

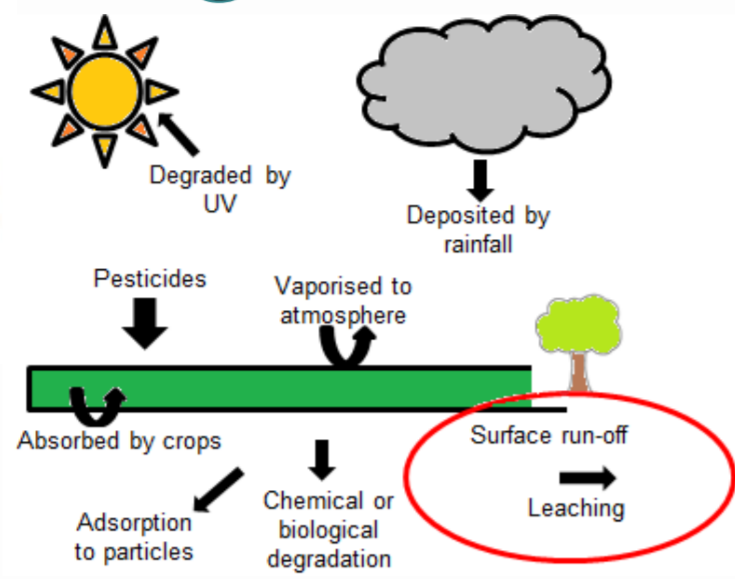
Making biology work for metaldehyde removal

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Metaldehyde is a pesticide used to control slugs and snails

