

## A.1 Technology Name

### Polymeric Sampling Devices

#### A.1.1 Source

Smith, A.V.; Shen, X.; Garza-Rubalcava, U.; Gardiner, W.; Reible, D. In Situ Passive Sampling to Monitor Long Term Cap Effectiveness at a Tidally Influenced Shoreline. *Toxics* **2022**, 10, 106. <https://doi.org/10.3390/toxics10030106>

#### A.1.2 Summary

<b>Media:</b>	Sediment porewater
<b>Study Type:</b>	Other
<b>Technology:</b>	PMDS coated SPME
<b>Peer Reviewed:</b>	Yes
<b>Publication Date:</b>	February 2022

#### A.1.3 Site Description

- Tidally influenced shoreline in Puget Sound (West Seattle, Washington) with creosote-related impacts.
- Long-term monitoring of a sand/gravel cap remedy that was placed in 2005 to prevent migration of PAHs to overlying water is ongoing in conjunction with monitoring a slurry wall to prevent further migration.
- Solid-phase microextraction (SPME) devices using a polydimethylsiloxane (PMDS) sorbent were deployed with performance reference compounds (PRCs) utilized to evaluate equilibration of target compounds and estimate mass-transfer coefficient for estimating groundwater upwelling velocities.
- Passive sampling was conducted in 2010 and 2018; study primarily focuses on 2018 data collected from 24 monitoring locations, with depth-discrete sample results.
- Remedy effectiveness was evaluated with respect to porewater concentrations near sediment-water interface and as compared to previous sampling results

#### A.1.4 Remedial Phase

Remedy has been in place for more than 15 years and is in long-term monitoring/evaluation. Passive sampling was previously deployed at the site in 2010 as well.

#### A.1.5 Outcome

Porewater PAH concentrations remain relatively low, with higher concentrations detected in the lower portion of porewater samplers. Sample results were also utilized to estimate groundwater upwelling velocity across the cap and for updating a model for PAH migration into the cap.

The authors conclude that: *“This work shows the ability to determine the groundwater upwelling velocity and contaminant flux using the rate of equilibration of performance reference compounds.*

31    *The approach to estimation of the groundwater upwelling velocity is a novel use of the PRCs*  
32    *that can be employed at other locations.”*  
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