

Martin Aaron, Incorporated

Final Release

PUBLIC HEALTH ASSESSMENT

MARTIN AARON, INCORPORATED

CAMDEN CITY, CAMDEN COUNTY, NEW JERSEY

EPA FACILITY ID: NJD014623854

Prepared by:

New Jersey Department of Health and Senior Services
Hazardous Site Health Evaluation Program
Consumer and Environmental Health Services
Division of Epidemiology, Environmental and Occupational Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

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FOREWORD

The Agency for Toxic Substances and Disease Registry, ATSDR, was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as the *Superfund* law. This law set up a fund to identify and clean up our country's hazardous waste sites. The Environmental Protection Agency, EPA, and the individual states regulate the investigation and clean up of the sites.

Since 1986, ATSDR has been required by law to conduct a public health assessment at each of the sites on the EPA National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Public health assessments are carried out by environmental and health scientists from ATSDR and from the states with which ATSDR has cooperative agreements. The public health assessment program allows the scientists flexibility in the format or structure of their response to the public health issues at hazardous waste sites. For example, a public health assessment could be one document or it could be a compilation of several health consultations the structure may vary from site to site. Nevertheless, the public health assessment process is not considered complete until the public health issues at the site are addressed.

Exposure: As the first step in the evaluation, ATSDR scientists review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by EPA, other government agencies, businesses, and the public. When there is not enough environmental information available, the report will indicate what further sampling data is needed.

Health Effects: If the review of the environmental data shows that people have or could come into contact with hazardous substances, ATSDR scientists evaluate whether or not these contacts may result in harmful effects. ATSDR recognizes that children, because of their play activities and their growing bodies, may be more vulnerable to these effects. As a policy, unless data are available to suggest otherwise, ATSDR considers children to be more sensitive and vulnerable to hazardous substances. Thus, the health impact to the children is considered first when evaluating the health threat to a community. The health impacts to other high risk groups within the community (such as the elderly, chronically ill, and people engaging in high risk practices) also receive special attention during the evaluation.

ATSDR uses existing scientific information, which can include the results of medical, toxicologic and epidemiologic studies and the data collected in disease registries, to determine the health effects that may result from exposures. The science of environmental health is still developing, and sometimes scientific information on the health effects of certain substances is not available. When this is so, the report will suggest what further public health actions are needed.

Conclusions: The report presents conclusions about the public health threat, if any, posed by a site. When health threats have been determined for high risk groups (such as children, elderly, chronically ill, and people engaging in high risk practices), they will be summarized in the conclusion section of the report. Ways to stop or reduce exposure will then be recommended in the public health action plan.

ATSDR is primarily an advisory agency, so usually these reports identify what actions are appropriate to be undertaken by EPA, other responsible parties, or the research or education divisions of ATSDR. However, if there is an urgent health threat, ATSDR can issue a public health advisory warning people of the danger. ATSDR can also authorize health education or pilot studies of health effects, fullscale epidemiology studies, disease registries, surveillance studies or research on specific hazardous substances.

Community: ATSDR also needs to learn what people in the area know about the site and what concerns they may have about its impact on their health. Consequently, throughout the evaluation process, ATSDR actively gathers information and comments from the people who live or work near a site, including residents of the area, civic leaders, health professionals and community groups. To ensure that the report responds to the community's health concerns, an early version is also distributed to the public for their comments. All the comments received from the public are responded to in the final version of the report.

Comments: If, after reading this report, you have questions or comments, we encourage you to send them to us.

Letters should be addressed as follows:

Attention: Chief, Program Evaluation, Records, and Information Services Branch, Agency for Toxic Substances and Disease Registry, 1600 Clifton Road (E56), Atlanta, GA 30333.

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Summary

The Martin Aaron, Inc. (MAI) site is approximately 2.4 acres, located in a mixed industrial and commercial area (with some residential sections), at 1542 South Broadway in Camden City, Camden County, New Jersey. The site is bordered by South Broadway to the west and buildings to the north, south, and east. The site was included on the U.S. Environmental Protection Agency's (USEPA's) National Priorities List in July 1999. The USEPA is currently performing removal and stabilization actions at the site. The USEPA will conduct a supplemental remedial investigation/feasibility study to determine the extent of groundwater contamination at the site and to evaluate remedial alternatives to address the contamination.

The MAI site is currently inactive. From 1969 to 1998, the site had been used for drum reconditioning and recycling. The drums were drained, pressure washed with caustic solution, and runoff collected in sewer basins to be discharged to the sanitary/storm sewage system. Prior investigations conducted by the New Jersey Department of Environmental Protection (NJDEP) have confirmed reports of disposal and observed buried drums of hazardous waste on-site. As a result of these practices, on-site soils and groundwater have been contaminated with volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), and metals.

Various organic compounds and metals were detected in soil throughout the site, both in near-surface (0 to 2 feet) and subsurface (2 to 8 feet) samples. Some of the contaminated near-surface and subsurface soils have been removed and replaced with 2 to 7 feet of clean fill material by the USEPA. Based on groundwater sampling results, contamination appears to be more prevalent in the shallow zone of the upper aquifer of the Potomac-Raritan-Magothy (PRM) aquifer system as compared to deeper zones. Elevated levels of various volatile organic compounds (VOCs) and heavy metals have been detected in groundwater samples. Public supply wells tapping the PRM aquifer system within 4 miles of the site provide water to approximately 105,000 persons. The nearest of these wells is a Camden City public supply well located approximately 1 3/4 miles to the east-northeast. There are no private potable wells within the site study area.

