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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date FEB 6 1987

From Environmental Engineer
Office of Health Assessment

Subject Bayonne Drum Reclamation Site (RC-87-003B)
Bayonne, New Jersey

To William Q. Nelson
Public Health Advisor
EPA Region II
Through: Director, OHA, ATSDR
Health Assessment Coordination Activities, OHA, ATSDR
Acting Chief, HAB, OHA, ATSDR

EXECUTIVE SUMMARY

The Bayonne Site was formerly operated under the Resource Conservation and Recovery Act (RCRA). The owner of the site filed for bankruptcy and the RCRA activities ceased. The site is used for the repair and storage of shipping containers and for truck repairs. Remains of the RCRA activities include in excess of 30,000 barrels stored in rows, an ash or residue pile, an aboveground storage tank, and a belowground storage tank. Several of the buildings used during the RCRA operation are also present. Site investigations have shown the presence of heavy metals, primarily cadmium, chromium, lead, and polynuclear aromatic hydrocarbons, and petroleum hydrocarbons in the soil. Analysis of the groundwater on the site showed the presence of small quantities of total petroleum hydrocarbons, polychlorinated biphenyls, and base/neutrals in both background samples and site samples. The levels of contaminants found indicate that the groundwater is not usable for drinking purposes regardless of whether remedial actions are taken on the site.

DOCUMENTS REVIEWED

Soils and Ground Water Characterization, Bayonne Barrel and Drum Company, Newark, New Jersey, Job No. 84C182; Dan Raviv Associates, Inc., July 1986.

Results of Preliminary Investigation and Sampling in Proposed New Jersey Turnpike Right-of-Way at the Bayonne Barrel and Drum Site, Newark, New Jersey; Louis Berger & Associates, Inc.; December 1986.

STATEMENT OF THE PROBLEM

This is a former RCRA site. The owner has declared bankruptcy and ceased drum reclamation activities. Surface and subsurface soil and groundwater contamination have been discovered and the Environmental Protection Agency (EPA) is concerned about whether the levels found pose a threat to human health. The Agency for Toxic Substances and Disease Registry (ATSDR) was asked to comment on the data in the reports named above, comment on whether any of the area should be restricted, and review a sampling plan for sampling around the office area.

DISCUSSION

The possible environmental pathways for human exposure to the contaminants at this site are inhalation, ingestion, or skin contact. The groundwater in the area is not used for drinking, cooking, bathing, or any other known method of human contact.

The two reports reviewed showed levels of various contaminants in the soil, surface water, and groundwater. The media of most concern is surface soil.

Groundwater: The Dan Raviv report evaluated the groundwater quality in two background monitoring wells, one well point, and two shallow monitoring wells. The levels of total petrochemical hydrocarbons (TPHC) in both the background wells indicate that the off-site groundwater is already contaminated with these materials. The well point, BBDC-5, indicated that the TPHC is elevated in the upper zone of the groundwater; however, the TPHC was not speciated. Therefore, it is not possible to determine the toxicity of this material since the species is unknown.

Polychlorinated biphenyls were found in well point number BBDC-5 near the oil storage tanks (53 ppb). Di-N-Butylphthalate (28ppb) and napthalene (14 ppb) were found in well BBDC-4 near the furnace residue pile. Neither of these chemicals has an EPA maximum contaminant level under the Safe Drinking Water Act. Neither is listed as a carcinogen. Sittig lists the allowable level for Di-N-Butyl Phthalate in water for protection of human health as 34,000 ug/l. Metals were analyzed in well BBDC-4; however, none of the levels were of public health concern. The Louis Berger report showed elevated levels of volatile organics, acid extractable organics, and total phenolics in monitoring well MW #2, near the northeast edge of the tire pile. It showed no contaminants of public health concern in MW #3 in the tank storage area.

Surface Soil: Both reports named above evaluated the level of contamination of surface soil. The report by Louis Berger & Associates only covered the proposed New Jersey Turnpike right-of-way. The Raviv report covered the entire site.

Several areas warranted an evaluation because of the levels of contaminants found. The residue pile, resulting from incineration of the contents of reconditioned barrels, and the area immediately adjacent to the residue pile, were such areas. These areas showed elevated levels of cadmium, chromium, and lead. The cadmium at 1300 ppm may be high enough to be of concern, depending on the exposure of the workers around the site. The levels normally used to decide whether a soil concentration of a contaminant is sufficient to be of concern are normally determined based on assumptions of quantities of soil ingested. The amount of soil ingested by workers at a site such as this one has not been well documented; therefore, an estimate of the levels of concern for soil contaminants at this site is difficult. Inhalation may be of a higher concern. A determination of the dust levels in the air found on the site would be necessary to estimate the intake of cadmium, or any other material in the

soil, for the workers. However, in view of the levels of cadmium found, versus the levels which are used for removal in residential areas, the 1300 ppm appears to be a potential threat to human health. Since this high level only occurs in the area around the residue pile, it appears that the area of concern can be isolated.

