PFAS Management in Drinking Water Catchments

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Problem

For Per- and Polyfluoroalkyl Substances (PFAS), the combination of persistence and mobility can cause widespread ambient detections as well as large groundwater plumes associated with point sources which can impact drinking water supplies.

Drinking water supplies are also under pressure from climate change related drought, urbanization and population increases.

There is a need to priorities action to protect sensitive drinking water catchments, protect human health and ensure security of future water supplies.

New regulatory guidelines for drinking water in the UK require all water companies to undertake catchment wide risk assessments, monitor for 47 PFAS compounds to lower thresholds and identify future investment.

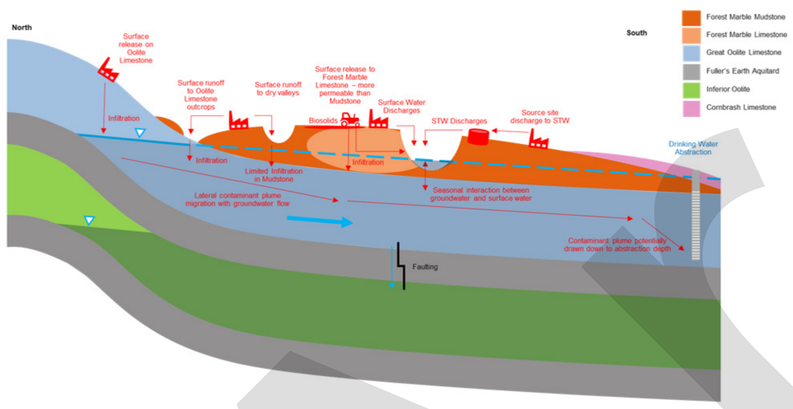
Approach

Case Study 1: UK Water Company

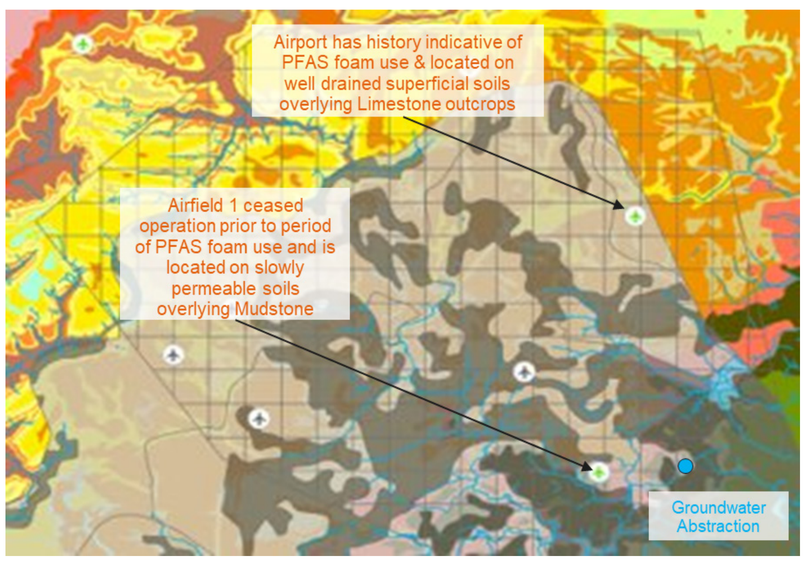
Following detections of PFAS in a groundwater abstraction used to supply drinking water in a rural area the regulator required further development of the catchment risk assessment to identify potential sources and actions.

Arcadis worked collaboratively with the company to:

- Built a GIS-based catchment wide Conceptual Site Model (Model) to identify Source Pathway Receptor (SPR) linkages;



- Develop PFAS Source Site Profiles;
- Source site risk ranking and visualisation via GIS Digital Tools;
  - Bespoke public & private datasets obtained over ~100km2
  - Including - biosolids applications, airfields, fire stations, discharge consents, pollution incidents, industrial permits, PFAS water quality datasets
  - Prioritise key SPR linkages – scoring based on likelihood, magnitude and release route, groundwater vulnerability and proximity to surface water features & abstractions
  - Support risk assessment, site prioritisation & regulatory liaison - inform targeted monitoring & further action.