Under current site conditions and based upon data and information available to the ATSDR and the NJDHSS, no completed human exposure pathways associated with the site were identified. The only two potential exposure pathways associated with the site are related to soils and groundwater contamination. ATSDR and NJDHSS evaluated the soil pathway and determined that because of current and past site access limitations and because surface soils have been remediated by the USEPA, it is unlikely that persons have been exposed to on-site soil-related contamination. Monitoring of the nearest public supply well (Camden City) has not indicated any site-related contamination. However, the extent of the off-site migration of site contaminants has not been determined. The USEPA will be conducting a remedial investigation and feasibility study, which addresses off-site migration of contaminants and potential impact to the municipal water supply.

This Public Health Assessment evaluates data and information relevant to completed and potential human exposure pathways associated with the MAI site. Since there are no completed human exposure pathways associated with the site, the site is evaluated by the ATSDR and the NJDHSS to currently present no public health hazard. However, there is a concern that if the groundwater is not remediated, then the public water systems in the vicinity of site, especially the closest Camden City well located at a distance of approximately 1 3/4 miles, may become contaminated and increase the potential for exposure. In order to gather information on community health concerns at the site, NJDHSS contacted the Camden County Health Department, the USEPA, and the New Jersey Department of Environmental Protection. No community concerns regarding the MAI site were identified. The NJDHSS has prepared a Citizen's Guide for the MAI site for distribution to the Camden County Health Department and other interested parties.

Purpose and Health Issues

This Public Health Assessment evaluates the public health issues associated with the Martin Aaron, Inc. (MAI) site, which has been included on the National Priorities List (NPL). NPL or "Superfund" sites represent those sites that are associated with significant public health concern in terms of the nature and magnitude of contamination present, and the potential to adversely impact the health of populations in their vicinity.

This document evaluates the potential for human exposure pathways associated with known contaminated environmental media within or associated with the site, and recommends actions consistent with protection of the public health. At the MAI site, the known contaminated media are on-site soils and groundwater.

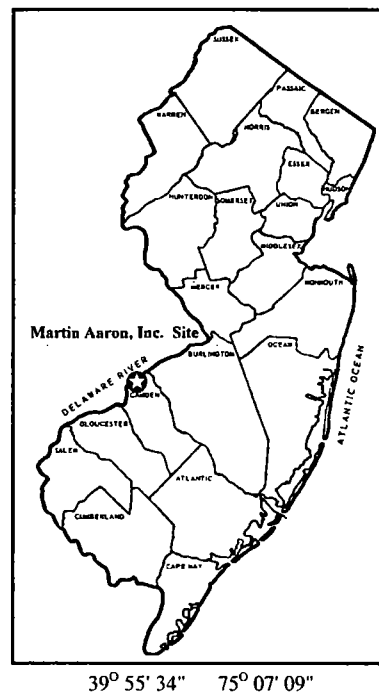
Background

Site Description And History

The Martin Aaron, Inc. site is approximately 2.4 acres, located in a mixed industrial and commercial area with some residential sections, at 1542 South Broadway in Camden City, Camden County, New Jersey (see inset). The site is bordered by South Broadway to the west and buildings to the north, south, and east (see Figure 1- site location and 1 mile radius).

The site is currently inactive and all operations ceased approximately at the end of 1998. From 1969 to 1998, the site had been used for drum reconditioning and recycling. The drums were drained, pressure washed with caustic solution and the runoff collected in sewer basins to be discharged to the sanitary/storm sewage system. However, it has been suspected that effluent was discharged directly to surface soils. Investigations conducted by NJDEP have confirmed reports of drums being buried and/or emptied directly into on-site soils. As a result of these practices, on-site soils and groundwater have been contaminated with volatile organic compounds and metals.⁽¹⁾

The MAI site was added to the National Priorities List in July 1999.⁽³⁾ The USEPA is currently performing removal and stabilization actions at the site. The USEPA will conduct a supplemental remedial investigation/feasibility study to determine the extent of groundwater contamination at the site and to evaluate remedial alternatives to address the contamination.



Demographics and Land Use

The MAI site is in a mixed industrial and commercial area with some residential sections. Residences on Jackson Avenue are located south of the site. Three schools are located within one-half mile of the site. The West Jersey Hospital-Camden is located one-half mile east of the site.⁽¹⁾

The site is located within the outcrop area of the Potomac-Raritan-Magothy (PRM) aquifer which is the primary source of groundwater in Camden City. The PRM is the most heavily used aquifer in the Coastal Plain of New Jersey. Within the PRM aquifer system, five mappable hydrogeologic units are defined. These five units include three water-bearing units identified as the upper, middle and lower aquifers, and two confining beds composed of silt and clay. The PRM system is more than 300 feet thick in the area of the site. There is some degree of vertical hydraulic interconnection throughout the PRM aquifer system in the Camden area. Shallow groundwater flow within the upper aquifer is believed to be to the east and southeast based on groundwater elevations measured in on-site monitoring wells. Deeper groundwater flow within the upper aquifer appears to be to the southeast. Groundwater within the middle and lower aquifers is expected to flow southeast from the site but is likely to have been altered due to heavy pumping by public supply wells in the area.⁽¹⁾

Public supply wells tapping the PRM aquifer system within 4 miles of the site provide water to approximately 105,000 persons. The nearest of these wells is a Camden City well located at a distance of approximately 1 3/4 miles. According to current site information provided by the NJDEP, there are no private potable wells in use which have been impacted by the area-wide groundwater contamination, and all residences in the vicinity of the site are provided with public water supplies.^(1,9)

Population demographics based upon the 1990 census have been prepared by the ATSDR using area-proportion spatial analysis, and are presented with Figure 1 (see Appendix). There are approximately 10,528 homes with approximately 29,536 people living within one mile of the site.

