

## Industrial Chemistry 2020-Title: A Chemical and Ecological Assessment into Elemental Loading from Ford Crossings in Ashdown Forest, Sussex, United Kingdom - Phillip Colyer - University of Portsmouth

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### Abstract

Numerous studies have identified the issue of road surface runoff as a source of contamination into waterways, but the impact of vehicular wash-off is less well understood. Ford crossings provide pathways for vehicle-derived contaminants emanating from both road surface runoff and vehicular wash-off into a river system. Twyford Lane Ford (Ford 1) and Birchgrove Lane Ford (Ford 2), located ca. 600m apart on a tributary of the River Ouse in Sussex (UK), were the focus of this study. Biomonitoring and chemical assessments of water and sediments have been undertaken to determine any detrimental impacts, such as a lack in biodiversity, resulting from the ford crossings. Sediment concentrations of chromium (Cr<sup>3+</sup>), lead (Pb) and zinc (Zn) were generally elevated at Ford 1, attenuating at sampling points between the fords to then peak at Ford 2. Soil organic matter (SOM) and sediment particle size were seen to have an influence on elemental concentrations. In general, an increase in elemental concentrations was associated with a higher percentage of fine-grained sediments ( $\leq 63 \mu\text{m}$ ). Elevated concentrations of Zn and magnesium (Mg) were identified within water samples taken during a precipitation event following a prolonged dry period. The biomonitoring results found reduced BMWP scores at positions close to the ford crossings, and in proximity to the roadside. Sensitive Ephemeroptera were largely absent at sampling points closest to the fords, which is likely to be associated with elevated Zn (Fig. 1). The results suggest that careful consideration should be applied when selecting crossing points over sensitive waters.

A portage is a lot less expensive type of waterway crossing than a scaffold, yet it might get closed after substantial downpour or during flood conditions. A passage is consequently typically just appropriate for extremely minor streets (and for ways expected for walkers and pony riders and so forth) Most current passages are typically shallow enough

to be crossed via vehicles and other wheeled or followed vehicles (a cycle known as "fording").

In New Zealand, nonetheless, portages are a typical piece of significant streets, including, until 2010, along State Highway 1 on the South Island's east coast.[2] As most between city homegrown travelers travel via air and as much freight passes via ocean, significant distance street traffic is low and passages are hence a reasonable necessity[clarification needed] for intersection occasional waterways. In dry climate, drivers become mindful of a portage by crunching across outwash debris on the street. A bailey scaffold might be worked off the principle line of the street to convey crisis traffic during high water.

At places where the water is sufficiently shallow, yet the material on the riverbed won't uphold hefty vehicles, portages are now and again improved by building a lowered solid floor. In such cases a control (kerb) is regularly positioned on the downstream side to forestall vehicles sneaking off, as development of green growth will frequently make the chunk extremely dangerous. Portages might be additionally outfitted with a post demonstrating the water profundity, so clients may know whether the water is too profound to even think about attempting to cross. Some have a neighboring footbridge so walkers may cross dryshod.

### Biography

Phillip is a senior consultant at OHES Environmental Limited with 7 years' experience in environmental science and ecology. He is a Chartered Scientist with the Institution of Environmental Sciences and working toward Chartered Environmentalist. Presently, Phillip is preparing to undertake his second research paper, which will focus of bryophytes as markers for water contamination. His first paper was published in Science of the Total Environment – Vol 738.