DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date . MAR 30 1987

From Environmnmental Engineer
Office of Health Assessment

Subject Health Assessment: Gold Coast Oil, NPL Site (SI-87-095)
Miami, Dade County, Florida

To Mr. Chuck Pietrosewicz
Public Health Advisor
EPA Region IV
Through: Director, Office of Health Assessment
Health Assessment Coordination Activities, OHA
Acting Chief, Environmental Engineering Branch, OHA

EXECUTIVE SUMMARY

The Agency for Toxic Substances and Disease Registry (ATSDR) has been asked by the Environmental Protection Agency (EPA), Region IV, to conduct a health assessment and provide comments on the potential health concerns for the above site through a review of all data and reports provided to us, including the December 22, 1986, Endangerment Assessment Report. Based on such review, we do not find evidence of a human exposure pathway for site contaminants; the site is, at worst, one of the various contributors to the overall contamination of the Biscayne Aquifer.

SITE DESCRIPTION AND BACKGROUND

The Gold Coast Oil site covers 2 acres of flat, sandy land located in a light-industrial area at 2835 SW 71st Avenue in the City of Miami, Dade County, Florida. The site is bounded on the north and west by railroad lines, on the south by a group of shops (painting shop, auto maintenance garage, and cabinet manufacturer), and on the east by SW 71st Avenue. The site has no distinguishable surface drainage pathways and is currently inactive and fenced with a locking gate.

The property, owned by the Seaboard Coast Line Railroad, was leased to Gold Coast Oil Corporation, who operated a solvent reclaiming facility and

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bulk storage area at the site for 11 years from 1971 through 1982. All wastes generated by the solvent recovery operations were disposed of (i.e., distillation blowdown sprayed directly onto the ground) or stored on-site (i.e., drums of sludge-contaminated soil, paint sludges, and still bottom waste). No wastes were shipped off-site during the 11 years the facility was in operation. In 1982, Seaboard Coast Line Railroad contracted with the Chemical Waste Management Company for the removal and off-site disposal of approximately 2500 drums, 5 tanker loads of liquid waste from on-site bulk storage tanks, and 40 loads of surface soil excavated to about a 6-inch depth from visibly contaminated areas of the site.

In June 1983, the Superfund Implementation Group, Center for Environmental Health (CEH), of the Centers for Disease Control (CDC), provided comments on the Gold Coast Oil Remedial Action Master Plan dated February 1983. CEH recommended that further assessment of both on- and off-site contamination, including additional sampling and analysis of soils and groundwater were necessary because the limitations of the existing data prevented an assessment of the public health implications of the site. In addition, it recommended that if such supplementary sampling demonstrated substantial off-site migration of contaminants, further characterization (i.e., off-site ground and surface water, soil and food chain sampling) of the amount of exposure and the population at risk would be necessary.

DOCUMENTS REVIEWED

Remedial Action Master Plan, Gold Coast Oil Site, Miami, Dade County, Florida, prepared by NUS Corporation, February 1983.

CEH, Superfund Implementation Group Memorandum, "Gold Coast Oil NPL Site, Miami, Florida," to Chuck Pietrosewicz, Public Health Advisor, EPA Region IV, June 9, 1983.

Draft Remedial Alternatives Evaluation Report for the Gold Coast Oil Corporation Site, Miami, Florida, prepared by Engineering-Science, June 1984.

Recommendations to Clean Up and Protect the Biscayne Aquifer in Southeast Florida Report, published by EPA, November 1985.

Final Report, Gold Coast Oil Site Endangerment Assessment, Miami, Florida, prepared by ICAIR, December 22, 1986.

ATSDR files containing various memorandums, a photographic/topographic information set, and records of communication, Gold Coast Oil Site, Miami (Dade), Florida, Region IV.

CONTAMINANTS

Two sampling efforts (BCM Eastern, December 1983 and EPA, July 1986) have been undertaken at the site since the voluntary cleanup of July 1982. The sampling efforts concentrated on the visually evident residual soil contamination on certain portions of the site and the quality of groundwater in the vicinity of the site. The site investigations show on-site contamination to consist primarily of volatile organic compounds and heavy metals. In the Exposure Assessment, the main contaminants of concern were selected based on (1) their frequency of detection in groundwater and/or soil samples, and (2) their similarity in terms of physicochemical and toxicological properties to the other contaminants present at the site. These are:

Methylene chloride
1,1-Dichloroethane
trans-1,2-Dichloroethylene
Trichloroethylene
Tetrachloroethylene
Toluene
Lead

No quality assurance/quality control (QA/QC) information on the sampling and analysis procedures for the groundwater or residual soils data was included with the available reports. While this information is important in assessing the validity of the values reported, it does not prevent us from commenting on the groundwater and soil contaminant concentrations in terms of potential health effects. However, it must be noted that all conclusions and recommendations made are based on the reliability of such data.

ENVIRONMENTAL EXPOSURE PATHWAYS

As a result of initial removal measures, the original sources of contamination at the site have been removed. The only likely contaminant source remaining which may result in further groundwater contamination appears to be an isolated area of subsurface soil in the northeast portion of the site. The constituents found in this medium are consistent with the type of materials previously stored and processed at this facility.

The site is located between two drainage canals: the Coral Gables Canal located about 850 feet south, and the Tamiami Canal located 1.25 miles north of the site. Localized groundwater flow is dependent upon the water level in these canals since they both intercept the aquifer (i.e., groundwater moves toward the canals when water level is higher in the aquifer or vice versa). However, no surface water quality data or purported contaminant plume migration characteristics have been presented which would indicate whether such surface waters can be considered an environmental exposure pathway.

