Letter Health Consultation

EVALUATE THE POTENTIAL HEALTH IMPACTS FROM A RELEASE OF A REGULATED CHEMICAL TO SOIL

GEORGIA POWER FACILITY

ATLANTA, FULTON COUNTY, GEORGIA

Prepared by the
Georgia Department of Human Resources

MAY 27, 2009

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR Toll Free at
1-800-CDC-INFO
or
Visit our Home Page at: http://www.atsdr.cdc.gov

LETTER HEALTH CONSULTATION

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Agency for Toxic Substances and Disease Registry

DHR

B. J. Walker, Commissioner

Georgia Department of Human Resources • Division of Public Health • S. Elizabeth Ford, M.D., MBA, Acting Director
Chemical Hazards Program • 2 Peachtree Street NW • Suite 13.452 • Atlanta, Georgia 30303-3142
404-657-6534 • FAX: 404-657-6533

March 27, 2009

Mark Smith, Director
Hazardous Waste Branch
Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King Blvd, 14th Floor
Atlanta, GA 30303

Dear Mark,

This letter is in response to your request to evaluate the potential public health impacts from a release of a regulated chemical to soil at a Georgia Power facility in Atlanta, Fulton County, Georgia. To evaluate current soil and groundwater conditions, GDPH reviewed the "Hazardous Site Response Notification" package [1]. Sampling was conducted in July 2008 to identify contamination in soil and groundwater at the spill site.

Background

In September 2008, the Georgia Environmental Protection Division (GEPD) contacted the Georgia Division of Public Health (GDPH) regarding a release of polychlorinated biphenyls (PCB) from the Georgia Power electricity supply substation located on Marietta Boulevard, just south of West Marietta Street, in Northwest Atlanta (Appendix A). PCBs are a group of man-made chemicals used for their insulating properties as lubricants and coolants in capacitors and other electrical equipment. PCBs are no longer produced in the United States, but are still found in the environment. Health effects associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals [2].

The nearest residence is located within 300 feet of the substation. The substation is fenced for limited access, but there are gaps in the fence. However, it is very unlikely that public trespass occurs on site. All residences within one mile of the facility are connected to a municipal water supply derived from surface water (not from groundwater). The electricity supply substation is located at an elevation of approximately 925 feet, similar to the surrounding residential community.

The facility began operations in 1929. There is an electricity supply substation and a landfill onsite. The landfill was first permitted in the 1970's, and used for substation project waste. It

was closed in 1996. In July 2008, a release notification was submitted to GEPD under the *Georgia Hazardous Site Response Act*. PCBs were detected in soil from the fenced area of the substation and from the landfill.

In response, approximately 450 surface soil samples (0 - 6") were collected from the substation (Appendix B). Ten subsurface soil samples (up to 20 feet below ground surface) were collected at intervals of two feet, from the landfill. All samples were analyzed for total PCBs; 103 soil samples were also analyzed for regulated metals, and several were analyzed for volatile organic compounds (VOCs).

Five groundwater samples were collected from the substation. Groundwater was analyzed for PCBs, VOCs and metals.

No off-site soil or groundwater samples were collected.

Exposure Evaluation

GDPH uses comparison values[1] to select contaminants that require further evaluation. Comparison values (CVs) are concentrations of contaminants that can reasonably (and conservatively) be regarded as harmless, assuming default conditions of exposure. The CVs generally include ample safety factors to ensure protection of sensitive populations. Because CVs do not represent thresholds of toxicity, exposure to contaminant concentrations above CVs will not necessarily lead to adverse health effects.

GDPH determines exposure to environmental contamination by examining exposure pathways. An exposure pathway is generally classified by environmental medium (e.g., groundwater, soil, air). A completed exposure pathway exists when people are actually exposed through ingestion or inhalation of, or by skin contact with a contaminated medium. GDPH evaluates the environmental and human components that lead to human exposure to determine whether people are exposed to contaminants from the site. An exposure pathway consists of five elements: a source of contamination; transport through an environmental medium; a point of exposure; a route of exposure; and a receptor population.

