103.9 mS	15.6		
	SW UNDERDRAIN	43	123.6 mS	20.9		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	8
**EAST FREEBOARD:	7.0
EAST UNDERDRAIN:	2.5
WEST LEVEL:	8.4 ~~6.6~~
**WEST FREEBOARD:	6.6'
WEST UNDERDRAIN:	0

REMARKS: Plant Wase 25.5 °c

Done Monthly

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Basso-Pelton

DATE: 7-16-09

CROW B[illegible]E RESOURCES, INC.

WEEKLY EVAPORA[illegible] POND UNDERDRAIN ANALYSIS

W 7/24/

COMMERCIAL PONDS		UNDERDRAIN WATER DEPTH / INCHES	METER READING	TEMP °C	CONDUCTIVITY µmhos/cm	LAB RESULTS µmhos/cm
POND # 1 Depth = 17 feet	POND LEVEL	9.3'		28.4		
	*FREEBOARD	7.7'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	9.7'		30		
	*FREEBOARD	7.8'				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	7	20.26 mS	12.6		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	7	544 uS	14.8		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.4'		28.7		
	*FREEBOARD	13.1'				
	NE UNDERDRAIN	17	115.9 mS	22.7		
	NM UNDERDRAIN	19	105.1 mS	18.2		
	NW UNDERDRAIN	18	123.1 mS	31.4		
	SE UNDERDRAIN	22	97.6 mS	24.3		
	SM UNDERDRAIN	31	101.4 mS	17.1		
	SW UNDERDRAIN	14	121.8 mS	22		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 7.9'
**EAST FREEBOARD: 7.1'
EAST UNDERDRAIN: 2.5
WEST LEVEL: 8.4'
**WEST FREEBOARD: 6.6'
WEST UNDERDRAIN: 0

REMARKS: 22.C Plant Discharge
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: [illegible]
DATE: 7-23-09

7/3

CROW BUTTE RESOURCES, INC.
WEEKLY EVAPORATI... 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'	[illegible]	25		
	*FREEBOARD	7.5'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	2				
POND # 3 Depth = 17.5 feet	POND LEVEL	9.6		23.4		
	*FREEBOARD	7.9'				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	7	20.8 ms	12.9		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	7	604 us	14.8		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.5		23		
	*FREEBOARD	13.0				
	NE UNDERDRAIN	17	116.04 ms	22.9		
	NM UNDERDRAIN	19	105.7 ms	18.4		
	NW UNDERDRAIN	18	123.9 ms	22		
	SE UNDERDRAIN	22	97.1 ms	23.1		
	SM UNDERDRAIN	27	113.9 ms	18.5		
	SW UNDERDRAIN	16	12.7 ms	21.2		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.9'
**EAST FREEBOARD:	7.1'
EAST UNDERDRAIN:	2.5
WEST LEVEL:	8.5'
**WEST FREEBOARD:	6.5'
WEST UNDERDRAIN:	0

REMARKS: Plant waste 22°C

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

SAMPLER: Bass - Pelton
DATE: 7-30-09

040010

CROW [illegible]E RESOURCES, INC.
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	9.4'		23.8		
	*FREEBOARD	7.4'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	2				
POND # 3 Depth = 17.5 feet	POND LEVEL	9.4'		21.8		
	*FREEBOARD	8.1'				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	7	21.3 ms	12.7		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	7	610 us	14.7		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.6'		24.5		
	*FREEBOARD	12.9'				
	NE UNDERDRAIN	17	116.7 ms	22.7		
	NM UNDERDRAIN	19	106.1 ms	18.4		
	NW UNDERDRAIN	18	124.3 ms	21.9		
	SE UNDERDRAIN	22	97.7 ms	18.5		
	SM UNDERDRAIN	31	123.0 ms	20.1		
	SW UNDERDRAIN	18	125.8 ms	22.3		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.8
**EAST FREEBOARD:	7.2'
EAST UNDERDRAIN:	25
WEST LEVEL:	8.4
**WEST FREEBOARD:	6.6'
WEST UNDERDRAIN:	0

REMARKS: 26°C Waste Temp
Very Windy

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

SAMPLER: Baos - Relton
DATE: 8-6-09

WA
8/13/(...)

CROW BU[illegible]E RESOURCES, INC.
WEEKLY EVAPORAT[illegible] 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	9.2'		27.1		
	*FREEBOARD	7.8'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	9.2'		24.4		
	*FREEBOARD	~~[illegible]~~ 8.3				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	6	19.4 ms	14.6		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	600 us	16.1		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.8'		29.9		
	*FREEBOARD	12.7'				
	NE UNDERDRAIN	16	112.3 ms	16.2		
	NM UNDERDRAIN	19	101.7 ms	25.5		
	NW UNDERDRAIN	17	118.6 ms	24.0		
	SE UNDERDRAIN	22	91.8 ms	23.3		
	SM UNDERDRAIN	21	114.7 ms	19.7		
	SW UNDERDRAIN	16	121.4 ms	21.9		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.7
**EAST FREEBOARD:	7.3
EAST UNDERDRAIN:	2
WEST LEVEL:	8.5
**WEST FREEBOARD:	6.5
WEST UNDERDRAIN:	0

REMARKS: Pond Waste Temp. 24°c

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass / Pelton

DATE: 8/13/09

CROW [illegible]E RESOURCES, INC.
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	9.1		20.1		
	*FREEBOARD	7.9				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	9'		19.8		
	*FREEBOARD	8.5				
	NE UNDERDRAIN	4				
	NM UNDERDRAIN	6	18.7 ms	14.3		
	NW UNDERDRAIN	5				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	600 us	15.7		
POND # 4 Depth = 17.5 feet	POND LEVEL	5'		20.2		
	*FREEBOARD	12.5				
	NE UNDERDRAIN	15	112.0 ms	15.8		
	NM UNDERDRAIN	19	106.6 ms	24.1		
	NW UNDERDRAIN	17	118.1 ms	22.9		
	SE UNDERDRAIN	22	91.2 ms	22.4		
	SM UNDERDRAIN	21	113.4 ms	19.		
	SW UNDERDRAIN	15	119.7 ms	20.6		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.7'
**EAST FREEBOARD:	7.3'
EAST UNDERDRAIN:	2
WEST LEVEL:	8.4'
**WEST FREEBOARD:	6.6'
WEST UNDERDRAIN:	0

REMARKS: Plant waste 25°C

Very windy

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass-Pelton

DATE: 8-20-09

8/

CROW BUTTE RESOURCES, INC.
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	9.1		26.7		
	*FREEBOARD	7.9'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	8.9'		29.3		
	*FREEBOARD	8.6'				
	NE UNDERDRAIN	6	748 us	16.4		
	NM UNDERDRAIN	4				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	3				
	SW UNDERDRAIN	6	630 us	16.9		
POND # 4 Depth = 17.5 feet	POND LEVEL	5.2'		25.6		
	*FREEBOARD	12.3'				
	NE UNDERDRAIN	7	31.75 ms	22.4		
	NM UNDERDRAIN	13	99.2 ms	20.3		
	NW UNDERDRAIN	14	117.8 ms	22.2		
	SE UNDERDRAIN	11	47.2 ms	23.9		
	SM UNDERDRAIN	22	116.8 ms	20.0		
	SW UNDERDRAIN	14	121.9 ms	21.9		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.8'
**EAST FREEBOARD:	7.2'
EAST UNDERDRAIN:	2"
WEST LEVEL:	8.5'
**WEST FREEBOARD:	6.5'
WEST UNDERDRAIN:	0"

REMARKS: Pond waste in Plant 28°c

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass / Pelton

DATE: 8/27/09

9/4?

CROW[illegible]E RESOURCES, INC.
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'		24.1		
	*FREEBOARD	8.0'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	0				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	8.5'		21.9		
	*FREEBOARD	9.0'				
	NE UNDERDRAIN	6	740 us	16.0		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	632 us	16.2		
POND # 4 Depth = 17.5 feet	POND LEVEL	4.9'		22.7		
	*FREEBOARD	12.6'				
	NE UNDERDRAIN	10	51.2 ms	22.3		
	NM UNDERDRAIN	13	111.4 ms	19.8		
	NW UNDERDRAIN	14	118.7 ms	21.2		
	SE UNDERDRAIN	9	45.3 ms	22.4		
	SM UNDERDRAIN	21	117.2 ms	19.1		
	SW UNDERDRAIN	14	119.9 ms	20.5		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.6'
**EAST FREEBOARD:	~~7.4~~ ~~7.5'~~ 7.4'
EAST UNDERDRAIN:	2"
WEST LEVEL:	8.5'
**WEST FREEBOARD:	6.5'
WEST UNDERDRAIN:	0"

REMARKS: Plant Waste 26°c
Done monthly + Pond contents

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

SAMPLER: Bass
DATE: 9/3/09

9/10

CROW BU[illegible]E RESOURCES, INC.
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	8.8'		23.8		
	*FREEBOARD	8.2'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	8.6'		22.3		
	*FREEBOARD	8.9'				
	NE UNDERDRAIN	6	731us	16.8		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	625us	17.6		
POND # 4 Depth = 17.5 feet	POND LEVEL	5.4'		24.7		
	*FREEBOARD	12.1'				
	NE UNDERDRAIN	10	67.2ms	23.1		
	NM UNDERDRAIN	14	104.4 ms	20.4		
	NW UNDERDRAIN	10	120.6 ms	21.7		
	SE UNDERDRAIN	8	48.78 ms	25.2		
	SM UNDERDRAIN	15	116.4 ms	21.8		
	SW UNDERDRAIN	14	61.9 ms	21.1		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 7.4'
**EAST FREEBOARD: 7.6'
EAST UNDERDRAIN: 2"
WEST LEVEL: 8.5'
**WEST FREEBOARD: 6.5'
WEST UNDERDRAIN: 0

REMARKS: Plant waste temp 25

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

SAMPLER: Bass-Pelton
DATE: 9-10-09

CROW E RESOURCES, INC.
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	8.7'		21.4		
	*FREEBOARD	8.3'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	8.1'		19.9		
	*FREEBOARD	9.4'				
	NE UNDERDRAIN	6	726 uo	16.3		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	630 uo	17.2		
POND # 4 Depth = 17.5 feet	POND LEVEL	5.6'		21.0		
	*FREEBOARD	11.9'				
	NE UNDERDRAIN	12	65.1 ms	22.8		
	NM UNDERDRAIN	10	103.7 ms	20.		
	NW UNDERDRAIN	14	119.0 ms	21.4		
	SE UNDERDRAIN	13	47.8 ms	22		
	SM UNDERDRAIN	8	115.3 ms	21.2		
	SW UNDERDRAIN	15	60.6 ms	20.3		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.3'
**EAST FREEBOARD:	7.7'
EAST UNDERDRAIN:	2
WEST LEVEL:	8.5'
**WEST FREEBOARD:	6.5'
WEST UNDERDRAIN:	

REMARKS: Plant waste 26°

*COMMERCIAL POND FREEBOARD = 5 FT MAX

** R&D POND FREEBOARD = 3 FT MAX

SAMPLER: Bass - Pelton

DATE: 9-17-09

9/2

CROW BUTTE RESOURCES, INC.
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	8.6'		16.4'		
	*FREEBOARD	8.4'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	8'		16.8'		
	*FREEBOARD	9.5'				
	NE UNDERDRAIN	6	714us	16		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	624us	16.3		
POND # 4 Depth = 17.5 feet	POND LEVEL	5.5'		15.6'		
	*FREEBOARD	12.0'				
	NE UNDERDRAIN	10	63.2 ms	20.6		
	NM UNDERDRAIN	10	102.8 ms	18.8		
	NW UNDERDRAIN	14	120.4 ms	19.7		
	SE UNDERDRAIN	12	38.95 ms	18.5		
	SM UNDERDRAIN	8	60.4 ms	18.4		
	SW UNDERDRAIN	10	115.1 ms	19.9		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 7.3'
**EAST FREEBOARD: 7.7'
EAST UNDERDRAIN: 2
WEST LEVEL: 8.5'
**WEST FREEBOARD: 6.5'
WEST UNDERDRAIN: 0

REMARKS: Plant waste temp 24°
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: Bass-Pelton
DATE: 9-24-09

AVE [illegible] WN
RATE = 20.[redacted] M 10/2/10

CROW B[redacted] RESOURCES, INC.
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	8.6' 31.77 AF		20.6		
	*FREEBOARD	8.4'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2"				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	1"				
	SW UNDERDRAIN	1"				
POND # 3 Depth = 17.5 feet	POND LEVEL	8' 28.46 AF		18.3		
	*FREEBOARD	9.5'				
	NE UNDERDRAIN	6"	730 us	16.1		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0"				
	SE UNDERDRAIN	0"				
	SM UNDERDRAIN	4"				
	SW UNDERDRAIN	6"	624 us			
POND # 4 Depth = 17.5 feet	POND LEVEL	5.5' 17.47 AF		19.8		
	*FREEBOARD	12.0'				
	NE UNDERDRAIN	12"	6.59 ms	22.7		
	NM UNDERDRAIN	10"	105.7 ms	20		
	NW UNDERDRAIN	14"	119.4 ms	21.2		
	SE UNDERDRAIN	14"	48.3 ms	21.9		
	SM UNDERDRAIN	9"	116.1 ms	21.		
	SW UNDERDRAIN	15	63.4 ms	20.1		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.3'
**EAST FREEBOARD:	~~6.5'~~ 7.7' - WN
EAST UNDERDRAIN:	2
WEST LEVEL:	8.5'
**WEST FREEBOARD:	~~7.7'~~ 6.5' - WN
WEST UNDERDRAIN:	0

REMARKS: Plant waste temp 25
Very windy for levels!

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

SAMPLER: Bass-Relton
DATE: 10-1-09

W 10/

CROW BI E RESOURCES, INC.
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	8.7		9.4		
	*FREEBOARD	8.3				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	8.0		7.0		
	*FREEBOARD	9.5				
	NE UNDERDRAIN	6	721 us	11.1		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	609 us	11.3		
POND # 4 Depth = 17.5 feet	POND LEVEL	5.5		8.4		
	*FREEBOARD	17.0				
	NE UNDERDRAIN	14	6.32 ms	12.1		
	NM UNDERDRAIN	13	101.0 ms	13.2		
	NW UNDERDRAIN	13	110.8 ms	14.7		
	SE UNDERDRAIN	18	79.6 ms	11.1		
	SM UNDERDRAIN	10	56.5 ms	14.2		
	SW UNDERDRAIN	14	87.7 ms	11.8		

R & D POND LEVELS (Depth = 15 ft)
EAST LEVEL: 7.4'
**EAST FREEBOARD: 7.6
EAST UNDERDRAIN: 2"
WEST LEVEL: 8.4'
**WEST FREEBOARD: 6.6'
WEST UNDERDRAIN: 0

REMARKS: 19.5 plant waste temp
*COMMERCIAL POND FREEBOARD = 5 FT MAX
** R&D POND FREEBOARD = 3 FT MAX
SAMPLER: Bass - Pelton
DATE: 10-8-09

ce 10/15

CROW B[illegible]E RESOURCES, INC.
WEEKLY EVAPORA[illegible] 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	8.8'		9.2		
	*FREEBOARD	8.7'				
	NE UNDERDRAIN	0				
	NM UNDERDRAIN	0				
	NW UNDERDRAIN	2				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	1				
	SW UNDERDRAIN	1				
POND # 3 Depth = 17.5 feet	POND LEVEL	7.9'		6.1		
	*FREEBOARD	9.6'				
	NE UNDERDRAIN	6	728 us	10.6		
	NM UNDERDRAIN	3				
	NW UNDERDRAIN	0				
	SE UNDERDRAIN	0				
	SM UNDERDRAIN	4				
	SW UNDERDRAIN	6	615 us	10.7		
POND # 4 Depth = 17.5 feet	POND LEVEL	5.5'		6.6		
	*FREEBOARD	12.0'				
	NE UNDERDRAIN	13	6.38 ms	16.8		
	NM UNDERDRAIN	13	101.3 ms	12.6		
	NW UNDERDRAIN	16	99.3 ms	14.2		
	SE UNDERDRAIN	18	102.3 ms	10.6		
	SM UNDERDRAIN	11	96.8 ms	14.6		
	SW UNDERDRAIN	11	90.7 ms	11.1		

R & D POND LEVELS (Depth = 15 ft)	
EAST LEVEL:	7.5'
**EAST FREEBOARD:	~~6.5~~ 7.5'
EAST UNDERDRAIN:	2
WEST LEVEL:	8.5'
**WEST FREEBOARD:	6.5'
WEST UNDERDRAIN:	0

REMARKS: Plant waste 26°
Done monthly

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

SAMPLER: Bass-Pelton
DATE: 10-15-09

CROW BUTTE MINE

Commercial Ponds - Stage Volume Analysis

Elevation from Pond Bottom (ft)	Pond 1 Volume (AF)	Pond 3 Volume (AF)	Pond 4 Volume (AF)	Description
0.0	0.00	0.00	0.00	
0.5	0.24	0.20	0.20	
1.0	0.98	0.80	0.80	
1.5	2.20	1.81	1.81	
2.0	3.90	3.21	3.21	
2.5	5.86	5.02	5.02	
3.0	7.85	7.04	7.04	
3.5	9.86	9.08	9.08	
4.0	11.90	11.15	11.15	
4.5	13.96	13.24	13.24	
5.0	16.05	15.33	15.33	
5.5	18.15	17.47	17.47	
6.0	20.28	19.62	19.62	
6.5	22.43	21.80	21.80	
7.0	24.61	23.99	23.99	
7.5	26.82	26.01	26.01	
8.0	29.05	28.46	28.46	
8.5	31.30	30.72	30.72	
9.0	33.58	33.01	33.01	
9.5	35.88	35.32	35.32	
10.0	38.21	37.66	37.66	
10.5	40.56	40.02	40.02	
11.0	42.93	42.40	42.40	
11.5	45.33	44.80	44.80	
12.0	47.75	47.23	47.23	Max. operating level Pond 1
12.5	50.19	49.68	49.68	Max. operating level Pond 3 & 4
13.0	52.66	52.15	52.15	
13.5	55.16	54.65	54.65	
14.0	57.67	57.18	57.18	Max. emergency level Pond 1
14.5	60.26	59.72	59.72	Max. emergency level Pond 3 & 4
15.0	62.78	62.29	62.29	
15.5	65.37	64.89	64.89	
16.0	67.99	67.51	67.51	
16.5	70.62	70.15	70.15	
17.0	73.29	72.81	72.81	Crest of Pond 1
17.5		75.51	75.51	Crest of Pond 3 & 4

Notes: 1- The maximum storage capacity of the pond system is 117.39 acre feet (AF)

2- Normal operating freeboard level is 5.0 feet, emergency freeboard level is 3.0 feet.

Appendix C-3
Summary of Water Chemistry of Pond Complex

- Summary sheet of the ten samples collected
- Analytical Reports for five Pond Composite Samples from Energy Laboratories, Inc.
- Analytical Reports for five Pond Discharge Samples from Energy Laboratories, Inc.

CROW BU_TE RESOURCES, INC.

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Analyte	Units	Report Limit	7/22/09 Composite	8/06/09 Composite	8/20/09 Composite	9/08/09 Composite	9/24/09 Composite	7/23/09 Discharge	8/06/09 Discharge	8/20/09 Discharge	9/08/09 Discharge	9/24/ Dischar
Alkalinity, Total Carbonate	mg/l	1	3130	3260	3490	3610	3520	1230	630	348	219	1
Carbonate as CO3	mg/l	1	821	885	971	991	972	ND	ND	ND	ND	N
Bicarbonate as HCO3	mg/l	1	2150	2170	2290	2390	2320	1500	769	424	267	2
Ca	mg/l	50	ND	ND	ND	16	ND	103	170	184	79	
Cl	mg/l	30	60900	61600	61600	67100	65100	21400	37200	37500	9870	218
F	mg/l	0.1	1.0	0.9	1.0	1.0	1.0	0.2	0.1	ND	0.3	(
Mg	mg/l	9	54	60	63	65	63	22	20	18	10	
Nitrogen, Ammonia as N	mg/l	0.1	ND	0.3	ND	1.53	7.0	0.20	0.50	0.50	0.40	N
Nitrogen, Nitrate+Nitrite as N	mg/l	0.2	0.62	1.5	0.42	1.1	1.0	4.48	6.7	3.76	2.5	
K	mg/l	20	274	287	298	260	294	39	426	276	33	1
Silica	mg/l	6	64.7	62.0	63.8	63.2	76.0	39.5	47.0	41.0	50.7	52
Na	mg/l	50	45700	48500	49000	48300	48800	15800	24600	28700	7780	146
SO4	mg/l	100	5250	5460	6090	7030	6370	1690	2250	2960	1320	11
Conductivity	µohms/cm	1	140000	139000	141000	205000	142000	58600	78800	93800	35600	567
pH	s.u.	0.01	9.11	9.09	9.03	9.58	9.00	8.01	7.45	7.33	7.17	6.
TDS	mg/l	10	102000	96700	119000	112000	110000	36600	40400	69200	21700	353
Al	mg/l	3	ND	ND	1.3	ND	ND	ND	ND	ND	ND	N
As	mg/l	0.005	0.082	0.115	0.091	0.092	0.088	0.060	0.086	0.046	0.033	0.0
Ba	mg/l	0.1	ND	ND	ND	ND	ND	ND	0.4	0.4	0.1	N
Bo	mg/l	0.1	ND	5.9	4.1	3.9	ND	ND	1.7	1.5	0.5	N
Cd	mg/l	0.005	0.006	0.010	0.007	0.008	0.009	ND	0.010	0.008	ND	N
Cr	mg/l	0.05	ND	0.17	0.05	0.07	ND	ND	0.12	ND	ND	N
Cu	mg/l	0.01	0.18	0.16	0.25	0.38	0.51	0.17	0.35	0.23	0.09	0.
Fe	mg/l	0.06	ND	0.08	0.20	0.15	ND	0.04	0.06	0.06	ND	N
Pb	mg/l	0.002	ND	0.015	0.015	0.001	0.016	0.001	0.030	0.018	ND	0.0
Mn	mg/l	0.01	0.04	0.04	0.05	0.04	0.07	0.06	0.16	0.22	0.15	0.
Hg	mg/l	0.004	0.009	0.033	0.010	0.014	0.009	0.013	0.040	0.018	0.006	N
Mo	mg/l	0.1	10.8	12.2	10.9	11.4	14.8	5.9	10.5	13.6	4.2	4
Ni	mg/l	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	N
Se	mg/l	0.003	0.155	0.153	0.112	0.118	ND	0.258	0.476	0.433	0.203	0.0
U	mg/l	0.003	164	322	378	332	91.8	11.7	25.9	14.3	4.72	1
V	mg/l	0.1	96.1	145	125	121	94.3	90.4	300	163	48.5	1
Zn	mg/l	0.02	0.18	1.02	0.48	0.41	0.29	0.06	0.56	0.15	0.13	0.
Ra-226	pCi/L	0.19	596	475	[illegible]8	977	805	753	2870	7680	[illegible]060	7

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	08/19/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	07/22/09
Lab ID:	C09071122-001	**DateReceived:**	07/29/09
Client Sample ID:	Pond Composite Samples	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	3130	mg/L		1		A2320 B	08/02/09 01:10 / ljl
Carbonate as CO3	821	mg/L		1		A2320 B	08/02/09 01:10 / ljl
Bicarbonate as HCO3	2150	mg/L		1		A2320 B	08/02/09 01:10 / ljl
Calcium	ND	mg/L	D	50		E200.7	08/14/09 16:13 / cp
Chloride	60900	mg/L	D	30		E300.0	08/11/09 14:22 / ljl
Fluoride	1.0	mg/L		0.1		A4500-F C	08/03/09 11:45 / ljl
Magnesium	54	mg/L	D	20		E200.7	08/14/09 16:13 / cp
Nitrogen, Ammonia as N	ND	mg/L		0.05		E350.1	07/30/09 13:56 / eli-b
Nitrogen, Nitrate+Nitrite as N	0.62	mg/L	D	0.03		E353.2	07/31/09 13:59 / eli-b
Potassium	274	mg/L	D	20		E200.7	08/14/09 16:13 / cp
Silica	64.7	mg/L		0.2		E200.8	07/30/09 15:18 / sml
Sodium	45700	mg/L	D	50		E200.7	08/14/09 16:13 / cp
Sulfate	5250	mg/L	D	100		E300.0	08/11/09 14:22 / ljl
PHYSICAL PROPERTIES							
Conductivity	140000	umhos/cm		1		A2510 B	07/29/09 14:20 / tlb
pH	9.11	s.u.		0.01		A4500-H B	07/29/09 14:20 / tlb
Solids, Total Dissolved TDS @ 180 C	102000	mg/L		10		A2540 C	07/29/09 15:57 / tlb
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	07/30/09 15:18 / sml
Arsenic	0.082	mg/L		0.001		E200.8	07/30/09 15:18 / sml
Barium	ND	mg/L		0.1		E200.8	07/30/09 15:18 / sml
Boron	ND	mg/L	D	6		E200.7	08/14/09 16:13 / cp
Cadmium	0.006	mg/L		0.005		E200.8	07/30/09 15:18 / sml
Chromium	ND	mg/L		0.05		E200.8	07/30/09 15:18 / sml
Copper	0.18	mg/L		0.01		E200.8	07/30/09 15:18 / sml
Iron	ND	mg/L		0.03		E200.8	07/30/09 15:18 / sml
Lead	ND	mg/L		0.001		E200.8	07/30/09 15:18 / sml
Manganese	0.04	mg/L		0.01		E200.8	07/30/09 15:18 / sml
Mercury	0.009	mg/L		0.001		E200.8	07/30/09 15:18 / sml
Molybdenum	10.8	mg/L		0.1		E200.8	07/30/09 15:18 / sml
Nickel	ND	mg/L		0.05		E200.8	07/30/09 15:18 / sml
Selenium	0.155	mg/L		0.001		E200.8	07/30/09 15:18 / sml
Uranium	164	mg/L		0.0003		E200.8	08/03/09 21:08 / sml
Vanadium	96.1	mg/L		0.1		E200.8	07/30/09 15:18 / sml
Zinc	0.18	mg/L		0.01		E200.8	07/30/09 15:18 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	596	pCi/L		0.19		E903.0	08/10/09 15:06 / trs
Radium 226 precision (±)	4.9	pCi/L				E903.0	08/10/09 15:06 / trs
Radium 226 MDC	0.19	pCi/L				E903.0	08/10/09 15:06 / trs

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.
D - RL increased due to sample matrix interference.

