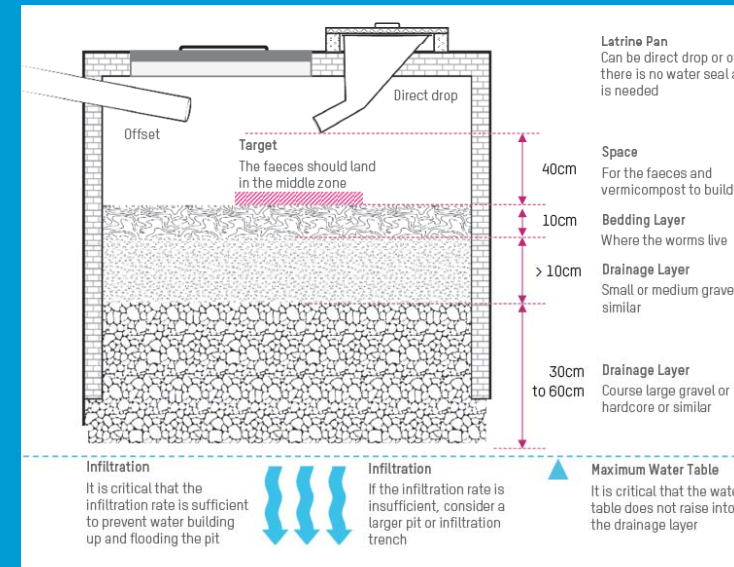


Learnings from containment research

Aire Furlong

E Delft

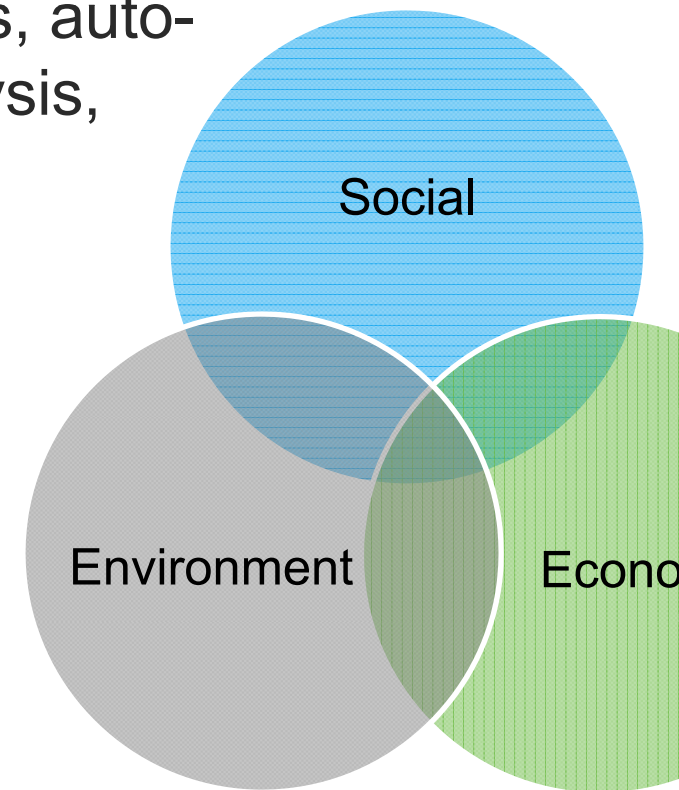


y history

Environmental engineering (background)

- Novel technologies for strong and hazardous waste
 - Anaerobic digestion, WAO, novel absorbents, auto-thermal thermophilic aerobic systems, pyrolysis, vermifilters

Nexus of people and technology



o we mean by containment?