GDPH categorizes an exposure pathway as a completed or potential exposure pathway if the exposure pathway cannot be eliminated. In completed exposure pathways, all five elements exist, and exposure to a contaminant has occurred in the past, is occurring, or will occur in the future. In potential pathways, at least one of the five elements is missing but could exist. Potential pathways indicate that exposure to a contaminant could have occurred in the past, could be occurring or could occur in the future. An exposure pathway can be eliminated if at least one of the five elements is missing and will never be present.

[1] Comparison values are developed by the federal Agency for Toxic Substances and Disease Registry for a specific chemical in each of three environmental media: air, soil, and drinking water: *www.atsdr.cdc.gov*.

Soil and Groundwater Sample Results

Analysis results identified 51 of 450 surface soil sample locations where PCBs were detected above the lowest CV of 0.4 parts PCB per million parts soil (0.4 ppm) [3]. This CV is the Cancer Risk Evaluation Guideline. It is an estimated comparison concentration that is based on an excess cancer rate of one in a million persons exposed over a lifetime (70 years), and is calculated using EPA's cancer slope factor of exposure to PCBs. The lowest CV for non-cancer health effects is 1 ppm (the chronic environmental media evaluation guide for children). Levels detected above CVs were found on-site in a fenced area or several feet below ground surface. For more information about CVs and the Toxicological Evaluation process see Appendix C.

Contaminated soil is currently under remediation by Georgia Power. The nearest residence is located within 300 feet of the substation, but is more than 1000 feet from the location of the PCB contamination. The substation is fenced for limited access, but there are gaps in the fence. However, access would require entry onto private property that is not easily accessible or visible. Additionally, with the generally unsafe operating conditions of an electricity supply substation and the scarcely populated surroundings, it is very unlikely that public trespass occurs on site.

The highest level detected at the landfill in subsurface soil was 9.7 ppm at 6 feet below ground surface. PCBs detected at the landfill were below ground surface. Therefore, human exposure to these contaminants is unlikely.

No contaminants were detected in groundwater above the detection level of 0.5 parts per billion (0.5 ppb). This detection level is above the lowest CV (0.02 ppb) [4]. However, because the public does not access the site and uses the municipal water supply derived from surface water, there is no point of exposure, route of exposure; or a receptor population. No exposure pathway to contaminated groundwater exists.

Therefore, this site poses no health hazard for exposure to contaminated soil or groundwater, and further evaluation is not needed.

Conclusion

GDPH concludes that this site poses ***No Public Health Hazard*** because no one is likely to be exposed to PCBs in soil or groundwater.

Recommendations

Based on the available information, GDPH recommends that:

1. Georgia Power continues to remediate soil cleanup
2. Georgia Power fixes the gaps in the fence to limit public access

GDPH will review data as it becomes available. If there are any questions regarding this health consultation, please contact Julia Campbell at (404) 657-5234.

Sincerely,

Julia Campbell
Program Consultant II
Chemical Hazards Program
Division of Public Health
Georgia Department of Human Resources

REFERENCES

1. MACTEC, *Hazardous Site Response Act Notification of Release*; 12/14/06.

2. Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Polychlorinated Biphenyls*; 8/07.

3. Agency for Toxic Substances and Disease Registry, *Soil Comparison Values*; 3/13/08.

4. Agency for Toxic Substances and Disease Registry, *Drinking Water Comparison Values*; 3/13/08.

CERTIFICATION

This letter health consultation was prepared by the Georgia Division of Public Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodologies and procedures existing at the time the health consultation was initiated. Editorial Review was completed by the Georgia Division of Public Health.