The concentration of chromium around the residue pile is also elevated; however, the valence state of the chromium was not given. This is very critical since the +6 state is much more toxic that the +3 state. The maximum value (3400 ppm) is slightly in excess of the maximum level found in supposedly uncontaminated soil (3000 ppm) (Parr). Since it is unlikely that a large part of the chromium is in the +6 state, due to its reacting with other chemicals on the site, the level of chromium is not considered to be a concern. Chromium was also found at elevated levels in the incinerator area. The levels found were less than those which have been found at some uncontaminated sites; therefore, the chromium in the soil in the incinerator area was not considered to be of concern.

The maximum lead concentration in soil at the residue pile is 8400 ppm. The Centers for Disease Control (CDC) has made a statement that soil lead concentrations of 500 to 1000 ppm in a residential area can result in an increase in the blood lead levels of children above background. Children normally have a higher ingestion rate for soil than adults and have a lower body weight, so exposure to lead in soil is a higher concern than for adults. The levels of lead found at this site are not likely to be a health concern due to its industrial nature. It is highly unlikely that children will enter the site, and it is also unlikely that the site will ever be anything other than an industrial site.

Total petroleum hydrocarbons (TPHC) were found in high concentrations (maximum 39,400 ppm) in the surface sediments on the site. However, the species of the TPHC were not stated. This is important because, as in the

case of chromium, the species present will determine the toxicity of the material. The more volatile compounds will have evaporated, leaving the less mobile, heavier compounds. The most likely route of entry for these heavier compounds is through inhalation during combustion, which is not likely at this site. Even higher concentrations of TPHC were found in the subsurface soils (59,000 ppm at 6-7 feet at site BBDC-3 or 171,000 ppm at BBD-8 at 3 feet).

Polychlorinated biphenyls were found near the residue pile at 65 ppm at BBD-14. High levels (213 ppm) were also found near the storage tanks at location BBD16. Elevated levels of PCBs were found in two of the buildings (80 ppm at BBDS-2 and 11.1 ppm at BBDS-4). Routes of exposure for PCBs are usually through inhalation or skin contact. Skin contact can be avoided through proper hygienic practices. Air sampling for PCBs should be carried in the areas of high soil concentration to determine whether inhalation is a problem.

Significant volatile organic contaminants were found only in the deeper levels of soil and were not considered to be accessible to humans.

Naphthalene (420 ppm) and bis(2-Ethylhexyl)phthalate (410 ppm) were found in soil near the tire pile. Naphthalene is not a known carcinogen. Allowable soil concentration for Bis(2-Ethylhexyl)phthalate, based on an Acceptable Daily Intake of 0.6 ug/kg/day (Sittig), is likely to be in excess of 420 ppm for an industrial site. Although this value does not consider the carcinogenicity of the compound, it provides an idea of possible levels of concern. Other base/neutrals and acid extractable compounds are found in the area on the northeast edge of the tire pile. Due to the fact that these elevated levels are found near the northeast edge of the tire pile and not at the southeast corner of the pile, there appears to have been a localized event in this area.

Phenol was present on the site at a maximum concentration of 20 ppm. This is not a significant level in soil.

The contents of the stored drums and the storage tanks are a concern. These contents were not given in either of the reports and should be characterized and disposed of, if they are defined as hazardous wastes; otherwise, they present the possibility for release, either gradual or catastrophic.

A sampling plan was proposed in a memo dated November 26, 1986, from Mr. Stanley Siegel to Mr. Richard Spear. This plan appears to be adequate, with the exception of its need for air monitoring for particulates near the office building. It should also include the provision for monitoring the soil near the tire pile and for monitoring two additional wells as mentioned below in the recommendations.

RECOMMENDATIONS

1. Isolate the residue pile from mechanical disturbance and from wind and precipitation.

2. Characterize the areas around the residue pile and around the tire pile to determine the amount of soil which contains levels of cadmium similar to those levels already found.

3. Restrict foot traffic around the residue pile and the tire pile to avoid moving the contaminants and to avoid human contact with these areas.

4. Perform air monitoring to determine the amount of particulates and vapors to which workers may be exposed. Include the area near the office building.

5. Prevent off-site migration of soil from the residue pile or from the area around the tire pile.

6. Characterize the contents of the belowground and aboveground tanks.

7. Characterize the contents of the stored drums.

8. Assure that appropriate worker hygienic practices are followed for those with activities in the outside areas, including the provision of clean work clothing daily. All work clothing and shoes should be left on-site and not taken home. Smoking, drinking, and eating should not be allowed in the contaminated area.

9. Fugitive dust during present operations or during cleanup operations should be prevented.

10. The sampling plan proposed in the memo from Mr. Stanley Siegel to Mr. Richard Spear should include sampling the soil in the area around the tire pile for base/neutral compounds to delineate the area of concern.

11. Include Raviv wells BBDC4 and BBDC5 in the sampling plan.

12. Sample the soil near the office building for metals, base/neutrals, and polychlorinated biphenyls.

REFERENCES

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