

Halliburton Osage Road (Duncan)

(September 9, 2016)

Location: The site is located at 605 West Osage Road in Duncan, OK.

Background: The site occupies a portion of the 161-acre Osage Road property and has been used for several different industrial operations. The most notable were the missile motor casing cleaning for the United States Department of Defense (approximately 1963 through 1991) and a project for recycling stainless steel nuclear power plant fuel rod racks (approximately 1983 to 1985).

Off-site residential wells were sampled in May 2011 near the Osage Road property. Perchlorate was discovered in residential groundwater above the Environmental Protection Agency (EPA) Interim Drinking Water Health Advisory for perchlorate of 15 micrograms per liter ($\mu\text{g/L}$). The presence of perchlorate was a result of cleaning out the missile motor casings. Propellant, wash water, and solid materials were stored and/or burned in unlined burn pits and evaporation ponds for approximately 28 years.

The on-site and off-site contamination of perchlorate has been defined. On-site and off-site interim remedial measures are currently under way. On-site and off-site groundwater monitoring wells are monitored for perchlorate quarterly. Select residential wells are also monitored quarterly.

Soil in a small enclosed portion of the property is affected by small amounts of radiation due to the rod rack operation from 1983 to 1985. The area has been characterized and disposal of from a localized area will be implemented soon.

Air: There are no air issues.

Soil: Six soil types are present across the site, which include: Newalla fine sandy loam; Stephenville and Newalla soils; Stephenville and Littleaxe soils; Stephenville-Pulaski complex; Stephenville-Darnell complex; and the Stephenville fine sandy loam. Several interim remedial measures are being implemented for soils on site. Soybean oil mixed with water is being injected in injection wells located at the North Burn Pit. There are two on-site pilot tests being conducted, which include a biocell and a bioreactor. The treatment consists of 10% calcium magnesium acetate mixed with perchlorate contaminated soils.

Surface Water: There is a creek in the northern part of the site near Gatlin Road that has tested above the 15 $\mu\text{g/L}$ limit for perchlorate. Investigation and sampling are ongoing.

Groundwater: The site is located within the Wichita Uplift geologic province. The site is underlain by thin, unconsolidated, alluvial terrace deposits that overlie bedrock. The underlying bedrock is of the Duncan Sandstone. Groundwater varies at different depths within the Duncan Sandstone. Water depths range from 15 feet to 65 feet below top of casing in monitoring wells. Groundwater flow is generally to the south-southeast direction.

On-site injections of soybean oil mixed with water are ongoing at the North burn pit area. Off-site groundwater extraction and treatment is being implemented to treat and prevent the perchlorate groundwater plume from moving further down-gradient.

Private/Public Wells: Several private wells are affected. Many of these wells have been plugged and abandoned. No known public wells are affected.

Vapor Intrusion to Indoor Air: Perchlorate is not a volatile substance. No vapor intrusion to Indoor air issues

Key Questions:

- **Have all known groundwater contaminant plumes been adequately evaluated and delineated?** Yes
- **Has the site been sampled for an adequate list of analytes?** Yes
- **Does soil or waste need to be cleaned up:** Yes
- **Has the surface water been sampled?** Yes
- **Has soil at the site been cleaned up to levels protective of groundwater?** There is not a regulatory level for perchlorate for groundwater protection.