Health Assessment for

KASSOUF-KIMERLING NATIONAL PRIORITY LIST (NPL) SITE

TAMPA, HILLSBOROUGH COUNTY, FLORIDA

AUGUST 11, 1988

SUMMARY

The Kassouf-Kimerling Site is an NPL site located in Tampa, Hillsborough County, Florida. The primary contaminants found at this site are lead, arsenic and cadmium. This site is of potential public health concern because of the risk to human health that could result from possible exposure to hazardous substances at levels that may result in adverse health effects over time. As noted in Human Exposure Pathways Section below, human exposure to several metals may occur via ingestion and dermal absorption of contaminated ground water, surface water and sediments, and soils and inhalation of contaminated soils. A health effects study for this site is not recommended at this time.

BACKGROUND

A. SITE DESCRIPTION

The Kassouf-Kimerling NPL site (58th Street Landfill) is located in Hillsborough County, Tampa, Florida. The site is approximately 60 feet by 700 feet. It lies just east of 58th Street and just west of a fresh water marsh and is in an uninhabited area where extensive debris has been disposed of along the dirt road side. A canal cutting through the site connects the marsh located west of 58th Street with another marsh just east of the site. The site is bordered on the east and north by dense vegetation.

It is believed that filling operations occurred in 1978 after peat deposits at the site were excavated. The landfill material consists of lead-acid battery casings. The battery casings are buried in both the saturated and unsaturated zones. The layer of casings is estimated at 6-12 feet thick. A thin layer of sand covers the battery cases. There is a six foot high galvanized chain link fence, with three strands of barbed wire running the entire length of the fence, along the southern and western property boundaries. There is no fence along the eastern and northern boundaries. There are two ten foot wide gates on either side of the canal.

A Remedial Investigation report (RI) was issued in May 1987. A draft Feasibility Study (FS) was issued in July 1987.

B. SITE VISIT

A site visit was conducted by the Agency for Toxic Substances and Disease Registry (ATSDR) regional staff on May 20, 1988. Several observations of the site and surrounding area were made during the site visit. The site was fenced by a 6 - 8 foot high fence on two sides but the chain link

fence had been torn from the gate. The other sides of the site were not fenced but were densely vegetated. There were cracked battery cases evident on the site. Rabbits, snake trails, and birds were abundant. Spent shotgun shells were noticed near the site. The road leading to the site was littered with debris. A large lake is located at the north end of the property.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. ON-SITE CONTAMINATION

Soil samples were taken in December 1982, and in September 1986. Preliminary surface and ground water samples were performed between September 1981, and January 1984. RI samples were taken in September 1986, and January 1987. The sediments were sampled in September 1986, and January 1987. For the purposes of this Health Assessment, all monitoring points within approximately ten feet of the site boundaries were considered on site (including surface water (SW) samples SW-2 - SW-6 from the RI.) See Table I for a list of contaminants of concern and the media in which they appear.

B. OFF-SITE CONTAMINATION

The off-site sampling was performed during the same time periods as on-site sampling. The only off-site contamination indicated by the RI was that of surface water (sample SW-9), in which the maximum level of total lead detected was 0.077 ppm . The FS did indicate, however, that in the past zinc and cadmium had also exceeded the state standards. No values for these exceedances were given.

C. PHYSICAL HAZARDS

The physical hazards posed by this site are expected to be those normally associated with a former waste disposal facility. There were no unusual physical hazards identified on site.

DEMOGRAPHICS OF POPULATION NEAR SITE

The population of the East Lake/Orient Park neighborhood in which the site is located is approximately 5500 persons. The area south of the site is zoned institutional/residential and commercial/light industrial. There are several churches, a school, and houses in this area. In the commercial/light industrial area are restaurants, offices, a currently inactive fish farm, an inactive landfill, a traffic sign storage and an auto junkyard. The immediate area of the site is uninhabited and is bordered on three sides by dense vegetation. The south side of the site is adjacent to the fenced sign storage area.