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	08/19/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	07/22/09
Lab ID:	C09071122-001	**DateReceived:**	07/29/09
Client Sample ID:	Pond Composite Samples	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	2.80	%				Calculation	08/17/09 08:57 / kbh
Anions	1890	meq/L				Calculation	08/17/09 08:57 / kbh
Cations	2000	meq/L				Calculation	08/17/09 08:57 / kbh
Solids, Total Dissolved Calculated	114000	mg/L				Calculation	08/17/09 08:57 / kbh
TDS Balance (0.80 - 1.20)	0.890					Calculation	08/17/09 08:57 / kbh

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

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	08/19/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	07/23/09
Lab ID:	C09071122-002	**DateReceived:**	07/29/09
Client Sample ID:	Pond Discharge Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	1230	mg/L		1		A2320 B	08/02/09 01:20 / ljl
Carbonate as CO3	ND	mg/L		1		A2320 B	08/02/09 01:20 / ljl
Bicarbonate as HCO3	1500	mg/L		1		A2320 B	08/02/09 01:20 / ljl
Calcium	103	mg/L	D	20		E200.7	08/14/09 16:17 / cp
Chloride	21400	mg/L	D	10		E300.0	08/11/09 14:38 / ljl
Fluoride	0.2	mg/L		0.1		A4500-F C	08/03/09 11:49 / ljl
Magnesium	22	mg/L	D	9		E200.7	08/14/09 16:17 / cp
Nitrogen, Ammonia as N	0.20	mg/L		0.05		E350.1	07/30/09 13:57 / eli-b
Nitrogen, Nitrate+Nitrite as N	4.48	mg/L	D	0.02		E353.2	07/31/09 14:00 / eli-b
Potassium	39	mg/L	D	10		E200.7	08/14/09 16:17 / cp
Silica	39.5	mg/L		0.2		E200.8	07/30/09 15:43 / sml
Sodium	15800	mg/L	D	20		E200.7	08/14/09 16:17 / cp
Sulfate	1690	mg/L	D	60		E300.0	08/11/09 14:38 / ljl
PHYSICAL PROPERTIES							
Conductivity	58600	umhos/cm		1		A2510 B	07/29/09 14:22 / tlb
pH	8.01	s.u.		0.01		A4500-H B	07/29/09 14:22 / tlb
Solids, Total Dissolved TDS @ 180 C	36600	mg/L		10		A2540 C	07/29/09 15:57 / tlb
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	07/30/09 15:43 / sml
Arsenic	0.060	mg/L		0.001		E200.8	07/30/09 15:43 / sml
Barium	ND	mg/L		0.1		E200.8	07/30/09 15:43 / sml
Boron	ND	mg/L	D	3		E200.7	08/14/09 16:17 / cp
Cadmium	ND	mg/L		0.005		E200.8	07/30/09 15:43 / sml
Chromium	ND	mg/L		0.05		E200.8	07/30/09 15:43 / sml
Copper	0.17	mg/L		0.01		E200.8	07/30/09 15:43 / sml
Iron	0.04	mg/L		0.03		E200.8	07/30/09 15:43 / sml
Lead	0.001	mg/L		0.001		E200.8	07/30/09 15:43 / sml
Manganese	0.06	mg/L		0.01		E200.8	07/30/09 15:43 / sml
Mercury	0.013	mg/L		0.001		E200.8	07/30/09 15:43 / sml
Molybdenum	5.9	mg/L		0.1		E200.8	07/30/09 15:43 / sml
Nickel	ND	mg/L		0.05		E200.8	07/30/09 15:43 / sml
Selenium	0.258	mg/L		0.001		E200.8	07/30/09 15:43 / sml
Uranium	11.7	mg/L		0.0003		E200.8	07/30/09 15:43 / sml
Vanadium	90.4	mg/L		0.1		E200.8	07/30/09 15:43 / sml
Zinc	0.06	mg/L		0.01		E200.8	07/30/09 15:43 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	753	pCi/L		0.18		E903.0	08/10/09 15:06 / trs
Radium 226 precision (±)	5.4	pCi/L				E903.0	08/10/09 15:06 / trs
Radium 226 MDC	0.18	pCi/L				E903.0	08/10/09 15:06 / trs

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.
D - RL increased due to sample matrix interference.

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	08/19/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	07/23/09
Lab ID:	C09071122-002	**DateReceived:**	07/29/09
Client Sample ID:	Pond Discharge Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	2.33	%				Calculation	08/17/09 08:58 / kbh
Anions	663	meq/L				Calculation	08/17/09 08:58 / kbh
Cations	695	meq/L				Calculation	08/17/09 08:58 / kbh
Solids, Total Dissolved Calculated	39900	mg/L				Calculation	08/17/09 08:58 / kbh
TDS Balance (0.80 - 1.20)	0.920					Calculation	08/17/09 08:58 / kbh

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

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 08/17/09
Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R121763
Sample ID: MBLK	3	Method Blank				Run: MANTECH_090801A				08/01/09 22:03
Alkalinity, Total as CaCO3		2	mg/L	0.2						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		3	mg/L	1						
Sample ID: LCS1		Laboratory Control Sample				Run: MANTECH_090801A				08/01/09 22:18
Alkalinity, Total as CaCO3		200	mg/L	5.0	99	90	110			
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_090801A				08/01/09 22:25
Alkalinity, Total as CaCO3		50.8	mg/L	5.0	97	90	110			
Sample ID: C09071096-013AMS		Sample Matrix Spike				Run: MANTECH_090801A				08/02/09 00:46
Alkalinity, Total as CaCO3		263	mg/L	5.0	100	80	120			
Sample ID: C09071096-013AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090801A				08/02/09 00:53
Alkalinity, Total as CaCO3		258	mg/L	5.0	97	80	120	1.6	20	
Method: A2510 B										Analytical Run: ORION555A-2_090729B
Sample ID: ICV2_090729_2		Initial Calibration Verification Standard								07/29/09 14:18
Conductivity		1440	umhos/cm	1.0	102	90	110			
Method: A2510 B										Batch: 090729_2_PH-W_555A-2
Sample ID: MBLK1_090729_2		Method Blank				Run: ORION555A-2_090729B				07/29/09 14:13
Conductivity		1	umhos/cm	0.2						
Sample ID: C09071142-001ADUP		Sample Duplicate				Run: ORION555A-2_090729B				07/29/09 14:41
Conductivity		2020	umhos/cm	1.0				0.6	10	
Method: A2540 C										Batch: R121679
Sample ID: MBLK1_		Method Blank				Run: BAL-1_090729C				07/29/09 12:47
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	6						
Sample ID: LCS1_		Laboratory Control Sample				Run: BAL-1_090729C				07/29/09 12:47
Solids, Total Dissolved TDS @ 180 C		1020	mg/L	10	102	90	110			
Sample ID: C09071094-001AMS		Sample Matrix Spike				Run: BAL-1_090729C				07/29/09 12:57
Solids, Total Dissolved TDS @ 180 C		20200	mg/L	10	103	90	110			
Sample ID: C09071094-001AMSD		Sample Matrix Spike Duplicate				Run: BAL-1_090729C				07/29/09 12:57
Solids, Total Dissolved TDS @ 180 C		20200	mg/L	10	103	90	110	0	10	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 08/17/09
Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C									Batch: R121817	
Sample ID: MBLK		Method Blank				Run: MANTECH_090803A			08/03/09 10:34	
Fluoride		ND	mg/L	0.05						
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_090803A			08/03/09 10:37	
Fluoride		1.02	mg/L	0.10	102	90	110			
Sample ID: C09071200-001AMS		Sample Matrix Spike				Run: MANTECH_090803A			08/03/09 11:58	
Fluoride		1.44	mg/L	0.10	106	80	120			
Sample ID: C09071200-001AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090803A			08/03/09 12:02	
Fluoride		1.44	mg/L	0.10	106	80	120	0	10	
Method: A4500-H B						Analytical Run: ORION555A-2_090729B				
Sample ID: ICV1_090729_2		Initial Calibration Verification Standard							07/29/09 14:16	
pH		6.85	s.u.	0.010	100	98	102			
Method: A4500-H B									Batch: 090729_2_PH-W_555A-2	
Sample ID: C09071142-001ADUP		Sample Duplicate				Run: ORION555A-2_090729B			07/29/09 14:41	
pH		8.20	s.u.	0.010				0	10	
Method: E300.0									Batch: R122221	
Sample ID: LCS	2	Laboratory Control Sample				Run: IC1-C_090810A			08/10/09 19:22	
Chloride		9.79	mg/L	1.0	97	90	110			
Sulfate		38.9	mg/L	1.0	97	90	110			
Sample ID: MBLK	2	Method Blank				Run: IC1-C_090810A			08/10/09 19:37	
Chloride		0.08	mg/L	0.01						
Sulfate		ND	mg/L	0.06						
Sample ID: C09080251-001AMS	2	Sample Matrix Spike				Run: IC1-C_090810A			08/11/09 15:24	
Chloride		51.2	mg/L	1.0	100	90	110			
Sulfate		392	mg/L	1.0	101	90	110			
Sample ID: C09080251-001AMSD	2	Sample Matrix Spike Duplicate				Run: IC1-C_090810A			08/11/09 15:39	
Chloride		51.7	mg/L	1.0	101	90	110	0.8	20	
Sulfate		392	mg/L	1.0	101	90	110	0.1	20	

Qualifiers:

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MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources | Report Date: 08/17/09
Project: Commercial Evaporation Pond G-8 Samples | Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R122391	
Sample ID: LFB-090814A	5	Laboratory Fortified Blank				Run: ICP2-C_090814A			08/14/09 12:21	
Boron		0.985	mg/L	0.10	96	85	115			
Calcium		49.5	mg/L	0.50	99	85	115			
Magnesium		49.0	mg/L	0.50	98	85	115			
Potassium		45.4	mg/L	0.50	91	85	115			
Sodium		50.2	mg/L	0.50	100	85	115			
Sample ID: MB-090814A	5	Method Blank				Run: ICP2-C_090814A			08/14/09 12:32	
Boron		0.03	mg/L	0.03						
Calcium		ND	mg/L	0.2						
Magnesium		ND	mg/L	0.09						
Potassium		ND	mg/L	0.1						
Sodium		0.4	mg/L	0.2						
Sample ID: C09080007-001CMS2	5	Sample Matrix Spike				Run: ICP2-C_090814A			08/14/09 16:37	
Boron		5.23	mg/L	0.14	103	70	130			
Calcium		674	mg/L	1.3	96	70	130			
Magnesium		305	mg/L	1.0	97	70	130			
Potassium		236	mg/L	1.0	90	70	130			
Sodium		367	mg/L	1.2	101	70	130			
Sample ID: C09080007-001CMSD	5	Sample Matrix Spike Duplicate				Run: ICP2-C_090814A			08/14/09 16:41	
Boron		5.32	mg/L	0.14	104	70	130	1.7	20	
Calcium		671	mg/L	1.3	95	70	130	0.4	20	
Magnesium		309	mg/L	1.0	98	70	130	1.2	20	
Potassium		233	mg/L	1.0	89	70	130	1.2	20	
Sodium		370	mg/L	1.2	102	70	130	0.7	20	

Qualifiers:

RL - Analyte reporting limit.

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MDC - Minimum detectable concentration

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QA/QC Summary Report

'ent: Crow Butte Resources
. . oject: Commercial Evaporation Pond G-8 Samples

Report Date: 08/17/09
Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R121712
Sample ID: LRB	17	Method Blank				Run: ICPMS4-C_090730A				07/30/09 11:26
Aluminum		ND	mg/L	0.0004						
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	4E-05						
Cadmium		ND	mg/L	4E-05						
Chromium		ND	mg/L	4E-05						
Copper		ND	mg/L	7E-05						
Iron		ND	mg/L	0.0006						
Lead		ND	mg/L	2E-05						
Manganese		ND	mg/L	3E-05						
Mercury		5E-05	mg/L	4E-05						
Molybdenum		ND	mg/L	0.0001						
Nickel		ND	mg/L	6E-05						
Selenium		5E-05	mg/L	3E-05						
Silicon		ND	mg/L	0.0003						
Uranium		ND	mg/L	3E-05						
Vanadium		ND	mg/L	4E-05						
Zinc		ND	mg/L	0.0002						
"ample ID: LFB	17	Laboratory Fortified Blank				Run: ICPMS4-C_090730A				07/30/09 11:31
ıminum		0.0566	mg/L	0.0010	111	85	115			
Arsenic		0.0556	mg/L	0.0010	109	85	115			
Barium		0.0557	mg/L	0.0010	109	85	115			
Cadmium		0.0560	mg/L	0.0010	110	85	115			
Chromium		0.0553	mg/L	0.0010	108	85	115			
Copper		0.0562	mg/L	0.0010	110	85	115			
Iron		1.29	mg/L	0.0010	101	85	115			
Lead		0.0548	mg/L	0.0010	107	85	115			
Manganese		0.0568	mg/L	0.0010	111	85	115			
Mercury		0.00550	mg/L	0.0010	107	85	115			
Molybdenum		0.0553	mg/L	0.0010	108	85	115			
Nickel		0.0555	mg/L	0.0010	109	85	115			
Selenium		0.0557	mg/L	0.0010	109	85	115			
Silicon		0.582	mg/L	0.0010	109	85	115			
Uranium		0.0560	mg/L	0.00030	110	85	115			
Vanadium		0.0551	mg/L	0.0010	108	85	115			
Zinc		0.0581	mg/L	0.0010	114	85	115			
Sample ID: C09071122-002CMS4	17	Sample Matrix Spike				Run: ICPMS4-C_090730A				07/30/09 15:48
Aluminum		0.587	mg/L	0.10	106	70	130			
Arsenic		0.582	mg/L	0.0010	104	70	130			
Barium		0.636	mg/L	0.10	112	70	130			
Cadmium		0.501	mg/L	0.010	100	70	130			
Chromium		0.568	mg/L	0.050	110	70	130			
Copper		0.678	mg/L	0.010	102	70	130			

ıalifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources — Report Date: 08/17/09

Project: Commercial Evaporation Pond G-8 Samples — Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R121712
Sample ID: C09071122-002CMS4	17	Sample Matrix Spike				Run: ICPMS4-C_090730A				07/30/09 15:48
Iron		12.3	mg/L	0.030	98	70	130			
Lead		0.566	mg/L	0.050	113	70	130			
Manganese		0.637	mg/L	0.010	115	70	130			
Mercury		0.0662	mg/L	0.0010	106	70	130			
Molybdenum		6.17	mg/L	0.10		70	130			A
Nickel		0.532	mg/L	0.050	101	70	130			
Selenium		0.729	mg/L	0.0010	94	70	130			
Silicon		26.2	mg/L	0.10	155	70	130			S
Uranium		11.8	mg/L	0.00030		70	130			A
Vanadium		89.4	mg/L	0.10		70	130			A
Zinc		0.533	mg/L	0.010	95	70	130			
Sample ID: C09071122-002CMSD	17	Sample Matrix Spike Duplicate				Run: ICPMS4-C_090730A				07/30/09 15:52
Aluminum		0.580	mg/L	0.10	104	70	130	1.1	20	
Arsenic		0.588	mg/L	0.0010	106	70	130	1.1	20	
Barium		0.650	mg/L	0.10	115	70	130	2.3	20	
Cadmium		0.505	mg/L	0.010	100	70	130	0.8	20	
Chromium		0.574	mg/L	0.050	112	70	130	1	20	
Copper		0.688	mg/L	0.010	104	70	130	1.4	20	
Iron		13.3	mg/L	0.030	106	70	130	7.5	20	
Lead		0.572	mg/L	0.050	114	70	130	1.1	20	
Manganese		0.632	mg/L	0.010	114	70	130	0.7	20	
Mercury		0.0678	mg/L	0.0010	110	70	130	2.4	20	
Molybdenum		6.24	mg/L	0.10		70	130	1.2	20	A
Nickel		0.541	mg/L	0.050	103	70	130	1.7	20	
Selenium		0.783	mg/L	0.0010	105	70	130	7.2	20	
Silicon		28.2	mg/L	0.10	195	70	130	7.4	20	S
Uranium		11.7	mg/L	0.00030		70	130	0.6	20	A
Vanadium		92.0	mg/L	0.10		70	130	2.9	20	A
Zinc		0.532	mg/L	0.010	94	70	130	0.2	20	
Method: E200.8										Batch: R121835
Sample ID: LRB		Method Blank				Run: ICPMS4-C_090803A				08/03/09 17:34
Uranium		ND	mg/L	3E-05						
Sample ID: C09071202-009CMS4		Sample Matrix Spike				Run: ICPMS4-C_090803A				08/03/09 20:53
Uranium		0.106	mg/L	0.00030	119	70	130			
Sample ID: C09071202-009CMSD		Sample Matrix Spike Duplicate				Run: ICPMS4-C_090803A				08/03/09 20:58
Uranium		0.111	mg/L	0.00030	129	70	130	4.5	20	
Sample ID: LFB		Laboratory Fortified Blank				Run: ICPMS4-C_090803A				08/04/09 08:20
Uranium		0.0536	mg/L	0.00030	107	85	115			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 08/17/09
Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E350.1										Analytical Run: SUB-B133555
Sample ID: ICV		Initial Calibration Verification Standard								07/30/09 10:05
Nitrogen, Ammonia as N		5.62	mg/L	0.11	103	90	110			
Method: E350.1										Batch: B_R133555
Sample ID: MBLK		Method Blank				Run: SUB-B133555				07/30/09 10:06
Nitrogen, Ammonia as N		ND	mg/L	0.02						
Sample ID: LFB		Laboratory Fortified Blank				Run: SUB-B133555				07/30/09 10:07
Nitrogen, Ammonia as N		1.08	mg/L	0.050	109	90	110			
Sample ID: B09072608-003BMS		Sample Matrix Spike				Run: SUB-B133555				07/30/09 13:21
Nitrogen, Ammonia as N		1.09	mg/L	0.050	111	90	110			S
Sample ID: B09072608-003BMSD		Sample Matrix Spike Duplicate				Run: SUB-B133555				07/30/09 13:22
Nitrogen, Ammonia as N		1.09	mg/L	0.050	111	90	110	0.6	10	S
Sample ID: B09072688-002BMS		Sample Matrix Spike				Run: SUB-B133555				07/30/09 13:37
Nitrogen, Ammonia as N		2.92	mg/L	0.050	116	90	110			S
Sample ID: B09072688-002BMSD		Sample Matrix Spike Duplicate				Run: SUB-B133555				07/30/09 13:38
Nitrogen, Ammonia as N		2.80	mg/L	0.050	103	90	110	4.3	10	
Sample ID: B09072693-002CMS		Sample Matrix Spike				Run: SUB-B133555				07/30/09 13:54
Nitrogen, Ammonia as N		4.38	mg/L	0.050	117	90	110			S
Sample ID: B09072693-002CMSD		Sample Matrix Spike Duplicate				Run: SUB-B133555				07/30/09 13:55
Nitrogen, Ammonia as N		4.78	mg/L	0.050	158	90	110	8.9	10	S
Method: E353.2										Analytical Run: SUB-B133633
Sample ID: ICV		Initial Calibration Verification Standard								07/31/09 10:32
Nitrogen, Nitrate+Nitrite as N		37.3	mg/L	0.032	105	90	110			
Method: E353.2										Batch: B_R133633
Sample ID: MBLK		Method Blank				Run: SUB-B133633				07/31/09 10:33
Nitrogen, Nitrate+Nitrite as N		0.002	mg/L	0.002						
Sample ID: LFB		Laboratory Fortified Blank				Run: SUB-B133633				07/31/09 10:35
Nitrogen, Nitrate+Nitrite as N		0.994	mg/L	0.010	101	90	110			
Sample ID: B09072710-011DMS		Sample Matrix Spike				Run: SUB-B133633				07/31/09 13:47
Nitrogen, Nitrate+Nitrite as N		0.999	mg/L	0.010	99	90	110			
Sample ID: B09072710-011DMSD		Sample Matrix Spike Duplicate				Run: SUB-B133633				07/31/09 13:48
Nitrogen, Nitrate+Nitrite as N		1.00	mg/L	0.010	99	90	110	0.2	10	

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 08/17/09
Work Order: C09071122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-3882
Sample ID: TAP_WATER-MS		Sample Matrix Spike				Run: BERTHOLD 770-2_090803B				08/10/09 16:40
Radium 226		8.5	pCi/L		106	70	130			
Sample ID: TAP_WATER-MSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-2_090803B				08/10/09 16:40
Radium 226		8.6	pCi/L		108	70	130	1.5	23.9	
Sample ID: MB-RA226-3882	3	Method Blank				Run: BERTHOLD 770-2_090803B				08/10/09 16:40
Radium 226		-0.1	pCi/L							U
Radium 226 precision (±)		0.08	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Sample ID: LCS-RA226-3882		Laboratory Control Sample				Run: BERTHOLD 770-2_090803B				08/10/09 16:40
Radium 226		7.6	pCi/L		99	70	130			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

ANALYTICAL SUMMARY REPORT

August 19, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09071122 Quote ID: C1125 - Crow Butte Uranium Project

Project Name: Commercial Evaporation Pond G-8 Samples

Energy Laboratories, Inc. received the following 2 samples for Crow Butte Resources on 7/29/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09071122-001	Pond Composite Samples	07/22/09 00:00	07/29/09	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Conductivity Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Radium 226, Dissolved Solids, Total Dissolved
C09071122-002	Pond Discharge Sample	07/23/09 00:00	07/29/09	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: Stephanie D. Waldrop

Stephanie D. Waldrop
Reporting Supervisor

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CLIENT: Crow Butte Resources **Date:** *19-Aug-09*

Project: Commercial Evaporation Pond G-8 Samples

Sample Delivery Group: C09071122

CASE NARRATIVE

BRANCH LABORATORY SUBCONTRACT ANALYSIS
Tests Associated with Analyst identified as ELI-B were subcontracted to Energy Laboratories Billings Branch, EPA Number MT00005.

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Energy Laboratories Inc
Workorder Receipt Checklist

Crow Butte Resources

C09071122

Login completed by: Corinne Wagner	Date and Time Received: 7/29/2009 9:15 AM
Reviewed by:	Received by: ckw
Reviewed Date:	Carrier name: Ground

…ipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
…dy seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
… seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
…stody present?	Yes ☑	No ☐	
…ly signed when relinquished and received?	Yes ☑	No ☐	
…grees with sample labels?	Yes ☑	No ☐	
…ntainer/bottle?	Yes ☑	No ☐	
…ct?	Yes ☑	No ☐	
…for indicated test?	Yes ☑	No ☐	
All sa… …in holding time?	Yes ☑	No ☐	
Container… …lank temperature:	19°C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	Not Applicable ☐

Contact and Corrective Action Comments:

The nitric acidified bottles for Pond Discharge was received at a pH of 6. 2mLs of HNO3 was added to bring down to a pH of 2.