Previous ATSDR/NJDHSS Activity

The ATSDR and the NJDHSS conducted a site visit and generated a Site Visit Report (SVR) in June 1998. The report noted the on-going investigation and remediation conducted by NJDEP at the site, including removal of drums and drilling of monitoring wells. The ATSDR and the NJDHSS concluded that further information is needed to adequately assess the potential impact of the site on public health.⁽⁴⁾

Site Visit

On December 10, 1999, Suzanne Hooper, Jeff J. Winegar, and Narendra P. Singh of the New Jersey Department of Health and Senior Services (NJDHSS) visited the site. The NJDHSS staff were

accompanied by representatives of the USEPA and the ATSDR. The following observations were made during the site visit:

- 1) As noted in the site documents, the surrounding area is industrial/residential;
- 2) Conditions at the site have changed since the 1998 site visit, as the on-going remediation is being undertaken;
- 3) The contents of all drums, tanks and other containers have been sampled and drums relocated off-site for disposal. The surface and subsurface soils have been removed from the site and replaced with fill materials. The fill layer ranges from 2 to 7 feet in thickness; and,
- 4) The site is fenced and hazard warning signs are posted. The site contains a one-story structure on a 2.4 acre lot. During the 1998 site visit there was some evidence of trespassing. No evidence of trespassing was observed during the site visit conducted for this Public Health Assessment. The USEPA on-scene coordinator informed us that trespassing at the site had not been documented due to the presence of on-site security.

Discussion

Environmental Contamination and Remedial History

Remedial Investigations (RI) at the site were conducted in two phases. During Phase I (May to September 1997), soil samples were collected from 15 locations inside the buildings and 25 exterior on-site locations, and 1 exterior off-site location. In addition, two rounds of groundwater samples were collected from 7 new monitoring wells. Hydropunch groundwater samples were also collected from 12 on-site locations.

During the Phase II investigation, (September to November 1998), soil samples were collected from 3 locations inside the building, 54 exterior on- and off-site locations, and from borings taken during the installation of 5 monitoring wells. One round of groundwater samples was collected from 7 existing monitoring wells, and 7 new monitoring wells.⁽¹⁾ The monitoring wells are located on-site and off-site; the off-site monitoring wells are located close to the site boundary.

On-Site Contamination

Soils

The primary contaminants of concern within on-site near-surface (0 to 2 feet) and subsurface (below 2 feet) soils include chlorinated and aromatic volatile organic compounds, semi-volatile organic compounds, pesticides, polychlorinated biphenyls (PCBs), and metals.

The contaminants detected above the ATSDR comparison values or NJDEP cleanup criteria in near-surface soils included tetrachloroethylene (for child), trichloroethylene, benzo(b)fluoranthene, polychlorinated biphenyls, 4,4-DDE, aldrin, dieldrin (for child), arsenic, cadmium (for child), and lead. Table 1 (see Appendix) reports the maximum concentrations of contaminants detected in near-surface soil samples (0 to 2 feet).⁽¹⁾

Subsurface soils (below 2 feet) exhibited similar contamination. The contaminants detected above the ATSDR comparison values or NJDEP cleanup criteria in subsurface soils included 1,2-dichloroethylene (for child), tetrachloroethylene (for child), trichloroethylene, 1,2-dichloroethane, benzene, benzo(b)fluoranthene, polychlorinated biphenyls, aldrin (for child), arsenic, cadmium, and lead. Table 2 (see Appendix) reports the maximum concentrations of contaminants detected in subsurface soil samples (below 2 feet).⁽¹⁾

The near-surface and subsurface soils have been removed by the USEPA from the site and replaced with clean fill materials. The clean fill layer ranges from 2 to 7 feet in thickness.⁽²⁾

Groundwater

The contaminants detected above the ATSDR comparison values or NJDEP primary drinking water standards in groundwater samples from the "shallow" zone of the upper aquifer included 1,2-dichloroethylene, tetrachloroethylene, trichloroethylene, 1,2-dichloroethane, benzene, chromium, arsenic, cadmium, mercury, and lead.⁽¹⁾

The contaminants detected above the ATSDR comparison values or NJDEP primary drinking water standards in groundwater samples from the "deep" zone of the upper aquifer included tetrachloroethylene and arsenic.⁽¹⁾

Table 3 (see Appendix) presents a summary of maximum contaminant levels detected in groundwater samples from the shallow and deep zones of the upper aquifer.⁽¹⁾

Shallow upper aquifer groundwater contamination identified at the site extends across the property and beyond the property borders to the east, south, and west. Based on the sampling results, groundwater contamination appears to be more prevalent in the shallow zone near the water table surface as opposed to deeper zones of the aquifer. The shallow upper aquifer groundwater contamination is of high concern because of the possibility of the migration of contaminants to the deeper groundwater (the deeper portions of the aquifer are used in the region as a source of water for the public water supply systems). Deeper groundwater in the middle and lower aquifers beneath the site is evaluated by the USEPA as not presently impacted by the site. As part of an overall remedial investigation of the site, additional groundwater data is being collected to further characterize the site, including the off-site migration of groundwater contamination beyond the present study area.⁽¹⁾

Off-Site Contamination

Other than groundwater contamination, there are no data or information describing off-site migration of site-related contaminants associated with any environmental media.

