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One of the factors important in determining the reassessment interval is the corrosion rate. Both external and internal corrosion rates are affected by a number of conditions. The objective of this project is to use mechanistic modeling to generate simplified guidelines for estimating external and internal corrosion rates. A need for such a model-based estimation is especially important for corrosion under shielded, disbonded coatings.

Significant progress has been made in modeling the corrosion rate under shielded, disbonded coatings for both static and low-flow conditions (low flow assumed for external corrosion is reasonable under most circumstances where pin-hole leaks in coatings can lead to slow flow of groundwater through the disbonded area). It is shown that with the diffusion of oxygen through the coating holiday, flow conditions can significantly increase the corrosion rate near the mouth of the disbondment. Validation is being performed using specially designed experimental apparatus. Partial validation of the trend in the corrosion current has been found. The limitations of the experimental data generated to date prevent further validation. Validation using field data will be performed in the future.