TABLE I

Ground Water
Maximum Concentration Detected (ppm)

Lead, Unfiltered	8.5
Lead, Filtered	2.9
Cadmium, Unfiltered	0.02
Cadmium, Filtered	0.01
Arsenic, Unfiltered	0.8
Arsenic, Filtered	0.15
Antimony, Unfiltered	0.3
Antimony, Filtered	0.25

Soil
Maximum Concentration Detected (mg/kg)

Lead	81000
Cadmium	12
Arsenic	150
Antimony	510

Surface Water
Maximum Concentration Detected (ppm)

Lead, Unfiltered	46
Lead, Filtered	1.3
Cadmium, Unfiltered	0.08
Cadmium, Filtered	0.002
Arsenic, Unfiltered	0.029
Arsenic, Filtered	0.002
Antimony, Unfiltered	1.0
Antimony, Filtered	n/a

Sediments
Maximum Concentration Detected (ppm)

Total Lead	17741

n/a - not available

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media

With the exception of domestic well monitoring, which was done only once, the environmental information collected during the remedial investigation was adequate to generally define potential exposure pathways at the site.

There were seven personal exposure air monitoring samples performed at various stages during the remedial investigation. There were twelve total monitoring wells (on- and off-site). Only one of these was located in the Floridian Aquifer. Eight residential potable water wells were sampled once. There were ten surface water monitoring stations and two additional locations which were sampled.

There were a total of fourteen on-site soil borings and five test pits. There were also two off-site soil borings. The location of these samples was appropriate. The water samples were taken downgradient of the buried battery casings with appropriate background samples taken upgradient. Soil samples were taken where known past activities and geophysical investigations would suggest that contamination might be high.

2. Demographics and Land Use

The RI does not discuss the demographics and land use of the immediate area of the site. The EPA Risk Assessment for this site has very good information about the demographics of the county in which the site is located but the information regarding the immediate area around the site is incomplete. The additional information gathered during the site visit suggests that the immediate area of the site is not inhabited.

3. Quality Assurance and Quality Control

The Quality Assurance and Quality Control (QA/QC) data that was included in the RI consists of the results for the analysis of several blank and duplicate samples. No contaminants were detected in the blank samples. The conclusions presented in this health assessment are based on the data contained in the RI. The validity of these conclusions is, therefore, dependent on the quality of the data provided.

B. ENVIRONMENTAL PATHWAYS

The environmental pathways of potential concern are soils, ground water, and surface water and its sediments. The primary contaminants of concern in relation to these pathways are lead, arsenic, cadmium and antimony.

The environmental media in which the most concentrated contaminants are found is soil. Lead, cadmium, arsenic and antimony are found in the soil. Although the properties of these chemicals indicate that they have a tendency to be sorbed to soils, they have been detected in ground water as well. This may have resulted from previous waste disposal operations at the site. However, their existence in soil can serve as a reservoir for future ground water contamination due to they many unknown factors which can affect their mobility.

Results of ground water samples indicated that contamination is present in this medium as well. The potential for movement of these contaminants increases greatly once they are in the ground water, especially if they exist in the dissolved phase.

The surficial geologic deposits at the site, in which the water table aquifer is located, consist of peat, unconsolidated sands and silty sands. Soil borings at the site showed that this strata is an average of 15 feet thick. Below this layer lies a low permeability clay layer which averages about 8 feet in thickness, and whose extent, based on regional geologic data may not be continuous. This clay layer overlies a limestone and dolomite formation which is several hundred feet thick and comprises the Floridian Aquifer. A regional well inventory revealed that there are nearly 300 wells in the area permitted for consumptive use.

The surficial aquifer is the only aquifer in the vicinity of the site which has shown contamination. The ground water flow direction in this aquifer appears to be toward the marsh to the east of the site where the aquifer seems to discharge. According to the RI, contaminant transport in the ground water appears to terminate in the marsh. The Floridian Aquifer, the source of most of the potable water supply in the area, is separated from the water table aquifer by the clay confining layer. During the RI sampling period, the piezometric level of the Floridian Aquifer was higher than the water level of the surficial aquifer. If this condition remains constant, migration of ground water will tend to be upward from the Floridian Aquifer toward the water table aquifer. Consequently, the water table aquifer would not be expected to contaminate the Floridian Aquifer by infiltration. This phenomenon combined with the low permeability of the intermediate clay layer and discharge of the water table aquifer to the marsh, may limit the potential for contamination of the Floridian. However, other factors such as improperly completely wells in the area, droughts, increase in waste mobility due to pH changes, discontinuity of and ground water flow from the water table aquifer through the clay layer may reverse these phenomena and result in ground water contamination of the Floridian. The domestic wells in the area were sampled only once which may not be an accurate determination if contaminant migration off-site has occurred.

