

United States Environmental Protection Agency
Region IV
POLLUTION REPORT

Date: Monday, September 22, 2008

From: Leonardo Ceron

Subject: POLREP 1 - Removal Site Evaluation
Huntsville Gas Company
426 Dallas Avenue NW, Huntsville, AL
Latitude: 34.7313370
Longitude: -86.5935230

POLREP No.:	1	Site #:	A4TG
Reporting Period:	April - September, 2008	D.O. #:	
Start Date:		Response Authority:	CERCLA
Mob Date:		Response Type:	Time-Critical
Demob Date:		NPL Status:	Non NPL
Completion Date:		Incident Category:	Removal Assessment
CERCLIS ID #:	ALN00040707462	Contract #	
RCRIS ID #:			

Site Description

A manufactured gas plant operated at the Huntsville Gas Company (HGC) site from 1856 to about 1948. The facility originally operated in 1856 as the Huntsville Gas Light Company, using rosin from coal to manufacture gas. In 1932, after several name changes, the facility became the Huntsville Gas company. It is not known whether a carbonization or gasification (or both) process was used at the plant. In 1946, HGC became part of the Alabama Gas Corporation (Alagasco) and the plant was abandoned as the city's distribution system switched from coal gas to propane air gas. Between 1940 and 1950, the City of Huntsville began redeveloping projects in the surrounding downtown area, removing several shanties and old antebellum homes from Dallas Avenue near the plant. The plant was disassembled between 1950 and 1970, though specific date(s) of disassembly and abandonment procedures are presently unknown; two tanks and the purifying house are still visible in a 1954 aerial photograph. In the 1970s, the Huntsville Housing Authority (HHA) constructed the Searcy Homes Development, a portion of which resides on property previously occupied by HGC.

The site is bordered on the west by an unnamed drainage ditch, which flows 200' to the southwest into Pinhook Creek. Directly across the drainage ditch is a Norfolk Southern railroad line, from which coal and other raw materials were allegedly supplied to the HGC facility. Infrastructure in the area surrounding the HGC site changed significantly between 1950 and 1970. The HGC plant was located at the intersection of Rison/Pollard Street and Spragins Street, but portions of both streets were removed prior to the construction of Searcy Homes and were replaced with Dallas Avenue and Monroe Street, which travel parallel to one-another and do not intersect. Property lines in the neighborhood were also redrawn so that the original parcel boundaries of the HGC facility no longer exist. A pre-1950 sanborn map superimposed over a post-1990 aerial image has shown that several current structures reside on the former HGC footprint: a 0.1 acre vegetable garden, a concrete basketball court, the Searcy Homes Office (426 Dallas Avenue NW), and 5 duplex buildings (424 A/B, 422 A/B, 420 A/B, 418 A/B, and 416 A/B on Dallas Avenue NW).

The Alabama Department of Environmental Management (ADEM) conducted a CERCLA Preliminary Assessment (PA) of the HGC site in February, 2003 and issued its findings to EPA in May, 2003. ADEM collected groundwater, surface water, sediment, and soil samples in September, 2004 and submitted its findings in a CERCLA Site Inspection (SI) in September, 2006 to EPA that received a low priority for further assessment. ADEM collected additional soil samples in February, 2007 and submitted a second SI in September, 2007 to EPA that received a higher priority for further assessment based on findings that high levels of Polynuclear Aromatic Hydrocarbons (PAHs) were found in a widespread area. The site was referred to EPA Emergency Response and Removal Branch (ERRB) in January, 2008. The site has been listed in the CERCLA Information System (CERCLIS) under identification number ALN00040707462.

Historical knowledge has shown that the following potential chemicals are often found at manufactured gas plant sites: arsenic, cadmium, cyanide, lead, mercury, benzene, toluene, ethylbenzene, xylene, naphthalene,

phenolic compounds, and PAHs. Analytical results for soil sample collected during the second SI indicated the presence of arsenic, chromium, mercury, cyanide, and 14 organic compounds above Alabama Risk Based Corrective Action (ARBCA) Preliminary Screening Value (PSV) for Direct Contact Exposure in Residential soils. The sample was a composite of 132 individual borings, collected at 0"-18" below ground surface (bgs), over 3 acres of the estimated HGC footprint. Concern was raised about the findings due to high levels of several constituents, particularly PAHs, being found in this particular composite sample which had a high probability for dilution.

