

## THERMAL INFRARED SCANNING FOR EVALUATING OIL PLUME THICKNESS CONTAMINATING GROUNDWATER

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### ABSTRACT

The characteristic that all objects emit a certain amount of black body radiation as a function of their temperatures was used in tracing the distribution of temperature in that black body. Generally speaking, the higher an object's temperature, the more infrared radiation is emitted as black-body radiation. A special camera can detect this radiation in a way similar to the way an ordinary camera detects visible light. It works even in total darkness because the ambient light level does not matter. This makes it useful for rescue operations in wells.

The area where the idea is applied located at the Al Giran site west of Tripoli the capital of Libya. Al Green subjected to an oil leakage took place along the W10 Al Zawya-Tripoli pipeline. Taking the advantage of the difference between the temperature of the water and oil with their ambient, thermal scanning executing on the polluted site in order to measure the thickness and areal extent of the oil plume polluting the groundwater.

The temperature of the fluids (Oil and Water) measured along the selected depth of the 25 drilled wells. The measured temperatures showed variation along the depth from ambient temperature, as well as aurally. This variation in oil and water temperatures enabled detecting the water, oil contact and its areal distribution on the polluted site subjected to remediation.

Comparing the time and cost of the technique applied to sampling groundwater technique appeared to be faster and cheaper, besides giving more informative data.

**KEYWORDS:** Thermal Infrared, Contamination, Groundwater Monitoring, oil Pollution