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/11/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/06/09
Lab ID:	C09080355-001	**DateReceived:**	08/11/09
Client Sample ID:	Pond Composite Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	3260	mg/L		1		A2320 B	08/17/09 11:36 / dvg
Carbonate as CO3	885	mg/L		1		A2320 B	08/17/09 11:36 / dvg
Bicarbonate as HCO3	2170	mg/L		1		A2320 B	08/17/09 11:36 / dvg
Calcium	ND	mg/L	D	50		E200.7	08/24/09 17:24 / cp
Chloride	61600	mg/L	D	30		E300.0	08/13/09 02:34 / ljl
Fluoride	0.9	mg/L		0.1		A4500-F C	08/13/09 12:05 / dvg
Magnesium	60	mg/L	D	20		E200.7	08/24/09 17:24 / cp
Nitrogen, Ammonia as N	0.3	mg/L	D	0.1		E350.1	08/12/09 16:02 / eli-b
Nitrogen, Nitrate+Nitrite as N	1.5	mg/L	D	0.2		E353.2	08/13/09 12:04 / eli-b
Potassium	287	mg/L	D	20		E200.7	08/24/09 17:24 / cp
Silica	62	mg/L	D	6		E200.7	08/31/09 14:58 / cp
Sodium	48500	mg/L	D	50		E200.7	08/24/09 17:24 / cp
Sulfate	5460	mg/L	D	100		E300.0	08/13/09 02:34 / ljl
PHYSICAL PROPERTIES							
Conductivity	139000	umhos/cm		1		A2510 B	08/12/09 12:56 / th
pH	9.09	s.u.		0.01		A4500-H B	08/12/09 12:56 / th
Solids, Total Dissolved TDS @ 180 C	96700	mg/L	H	10		A2540 C	08/19/09 13:12 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L	D	3		E200.7	08/31/09 14:58 / cp
Arsenic	0.115	mg/L	D	0.005		E200.8	08/14/09 15:08 / sml
Barium	ND	mg/L		0.1		E200.8	08/14/09 15:08 / sml
Boron	5.9	mg/L		0.1		E200.8	08/14/09 15:08 / sml
Cadmium	0.010	mg/L		0.005		E200.8	08/14/09 15:08 / sml
Chromium	0.17	mg/L		0.05		E200.8	08/14/09 15:08 / sml
Copper	0.16	mg/L		0.01		E200.8	08/14/09 15:08 / sml
Iron	0.08	mg/L	D	0.06		E200.8	08/14/09 15:08 / sml
Lead	0.015	mg/L	D	0.002		E200.8	08/14/09 15:08 / sml
Manganese	0.04	mg/L		0.01		E200.8	08/14/09 15:08 / sml
Mercury	0.033	mg/L	D	0.004		E200.8	08/14/09 15:08 / sml
Molybdenum	12.2	mg/L		0.1		E200.8	08/14/09 15:08 / sml
Nickel	ND	mg/L		0.05		E200.8	08/14/09 15:08 / sml
Selenium	0.153	mg/L	D	0.003		E200.8	08/14/09 15:08 / sml
Uranium	322	mg/L	D	0.003		E200.8	08/14/09 15:08 / sml
Vanadium	145	mg/L		0.1		E200.8	08/14/09 15:08 / sml
Zinc	1.02	mg/L	D	0.02		E200.8	08/14/09 15:08 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	475	pCi/L		0.18		E903.0	08/25/09 22:31 / trs
Radium 226 precision (±)	4.4	pCi/L				E903.0	08/25/09 22:31 / trs
Radium 226 MDC	0.18	pCi/L				E903.0	08/25/09 22:31 / trs

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/11/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/06/09
Lab ID:	C09080355-001	**DateReceived:**	08/11/09
Client Sample ID:	Pond Composite Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	5.12	%				Calculation	08/25/09 10:03 / kbh
Anions	1920	meq/L				Calculation	08/25/09 10:03 / kbh
Cations	2120	meq/L				Calculation	08/25/09 10:03 / kbh
Solids, Total Dissolved Calculated	118000	mg/L				Calculation	08/25/09 10:03 / kbh
TDS Balance (0.80 - 1.20)	0.820					Calculation	08/25/09 10:03 / kbh

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

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/11/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/06/09
Lab ID:	C09080355-002	**DateReceived:**	08/11/09
Client Sample ID:	Pond Discharge Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	630	mg/L		1		A2320 B	08/17/09 11:44 / dvg
Carbonate as CO3	ND	mg/L		1		A2320 B	08/17/09 11:44 / dvg
Bicarbonate as HCO3	769	mg/L		1		A2320 B	08/17/09 11:44 / dvg
Calcium	170	mg/L	D	50		E200.7	08/24/09 17:28 / cp
Chloride	37200	mg/L	D	10		E300.0	08/13/09 02:50 / ljl
Fluoride	0.1	mg/L		0.1		A4500-F C	08/13/09 12:09 / dvg
Magnesium	20	mg/L	D	20		E200.7	08/24/09 17:28 / cp
Nitrogen, Ammonia as N	0.5	mg/L	D	0.1		E350.1	08/12/09 16:04 / eli-b
Nitrogen, Nitrate+Nitrite as N	6.7	mg/L	D	0.2		E353.2	08/13/09 12:06 / eli-b
Potassium	426	mg/L	D	20		E200.7	08/24/09 17:28 / cp
Silica	47	mg/L	D	3		E200.7	08/31/09 15:02 / cp
Sodium	24600	mg/L	D	50		E200.7	08/24/09 17:28 / cp
Sulfate	2250	mg/L	D	60		E300.0	08/13/09 02:50 / ljl
PHYSICAL PROPERTIES							
Conductivity	78800	umhos/cm		1		A2510 B	08/12/09 12:57 / th
pH	7.45	s.u.		0.01		A4500-H B	08/12/09 12:57 / th
Solids, Total Dissolved TDS @ 180 C	40400	mg/L	H	10		A2540 C	08/19/09 13:13 / dd
METALS - DISSOLVED							
Aluminum	ND	mg/L	D	1		E200.7	08/31/09 15:02 / cp
Arsenic	0.086	mg/L	D	0.005		E200.8	08/14/09 15:13 / sml
Barium	0.4	mg/L		0.1		E200.8	08/14/09 15:13 / sml
Boron	1.7	mg/L		0.1		E200.8	08/14/09 15:13 / sml
Cadmium	0.010	mg/L		0.005		E200.8	08/14/09 15:13 / sml
Chromium	0.12	mg/L		0.05		E200.8	08/14/09 15:13 / sml
Copper	0.35	mg/L		0.01		E200.8	08/14/09 15:13 / sml
Iron	0.06	mg/L	D	0.06		E200.8	08/14/09 15:13 / sml
Lead	0.030	mg/L	D	0.002		E200.8	08/14/09 15:13 / sml
Manganese	0.16	mg/L		0.01		E200.8	08/14/09 15:13 / sml
Mercury	0.040	mg/L	D	0.004		E200.8	08/14/09 15:13 / sml
Molybdenum	10.5	mg/L		0.1		E200.8	08/14/09 15:13 / sml
Nickel	ND	mg/L		0.05		E200.8	08/14/09 15:13 / sml
Selenium	0.476	mg/L	D	0.003		E200.8	08/14/09 15:13 / sml
Uranium	25.9	mg/L	D	0.003		E200.8	08/14/09 15:13 / sml
Vanadium	300	mg/L		0.1		E200.8	08/14/09 15:13 / sml
Zinc	0.56	mg/L	D	0.02		E200.8	08/14/09 15:13 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	2870	pCi/L		0.16		E903.0	08/25/09 22:31 / trs
Radium 226 precision (±)	9.9	pCi/L				E903.0	08/25/09 22:31 / trs
Radium 226 MDC	0.16	pCi/L				E903.0	08/25/09 22:31 / trs

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
H - Analysis performed past recommended holding time.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples
Lab ID: C09080355-002
Client Sample ID: Pond Discharge Sample

Report Date: 09/11/09
Collection Date: 08/06/09
DateReceived: 08/11/09
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	-0.704	%				Calculation	08/25/09 10:04 / kbh
Anions	1110	meq/L				Calculation	08/25/09 10:04 / kbh
Cations	1090	meq/L				Calculation	08/25/09 10:04 / kbh
Solids, Total Dissolved Calculated	65100	mg/L				Calculation	08/25/09 10:04 / kbh
TDS Balance (0.80 - 1.20)	0.620					Calculation	08/25/09 10:04 / kbh

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

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QA/QC Summary Report

Client: Crow Butte Resources | Report Date: 09/11/09
Project: Commercial Evaporation Pond G-8 Samples | Work Order: C09080355

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B								Batch: R122453		
Sample ID: MBLK	3	Method Blank				Run: MANTECH_090817A			08/17/09 10:55	
Alkalinity, Total as CaCO3		3	mg/L	0.2						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		4	mg/L	1						
Sample ID: LCS1		Laboratory Control Sample				Run: MANTECH_090817A			08/17/09 11:10	
Alkalinity, Total as CaCO3		200	mg/L	5.0	98	90	110			
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_090817A			08/17/09 11:17	
Alkalinity, Total as CaCO3		51.3	mg/L	5.0	96	90	110			
Sample ID: C09080484-001AMS		Sample Matrix Spike				Run: MANTECH_090817A			08/17/09 12:28	
Alkalinity, Total as CaCO3		245	mg/L	5.0	103	80	120			
Sample ID: C09080484-001AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090817A			08/17/09 12:35	
Alkalinity, Total as CaCO3		240	mg/L	5.0	99	80	120	2.1	20	
Method: A2510 B								Analytical Run: ORION555A-2_090812A		
Sample ID: ICV2_090812_1		Initial Calibration Verification Standard							08/12/09 12:36	
Conductivity		1430	umhos/cm	1.0	101	90	110			
Method: A2510 B								Batch: 090812_1__555A-2		
Sample ID: MBLK1_090812_1		Method Blank				Run: ORION555A-2_090812A			08/12/09 12:31	
Conductivity		0.9	umhos/cm	0.2						
Sample ID: C09080355-002BDUP		Sample Duplicate				Run: ORION555A-2_090812A			08/12/09 12:59	
Conductivity		79300	umhos/cm	1.0				0.6	10	
Method: A2540 C								Batch: 090819_1_SLDS-TDS-W		
Sample ID: MBLK1_090819		Method Blank				Run: BAL-1_090819A			08/19/09 10:14	
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	6						
Sample ID: LCS1_090819		Laboratory Control Sample				Run: BAL-1_090819A			08/19/09 10:14	
Solids, Total Dissolved TDS @ 180 C		1000	mg/L	10	100	90	110			
Sample ID: C09071232-004AMS		Sample Matrix Spike				Run: BAL-1_090819A			08/19/09 13:10	
Solids, Total Dissolved TDS @ 180 C		3540	mg/L	10	99	90	110			
Sample ID: C09071232-004AMSD		Sample Matrix Spike Duplicate				Run: BAL-1_090819A			08/19/09 13:11	
Solids, Total Dissolved TDS @ 180 C		3470	mg/L	10	96	90	110	1.9	10	
Sample ID: C09080383-002DMS		Sample Matrix Spike				Run: BAL-1_090819A			08/19/09 13:14	
Solids, Total Dissolved TDS @ 180 C		4020	mg/L	10	102	90	110			
Sample ID: C09080383-002DMSD		Sample Matrix Spike Duplicate				Run: BAL-1_090819A			08/19/09 13:15	
Solids, Total Dissolved TDS @ 180 C		4000	mg/L	10	101	90	110	0.5	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples
Report Date: 09/11/09
Work Order: C09080355

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C										Batch: R122309
Sample ID: MBLK-1		Method Blank				Run: MANTECH_090813A				08/13/09 11:26
Fluoride		ND	mg/L	0.05						
Sample ID: LCS-1		Laboratory Control Sample				Run: MANTECH_090813A				08/13/09 11:28
Fluoride		0.980	mg/L	0.10	98	90	110			
Sample ID: C09080344-003BMS		Sample Matrix Spike				Run: MANTECH_090813A				08/13/09 11:51
Fluoride		1.32	mg/L	0.10	99	80	120			
Sample ID: C09080344-003BMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090813A				08/13/09 11:53
Fluoride		1.30	mg/L	0.10	97	80	120	1.5	10	
Method: A4500-H B										Analytical Run: ORION555A-2_090812A
Sample ID: ICV1_090812_1		Initial Calibration Verification Standard								08/12/09 12:34
pH		6.96	s.u.	0.010	101	98	102			
Method: A4500-H B										Batch: 090812_1__555A-2
Sample ID: C09080355-002BDUP		Sample Duplicate				Run: ORION555A-2_090812A				08/12/09 12:59
pH		7.44	s.u.	0.010				0.1	10	
Method: E200.7										Batch: R122798
Sample ID: MB-090821A	4	Method Blank				Run: ICP2-C_090824A				08/24/09 13:42
Calcium		ND	mg/L	0.2						
Magnesium		ND	mg/L	0.09						
Potassium		ND	mg/L	0.1						
Sodium		ND	mg/L	0.2						
Sample ID: LFB-090821A	4	Laboratory Fortified Blank				Run: ICP2-C_090824A				08/24/09 13:46
Calcium		50.9	mg/L	0.50	102	85	115			
Magnesium		50.4	mg/L	0.50	101	85	115			
Potassium		46.9	mg/L	0.50	94	85	115			
Sodium		50.5	mg/L	0.50	101	85	115			
Sample ID: C09080620-001BMS2	4	Sample Matrix Spike				Run: ICP2-C_090824A				08/24/09 17:40
Calcium		150	mg/L	0.51	99	70	130			
Magnesium		120	mg/L	0.50	101	70	130			
Potassium		99	mg/L	0.50	94	70	130			
Sodium		150	mg/L	0.50	104	70	130			
Sample ID: C09080620-001BMSD	4	Sample Matrix Spike Duplicate				Run: ICP2-C_090824A				08/24/09 17:44
Calcium		150	mg/L	0.51	101	70	130	1.4	20	
Magnesium		120	mg/L	0.50	101	70	130	0.2	20	
Potassium		97	mg/L	0.50	92	70	130	2.2	20	
Sodium		150	mg/L	0.50	107	70	130	1.8	20	

Qualifiers:

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MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources **Report Date:** 09/11/09
Project: Commercial Evaporation Pond G-8 Samples **Work Order:** C09080355

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.7**									Batch: R123143	
Sample ID: MB-090831A	2	Method Blank				Run: ICP2-C_090831A			08/31/09 13:42	
Aluminum		ND	mg/L	0.03						
Silicon		0.02	mg/L	0.01						
Sample ID: LFB-090831A	2	Laboratory Fortified Blank				Run: ICP2-C_090831A			08/31/09 13:46	
Aluminum		0.933	mg/L	0.10	93	85	115			
Silicon		0.460	mg/L	0.015	97	85	115			
Sample ID: C09080777-003AMS2	2	Sample Matrix Spike				Run: ICP2-C_090831A			08/31/09 15:34	
Aluminum		2.5	mg/L	0.10	101	70	130			
Silicon		2.2	mg/L	0.10	105	70	130			
Sample ID: C09080777-003AMSD	2	Sample Matrix Spike Duplicate				Run: ICP2-C_090831A			08/31/09 15:38	
Aluminum		2.7	mg/L	0.10	108	70	130	5.5	20	
Silicon		2.2	mg/L	0.10	105	70	130	0.1	20	

Qualifiers:

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QA/QC Summary Report

Client: Crow Butte Resources **Report Date:** 09/11/09
Project: Commercial Evaporation Pond G-8 Samples **Work Order:** C09080355

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R122400
Sample ID: LRB	16	Method Blank				Run: ICPMS4-C_090814A				08/14/09 12:56
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	4E-05						
Boron		ND	mg/L	0.0004						
Cadmium		ND	mg/L	4E-05						
Chromium		ND	mg/L	4E-05						
Copper		ND	mg/L	7E-05						
Iron		ND	mg/L	0.0006						
Lead		ND	mg/L	2E-05						
Manganese		ND	mg/L	3E-05						
Mercury		ND	mg/L	4E-05						
Molybdenum		ND	mg/L	0.0001						
Nickel		ND	mg/L	6E-05						
Selenium		5E-05	mg/L	3E-05						
Uranium		ND	mg/L	3E-05						
Vanadium		ND	mg/L	4E-05						
Zinc		ND	mg/L	0.0002						
Sample ID: LFB	16	Laboratory Fortified Blank				Run: ICPMS4-C_090814A				08/14/09 13:01
Arsenic		0.0533	mg/L	0.0010	107	85	115			
Barium		0.0527	mg/L	0.0010	105	85	115			
Boron		0.0531	mg/L	0.0010	106	85	115			
Cadmium		0.0530	mg/L	0.0010	106	85	115			
Chromium		0.0527	mg/L	0.0010	105	85	115			
Copper		0.0535	mg/L	0.0010	107	85	115			
Iron		1.36	mg/L	0.0010	109	85	115			
Lead		0.0536	mg/L	0.0010	107	85	115			
Manganese		0.0516	mg/L	0.0010	103	85	115			
Mercury		0.00519	mg/L	0.0010	104	85	115			
Molybdenum		0.0527	mg/L	0.0010	105	85	115			
Nickel		0.0535	mg/L	0.0010	107	85	115			
Selenium		0.0538	mg/L	0.0010	107	85	115			
Uranium		0.0501	mg/L	0.00030	100	85	115			
Vanadium		0.0527	mg/L	0.0010	105	85	115			
Zinc		0.0542	mg/L	0.0010	108	85	115			
Sample ID: C09080487-003BMS4	16	Sample Matrix Spike				Run: ICPMS4-C_090814A				08/14/09 15:49
Arsenic		0.0537	mg/L	0.0010	105	70	130			
Barium		0.0609	mg/L	0.0010	101	70	130			
Boron		0.105	mg/L	0.10	117	70	130			
Cadmium		0.0520	mg/L	0.010	104	70	130			
Chromium		0.0536	mg/L	0.050	107	70	130			
Copper		0.0526	mg/L	0.010	105	70	130			
Iron		1.35	mg/L	0.030	107	70	130			
Lead		0.0530	mg/L	0.050	106	70	130			

Qualifiers:

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MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources | Report Date: 09/11/09
Project: Commercial Evaporation Pond G-8 Samples | Work Order: C09080355

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Batch: R122400	
Sample ID: C09080487-003BMS4	16	Sample Matrix Spike			Run: ICPMS4-C_090814A				08/14/09 15:49	
Manganese		0.0616	mg/L	0.010	112	70	130			
Mercury		0.00520	mg/L	0.0010	103	70	130			
Molybdenum		0.0550	mg/L	0.0010	107	70	130			
Nickel		0.0524	mg/L	0.050	104	70	130			
Selenium		0.0543	mg/L	0.0010	108	70	130			
Uranium		0.0541	mg/L	0.0010	102	70	130			
Vanadium		0.0559	mg/L	0.010	110	70	130			
Zinc		0.0563	mg/L	0.0010	107	70	130			
Sample ID: C09080487-003BMSD	15	Sample Matrix Spike Duplicate			Run: ICPMS4-C_090814A				08/14/09 16:15	
Arsenic		0.0542	mg/L	0.0010	106	70	130	0.8	20	
Barium		0.0622	mg/L	0.0010	104	70	130	2.1	20	
Boron		0.103	mg/L	0.10	114	70	130	1.7	20	
Cadmium		0.0526	mg/L	0.010	105	70	130	1.1	20	
Chromium		0.0545	mg/L	0.050	109	70	130	1.7	20	
Copper		0.0523	mg/L	0.010	104	70	130	0.5	20	
Iron		1.38	mg/L	0.030	110	70	130	2.1	20	
Lead		0.0542	mg/L	0.050	108	70	130	2.2	20	
Manganese		0.0625	mg/L	0.010	114	70	130	1.4	20	
Mercury		0.00538	mg/L	0.0010	106	70	130	3.3	20	
Molybdenum		0.0557	mg/L	0.0010	109	70	130	1.2	20	
Nickel		0.0524	mg/L	0.050	104	70	130	0	20	
Selenium		0.0559	mg/L	0.0010	111	70	130	2.9	20	
Vanadium		0.0553	mg/L	0.0010	109	70	130	0.9	20	
Zinc		0.0563	mg/L	0.010	107	70	130	0.1	20	
Method: E300.0									Batch: R122306	
Sample ID: LCS	2	Laboratory Control Sample			Run: IC1-C_090812A				08/12/09 19:38	
Chloride		9.86	mg/L	1.0	99	90	110			
Sulfate		39.7	mg/L	1.0	99	90	110			
Sample ID: MBLK	2	Method Blank			Run: IC1-C_090812A				08/12/09 19:54	
Chloride		ND	mg/L	0.01						
Sulfate		ND	mg/L	0.06						
Sample ID: C09080382-001AMS	2	Sample Matrix Spike			Run: IC1-C_090812A				08/13/09 04:22	
Chloride		101	mg/L	1.0	101	90	110			
Sulfate		285	mg/L	1.0	104	90	110			
Sample ID: C09080382-001AMSD	2	Sample Matrix Spike Duplicate			Run: IC1-C_090812A				08/13/09 04:38	
Chloride		103	mg/L	1.0	106	90	110	2	20	
Sulfate		291	mg/L	1.0	107	90	110	2.1	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples
Report Date: 09/11/09
Work Order: C09080355

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E350.1									Batch: B_R134186	
Sample ID: MBLK		Method Blank				Run: SUB-B134186			08/12/09 10:04	
Nitrogen, Ammonia as N		ND	mg/L	0.02						
Sample ID: LFB		Laboratory Fortified Blank				Run: SUB-B134186			08/12/09 10:06	
Nitrogen, Ammonia as N		1.03	mg/L	0.050	104	90	110			
Sample ID: B09080903-002CMS		Sample Matrix Spike				Run: SUB-B134186			08/12/09 10:28	
Nitrogen, Ammonia as N		0.991	mg/L	0.050	101	90	110			
Sample ID: B09080903-002CMSD		Sample Matrix Spike Duplicate				Run: SUB-B134186			08/12/09 10:29	
Nitrogen, Ammonia as N		1.00	mg/L	0.050	102	90	110	0.9	10	
Method: E353.2									Batch: B_R134288	
Sample ID: MBLK		Method Blank				Run: SUB-B134288			08/13/09 09:53	
Nitrogen, Nitrate+Nitrite as N		0.006	mg/L	0.002						
Sample ID: LFB		Laboratory Fortified Blank				Run: SUB-B134288			08/13/09 09:54	
Nitrogen, Nitrate+Nitrite as N		1.06	mg/L	0.010	107	90	110			
Sample ID: B09081061-001EMS		Sample Matrix Spike				Run: SUB-B134288			08/13/09 10:50	
Nitrogen, Nitrate+Nitrite as N		1.14	mg/L	0.010	103	90	110			
Sample ID: B09081061-001EMSD		Sample Matrix Spike Duplicate				Run: SUB-B134288			08/13/09 10:51	
Nitrogen, Nitrate+Nitrite as N		1.13	mg/L	0.010	102	90	110	0.6	10	
Sample ID: B09081082-002AMS		Sample Matrix Spike				Run: SUB-B134288			08/13/09 11:49	
Nitrogen, Nitrate+Nitrite as N		1.06	mg/L	0.010	106	90	110			
Sample ID: B09081082-002AMSD		Sample Matrix Spike Duplicate				Run: SUB-B134288			08/13/09 11:50	
Nitrogen, Nitrate+Nitrite as N		1.05	mg/L	0.010	105	90	110	0.8	10	
Method: E903.0									Batch: RA226-3913	
Sample ID: C09080528-001DMS		Sample Matrix Spike				Run: BERTHOLD 770-1_090819B			08/25/09 22:31	
Radium 226		11.0	pCi/L		97	70	130			
Sample ID: C09080528-001DMSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_090819B			08/25/09 22:31	
Radium 226		10.5	pCi/L		93	70	130	4.9	23.8	
Sample ID: MB-RA226-3913	3	Method Blank				Run: BERTHOLD 770-1_090819B			08/26/09 02:05	
Radium 226		-0.1	pCi/L							U
Radium 226 precision (±)		0.06	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Sample ID: LCS-RA226-3913		Laboratory Control Sample				Run: BERTHOLD 770-1_090819B			08/26/09 02:05	
Radium 226		6.8	pCi/L		88	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

ANALYTICAL SUMMARY REPORT

September 11, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09080355 Quote ID: C1125 - Crow Butte Uranium Project

Project Name: Commercial Evaporation Pond G-8 Samples

Energy Laboratories, Inc. received the following 2 samples for Crow Butte Resources on 8/11/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09080355-001	Pond Composite Sample	08/06/09 00:00	08/11/09	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Conductivity Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Radium 226, Dissolved Solids, Total Dissolved
C09080355-002	Pond Discharge Sample	08/06/09 00:00	08/11/09	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: Stephanie D. Waldrop

Stephanie D. Waldrop
Reporting Supervisor

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CLIENT: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples
Sample Delivery Group: C09080355

Date: *11-Sep-09*

CASE NARRATIVE

BRANCH LABORATORY SUBCONTRACT ANALYSIS
Tests Associated with Analyst identified as ELI-B were subcontracted to Energy Laboratories Billings Branch, EPA Number MT00005.

