Garrett, Betty

From: John Schmuck [John_Schmuck@Cameco.com]
Sent: Thursday, October 18, 2012 5:56 PM
To: Burrows, Ronald
Subject: North Trend Replacement Pages
Attachments: North Trend October 2012 Page Changes.pdf

Ron – Attached please find page changes for the North Trend License Amendment Application.

Thanks. .john

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preoperational monitoring on the White River at sampling locations W-1, and W-2, as shown in **Figure 2.9-5**. The purpose of these sampling locations is for establishing baseline conditions of the White River in the vicinity of the NTEA. W-1 is located approximately 2.63 miles upstream of the south end of the North Trend site boundary where the White River crosses through the site boundary. The location of W-1 is such that it is suitable for use as an upstream sample location. W-2 is located approximately 4.42 miles downstream of W-1 and is located approximately 0.94 miles upstream of where the White River flows along the southeast corner of the NTEA site boundary. W-2 is located on a line roughly perpendicular to the topographical contours in the middle of the site such that measurements are representative of river conditions in close proximity to the proposed project boundary and consistent with RG 4.14. Any releases to the surface within the project boundary that would have the highest potential of reaching the White River, due to being in closer proximity to the river, would be between W-1 and W-2 (**Figure 2.9-5**).

These sample locations, plus sampling location W-3, were also used for preoperational monitoring associated with the current CBR operations. W-3 was located approximately 5.84 miles upstream of W-2 and is located approximately 2 miles outside of the NTEA Area of Review (AOR). Results for initial baseline sampling conducted during studies for this current license area were previously reported to the NRC (Ferret 1987). W-3 was not used for NTEA preoperational monitoring due to the distance from the NTEA (e.g. approximately 5.54 miles upstream of W-2).

During sampling of two sampling stations on the White River (W-1 and W-2) in 2004 and 2005 for NTEA baseline monitoring, all samples were analyzed for the concentration of natural uranium, thorium-230, radium-226, lead-210 and polonium-210 with the exception of the first and third quarters of 2005 when an error in the chain of custody resulted in no analysis for thorium-230, polonium-210 and lead-210 (**Table 2.9-7**). There were a total of 5 sampling quarters in 2004 and 2005, with 3 of these quarters having analytical results for these latter parameters for each of the W-1 and W-2 sampling locations. All 6 of the individual results for W-1 and W-2 (3rd and 4th quarter, 2004 and second quarter, 2005) for thorium-230, polonium-210 and lead-210 were <0.02, <1.0 and <0.10 uCi/ml x 10^{-9}, respectively. RA-226 levels were also consistent for all of the 9 quarterly sampling periods (<0.2 uCi/ml x 10^{-9}). There was little variation in the natural uranium levels for W-1 for 9 quarters (3.6 to 5.0 uCi/ml x 10^{-9}). It was the opinion of CBR that since all of the sample results were less than the detection limit for three quarters, and there was little variation in the other radiological parameters, the analytical results appeared to be representative of the White River at W-1 and W-2. Additional sampling did not appear to be warranted.

Grab samples were taken for each sample collected. The collection of surface water samples was as specified in CBR's *Environmental Manual* (CBR 2010a). Sampling procedures were consistent with EPA surface water sampling procedures (EPA 1994).

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2.9.8.2 Additional Soil Monitoring Program

CBR will conduct additional soil sampling as part of the preoperational monitoring program.

Sample Location

Surface soil grab samples will be collected at two different designated locations:

a. Discrete soil samples will be collected along transects radiating in 8 compass directions from the center of the satellite production facility at 300 meter intervals (**Figure 2.9-6**). Six transect lines will be approximately 1500 meters in length, resulting in the collection of 5 samples per transect plus one center sample point for a total of 31 samples. Two of the transects will have a distance of less than 1500 meters due to the distance to the permit boundary, resulting in a total of 7 additional samples. This will result in a total of 37 samples versus up to 41 specified in Reg. Guide 4.14.

b. Five or more samples at the same locations of the air particulate matter samplers (**Figure 2.9-3**).

