Mapping PFAS Risk: Using GIS and Cross-Collaboration to Protect Onehunga's Drinking Water Supply

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Agenda

- Background
- Methodology - Multi-Disciplinary and Collaborative Approach
- GIS Web Map Development
- Successes and Challenges
- Future Applications

Background

- Onehunga WTP - 4% of Auckland’s water supply, strategically important
- Groundwater source – 2x abstraction wells, heavily urban/ industrial catchment
- PFAS detected above DWSNZ MAV
- WTP shut down since November 2022
- Multi-barrier approach – PFAS treatment and source identification
- PDP commissioned to complete a desktop PFAS source investigation
- Required close collaboration between Watercare and PDP (Hydrogeologists, Contaminated Land specialists and Geospatial team)

Methodology: Hydrogeological Review

Hydrogeological Conceptual Review

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Critical Source Protection Zone (SPZ) Delineation

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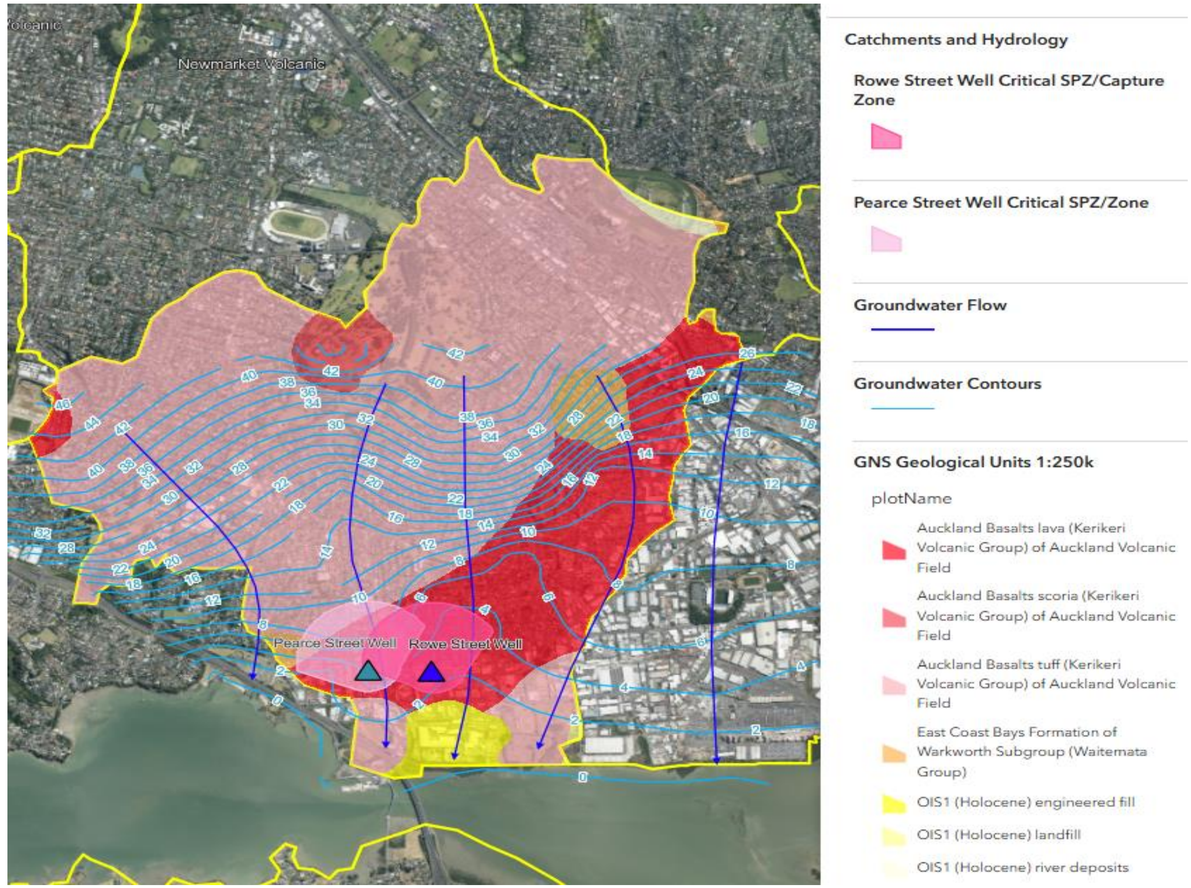
Review of PFAS analytical data against meteorological data to identify potential trends



