A.1 Technology Name

Peepers (Inorganics)

A.1.1 Source

Risacher, F.; H. Schneider; I. Drygiannaki; J. Conder; B. G. Pautler; and W.A. Jackson. A review of peeper passive sampling approaches to measure the availability of inorganics in sediment porewater. Environmental Pollution. 2023, 121581.

A.1.2 Summary

Media:	Sediment Porewater
Study Type:	Side-by-Side
Technology:	Peeper – Inorganics
Peer Reviewed:	Yes
Publication Date:	April 2023

A.1.3 Site Description

- Review of over 85 peer-reviewed and grey literature documents that detail applications of peepers to measure freely-dissolved inorganics (primarily cadmium, chromium, copper, nickel, lead, zinc, and inorganic mercury) in sediment porewater.
- Evaluation of key technical aspects to enhance the standardized use of peepers for measuring concentrations of inorganics in sediment porewater, including peeper design (chamber material and volume, membrane material and pore size, and chamber design factor), pre-equilibrium sampling methods (i.e. use of a performance reference compound/reverse tracer), and effect of oxygen contamination.

A.1.4 Remedial Phase

Not Applicable. This is a literature review of several peer-reviewed case studies that summarizes best-practices for use of peepers to evaluate inorganics in sediment porewater.

A.1.5 Outcome

The study concluded that 1) the best materials for inorganic sampling are inert polymers such as polyethylene, polycarbonate, polypropylene, or polytetrafluoroethylene; 2) 0.45 microns is a standard and reasonable membrane pore size for sampling inorganics; 3) more research is needed to evaluate the effects of salinity and oxygen on peeper equilibration and accuracy of measured concentrations of inorganics; and 4) the accuracy of a bromide reverse tracer to calculate the percentage of equilibrium obtained by inorganics needs to be more rigorously evaluated in sediment environments.