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MDC in the Radionuclide Particulate RASA System

The monitoring community expressed desires to improve the RASA particulate radionuclide system MDC to increase network sensitivity. Before investing and developing new sampling technology, GDMS investigated minor configuration changes to improve the RASA MDC. MDC may be improved by enhancing the detector signal-to-noise ratio or increasing air flow. Focusing on detector signal-to-noise, GDMS investigated shielding improvements, alternate materials, reduction in detector chamber dead space and mechanical/electrical noise reduction to quantify MDC effects. GDMS conducted several different experiments to determine whether the addition of lead shielding and/or modification of the internal lead cave reduced the MDC. GDMS performed experiments to determine if material inside the lead cave adversely affected the MDC by elevating the Gross Background Count Rate (GBCR). By testing the absence of the component, GDMS quantified the potential benefit of changing material or eliminating the component altogether. GDMS investigated and found no measureable benefit to adjusting the current radon decay protocol. The results showed additional lead shielding provides a simple and cost effective method to reduce the MDC. This small shielding improvement was simple to manufacture, install and maintain. In 2017, GDMS began implementing this shielding improvement into the IMS to reduce the RASA MDC.

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