Background

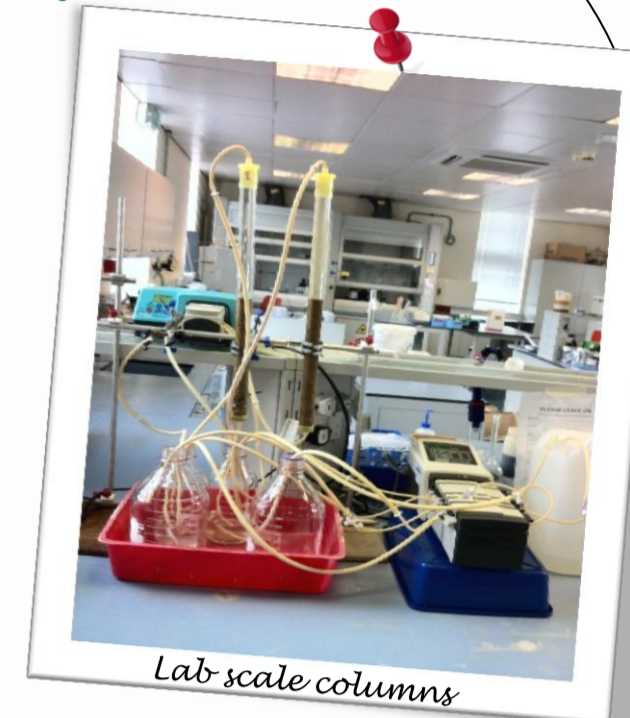


It enters watercourses through surface run off and leaching

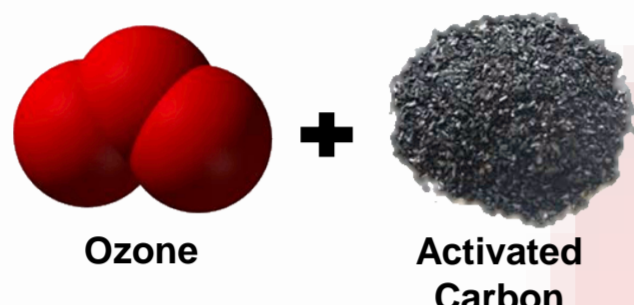
Lab Scale Metaldehyde Removal



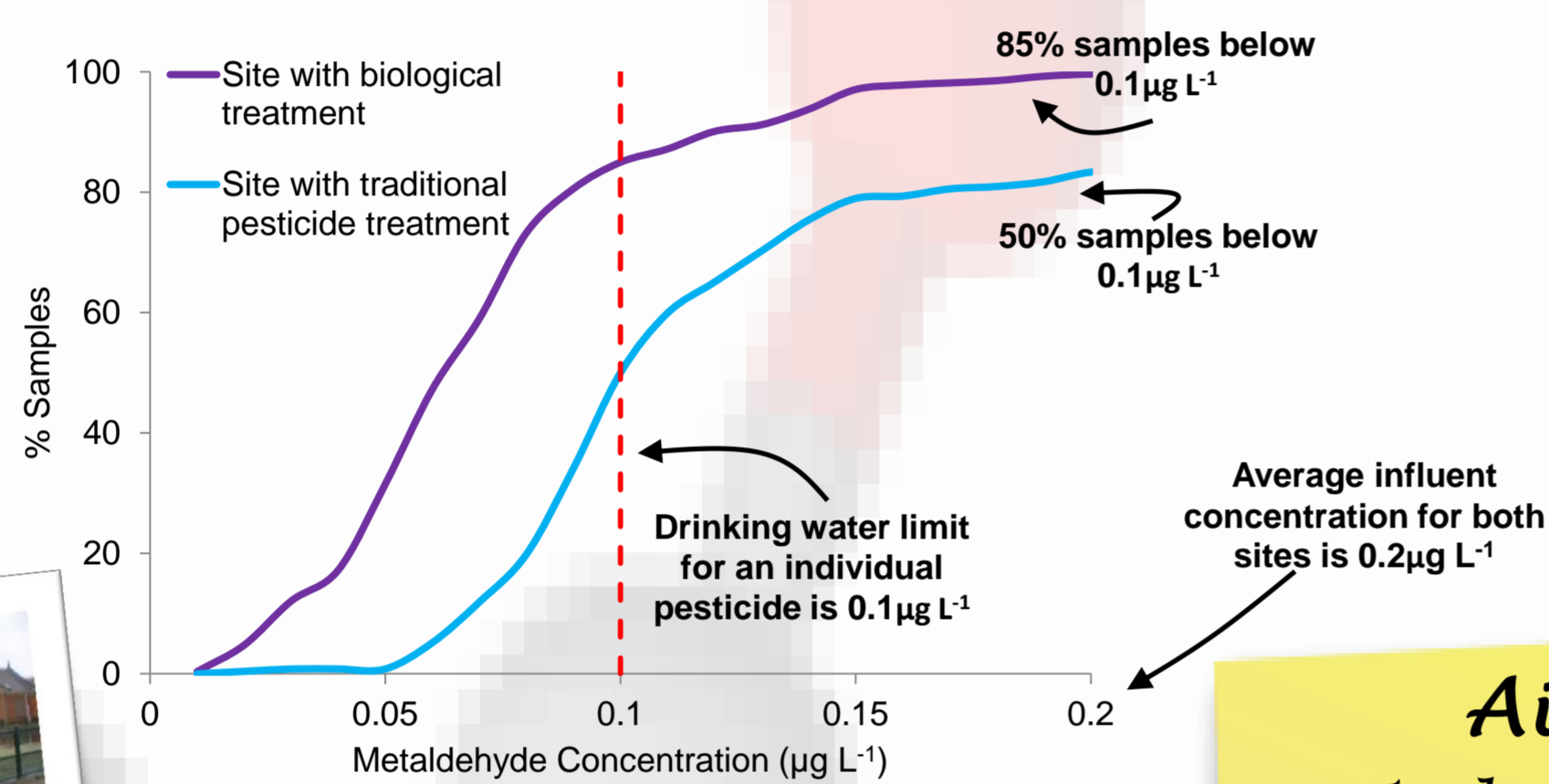
Sand with an active biofilm was used in a fluidised bed bioreactor and downflow contactor