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Energy Laboratories Inc
Workorder Receipt Checklist

Crow Butte Resources

C09080355

Login completed by: Corinne Wagner

Date and Time Received: 8/11/2009 9:15 AM

Reviewed by:

Received by: al

Reviewed Date:

Carrier name: Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature:	21°C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Contact and Corrective Action Comments:

2mLs of HNO3 was added to all radiochem bottles and 1mL of H2SO4 was added to the nitrate/ammonia bottle for the Pond Composite sample to bring them down to a pH of 2.

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/16/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/20/09
Lab ID:	C09080916-001	**DateReceived:**	08/25/09
Client Sample ID:	Pond Composite	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	3490	mg/L		1		A2320 B	08/28/09 20:38 / dvg
Carbonate as CO3	971	mg/L		1		A2320 B	08/28/09 20:38 / dvg
Bicarbonate as HCO3	2290	mg/L		1		A2320 B	08/28/09 20:38 / dvg
Calcium	ND	mg/L	D	50		E200.7	09/14/09 14:08 / cp
Chloride	61600	mg/L	D	80		E300.0	08/28/09 03:01 / ljl
Fluoride	1.0	mg/L		0.1		A4500-F C	09/03/09 14:30 / dvg
Magnesium	63	mg/L	D	20		E200.7	09/14/09 14:08 / cp
Nitrogen, Ammonia as N	ND	mg/L	D	0.1		E350.1	08/26/09 15:04 / eli-b
Nitrogen, Nitrate+Nitrite as N	0.42	mg/L	D	0.03		E353.2	08/28/09 13:44 / eli-b
Potassium	298	mg/L	D	20		E200.7	09/14/09 14:08 / cp
Silica	63.8	mg/L		0.2		E200.8	08/27/09 15:18 / sml
Sodium	49000	mg/L	D	50		E200.7	09/14/09 14:08 / cp
Sulfate	6090	mg/L	D	200		E300.0	08/28/09 03:01 / ljl
PHYSICAL PROPERTIES							
Conductivity	141000	umhos/cm		1		A2510 B	08/26/09 14:25 / dd
pH	9.03	s.u.		0.01		A4500-H B	08/26/09 14:25 / dd
Solids, Total Dissolved TDS @ 180 C	119000	mg/L		10		A2540 C	08/26/09 20:40 / dnp
METALS - DISSOLVED							
Aluminum	1.3	mg/L		0.1		E200.8	08/27/09 15:18 / sml
Arsenic	0.091	mg/L		0.001		E200.8	08/27/09 15:18 / sml
Barium	ND	mg/L		0.1		E200.8	08/27/09 15:18 / sml
Boron	4.1	mg/L		0.1		E200.8	08/27/09 15:18 / sml
Cadmium	0.007	mg/L		0.005		E200.8	08/27/09 15:18 / sml
Chromium	0.05	mg/L		0.05		E200.8	08/27/09 15:18 / sml
Copper	0.25	mg/L		0.01		E200.8	08/27/09 15:18 / sml
Iron	0.20	mg/L		0.03		E200.8	08/27/09 15:18 / sml
Lead	0.015	mg/L	D	0.002		E200.8	08/28/09 18:26 / sml
Manganese	0.05	mg/L		0.01		E200.8	08/27/09 15:18 / sml
Mercury	0.010	mg/L	D	0.004		E200.8	08/28/09 18:26 / sml
Molybdenum	10.9	mg/L		0.1		E200.8	08/27/09 15:18 / sml
Nickel	ND	mg/L		0.05		E200.8	08/27/09 15:18 / sml
Selenium	0.112	mg/L		0.001		E200.8	08/27/09 15:18 / sml
Uranium	378	mg/L	D	0.003		E200.8	08/28/09 18:26 / sml
Vanadium	125	mg/L		0.1		E200.8	08/27/09 15:18 / sml
Zinc	0.48	mg/L		0.01		E200.8	08/27/09 15:18 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	948	pCi/L		0.19		E903.0	09/08/09 18:20 / jah
Radium 226 precision (±)	6.0	pCi/L				E903.0	09/08/09 18:20 / jah
Radium 226 MDC	0.19	pCi/L				E903.0	09/08/09 18:20 / jah

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.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/16/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/20/09
Lab ID:	C09080916-001	**DateReceived:**	08/25/09
Client Sample ID:	Pond Composite	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	5.12	%				Calculation	09/15/09 09:48 / kbh
Anions	1930	meq/L				Calculation	09/15/09 09:48 / kbh
Cations	2140	meq/L				Calculation	09/15/09 09:48 / kbh
Solids, Total Dissolved Calculated	119000	mg/L				Calculation	09/15/09 09:48 / kbh
TDS Balance (0.80 - 1.20)	1.00					Calculation	09/15/09 09:48 / kbh

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

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/16/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/20/09
Lab ID:	C09080916-002	**DateReceived:**	08/25/09
Client Sample ID:	Pond Discharge	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	348	mg/L		1		A2320 B	08/28/09 20:45 / dvg
Carbonate as CO3	ND	mg/L		1		A2320 B	08/28/09 20:45 / dvg
Bicarbonate as HCO3	424	mg/L		1		A2320 B	08/28/09 20:45 / dvg
Calcium	184	mg/L	D	20		E200.7	09/14/09 14:25 / cp
Chloride	37500	mg/L	D	40		E300.0	08/28/09 03:16 / ljl
Fluoride	ND	mg/L		0.1		A4500-F C	09/03/09 14:34 / dvg
Magnesium	18	mg/L	D	9		E200.7	09/14/09 14:25 / cp
Nitrogen, Ammonia as N	0.5	mg/L	D	0.1		E350.1	08/26/09 15:14 / eli-b
Nitrogen, Nitrate+Nitrite as N	3.76	mg/L	D	0.03		E353.2	08/28/09 13:45 / eli-b
Potassium	276	mg/L	D	10		E200.7	09/14/09 14:25 / cp
Silica	41.0	mg/L		0.2		E200.8	08/27/09 15:23 / sml
Sodium	28700	mg/L	D	20		E200.7	09/14/09 14:25 / cp
Sulfate	2960	mg/L	D	100		E300.0	08/28/09 03:16 / ljl
PHYSICAL PROPERTIES							
Conductivity	93800	umhos/cm		1		A2510 B	08/26/09 14:26 / dd
pH	7.33	s.u.		0.01		A4500-H B	08/26/09 14:26 / dd
Solids, Total Dissolved TDS @ 180 C	69200	mg/L		10		A2540 C	08/26/09 20:41 / dnp
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	08/27/09 15:23 / sml
Arsenic	0.046	mg/L		0.001		E200.8	08/27/09 15:23 / sml
Barium	0.4	mg/L		0.1		E200.8	08/27/09 15:23 / sml
Boron	1.5	mg/L		0.1		E200.8	08/27/09 15:23 / sml
Cadmium	0.008	mg/L		0.005		E200.8	08/27/09 15:23 / sml
Chromium	ND	mg/L		0.05		E200.8	08/27/09 15:23 / sml
Copper	0.23	mg/L		0.01		E200.8	08/27/09 15:23 / sml
Iron	0.06	mg/L		0.03		E200.8	08/27/09 15:23 / sml
Lead	0.018	mg/L		0.001		E200.8	08/27/09 15:23 / sml
Manganese	0.22	mg/L		0.01		E200.8	08/27/09 15:23 / sml
Mercury	0.018	mg/L		0.001		E200.8	08/27/09 15:23 / sml
Molybdenum	13.6	mg/L		0.1		E200.8	08/27/09 15:23 / sml
Nickel	ND	mg/L		0.05		E200.8	08/27/09 15:23 / sml
Selenium	0.433	mg/L		0.001		E200.8	08/27/09 15:23 / sml
Uranium	14.3	mg/L	D	0.0006		E200.8	08/27/09 15:23 / sml
Vanadium	163	mg/L		0.1		E200.8	08/27/09 15:23 / sml
Zinc	0.15	mg/L		0.01		E200.8	08/27/09 15:23 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	7680	pCi/L		0.20		E903.0	09/08/09 18:20 / jah
Radium 226 precision (±)	18	pCi/L				E903.0	09/08/09 18:20 / jah
Radium 226 MDC	0.20	pCi/L				E903.0	09/08/09 18:20 / jah

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.
D - RL increased due to sample matrix interference.

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	09/16/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	08/20/09
Lab ID:	C09080916-002	**DateReceived:**	08/25/09
Client Sample ID:	Pond Discharge	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	5.83	%				Calculation	09/15/09 09:54 / kbh
Anions	1130	meq/L				Calculation	09/15/09 09:54 / kbh
Cations	1270	meq/L				Calculation	09/15/09 09:54 / kbh
Solids, Total Dissolved Calculated	69900	mg/L				Calculation	09/15/09 09:54 / kbh
TDS Balance (0.80 - 1.20)	0.990					Calculation	09/15/09 09:54 / kbh

- The Anion / Cation balance was confirmed by re-analysis.

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

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 09/16/09
Work Order: C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R123058
Sample ID: MBLK	3	Method Blank				Run: MANTECH_090828A				08/28/09 14:36
Alkalinity, Total as CaCO3		2	mg/L	0.2						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		3	mg/L	1						
Sample ID: LCS1		Laboratory Control Sample				Run: MANTECH_090828A				08/28/09 14:51
Alkalinity, Total as CaCO3		200	mg/L	5.0	99	90	110			
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_090828A				08/28/09 14:59
Alkalinity, Total as CaCO3		54.7	mg/L	5.0	105	90	110			
Sample ID: C09080914-001AMS		Sample Matrix Spike				Run: MANTECH_090828A				08/28/09 19:56
Alkalinity, Total as CaCO3		329	mg/L	5.0	101	80	120			
Sample ID: C09080914-001AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090828A				08/28/09 20:04
Alkalinity, Total as CaCO3		337	mg/L	5.0	107	80	120	2.3	20	
Method: A2510 B										Analytical Run: ORION555A-2_090826B
Sample ID: ICV2_090826_2		Initial Calibration Verification Standard								08/26/09 13:32
Conductivity		1380	umhos/cm	1.0	98	90	110			
Method: A2510 B										Batch: 090826_2_PH-W_555A-2
Sample ID: MBLK1_090826_2		Method Blank				Run: ORION555A-2_090826B				08/26/09 13:28
Conductivity		2	umhos/cm	0.2						
Sample ID: C09080911-006ADUP		Sample Duplicate				Run: ORION555A-2_090826B				08/26/09 13:53
Conductivity		1930	umhos/cm	1.0				0.1	10	
Method: A2540 C										Batch: 090826_4_SLDS-TDS-W
Sample ID: MBLK1_090826		Method Blank				Run: BAL-1_090826D				08/26/09 17:13
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	6						
Sample ID: LCS1_090826		Laboratory Control Sample				Run: BAL-1_090826D				08/26/09 17:13
Solids, Total Dissolved TDS @ 180 C		994	mg/L	10	99	90	110			
Sample ID: C09080917-004AMS		Sample Matrix Spike				Run: BAL-1_090826D				08/26/09 20:41
Solids, Total Dissolved TDS @ 180 C		2730	mg/L	10	104	90	110			
Sample ID: C09080917-004AMSD		Sample Matrix Spike Duplicate				Run: BAL-1_090826D				08/26/09 20:42
Solids, Total Dissolved TDS @ 180 C		2740	mg/L	10	104	90	110	0.4	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 09/16/09
Work Order: C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C									Batch: R123317	
Sample ID: MBLK		Method Blank				Run: MANTECH_090903B			09/03/09 13:32	
Fluoride		ND	mg/L	0.05						
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_090903B			09/03/09 13:34	
Fluoride		1.02	mg/L	0.10	102	90	110			
Sample ID: C09080922-005AMS		Sample Matrix Spike				Run: MANTECH_090903B			09/03/09 14:57	
Fluoride		2.12	mg/L	0.10	106	80	120			
Sample ID: C09080922-005AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090903B			09/03/09 15:02	
Fluoride		2.12	mg/L	0.10	106	80	120	0	10	
Method: A4500-H B							Analytical Run: ORION555A-2_090826B			
Sample ID: ICV1_090826_2		Initial Calibration Verification Standard							08/26/09 13:30	
pH		6.94	s.u.	0.010	101	98	102			
Method: A4500-H B							Batch: 090826_2_PH-W_555A-2			
Sample ID: C09080914-002ADUP		Sample Duplicate				Run: ORION555A-2_090826B			08/26/09 14:12	
pH		8.20	s.u.	0.010				0.4	10	
Method: E200.7									Batch: R123683	
Sample ID: MB-090914A	4	Method Blank				Run: ICP2-C_090914A			09/14/09 13:11	
Calcium		ND	mg/L	0.2						
Magnesium		ND	mg/L	0.09						
Potassium		ND	mg/L	0.1						
Sodium		0.3	mg/L	0.2						
Sample ID: LFB-090914A	4	Laboratory Fortified Blank				Run: ICP2-C_090914A			09/14/09 13:15	
Calcium		51.0	mg/L	0.50	102	85	115			
Magnesium		50.1	mg/L	0.50	100	85	115			
Potassium		46.0	mg/L	0.50	92	85	115			
Sodium		47.4	mg/L	0.50	94	85	115			
Sample ID: C09080916-001CMS2	4	Sample Matrix Spike				Run: ICP2-C_090914A			09/14/09 14:17	
Calcium		9800	mg/L	51	96	70	130			
Magnesium		10000	mg/L	18	97	70	130			
Potassium		9630	mg/L	21	91	70	130			
Sodium		58200	mg/L	47		70	130			A
Sample ID: C09080916-001CMSD	4	Sample Matrix Spike Duplicate				Run: ICP2-C_090914A			09/14/09 14:21	
Calcium		9930	mg/L	51	97	70	130	1.3	20	
Magnesium		10200	mg/L	18	99	70	130	1.9	20	
Potassium		9850	mg/L	21	94	70	130	2.2	20	
Sodium		59200	mg/L	47		70	130	1.7	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 09/16/09
Work Order: C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R122952
Sample ID: LRB	18	Method Blank			Run: ICPMS4-C_090826B					08/26/09 21:18
Aluminum		0.001	mg/L	0.0004						
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	4E-05						
Boron		ND	mg/L	0.0004						
Cadmium		ND	mg/L	4E-05						
Chromium		ND	mg/L	4E-05						
Copper		ND	mg/L	7E-05						
Iron		ND	mg/L	0.0006						
Lead		ND	mg/L	2E-05						
Manganese		ND	mg/L	3E-05						
Mercury		6E-05	mg/L	4E-05						
Molybdenum		ND	mg/L	0.0001						
Nickel		ND	mg/L	6E-05						
Selenium		5E-05	mg/L	3E-05						
Silicon		0.003	mg/L	0.0003						
Uranium		ND	mg/L	3E-05						
Vanadium		ND	mg/L	4E-05						
Zinc		0.0009	mg/L	0.0002						
Sample ID: LFB	18	Laboratory Fortified Blank			Run: ICPMS4-C_090826B					08/26/09 21:23
Aluminum		0.0574	mg/L	0.0010	112	85	115			
Arsenic		0.0538	mg/L	0.0010	108	85	115			
Barium		0.0538	mg/L	0.0010	108	85	115			
Boron		0.0535	mg/L	0.0010	107	85	115			
Cadmium		0.0537	mg/L	0.0010	107	85	115			
Chromium		0.0536	mg/L	0.0010	107	85	115			
Copper		0.0549	mg/L	0.0010	110	85	115			
Iron		1.32	mg/L	0.0010	105	85	115			
Lead		0.0529	mg/L	0.0010	106	85	115			
Manganese		0.0538	mg/L	0.0010	108	85	115			
Mercury		0.00532	mg/L	0.0010	105	85	115			
Molybdenum		0.0526	mg/L	0.0010	105	85	115			
Nickel		0.0543	mg/L	0.0010	109	85	115			
Selenium		0.0541	mg/L	0.0010	108	85	115			
Silicon		0.572	mg/L	0.0010	109	85	115			
Uranium		0.0529	mg/L	0.00030	106	85	115			
Vanadium		0.0535	mg/L	0.0010	107	85	115			
Zinc		0.0564	mg/L	0.0010	111	85	115			
Sample ID: C09080954-005BMS4	18	Sample Matrix Spike			Run: ICPMS4-C_090826B					08/27/09 16:42
Aluminum		0.0668	mg/L	0.0010	113	70	130			
Arsenic		0.0561	mg/L	0.0010	109	70	130			
Barium		0.155	mg/L	0.10	113	70	130			
Boron		0.116	mg/L	0.10	106	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources **Report Date:** 09/16/09

Project: Commercial Evaporation Pond G-8 Samples **Work Order:** C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R122952
Sample ID: C09080954-005BMS4	18	Sample Matrix Spike				Run: ICPMS4-C_090826B				08/27/09 16:42
Cadmium		0.0538	mg/L	0.010	108	70	130			
Chromium		0.0541	mg/L	0.050	107	70	130			
Copper		0.0534	mg/L	0.010	106	70	130			
Iron		1.29	mg/L	0.030	103	70	130			
Lead		0.0534	mg/L	0.050	106	70	130			
Manganese		0.0550	mg/L	0.010	109	70	130			
Mercury		0.00512	mg/L	0.0010	102	70	130			
Molybdenum		0.0553	mg/L	0.0010	107	70	130			
Nickel		0.0536	mg/L	0.050	107	70	130			
Selenium		0.0567	mg/L	0.0010	109	70	130			
Silicon		9.81	mg/L	0.10		70	130			A
Uranium		0.0569	mg/L	0.00030	106	70	130			
Vanadium		0.0638	mg/L	0.0010	108	70	130			
Zinc		0.0545	mg/L	0.010	106	70	130			
Sample ID: C09080954-005BMSD	18	Sample Matrix Spike Duplicate				Run: ICPMS4-C_090826B				08/27/09 16:47
Aluminum		0.0683	mg/L	0.0010	116	70	130	2.2	20	
Arsenic		0.0557	mg/L	0.0010	108	70	130	0.7	20	
Barium		0.155	mg/L	0.10	112	70	130	0.4	20	
Boron		0.117	mg/L	0.10	108	70	130	0.9	20	
Cadmium		0.0538	mg/L	0.010	108	70	130	0	20	
Chromium		0.0539	mg/L	0.050	107	70	130	0.4	20	
Copper		0.0529	mg/L	0.010	105	70	130	1	20	
Iron		1.31	mg/L	0.030	104	70	130	1.1	20	
Lead		0.0545	mg/L	0.050	109	70	130	2.1	20	
Manganese		0.0553	mg/L	0.010	110	70	130	0.6	20	
Mercury		0.00518	mg/L	0.0010	104	70	130	1.2	20	
Molybdenum		0.0562	mg/L	0.0010	109	70	130	1.5	20	
Nickel		0.0527	mg/L	0.050	105	70	130	1.6	20	
Selenium		0.0568	mg/L	0.0010	109	70	130	0.1	20	
Silicon		9.81	mg/L	0.10		70	130	0.1	20	A
Uranium		0.0579	mg/L	0.00030	108	70	130	1.6	20	
Vanadium		0.0629	mg/L	0.0010	106	70	130	1.4	20	
Zinc		0.0535	mg/L	0.010	104	70	130	1.9	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 09/16/09
Work Order: C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R123080
Sample ID: LRB	3	Method Blank				Run: ICPMS4-C_090828A				08/28/09 11:18
Lead		ND	mg/L	2E-05						
Mercury		6E-05	mg/L	4E-05						
Uranium		ND	mg/L	3E-05						
Sample ID: LFB	3	Laboratory Fortified Blank				Run: ICPMS4-C_090828A				08/28/09 11:23
Lead		0.0549	mg/L	0.0010	110	85	115			
Mercury		0.00545	mg/L	0.0010	108	85	115			
Uranium		0.0536	mg/L	0.00030	107	85	115			
Sample ID: C09081021-005BMS4	3	Sample Matrix Spike				Run: ICPMS4-C_090828A				08/28/09 19:37
Lead		0.0545	mg/L	0.050	109	70	130			
Mercury		0.00530	mg/L	0.0010	106	70	130			
Uranium		0.0561	mg/L	0.00030	106	70	130			
Sample ID: C09081021-005BMSD	3	Sample Matrix Spike Duplicate				Run: ICPMS4-C_090828A				08/28/09 19:42
Lead		0.0548	mg/L	0.050	110	70	130	0.7	20	
Mercury		0.00550	mg/L	0.0010	110	70	130	3.7	20	
Uranium		0.0567	mg/L	0.00030	107	70	130	1.2	20	
Method: E300.0										Batch: R123052
Sample ID: LCS	2	Laboratory Control Sample				Run: IC2-C_090826A				08/27/09 01:36
Chloride		9.42	mg/L	1.0	94	90	110			
Sulfate		37.8	mg/L	1.0	95	90	110			
Sample ID: MBLK	2	Method Blank				Run: IC2-C_090826A				08/27/09 01:52
Chloride		ND	mg/L	0.04						
Sulfate		ND	mg/L	0.1						
Sample ID: C09080914-003AMS	2	Sample Matrix Spike				Run: IC2-C_090826A				08/28/09 02:30
Chloride		305	mg/L	1.0		90	110			A
Sulfate		658	mg/L	1.0	97	90	110			
Sample ID: C09080914-003AMSD	2	Sample Matrix Spike Duplicate				Run: IC2-C_090826A				08/28/09 02:45
Chloride		303	mg/L	1.0		90	110	0.7	20	A
Sulfate		656	mg/L	1.0	96	90	110	0.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources

Project: Commercial Evaporation Pond G-8 Samples

Report Date: 09/16/09

Work Order: C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E350.1									Analytical Run: SUB-B134986	
Sample ID: ICV	Initial Calibration Verification Standard								08/26/09 14:05	
Nitrogen, Ammonia as N		5.60	mg/L	0.11	102	90	110			
Method: E350.1									Batch: B_R134986	
Sample ID: MBLK	Method Blank					Run: SUB-B134986			08/26/09 14:06	
Nitrogen, Ammonia as N		ND	mg/L	0.02						
Sample ID: LFB	Laboratory Fortified Blank					Run: SUB-B134986			08/26/09 14:07	
Nitrogen, Ammonia as N		1.00	mg/L	0.050	101	90	110			
Sample ID: B09082243-002DMS	Sample Matrix Spike					Run: SUB-B134986			08/26/09 14:57	
Nitrogen, Ammonia as N		1.10	mg/L	0.050	100	90	110			
Sample ID: B09082243-002DMSD	Sample Matrix Spike Duplicate					Run: SUB-B134986			08/26/09 14:58	
Nitrogen, Ammonia as N		1.09	mg/L	0.050	99	90	110	1.1	10	
Sample ID: B09082362-001EMS	Sample Matrix Spike					Run: SUB-B134986			08/26/09 15:11	
Nitrogen, Ammonia as N		0.979	mg/L	0.050	98	90	110			
Sample ID: B09082362-001EMSD	Sample Matrix Spike Duplicate					Run: SUB-B134986			08/26/09 15:12	
Nitrogen, Ammonia as N		0.970	mg/L	0.050	97	90	110	0.9	10	
Method: E353.2									Analytical Run: SUB-B135099	
Sample ID: ICV	Initial Calibration Verification Standard								08/28/09 10:28	
Nitrogen, Nitrate+Nitrite as N		36.7	mg/L	0.032	104	90	110			
Method: E353.2									Batch: B_R135099	
Sample ID: MBLK	Method Blank					Run: SUB-B135099			08/28/09 10:30	
Nitrogen, Nitrate+Nitrite as N		0.003	mg/L	0.002						
Sample ID: LFB	Laboratory Fortified Blank					Run: SUB-B135099			08/28/09 10:31	
Nitrogen, Nitrate+Nitrite as N		1.00	mg/L	0.010	102	90	110			
Sample ID: B09082404-004CMS	Sample Matrix Spike					Run: SUB-B135099			08/28/09 13:48	
Nitrogen, Nitrate+Nitrite as N		1.05	mg/L	0.010	103	90	110			
Sample ID: B09082404-004CMSD	Sample Matrix Spike Duplicate					Run: SUB-B135099			08/28/09 13:49	
Nitrogen, Nitrate+Nitrite as N		1.05	mg/L	0.010	103	90	110	0.2	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 09/16/09
Work Order: C09080916

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-3935
Sample ID: C09080908-001CMS		Sample Matrix Spike				Run: BERTHOLD 770-2_090831A				09/08/09 16:31
Radium 226		19	pCi/L		120	70	130			
Sample ID: C09080908-001CMSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-2_090831A				09/08/09 16:31
Radium 226		19	pCi/L		121	70	130	0.9	23.7	
Sample ID: MB-RA226-3935	3	Method Blank				Run: BERTHOLD 770-2_090831A				09/08/09 22:51
Radium 226		0.04	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Sample ID: LCS-RA226-3935		Laboratory Control Sample				Run: BERTHOLD 770-2_090831A				09/08/09 22:51
Radium 226		9.7	pCi/L		123	70	130			

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration

ANALYTICAL SUMMARY REPORT

September 16, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09080916 Quote ID: C1125 - Crow Butte Uranium Project

Project Name: Commercial Evaporation Pond G-8 Samples

Energy Laboratories, Inc. received the following 2 samples for Crow Butte Resources on 8/25/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09080916-001	Pond Composite	08/20/09 00:00	08/25/09	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Conductivity Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Radium 226, Dissolved Solids, Total Dissolved
C09080916-002	Pond Discharge	08/20/09 00:00	08/25/09	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: Stephanie D. Waldrop

Stephanie D. Waldrop
Reporting Supervisor

CLIENT: Crow Butte Resources

Project: Commercial Evaporation Pond G-8 Samples

Sample Delivery Group: C09080916

Date: *16-Sep-09*

CASE NARRATIVE

BRANCH LABORATORY SUBCONTRACT ANALYSIS
Tests Associated with Analyst identified as ELI-B were subcontracted to Energy Laboratories Billings Branch, EPA Number MT00005.

