

5.9 Old Coal House Site

The Old Coal House Site is located within the City of St. George, approximately 100 feet north of the Church (Figure 1-3). It is bounded on three sides by roads and to the east by a steep slope and the City Maintenance Facility. The Coal House is a rectangular concrete building approximately 80 feet long by 30 feet wide. It was built into the hillside with the ground surface on the south side of the building approximately 8 feet higher than on the north side. The south side, or back of the building, is underground up to nearly the roof line. The front, or northern side of the building, contains three large doors and a relatively flat yard which extends approximately 90 feet north of the building. At that point the ground begins to slope downward toward the ocean again. With the exception of a driveway which accesses the site from the northwest corner, the east and west sides of the yard are bermed by the north sloping hillside.

5.9.1 Background

Reportedly, the Old Coal House building was once used to store coal, but is currently used for crab pot storage. The building has a concrete floor (Max Malavansky, 1995). During the Hart Crowser spring 1996 visit, metal debris (e.g., pipe fittings) was observed at several locations in the yard along with coal fragments scattered on the ground, especially just northwest of the building.

5.9.2 ESI Objectives

The objectives of the ESI were to determine whether polycyclic aromatic hydrocarbons (PAHs) may have been released to near-surface soils from coal stored in the yard north of the Old Coal House Site, and to evaluate the nature and extent of contamination.

5.9.3 Field Activities

Six surface soil samples (SS-1 through SS-6) were collected at the Old Coal House Site as indicated on Figure 5.9-1. The surface samples were screened in the field laboratory for the presence of PAHs using PAH immunoassay test kits and EPA Method 8015 Modified. Scattered coal fragments were observed in the samples but no positive detections of PAHs were encountered using the immunoassay test kits. Additional explorations were installed based on the positive detections of hydrocarbons using the Method 8015 Modified test and visual indications of coal occurrences. Five hand-auger explorations (HA-1 through HA-5) were installed to further delineate the spatial and vertical extent of coal occurrences at the site. Hand-auger boring HA-1 was installed at the SS-5 sample location to define the vertical extent of coal fragments. However, the hand-auger exploration could not be advanced beyond 0.5 foot and no samples were collected from HA-1.

Twelve soil samples (excluding duplicate samples) were collected from the explorations at depths ranging from 0 to 2 feet below ground surface. Hand-auger explorations could only be advanced to depths ranging from 0.5 to 2 feet below ground surface because the presence of basalt bedrock (see exploration logs presented in Appendix A).

Seven soil samples were submitted to the project laboratory for semivolatile organics analysis (including PAHs) using EPA Method 8270.

5.9.4 Site Geology

Soils encountered in the Old Coal House Site generally consisted of 0.5 to 2 feet of gravelly silty sand over basalt bedrock. Scattered fragments of anthracitic-type coal were observed in surface soils covering the area shown on Figure 5.9-1. No continuous layers of coal were observed at the site. In addition, no seeps or groundwater were encountered in the site explorations.

5.9.5 Soil Quality

Figure 5.9-1 presents the field laboratory Method 8015 modified hydrocarbon screening results for the collected samples. Table 5.9-1 presents a statistical summary of the field laboratory analytical results, indicating the frequency and magnitude of detections and exceedences of RBCs. Table 5.9-2 provides additional concentration and location information on the samples which exceeded the cleanup levels. Analytical results for the Old Coal House Site are summarized below:

- ▶ Diesel was encountered in only one surface sample at an estimated concentration (200 to 250 mg/kg) that is well below the ADEC Category C (1,000 mg/kg) or D (2,000 mg/kg) cleanup levels that would likely apply to the site.
- ▶ PAHs were not detected (at a detection limit of 10 mg/kg) in the six surface samples screened in the field laboratory using the PAH immunoassay test kits.
- ▶ Low concentrations of PAHs (less than 1 mg/kg for individual compounds) were detected in seven soil samples analyzed by the project laboratory. The benzo(a)pyrene concentration (0.46 mg/kg) detected in the HA-4 surface sample was the only PAH compound to exceed the conservative EPA Region 3 RBCs.

