

MIDDLE EAST PETROLEUM BULK PLANT REMEDIATION STRATEGY

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Linebach Funkhouser, Inc. (LFI) worked with a major oil company to install one of the first groundwater remediation systems at a bulk petroleum terminal in the Middle East. This bulk plant utilizes approximately 20 large capacity above-ground petroleum storage tanks. LFI also worked with a Middle East regulatory authority to determine an appropriate framework relative to the groundwater impacts since no formal written environmental regulations existed. In January 2012, LFI was retained by the oil company to assess groundwater quality at their bulk petroleum plant. Previous assessment of site groundwater documented the petroleum groundwater plume was migrating toward a nearby navigable water body.

To address this plume, LFI designed and implemented a vacuum-enhanced dual-phase extraction/air sparge (VEDPE/AS) groundwater remediation system on the property. The system consisted of 15 recovery wells connected to pumps, blowers, water treatment equipment, a moisture separator, and an oil/water separator, all of which are housed in a mobile enclosure on a concrete pad. The treated groundwater, following testing and confirmation that regulatory limits have been met, was allowed to discharge to the water body.

LFI evaluated pertinent provided site assessment information in an effort to optimize the remedial system design including, the hydrogeologic regime of the shallow water-bearing zone, groundwater chemistry data, minimum/maximum estimated horizontal hydraulic conductivities, groundwater flow direction and the extent of free product and dissolved fraction plumes along and beyond the downgradient western property boundary. The LFI team had to consider site specific and bid specification constraints relative to the remediation system design including: no off-site access within free product or dissolved fraction contaminant plumes, remediation system design limited to 15 recovery wells and bid specification values. In addition, recovery wells could not be placed any farther than 14 meters (approx. 46 feet) apart based on radius of influence for both soil vapor and groundwater, recovery wells maximum depths are 9 meters and the system design specifications relative to flow rates versus system capacity. The LFI team had to consider the overall client project objective/goal relative to the design was to eliminate/prevent further migration of free-phase and dissolved phase contaminant plumes and vapor intrusion beneath an off-site building, construct the most efficient and cost effective remediation system in consideration of site and budgetary constraints and to develop a final remedial system design to accomplish these objectives prior to installation.

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