

Road Run-off Pollution: An evidence review of current and emerging risks to Scotland's water environment, human health, and the policy and regulatory landscape

Section 1: Project Overview

Introduction

The Centre of Expertise for Waters (CREW) intends to commission a **capacity building project** aligned with CREW's **Water Quality and Health theme**. The project aims to develop a risk framework to assess the potential impacts of road run-off on Scotland's water environment and human health.

Background

There is increasing awareness of the implications of surface water run-off for the water environment and its management. Road run-off (RRO), as a subset of surface water, is particularly challenging to capture and manage due to the multiple pathways by which it can enter the water environment. RRO may enter receiving waters directly or via surface water drainage systems that discharge through surface water outfalls (SWOs), where there is often limited opportunity for dilution. It may also flow through sustainable urban drainage systems (SuDS) or enter combined sewer systems, with subsequent release through spills from sewer overflows and/or discharges from wastewater treatment works.

Consequently, pollutants associated with RRO may enter the water environment through these pathways, raising concerns about their potential impacts. Key pollutants of concern include heavy metals, tyre-wear particles, microplastics, and organic substances such as hydrocarbons, plasticisers, and preservatives. A previous [CREW report](#) identified road run-off as a common pathway for most groups of emerging contaminants examined, highlighting the need to better understand sources of emerging compounds and to identify and evidence pathways of pollutants in order to prioritise effective intervention and controls¹.

Knowledge gap

Recent [national-level discussion](#) in England has highlighted gaps in the regulation and monitoring of RRO. Given the multiple pathways through which RRO may enter the environment, the wide range of potential contaminants, and limited understanding of the attenuation of contaminants along these pathways, the potential impacts and associated risks to the water environment and public health remain unclear.

In Scotland, limited collated evidence on RRO-related pathways, their relative importance, and the scale of associated impacts similarly makes the development of policies and prioritisation of mitigation measures challenging. For example, a number of waterbodies in Scotland are not currently achieving 'Good' status, but the underlying reasons are not always well understood, including the extent to which RRO may be a contributing pressure.

¹ See logic model, [Figure 5](#).

Policy relevance

To support the development of future policy in Scotland, there is a need to develop a risk hierarchy based on a source-pathway-receptor (S-P-R) approach. This would involve:

1. Improving understanding of the hazards, pathways, and receptors;
2. Establishing an overview of the current Scottish landscape (including relevant regulatory regimes, design standards, and other appropriate information to provide context);
3. Identifying information gaps and opportunities to address them, including options to break the S-P-R routes and potential interventions (e.g. new or retrofit SUDS and appropriate design standards).

Such a risk hierarchy would support the consideration, prioritisation and development of monitoring, mitigation options, and policies to help protect and improve the water environment, including through River Basin Management Planning (RBMP) and wider policy frameworks.

Considerations relevant to its practical application include:

- Reviewing the evidence base, stakeholder landscape, and policy context to identify evidence gaps and potential intervention points;
- Appraising existing monitoring, mapping, and modelling approaches in Scotland and UK to inform future RRO monitoring and research;
- Analysing current operational practices, statutory duties, regulations, and policies to identify any gaps relevant to the management and mitigation of the impacts of RRO on the water environment in Scotland.

Aim

The overall aim of this project is to develop a risk hierarchy for potential impacts of road run-off on Scotland's water environment and human health, informed by a systems-based understanding of source-pathway-receptor interactions. This will support improved understanding of the pollutants of concern in road run-off and their pathways into the water environment in Scotland to inform future policy and regulation.

The key questions to be addressed are:

1. **Priority pollutants**²: What pollutants of concern are most relevant in RRO in the Scottish context, and how might this change in the future?
2. **Pathways**: What are the main pathways through which these pollutants of concern are likely to enter the water environment (e.g., types and usage of roads, treatment in place etc.)?³

² Drawing on existing UK/international evidence with prioritisation informed by the Scottish context. Focus should be on those contaminants that are most likely to have an impact on the water environment, and human health. Those of concern to air and land quality are out of scope.