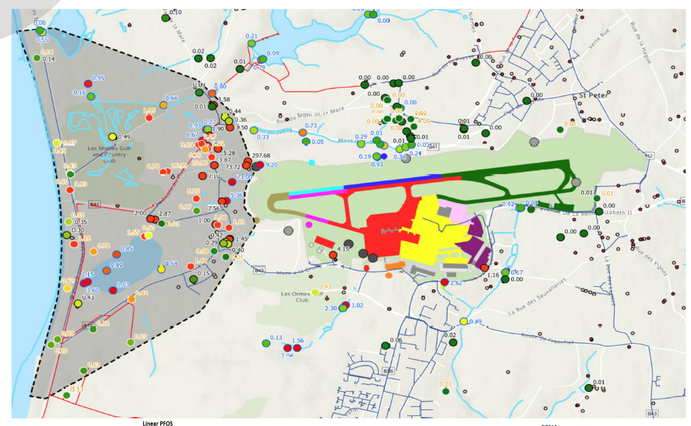


Solutions

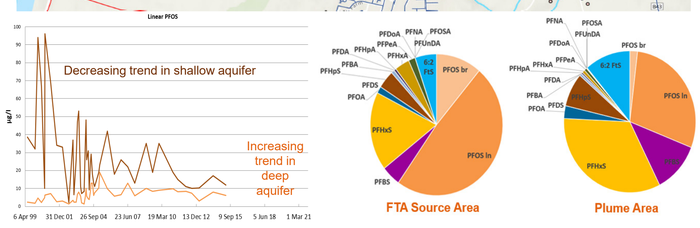
Case Study 2: Government of Jersey

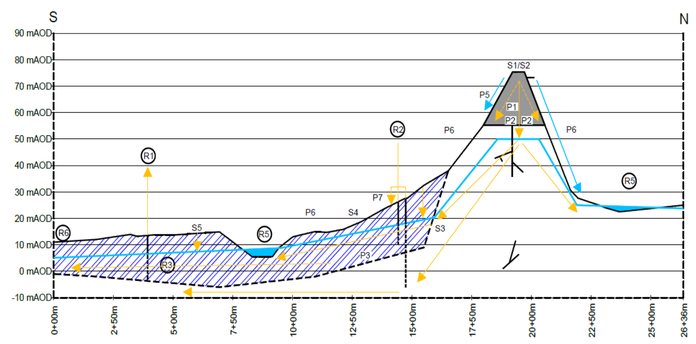
Historical firefighting foam use at Jersey Airport – impacting two drinking water catchments and causing public health concerns.

Arcadis undertaking PFAS Hydrogeological Study and Risk Assessment



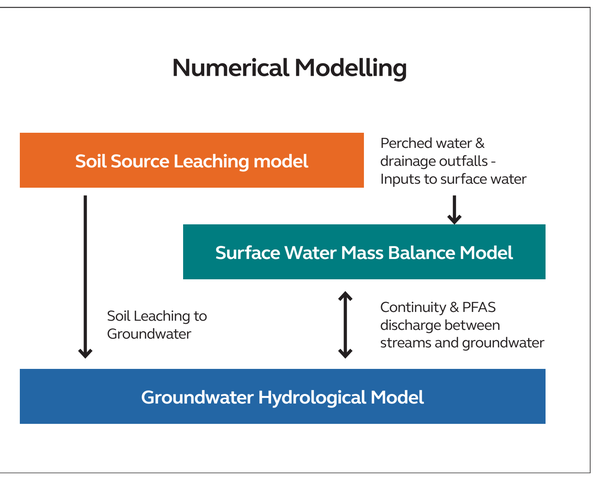
Phase 1	Phase 2
1. Define Objectives	1. Investigation Supervision
2. Review Existing Available Data	2. Update GIS Model
3. Update ArcGIS Model	3. Hydrogeological CSM Development
4. Initial Conceptual Site Model (CSM) Development	4. Numerical Modelling to Support Risk Assessment
5. Data Gap Assessment	5. Risk Assessment
6. PFAS Standards Review	6. Waste Management Action Levels
7. Further Assessment / Monitoring Scoping	7. Remediation Options Appraisal (ROA)
8. Tender Support	





Works completed to date:

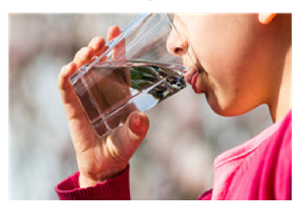
- ESDat database creation – historical government data, QAQC
- GIS Model Development
- Statistical Trends & PFAS Fingerprinting
- CSM & Preliminary Risk Assessment - 2 interacting groundwater bodies , ephemeral surface water features, airport outfalls & reedbeds, FTA and other soil hotspots on airport
- 12-month monitoring strategy – address data gaps



Source → **Pathway** → **Receptors**

Residual PFAS source areas on airport (Fire training, testing, crash sites, concrete, drainage) plus potential off-site sources

Drainage outfalls, perched & surface water, ground water



Drinking water, ecological, biota, crops, livestock