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Energy Laboratories Inc
Workorder Receipt Checklist

Crow Butte Resources

C09080916

Login completed by: Kimberly Humiston

Date and Time Received: 8/25/2009 9:15 AM

Reviewed by:

Received by: al

Reviewed Date:

Carrier name: Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature:	22°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Contact and Corrective Action Comments:

4mL HNO3 was added to sample Pond Composite.

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/05/09
Project:	Commercial Evaporation Pond G-8	**Collection Date:**	09/08/09
Lab ID:	C09090469-001	**DateReceived:**	09/11/09
Client Sample ID:	Pond Composite Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	3610	mg/L		1		A2320 B	09/14/09 17:46 / dvg
Carbonate as CO3	991	mg/L		1		A2320 B	09/14/09 17:46 / dvg
Bicarbonate as HCO3	2390	mg/L		1		A2320 B	09/14/09 17:46 / dvg
Calcium	16	mg/L	D	5		E200.7	09/22/09 14:07 / cp
Chloride	67100	mg/L	D	80		E300.0	09/24/09 23:49 / ljl
Fluoride	1.0	mg/L		0.1		A4500-F C	09/15/09 15:13 / dvg
Magnesium	65	mg/L	D	2		E200.7	09/22/09 14:07 / cp
Nitrogen, Ammonia as N	1.53	mg/L		0.05		A4500-NH3 G	09/17/09 11:47 / jal
Nitrogen, Nitrate+Nitrite as N	1.1	mg/L		0.1		E353.2	09/18/09 09:02 / jal
Potassium	260	mg/L	D	2		E200.7	09/22/09 14:07 / cp
Silica	63.2	mg/L		0.2		E200.8	09/15/09 06:25 / sml
Sodium	48300	mg/L	D	50		E200.7	09/23/09 15:18 / cp
Sulfate	7030	mg/L	D	10		E300.0	09/16/09 20:41 / ljl
PHYSICAL PROPERTIES							
Conductivity	205000	umhos/cm	D	2		A2510 B	10/01/09 15:59 / dd
pH	9.58	s.u.		0.01		A4500-H B	09/14/09 11:00 / dd
Solids, Total Dissolved TDS @ 180 C	112000	mg/L		10		A2540 C	09/14/09 15:06 / th
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/15/09 06:25 / sml
Arsenic	0.092	mg/L		0.001		E200.8	09/15/09 06:25 / sml
Barium	ND	mg/L		0.1		E200.8	09/15/09 06:25 / sml
Boron	3.9	mg/L		0.1		E200.8	09/15/09 06:25 / sml
Cadmium	0.008	mg/L		0.005		E200.8	09/15/09 06:25 / sml
Chromium	0.07	mg/L		0.05		E200.8	09/15/09 06:25 / sml
Copper	0.38	mg/L		0.01		E200.8	09/15/09 06:25 / sml
Iron	0.15	mg/L		0.03		E200.8	09/15/09 06:25 / sml
Lead	0.001	mg/L		0.001		E200.8	09/15/09 06:25 / sml
Manganese	0.04	mg/L		0.01		E200.8	09/15/09 06:25 / sml
Mercury	0.014	mg/L		0.001		E200.8	09/15/09 06:25 / sml
Molybdenum	11.4	mg/L		0.1		E200.8	09/15/09 06:25 / sml
Nickel	ND	mg/L		0.05		E200.8	09/15/09 06:25 / sml
Selenium	0.118	mg/L		0.001		E200.8	09/15/09 06:25 / sml
Uranium	332	mg/L	D	0.0006		E200.8	09/15/09 14:56 / sml
Vanadium	121	mg/L		0.1		E200.8	09/15/09 06:25 / sml
Zinc	0.41	mg/L		0.01		E200.8	09/15/09 06:25 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	977	pCi/L		0.23		E903.0	09/22/09 16:38 / trs
Radium 226 precision (±)	6.5	pCi/L				E903.0	09/22/09 16:38 / trs
Radium 226 MDC	0.23	pCi/L				E903.0	09/22/09 16:38 / trs

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.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/05/09
Project:	Commercial Evaporation Pond G-8	**Collection Date:**	09/08/09
Lab ID:	C09090469-001	**DateReceived:**	09/11/09
Client Sample ID:	Pond Composite Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	0.0482	%				Calculation	10/02/09 10:00 / kbh
Anions	2110	meq/L				Calculation	10/02/09 10:00 / kbh
Cations	2110	meq/L				Calculation	10/02/09 10:00 / kbh
Solids, Total Dissolved Calculated	125000	mg/L				Calculation	10/02/09 10:00 / kbh
TDS Balance (0.80 - 1.20)	0.900					Calculation	10/02/09 10:00 / kbh

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

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/05/09
Project:	Commercial Evaporation Pond G-8	**Collection Date:**	09/08/09
Lab ID:	C09090469-002	**DateReceived:**	09/11/09
Client Sample ID:	Pond Discharge Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	219	mg/L		1		A2320 B	09/14/09 17:54 / dvg
Carbonate as CO3	ND	mg/L		1		A2320 B	09/14/09 17:54 / dvg
Bicarbonate as HCO3	267	mg/L		1		A2320 B	09/14/09 17:54 / dvg
Calcium	79	mg/L		1		E200.7	09/22/09 15:07 / cp
Chloride	9870	mg/L	D	8		E300.0	09/21/09 20:38 / ljl
Fluoride	0.3	mg/L		0.1		A4500-F C	09/15/09 15:33 / dvg
Magnesium	10	mg/L		1		E200.7	09/22/09 15:07 / cp
Nitrogen, Ammonia as N	0.40	mg/L		0.05		A4500-NH3 G	09/17/09 11:49 / jal
Nitrogen, Nitrate+Nitrite as N	2.5	mg/L		0.1		E353.2	09/18/09 09:12 / jal
Potassium	33	mg/L		1		E200.7	09/22/09 15:07 / cp
Silica	50.7	mg/L		0.2		E200.8	09/15/09 06:30 / sml
Sodium	7780	mg/L	D	50		E200.7	09/23/09 15:22 / cp
Sulfate	1320	mg/L		1		E300.0	09/16/09 20:56 / ljl
PHYSICAL PROPERTIES							
Conductivity	35600	umhos/cm	D	2		A2510 B	10/01/09 16:01 / dd
pH	7.17	s.u.		0.01		A4500-H B	09/14/09 11:23 / dd
Solids, Total Dissolved TDS @ 180 C	21700	mg/L		10		A2540 C	09/14/09 15:06 / th
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	09/15/09 06:30 / sml
Arsenic	0.033	mg/L		0.001		E200.8	09/15/09 06:30 / sml
Barium	0.1	mg/L		0.1		E200.8	09/15/09 06:30 / sml
Boron	0.5	mg/L		0.1		E200.8	09/15/09 06:30 / sml
Cadmium	ND	mg/L		0.005		E200.8	09/15/09 06:30 / sml
Chromium	ND	mg/L		0.05		E200.8	09/15/09 06:30 / sml
Copper	0.09	mg/L		0.01		E200.8	09/15/09 06:30 / sml
Iron	ND	mg/L		0.03		E200.8	09/15/09 06:30 / sml
Lead	ND	mg/L		0.001		E200.8	09/15/09 06:30 / sml
Manganese	0.15	mg/L		0.01		E200.8	09/15/09 06:30 / sml
Mercury	0.006	mg/L		0.001		E200.8	09/15/09 06:30 / sml
Molybdenum	4.2	mg/L		0.1		E200.8	09/15/09 06:30 / sml
Nickel	ND	mg/L		0.05		E200.8	09/15/09 06:30 / sml
Selenium	0.203	mg/L		0.001		E200.8	09/15/09 06:30 / sml
Uranium	4.72	mg/L		0.0003		E200.8	09/15/09 15:39 / sml
Vanadium	48.5	mg/L		0.1		E200.8	09/15/09 06:30 / sml
Zinc	0.13	mg/L		0.01		E200.8	09/15/09 06:30 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	1060	pCi/L		0.24		E903.0	09/22/09 21:42 / trs
Radium 226 precision (±)	6.9	pCi/L				E903.0	09/22/09 21:42 / trs
Radium 226 MDC	0.24	pCi/L				E903.0	09/22/09 21:42 / trs

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.
D - RL increased due to sample matrix interference.

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/05/09
Project:	Commercial Evaporation Pond G-8	**Collection Date:**	09/08/09
Lab ID:	C09090469-002	**DateReceived:**	09/11/09
Client Sample ID:	Pond Discharge Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	5.13	%				Calculation	10/02/09 10:01 / kbh
Anions	310	meq/L				Calculation	10/02/09 10:01 / kbh
Cations	344	meq/L				Calculation	10/02/09 10:01 / kbh
Solids, Total Dissolved Calculated	19300	mg/L				Calculation	10/02/09 10:01 / kbh
TDS Balance (0.80 - 1.20)	1.12					Calculation	10/02/09 10:01 / kbh

- The Anion / Cation balance was confirmed by re-analysis.

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

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8

Report Date: 10/05/09
Work Order: C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R123690
Sample ID: MBLK	3	Method Blank				Run: MANTECH_090914A				09/14/09 10:24
Alkalinity, Total as CaCO3		3	mg/L	0.2						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		4	mg/L	1						
Sample ID: LCS1		Laboratory Control Sample				Run: MANTECH_090914A				09/14/09 10:39
Alkalinity, Total as CaCO3		203	mg/L	5.0	100	90	110			
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_090914A				09/14/09 10:46
Alkalinity, Total as CaCO3		54.8	mg/L	5.0	103	90	110			
Sample ID: C09090466-008AMS		Sample Matrix Spike				Run: MANTECH_090914A				09/14/09 17:06
Alkalinity, Total as CaCO3		131	mg/L	5.0	104	80	120			
Sample ID: C09090466-008AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_090914A				09/14/09 17:13
Alkalinity, Total as CaCO3		132	mg/L	5.0	105	80	120	0.8	20	
Method: A2510 B										Analytical Run: ORION555A-2_091001C
Sample ID: ICV2_091001_3		Initial Calibration Verification Standard								10/01/09 15:57
Conductivity		1360	umhos/cm	1.0	96	90	110			
Method: A2510 B										Batch: 091001_3_PH-W_555A-2
Sample ID: MBLK1_091001_3		Method Blank				Run: ORION555A-2_091001C				10/01/09 15:53
Conductivity		2	umhos/cm	0.2						
Sample ID: C09100033-004ADUP		Sample Duplicate				Run: ORION555A-2_091001C				10/01/09 16:16
Conductivity		292	umhos/cm	1.0				0.4	10	
Method: A2540 C										Batch: 090914_1_SLDS-TDS-W
Sample ID: MBLK1_090914		Method Blank				Run: BAL-1_090914B				09/14/09 14:59
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	6						
Sample ID: LCS1_090914		Laboratory Control Sample				Run: BAL-1_090914B				09/14/09 15:00
Solids, Total Dissolved TDS @ 180 C		987	mg/L	10	99	90	110			
Sample ID: C09090482-015AMS		Sample Matrix Spike				Run: BAL-1_090914B				09/14/09 15:07
Solids, Total Dissolved TDS @ 180 C		3020	mg/L	10	104	90	110			
Sample ID: C09090482-015AMSD		Sample Matrix Spike Duplicate				Run: BAL-1_090914B				09/14/09 15:08
Solids, Total Dissolved TDS @ 180 C		3060	mg/L	10	106	90	110	1.3	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8

Report Date: 10/05/09
Work Order: C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C									Batch: R123751	
Sample ID: MBLK	Method Blank					Run: MANTECH_090915A			09/15/09 11:53	
Fluoride		ND	mg/L	0.05						
Sample ID: LCS	Laboratory Control Sample					Run: MANTECH_090915A			09/15/09 11:56	
Fluoride		1.02	mg/L	0.10	102	90	110			
Sample ID: C09090456-009AMS	Sample Matrix Spike					Run: MANTECH_090915A			09/15/09 14:56	
Fluoride		1.18	mg/L	0.10	102	80	120			
Sample ID: C09090456-009AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_090915A			09/15/09 14:59	
Fluoride		1.21	mg/L	0.10	105	80	120	2.5	10	
Sample ID: C09090486-001AMS	Sample Matrix Spike					Run: MANTECH_090915A			09/15/09 15:44	
Fluoride		1.45	mg/L	0.10	103	80	120			
Sample ID: C09090486-001AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_090915A			09/15/09 15:48	
Fluoride		1.48	mg/L	0.10	106	80	120	2	10	
Method: A4500-H B						Analytical Run: ORION555A-2_090914A				
Sample ID: ICV1_090914_1	Initial Calibration Verification Standard								09/14/09 09:50	
pH		6.94	s.u.	0.010	101	98	102			
Method: A4500-H B									Batch: 090914_1_PH-W_555A-2	
Sample ID: C09090466-001ADUP	Sample Duplicate					Run: ORION555A-2_090914A			09/14/09 10:17	
pH		6.72	s.u.	0.010				0.1	10	
Method: A4500-NH3 G									Batch: R123858	
Sample ID: MBLK-1	Method Blank					Run: TECHNICON_090917A			09/17/09 10:03	
Nitrogen, Ammonia as N		ND	mg/L	0.02						
Sample ID: LCS-2	Laboratory Control Sample					Run: TECHNICON_090917A			09/17/09 10:05	
Nitrogen, Ammonia as N		1.93	mg/L	0.050	96	80	120			
Sample ID: C09090566-008DMS	Sample Matrix Spike					Run: TECHNICON_090917A			09/17/09 11:17	
Nitrogen, Ammonia as N		2.02	mg/L	0.050	101	80	120			
Sample ID: C09090566-008DMSD	Sample Matrix Spike Duplicate					Run: TECHNICON_090917A			09/17/09 11:19	
Nitrogen, Ammonia as N		2.02	mg/L	0.050	101	80	120	0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8
Report Date: 10/05/09
Work Order: C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Batch: R124081
Sample ID: MB-090922A	3	Method Blank				Run: ICP2-C_090922A				09/22/09 11:49
Calcium		ND	mg/L	0.2						
Magnesium		ND	mg/L	0.09						
Potassium		ND	mg/L	0.1						
Sample ID: LFB-090922A	3	Laboratory Fortified Blank				Run: ICP2-C_090922A				09/22/09 11:54
Calcium		48.0	mg/L	0.50	96	85	115			
Magnesium		50.2	mg/L	0.50	100	85	115			
Potassium		47.0	mg/L	0.50	94	85	115			
Sample ID: C09090469-001CMS2	3	Sample Matrix Spike				Run: ICP2-C_090922A				09/22/09 14:11
Calcium		1010	mg/L	5.1	98	70	130			
Magnesium		1090	mg/L	1.8	100	70	130			
Potassium		1040	mg/L	2.1	77	70	130			
Sample ID: C09090469-001CMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-C_090922A				09/22/09 14:15
Calcium		1010	mg/L	5.1	97	70	130	0.4	20	
Magnesium		1080	mg/L	1.8	100	70	130	0.4	20	
Potassium		1040	mg/L	2.1	77	70	130	0	20	
Method: E200.7										Batch: R124138
Sample ID: MB-090923A		Method Blank				Run: ICP2-C_090923A				09/23/09 14:05
Sodium		ND	mg/L	0.2						
Sample ID: LFB-090923A		Laboratory Fortified Blank				Run: ICP2-C_090923A				09/23/09 14:09
Sodium		47.5	mg/L	0.50	95	85	115			
Sample ID: C09090558-006BMS2		Sample Matrix Spike				Run: ICP2-C_090923A				09/23/09 16:18
Sodium		8030	mg/L	23	103	70	130			
Sample ID: C09090558-006BMSD		Sample Matrix Spike Duplicate				Run: ICP2-C_090923A				09/23/09 16:22
Sodium		8050	mg/L	23	103	70	130	0.3	20	

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QA/QC Summary Report

Client: Crow Butte Resources **Report Date:** 10/05/09

Project: Commercial Evaporation Pond G-8 **Work Order:** C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R123704
Sample ID: LRB	17 Method Blank					Run: ICPMS4-C_090914A				09/14/09 11:39
Aluminum		0.001	mg/L	0.0004						
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	4E-05						
Boron		ND	mg/L	0.0004						
Cadmium		ND	mg/L	4E-05						
Chromium		ND	mg/L	4E-05						
Copper		ND	mg/L	7E-05						
Iron		ND	mg/L	0.0006						
Lead		ND	mg/L	2E-05						
Manganese		ND	mg/L	3E-05						
Mercury		ND	mg/L	4E-05						
Molybdenum		ND	mg/L	0.0001						
Nickel		ND	mg/L	6E-05						
Selenium		5E-05	mg/L	3E-05						
Silicon		ND	mg/L	0.0003						
Vanadium		ND	mg/L	4E-05						
Zinc		0.0003	mg/L	0.0002						
Sample ID: LFB	17 Laboratory Fortified Blank					Run: ICPMS4-C_090914A				09/14/09 11:44
Aluminum		0.0515	mg/L	0.0010	100	85	115			
Arsenic		0.0520	mg/L	0.0010	104	85	115			
Barium		0.0514	mg/L	0.0010	103	85	115			
Boron		0.0505	mg/L	0.0010	101	85	115			
Cadmium		0.0512	mg/L	0.0010	102	85	115			
Chromium		0.0521	mg/L	0.0010	104	85	115			
Copper		0.0528	mg/L	0.0010	106	85	115			
Iron		1.27	mg/L	0.0010	101	85	115			
Lead		0.0508	mg/L	0.0010	102	85	115			
Manganese		0.0520	mg/L	0.0010	104	85	115			
Mercury		0.00523	mg/L	0.0010	105	85	115			
Molybdenum		0.0513	mg/L	0.0010	103	85	115			
Nickel		0.0526	mg/L	0.0010	105	85	115			
Selenium		0.0515	mg/L	0.0010	103	85	115			
Silicon		0.561	mg/L	0.0010	112	85	115			
Vanadium		0.0520	mg/L	0.0010	104	85	115			
Zinc		0.0541	mg/L	0.0010	108	85	115			
Sample ID: C09090486-001BMS4	17 Sample Matrix Spike					Run: ICPMS4-C_090914A				09/15/09 06:40
Aluminum		0.0510	mg/L	0.0010	96	70	130			
Arsenic		0.0764	mg/L	0.0010	103	70	130			
Barium		0.0908	mg/L	0.0010	101	70	130			
Boron		0.743	mg/L	0.10		70	130			A
Cadmium		0.0498	mg/L	0.010	100	70	130			
Chromium		0.0518	mg/L	0.050	103	70	130			

Qualifiers:

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ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8

Report Date: 10/05/09
Work Order: C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R123704
Sample ID: C09090486-001BMS4	17	Sample Matrix Spike				Run: ICPMS4-C_090914A				09/15/09 06:40
Copper		0.0515	mg/L	0.010	101	70	130			
Iron		1.35	mg/L	0.030	100	70	130			
Lead		0.0514	mg/L	0.050	103	70	130			
Manganese		0.0599	mg/L	0.010	100	70	130			
Mercury		0.00498	mg/L	0.0010	99	70	130			
Molybdenum		0.0544	mg/L	0.0010	103	70	130			
Nickel		0.0502	mg/L	0.050	100	70	130			
Selenium		0.0498	mg/L	0.0010	99	70	130			
Silicon		4.26	mg/L	0.10		70	130			A
Vanadium		0.0522	mg/L	0.0010	103	70	130			
Zinc		0.0518	mg/L	0.010	100	70	130			
Sample ID: C09090486-001BMSD	17	Sample Matrix Spike Duplicate				Run: ICPMS4-C_090914A				09/15/09 06:45
Aluminum		0.0507	mg/L	0.0010	96	70	130	0.5	20	
Arsenic		0.0771	mg/L	0.0010	104	70	130	1	20	
Barium		0.0922	mg/L	0.0010	103	70	130	1.6	20	
Boron		0.733	mg/L	0.10		70	130	1.3	20	A
Cadmium		0.0508	mg/L	0.010	102	70	130	2	20	
Chromium		0.0524	mg/L	0.050	105	70	130	1.3	20	
Copper		0.0529	mg/L	0.010	104	70	130	2.6	20	
Iron		1.39	mg/L	0.030	103	70	130	3.1	20	
Lead		0.0525	mg/L	0.050	105	70	130	2.1	20	
Manganese		0.0608	mg/L	0.010	102	70	130	1.4	20	
Mercury		0.00531	mg/L	0.0010	105	70	130	6.4	20	
Molybdenum		0.0554	mg/L	0.0010	105	70	130	1.8	20	
Nickel		0.0514	mg/L	0.050	102	70	130	2.3	20	
Selenium		0.0522	mg/L	0.0010	103	70	130	4.6	20	
Silicon		4.33	mg/L	0.10		70	130	1.6	20	A
Vanadium		0.0529	mg/L	0.0010	104	70	130	1.3	20	
Zinc		0.0523	mg/L	0.010	101	70	130	0.9	20	
Method: E200.8										Batch: R123783
Sample ID: LRB		Method Blank				Run: ICPMS4-C_090915A				09/15/09 12:03
Uranium		ND	mg/L	3E-05						
Sample ID: LFB		Laboratory Fortified Blank				Run: ICPMS4-C_090915A				09/15/09 12:08
Uranium		0.0496	mg/L	0.00030	99	85	115			
Sample ID: C09090469-001CMS4		Sample Matrix Spike				Run: ICPMS4-C_090915A				09/15/09 15:21
Uranium		283	mg/L	0.00064		70	130			A
Sample ID: C09090469-001CMSD		Sample Matrix Spike Duplicate				Run: ICPMS4-C_090915A				09/15/09 15:26
Uranium		276	mg/L	0.00064		70	130	2.5	20	A

Qualifiers:

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MDC - Minimum detectable concentration