³ This should summarise and, where possible, build on previous work to identify relative loadings by pathway. There may be opportunities to supplement the literature with support from project partners.

3. Environmental impacts and risk:

- a. Do the risks associated with contaminants differ depending on the identified pathways (for example, relative source loadings) and different receiving waters⁴, and which combinations of sources, pathways and contaminants present the greatest risk?
- b. Based on the pathways analysis, what options exist for breaking S-P-R routes⁵; how can these be prioritised, informed by a review of existing modelling approaches, to arrive at the highest risk/impact solutions; and what are the potential barriers to implementing these⁶?

4. Policy, Regulation, and information gaps:

- a. Who are the main stakeholders and what are their roles/responsibilities/interests in road run-off and how do current policies and regulation support and enable or hinder this?
- b. What policies and regulations, both devolved and reserved, could influence pollution from road run-off, and what are the gaps in current policy/regulation⁷?
- c. Given the identified pollutants, pathways, and risk, what are the key gaps in current monitoring relevant to RRO, and where could monitoring efforts be best targeted and prioritised to support effective risk management and protection of Scotland's water environment?

Deliverables

- **Final report** of 20-30 pages, excluding annexes and the bibliography, and including:
 - A review of RRO pollutants of concern in the Scottish context, their pathways, and associated risks, including options for breaking S-P-R connections
 - An overview of key stakeholders and the relevant policy and regulatory landscape
 - A review of existing monitoring and modelling approaches relevant to RRO, identifying key evidence gaps and implications for the SPR risk hierarchy
 - A visual summary of the S-P-R risk framework, underpinned by a systems-based approach to illustrate key interconnections and intervention points.
 - A concise set of recommendations
 - Cover image(s) with associated photo credits
- **Spreadsheet database (e.g. excel format)** cataloguing RRO pollutants of concern in the Scottish context, their pathways, associated risk, and evidence gaps.
- **Policy brief** (of 3-4 pages)
- **Plain English summary** of aims and results (up to 1-2 pages)
- **Website summary** (200 words)
- **Communications and impact plan** – supported by CREW at the start and throughout the project

Events/meetings

- 3 Project Steering Group meetings (throughout the project lifecycle⁸)
- 1 Online stakeholder workshop

⁴ E.g. type of receiving water, flows, sensitive areas (e.g. drinking water protected areas).

⁵ Including treatment options, their maintenance requirements and risk of contaminated waste management.

⁶ Including, but not restricted to, historic infrastructure, topography, and limited drainage capacity.

⁷ This could explore positive solutions in other countries, such as SUDS standards and necessary maintenance regimes required to maintain treatment efficacy.

⁸ Please note, CREW requests a brief written update c. two weeks prior to project steering group meetings.

Intended impacts

There are multiple pathways for a project to achieve impact, and multiple factors that can impact the project’s ability to achieve what it intends to do; both along the project lifecycle (A.IMPACT) and beyond project completion (B.IMPACT) (Figure 1).