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Sample Method

Soil samples (Grab) will be obtained with a clean auger, spade, or shovel. At the sampling location, the vegetation will be removed and a grab soil sample of the top 5 cm (2 inches) of soil will be collected. In this application, Cameco requests a soil sampling program different from that specified in NUREG-1569, Standard Review Plan for In Situ Leach Uranium Extraction License Applications. Specifically, Cameco does not propose taking soil samples at both a 5cm and 15cm depth as recommended by NUREG-1569, Acceptance Criteria 2.9.3(2). In a public meeting (ML12255A258) NRC stated, that in light of the EPA technical basis for its Ra-226 soil cleanup standard (refer to EPA 520/4-82-013-2, Final Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192), Volume II, October, 1982, pages D-51, 52), where EPA found no difference in health protection between averaging contamination throughout the top 5cm of soil versus the top 15cm of soil, it is not necessary to sample to 15cm. That rational is applicable here.

Samples will be placed in appropriate plastic bags. The amount of sample will be sufficient to provide the laboratory with at least 50 grams of soil. This quantity of sample is necessary to meet the LLD requirements. Any non-soil material such as rocks, sticks, vegetation, and large amounts of roots will be removed from the sample. As much as possible of the air in the bag will be removed and the bag sealed.

Plastic bags will be clearly labeled at the time of sampling with a permanent marker, identifying the project location, sample site, name of the sampler, the depth interval of the sample (i.e., 0-5 cm"), and the sample date and time. The type of soil extraction method to be used for the various chemical analyses will be clearly identified on the

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The average background gamma level in the Western Great Plains has been reported to be 0.014 mR/hr (NRC 1979), which corresponds well to the results obtained with the TLD gamma monitors.

2.9.10.1.2 Direct Gamma Radiation Measurement Results

Direct gamma radiation measurements were conducted at the proposed satellite processing area in May 2004 A rectangular area approximately 190 feet long by 70 feet wide (0.3 acres) was surveyed using a Ludlum Model 44-10 2-inch by 2-inch sodium iodide (NaI) detector coupled to a Ludlum Model 2221 ratemeter/scaler and a Trimble ProXRS GPS survey unit. The detector was carried approximately 18 inches above the ground surface. Survey personnel walked the area at a rate of approximately 2.5 feet per second with a transect spacing of approximately 10 feet. The survey system automatically logged individual gamma count rates with a corresponding coordinate every two seconds. A total of 422 measurements were collected and are presented in **Figure 2.9-9**. In addition, exposure rate measurement were collected at each satellite processing area soil sample location described in Section 2.9.8.1 using a Ludlum Model 19 µR meter. Summary data for the gamma direct gamma radiation measurements are presented in **Table 2.9-13**.

2.9.10.2 Additional Direct Radiation Monitoring Program

CBR will conduct additional direct radiation monitoring as part of the preoperational baseline monitoring program. The monitoring plan will be consistent with Reg. Guide 4.14 (NRC 1980), Reg. Guide 3.46 (NRC 9182), NUREG-1569 (NRC 2002), as well as radiological survey guidelines outlined in MARSSIM, the Multi-Agency Radiation Survey and Site Investigation Manual (NRC 2000).

2.9.10.2.1 Direct Gamma Measurements

Sample Location

Direct gamma measurements will be made along transects radiating in 8 compass directions from the center of the satellite production facility at 150 meter intervals (**Figure 2.9-6**). Six transect lines will be approximately 1500 meters in length, resulting in the collection of 10 measurements per transect plus one center sample point for a total of 61 samples. Two of the transects will have a distance of less than 1500 meters due to the distance to the permit boundary, resulting in a total of 13 additional measurements. This will result in a total of 74 measurements versus up to 81 specified in Reg. Guide 4.14.

Measurements will also be collected at each of the air particulate monitor stations (5 sites) (**Figure 2.9-3**).

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