Pathways Analysis

This section contains discussion of the exposure pathways at the site and their public health implications. An exposure pathway is the process by which an individual is exposed to contaminants that originate from some source of contamination. The ATSDR and the NJDHSS classify exposure pathways into three groups: (1) "completed pathways," that is, those in which exposure has occurred, is occurring, or will occur; (2) "potential pathways," that is, those in which exposure might have occurred, may be occurring, or may yet occur; and (3) "eliminated pathways," that is, those which can be eliminated from further analysis because one of the five elements is missing and will never be present, or in which no contaminants of concern can be identified.⁽⁵⁾ To determine whether residents of Camden City were or are exposed to contaminants related to the site, the ATSDR and the NJDHSS evaluate the environmental and human components that lead to human exposure. This pathways analysis consists of five elements: (1) a source of contamination; (2) transport through an environmental medium; (3) a point of human exposure; (4) a route of human exposure; and (5) a receptor (exposed) population.⁽⁵⁾

Under current site conditions, and based upon data and information available to the ATSDR and the NJDHSS, no completed human exposure pathways associated with the site were identified. The only two potential exposure pathways related to the site are discussed below:

On-site Soil-Related Exposure Pathway

Currently, on-site surface soils have been remediated and are not accessible to either adults or to children because of the presence of 24-hour security at the site. Furthermore, past exposures to the non-worker public, although not impossible, were not likely because the site was an active facility until 1998, and 24-hour security has been in place at the site since the closing of the MAI. Therefore, the NJDHSS and ATSDR believe that exposures to contaminated soils to the non-worker public has probably not occurred at levels of health concern. For this reason, this pathway has been eliminated and will not be discussed further.

Groundwater-Related Exposure Pathways

Based on NJDHSS and ATSDR's evaluation of the Remedial Investigation and other site-related information, the primary potential exposure pathway associated with the site pertains to groundwater contamination and its impact on the PRM aquifer which is a significant source for public water

supplies in the area. As previously indicated, there are several public water supply wells located within 4 miles of the site, the nearest of which is approximately 1 3/4 miles away. Although the exact extent of the off-site movement of site-related contaminants has not been defined, data from a review of routine sampling of water from the public water systems in the area indicate that the site is currently not impacting these systems. ⁽¹⁾ However, there is a concern that if the groundwater is not remediated, then these public water systems, especially the closest Camden City well, may become contaminated, thus, increasing the potential for exposure. According to the NJDEP, ^(1,9) no private potable wells exist within a 5-mile radius of the site.

Public Health Implications

There are no past or current completed exposure pathways at the site which warrant evaluation. However, the levels of some groundwater contaminants, especially 1,2-dichloroethene, tetrachloroethylene, trichloroethylene, 1,2-dichloroethane, benzene, chromium, arsenic, cadmium, mercury, and lead have been detected in monitoring well samples in concentrations above ATSDR health comparison values or NJDEP primary drinking water standards. Therefore, to prevent future exposures to site-related contamination at levels of public health concern, additional investigation of the potential for the contamination of public supply wells is necessary.

ATSDR Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination in their environment. Children are at greater risk than adults from certain kinds of exposures to hazardous substances emitted from waste sites. They are more likely exposed because they play outdoors and they often bring food into contaminated areas. They are shorter than adults, which means they breathe dust, soil, and heavy vapors closer to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. The developing body systems of the growing child can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care. There were no completed exposure pathways associated with the MAI site. Therefore, the NJDHSS and the ATSDR have determined that children are not presently exposed to site-related contaminants. If site conditions change that result in potential exposures to children or pregnant women, the NJDHSS and the ATSDR will re-examine childhood health issues.

Community Health Concerns

In order to gather information on community health concerns at the site, NJDHSS contacted the Camden County Health Department, the USEPA, and the New Jersey Department of Environmental Protection. No community concerns regarding the MAI site were identified.

Public Comment

Public comment was solicited from September 18 to October 18, 2000. No comments were received.

Health Outcome Data Evaluation

Health outcome data were not reviewed because there are no completed human exposure pathways associated with the MAI site. In addition, no community health concerns have been expressed related to adverse health effects from exposures to site-related contaminants.

Conclusions

Hazard Category

Based on the information reviewed, the ATSDR and NJDHSS have concluded that the MAI site currently poses no public health hazard. This evaluation is the result of an absence of a completed human exposure pathway associated with environmental media contaminated by previous disposal practices at the site (i.e., soils and groundwater).

However, groundwater contamination at the MAI site is present at levels of public health concern. The site is not presently impacting public supply wells. However, there is a concern that if the groundwater is not remediated, then public water system wells in the vicinity of site (especially the closest Camden City well located at a distance of approximately 1 3/4 miles) may become contaminated and increase the potential for exposure.

Recommendations

Cease/Reduce Exposure Recommendations

There are no immediate site specific actions necessary to reduce human exposures at the MAI site. However, monitoring of public supply wells in the vicinity of the site should continue.

Site Characterization Recommendations

Full characterization of the groundwater plume with respect to potentially affected public supply wells should be determined as soon as practicable so that appropriate remedial measures for the groundwater can be developed.