GIS Web-Map – Hydrogeology and Critical SPZs

Methodology: Desktop Review and Development of Potential PFAS Sources Database

Large-scale desktop review of publicly available information (~1,500 information records/sites)

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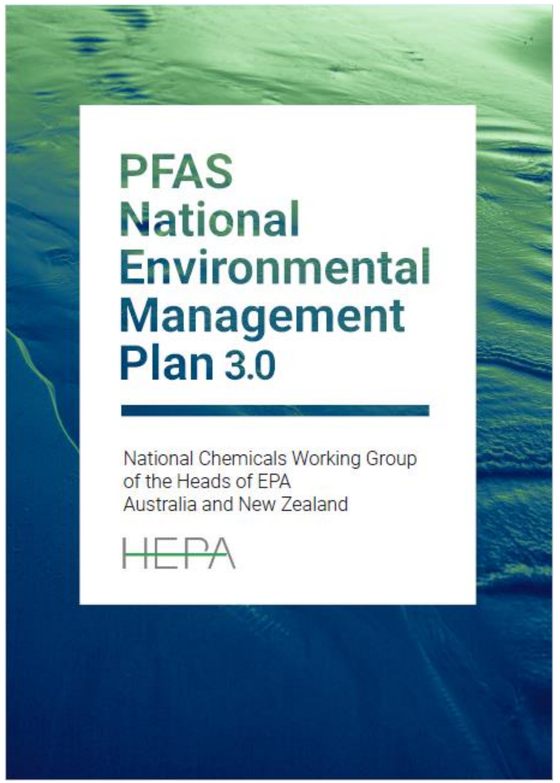
Preliminary ranking assessment and development of potential PFAS sources database based on the HEPA PFAS NEMP – ‘Activities associated with sources of PFAS contamination’

(resulted in ~415 potential sites of interest)



GIS Web-Map – Publicly Sourced Information – Preliminary Ranking

Methodology: GIS Web Map/Conceptual Review

GIS Web Map development
Importation of various information and database of potential PFAS sources (preliminarily ranked)

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Conceptual review of GIS Web Map and refinement of potential PFAS sources based on likelihood/risk of PFAS contamination and potential source – pathway – receptor linkage

