

## Radiocarbon – Obtaining and Understanding Analyses for Monitoring Environmental Impact from Nuclear Power Plant Emissions.

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Discussions within recent guidelines published by the NRC has generated a flurry of interest in understanding how to use radiocarbon ( $^{14}\text{C}$ ) analysis to assess environmental impact of carbon uptake from nuclear power plant emissions. The use of radiocarbon for this application is not new. It has been applied both academically and industrially for over 4 decades. As such, existing expertise is readily available and both sample collection strategies and understanding of error constraints are well known.

Radiocarbon is present naturally in an atom percent of only  $1 \times 10^{-12}$  carbon, with present day radiation levels in the atmospheric of about 6 femptocuries. As such, the specialties of a radiocarbon dating laboratory that only analyses natural level radiocarbon is required for this purpose. Your conventional radiogenic laboratory will not be able to do it. And conversely, a direct emission sample (“hot” sample by nature’s definition) must never be sent to one of these natural level laboratories.

Understanding how radiocarbon serves as a qualifier for environmental impact rests in understanding how radiocarbon dating works. This presentation discusses the relationship between the two and provides insight on sampling strategies and interpreting results obtained for this purpose.

Beta Analytic is an ISO-17025 accredited laboratory based in Miami Florida. It is natural level radiocarbon analysis laboratory with over 30 years of service to the regulatory, academic and industrial communities.