Traditional pesticide treatments are not effective for metaldehyde removal



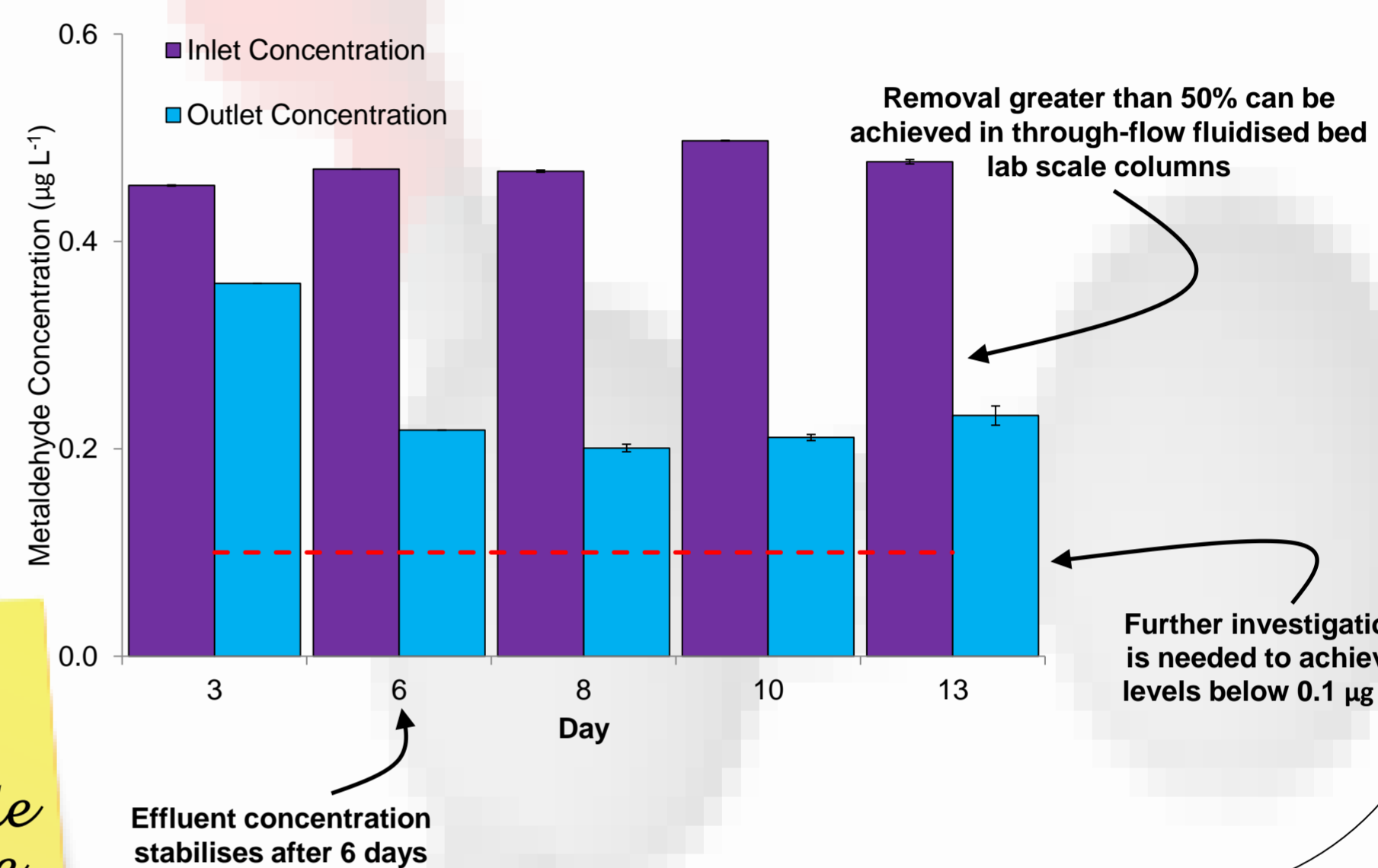
There is evidence that biological treatments could be suitable for metaldehyde removal



Increased removal of metaldehyde is seen through slow sand filtration



The increased contact time in a fluidised bed bioreactor led to enhanced removal compared to a downflow contactor