Technical Project Officer, CAT, CAPEB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

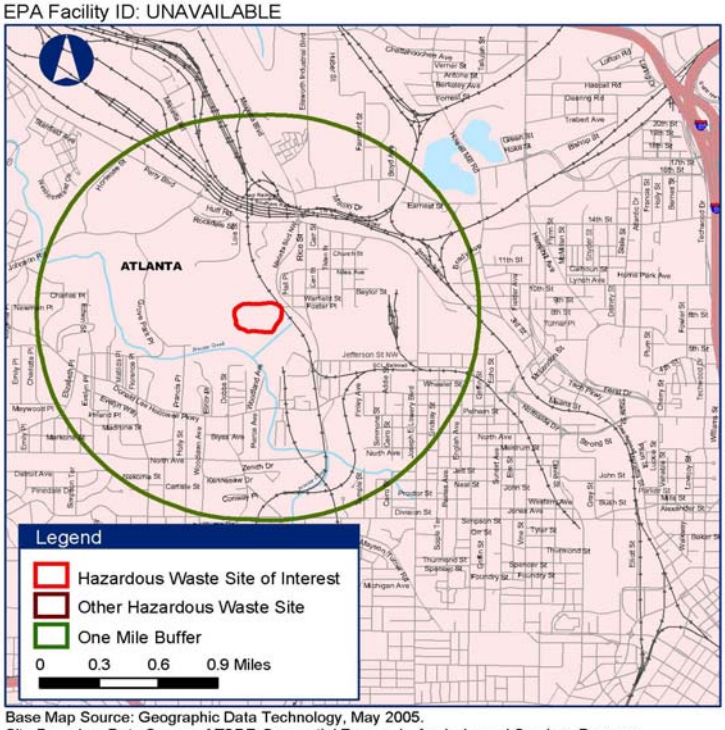
Team Lead, CAT, CAPEB, DHAC, ATSDR

APPENDIX A: SITE AND DEMOGRAPHIC MAPS

Georgia Power Substation
Atlanta, GA

ATSDR

EPA Facility ID: UNAVAILABLE



Base Map Source: Geographic Data Technology, May 2005.
Site Boundary Data Source: ATSDR Geospatial Research, Analysis, and Services Program, Current as of Generate Date (bottom left-hand corner).
Coordinate System (All Panels): NAD 1983 StatePlane Georgia West FIPS 1002 Feet

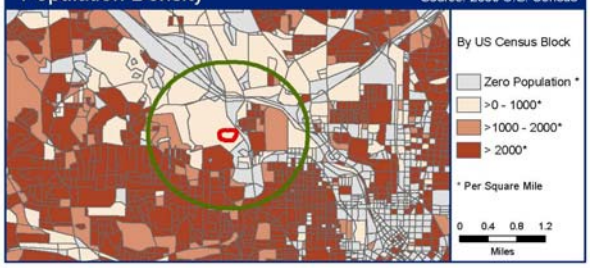
Site Location: Fulton County, GA

Demographic Statistics
Within One Mile of Site*

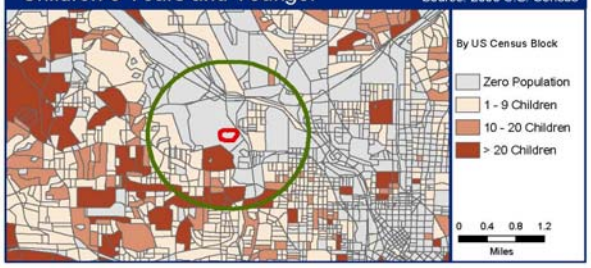
Total Population	10,948
White Alone	652
Black Alone	10,149
Am. Indian & Alaska Native Alone	4
Asian Alone	22
Native Hawaiian & Other Pacific Islander Alone	11
Some Other Race Alone	39
Two or More Races	71
Hispanic or Latino**	114
Children Aged 6 and Younger	930
Adults Aged 65 and Older	860
Females Aged 15 to 44	2,091
Total Housing Units	3,742

Demographics Statistics Source: 2000 U.S. Census
* Calculated using an area-proportion spatial analysis technique
** People who identify their origin as Hispanic or Latino may be of any race.

