

From HALLMAN@NICHEL.LAURENTIAN.CA Thu May 18 07:20 EDT 1995  
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 Date: Thu, 18 May 1995 07:18:14 -0500 (EST)  
 Subject: Radon Measurement Summary  
 To: stokstad@lbl.gov, henry@mips2.phy.queensu.ca, bar@mips2.phy.queensu.ca  
 Cc: hallman@NICHEL.LAURENTIAN.CA  
 Message-id: <01HQ1YQS6W299E2UA@NICHEL.LAURENTIAN.CA>  
 X-VMS-To: STOKSTAD, LEE, BROBERTSON  
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SNO-STR-95-036

Radon Measurements in the SNO Laboratory  
 May 16, 1995  
 Doug Hallman, Laurentian University

Radon in several areas of the laboratory and in the entrance drift (near the ramp) was sampled using our Pylon (Lucas Cell) Portable Radon Monitoring Instrument. Calibrated cells (of known efficiency) having a volume 160 mL were evacuated with a hand pump, the background of the cell was determined, and a sample of room air was introduced for counting. Counts were made just after sampling, after 2 hours, and about 1 day later. Results are summarized in the table below

Table 1 Radon Measurements

Location	Cell 1 Deck E	Cell 2 Junction	Cell 3 Deck W	Cell 1 Drift
Cell Efficiency (cpm/pCi/L)	0.787	0.767	0.857	0.787
Net Counts/min	1.43	1.35	1.68	1.85
Radon (pCi/L)	1.82	1.76	1.96	2.35
+/-	0.40	0.40	0.40	0.50

Monitoring sites on the deck were about 2 m from the central access hole, on the east E and west W sides. The W site was under an air supply vent. The corridor site was just in front of the car wash inner door, also under an air supply vent. Cell 1 was re-evacuated after the deck measurement, and re-used for the mine drift location (since only 3 cells were brought to the site).

Clearly, there is still significant radon in laboratory air - these levels are not much different from earlier mine air measurements. There does appear to be a significant (20%) reduction in radon from drift values, probably due to the relatively small (20-30%) introduction of make-up fresh air into the lab, and the coated surfaces in all lab rooms. Given the available time for counting during this test, only 20% measurements were made - I could lower this to 10% in a subsequent test. I could also determine radon decay products,

with a filter count, in a subsequent measurement.

I would expect that these levels might vary at the 20-30% level, with pressure, air flow or humidity changes in the mine, based on our earlier measurements underground. I am arranging for a continuous monitor to be installed within the next two weeks (from Jaime Bigu) to check this.

For the deck clean room, we could perhaps arrange for a nitrogen gas flow at the neck entrance when the cover is open, to prevent entry of radon. Flows of 20-30 L/min would be feasible from a liquid nitrogen dewar.