Public Health Action Plan (PHAP)

The Public Health Action Plan (PHAP) for the MAI site contains a description of the actions to be taken by the ATSDR and the NJDHSS at or in the vicinity of the site subsequent to the completion of this Public Health Assessment (PHA). The purpose of the PHAP is to ensure that this PHA not only identifies public health hazards, but provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. The ATSDR and the NJDHSS are committed to follow up on this plan to ensure that it is implemented. The public health actions to be implemented by the ATSDR and the NJDHSS are as follows:

Public Health Actions Undertaken by ATSDR/NJDHSS:

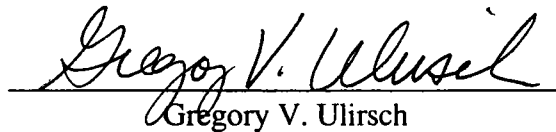
- 1) Environmental data have been evaluated within the context of human exposure pathways and relevant public health issues.
- 2) The NJDHSS has prepared a Citizen's Guide for the MAI site for distribution to the Camden County Health Department and other interested parties.

Public Health Actions Planned by ATSDR/NJDHSS:

- 1) The ATSDR and/or the NJDHSS will review additional site data generated by future remedial investigations for public health significance.
- 2) ATSDR will provide a follow-up to this PHAP, as needed, outlining any additional actions completed and those in progress. This report will be placed in repositories that contain copies of this PHA, and will be provided to persons who request it.

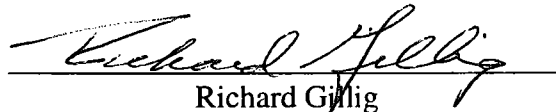
Certification

This Public Health Assessment was prepared by the New Jersey Department of Health and Senior Services (NJDHSS) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the Public Health Assessment was begun.



Gregory V. Ulirsch
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Superfund Site Assessment Branch (SSAB)
Division of Health Assessment and Consultation (DHAC)
ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this Public Health Assessment and concurs with its findings.



Richard Gillig
Chief, SSAB, DHAC, ATSDR

Documents Reviewed

- 1) Hazard Ranking System Documentation Package, Volume 1 of 1 - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. April 1999.
- 2) Pollution Report - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. December 21, 1999.
- 3) National Priorities List (NPL) Site Narrative at Listing - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. July 22, 1999.
- 4) Site Visit Report (SVR), Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. NJDHSS/ATSDR. June 1998.
- 5) Agency For Toxic Substances and Disease Registry. Health Assessment Guidance Manual. Chelsea, Michigan: Lewis Publishers, 1992.
- 6) Pollution Report - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. December 11, 1999.
- 7) Pollution Report - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. November 26, 1999.
- 8) Pollution Report - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. November 19, 1999.
- 9) Personal Communication, Craig Wallace, NJDEP, April 12, 2000.

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210 South Broad Street
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Appendices

Table # 1 - Maximum Concentrations of Contaminants in On-Site Near-Surface Soil Samples (0 to 2 feet)-Pre-Removal Levels.

Source: Hazard Ranking System Documentation Package, Volume 1 of 1 - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. April 1999.

Contaminant	Maximum Concentrations (PPM)	Comparison Value	
		PPM	Source
1,2-dichloroethylene	180	500(child) 6000(adult)	EMEG
tetrachloroethylene	2400	500(child) 7000(adult)	RMEG
trichloroethylene	1800	54	NRDCSCC
1,1-dichloroethane	98	1000	NRDCSCC
1,2-dichloroethane	4.2	8	CREG
benzene	19	20	CREG
chlorobenzene	21	40(child) 1000(adult)	RMEG
chloroform	2.7	500(child) 7000(adult)	EMEG
methylene chloride	18	10000(child) 100000(adult)	EMEG
benzo(b)fluoranthene	82	4	NRDCSCC
polychlorinated biphenyls	65	0.4	CREG
4,4-DDE	6.9	2	CREG
aldrin	45	2(child) 20(adult)	EMEG
dieldrin	14	3(child) 40(adult)	EMEG
arsenic	515	20(child) 200(adult)	EMEG
cadmium	19.7	10(child) 100(adult)	EMEG
mercury	16	270	NRDCSCC
lead	6620	600	NRDCSCC

NRDCSCC - Non-Residential Direct Contact Soil Cleanup Criteria

N.D. - Not Detected

RMEG - Reference Dose Media Evaluation Guide

NJMCL - New Jersey Maximum Contaminant Level

CREG - Cancer Risk Evaluation Guide

EMEG - Environmental Media Evaluation Guide

AL - Action Level

Table # 2-Maximum Concentrations of Contaminants in On-Site Subsurface Soil Samples (below 2 feet)-Pre-Removal Levels

Source: Hazard Ranking System Documentation Package, Volume 1 of 1 - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. April 1999.

Contaminant	Maximum Concentrations (PPM)	Comparison Value	
		PPM	Source
1,2-dichloroethylene	900	500(child) 6000(adult)	EMEG
tetrachloroethylene	1500	500(child) 7000(adult)	RMEG
trichloroethylene	390	54	NRDCSCC
1,1-dichloroethane	74	1000	NRDCSCC
1,2-dichloroethane	360	8	CREG
benzene	78	20	CREG
chlorobenzene	18	40(child) 1000(adult)	RMEG
chloroform	15	500(child) 7000(adult)	EMEG
methylene chloride	33	10000(child) 100000(adult)	EMEG
benzo(b)fluoranthene	65	4	NRDCSCC
polychlorinated biphenyls	107	0.4	CREG
aldrin	11	2(child) 20(adult)	EMEG
dieldrin	0.92	3(child) 40(adult)	EMEG
chromium	16,000	N.A.	N.A.
arsenic	14,000	20(child) 200(adult)	EMEG
cadmium	231	10(child) 100(adult)	EMEG
mercury	14.2	270	NRDCSCC
lead	8,960	600	NRDCSCC

NRDCSCC - Non-Residential Direct Contact Soil Cleanup Criteria

N.D. - Not Detected

RMEG - Reference Dose Media Evaluation Guide

NJMCL - New Jersey Maximum Contaminant Level

CREG - Cancer Risk Evaluation Guide

EMEG - Environmental Media Evaluation Guide

AL - Action Level

Table # 3-Maximum Concentrations of Contaminants in On-Site Monitoring Well Samples (Shallow and Deep Portions of the Upper Aquifer of the Potomac-Raritan-Magothy (PRM) aquifer).