A tenant list submitted by the HHA reported that 8 of the 10 residential units (2 units per building) located in the projected HGC footprint were occupied during April, 2008. It has been observed by EPA and ADEM that several children, ages 1-15, are often playing in the area; no data has been collected during the environmental investigation on the population and ages of the children in the neighborhood. A portion of the Searcy Homes Office building is utilized by a Boy Scout Troop. The vegetable garden is used and tended regularly by the Boy Scout Troop. The basketball court is used regularly by neighborhood children.

Current Activities

EPA ERRB and a Superfund Technical Assessment and Response Team (START) contractor, with assistance from ADEM, collected samples from the site in May, 2008 and again in August, 2008.

The first series of samples consisted of individual five-point composite soil samples at 12"-18" bgs over 37 delineated zones within or around the estimated HGC footprint. In addition, three sediment samples were collected from the stream bank, three duplicate samples were taken, and a background soil sample was collected from a yard on the northeast corner of the Searcy Homes community. Debris consisting of brick and wood was observed in several boreholes. Visual contamination of coal, ash, and coke were observed in several other boreholes as well as on the surface of the recently tilled vegetable garden. The creek bank adjacent to the site has a shear drop of 12'-15' deep, revealing protruding structures such as brick foundations and iron pipes, as well as unnatural stratification such as 12" of black material beginning just 18" bgs.

Soil and sediment samples were analyzed for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Metals, and Cyanide. Multiple samples exceeded EPA Region 4 recommended risk based Removal Action Level (RAL) for PAHs and 24 samples exceeded the RAL for carcinogenic PAHs (cPAHs) which is compounded on a benzo(a)pyrene equivalent value (BaP Eq).

TABLE 1 – Subsurface Soil PAH Concentrations Versus RALs

Analyte	RAL (mg/kg)	Number of Samples that Exceeded RAL	Maximum Concentration (mg/kg)
Benzo[a]anthracene	15	7	69
Benzo[a]pyrene	1.5	20	55
Benzo[b]fluoranthene	15	8	110
Indeno[1,2,3-cd]pyrene	15	6	53
cPAH Benzo[a]pyrene equivalent (BaP Eq)	1.5	24	78.7

One soil sample at 41 mg/kg and one sediment sample at 44 mg/kg exceeded the RAL of for arsenic in residential surface soil (40 mg/kg); the average arsenic concentration for all the soil samples was approximately 15 mg/kg and for all sediment samples was approximately 35 mg/kg. One soil sample at 1900 mg/kg exceeded the RAL for Lead in residential surface soil (1200 mg/kg); the average lead concentration for all the soil samples was approximately 240 mg/kg.

The second series of samples consisted of individual five-point composite surface soil samples at 0"-6" bgs over 6 of the delineated zones from the previous sampling investigation. In addition, one duplicate sample was taken, and one background surface soil sample was collected from the same yard at the northeast corner of the Searcy Homes community that was used during the previous sampling investigation.

It was determined from the previous subsurface data that PAHs were the primary contaminant of concern at the site, so the surface soil samples collected in the second series of samples were only analyzed for VOCs (which encompasses multiple PAHs). Multiple samples exceeded EPA RAL for PAHs and BaP Eq for cPAHs.