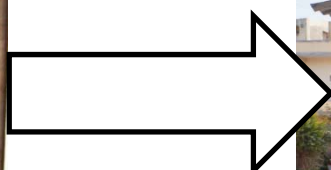
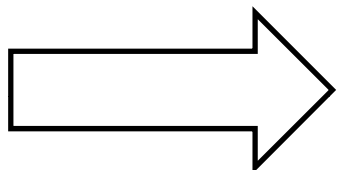


Containment + Treatment

Containment + Partial Treatment

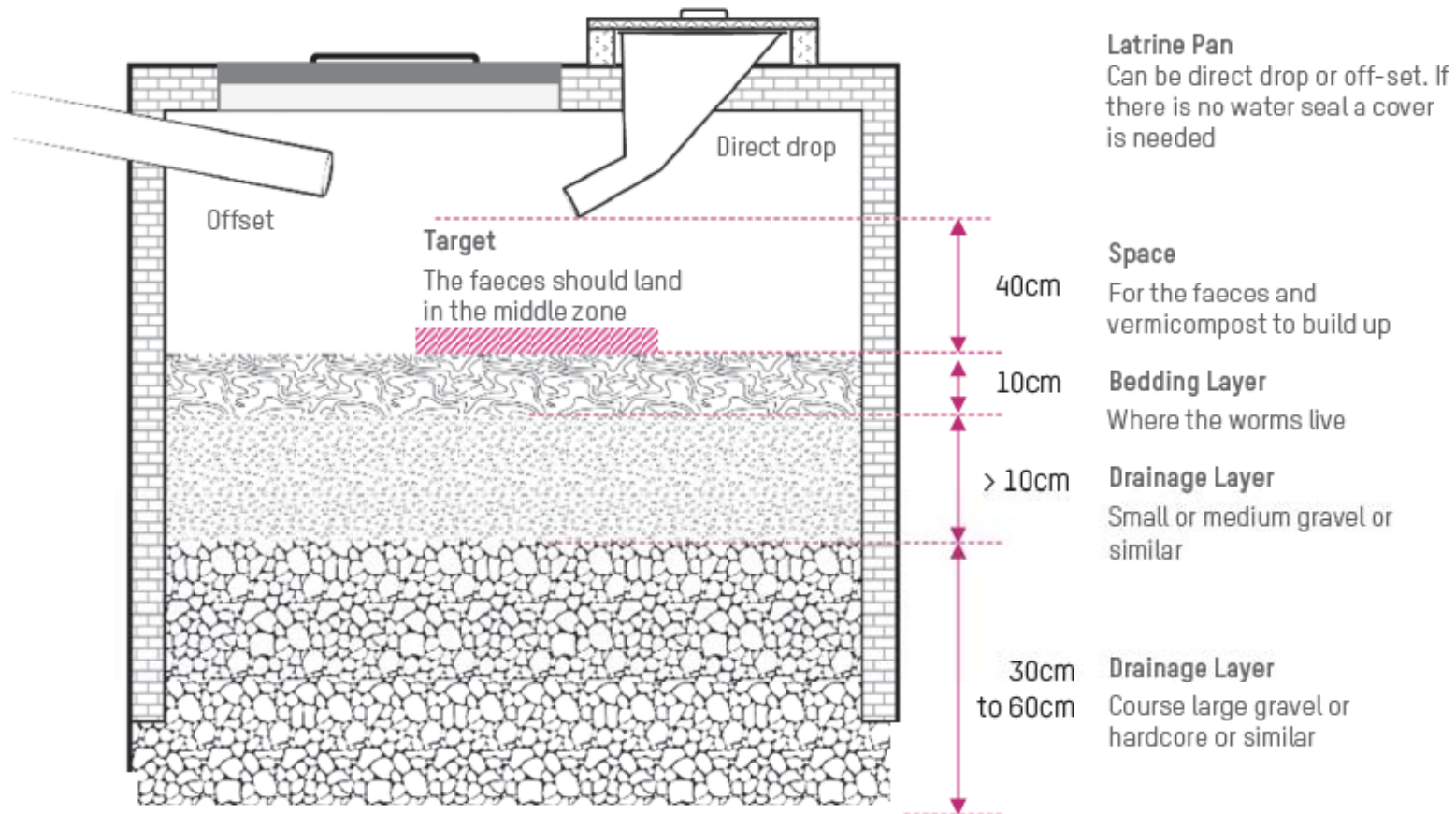


proof of concept to scale...