Source: Hazard Ranking System Documentation Package, Volume 1 of 1 - Martin Aaron, Inc. site, Camden City, Camden County, New Jersey. USEPA Region II. April 1999.

Contaminant	Maximum Concentrations (PPB)	Comparison Value	
		PPB	Source
1,2-dichloroethylene	73	10	NJMCL
tetrachloroethylene	4	1	NJMCL
trichloroethylene	3	1	NJMCL
1,1-dichloroethane	5	50	NJMCL
1,2-dichloroethane	9	0.4	CREG
benzene	560	1	NJMCL
chlorobenzene	N.D.	4	NJMCL
chloroform	N.D.	-	-
methylene chloride	N.D.	2	NJMCL
benzo(b)fluoranthene	N.D.	-	-
PCBs	N.D.	0.5	NJMCL
Aldrin	N.D.	-	-
Dieldrin	N.D.	-	-
chromium	1090	100	NJMCL
arsenic	9800	50	NJMCL
cadmium	33.1	5	NJMCL
mercury	2.7	2	NJMCL
lead	526	15	AL

NRDCSCC - Non-Residential Direct Contact Soil Cleanup Criteria

N.D. - Not Detected

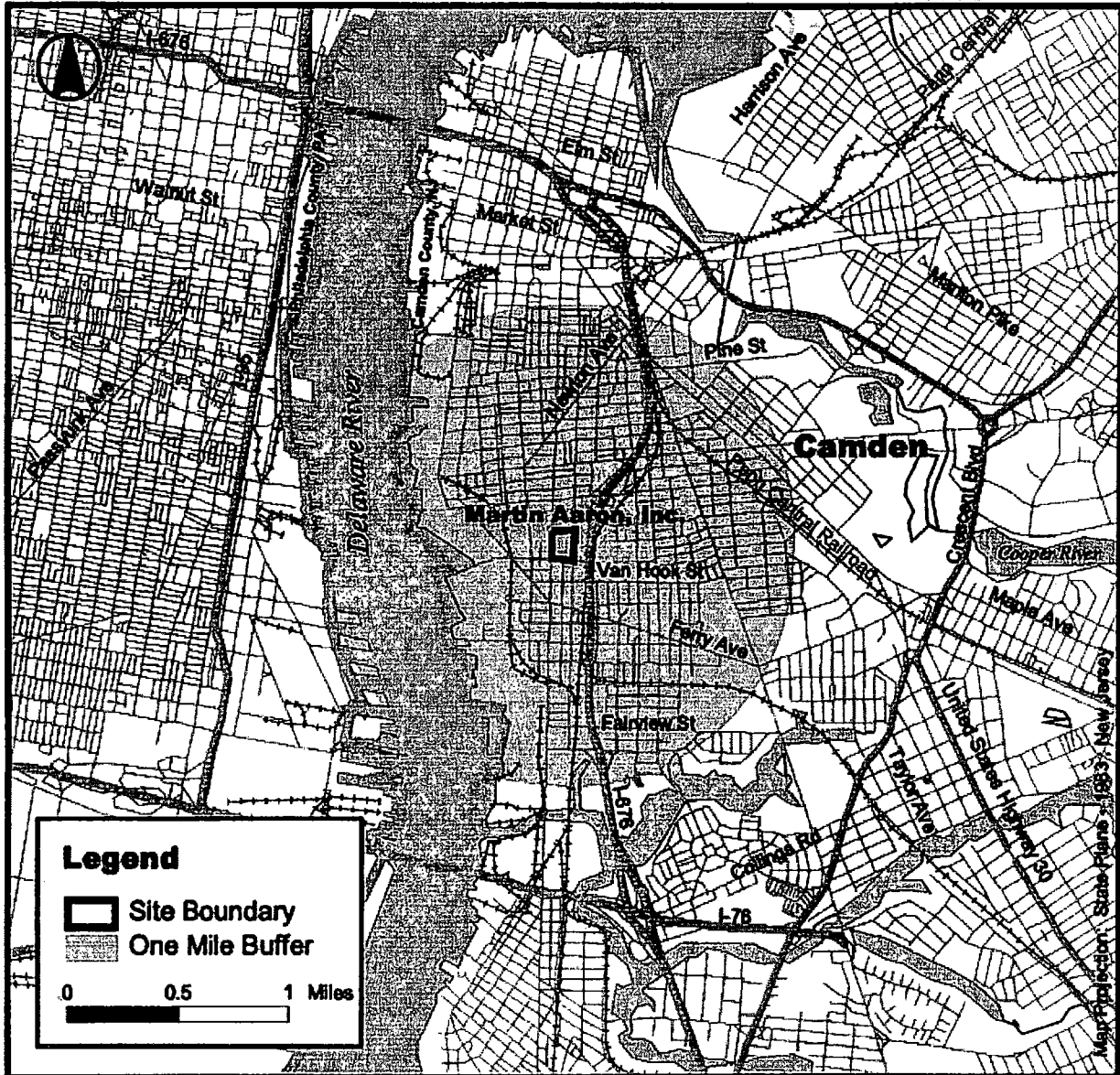
RMEG - Reference Dose Media Evaluation Guide

NJMCL - New Jersey Maximum Contaminant Level

CREG - Cancer Risk Evaluation Guide

EMEG - Environmental Media Evaluation Guide

AL - Action Level



Base Map Source: 1995 TIGER/Line Files

Figure 1 - Site location and 1 mile buffer.

