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Inspiring Minds

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## Stable isotopes, tracking water, and burying nuclear waste safely

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Carsyn Cassidy

A significant portion of Ontario's, and Canada's, electricity is generated by nuclear energy. But something must happen to the nuclear fuel after it has been expended the reactor. In Canada this will come in the form of a Deep Geologic Repository (DGR). It's imperative that where we build the DGR, the 500m+ of overlying rocks will not let water carry away anything hazardous. My research provides additional evidence for the safety case of the South Bruce, Ontario potential DGR site. I'm performing experiments to track the movement of stable hydrogen and oxygen isotopes between clay minerals and water at elevated temperatures, and any changes happening in the minerals as a result. The more information we have about the system, the more confidently we can use these isotopes as tags to trace where water has come from and how long it's been there.