

**KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT  
Bureau of Environmental Remediation**

**MEMORANDUM**

**To:** Rick Bean *RB*  
**Through:** Doug Doubek *DD*  
**From:** Jon Vopata JV  
**Date:** June 18<sup>th</sup>, 2010  
**Subject:** Recommendation for Removal of the Former H & H  
Refinery Site from the State Water Plan Contamination  
Remediation Program

**FINAL**

**Site Description:**

The Former H&H Refinery site includes approximately nine (9) acres of commercial and undeveloped properties located west of 6<sup>th</sup> Street and south of Kelly Avenue on the South edge of Osawatomie, Miami County, Kansas. Surrounding the subject property are industrial, commercial, and residential properties to the north, undeveloped and residential property to the east, undeveloped property to the south to a flood control levee along Pottawatomie Creek, and undeveloped/residential property to the west.

The approximate latitude and longitude coordinates of the subject property are -94.951593°W and 38.490010°N. The subject property is located in the northwest ¼ of Section 14, Township 18 South, Range 22 East. The subject property is approximately 850 feet above mean sea level.

**Site History:**

The H&H Refinery operated intermittently from 1919 to 1923. The property was purchased in July 1915, but construction was not begun until March 1919. On May 4, 1921, an order of bankruptcy was filed for the H&H Refinery. On April 7, 1922, property was sold by Homer H. Berger, trustee, to the Chemical Oil and Gas Company. What happened to the Chemical Oil and Gas Company is unknown, but according to Phase 1 FFRA ownership of the property was transferred from Goudie George to Whiteford Charles to Allen Otis and then back to Whiteford Charles. According to an interview with a former property owner, the refinery was not in production in the 1930s and only remnants of the foundation existed at that time.

Many businesses have occupied the land west of 6<sup>th</sup> Street and south of Kelly Avenue since the existence of the refinery. However, the land was primarily undeveloped until

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the 1960s, when the U.S. Army Corp of Engineers built a levee to control flooding of the Pottawatomie Creek.

In February 2006, Tetra Tech EM Inc. conducted the Phase 1 FFRA of the Former H&H Refinery Site. The Phase 1 report revealed evidence of environmental impacts at the subject property and recommended the collection of soil and groundwater samples to determine if a release or potential release of petroleum products or hazardous substances has impacted the subject property.

In October 2006, KDHE conducted Phase 2 FFRA field sampling activities at the Site. Soil and groundwater samples were collected utilizing Geoprobe technology and analyzed for Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO), Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH-GRO), Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Compounds (VOCs), and RCRA metals. In June 2010 a memorandum summarizing the Phase 2 FFRA sampling activities and analytical results was approved. Based on analytical results from the Phase 2 FFRA no soil or groundwater samples collected at the site indicated detectable concentrations of TPH-DRO, TPH-GRO, PAHs, VOCs, or RCRA metals at concentrations exceeding KDHE's Tier 2 RSK levels for residential scenarios.

#### **Hydrogeologic Setting:**

The Former H&H Refinery Site is situated within the alluvial floodplain of Pottawatomie Creek. Soils on the subject property have been mapped as the Verdigris-Osage-Lanton Association. This Association is comprised of deep, nearly level, moderately well drained to poorly drained soils that have silty and clayey subsoil on the flood plains.

Direct-push sampling during the Phase 2 FFRA identified predominately clay soils/alluvium overlying bedrock at approximately 20-25 feet below ground surface. Using direct-push sampling technology, groundwater was low yielding to absent on the eastern and western edges of the subject property, however static groundwater levels were recorded at approximately 10 feet below ground surface in the central portion of the subject property. Based on site topography and observations during the Phase 2 FFRA, groundwater flow is anticipated to be south.

#### **Target Identification:**

The source of public water in the area of the subject property is the City of Osawatomie. The City obtains its water from the Marias des Cygnes River and from one public water supply well located within 1 mile upgradient of the subject property. Water is treated by the city water treatment plant within the city prior to distribution.

No wells were identified on the subject property during the Phase 1 FFRA. A search of all water wells within a 1-mile radius of the subject property identified no private domestic wells, eight private monitoring wells, and one public water supply well located approximately 0.5 mile upgradient of the subject property.

### **Significant Analytical Results:**

The following is a summary of the Phase 2 FFRA analytical results. For a comprehensive report of all analytical results and figures depicting sample locations refer to the *Phase 2 FFRA Investigation of the Former H&H Refinery Site Memorandum*.

TPH-DRO was only detected in soil sample SB-10(8') at 103 milligrams per kilogram (mg/kg), below the KDHE Tier 2 Risk-Based Residential Soil Pathway of 2,000 mg/kg.

TPH-GRO was detected in soil samples SB-03(4-6') at 6.39 mg/kg, SB-04(4-6') at 6.66 mg/kg, SB-05(4-6') at 6.33 mg/kg, and SB-10(8') at 7.92 mg/kg; all below the KDHE Tier 2 Risk-Based Residential Soil to Groundwater Protection Pathway of 39 mg/kg.

No PAHs or VOCs were detected in any soil samples collected at the former H&H Refinery Site.

No RCRA metals were detected in any soil samples at concentrations exceeding their respective KDHE Tier 2 Risk-Based Residential Soil Pathway RSK values.

TPH-DRO, TPH-GRO, PAHs, and VOCs were not detected in any groundwater samples.

Barium was the only RCRA metal detected in groundwater samples collected at the former H&H Refinery Site. All reported concentrations of barium were below the KDHE Tier 2 Risk-Based Residential Groundwater Pathway RSK value of 2 milligrams per liter (mg/L).

### **Recommendations:**

It is recommended the Former H & H Refinery Site be removed from the State Water Plan Contamination Remediation Program. Based on analytical results from the Phase 2 FFRA, no soil or groundwater samples collected at the site indicated detectable concentrations of TPH-DRO, TPH-GRO, PAHs, VOCs, or RCRA metals at concentrations exceeding KDHE's Tier 2 RSK levels for residential scenarios and no surface water or sediment is present on site. Based on the findings reported in the Phase 2 FFRA memo, the Former H&H Refinery Site is eligible for removal from the State Water Plan Contamination Remediation Program.