Total Population	29,536	Total Housing Units	10,528
White	3,150	Hispanic	6,367
Black	21,839	Children (<6 years)	4,488
American Indian	103	Adults (> 65 years)	2,770
Other	4,263	Females (15 - 44)	7,238

ATSDR Plain Language Glossary of Environmental Health Terms

Absorption:	How a chemical enters a person's blood after the chemical has been swallowed, has come into contact with the skin, or has been breathed in.
Acute Exposure:	Contact with a chemical that happens once or only for a limited period of time. ATSDR defines acute exposures as those that might last up to 14 days.
Additive Effect:	A response to a chemical mixture, or combination of substances, that might be expected if the known effects of individual chemicals, seen at specific doses, were added together.
Adverse Health Effect:	A change in body function or the structures of cells that can lead to disease or health problems.
Antagonistic Effect:	A response to a mixture of chemicals or combination of substances that is less than might be expected if the known effects of individual chemicals, seen at specific doses, were added together.
ATSDR:	The Agency for Toxic Substances and Disease Registry. ATSDR is a federal health agency in Atlanta, Georgia that deals with hazardous substance and waste site issues. ATSDR gives people information about harmful chemicals in their environment and tells people how to protect themselves from coming into contact with chemicals.
Background Level:	An average or expected amount of a chemical in a specific environment. Or, amounts of chemicals that occur naturally in a specific-environment.
Biota:	Used in public health, things that humans would eat – including animals, fish and plants.
CAP:	See Community Assistance Panel.
Cancer:	A group of diseases which occur when cells in the body become abnormal and grow, or multiply, out of control
Carcinogen:	Any substance shown to cause tumors or cancer in experimental studies.
CERCLA:	See Comprehensive Environmental Response, Compensation, and Liability Act.
Chronic Exposure:	A contact with a substance or chemical that happens over a long period of time. ATSDR considers exposures of more than one year to be <i>chronic</i> .
Completed Exposure Pathway:	See Exposure Pathway.
Community Assistance Panel (CAP):	A group of people from the community and health and environmental agencies who work together on issues and problems at hazardous waste sites.

**Comparison Value:
(CVs)**

Concentrations or the amount of substances in air, water, food, and soil that are unlikely, upon exposure, to cause adverse health effects. Comparison values are used by health assessors to select which substances and environmental media (air, water, food and soil) need additional evaluation while health concerns or effects are investigated.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):

CERCLA was put into place in 1980. It is also known as **Superfund**. This act concerns releases of hazardous substances into the environment, and the cleanup of these substances and hazardous waste sites. ATSDR was created by this act and is responsible for looking into the health issues related to hazardous waste sites.

Concern:

A belief or worry that chemicals in the environment might cause harm to people.

Concentration:

How much or the amount of a substance present in a certain amount of soil, water, air, or food.

Contaminant:

See **Environmental Contaminant**.

Delayed Health Effect:

A disease or injury that happens as a result of exposures that may have occurred far in the past.

Dermal Contact:

A chemical getting onto your skin. (see **Route of Exposure**).

Dose:

The amount of a substance to which a person may be exposed, usually on a daily basis. Dose is often explained as "amount of substance(s) per body weight per day".

Dose / Response:

The relationship between the amount of exposure (dose) and the change in body function or health that result.

Duration:

The amount of time (days, months, years) that a person is exposed to a chemical.

Environmental Contaminant:

A substance (chemical) that gets into a system (person, animal, or the environment) in amounts higher than that found in **Background Level**, or what would be expected.

Environmental Media:

Usually refers to the air, water, and soil in which chemical of interest are found. Sometimes refers to the plants and animals that are eaten by humans. **Environmental Media** is the second part of an **Exposure Pathway**.

U.S. Environmental Protection

Agency (EPA):

The federal agency that develops and enforces environmental laws to protect the environment and the public's health.

Epidemiology:

The study of the different factors that determine how often, in how many people, and in which people will disease occur.

Exposure:

Coming into contact with a chemical substance. (For the three ways people can come in contact with substances, see **Route of Exposure**.)

Exposure Assessment:	The process of finding the ways people come in contact with chemicals, how often and how long they come in contact with chemicals, and the amounts of chemicals with which they come in contact.
Exposure Pathway:	A description of the way that a chemical moves from its source (where it began) to where and how people can come into contact with (or get exposed to) the chemical. ATSDR defines an exposure pathway as having 5 parts: <ol style="list-style-type: none"> 1. Source of Contamination, 2. Environmental Media and Transport Mechanism, 3. Point of Exposure, 4. Route of Exposure; and, 5. Receptor Population. <p>When all 5 parts of an exposure pathway are present, it is called a Completed Exposure Pathway. Each of these 5 terms is defined in this Glossary.</p>
Frequency:	How often a person is exposed to a chemical over time; for example, every day, once a week, twice a month.
Hazardous Waste:	Substances that have been released or thrown away into the environment and, under certain conditions, could be harmful to people who come into contact with them.
Health Effect:	ATSDR deals only with Adverse Health Effects (see definition in this Glossary).
Indeterminate Public Health Hazard:	The category is used in Public Health Assessment documents for sites where important information is lacking (missing or has not yet been gathered) about site-related chemical exposures.
Ingestion:	Swallowing something, as in eating or drinking. It is a way a chemical can enter your body (See Route of Exposure).
Inhalation:	Breathing. It is a way a chemical can enter your body (See Route of Exposure).
LOAEL:	Lowest Observed Adverse Effect Level. The lowest dose of a chemical in a study, or group of studies, that has caused harmful health effects in people or animals.
Malignancy:	See Cancer .
MRL:	Minimal Risk Level. An estimate of daily human exposure -- by a specified route and length of time -- to a dose of chemical that is likely to be without a measurable risk of adverse, noncancerous effects. An MRL should not be used as a predictor of adverse health effects.
NPL:	The National Priorities List. (Which is part of Superfund .) A list kept by the U.S. Environmental Protection Agency (EPA) of the most serious, uncontrolled or abandoned hazardous waste sites in the country. An NPL site needs to be cleaned up or is being looked at to see if people can be exposed to chemicals from the site.