Lead, arsenic, cadmium and antimony are also found in the surface waters and sediments on-site. Surface water is probably the most likely pathway

to contribute to off-site contamination. Ground water discharging to the marsh has contributed to the maintenance and, therefore, the contamination of the marsh. Rainfall runoff from the site has probably been a factor in the contamination of on-site surface water and sediments as well. The marsh flows into a small stream to the southeast of the landfill which eventually empties into McKay Bay.

Five personal exposure air monitoring samples revealed air contamination below the Occupational Safety and Health Administration (OSHA) standard of 50 ug/l. Based on these results, air is not expected to be an environmental pathway of concern. However, it could become a pathway of concern, especially for remedial workers, depending on the soil disturbing characteristics of the selected alternative for remediation.

C. HUMAN EXPOSURE PATHWAYS

The contamination of the environmental media previously identified constitute the following potential human exposure pathways;

1. Ingestion, inhalation, and dermal absorption of contaminated soils. Since off-site soils showed no contamination, this pathway would only be of importance to anyone on-site. Site access is partially limited by a fence, so in general only site workers or trespassers would be exposed to the contaminated soils in this manner.

2. Ingestion and dermal absorption of contaminated ground water. The water table aquifer on-site is the only ground water in the area which has shown contamination. The RI indicates that this aquifer is not currently used for a potable water supply or for any domestic purposes. Since the water table aquifer appears to discharge to the marsh east of the site and vertical migration of ground water in the Floridian aquifer is upwards, it appears that the water table aquifer is contaminating the Floridian by mixing or infiltration. Therefore, human exposure via any routes related to ground water seems unlikely at present. If contamination of the Floridian Aquifer occurs as discussed in the environmental pathway section, then future human exposure may occur.

3. Ingestion and dermal absorption of contaminated surface water and sediment. Site specific conditions as noted in the site visit report do not favor frequent human exposure with the site. However, access to the site remains possible. There were no food chain samples performed.

PUBLIC HEALTH IMPLICATIONS

The Kassouf-Kimerling site in its current state of contamination poses a potential threat to public health. Lead, cadmium, arsenic and antimony,

the major contaminants of concern, are present in the on-site ground water, soil and surface water. Lead is the contaminant of concern in off-site surface water. Populations at potential risk of exposure to contaminants associated with the site are remedial workers and trespassers.

Exposure to On-site Contaminants

On-site ground water.

Exposure to the levels of lead, cadmium, arsenic and antimony present in the on-site ground water may adversely affect public health. Since there are no known receptors at present, ingestion of contaminated on-site ground water is currently not an exposure pathway of concern. This does not, however, rule out a potential for future exposure if the site is not remediated and contamination of the potable water supply aquifer (i.e., the Floridian) occurs as discussed in the environmental pathway section.

Exposure to On-site Soil

Potential human exposure pathways to on-site soil are ingestion, inhalation of suspended particles and dust, and direct dermal contact. Lead, arsenic and antimony are present in the on-site soil at levels which may pose a potential health concern to all trespassers including children. Interactions between lead, cadmium, arsenic, antimony and mercury may increase the chemical specific toxicity of the above mentioned metals, thereby leading to a potential increase in the overall toxicity and adverse health effects resulting from exposure to on-site soil. Children are at specific risk for adverse health effects potentially resulting from lead induced toxicity. Potential populations at risk of exposure are remedial workers and trespassers. During the site visit conducted by ATSDR regional personnel, additional information on accessibility of the site became available. This information indicates that the dense vegetation makes it very difficult to penetrate the marsh. Since this condition probably will not favor frequent contact with on-site soil, exposure of trespassers may be considered a minimal health concern.

Adequate personal protection equipment is needed to protect workers from potential adverse health effects associated with exposure to on-site soil.