HUMAN EXPOSURE PATHWAYS

Given the nature of contamination at the site during its original and present condition, the only potential human exposure pathway is limited to long-term consumption and use (i.e., ingestion, dermal contact, and inhalation of volatile vapors) of contaminated groundwater. Such exposure would only be possible if the purported contaminant plume from the site migrates and reaches nearby individual drinking water supply wells.

At present there is little potential for human exposure to contaminated surface soil, since the reported organic and heavy metal concentrations at the site are below levels of human health concern. Furthermore, access to the site is controlled by a fence and a locking gate. In addition, the area is zoned for light industrial development, and because of its location has little potential for residential development. However, because of certain hot spots in the subsurface soils containing elevated levels of heavy metals, groundwater contamination of the aquifer beneath the site may result from continued leaching through the soil.

DISCUSSION

Groundwater

The Endangerment Assessment Report concludes that there is sufficient evidence to support a finding that a potential endangerment to human health exists due to the contamination of the shallow groundwater (i.e., upper portion of the Biscayne Aquifer) at the site. At this time, based on the information available for review, there are two reasons why we can not concur with this conclusion.

First, the majority of the residents within a 3-mile radius of the site are served by either of two public water supply well fields (i.e., Alexander Orr and Hialeah-Miami Springs) which are not expected to be impacted by the site, since its location is outside the radius of influence for both of these fields. In addition, due to the overall aquifer contamination that has been previously documented, various methods to chemically and physically treat groundwater for heavy metals and volatile organics before it enters the distribution system are now in place at the public water supply systems.

Second, off-site contamination in nearby private water supply wells has not been demonstrated. The wells at four residences which currently use individual wells for potable water (two located 0.4 miles southwest and across the Coral Gables Canal, and two located 0.44 miles northeast of the site) have not been sampled. A private water supply well at the Delta Gas Company (located 100 feet east of the site) has been sampled twice during the 1983 and 1986 sampling rounds, neither of which detected any contamination. Because the four individual potable water supply wells have not been sampled, no conclusions can be made regarding exposure due to use of the groundwater from these wells. Exposure from these or other individual well users in the area will depend on whether a contaminant plume exists off-site and the future migration potential for on-site contaminants. Therefore, as CEHs Superfund Implementation Group concluded in their June 9, 1983, review memorandum, characterization of the off-site contamination (i.e., plume delineation, movement, and intensity) was and still remains a crucial and necessary analysis in determining if a potential health threat exists.

Soils

The Endangerment Assessment Report concludes that the existing lead levels in the on-site soils may result in unacceptable human exposure levels. This conclusion, in our opinion, is a misrepresentation of the magnitude of endangerment at the site, since the risk calculations were based on the assumption that an adult (average weight of 70 kg) will unintentionally ingest 0.35 grams of soil per day and that 100 percent of the chemical in the ingested soil will be absorbed. Both of these assumptions tend to overestimate the actual exposure levels. ATSDR believes that a more realistic assumption for soil ingestion by adults is 0.1 gram of soil per day, unless they have pica. Also, it is likely that chemical absorption resulting from ingestion will be less than 100 percent, since not all soil contaminants ingested will be adsorbed or available to create a body burden.

We agree that the most realistic exposure scenario for assessing human exposure to contaminated soils should be based on an industrial setting (see previous discussion under exposure pathways); it would, therefore, be highly unlikely that a child would be exposed to on-site soil contaminants. However, based on the results of the only heavy metal sampling and analysis performed after the removal action of 1982, we do not agree with the Endangerment Assessment Report that the existing lead levels in the on-site soils may result in unacceptable exposure levels. This monitoring, performed in 1986 by EPA, consisted of 11 samples ranging in depth from surface to 38 inches, with a maximum lead concentration of 2000 mg/kg and an average of 588 mg/kg. Based on the average concentration given, such amounts do not represent a significant public health threat due to soil ingestion. The CDC has stated that elevated blood lead levels in children increase when soil or dust concentrations in a residential setting exceed 500-1,000 ppm; however, only two samples showed concentrations above 1000 ppm. In an industrial-type setting such as this site, these concentrations are even less significant given only adult exposure and considering that exposure may only be likely 8 hours a day, 5 days a week.

Nevertheless, there appear to be areas where elevated concentrations of organics and heavy metals in the subsurface soil, especially in the northeast portion of the site, warrant further investigation due to the potential impact of contaminants leaching into the aquifer.

CONCLUSIONS

The Endangerment Assessment described the possible human health threat posed by this site. We believe that the conclusions drawn are rather conservative and somewhat unrealistic. Based on our review, we find that the public health threat posed by this site is somewhat tenuous and remote since no evidence of a human exposure pathway for site contaminants has been demonstrated and is, at worst, one of the various contributors to the overall contamination of the Biscayne Aquifer.

RECOMMENDATIONS

1. All potable water supply wells in the vicinity of the site should be sampled to determine if site contaminants have impacted, or could impact, such wells, especially given the groundwater movement patterns indicated.

2. In order to determine the public health significance of the purported contaminant plume, the plume must be better defined as discussed previously. Strict dependence on the resistivity survey performed in 1983 to define the plume should be avoided, since this technique is highly subjective, especially sensitive to fence location, and does not accurately define the characteristics of the plume.

3. If a significant off-site contaminant plume is identified, its effects on the surface water bodies which might be affected must be evaluated, given proper consideration of the dilution effects to determine the public health significance to the receptor population.

Juan J. Reyes

cc:
Henry Longest
George Buynoski