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QA/QC Summary Report

lient: Crow Butte Resources | Report Date: 10/05/09
oject: Commercial Evaporation Pond G-8 | Work Order: C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0									Batch: R123982	
Sample ID: LCS		Laboratory Control Sample				Run: IC2-C_090916A			09/16/09 18:07	
Sulfate		37.8	mg/L	1.0	95	90	110			
Sample ID: MBLK		Method Blank				Run: IC2-C_090916A			09/16/09 18:22	
Sulfate		ND	mg/L	0.1						
Sample ID: C09081087-015AMS		Sample Matrix Spike				Run: IC2-C_090916A			09/16/09 19:24	
Sulfate		85.6	mg/L	1.0	93	80	120			
Sample ID: C09081087-015AMSD		Sample Matrix Spike Duplicate				Run: IC2-C_090916A			09/16/09 19:39	
Sulfate		88.2	mg/L	1.0	96	80	120	3	20	
Method: E300.0									Batch: R124094	
Sample ID: LCS		Laboratory Control Sample				Run: IC2-C_090921A			09/21/09 17:18	
Chloride		9.37	mg/L	1.0	94	90	110			
Sample ID: MBLK		Method Blank				Run: IC2-C_090921A			09/21/09 17:33	
Chloride		ND	mg/L	0.04						
Sample ID: C09090476-001AMS		Sample Matrix Spike				Run: IC2-C_090921A			09/21/09 21:55	
Chloride		21.8	mg/L	1.0	95	80	120			
ample ID: C09090476-001AMSD		Sample Matrix Spike Duplicate				Run: IC2-C_090921A			09/21/09 22:11	
hloride		22.0	mg/L	1.0	97	80	120	1.1	20	
Method: E300.0									Batch: R124220	
Sample ID: LCS		Laboratory Control Sample				Run: IC2-C_090923A			09/23/09 23:39	
Chloride		9.79	mg/L	1.0	98	90	110			
Sample ID: MBLK		Method Blank				Run: IC2-C_090923A			09/23/09 23:55	
Chloride		ND	mg/L	0.04						
Sample ID: C09090492-001AMS		Sample Matrix Spike				Run: IC2-C_090923A			09/24/09 00:56	
Chloride		33.9	mg/L	1.0	101	80	120			
Sample ID: C09090492-001AMSD		Sample Matrix Spike Duplicate				Run: IC2-C_090923A			09/24/09 01:12	
Chloride		34.0	mg/L	1.0	101	80	120	0.2	20	
Sample ID: C09090636-001AMS		Sample Matrix Spike				Run: IC2-C_090923A			09/24/09 23:02	
Chloride		52.5	mg/L	1.0	98	80	120			
Sample ID: C09090636-001AMSD		Sample Matrix Spike Duplicate				Run: IC2-C_090923A			09/24/09 23:18	
Chloride		53.3	mg/L	1.0	100	80	120	1.6	20	

ualifiers:

L - Analyte reporting limit. | ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

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QA/QC Summary Report

Client: Crow Butte Resources — Report Date: 10/05/09
Project: Commercial Evaporation Pond G-8 — Work Order: C09090469

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2									Batch: R123931	
Sample ID: MBLK-1		Method Blank				Run: TECHNICON_090918A			09/18/09 07:44	
Nitrogen, Nitrate+Nitrite as N		ND	mg/L	0.03						
Sample ID: LCS-2		Laboratory Control Sample				Run: TECHNICON_090918A			09/18/09 07:47	
Nitrogen, Nitrate+Nitrite as N		2.57	mg/L	0.10	101	90	110			
Sample ID: C09090455-001DMS		Sample Matrix Spike				Run: TECHNICON_090918A			09/18/09 08:44	
Nitrogen, Nitrate+Nitrite as N		2.22	mg/L	0.10	109	90	110			
Sample ID: C09090455-001DMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_090918A			09/18/09 08:47	
Nitrogen, Nitrate+Nitrite as N		2.21	mg/L	0.10	108	90	110	0.5	10	
Sample ID: C09090504-003CMS		Sample Matrix Spike				Run: TECHNICON_090918A			09/18/09 09:58	
Nitrogen, Nitrate+Nitrite as N		1.92	mg/L	0.10	91	90	110			
Sample ID: C09090504-003CMSD		Sample Matrix Spike Duplicate				Run: TECHNICON_090918A			09/18/09 10:00	
Nitrogen, Nitrate+Nitrite as N		1.82	mg/L	0.10	87	90	110	5.3	10	S
Method: E903.0									Batch: RA226-3974	
Sample ID: TAP-WATER-MS		Sample Matrix Spike				Run: BERTHOLD 770-1_090916A			09/22/09 21:42	
Radium 226		8.6	pCi/L		107	70	130			
Sample ID: TAP-WATER-MSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_090916A			09/22/09 21:42	
Radium 226		9.3	pCi/L		117	70	130	8.4	24.1	
Sample ID: MB-RA226-3974	3	Method Blank				Run: BERTHOLD 770-1_090916A			09/22/09 21:42	
Radium 226		-0.2	pCi/L							U
Radium 226 precision (±)		0.09	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Sample ID: LCS-RA226-3974		Laboratory Control Sample				Run: BERTHOLD 770-1_090916A			09/22/09 21:42	
Radium 226		9.8	pCi/L		127	70	130			

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

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ANALYTICAL SUMMARY REPORT

October 05, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09090469 Quote ID: C1125 - Crow Butte Uranium Project

Project Name: Commercial Evaporation Pond G-8

Energy Laboratories, Inc. received the following 2 samples for Crow Butte Resources on 9/11/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09090469-001	Pond Composite Sample	09/08/09 00:00	09/11/09	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Conductivity Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Radium 226, Dissolved Solids, Total Dissolved
C09090469-002	Pond Discharge Sample	09/08/09 00:00	09/11/09	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: Stephanie D. Waldrop

Stephanie D. Waldrop
Reporting Supervisor

CLIENT: Crow Butte Resources **Date:** 05-Oct-09
Project: Commercial Evaporation Pond G-8
Sample Delivery Group: C09090469

CASE NARRATIVE

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Energy Laboratories Inc
Workorder Receipt Checklist

Crow Butte Resources

C09090469

Login completed by: Kimberly Humiston

Reviewed by:

Reviewed Date:

Date and Time Received: 9/11/2009 9:15 AM

Received by: ha

Carrier name: Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature:	14°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Contact and Corrective Action Comments:

None

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LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/28/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	09/24/09
Lab ID:	C09091126-001	**DateReceived:**	09/29/09
Client Sample ID:	Pond Composite Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	3520	mg/L		5		A2320 B	10/02/09 22:37 / dvg
Carbonate as CO3	972	mg/L		1		A2320 B	10/02/09 22:37 / dvg
Bicarbonate as HCO3	2320	mg/L		1		A2320 B	10/02/09 22:37 / dvg
Calcium	ND	mg/L	D	50		E200.7	10/12/09 13:53 / cp
Chloride	65100	mg/L	D	80		E300.0	10/02/09 04:52 / ljl
Fluoride	1.0	mg/L		0.1		A4500-F C	10/06/09 12:01 / dvg
Magnesium	63	mg/L	D	20		E200.7	10/12/09 13:53 / cp
Nitrogen, Ammonia as N	7	mg/L	D	1		E350.1	10/01/09 16:21 / eli-b
Nitrogen, Nitrate+Nitrite as N	1	mg/L	D	1		E353.2	10/02/09 13:50 / eli-b
Potassium	294	mg/L	D	20		E200.7	10/12/09 13:53 / cp
Silica	76	mg/L	D	6		E200.7	10/12/09 13:53 / cp
Sodium	48800	mg/L	D	50		E200.7	10/12/09 13:53 / cp
Sulfate	6370	mg/L	D	200		E300.0	10/02/09 04:52 / ljl
PHYSICAL PROPERTIES							
Conductivity	142000	umhos/cm		1		A2510 B	09/30/09 11:27 / dd
pH	9.00	s.u.		0.01		A4500-H B	09/30/09 11:27 / dd
Solids, Total Dissolved TDS @ 180 C	110000	mg/L		10		A2540 C	09/30/09 12:52 / th
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	10/01/09 05:48 / sml
Arsenic	0.088	mg/L		0.001		E200.8	10/01/09 05:48 / sml
Barium	ND	mg/L		0.1		E200.8	10/01/09 05:48 / sml
Boron	ND	mg/L	D	6		E200.7	10/12/09 13:53 / cp
Cadmium	0.009	mg/L		0.005		E200.8	10/01/09 05:48 / sml
Chromium	ND	mg/L		0.05		E200.8	10/01/09 05:48 / sml
Copper	0.51	mg/L		0.01		E200.8	10/01/09 05:48 / sml
Iron	ND	mg/L	D	1		E200.7	10/12/09 13:53 / cp
Lead	0.016	mg/L	D	0.003		E200.8	10/01/09 14:49 / ts
Manganese	0.07	mg/L		0.01		E200.8	10/01/09 05:48 / sml
Mercury	0.009	mg/L	D	0.008		E200.8	10/01/09 14:49 / ts
Molybdenum	14.8	mg/L		0.1		E200.8	10/01/09 05:48 / sml
Nickel	ND	mg/L		0.05		E200.8	10/01/09 05:48 / sml
Selenium	ND	mg/L	D	0.03		E200.8	10/01/09 05:48 / sml
Uranium	91.8	mg/L	D	0.001		E200.8	10/01/09 14:49 / ts
Vanadium	94.3	mg/L		0.1		E200.8	10/01/09 05:48 / sml
Zinc	0.29	mg/L		0.01		E200.8	10/01/09 05:48 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	805	pCi/L		0.23		E903.0	10/13/09 17:37 / trs
Radium 226 precision (±)	5.9	pCi/L				E903.0	10/13/09 17:37 / trs
Radium 226 MDC	0.23	pCi/L				E903.0	10/13/09 17:37 / trs

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.
D - RL increased due to sample matrix interference.

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/28/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	09/24/09
Lab ID:	C09091126-001	**DateReceived:**	09/29/09
Client Sample ID:	Pond Composite Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	2.27	%				Calculation	10/14/09 12:50 / kbh
Anions	2040	meq/L				Calculation	10/14/09 12:50 / kbh
Cations	2130	meq/L				Calculation	10/14/09 12:50 / kbh
Solids, Total Dissolved Calculated	123000	mg/L				Calculation	10/14/09 12:50 / kbh
TDS Balance (0.80 - 1.20)	0.890					Calculation	10/14/09 12:50 / kbh

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

LABORATORY ANALYTICAL REPORT

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples
Lab ID: C09091126-002
Client Sample ID: Pond Discharge Sample

Report Date: 10/28/09
Collection Date: 09/24/09
DateReceived: 09/29/09
Matrix: Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
MAJOR IONS							
Alkalinity, Total as CaCO3	168	mg/L		5		A2320 B	10/02/09 22:44 / dvg
Carbonate as CO3	ND	mg/L		1		A2320 B	10/02/09 22:44 / dvg
Bicarbonate as HCO3	206	mg/L		1		A2320 B	10/02/09 22:44 / dvg
Calcium	74	mg/L	D	20		E200.7	10/12/09 13:57 / cp
Chloride	21800	mg/L	D	20		E300.0	10/02/09 05:10 / ljl
Fluoride	0.1	mg/L		0.1		A4500-F C	10/06/09 12:05 / dvg
Magnesium	12	mg/L	D	9		E200.7	10/12/09 13:57 / cp
Nitrogen, Ammonia as N	ND	mg/L	D	1		E350.1	10/01/09 16:22 / eli-b
Nitrogen, Nitrate+Nitrite as N	5	mg/L	D	1		E353.2	10/02/09 13:51 / eli-b
Potassium	176	mg/L	D	10		E200.7	10/12/09 13:57 / cp
Silica	52	mg/L	D	3		E200.7	10/12/09 13:57 / cp
Sodium	14600	mg/L	D	20		E200.7	10/12/09 13:57 / cp
Sulfate	1140	mg/L	D	60		E300.0	10/02/09 05:10 / ljl
PHYSICAL PROPERTIES							
Conductivity	56700	umhos/cm		1		A2510 B	09/30/09 11:28 / dd
pH	6.82	s.u.		0.01		A4500-H B	09/30/09 11:28 / dd
Solids, Total Dissolved TDS @ 180 C	35300	mg/L		10		A2540 C	09/30/09 12:53 / th
METALS - DISSOLVED							
Aluminum	ND	mg/L		0.1		E200.8	10/01/09 05:53 / sml
Arsenic	0.043	mg/L		0.001		E200.8	10/01/09 05:53 / sml
Barium	ND	mg/L		0.1		E200.8	10/01/09 14:56 / ts
Boron	ND	mg/L	D	3		E200.7	10/12/09 13:57 / cp
Cadmium	ND	mg/L		0.005		E200.8	10/01/09 14:56 / ts
Chromium	ND	mg/L		0.05		E200.8	10/01/09 05:53 / sml
Copper	0.09	mg/L		0.01		E200.8	10/01/09 05:53 / sml
Iron	ND	mg/L	D	0.5		E200.7	10/12/09 13:57 / cp
Lead	0.002	mg/L		0.001		E200.8	10/01/09 14:56 / ts
Manganese	0.04	mg/L		0.01		E200.8	10/01/09 05:53 / sml
Mercury	ND	mg/L	D	0.004		E200.8	10/01/09 14:56 / ts
Molybdenum	4.5	mg/L		0.1		E200.8	10/01/09 14:56 / ts
Nickel	ND	mg/L		0.05		E200.8	10/01/09 05:53 / sml
Selenium	0.019	mg/L	D	0.005		E200.8	10/01/09 05:53 / sml
Uranium	18.0	mg/L	D	0.0007		E200.8	10/01/09 14:56 / ts
Vanadium	114	mg/L		0.1		E200.8	10/01/09 14:56 / ts
Zinc	0.07	mg/L		0.01		E200.8	10/01/09 05:53 / sml
RADIONUCLIDES - DISSOLVED							
Radium 226	742	pCi/L		0.23		E903.0	10/13/09 17:37 / trs
Radium 226 precision (±)	5.6	pCi/L				E903.0	10/13/09 17:37 / trs
Radium 226 MDC	0.23	pCi/L				E903.0	10/13/09 17:37 / trs

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.
D - RL increased due to sample matrix interference.

LABORATORY ANALYTICAL REPORT

Client:	Crow Butte Resources	**Report Date:**	10/28/09
Project:	Commercial Evaporation Pond G-8 Samples	**Collection Date:**	09/24/09
Lab ID:	C09091126-002	**DateReceived:**	09/29/09
Client Sample ID:	Pond Discharge Sample	**Matrix:**	Aqueous

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
DATA QUALITY							
A/C Balance (± 5)	0.0842	%				Calculation	10/14/09 12:50 / kbh
Anions	643	meq/L				Calculation	10/14/09 12:50 / kbh
Cations	644	meq/L				Calculation	10/14/09 12:50 / kbh
Solids, Total Dissolved Calculated	38000	mg/L				Calculation	10/14/09 12:50 / kbh
TDS Balance (0.80 - 1.20)	0.930					Calculation	10/14/09 12:50 / kbh

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

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B										Batch: R124562
Sample ID: MBLK	3	Method Blank				Run: MANTECH_091002B				10/02/09 16:13
Alkalinity, Total as CaCO3		ND	mg/L	0.2						
Carbonate as CO3		ND	mg/L	1						
Bicarbonate as HCO3		ND	mg/L	1						
Sample ID: LCS1		Laboratory Control Sample				Run: MANTECH_091002B				10/02/09 16:28
Alkalinity, Total as CaCO3		201	mg/L	5.0	100	90	110			
Sample ID: LCS		Laboratory Control Sample				Run: MANTECH_091002B				10/02/09 16:35
Alkalinity, Total as CaCO3		54.2	mg/L	5.0	108	90	110			
Sample ID: C09091129-001AMS		Sample Matrix Spike				Run: MANTECH_091002B				10/02/09 22:59
Alkalinity, Total as CaCO3		307	mg/L	5.0	102	80	120			
Sample ID: C09091129-001AMSD		Sample Matrix Spike Duplicate				Run: MANTECH_091002B				10/02/09 23:08
Alkalinity, Total as CaCO3		315	mg/L	5.0	108	80	120	2.5	20	
Method: A2510 B										Analytical Run: ORION555A-2_090930A
Sample ID: ICV2_090930_1		Initial Calibration Verification Standard								09/30/09 11:15
Conductivity		1400	umhos/cm	1.0	99	90	110			
Method: A2510 B										Batch: 090930_1_PH-W_555A-2
Sample ID: MBLK1_090930_1		Method Blank				Run: ORION555A-2_090930A				09/30/09 11:11
Conductivity		1	umhos/cm	0.2						
Sample ID: C09091151-004ADUP		Sample Duplicate				Run: ORION555A-2_090930A				09/30/09 11:59
Conductivity		1850	umhos/cm	1.0				0.1	10	
Method: A2540 C										Batch: 090930_1_SLDS-TDS-W
Sample ID: MBLK1_090930		Method Blank				Run: BAL-1_090930B				09/30/09 12:41
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	6						
Sample ID: LCS1_090930		Laboratory Control Sample				Run: BAL-1_090930B				09/30/09 12:41
Solids, Total Dissolved TDS @ 180 C		1010	mg/L	10	101	90	110			
Sample ID: C09091101-002AMS		Sample Matrix Spike				Run: BAL-1_090930B				09/30/09 12:50
Solids, Total Dissolved TDS @ 180 C		2440	mg/L	10	104	90	110			
Sample ID: C09091101-002AMSD		Sample Matrix Spike Duplicate				Run: BAL-1_090930B				09/30/09 12:50
Solids, Total Dissolved TDS @ 180 C		2410	mg/L	10	102	90	110	1.5	10	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C										Batch: R124694
Sample ID: MBLK	Method Blank					Run: MANTECH_091006A				10/06/09 11:28
Fluoride		ND	mg/L	0.05						
Sample ID: LCS	Laboratory Control Sample					Run: MANTECH_091006A				10/06/09 11:32
Fluoride		1.04	mg/L	0.10	104	90	110			
Sample ID: C09091129-001AMS	Sample Matrix Spike					Run: MANTECH_091006A				10/06/09 12:11
Fluoride		1.48	mg/L	0.10	105	80	120			
Sample ID: C09091129-001AMSD	Sample Matrix Spike Duplicate					Run: MANTECH_091006A				10/06/09 12:13
Fluoride		1.48	mg/L	0.10	105	80	120	0	10	
Method: A4500-H B							Analytical Run: ORION555A-2_090930A			
Sample ID: ICV1_090930_1	Initial Calibration Verification Standard									09/30/09 11:13
pH		6.89	s.u.	0.010	100	98	102			
Method: A4500-H B								Batch: 090930_1_PH-W_555A-2		
Sample ID: C09091151-004ADUP	Sample Duplicate					Run: ORION555A-2_090930A				09/30/09 11:59
pH		7.62	s.u.	0.010				0.4	10	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

QA/QC Summary Report

lient: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R124979	
Sample ID: MB-091012A	7	Method Blank				Run: ICP2-C_091012A			10/12/09 12:12	
Boron		ND	mg/L	0.03						
Calcium		ND	mg/L	0.2						
Iron		ND	mg/L	0.005						
Magnesium		ND	mg/L	0.09						
Potassium		ND	mg/L	0.1						
Silicon		0.04	mg/L	0.01						
Sodium		ND	mg/L	0.10						
Sample ID: LFB-091012A	7	Laboratory Fortified Blank				Run: ICP2-C_091012A			10/12/09 12:27	
Boron		1.04	mg/L	0.10	104	85	115			
Calcium		47.7	mg/L	0.50	95	85	115			
Iron		0.978	mg/L	0.030	98	85	115			
Magnesium		49.2	mg/L	0.50	98	85	115			
Potassium		43.5	mg/L	0.50	87	85	115			
Silicon		0.515	mg/L	0.015	105	85	115			
Sodium		44.7	mg/L	0.50	89	85	115			
Sample ID: C09091057-001CMS2	7	Sample Matrix Spike				Run: ICP2-C_091012A			10/12/09 13:32	
Boron		2.25	mg/L	0.10	104	70	130			
Calcium		109	mg/L	0.51	106	70	130			
Iron		6.10	mg/L	0.030	94	70	130			
Magnesium		107	mg/L	0.50	105	70	130			
Potassium		100	mg/L	0.50	98	70	130			
Silicon		1.30	mg/L	0.030	111	70	130			
Sodium		108	mg/L	0.50	103	70	130			
Sample ID: C09091057-001CMSD	7	Sample Matrix Spike Duplicate				Run: ICP2-C_091012A			10/12/09 13:36	
Boron		2.24	mg/L	0.10	103	70	130	0.6	20	
Calcium		101	mg/L	0.51	98	70	130	7.6	20	
Iron		6.09	mg/L	0.030	94	70	130	0.2	20	
Magnesium		103	mg/L	0.50	100	70	130	4.1	20	
Potassium		96.3	mg/L	0.50	94	70	130	3.8	20	
Silicon		1.31	mg/L	0.030	112	70	130	0.8	20	
Sodium		101	mg/L	0.50	96	70	130	6.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

ENERGY LABORATORIES
Toll Free 888.235.0515 • 307.235.0515 • Fax 307.234.1639 • casper@energylab.com • www.energylab.com

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R124451
Sample ID: LRB	12	Method Blank				Run: ICPMS4-C_090930A				09/30/09 13:25
Aluminum		ND	mg/L	0.0004						
Arsenic		ND	mg/L	5E-05						
Barium		ND	mg/L	4E-05						
Cadmium		ND	mg/L	4E-05						
Chromium		ND	mg/L	4E-05						
Copper		ND	mg/L	7E-05						
Manganese		ND	mg/L	3E-05						
Molybdenum		ND	mg/L	0.0001						
Nickel		ND	mg/L	6E-05						
Selenium		ND	mg/L	3E-05						
Vanadium		ND	mg/L	4E-05						
Zinc		ND	mg/L	0.0002						
Sample ID: LFB	12	Laboratory Fortified Blank				Run: ICPMS4-C_090930A				09/30/09 13:30
Aluminum		0.0557	mg/L	0.0010	111	85	115			
Arsenic		0.0541	mg/L	0.0010	108	85	115			
Barium		0.0535	mg/L	0.0010	107	85	115			
Cadmium		0.0539	mg/L	0.0010	108	85	115			
Chromium		0.0526	mg/L	0.0010	105	85	115			
Copper		0.0540	mg/L	0.0010	108	85	115			
Manganese		0.0544	mg/L	0.0010	109	85	115			
Molybdenum		0.0512	mg/L	0.0010	102	85	115			
Nickel		0.0543	mg/L	0.0010	109	85	115			
Selenium		0.0536	mg/L	0.0010	107	85	115			
Vanadium		0.0524	mg/L	0.0010	105	85	115			
Zinc		0.0554	mg/L	0.0010	111	85	115			
Sample ID: C09091126-002CMS4	12	Sample Matrix Spike				Run: ICPMS4-C_090930A				10/01/09 05:58
Aluminum		0.268	mg/L	0.10	106	70	130			
Arsenic		0.310	mg/L	0.0010	107	70	130			
Barium		0.366	mg/L	0.10	114	70	130			
Cadmium		0.245	mg/L	0.010	97	70	130			
Chromium		0.309	mg/L	0.050	115	70	130			
Copper		0.358	mg/L	0.010	107	70	130			
Manganese		0.322	mg/L	0.010	112	70	130			
Molybdenum		5.12	mg/L	0.10		70	130			A
Nickel		0.278	mg/L	0.050	106	70	130			
Selenium		0.292	mg/L	0.0010	109	70	130			
Vanadium		123	mg/L	0.10		70	130			A
Zinc		0.298	mg/L	0.010	92	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R124451
Sample ID: C09091126-002CMSD	12	Sample Matrix Spike Duplicate				Run: ICPMS4-C_090930A			10/01/09 06:03	
Aluminum		0.259	mg/L	0.10	102	70	130	3.7	20	
Arsenic		0.304	mg/L	0.0010	105	70	130	1.9	20	
Barium		0.360	mg/L	0.10	111	70	130	1.7	20	
Cadmium		0.241	mg/L	0.010	95	70	130	1.8	20	
Chromium		0.308	mg/L	0.050	114	70	130	0.4	20	
Copper		0.352	mg/L	0.010	105	70	130	1.5	20	
Manganese		0.313	mg/L	0.010	108	70	130	3	20	
Molybdenum		5.07	mg/L	0.10		70	130	1.1	20	A
Nickel		0.276	mg/L	0.050	106	70	130	0.7	20	
Selenium		0.278	mg/L	0.0010	104	70	130	4.9	20	
Vanadium		121	mg/L	0.10		70	130	1.5	20	A
Zinc		0.296	mg/L	0.010	91	70	130	0.7	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: R124517
Sample ID: LRB	7	Method Blank				Run: ICPMS2-C_091001A				10/01/09 13:21
Barium		ND	mg/L	3E-05						
Cadmium		ND	mg/L	6E-05						
Lead		ND	mg/L	2E-05						
Mercury		ND	mg/L	4E-05						
Molybdenum		6E-05	mg/L	4E-05						
Uranium		ND	mg/L	8E-06						
Vanadium		ND	mg/L	9E-05						
Sample ID: LFB	7	Laboratory Fortified Blank				Run: ICPMS2-C_091001A				10/01/09 13:28
Barium		0.0510	mg/L	0.0010	102	85	115			
Cadmium		0.0510	mg/L	0.0010	102	85	115			
Lead		0.0513	mg/L	0.0010	103	85	115			
Mercury		0.00513	mg/L	0.0010	103	85	115			
Molybdenum		0.0511	mg/L	0.0010	102	85	115			
Uranium		0.0491	mg/L	0.00030	98	85	115			
Vanadium		0.0500	mg/L	0.0010	100	85	115			
Sample ID: C09091173-003BMS4	7	Sample Matrix Spike				Run: ICPMS2-C_091001A				10/01/09 15:46
Barium		0.281	mg/L	0.10	103	70	130			
Cadmium		0.252	mg/L	0.010	101	70	130			
Lead		0.261	mg/L	0.050	104	70	130			
Mercury		0.0265	mg/L	0.0010	106	70	130			
Molybdenum		0.351	mg/L	0.10	107	70	130			
Uranium		2.03	mg/L	0.00030		70	130			A
Vanadium		0.259	mg/L	0.10	102	70	130			
Sample ID: C09091173-003BMSD	7	Sample Matrix Spike Duplicate				Run: ICPMS2-C_091001A				10/01/09 15:53
Barium		0.281	mg/L	0.10	103	70	130	0.2	20	
Cadmium		0.253	mg/L	0.010	101	70	130	0.4	20	
Lead		0.262	mg/L	0.050	105	70	130	0.3	20	
Mercury		0.0266	mg/L	0.0010	106	70	130	0.5	20	
Molybdenum		0.353	mg/L	0.10	108	70	130	0.6	20	
Uranium		2.04	mg/L	0.00030		70	130	0.5	20	A
Vanadium		0.258	mg/L	0.10	102	70	130	0.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0										Batch: R124554
Sample ID: LCS	2	Laboratory Control Sample				Run: IC2-C_091001A				10/01/09 14:39
Chloride		9.72	mg/L	1.0	97	90	110			
Sulfate		38.6	mg/L	1.0	96	90	110			
Sample ID: MBLK	2	Method Blank				Run: IC2-C_091001A				10/01/09 14:56
Chloride		ND	mg/L	0.04						
Sulfate		ND	mg/L	0.1						
Sample ID: C09091122-002AMS	2	Sample Matrix Spike				Run: IC2-C_091001A				10/02/09 04:18
Chloride		482	mg/L	1.0		80	120			A
Sulfate		977	mg/L	1.0		80	120			A
Sample ID: C09091122-002AMSD	2	Sample Matrix Spike Duplicate				Run: IC2-C_091001A				10/02/09 04:35
Chloride		480	mg/L	1.0		80	120	0.4	20	A
Sulfate		975	mg/L	1.0		80	120	0.1	20	A
Method: E350.1										Analytical Run: SUB-B136889
Sample ID: ICV		Initial Calibration Verification Standard								10/01/09 13:44
Nitrogen, Ammonia as N		5.53	mg/L	0.30	101	90	110			
Method: E350.1										Batch: B_R136889
Sample ID: MBLK		Method Blank				Run: SUB-B136889				10/01/09 13:45
Nitrogen, Ammonia as N		ND	mg/L	0.05						
Sample ID: LFB		Laboratory Fortified Blank				Run: SUB-B136889				10/01/09 13:46
Nitrogen, Ammonia as N		1.01	mg/L	0.050	102	90	110			
Sample ID: B09100060-002BMS		Sample Matrix Spike				Run: SUB-B136889				10/01/09 15:05
Nitrogen, Ammonia as N		0.966	mg/L	0.050	99	90	110			
Sample ID: B09100060-002BMSD		Sample Matrix Spike Duplicate				Run: SUB-B136889				10/01/09 15:06
Nitrogen, Ammonia as N		0.966	mg/L	0.050	99	90	110	0	10	
Sample ID: C09091173-007D		Sample Matrix Spike				Run: SUB-B136889				10/01/09 15:34
Nitrogen, Ammonia as N		1.02	mg/L	0.050	102	90	110			
Sample ID: C09091173-007D		Sample Matrix Spike Duplicate				Run: SUB-B136889				10/01/09 15:35
Nitrogen, Ammonia as N		0.987	mg/L	0.050	99	90	110	3.2	10	