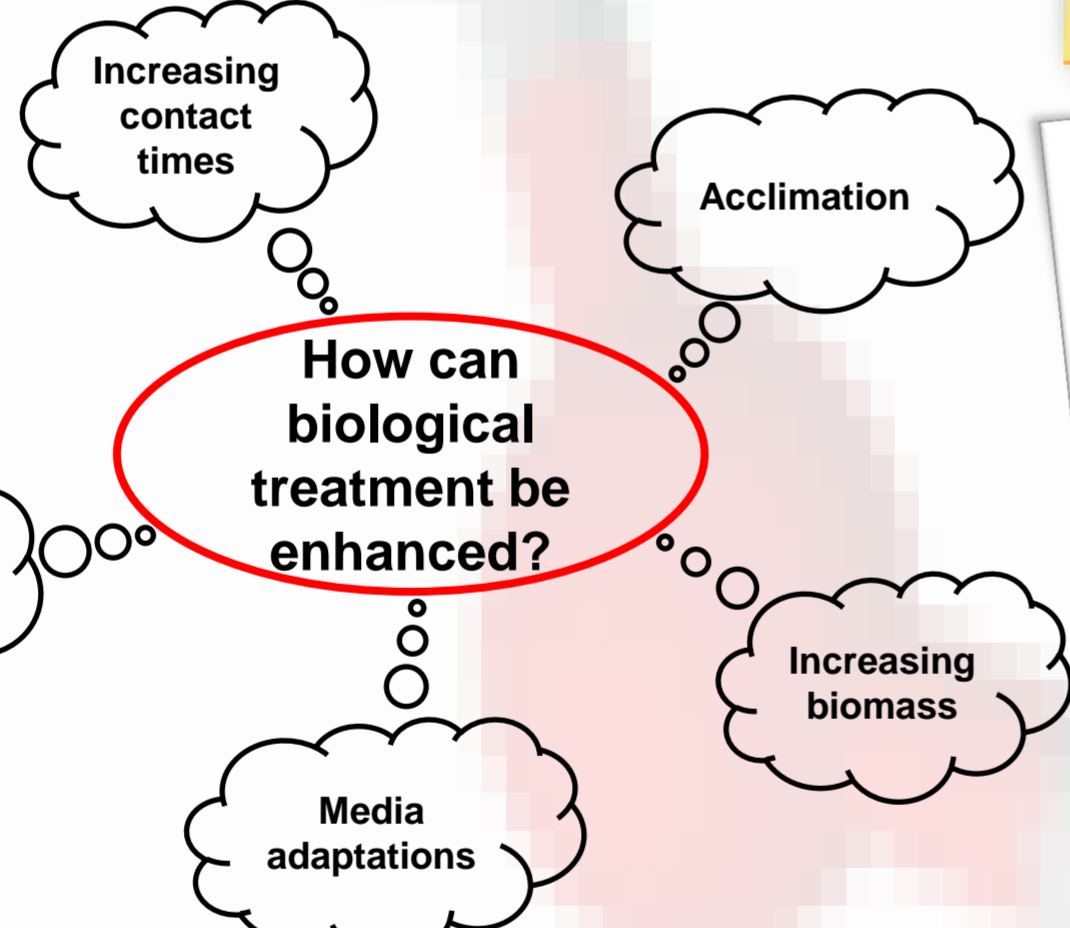
Removal greater than 50% can be achieved in through-flow fluidised bed lab scale columns

Further investigation is needed to achieve levels below 0.1 µg L⁻¹

Aim
To develop an economically viable bioreactor suitable for the treatment of drinking water with special reference to metaldehyde