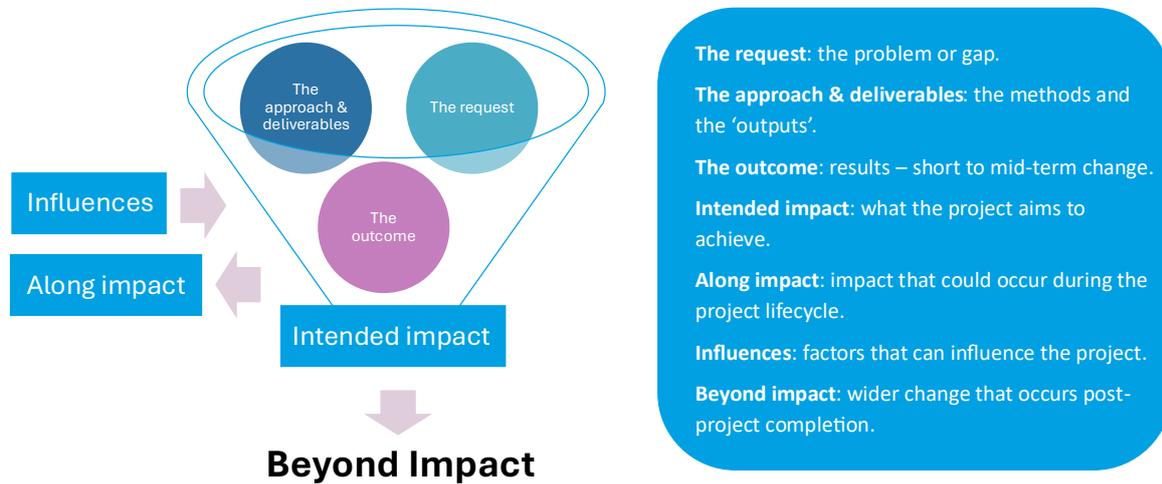


Figure 1: Pathways to impact

Along Impact (A.Impact):

These stakeholders will be part of the project steering group: The Scottish Government, SEPA, and Scottish Water.

Beyond Impact (B.Impact):

This project will improve understanding of the risks of RRO to the water environment and public health, particularly where sensitive receptors like bathing and shellfish waters are the receiving waters. By applying a S-P-R risk hierarchy to identify combinations of pollutants, pathways and water-environment-receptors considered to be of greatest concern, the project will provide important insight into where risks are most likely to occur. This will support the identification of policy and regulatory gaps and improve understanding of where policies can be targeted for the greatest benefit.

The risk hierarchy is intended to support SEPA in the prioritisation and optimisation of monitoring, help develop initiatives to encourage partnership working and where necessary the use of our regulatory tools to help protect and improve the water environment, including through RMBP and wider policies. It is also expected to provide responsible authorities with a clearer understanding of the issues, helping to clarify responsibilities and support the development of coordinated plans so that the highest risk areas can be tackled.

Section 2: Further information for applicants

Eligibility

CREW Capacity Building funding is open to applications from **all relevant Scottish HEIs and Research Institutes (approved subcontractors)**. One eligible organisation must lead the bid, however an eligible organisation can sub-contract work in accordance with the Grant Terms which would include putting in place an appropriate agreement with the relevant sub-contractor(s) (updated December 2022). Any UK based HEI, RI or SME can be sub-contracted. Where successful, CREW funding would be subject to agreement to the CREW Grant Offer Letter and T&Cs (“Grant Terms”). CREW encourages applications from experienced to early career researchers (ECRs) under the supervision and mentorship of experienced researchers.

Expectations and award criteria

A copy of expectations and the award criteria are provided on page 6 and 7, respectively.

Project management

Day-to-day communication will be between the research/review team (the contractor) and a CREW Project Manager and is likely to involve short catchups as agreed.

Communications and impact

CREW’s impact officer will engage with the research team and project steering group on any agreed upon comms and impact activities throughout the project and for post project evaluation.

Project steering group

A CREW representative, and representatives of Scottish Government and its delivery partners, will form part of the project steering group. They will meet with the preferred bidder(s) for a pre-contract meeting. A pre-contract meeting between will take place approximately **wb.25th May 2026**.

Anticipated timescale (c. 7.5 months)

- The project will commence on **8th June 2026**, depending on contract processing and signage.
- The 1st PSG meeting should be held in **early August 2026**. *Project progress should be presented, with an opportunity for the Project Steering Group to review any initial work in progress.*
- A first draft of the report and spreadsheet database should be submitted by **25th September 2026**. *Please allow 2 weeks for the project steering group to review the drafts.*
- The 2nd PSG meeting should be held in **mid-October 2026**, following the project steering group review period.
- An online stakeholder workshop should be held in **late-October 2026**.
- A second draft of the report and spreadsheet database, and a first draft of the policy brief should be submitted by **23rd November 2026**. *Please allow 2 weeks for the project steering group to review the drafts.*
- The 3rd PSG meeting should be held **wb.7th December 2026**, following the project steering group review period.
- A final copy of all draft outputs (report, database, policy brief, and plain English summary) should be submitted **by 11th January 2027**. *Please allow 2 weeks for the project steering group to review the drafts.*

- All final outputs should be submitted by **29th January 2027** for sign off by the CREW Director and formatting

Funding

The maximum amount of funding available **exclusive of VAT** (where applicable) is **£85,000**.