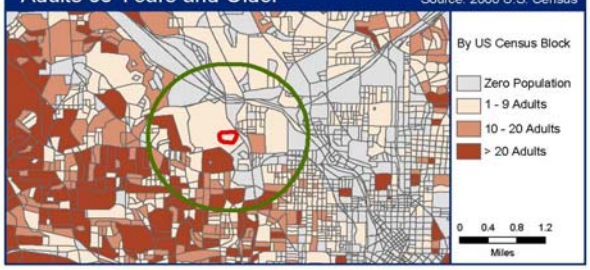
Population Density
Source: 2000 U.S. Census



Children 6 Years and Younger
Source: 2000 U.S. Census



Adults 65 Years and Older
Source: 2000 U.S. Census



Females Aged 15 to 44
Source: 2000 U.S. Census

<project=03432><userid=JXA0><geo=Glynn County, GA><keywords=GASAIDS3432, Georgia, Power>

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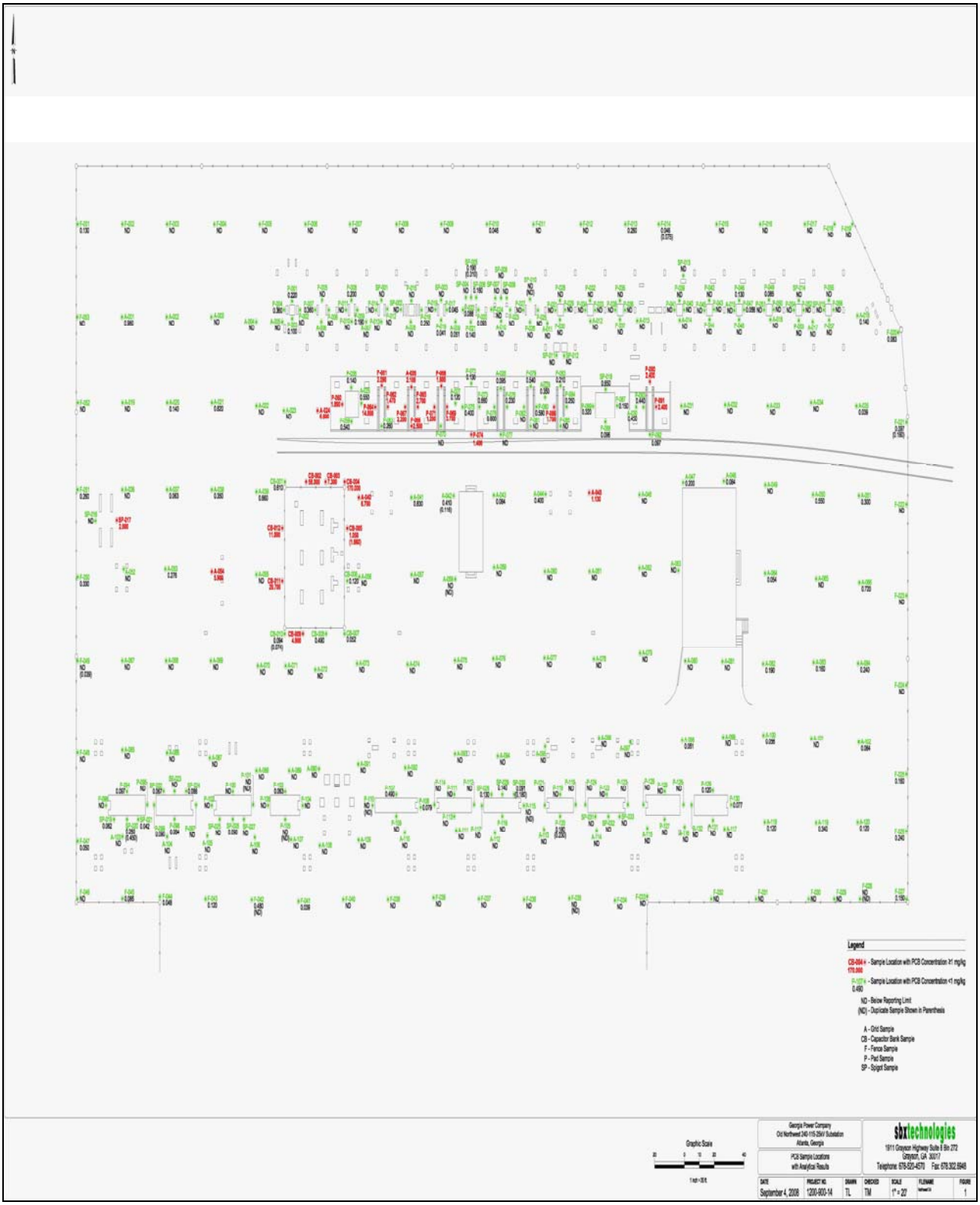
APPENDIX B: SOIL SAMPLE LOCATIONS