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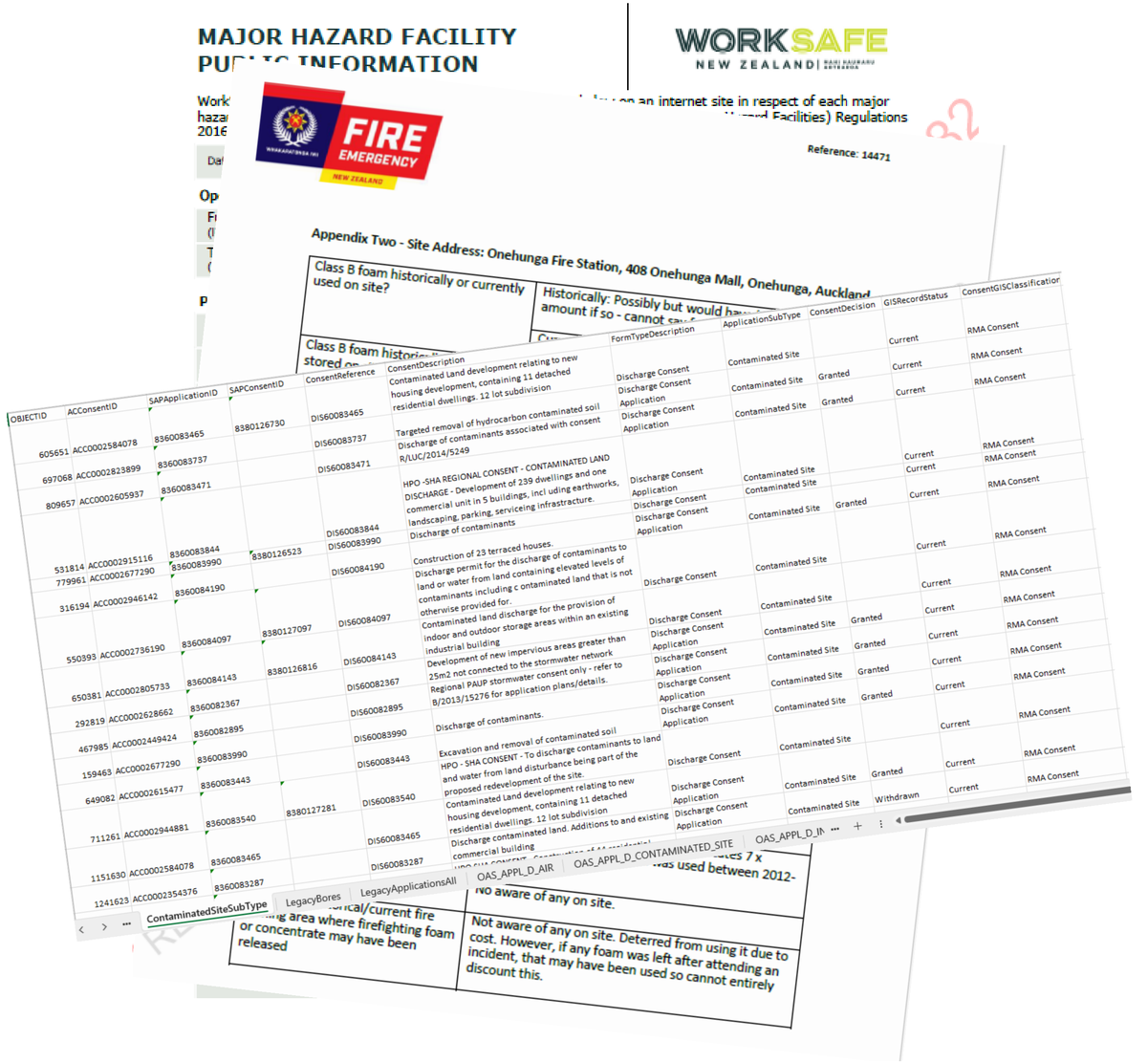
Development of list of highly likely PFAS sources and importation into GIS Web Map
(8 highly likely and 14 likely sources identified)

GIS Web-Map - All layers (hydrogeology, public information reviewed, stormwater and wastewater network etc.)

Project Challenges

- Large volume of data in varying formats (~1,500 information records to begin with)
- Information review was initially time intensive and required manual sorting and assessment prior to importing into the GIS Web Map
- Working across multiple disciplines took time but was essential to informing a robust assessment



Project Successes

Development of GIS Web Map

- Time efficient method for reviewing various information simultaneously in a spatial context
- Facilitated conceptual review to identify ‘highly likely’ PFAS sources
- GIS is a powerful tool to convey information/findings to a range of audiences

Benefits to Watercare

- Enhances Source Water Risk Management Plan/catchment understanding
- Identifying future monitoring sites
- Identifying opportunities for trade waste/network controls

Collaboration

- Multi-disciplinary collaboration between Watercare and PDP specialists, integrating hydrogeology, contaminated land, and geospatial expertise to identify potential PFAS sources and interpret risk

Future Applications

- Assessment of other contaminants/hazards
- Enhancing Source Water Risk Management Plans
- Use of GIS tools for collating, managing, analysing and visualising large datasets, site selection assessments etc.
- Further PFAS source investigations across Aotearoa
- Consideration of both groundwater and surface water sources

Questions / Pātai?

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