Submitting a proposal

Please complete a **CREW Capacity Building Application form** outlining your proposal. Proposals need to be submitted to Procurement@crew.ac.uk for evaluation **by 15:00 on Wednesday 22nd April 2026**. We aim to notify the preferred bidder by **13th May**.

Please contact Procurement@crew.ac.uk **by 15th April 2026** if you would like any clarification on any of the above. You should highlight any potential conflicts of interest in your proposal. For queries about what may constitute a potential conflict of interest please contact the CREW Manager (Nikki.Dodd@hutton.ac.uk).

Expectations

No.	Criteria	Descriptor
1	Duration	The proposed duration will align closely to the details provided in the anticipated timescales section of the specification.
2	Staff time and effort	The proposed allocation of staff time and effort is appropriate and includes all deliverables. The proposal provides a commitment that named staff members will be available to work on the contract if the bid is successful. For any unnamed staff, appropriate risk identification and mitigation measures are provided.
3	Project costs	The estimated breakdown of project costs is realistic and inclusive of all deliverables.

Award criteria

No.	Criteria	Descriptor
1	Understanding the project ask and the Scottish policy background	The proposal should include an introduction which demonstrates a clear understanding of the project requirements. This should include an understanding of the Scottish policy background and the supporting role of this project; the need for this research; the project aim; and how the proposal will address this aim.
2	Proposed methodology	The proposal should demonstrate a high quality and workable methodology, including how the evidence will be identified, reviewed, and assessed; consulting relevant stakeholders and/or experts where appropriate to address the key questions and produce the deliverables in the timescales required. It should explain the suitability, robustness, and limitations of the proposed methodology.
3	Milestones	The project milestones are logical, practical and include all deliverables.
4	Project Management	The staff, resources and expertise are appropriate for conducting the proposed project. The proposal should name the project lead and outline their project management experience.

5	General and specific topic expertise and experience	The proposal should provide details of individual staff members who will work on this project and demonstrate how they will meet the project requirements, both in terms of general research experience and expertise, and specifically: - experience and expertise on the topic of environmental pollution and surface water management; and - relevant knowledge of the Scottish and UK policy and regulatory context
6	General communication and deliverables	The proposal should describe the approach to producing the deliverables, which will be published on the CREW website. It should detail who will take lead responsibility for report-writing and overall report quality. It should provide examples of previously published reports, reviews, or similar assessments in which they have been involved.
7	Quality assurance	The proposal should provide details of quality assurance procedures to demonstrate how the contract will be continuously delivered to a high standard. It should specifically address issues of quality control at different stages of the project, including evidence gathering, analysis and report writing. It should include a timetable for delivery of tasks, project milestones and allocation of staff and staff time against each task, covering the duration of the contract.
8	Risk	The proposal should provide a risk assessment matrix detailing any risks identified in relation to the delivery of this contract, and proposed mitigation measures to minimise their probability and impact, focused particularly on risk to completion on time.

Annex A. Relevant reports, studies, and policies

[Emerging Contaminants: Informing Scotland’s strategic monitoring and policy approaches on substances of increasing concern](#) – CREW

[National Highways and environmental sustainability - Oral evidence](#) – UK Parliament

[Highway runoff and the water environment](#) – Stormwater Shepherds and CIWEM

[How We Can Tackle Road Runoff Pollution to Protect Our Rivers](#) - Institution of Civil Engineers (ICE)