Qualifiers:

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ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

MDC - Minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: Commercial Evaporation Pond G-8 Samples

Report Date: 10/28/09
Work Order: C09091126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2										Analytical Run: SUB-B136930
Sample ID: ICV		Initial Calibration Verification Standard								10/02/09 10:26
Nitrogen, Nitrate+Nitrite as N		37.5	mg/L	0.20	106	90	110			
Method: E353.2										Batch: B_R136930
Sample ID: MBLK		Method Blank				Run: SUB-B136930				10/02/09 10:27
Nitrogen, Nitrate+Nitrite as N		ND	mg/L	0.01						
Sample ID: LFB		Laboratory Fortified Blank				Run: SUB-B136930				10/02/09 10:28
Nitrogen, Nitrate+Nitrite as N		0.997	mg/L	0.010	102	90	110			
Sample ID: B09100141-001CMS		Sample Matrix Spike				Run: SUB-B136930				10/02/09 15:26
Nitrogen, Nitrate+Nitrite as N		1.06	mg/L	0.010	96	90	110			
Sample ID: B09100141-001CMSD		Sample Matrix Spike Duplicate				Run: SUB-B136930				10/02/09 15:27
Nitrogen, Nitrate+Nitrite as N		1.08	mg/L	0.010	98	90	110	2.2	10	
Sample ID: C09091173-020D		Sample Matrix Spike				Run: SUB-B136930				10/02/09 13:47
Nitrogen, Nitrate+Nitrite as N		2.54	mg/L	0.010	107	90	110			
Sample ID: C09091173-020D		Sample Matrix Spike Duplicate				Run: SUB-B136930				10/02/09 13:48
Nitrogen, Nitrate+Nitrite as N		2.54	mg/L	0.010	107	90	110	0.1	10	
Method: E903.0										Batch: RA226-4051
Sample ID: C09091122-001DMS		Sample Matrix Spike				Run: BERTHOLD 770-1_091005C				10/13/09 17:37
Radium 226		18	pCi/L		108	70	130			
Sample ID: C09091122-001DMSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_091005C				10/13/09 17:37
Radium 226		19	pCi/L		113	70	130	3.8	25.4	
Sample ID: MB-RA226-4051	3	Method Blank				Run: BERTHOLD 770-1_091005C				10/13/09 22:20
Radium 226		-0.3	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.3	pCi/L							
Sample ID: LCS-RA226-4051		Laboratory Control Sample				Run: BERTHOLD 770-1_091005C				10/13/09 22:20
Radium 226		7.6	pCi/L		100	70	130			

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration

ANALYTICAL SUMMARY REPORT

October 28, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09091126 Quote ID: C1125 - Crow Butte Uranium Project

Project Name: Commercial Evaporation Pond G-8 Samples

Energy Laboratories, Inc. received the following 2 samples for Crow Butte Resources on 9/29/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09091126-001	Pond Composite Sample	09/24/09 00:00	09/29/09	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity QA Calculations Conductivity Fluoride E300.0 Anions Nitrogen, Ammonia Nitrogen, Nitrate + Nitrite pH Radium 226, Dissolved Solids, Total Dissolved
C09091126-002	Pond Discharge Sample	09/24/09 00:00	09/29/09	Aqueous	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: Stephanie D. Waldrop

Stephanie D. Waldrop
Reporting Supervisor

CLIENT: Crow Butte Resources

Date: 28-Oct-09

Project: Commercial Evaporation Pond G-8 Samples

Sample Delivery Group: C09091126

CASE NARRATIVE

BRANCH LABORATORY SUBCONTRACT ANALYSIS
Tests Associated with Analyst identified as ELI-B were subcontracted to Energy Laboratories Billings Branch, EPA Number MT00005.

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Energy Laboratories Inc
Workorder Receipt Checklist

C09091126

Crow Butte Resources

Login completed by: Edith McPike

Reviewed by: BL2000\tedwards

Reviewed Date: 9/30/2009 3:00:20 PM

Date and Time Received: 9/29/2009 9:30 AM

Received by: al

Carrier name: Ground

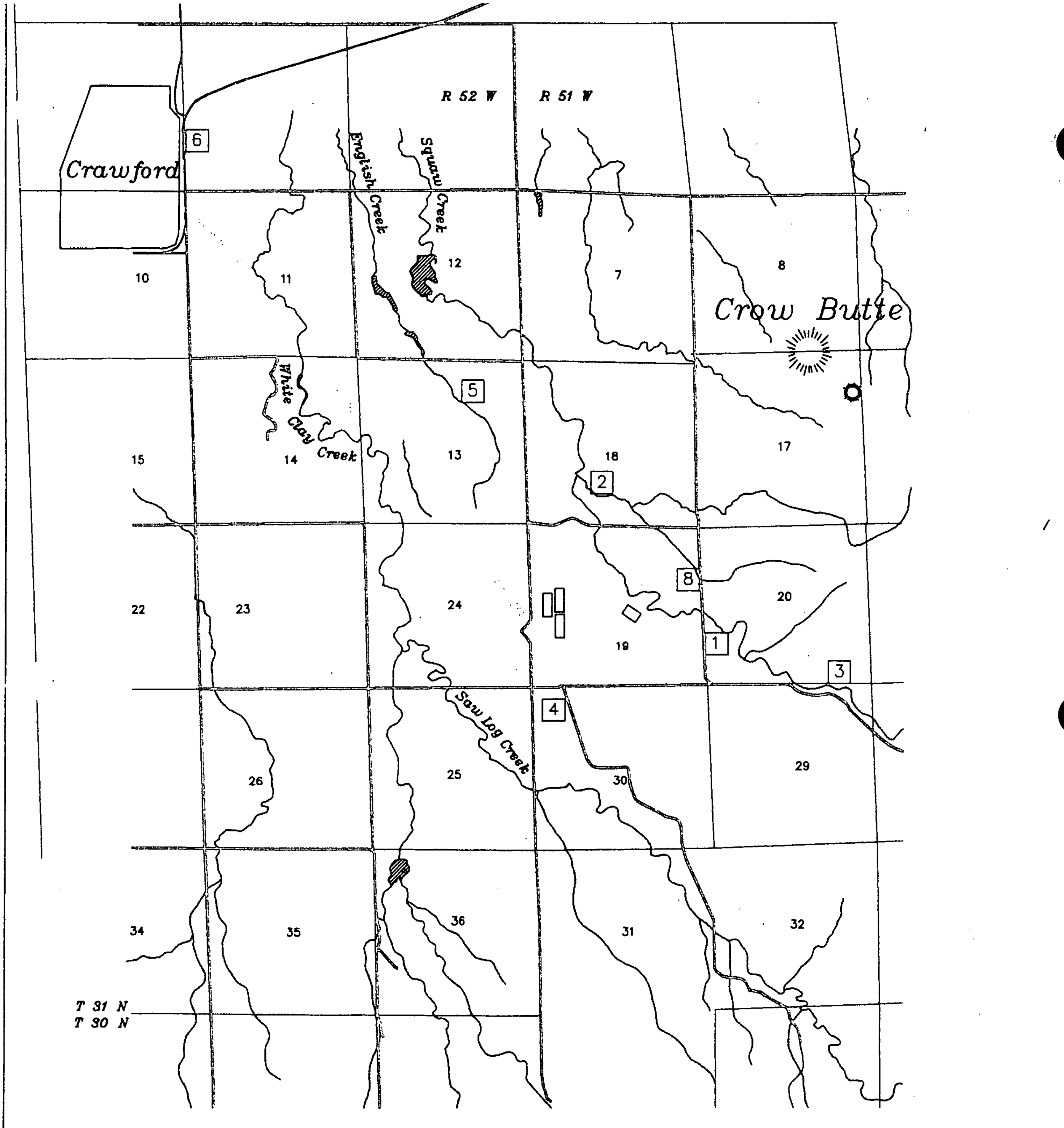
Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature:	14°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	Not Applicable ☐

Contact and Corrective Action Comments:

Pond Composite sample received at a pH of 6. After adding 4 mls of HNO3 pH was still at 6. Did not try to adjust further. Sample contained strong buffering capacity.

Appendix C-4
Environmental Air Samples Collected Under NRC Operating License During the 90-day Sampling Period

- Map of Air Monitoring Station Locations
- High Volume Air Sampling Report from Energy Laboratories, Inc.



8 Air Monitoring Stations

CROW BUTTE RESOURCES, INC.

Environmental Air Sample Locations

Date: 1/5/2010

Fig. 1

ENERGY LABORATORIES, INC. • 2393 Salt Creek Highway (82601) • P.O. Box 3258 • Casper, WY 82602
Toll Free 888.235.0515 • 307.235.0515 • Fax 307.234.1639 • casper@energylab.com • www.energylab.com

ANALYTICAL SUMMARY REPORT

December 09, 2009

Crow Butte Resources
86 Crow Butte Rd
Crawford, NE 69339

Workorder No.: C09100086

Project Name: 3rd Quarter 2009 Environmental Air Composites

Energy Laboratories, Inc. received the following 7 samples for Crow Butte Resources on 10/2/2009 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C09100086-001	AM-1		10/02/09	Filter	Metals, Total Digestion, Total Metals Lead 210 Radium 226
C09100086-002	AM-2		10/02/09	Filter	Same As Above
C09100086-003	AM-3		10/02/09	Filter	Same As Above
C09100086-004	AM-4		10/02/09	Filter	Same As Above
C09100086-005	AM-5		10/02/09	Filter	Same As Above
C09100086-006	AM-6		10/02/09	Filter	Same As Above
C09100086-007	AM-8		10/02/09	Filter	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:

Steven E. Carlston
Technical Director

ENERGY LABORATORIES, INC. • 2393 Salt Creek Highway (82601) • P.O. Box 3258 • Casper, WY 82602
Toll Free 888.235.0515 • 307.235.0515 • Fax 307.234.1639 • casper@energylab.com • www.energylab.com

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-1

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-001	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2009	^{226}Ra	< 1.00E-16	1.44E-17	3.44E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.51E-14	3.40E-15	5.41E-15	2.00E-15	6.00E-13	2.51E+00
5.18E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-001	^{nat}U	2.26E-16	N/A	N/A	1.00E-16	9.00E-14	2.51E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	1.78E-17	3.11E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	5.64E-15	1.68E-15	2.64E-15	2.00E-15	6.00E-13	9.40E-01
5.14E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-001	^{nat}U	8.27E-15	N/A	N/A	1.00E-16	9.00E-14	9.19E+00
Third Quarter 2009	^{226}Ra	< 1.00E-16	4.70E-17	8.61E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.78E-14	2.66E-15	4.13E-15	2.00E-15	6.00E-13	2.97E+00
5.54E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-2

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-002	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2009	^{226}Ra	< 1.00E-16	2.95E-17	5.15E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.36E-14	3.45E-15	5.54E-15	2.00E-15	6.00E-13	2.27E+00
5.06E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-002	^{nat}U	6.21E-16	N/A	N/A	1.00E-16	9.00E-14	6.90E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	1.81E-17	3.07E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.07E-14	1.77E-15	2.66E-15	2.00E-15	6.00E-13	1.78E+00
5.11E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-002	^{nat}U	8.12E-16	N/A	N/A	1.00E-16	9.00E-14	9.02E-01
Third Quarter 2009	^{226}Ra	< 1.00E-16	5.04E-17	9.81E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.25E-14	2.66E-15	4.26E-15	2.00E-15	6.00E-13	2.08E+00
5.42E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-3

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-003	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2009	^{226}Ra	1.07E-16	3.48E-17	4.76E-17	1.00E-16	9.00E-13	1.19E-02
Air Volume in mLs	^{210}Pb	1.65E-14	3.92E-15	6.29E-15	2.00E-15	6.00E-13	2.75E+00
4.45E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-003	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	1.97E-17	2.88E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	8.95E-15	1.72E-15	2.62E-15	2.00E-15	6.00E-13	1.49E+00
5.19E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-003	^{nat}U	2.79E-16	N/A	N/A	1.00E-16	9.00E-14	3.10E-01
Third Quarter 2009	^{226}Ra	< 1.04E-16	5.67E-17	1.04E-16	1.00E-16	9.00E-13	< 1.16E-02
Air Volume in mLs	^{210}Pb	1.97E-14	2.68E-15	4.13E-15	2.00E-15	6.00E-13	3.29E+00
5.54E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-4

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-004	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2009	^{226}Ra	< 1.00E-16	2.22E-17	3.95E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.46E-14	3.26E-15	5.20E-15	2.00E-15	6.00E-13	2.44E+00
5.39E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-004	^{nat}U	2.73E-16	N/A	N/A	1.00E-16	9.00E-14	3.03E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	1.91E-17	2.70E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.11E-14	1.68E-15	2.51E-15	2.00E-15	6.00E-13	1.85E+00
5.42E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-004	^{nat}U	7.13E-16	N/A	N/A	1.00E-16	9.00E-14	7.92E-01
Third Quarter 2009	^{226}Ra	< 1.05E-16	6.03E-17	1.05E-16	1.00E-16	9.00E-13	< 1.17E-02
Air Volume in mLs	^{210}Pb	1.84E-14	2.56E-15	3.98E-15	2.00E-15	6.00E-13	3.07E+00
5.78E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-5

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-005	^{nat}U	1.10E-16	N/A	N/A	1.00E-16	9.00E-14	1.23E-01
First Quarter 2009	^{226}Ra	< 1.00E-16	2.51E-17	3.70E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.43E-14	3.51E-15	5.63E-15	2.00E-15	6.00E-13	2.39E+00
4.98E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-005	^{nat}U	2.52E-16	N/A	N/A	1.00E-16	9.00E-14	2.80E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	2.59E-17	3.01E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	7.82E-15	1.87E-15	2.91E-15	2.00E-15	6.00E-13	1.30E+00
4.68E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-005	^{nat}U	5.74E-16	N/A	N/A	1.00E-16	9.00E-14	6.38E-01
Third Quarter 2009	^{226}Ra	1.23E-16	6.98E-17	9.00E-17	1.00E-16	9.00E-13	1.37E-02
Air Volume in mLs	^{210}Pb	2.14E-14	2.86E-15	4.43E-15	2.00E-15	6.00E-13	3.57E+00
5.21E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-6

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-006	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
First Quarter 2009	^{226}Ra	< 1.00E-16	2.06E-17	3.56E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.66E-14	3.23E-15	5.12E-15	2.00E-15	6.00E-13	2.77E+00
5.48E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-006	^{nat}U	< 1.00E-16	N/A	N/A	1.00E-16	9.00E-14	< 1.11E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	1.97E-17	2.50E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	6.90E-15	1.59E-15	2.47E-15	2.00E-15	6.00E-13	1.15E+00
5.51E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-006	^{nat}U	1.52E-16	N/A	N/A	1.00E-16	9.00E-14	1.69E-01
Third Quarter 2009	^{226}Ra	< 1.00E-16	4.45E-17	9.47E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	2.48E-14	2.60E-15	3.95E-15	2.00E-15	6.00E-13	4.13E+00
5.80E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

HIGH VOLUME AIR SAMPLING REPORT

CLIENT: Crow Butte Resources
PROJECT: 3rd Quarter 2009 Environmental Air Composites
REPORT DATE: December 9, 2009

SAMPLE ID: AM-8

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09040202-007	^{nat}U	1.30E-16	N/A	N/A	1.00E-16	9.00E-14	1.45E-01
First Quarter 2009	^{226}Ra	< 1.00E-16	2.40E-17	4.36E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.87E-14	3.72E-15	5.89E-15	2.00E-15	6.00E-13	3.12E+00
4.76E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09070028-007	^{nat}U	2.86E-16	N/A	N/A	1.00E-16	9.00E-14	3.17E-01
Second Quarter 2009	^{226}Ra	< 1.00E-16	2.48E-17	2.99E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.51E-14	2.01E-15	2.94E-15	2.00E-15	6.00E-13	2.51E+00
4.62E+09							

Quarter/Date Sampled Air Volume	Radionuclide	Concentration µCi/mL	Counting Precision µCi/mL	MDC µCi/mL	L.L.D. µCi/mL	Effluent Conc.* µCi/mL	% Effluent Concentration
C09100086-007	^{nat}U	2.02E-16	N/A	N/A	1.00E-16	9.00E-14	2.24E-01
Third Quarter 2009	^{226}Ra	< 1.00E-16	3.70E-17	5.37E-17	1.00E-16	9.00E-13	< 1.11E-02
Air Volume in mLs	^{210}Pb	1.96E-14	3.55E-15	5.61E-15	2.00E-15	6.00E-13	3.26E+00
4.10E+09							

LLD's are from Reg. Guide 4.14
*Effluent Concentration from the NEW 10 CFR Part 20 - Appendix B - Table 2
Year for Natural Uranium
Year for Thorium-230
Week for Radium-226
Day for Lead-210

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QA/QC Summary Report

Client: Crow Butte Resources **Report Date:** 12/09/09
Project: 3rd Quarter 2009 Environmental Air Composites **Work Order:** C09100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0									Batch: 127373
Sample ID: C09100973-017AMS	Sample Matrix Spike				Run: BERTHOLD 770-1_091201A				12/07/09 15:57
Radium 226	15	pCi/g-dry		109	70	130			
Sample ID: C09100973-017AMSD	Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_091201A				12/07/09 15:57
Radium 226	16	pCi/g-dry		111	70	130	2.9	18	
Sample ID: MB-RA226-4221	Method Blank				Run: BERTHOLD 770-1_091201A				12/07/09 15:57
Radium 226	-0.3	pCi/L							U
Radium 226 precision (±)	0.1	pCi/L							
Radium 226 MDC	0.2	pCi/L							
Sample ID: LCS-RA226-4221	Laboratory Control Sample				Run: BERTHOLD 770-1_091201A				12/07/09 15:57
Radium 226	17	pCi/L		111	70	130			
Method: E903.0									Batch: 23958
Sample ID: C09100086-001AMS	Sample Matrix Spike				Run: BERTHOLD 770-1_091013A				10/21/09 18:20
Radium 226	45.1	pCi/Filter		120	70	130			
Sample ID: C09100086-001AMSD	Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_091013A				10/21/09 18:20
Radium 226	46.9	pCi/Filter		126	70	130	4	23.5	
Sample ID: LCS-23958	Laboratory Control Sample				Run: BERTHOLD 770-1_091013A				10/21/09 23:55
Radium 226	16.3	pCi/Filter		110	70	130			
Sample ID: MB-23958	Method Blank				Run: BERTHOLD 770-1_091013A				10/21/09 23:55
Radium 226	-0.1	pCi/Filter							U
Radium 226 precision (±)	0.07	pCi/Filter							
Radium 226 MDC	0.2	pCi/Filter							
Method: E909.0M									Batch: 23958
Sample ID: C09100086-003AMS	Sample Matrix Spike				Run: BECKMAN 6100TA_091109A				11/09/09 15:00
Lead 210	1320	pCi/Filter		113	70	130			
Sample ID: C09100086-003AMSD	Sample Matrix Spike Duplicate				Run: BECKMAN 6100TA_091109A				11/09/09 15:00
Lead 210	1180	pCi/Filter		101	70	130	11	30	
Sample ID: MB-R127232	Method Blank				Run: BECKMAN 6100TA_091109A				11/09/09 15:00
Lead 210	-2	pCi/Filter							U
Lead 210 precision (±)	3	pCi/Filter							
Lead 210 MDC	5	pCi/Filter							
Sample ID: LCS-R127232	Laboratory Control Sample				Run: BECKMAN 6100TA_091109A				11/09/09 15:00
Lead 210	555	pCi/Filter		98	70	130			

Qualifiers:

RL - Analyte reporting limit.
MDC - Minimum detectable concentration
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Client: Crow Butte Resources
Project: 3rd Quarter 2009 Environmental Air Composites

Report Date: 12/09/09
Work Order: C09100086

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: 23958
Sample ID: MB-23958	Method Blank				Run: ICPMS2-C_091012A				10/12/09 13:55
Uranium	0.0002	mg/filter	6E-05						
Sample ID: LCS2-23958	Laboratory Control Sample				Run: ICPMS2-C_091012A				10/12/09 14:00
Uranium	0.105	mg/filter	0.00030	105	85	115			
Sample ID: C09100086-006AMS	Sample Matrix Spike				Run: ICPMS2-C_091012A				10/12/09 15:29
Uranium	0.0539	mg/filter	0.00030	105	75	125			
Sample ID: C09100086-006AMSD	Sample Matrix Spike Duplicate				Run: ICPMS2-C_091012A				10/12/09 15:34
Uranium	0.0534	mg/filter	0.00030	104	75	125	0.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

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CLIENT: Crow Butte Resources

Date: *09-Dec-09*

Project: 3rd Quarter 2009 Environmental Air Composites

CASE NARRATIVE

Sample Delivery Group: C09100086

RADIOCHEMISTRY ANALYSIS
Per client request, results less than MDC (or precision if no MDC), are reported as <MDC (or <precision). Actual instrument results are available by request.

