

# Fate and Transport of PFAS in a Multi-Stage Groundwater Treatment Plant

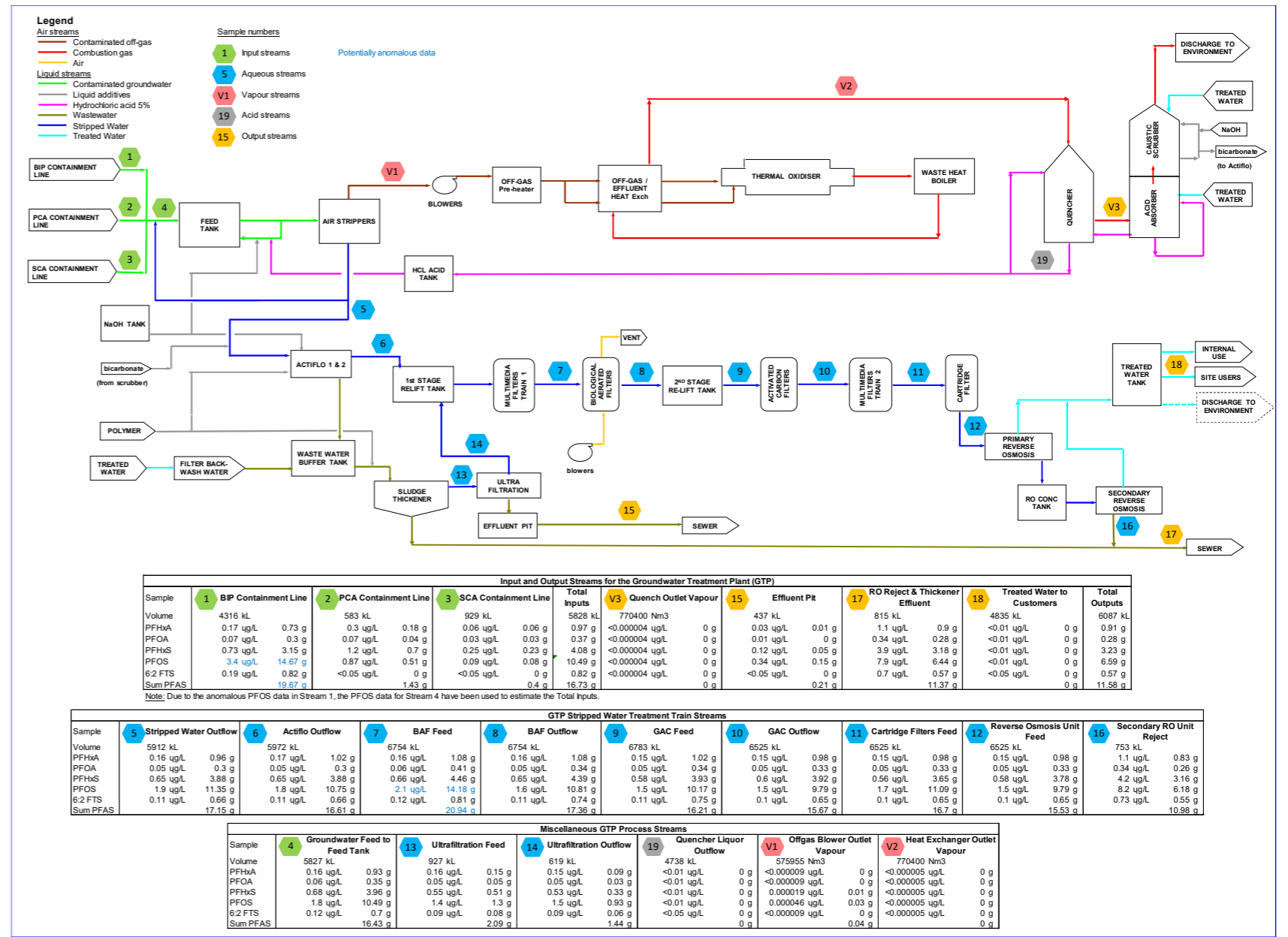
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- Botany Industrial Park (BIP) is located ~6 miles south of downtown Sydney, ~0.5 mile upgradient of Botany Bay.
- Historical use of AFFF:
  - Plant deluge system in 1970s;
  - Firefighting training in two locations – ceased 2004.
- Groundwater, surface water and sediment testing in 2016 and 2016 confirmed PFAS presence.



- In 2006 Groundwater Treatment Plant (GTP) was commissioned – primarily to manage chlorinated hydrocarbon contamination.
- Three containment lines:
  - On BIP boundary (BIP line);
  - Near Botany Bay (SCA line);
  - In between (PCA line).
- Multiple treatment stages to remove manmade and natural contaminants.
- 1.1-1.6 million US gal/day of groundwater extracted and treated.
- Treated water is used in on-site and adjacent chemical manufacturing processes - ~1.1 million US gal/day.



In a single day in July 2017 19 aqueous and 3 vapour samples were taken in the GTP and analysed for PFAS.

## Conclusions

- 16.7 g of PFAS was extracted in the three groundwater containment lines.
- 11.6 g (70%) of PFAS were removed – primarily by the two-stage reverse osmosis units – and discharged to sewer.
- No PFAS were detected in the Treated Water or in the vent to atmosphere.
- By inference 30% of PFAS was held up in process, but the aqueous analyses do not clearly show where.
- Separate testing of solid waste streams indicate 0.1-4.3 mg/kg in granular activated carbon (GAC), <0.1 mg/kg in zeolite from the Biological Aerated Filters (BAFs), and 16.2 mg/kg in sludge cleaned from the air strippers (which are cleaned fortnightly).
- A second round of sampling is required to verify initial results.

