



## PROJECTS

### HYDROGEOLOGY

Hydro25

# Major WA BASED IRON ORE PRODUCER Hydrochemical Investigations

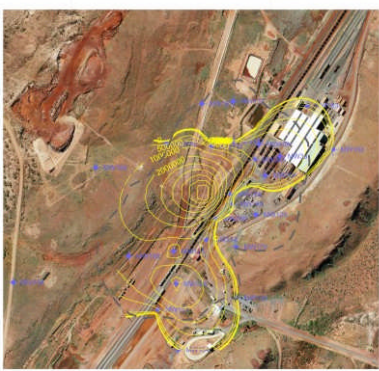
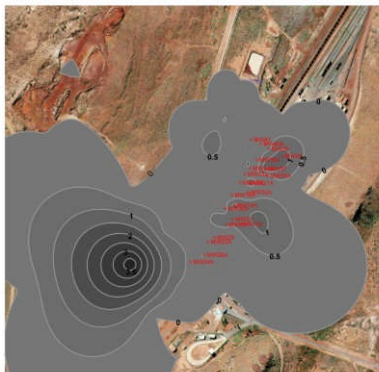
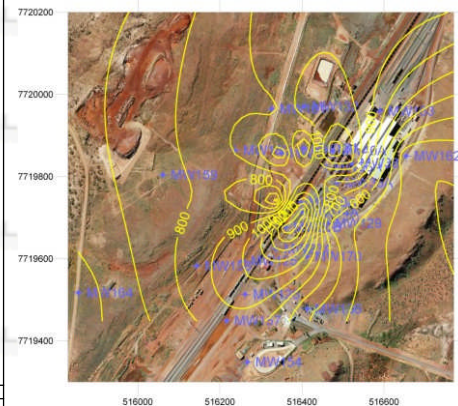
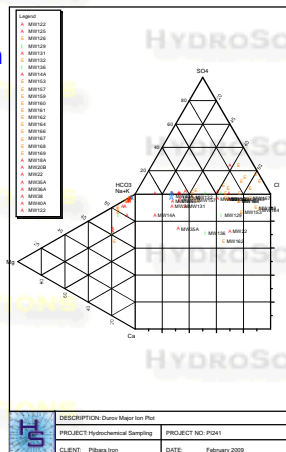
HydroSolutions Pty Ltd undertook an extensive hydrochemical sampling exercise at a major hydrocarbon spillage site in the Pilbara, WA, to investigate future remedial options for the site.

The objective was to adequately characterise the chemistry of both the Phase Separated Hydrocarbons (PSH) and the underlying groundwater to assess potential treatment requirements for a dual-phase recovery system.

Unconfined groundwater is present within weathered and fractured basalt, laterally continuous with overlying colluvium/marine deposits. Beneath the site, groundwater occurs broadly to the SW and NW.

The major ion chemistry was 'typed' according to ionic ratios:

- Type 6: mixing of fresh recharge water with saline groundwater
- Type 3: dominated by HCO<sub>3</sub> & Na produced from active biodegradation of hydrocarbons
- Type 9: Na & Cl end waters



PSH was characterised as aged diesel high in sulfur, with some Polycyclic Aromatic Hydrocarbons (PAHs). PSH viscosity was increased with a variable solubility & bacterial count reflecting the degree of decomposition. TRH fingerprinting indicated predominant alkane components consistent with aged fuel.

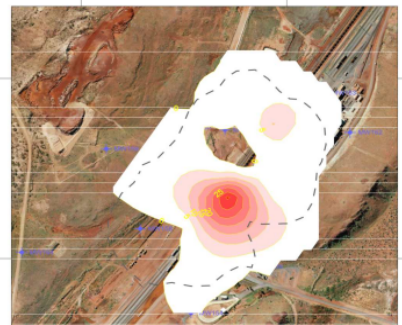
Groundwater in PSH impacted bores was assessed to be high in dissolved phase contaminants beneath and adjacent to the PSH plume. BTEX components remained elevated within the central plume, consistent with reduced degradation rates.

An appraisal of Monitored Natural Attenuation (MNA) parameters was undertaken to look for evidence of biodegradation processes. Degradation appears to be primarily via aerobic decomposition occurring at the plume margins.

A qualitative risk assessment was undertaken.

Recommendations included:

- Development of a short-medium term Remedial Action Plan (RAP) to recover remnant PSH to the extent practicable
- Investigation of soil-vapour conditions in the plume vicinity
- Pilot study assessment of options to promote biodegradation through re-aeration
- A long-term RAP through MNA.



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