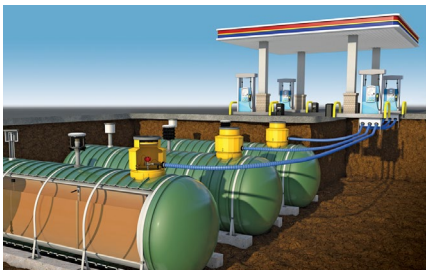


Introduction

KAUST is located above a shallow and saline groundwater system. These conditions can increase corrosion rates of metal infrastructure, such as buried metal fuel pipes and tanks.

Through its internationally certified ISO14001:2015 Environmental Management System, Health, Safety & Environment (HSE) Department identified the risk of leaking underground fuel lines and required that an early-warning system be installed by operations.

Although groundwater moves at a very slow velocity at KAUST (approx. 1 meter per /year) gas stations are known to leak at some point in their operational life. This has the potential to cause risk of harm to human health (eg. building vapor accumulation), the environment (eg. pollution), and/or environmental values (eg. intergenerational equity).



Typical underground tank and fuel line layout

Early-warning system

Prevention of contamination is a key component of the University's Environmental Stewardship Policy, the installation of groundwater monitoring wells have given operational entities and HSE a risk mitigation tool. KAUST HSE firmly believes this forms part of our "social license to operate".

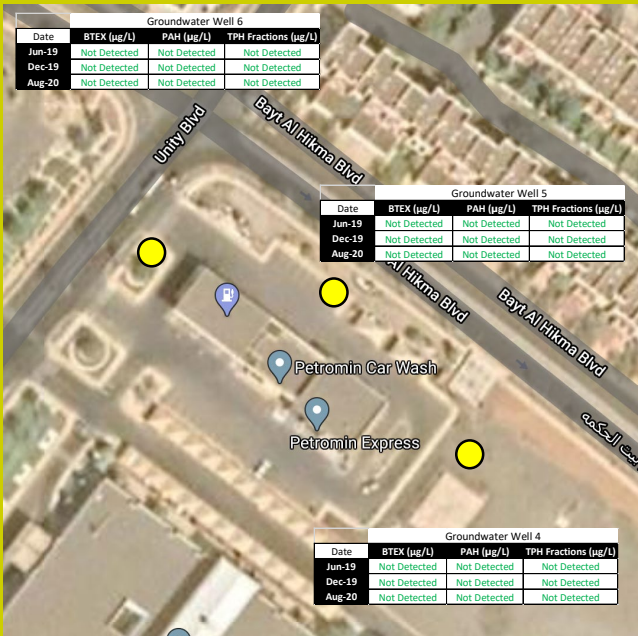
Of the many systems available, a groundwater monitoring system was selected due to being an industry accepted practice and the ease of installation. A total of six groundwater monitoring wells were installed, three at the main gas station and three at the transportation building gas station.



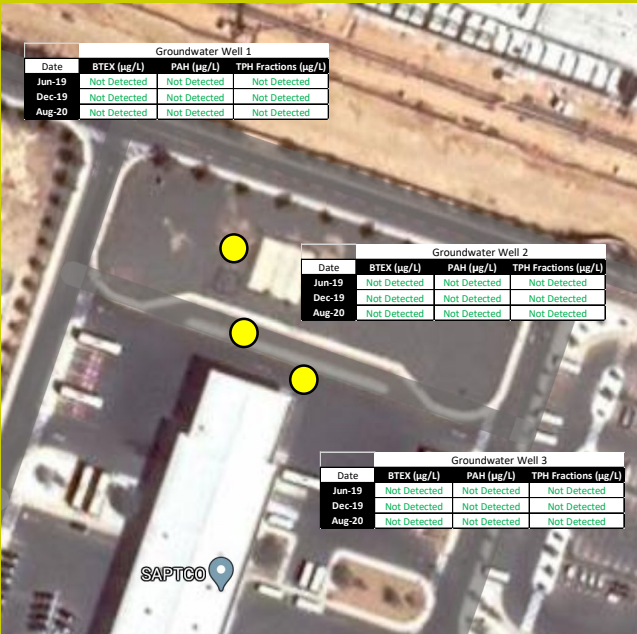
Groundwater well being installed (left) and sampled (right)

What are the monitoring results?

No hydrocarbon contamination has been detected in 3 monitoring events to date. This is a positive outcome and HSE will continue to monitor groundwater into the future and ensure existing controls are maintained (eg. fuel reconciliation, inspections, and maintenance). As part of new projects at KAUST, HSE requires advanced leak detection systems to ensure human health and the environment is protected.



Community Gas Station – Groundwater Summary*



Transportation Gas Station – Groundwater Summary*

* Full groundwater analytical suite included individual and total PAHs, BTEX, 5 fraction and sum TPH, heavy metal suite, natural monitored attenuation parameters, and field parameters