APPENDIX C: EXPLANATION OF TOXICOLOGICAL EVALUATION

Step 1--The Screening Process

In order to evaluate the available data, GDPH used comparison values (CVs) to determine which chemicals to examine more closely. CVs are contaminant concentrations found in a specific environmental media (for example: air, soil, or water) and are used to select contaminants for further evaluation. CVs incorporate assumptions of daily exposure to the chemical and a standard amount of air, soil, or water that someone may inhale or ingest each day. CVs are generated to be conservative and non-site specific. The CV is used as a screening level during the public health assessment process where substances found in amounts greater than their CVs might be selected for further evaluation. CVs are not intended to be environmental clean-up levels or to indicate that health effects occur at concentrations that exceed these values.

CVs can be based on either carcinogenic (cancer-causing) or non-carcinogenic effects. Cancer-based CVs are calculated from the U.S. Environmental Protection Agency's (EPA) oral cancer slope factors for ingestion exposure, or inhalation risk units for inhalation exposure. Non-cancer CVs are calculated from ATSDR's minimal risk levels, EPA's reference doses, or EPA's reference concentrations for ingestion and inhalation exposure. When a cancer and non-cancer CV exist for the same chemical, the lower of these values is used as a conservative measure. The chemical and media-specific CVs used in the preparation of this public health assessment are:

An **Environmental Media Evaluation Guide (EMEG)** is an estimated comparison concentration for exposure that is unlikely to cause adverse health effects, as determined by ATSDR from its toxicological profiles for a specific chemical.

A **Cancer Risk Evaluation Guide (CREG)** is an estimated comparison concentration that is based on an excess cancer rate of one in a million persons exposed over a lifetime (70 years), and is calculated using EPA's cancer slope factor.

Step 2--Evaluation of Public Health Implications

The next step in the evaluation process is to take those contaminants that are above their respective CVs and further identify which chemicals and exposure situations are likely to be a health hazard. Separate child and adult exposure doses (or the amount of a contaminant that gets into a person's body) are calculated for site-specific scenarios, using assumptions regarding an individual's likelihood of accessing the site and contacting contamination. Usually little or no information is available for a site to know exactly how much exposure is actually occurring, so assessors assume that maximum exposure is taking place. That assumption would include any worse case scenarios where someone received a maximum dose. Actual exposure is likely much less than the assumed exposure.

