



## CASE NARRATIVE

The analytical data from groundwater monitoring wells and surface water associated with Source Material License SUA-56, Western Nuclear Inc, Split Rock Uranium Tailings Facility were reviewed and evaluated. According to the license agreement (lines 74B and 74C), wells Well-5 and WN-21 (Well-21) were to be analyzed for: beryllium, cadmium, chromium, lead, nickel, selenium, thorium-230, ammonia, manganese, molybdenum, nitrate, radium-226 and -228, and natural uranium. In all but one case, the analytical results were below the concentration limits as stated in the license. The one case exceeding applicable limits was Well-5. Well-5 had a selenium concentration of 0.021 mg/mL compared with the concentration limit of 0.013 mg/mL. No analytical data were presented for chromium as outlined in line 74B of the agreement. However, line 74A in the agreement does not address chromium. There seems to be an inconsistency in the license agreement and the analytical results regarding chromium analysis.

Twelve other wells were to be analyzed for the following: ammonia, manganese, molybdenum, nitrate, radium-226 and -228, and natural uranium. These wells included: JJ-1R, SWAB-22, SWAB-31, SWAB-32, WN-41B, SW-1, SW-2, SW-3, SW-4, SW-5, SWAB-1, and SWAB-12. No data were presented for SWAB-1 and SWAB-12 because it was stated that there was not sufficient water in the wells to provide a valid sample. The analytical results for nine of the ten sampled wells were all less than the stated concentration limit as outlined in the license. Well SWAB-31 had a natural uranium concentration of 0.031 mg/mL versus the concentration limit of 0.03 mg/mL.

All the analyses were performed using EPA accepted methodologies. However, the Ra-226 results could possibly be biased high. The licensee laboratory used EPA method 903.0. This method, as written, is used for the determination of all alpha emitting radium radionuclides, including Ra-223, -224, and -226. Thus, for complete accuracy when using this method, the stated concentration should list Ra-223, -224, and -226, not just Ra-226. However, after further review of the reported data for Ra-226, the concentrations are statistically at or below background concentrations. The associated uncertainties are within expected values for these low concentrations. In fact, all the radionuclide (Ra-226 and -228, and Th-230) analytical uncertainties appear to be appropriate as the concentrations approximate nominal background levels.

ORISE does recommend that the sample identifications listed in the table reflect the sample identifications for the individual sample results. There were a few cases in which the only way to associate the sample IDs in the table to the individual results was by comparing the data (point by point) between the table and individual results.

ORISE believes the data presented in this report are valid and legally defensible. ORISE believes the laboratory analyses are adequate to meet the requirements of the existing license for monitoring ground and surface water for the contaminants of interest. However, the report requires some clarification for the absence of chromium analyses.