TABLE 2 - Surface Soil PAH Concentrations Versus RALs

Analyte	RAL (mg/kg)	Number of Samples that Exceeded RAL	Maximum Concentration (mg/kg)
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Analyte	RAL (mg/kg)	Number of Samples that Exceeded RAL	Maximum Concentration (mg/kg)
Benzo[a]anthracene	15	2	36
Benzo[a]pyrene	1.5	5	29
Benzo[b]fluoranthene	15	2	49
Indeno[1,2,3-cd]pyrene	15	1	19
Dibenzo[a,h]anthracene	1.5	2	4.1
cPAH Benzo[a]pyrene equivalent (BaP Eq)	1.5	5	43.9

Increases or decreases in concentrations of various cPAHs were extremely similar for all constituents when compared to concentrations found in subsurface soils from the same 6 zones. Two zones with subsurface BaP Eq concentrations above RALs showed decreased concentrations of approximately 50% at surface soils, but remained above BaP Eq RALs at surface soils. Two other zones with subsurface BaP Eq concentrations above RALs showed decreased concentrations of approximately 90% at surface soil, but still remained above BaP Eq RALs at surface soils. One zone with subsurface BaP Eq concentrations above RALs showed increased concentrations of approximately 300% at surface soils. The remaining zone and background location did not have subsurface PAH concentrations above RALs, and although both showed increased concentrations at surface soils from 30% to 300%, neither had surface soil PAH concentrations above RALs.

Planned Removal Actions

Carcinogenic PAHs are hazardous substances as defined by CERCLA Section 101(14) and at least six cPAHs (benzo[a]pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, and naphthalene) are listed hazardous wastes under RCRA § 261.33(f). EPA Region 4's Technical Services Section has assessed the potential carcinogenic effects associated with exposure to PAHs in environmental media at the site in accordance with the toxicity equivalency approach developed by EPA (EPA/600/R-93/089, 1993), and determined that contaminated surface soils present a risk to children in the neighborhood. Additionally, although PAHs are not easily absorbed into plants, contaminants in dust or soil may settle on leaf or fruit surfaces and present a risk of ingestion if food grown in the neighborhood garden is not thoroughly washed prior to consumption.

Site conditions meet the requirements for initiating a time-critical removal action according to criteria listed in Section 300.415 (b)(2) of the NCP:

- **Section 300.415(b)(2)(i):** *“Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;”* Sample analysis has shown that cPAHs exist in surface and subsurface soils (up to at least 24” bgs) at concentrations above established RALs. Children regularly play in the area and are exposed to the surface soils on a daily basis. Ten residential units reside on the known affected area, eight of which are known to be currently occupied. A vegetable garden of 0.1 acres has been maintained within the affected area for an unknown number of years, and residents throughout the neighborhood regularly consume produce from the garden.

- **Section 300.415(b)(2)(iv):** *“High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;”* Sample analysis has shown that cPAHs exist in surface soils and the drainage ditch bank at concentrations above established RALs. Runoff from the site or washout of the drainage ditch bank will immediately enter Pinhook Creek. The property at Searcy Homes is regularly mowed and surface soils may become airborne, causing a threat of inhalation or ingestion of contaminated dusts.

- **Section 300.415(b)(2)(vii):** *“The availability of other appropriate federal or state response mechanisms to respond to the release;”* State funds are insufficient. No other governmental entity has funds available to conduct the necessary removal activity.

Next Steps

EPA's Enforcement Section is preparing an assessment of liability and ability to pay on Potentially Responsible Parties (PRPs) related to the site. If it is determined that one or more PRPs are able to complete a removal action, ERRB *may* pursue an Administrative Order on Consent (AOC) with them to carry out the time-critical removal action and provide reimbursement for past costs.

Key Issues

The total expanse and depth of soil contamination at the HGC site is presently unknown. Current data

shows that the site boundary consists of a an area of approximately 3 acres, bordered on the east Dallas Avenue NW, on the west by the unnamed tributary, on the south by the H.C. Blake Company property line, and on the north near building 412 A/B Dallas Avenue NW. Earth moving or grading during construction of the Searcy Homes development may have spread the contaminated soils further northward. Also, samples have only been collected at a depth up to 24". Previous and unrelated remedial actions at manufactured gas plants of similar size and age have addressed contaminated soils at depths up to 6'-8'. The total extent of contamination at the HGC site will have to be determined either during a subsequent site assessment or over the course of a removal action.

[response.epa.gov/HGC](https://www.epa.gov/response.epa.gov/HGC)