Non-cancer Health Risks

The doses calculated for exposure to individual chemicals are then compared to an established health guideline, such as an ATSDR minimal risk level (MRL) or an EPA reference dose (RfD), in order to assess whether adverse health impacts from exposure are expected. Health guidelines are chemical-specific values that are based on available scientific literature and are considered protective of human health. Non-carcinogenic effects, unlike carcinogenic effects, are believed to have a threshold, that is, a dose below which adverse health effects will not occur. As a result, the current practice to derive health guidelines is to identify, usually from animal toxicology experiments, a no observed adverse effect level (NOAEL), which indicates that no effects are observed at a particular exposure level. This is the experimental exposure level in animals (and sometimes humans) at which no adverse toxic effect is observed. The known toxicological values are doses derived from human and animal studies that are summarized in ATSDR's *Toxicological Profiles (www.atsdr.cdc.gov/toxpro2.html).* The NOAEL is modified with an uncertainty (or safety) factor, which reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the human population. The magnitude of the uncertainty factor considers various factors such as sensitive subpopulations (e.g., children, pregnant women, the elderly), extrapolation from animals to humans, and the completeness of the available data. Thus, exposure doses at or below the established health guideline are not expected to cause adverse health effects because these values are much lower (and more human health protective) than doses, which do not cause adverse health effects in laboratory animal studies.

For non-cancer health effects, the following health guidelines were used in this public health assessment:

A **minimal risk level (MRL)** is an estimate of the daily human exposure to a chemical that is likely to be without a significant risk of harmful effects over a specified period of time. MRLs are developed for ingestion and inhalation exposure, and for lengths of exposures; acute (less than 14 days), intermediate (between 15-364 days), and chronic (365 days or greater). ATSDR has not developed MRLs for dermal exposure (absorption through skin).

If the estimated exposure dose to an individual is less than the health guideline value, the exposure is unlikely to result in non-cancer health effects. If the calculated exposure dose is greater than the health guideline, the exposure dose is compared to known toxicological values for the particular chemical and is discussed in more detail in the text of the public health assessment. A direct comparison of site-specific exposure and doses to study-derived exposures and doses found to cause adverse health effects is the basis for deciding whether health effects are likely to occur.

It is important to consider that the methodology used to develop health guidelines does not provide any information on the presence, absence, or level of cancer risk. Therefore, a separate cancer risk evaluation is necessary for potentially cancer-causing contaminants detected at this site.

Cancer Risks

Exposure to a cancer-causing chemical, even at low concentrations, is assumed to be associated with some increased risk for evaluation purposes. The estimated risk for developing cancer from exposure to contaminants associated with the site was calculated by multiplying the site-specific doses by EPA's chemical-specific cancer slope factors (CSFs) available at *www.epa.gov/iris*. This calculation estimates a theoretical excess cancer risk expressed as a proportion of the population that may be affected by a carcinogen during a lifetime of exposure. For example, an estimated risk of 1×10^{-6} predicts the probability of one additional cancer over background in a population of 1 million. An increased lifetime cancer risk is not a specified estimate of expected cancers. Rather, it is an estimate of the increase in the probability that a person may develop cancer sometime in his or her lifetime following exposure to a particular contaminant under specific exposure scenarios. For children, the theoretical excess cancer risk is not calculated for a lifetime of exposure, but from a fraction of lifetime; based on known or suspected length of exposure, or years of childhood.

Because of conservative models used to derive CSFs, using this approach provides a theoretical estimate of risk; the true or actual risk is unknown and could be as low as zero. Numerical risk estimates are generated using mathematical models applied to epidemiologic or experimental data for carcinogenic effects. The mathematical models extrapolate from higher experimental doses to lower experimental doses. Often, the experimental data represent exposures to chemicals at concentrations orders of magnitude higher than concentrations found in the environment. In addition, these models often assume that there are no thresholds to carcinogenic effects--a single molecule of a carcinogen is assumed to be able to cause cancer. The doses associated with these estimated hypothetical risks might be orders of magnitude lower than doses reported in toxicology literature to cause carcinogenic effects. As such, a low cancer risk estimate of 1×10^{-6} and below may indicate that the toxicology literature supports a finding that no excess cancer risk is likely. A cancer risk estimate greater than 1×10^{-6}, however, indicates that a careful review of toxicology literature before making conclusions about cancer risks is in order.