Implementing the Vision

Modifications have been made to increase metaldehyde removal



A bioreactor could be used as a complete treatment solution

Example A

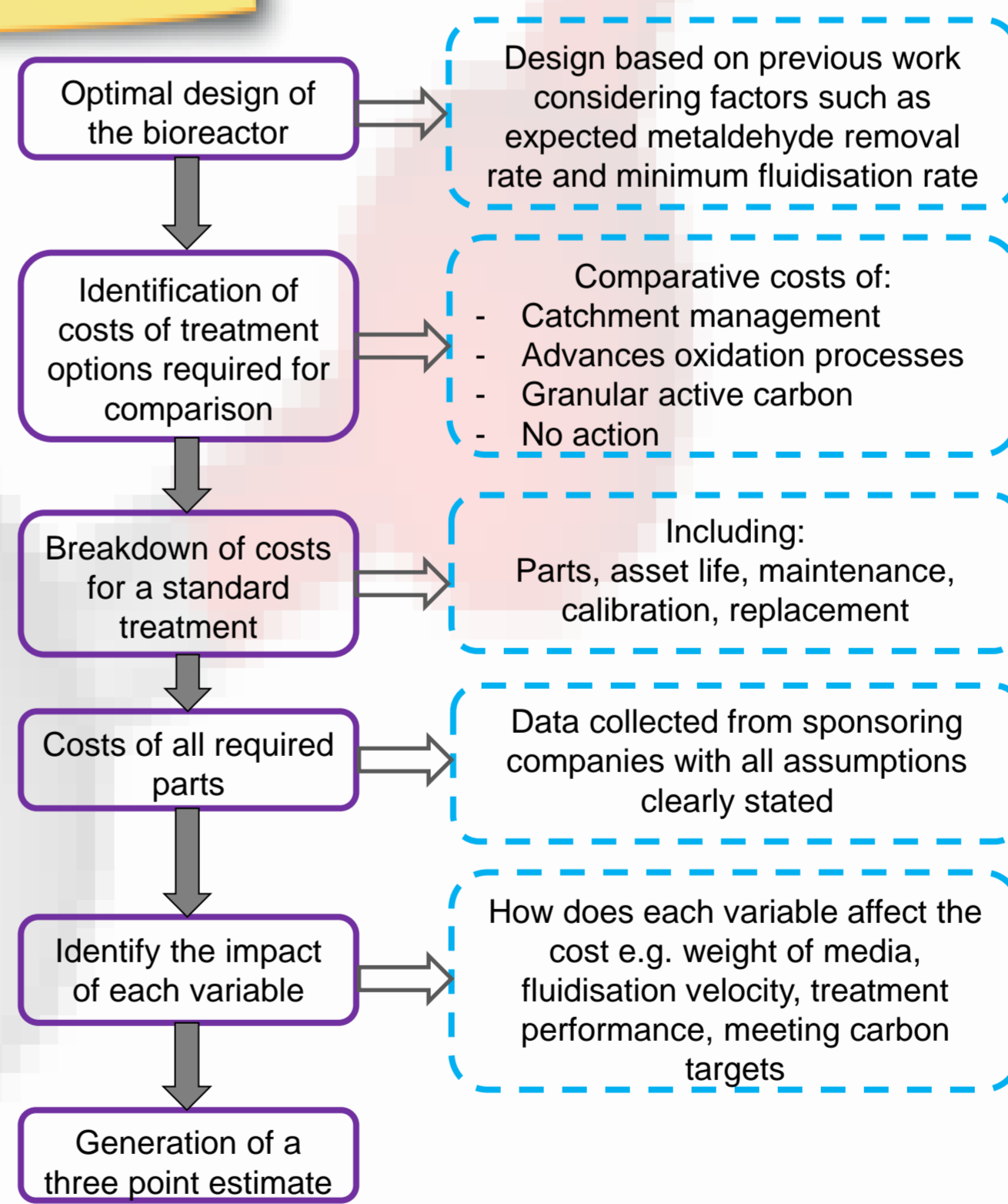


Or to reduce metaldehyde levels so it can be effectively removed by existing treatments

Example B



Business Case



Design based on previous work considering factors such as expected metaldehyde removal rate and minimum fluidisation rate

Comparative costs of:
- Catchment management
- Advances oxidation processes
- Granular active carbon
- No action

Including:
Parts, asset life, maintenance, calibration, replacement

Data collected from sponsoring companies with all assumptions clearly stated

How does each variable affect the cost e.g. weight of media, fluidisation velocity, treatment performance, meeting carbon targets



High rate biological processes have the potential to provide a **sustainable, affordable** treatment for drinking water