- Approx. 600 to
- Approx. 6,000

y research



Infiltration

It is critical that the infiltration rate is sufficient to prevent water building up and flooding the pit



Infiltration

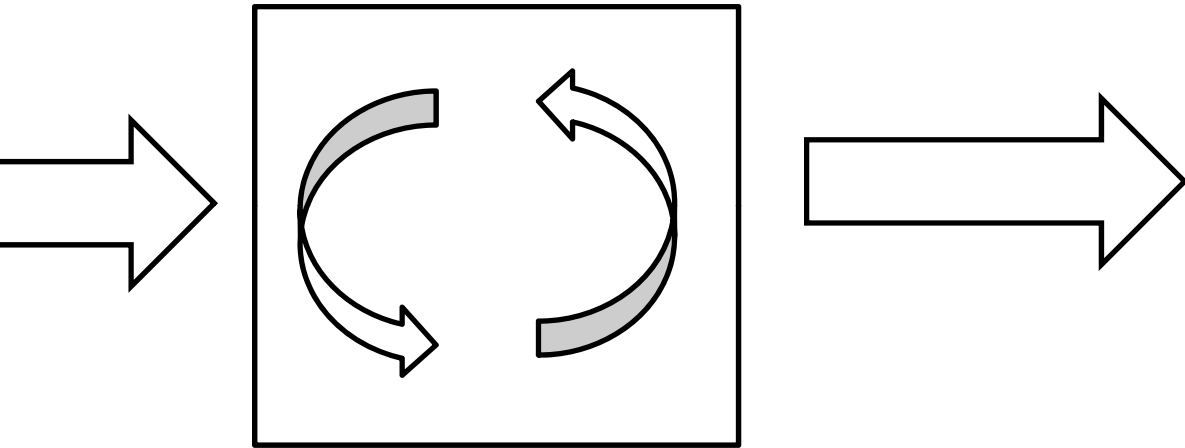
If the infiltration rate is insufficient, consider a larger pit or infiltration trench



Maximum Water Table

It is critical that the water table does not raise into the drainage layer

our biological system...



Important questions

- What goes into your system?
- What comes out of your system?
- What other factors affect your processes?



challenges....

Time required

- Cannot speed up biological processes
- Sustainability (O&M) field trials

Sample analysis

- Sampling?
- Analysis... where?

How to monitoring in field

- Development of indicators

Only monitor – what you are looking for...

- Unintended consequences

Processing of human faeces by wet vermifiltration for improved on-site sanitation

C. Furlong, M. R. Templeton and W. T. Gibson

ABSTRACT

The use of a vermifilter containing *Eisenia fetida* to degrade human faeces in a continuous wet system was explored. This paper aimed to understand the formation of vermicompost within the system, the quality of the effluent produced, and the effect of different bedding matrices. Eight filters were constructed, utilising four different bedding materials: four of these systems were seeded with 400 g of worms (vermifilters) while the others served as controls. The systems were flushed with 12 L of water per day and the experiment was split into five phases, each with different feeding regimes. Between 23.7 and 24.7 kg of fresh human faecal matter was added to the vermifilters over the 360 day period. The presence of the worms was found to increase the faecal reduction to 76% on average, compared to 17% in the control systems on average. Statistically significant reductions in phosphate, chemical oxygen demand and thermotolerant coliforms were achieved in the effluent of all vermifilters. The most suitable bedding matrix was a mixture of coir and woodchip. This study shows that there is potential for continuous treatment of human faeces using wet, on-site vermifilters.

Key words | *Eisenia fetida*, sewage, vermicompost, vermifilter, vermireactor, worm

C. Furlong (corresponding author)
M. R. Templeton
Department of Civil and
Engineering,
Imperial College London,
London,
SW7 2AZ,
UK
E-mail: claire.furlong@imperial.ac.uk

W. T. Gibson
Bear Valley Ventures Limited,
Braeside,
Utkinton Lane,
Cotebrook,
Tarporley,
Cheshire, CW6 0JH,
UK



er engagement/acceptance is a huge part of containment research