Petroleum Hydrocarbons. Petroleum hydrocarbons were encountered in one of twelve samples analyzed by the field laboratory for Method 8015 Modified. Diesel was encountered in surface sample SS-2 at an estimated concentration of 200 to 250 mg/kg. The quantitation of the diesel-derived hydrocarbons was complicated by the presence of coal which also contained compounds that fell within the diesel range. Significant concentrations of diesel were not detected in any of the other site samples. The occurrence of diesel at the SS-2 sample location was likely associated with vehicles using this area.

The occurrence of diesel at SS-2 appears to be limited in extent and at concentrations are well below the ADEC Category C (1,000 mg/kg) or D (2,000 mg/kg) cleanup levels that would likely apply to the site.

PAHs. PAHs were not detected in the six surface samples screened in the field laboratory using the PAH immunoassay test kits. A discrete sample of the coal was also analyzed using the

immunoassay test kit. No PAHs were detected in the coal sample at a detection limit of 10 mg/kg. Since the immunoassay kit could not detect the presence of coal based on PAH content, its use as a field screening method was discontinued at the Old Coal House Site. As discussed below, project laboratory confirmation analysis confirms that PAH detections in soil were less than 10 mg/kg, the detection limit for the field immunoassay test.

Method 8015 Modified results were used to provide an indication of coal content in soils and direct the field sampling program. These results are presented on Figure 5.9-1. The anthracitic coal produced a distinctive signature on the GC-FID chromatograms. The coal-derived hydrocarbons occurred primarily in the oil-range but were also present in the gasoline- and diesel-ranges. Because compounds other than PAHs are also quantified using the Method 8015 Modified test, these results cannot be compared to PAH risk-based cleanup levels. However, they are useful in conjunction with visual observations for delineating the extent of coal occurrences.

To assess the environmental and human health risks associated with the coal-containing soils, samples were submitted to the project laboratory for semivolatile organic analysis. Low concentrations of PAHs (less than 1 mg/kg for individual compounds) were detected in the seven soil samples. Benzo(a)pyrene was the only PAH compound to exceed the conservative EPA Region 3 RBC (Tables 5.9-1 and 5.9-2). The benzo(a)pyrene concentration (0.46 mg/kg) detected in the HA-4 surface sample exceeded the EPA 3 RBC of 0.088 mg/kg.

Despite this exceedence, PAH concentrations detected in site soils are relatively low compared to most residential or industrial areas. For example, average background levels for benzo(a)pyrene established in a study conducted in several northeastern cities in the United States ranged from 2.1 to 2.8 mg/kg (Bradley et al., 1994). The authors attributed the source of these background concentrations of PAHs to primarily deposition of vehicle exhaust particles and runoff from asphalt and motor oil-stained surfaces.

5.9.6 Potential Human Health and Ecological Considerations

As discussed previously, benzo(a)pyrene (BAP) was the only constituent analyzed that exceeded site cleanup levels. The primary potential risk from BAP at the Old Coal House Site is associated with direct contact exposure to the soil. The following discussion evaluates the potential risks from the BAP exceedence using the EPA Region 3 exposure assumptions.

Direct Contact. The primary potential route of exposure to PAH-impacted soil at the Old Coal House Site is through direct contact with the soil. Access to the site is not restricted, and humans, foxes, and birds can come into contact with impacted soil. Direct contact risks posed by the coal-containing soils are likely to be limited because of the nature of PAH-containing matrix. The hard anthracitic coal is not very friable and will not easily break down into smaller particles that can be ingested by humans or animals.

The risk-based residential cleanup level based on EPA Region 3 RBCs is based on direct contact assumptions that could theoretically result in one excess cancer in a population of 1 million, over

a lifetime. Under these conservative residential exposure assumptions, the individual BAP concentration associated with the surface sample collected from hand-auger HA-4 represents a potential excess cancer risk of approximately 5 in a million.

The residential exposure assumptions are overly conservative for this site given the industrial nature of the surrounding area and the non-friable nature of the coal. Children would not frequently play (i.e., daily) for extended periods of time at this site and would not likely ingest coal at the rate used in the RBC residential exposure algorithm. Under CERCLA, cleanup levels at nominated National Priorities List (NPL) sites (Superfund Sites) are generally established at concentrations that could result in between one in a million and one in 10,000 excess cancers. NPL candidate sites (i.e., those that have not been formally put on the list) with cumulative cancer risks of less than one in 10,000 are not generally placed on the NPL (EPA, 1991). As noted, the excess cancer risk from BAP at this site is about 0.05 in 10,000. Thus, under current CERCLA procedures, the detection of BAP in only one sample at a concentration slightly exceeding the Region 3 RBC would not likely trigger action at this site because the concentration, in effect, already substantially meets the cleanup levels that could be established for the site. Based on available data, the risk from direct exposure to benzo(a)pyrene is low and within generally accepted levels under CERCLA.