Exposure to On-site Surface Water and Sediments

Ingestion of on-site surface water, contaminated with lead, cadmium and antimony at levels reported in Table I, poses a potential health concern. Similarly, on-site sediments have shown contamination with levels of lead which may adversely affect public health. Documentation of recreational activities associated with the site was not provided. Although personal conversation with a former area resident indicated that fishing does take

place on the site and on other hazardous waste sites in the area, the site visit report indicates that this is probably an infrequent occurrence. Therefore, ingestion of potentially contaminated fish present in the on-site surface water, - and to a lesser extent accidental ingestion of surface water and sediments-, should be considered as potential human exposure pathways of minimal concern.

Exposure to Off-site Contaminants

Off-site Ground water

One round of sampling (January 1987) of domestic water supply wells surrounding the site did not reveal contamination which could pose a current health concern. Future public health concerns would depend on contaminant migration and human exposure to these contaminants.

Off-site Surface Water

The only documented contamination of off-site surface water, was where lead was detected at a maximum level of 0.077 mg/l. Chronic ingestion of off-site surface water may cause adverse health effects. Since ingestion of off-site surface water may most likely occur on an accidental basis, ingestion of off-site surface water is not an exposure pathway of major concern.

The presence of such metals may influence the significance of food chain contamination as a potential exposure pathway. As discussed above, documentation of recreational activities around the site was not provided.

CONCLUSIONS AND RECOMMENDATIONS

This site is of potential public health concern because of the risk to human health that could result from possible exposure to hazardous substances at levels that may result in adverse health effects over time. As noted in Human Exposure Pathways Section above, human exposure to several metals may occur via ingestion and dermal absorption of contaminated ground water, surface water and sediments, and soils and inhalation of contaminated soils.

The Kassouf-Kimerling site in its current state of contamination poses a potential health concern. Populations at potential risk of exposure are remedial workers and trespassers. There is also a potential for future exposure to contaminated ground water.

Surface water appears to be a primary environmental pathway for migration of contaminants off-site. Presently, because site specific conditions do not favor frequent human exposure, food chain contamination is of minimal health concern.

Feasibility Study Alternative 2-(Offsite Disposal of Landfill Wastes), Alternative 3-(Excavation and Fixation of Landfill Materials, Resource Recovery and Capping), Alternative 4-(Excavation of Contaminated Marsh Sediments and Erosion Control) and Alternative 6-(Excavation of Landfill Materials, Resource Recovery, Capping and Treatment of Ground Water) should be protective of public health provided adequate monitoring, to determine their effectiveness, is performed.

1. Restrict access to the site, including repair of the gate, to prevent exposures to on-site contaminants. Dense vegetation should also aid in limiting access to the site.

2. Regularly monitor surface water until remediation of the site is completed to ensure that surface water contaminants including those in sediments will not result in food chain contamination if fish or animals from this area are consumed.

3. Regularly monitor off-site ground water, including periodic sampling of domestic water supply wells, until remediation is completed, to determine if off-site contaminant migration is occurring which may adversely affect the health of area residents.

4. Provide, at a minimum, adequate personal protective equipment as required by the Occupational Safety and Health Administration to remedial workers who may be exposed to contaminants in the on-site soil, ambient air, surface water and sediments. Conduct air sampling during these activities to ensure that workers are not exposed to unacceptable levels of chemicals present in the on-site soil since soil disturbing activities may increase the concentration of on-site contaminants in the ambient air.

5. Consider institutional controls to prevent installation of any on-site drinking water wells in the near future.

6. In accordance with CERCLA as amended, the Kassouf-Kimerling site has been evaluated for appropriate follow-up with respect to health effects studies. Although there is currently a potential for human exposure to on-site/off-site contaminants , there are no indications in the information and data reviewed for this Health Assessment that human exposure is actually occurring at the present time or has occurred in the past. Accordingly, this site is not being considered for follow-up health studies at this time. However, if data becomes available suggesting that human exposure is currently occurring or has occurred in the past, ATSDR will reevaluate this site for any indicated follow-up.

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REFERENCES

1. Remedial Investigation of the 58th Street Landfill Site (Kassouf-Kimerling), ERM South, Inc., May 1987.

2. Comprehensive Feasibility Study of the 58th Street Landfill Site, ERM South, Inc., July 1987.

3. Draft 58th Street Landfill Endangerment Assessment, ERM South, Inc., May 1987.

4. Draft 58th Street Landfill Risk Assessment, ERM South, Inc., August 1987.