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

Appendix C-5
Historical Wind Rose Data

- Section 2.5.6 Local Meteorological Station, Crow Butte Uranium Project, Application and Supporting Environmental Report for USNRC Commercial Source Material License, September 1987

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LIST OF TABLES

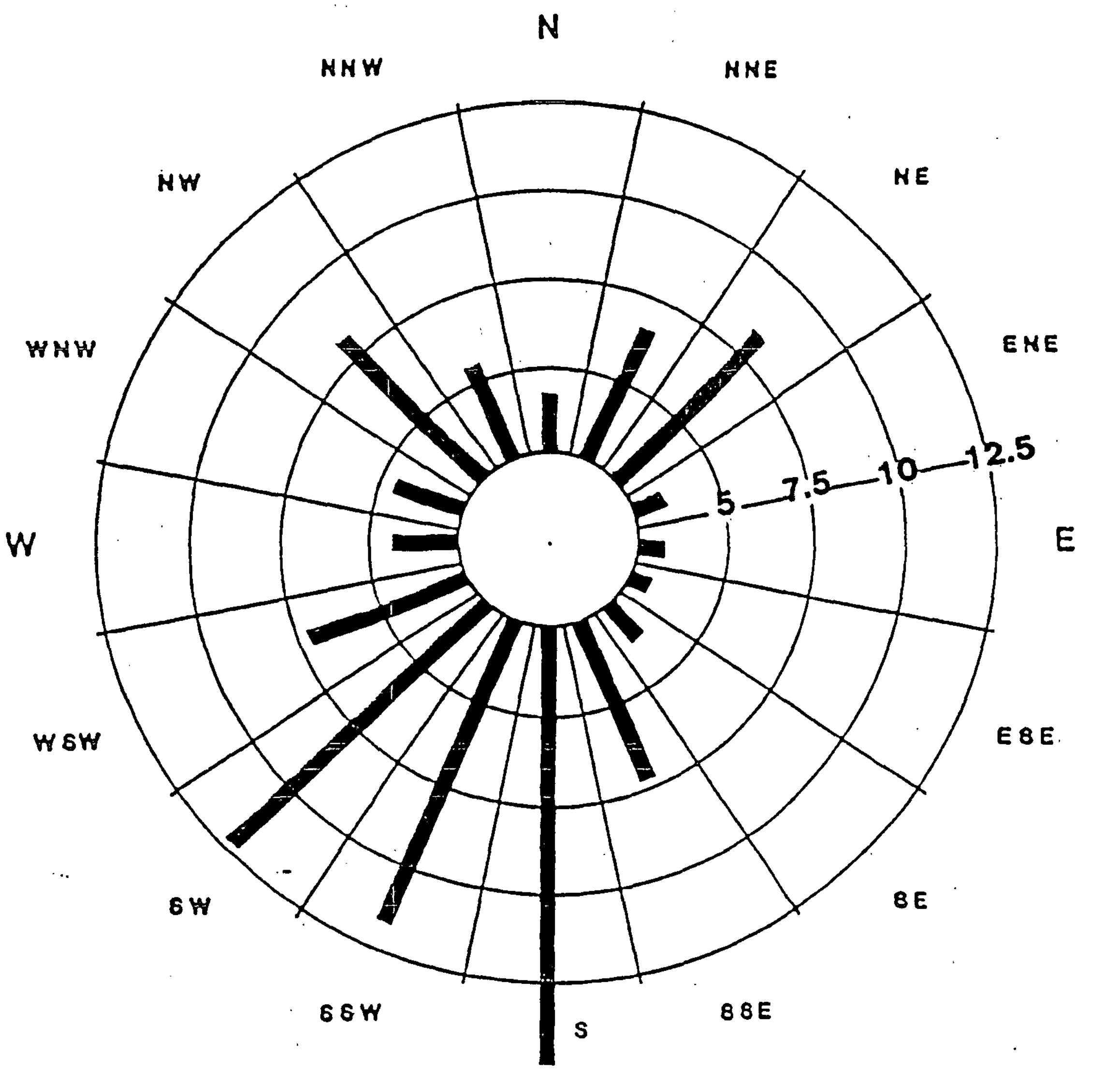
LIST OF FIGURES

2.5.6 Local Meteorological Station

Local terrain will have a significant influence on the wind patterns in a given area. Because of this, a meteorological station has been installed on the project site. This station is capable of measuring wind speed, direction, and the standard deviation of the wind direction. From this information joint frequency data has been compiled. Figure 2.5-3 exhibits the windrose that were identified for the site and Table 2.5-8 shows the frequency of winds by direction and speed for the six stability classes. Table 2.5-9 shows the annual relative joint frequency distribution. The windrose from the local meteorological station shows the prevailing swinds to be from the south-southwest.

Precipitation was also recorded at the station with a heated tipping bucket rain gauge. Evaporation is measured using a 48" evaporation pan and an evaporation gauge with analog output. The air temperature was also recorded using a precision linear thermistor and fan aspirated radiation shield. All the information was recorded on strip chart recorders. In addition the information was run through a microprocessor and recorded on magnetic tape. The information from the tape was transferred to a computer and then verified by comparison from the strip charts and from visual observation records.

The data obtained at the local meteorological station for precipitation, evaporation and temperature were in good agreement with the results from the National Weather Service Stations located at Scottsbluff, Nebraska and Rapid City, South Dakota.



UNITS IN PERCENT

ENECOTECH
Denver, Colorado

PROJECT FERRET
CROW BUTTE, NEBRASKA

PERCENT OCCURRENCES BY DIRECTION
CROW BUTTE, NEBRASKA
MAY 1982 THROUGH APRIL 1984

FILE NO. 153-001 DATE JULY 1987 FIGURE NO. 2.5-3

TABLE 2.5-8

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS A
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

SPEED CLASS INTERVALS(KNOTS)

DIRECTION	1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	0.98	8.63	2.62	0.11	0.00	0.00	12.35	4.9
NNE	2.51	8.74	2.95	0.11	0.00	0.00	14.32	4.6
NE	1.64	8.52	1.31	0.00	0.00	0.00	11.48	4.5
ENE	0.66	4.37	0.55	0.00	0.00	0.00	5.57	4.4
E	1.20	1.97	0.77	0.00	0.00	0.00	3.93	4.4
ESE	0.33	0.87	0.22	0.00	0.00	0.00	1.42	4.0
SE	0.98	1.75	1.64	0.00	0.00	0.00	4.37	5.1
SSE	0.44	2.51	1.64	0.11	0.00	0.00	4.70	5.3
S	0.98	3.72	1.53	0.00	0.00	0.00	6.23	5.0
SSW	0.55	1.97	2.08	0.22	0.00	0.00	4.81	6.0
SW	0.77	3.72	1.53	0.00	0.00	0.00	6.01	5.0
WSW	0.66	2.08	1.53	0.00	0.00	0.00	4.26	5.3
W	0.66	1.75	1.75	0.11	0.00	0.00	4.26	5.5
WNW	0.77	1.42	0.98	0.44	0.00	0.00	3.61	5.7
NW	0.66	2.30	1.53	0.11	0.00	0.00	4.59	5.5
NNW	1.53	3.93	1.86	0.44	0.00	0.00	7.76	5.3
ALL	15.30	58.25	24.48	1.64	0.00	0.00	99.67	5.0

Calm (less than one knot) = 0.3%
Period mean wind speed = 5.0 knots
Percent occurrence for A stability class 5.6%

ENECOTECH INC.
SBWIND(3.2) 1/ 5/84

TABLE 2.5-8

(cont'd)

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS B
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

DIRECTION	SPEED CLASS INTERVALS(KNOTS) 1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	1.01	2.68	5.53	0.67	0.00	0.00	9.89	6.4
NNE	1.34	3.52	3.77	0.34	0.00	0.00	8.97	5.7
NE	0.92	5.28	5.45	0.50	0.00	0.00	12.15	6.0
ENE	0.84	1.76	2.85	0.25	0.00	0.00	5.70	6.0
E	0.17	0.84	0.75	0.08	0.00	0.00	1.84	6.0
ESE	0.59	0.59	1.09	0.00	0.00	0.00	2.26	5.8
SE	0.08	1.26	2.26	0.25	0.00	0.00	3.86	6.9
SSE	0.67	1.17	2.43	0.50	0.00	0.00	4.78	6.5
S	1.09	1.01	4.02	0.92	0.00	0.00	7.04	7.0
SSW	1.01	2.01	2.26	0.75	0.00	0.00	6.04	6.3
SW	0.92	3.19	2.51	0.59	0.00	0.00	7.21	6.1
WSW	0.59	2.01	2.60	0.84	0.08	0.00	6.12	6.9
W	0.42	1.34	2.35	0.42	0.08	0.00	4.61	7.2
WNW	0.67	1.09	2.10	0.34	0.00	0.00	4.19	6.6
NW	0.25	1.09	4.02	1.09	0.08	0.00	6.54	7.8
NNW	0.42	1.51	4.95	1.68	0.08	0.00	8.63	7.8
ALL	10.98	30.34	48.95	9.22	0.34	0.00	99.83	6.6

Calm (less than one knot) = 0.2%
Period mean wind speed = 6.5 knots
Percent occurrence for B stability class 7.4%

ENECOTECH INC.
SEWIND(3.2) 1/ 5/84

TABLE 2.5-8
(cont'd)

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS C
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

SPEED CLASS INTERVALS(KNOTS)

DIRECTION	1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	0.74	1.54	2.68	0.74	0.00	0.00	5.69	6.7
NNE	0.63	2.62	2.90	0.85	0.00	0.00	7.00	6.6
NE	0.91	2.28	5.69	1.20	0.00	0.00	10.08	7.0
ENE	0.46	1.03	2.96	0.97	0.00	0.00	5.41	7.3
E	0.00	0.57	0.74	0.28	0.00	0.00	1.59	7.6
ESE	0.23	0.34	0.91	0.23	0.00	0.00	1.71	7.0
SE	0.17	0.68	1.82	0.74	0.00	0.00	3.42	7.7
SSE	0.46	0.74	2.22	1.48	0.00	0.00	4.90	8.0
S	0.97	1.65	5.30	2.28	0.00	0.00	10.19	7.7
SSW	1.14	3.02	3.93	0.97	0.00	0.00	9.05	6.6
SW	1.03	3.36	4.67	1.14	0.11	0.00	10.31	6.8
WSW	0.97	3.02	3.59	1.14	0.06	0.06	8.83	6.8
W	0.11	0.91	1.99	1.03	0.11	0.00	4.16	8.4
WNW	0.17	0.51	1.03	1.25	0.06	0.00	3.02	9.1
NW	0.40	0.74	3.70	2.22	0.06	0.00	7.12	8.7
NNW	0.40	1.42	3.42	2.11	0.00	0.00	7.35	8.2
ALL	8.77	24.43	47.55	18.62	0.40	0.06	99.83	7.4

Calm (less than one knot) = 0.2%
Period mean wind speed = 7.4 knots
Percent occurrence for C stability class 10.8%

ENECOTECH INC.
SBWIND(3.2) 1/ 5/84

TABLE 2.5-8

(cont'd)

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS D
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

DIRECTION	SPEED CLASS INTERVALS (KNOTS) 1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	0.17	0.52	1.14	0.83	0.20	0.02	2.88	9.2
NNE	0.16	1.12	2.34	2.90	0.89	0.19	7.59	10.7
NE	0.13	1.53	2.55	2.72	0.46	0.08	7.46	9.8
ENE	0.04	0.47	0.79	0.50	0.06	0.00	1.86	8.3
E	0.02	0.06	0.28	0.22	0.04	0.00	0.61	9.5
ESE	0.01	0.25	0.35	0.13	0.00	0.00	0.74	7.4
SE	0.06	0.42	0.71	0.52	0.18	0.01	1.90	9.5
SSE	0.13	1.78	1.50	2.60	1.21	0.34	7.56	11.1
S	0.34	1.67	3.58	7.77	3.57	0.58	17.51	12.4
SSW	0.22	1.37	3.82	3.60	0.76	0.12	9.89	10.0
SW	0.17	2.11	5.80	3.80	0.29	0.02	12.20	8.8
WSW	0.17	0.61	2.28	2.74	0.54	0.16	6.50	10.7
W	0.10	0.20	0.64	1.03	0.47	0.19	2.63	12.5
WNW	0.05	0.17	0.91	1.39	0.66	0.28	3.46	13.2
NW	0.05	0.31	1.60	5.13	2.68	1.55	11.32	15.0
NNW	0.04	0.49	1.80	2.34	0.90	0.20	5.78	11.9
ALL	1.84	13.08	30.10	38.22	12.90	3.75	99.89	11.2

Calm (less than one knot) = 0.1%
Period mean wind speed = 11.2 knots
Percent occurrence for D stability class 51.3%

ENECOTECH INC.
SBWIND(3.2) 1/ 5/84

TABLE 2.5-8

(cont'd)

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS E
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

	SPEED CLASS INTERVALS(KNOTS)							
DIRECTION	1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	0.85	2.92	0.65	0.04	0.00	0.00	4.46	4.6
NNE	0.97	2.80	1.82	0.00	0.00	0.00	5.59	5.2
NE	0.97	3.32	1.90	0.08	0.00	0.00	6.28	5.1
ENE	0.45	1.26	0.73	0.00	0.00	0.00	2.43	5.1
E	0.16	0.73	0.20	0.00	0.00	0.00	1.09	4.7
ESE	0.28	0.65	0.45	0.00	0.00	0.00	1.38	4.8
SE	0.49	1.82	0.85	0.12	0.00	0.00	3.28	5.1
SSE	1.70	7.62	1.05	0.08	0.00	0.00	10.45	4.4
S	2.23	11.06	4.34	0.16	0.00	0.00	17.79	5.0
SSW	2.11	10.53	2.80	0.04	0.00	0.00	15.48	4.7
SW	1.78	8.18	5.67	0.12	0.04	0.00	15.80	5.5
WSW	1.05	2.88	2.47	0.04	0.00	0.00	6.44	5.4
W	0.65	0.97	0.36	0.04	0.00	0.00	2.03	4.3
WNW	0.36	0.97	0.81	0.00	0.00	0.00	2.15	5.5
NW	0.45	1.18	0.85	0.20	0.00	0.00	2.67	5.7
NNW	0.61	1.34	0.49	0.00	0.00	0.00	2.43	4.5
ALL	15.11	58.23	25.45	0.93	0.04	0.00	99.76	5.0

Calm (less than one knot) = 0.2%
Period mean wind speed = 5.0 knots
Percent occurrence for E stability class 15.2%

ENECOTECH INC.
SBWIND(3.2) 1/ 5/84

TABLE 2.5-8

(cont'd)

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS F
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

SPEED CLASS INTERVALS(KNOTS)

DIRECTION	1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	3.30	1.65	0.00	0.00	0.00	0.00	4.96	2.8
NNE	1.65	1.33	0.00	0.00	0.00	0.00	2.99	3.0
NE	0.95	1.40	0.00	0.00	0.00	0.00	2.35	3.1
ENE	1.40	0.76	0.00	0.00	0.00	0.00	2.16	2.8
E	1.27	0.44	0.00	0.00	0.00	0.00	1.72	2.8
ESE	1.78	1.02	0.00	0.00	0.00	0.00	2.80	2.6
SE	1.72	1.78	0.00	0.00	0.00	0.00	3.49	3.0
SSE	3.75	4.76	0.00	0.00	0.00	0.00	8.51	3.1
S	7.50	12.07	0.00	0.00	0.00	0.00	19.57	3.3
SSW	7.24	13.15	0.00	0.00	0.00	0.00	20.39	3.3
SW	6.48	8.01	0.00	0.00	0.00	0.00	14.49	3.2
WSW	2.73	2.60	0.00	0.00	0.00	0.00	5.34	3.0
W	1.78	1.46	0.00	0.00	0.00	0.00	3.24	2.9
WNW	0.83	0.95	0.00	0.00	0.00	0.00	1.78	3.0
NW	1.33	1.21	0.00	0.00	0.00	0.00	2.54	3.0
NNW	1.33	0.51	0.00	0.00	0.00	0.00	1.84	2.5
ALL	45.04	53.11	0.00	0.00	0.00	0.00	98.16	3.1

Calm (less than one knot) = 1.8%
Period mean wind speed = 3.1 knots
Percent occurrence for F stability class 9.7%

ENECOTECH INC.
SBWIND(3.2) 1/ 5/84

ENECOTECH

TABLE 2.5-8

(cont'd)

FREQUENCY OF WINDS BY DIRECTION AND SPEED
FOR STABILITY CLASS ALL
DATA RECORDED FROM MAY 1982 THROUGH APRIL 1984
CROW BUTTE - NEBRASKA

	SPEED CLASS INTERVALS(KNOTS)							
DIRECTION	1,<3	3,<6	6,<10	10,<16	16,<21	>21	ALL	MEAN SPEED
N	0.75	1.72	1.53	0.57	0.10	0.01	4.68	6.5
NNE	0.70	2.16	2.24	1.61	0.46	0.10	7.26	8.2
NE	0.57	2.54	2.69	1.57	0.23	0.04	7.64	7.7
ENE	0.37	0.99	1.08	0.38	0.03	0.00	2.85	6.5
E	0.24	0.42	0.35	0.15	0.02	0.00	1.18	6.2
ESE	0.31	0.46	0.44	0.09	0.00	0.00	1.29	5.5
SE	0.35	0.93	0.95	0.38	0.09	0.01	2.71	7.0
SSE	0.81	2.84	1.44	1.55	0.62	0.17	7.44	8.2
S	1.48	4.17	3.45	4.33	1.83	0.30	15.55	9.3
SSW	1.36	4.17	3.09	2.03	0.39	0.06	11.10	7.2
SW	1.21	3.91	4.62	2.13	0.17	0.01	12.05	7.1
WSW	0.70	1.60	2.21	1.60	0.29	0.09	6.48	8.2
W	0.40	0.69	0.87	0.68	0.26	0.10	3.00	8.9
WNW	0.27	0.54	0.91	0.90	0.35	0.14	3.11	10.2
NW	0.32	0.75	1.73	2.99	1.39	0.79	7.97	12.8
NNW	0.40	0.99	1.84	1.58	0.47	0.10	5.38	9.5
ALL	10.23	28.87	29.43	22.53	6.69	1.93	99.68	8.4

Calm (less than one knot) = 0.3%
Period mean wind speed = 8.4 knots
Percent occurrence for ALL stability classes 100.0%

ENECOTECH INC.
SBWIND(3.2) 1/ 5/84

TABLE 2.5-9

JOINT FREQUENCY DISTRIBUTION
CROW BUTTE

.00056	.00488	.00148	.00006	.00000	.00000	JFD FOR CROW BUTTE
.00142	.00495	.00167	.00006	.00000	.00000	DATE(SBWIND3.2) 1/ 6/84
.00093	.00482	.00074	.00000	.00000	.00000	
.00037	.00247	.00031	.00000	.00000	.00000	
.00068	.00111	.00043	.00000	.00000	.00000	
.00019	.00049	.00012	.00000	.00000	.00000	
.00056	.00099	.00093	.00000	.00000	.00000	
.00025	.00142	.00093	.00006	.00000	.00000	
.00056	.00210	.00087	.00000	.00000	.00000	
.00031	.00111	.00117	.00012	.00000	.00000	
.00043	.00210	.00087	.00000	.00000	.00000	
.00037	.00117	.00087	.00000	.00000	.00000	
.00037	.00099	.00099	.00006	.00000	.00000	
.00043	.00080	.00056	.00025	.00000	.00000	
.00037	.00130	.00087	.00006	.00000	.00000	
.00087	.00223	.00105	.00025	.00000	.00000	
.00074	.00198	.00408	.00049	.00000	.00000	B START
.00099	.00260	.00278	.00025	.00000	.00000	
.00068	.00389	.00402	.00037	.00000	.00000	
.00062	.00130	.00210	.00019	.00000	.00000	
.00012	.00062	.00056	.00006	.00000	.00000	
.00043	.00043	.00080	.00000	.00000	.00000	
.00006	.00093	.00167	.00019	.00000	.00000	
.00049	.00087	.00179	.00037	.00000	.00000	
.00080	.00074	.00297	.00068	.00000	.00000	
.00074	.00148	.00167	.00056	.00000	.00000	
.00068	.00235	.00185	.00043	.00000	.00000	
.00043	.00148	.00192	.00062	.00006	.00000	
.00031	.00099	.00173	.00031	.00006	.00000	
.00049	.00080	.00155	.00025	.00000	.00000	
.00019	.00080	.00297	.00080	.00006	.00000	
.00031	.00111	.00365	.00124	.00006	.00000	
.00080	.00167	.00291	.00080	.00000	.00000	C START
.00068	.00284	.00315	.00093	.00000	.00000	
.00099	.00247	.00618	.00130	.00000	.00000	
.00049	.00111	.00321	.00105	.00000	.00000	
.00000	.00062	.00080	.00031	.00000	.00000	
.00025	.00037	.00099	.00025	.00000	.00000	
.00019	.00074	.00198	.00080	.00000	.00000	
.00049	.00080	.00241	.00161	.00000	.00000	
.00105	.00179	.00576	.00247	.00000	.00000	
.00124	.00328	.00427	.00105	.00000	.00000	
.00111	.00365	.00507	.00124	.00012	.00000	
.00105	.00328	.00389	.00124	.00006	.00006	
.00012	.00099	.00216	.00111	.00012	.00000	
.00019	.00056	.00111	.00136	.00006	.00000	
.00043	.00080	.00402	.00241	.00006	.00000	
.00043	.00155	.00371	.00229	.00000	.00000	

TABLE 2.5-9
(cont'd)

.00087	.00266	.00587	.00427	.00105	.00012	D START
.00080	.00575	.01205	.01490	.00457	.00099	
.00068	.00785	.01311	.01397	.00235	.00043	
.00019	.00241	.00408	.00260	.00031	.00000	
.00012	.00031	.00142	.00111	.00019	.00000	
.00006	.00130	.00179	.00068	.00000	.00000	
.00031	.00216	.00365	.00266	.00093	.00006	
.00068	.00915	.00773	.01335	.00624	.00173	
.00173	.00859	.01842	.04000	.01836	.00297	
.00111	.00705	.01966	.01854	.00389	.00062	
.00087	.01088	.02986	.01953	.00148	.00012	
.00087	.00315	.01175	.01409	.00278	.00080	
.00049	.00105	.00328	.00532	.00241	.00099	
.00025	.00087	.00470	.00717	.00340	.00142	
.00025	.00161	.00822	.02640	.01379	.00797	
.00019	.00253	.00927	.01205	.00464	.00105	
.00130	.00446	.00099	.00006	.00000	.00000	E START
.00148	.00427	.00278	.00000	.00000	.00000	
.00148	.00507	.00291	.00012	.00000	.00000	
.00068	.00192	.00111	.00000	.00000	.00000	
.00025	.00111	.00031	.00000	.00000	.00000	
.00043	.00099	.00068	.00000	.00000	.00000	
.00074	.00278	.00130	.00019	.00000	.00000	
.00260	.01162	.00161	.00012	.00000	.00000	
.00340	.01688	.00661	.00025	.00000	.00000	
.00321	.01607	.00427	.00006	.00000	.00000	
.00272	.01249	.00865	.00019	.00006	.00000	
.00161	.00439	.00377	.00006	.00000	.00000	
.00099	.00148	.00056	.00006	.00000	.00000	
.00056	.00148	.00124	.00000	.00000	.00000	
.00068	.00179	.00130	.00031	.00000	.00000	
.00093	.00204	.00074	.00000	.00000	.00000	
.00321	.00161	.00000	.00000	.00000	.00000	F START
.00161	.00130	.00000	.00000	.00000	.00000	
.00093	.00136	.00000	.00000	.00000	.00000	
.00136	.00074	.00000	.00000	.00000	.00000	
.00124	.00043	.00000	.00000	.00000	.00000	
.00173	.00099	.00000	.00000	.00000	.00000	
.00167	.00173	.00000	.00000	.00000	.00000	
.00365	.00464	.00000	.00000	.00000	.00000	
.00729	.01175	.00000	.00000	.00000	.00000	
.00705	.01280	.00000	.00000	.00000	.00000	
.00631	.00779	.00000	.00000	.00000	.00000	
.00266	.00253	.00000	.00000	.00000	.00000	
.00173	.00142	.00000	.00000	.00000	.00000	
.00080	.00093	.00000	.00000	.00000	.00000	
.00130	.00117	.00000	.00000	.00000	.00000	
.00130	.00049	.00000	.00000	.00000	.00000	