Groundwater Effects. Direct impacts to shallow groundwater quality are unlikely at this site. The uppermost aquifer likely exists approximately 45 to 55 feet below the coal-containing soils at an elevation near sea level. No groundwater was encountered in the hand-auger explorations installed at the Old Coal House Area. Soils encountered in the Old Coal House Area typically consisted of 0.5 to 2 feet of gravelly silty sand over basalt bedrock. Because the site slopes fairly steeply to the northwest toward the Bering Sea, heavy precipitation that falls on areas where coal-containing soils were encountered would likely infiltrate the upper sandy soils, flow laterally along the shallow soil/basalt contact, and discharge rapidly downhill to the northwest towards the Bering Sea.

It is unlikely that discharge of this near-surface water could impact off-site areas, primarily the Old Power Plant and Wash House sites located to the northwest of the Old Coal House (Figure 5.9-1). Exposure of BAP-containing soils to water will not likely result in any significant impacts. BAP is relatively insoluble in water and is present at low concentrations in Old Coal House Area soils. Because of the low affinity for water, and high affinity for soil and organic matter, BAP and other carcinogenic PAHs are not very mobile in soil and rarely present a groundwater problem, unless concentrations are extremely high and large quantities of an organic solvent are present to act as a carrier. The conditions that could enhance BAP movement are not present in the Old Coal House area.

Surface Water Runoff and Air Dispersion. Surface water runoff and transport of BAP from the impacted soils are likely to be minimal. A thick vegetative cover present immediately downhill of the coal-containing soils will likely prevent any significant surface water runoff from occurring. The vegetative cover and large particle size of most coal fragments will also prevent airborne transport of coal-containing soils. Since BAP is essentially non-volatile, volatilization is not a significant route of exposure at this site.

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TONY KNOWLES, GOVERNOR

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September 9, 1997

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REC'D SEP 15 1997

Re: St. George Island, Old Coal House site; closure for

Dear Mary,

The Department has reviewed your letter request of July 15, 1997 regarding the requested closure for the above referenced site and has the following comments:

Background:

1. The site (number 20) for attachment A to the two party agreement (St. George Island) is identified as a coal house where benzo(a)pyrene is or could be expected to exist or be present.
2. Attachment A, the column entitled Remaining Activities, does indicate that "if contamination is found, cleanup by NOAA will be conducted in accordance with the two party agreement requirements."
3. Page 5.9.2 of the Hart Crowser report (J-4421-05G) entitled Expanded Site Investigation for St. George Island and specifically section 5.9.5 indicates that low levels of PAH's (Polyaeromatchydrocarbons) (less than 1 mg/kg for individual compounds) were detected by laboratory analyses and that a single detection of .46 mg/kg for benzo(a)pyrene exceeded (BAP) EPA Region 3 RBCs.

Analysis:

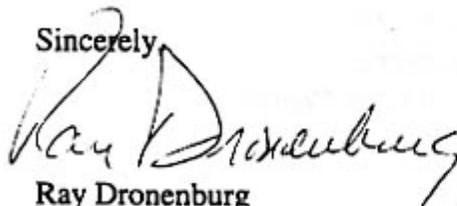
The Department agrees that based on information contained in the ESI, groundwater contamination is unlikely to occur with groundwater at approximately 55 feet. Also the Department agrees that runoff and air dispersion are highly unlikely as exposure pathways. Consequently with the single "hit" or excedence for BAP the Department does not feel that further investigation or remedial actions beyond the Expanded Site Investigation is warranted.

September 9, 1997

Decision:

A determination that "No Further Action" has been assigned for this site effective this date. This determination applies to site 20 only and should not be implied as affecting any other site or location. It is suggested that NOAA notify the landowner (St. George Traditional Council) to inform them that the single sample did result in an exceedence and that future land use should take this fact into consideration.

Sincerely,



Ray Dronenburg
Project Manager

RD:el

cc: File
Breck Tostevin, AG's Office
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