SAND2017-12274C

DOE/EPA Technical Exchange Meeting

Discussion of Technical Issues for a Follow-On Performance Assessment for CRA-2019

Conducted Via Videoconference

November 8, 2017

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Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA-0003525. This research is funded by the WIPP programs administered by the Office of Environmental Management (EM) of the U.S Department of Energy.

MgO Hydration Rates

- Three vendors for the MgO in the WIPP

Table 1. Amounts of MgO from three vendors that were already emplaced in WIPP (from Kouba, 2015)

Vendor	Amounts of MgO Procured and Emplaced in WIPP (Tons)	Percentage (%)
National Magnesia Chemicals	148	0.41
Premier Chemicals	10856.4	30.14
Martin Marietta Magnesia Specialties	25016.1	69.45

$$(R)_{MgO\ Hydration} = 0.0041 \times R_{National} + 0.3014 \times R_{Premier} + 0.6945 \times R_{Martin} \quad \text{(Equation 1)}$$

- Premier Chemicals- **complete hydration for the reactive portion in 78 days** (elevated temperature)
- Martin Marietta Magnesia Specialties – **estimated complete hydration in 43 days** (elevated temperature)

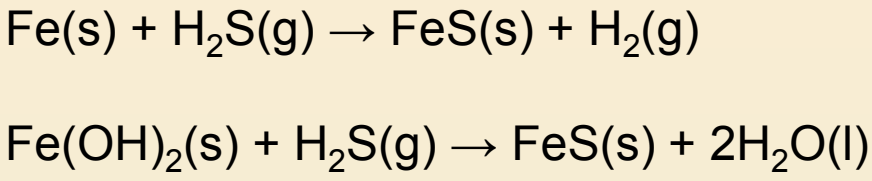
$$R_{Martin} > R_{Premier}$$

$$(R)_{MgO\ Hydration} = 0.0041 \times R_{Premier} + 0.3014 \times R_{Premier} + 0.6945 \times R_{Premier} \quad \text{(Equation 2)}$$

DOE believes this is a conservative assumption because the repository is "wet" longer, the repository does not dry out as fast.

- Please Note:
  - *Only for the undisturbed repository – the MgO hydration rate will make no difference if the repository is filled with brine.*
  - *Fast MgO hydration rates dry out the repository faster than slow MgO hydration rates.*
  - *Based on sensitivity analyses performed, releases from the repository are at best only weakly correlated with the MgO hydration rates.*

Sulfidation Reactions



DOE agrees that project-specific experimental evidence for these reactions has not been published as yet. Therefore, DOE agrees to remove these two reactions from the calculations of gas generation in upcoming performance assessment calculations.