NOAEL: No Observed Adverse Effect Level. The highest dose of a chemical in a study, or group of studies, that did not cause harmful health effects in people or animals.

No Apparent Public Health Hazard: The category is used in ATSDR's Public Health Assessment documents for sites where exposure to site-related chemicals may have occurred in the past or is still occurring but the exposures are not at levels expected to cause adverse health effects.

No Public Health Hazard: The category is used in ATSDR's Public Health Assessment documents for sites where there is evidence of an absence of exposure to site-related chemicals.

PHA: Public Health Assessment. A report or document that looks at chemicals at a hazardous waste site and tells if people could be harmed from coming into contact with those chemicals. The PHA also tells if possible further public health actions are needed.

Plume: A line or column of air or water containing chemicals moving from the source to areas further away. A plume can be a column or clouds of smoke from a chimney or contaminated underground water sources or contaminated surface water (such as lakes, ponds and streams).

Point of Exposure: The place where someone can come into contact with a contaminated environmental medium (air, water, food or soil). For examples: the area of a playground that has contaminated dirt, a contaminated spring used for drinking water, the location where fruits or vegetables are grown in contaminated soil, or the backyard area where someone might breathe contaminated air.

Population: A group of people living in a certain area; or the number of people in a certain area.

PRP: Potentially Responsible Party. A company, government or person that is responsible for causing the pollution at a hazardous waste site. PRP's are expected to help pay for the clean up of a site.

Public Health Assessment(s): See PHA.

Public Health Hazard: The category is used in PHAs for sites that have certain physical features or evidence of chronic, site-related chemical exposure that could result in adverse health effects.

Public Health Hazard Criteria: PHA categories given to a site which tell whether people could be harmed by conditions present at the site. Each are defined in the Glossary. The categories are:
 1. Urgent Public Health Hazard
 2. Public Health Hazard
 3. Indeterminate Public Health Hazard
 4. No Apparent Public Health Hazard
 5. No Public Health Hazard

Receptor Population: People who live or work in the path of one or more chemicals, and who could come into contact with them (See Exposure Pathway).

Reference Dose (RfD):	An estimate, with safety factors (see safety factor) built in, of the daily, life-time exposure of human populations to a possible hazard that is <u>not</u> likely to cause harm to the person.
Route of Exposure:	The way a chemical can get into a person's body. There are three exposure routes: - breathing (also called inhalation), - eating or drinking (also called ingestion), and - or getting something on the skin (also called dermal contact).
Safety Factor:	Also called Uncertainty Factor . When scientists don't have enough information to decide if an exposure will cause harm to people, they use "safety factors" and formulas in place of the information that is not known. These factors and formulas can help determine the amount of a chemical that is <u>not</u> likely to cause harm to people.
SARA:	The Superfund Amendments and Reauthorization Act in 1986 amended CERCLA and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from chemical exposures at hazardous waste sites.
Sample Size:	The number of people that are needed for a health study.
Sample:	A small number of people chosen from a larger population (See Population).
Source (of Contamination):	The place where a chemical comes from, such as a landfill, pond, creek, incinerator, tank, or drum. Contaminant source is the first part of an Exposure Pathway .
Special Populations:	People who may be more sensitive to chemical exposures because of certain factors such as age, a disease they already have, occupation, sex, or certain behaviors (like cigarette smoking). Children, pregnant women, and older people are often considered special populations.
Statistics:	A branch of the math process of collecting, looking at, and summarizing data or information.
Superfund Site:	See NPL.
Survey:	A way to collect information or data from a group of people (population). Surveys can be done by phone, mail, or in person. ATSDR cannot do surveys of more than nine people without approval from the U.S. Department of Health and Human Services.
Synergistic effect:	A health effect from an exposure to more than one chemical, where one of the chemicals worsens the effect of another chemical. The combined effect of the chemicals acting together are greater than the effects of the chemicals acting by themselves.
Toxic:	Harmful. Any substance or chemical can be toxic at a certain dose (amount). The dose is what determines the potential harm of a chemical and whether it would cause someone to get sick.
Toxicology:	The study of the harmful effects of chemicals on humans or animals.

Tumor: Abnormal growth of tissue or cells that have formed a lump or mass.

**Uncertainty
Factor:** See **Safety Factor**.

**Urgent Public
Health Hazard:** This category is used in ATSDR's Public Health Assessment documents for sites that have certain physical features or evidence of short-term (less than 1 year), site-related chemical exposure that could result in adverse health effects and require quick intervention to stop people from being exposed.