
Public Comment Draft

Health Consultation

Dewey Loeffel Landfill

TOWN OF NASSAU,
RENSSELAER COUNTY, NEW YORK

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SUMMARY

INTRODUCTION

The New York State Department of Health (DOH) and the Agency for Toxic Substances and Disease Registry (ATSDR) want to provide the community around the Dewey-Loeffel Landfill site with the best information possible about whether and how people might contact contaminants from the site and any potential health risks.

This health consultation (HC) fulfills the congressional mandate that requires public health assessments be conducted for each site proposed by the United States Environmental Protection Agency (EPA) to the National Priorities List (NPL).

The ATSDR released a Health Consultation on the Dewey-Loeffel Landfill in May of 2003. This health consultation updates information on human exposure pathways identified in the 2003 health consultation. It also evaluates soil vapor intrusion, an additional exposure pathway.

CONCLUSION 1

The DOH and ATSDR conclude that drinking and using water from private wells near the Dewey Loeffel Landfill site is not expected to harm people's health.

BASIS FOR DECISION

This is because possible exposure to volatile organic contaminants in private wells is being minimized by use and maintenance of treatment systems. The treated water meets state and federal drinking water standards for public water supplies.

CONCLUSION 2

The DOH and ATSDR conclude that data are sufficient within one half mile south of the site to indicate that soil vapor intrusion is not occurring in the existing homes in this direction.

BASIS FOR DECISION

Recent shallow groundwater sampling data indicate that there are no site related contaminants in this media to the south and, therefore, soil vapor intrusion in the future is unlikely. However, we do not have sufficient data to evaluate this pathway north, east and west of the site.

CONCLUSION 3

The DOH and ATSDR conclude that eating fish from Nassau Lake and other affected waters could harm people's health if people do not follow the DOH fish consumption advisories for these waters.

BASIS FOR DECISION

This is because elevated levels of polychlorinated biphenyls (PCBs) are present in certain species of fish in three water bodies affected by contamination from the landfill: the Valatie Kill, Nassau Lake, and Kinderhook Lake.

CONCLUSION 4

Exposures to PCBs in soils and sediments in and along the shoreline of the lake, outdoor air, and surface water are likely to be small and are not expected to harm people's health.

BASIS FOR DECISION

DOH estimated exposures based on the levels of PCBs detected in lake sediments as well as soils on lake properties that were prone to flooding, assuming a child is exposed by ingestion and by absorbing PCBs through the skin. The estimated exposures were about 500 times lower than exposures that have caused adverse health effects in animals. These evaluations suggested that exposures to PCBs in Nassau Lake sediments and soil are likely to be small and people are unlikely to have health effects that can be associated with such exposures. PCBs were not detected in air at Nassau Lake, and also were not detected in surface water except for one sample during heavy runoff. The level of PCBs in this one sample was below the state drinking water standard. Therefore, exposures to PCBs through inhalation or while swimming are unlikely to be harmful. The ATSDR reviewed the DOH analysis and concurred with the DOH conclusions.

RECOMMENDATIONS

Potable water treatment systems should continue to be maintained and monitored to prevent exposure to site related contaminants in drinking water from private wells.

The potential for exposure to site related contaminants in soil vapor should be evaluated in areas where previous evaluations have not been made (north, east and west of the site).

Anglers should follow the DOH's health advisory for consumption of fish in Nassau Lake and the other affected water bodies. These fish consumption advisories are for the Valatie Kill, Nassau Lake, and Kinderhook Lake.

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he fish consumption health advisory is as follows:

Women under 50 years of age and children under 15 years of age should not eat any fish from the Valatie Kill from County Route 18 downstream to Nassau Lake or between Nassau Lake and Kinderhook Lake, and from Nassau and Kinderhook Lakes.

Women over 50 years old and men over 15 years old should follow the waterbody specific advice below:

- “Don’t Eat” any fish species taken from the Valatie Kill from County Route 18 downstream to Nassau Lake and Nassau Lake itself.
- “Eat up to one meal per month” for American eel, bluegill and redbreasted sunfish from the Valatie Kill from Nassau Lake to Kinderhook Lake
- “Eat up to one meal per month” for American eel taken from Kinderhook Lake.
- The general health advisory of “eat up to four one-half pound fish meals per month” applies to other fish species in the Valatie Kill from Nassau Lake to Kinderhook Lake and in Kinderhook Lake.

NEXT STEPS

1. The New York State Department of Environmental Conservation (DEC) or EPA will continue to oversee monitoring and maintenance of potable water treatment systems to prevent exposure to site related contaminants in drinking water. DOH will continue to review these sampling results and make recommendations if further action is needed.
2. DEC or EPA will evaluate the potential for exposure to site related contaminants in the soil vapor media north, east and west of the site. DOH will review the results of this work and make recommendations if further public health actions are needed.
3. The DOH will continue to support, re-evaluate as needed and encourage people to adhere to the DOH health advisory for consumption of fish in Nassau Lake and the other affected water bodies. DOH will continue to make fish consumption advisory signs available to organizations wishing to further post signs for these water bodies.

FOR MORE INFORMATION

If you have questions about the environmental investigation of the Dewey-Loeffel Landfill, please contact the EPA at 212-637-3030. More information about the site can also be found at <http://www.epa.gov/region02/superfund/npl/dewey/>. If you have questions about this health consultation, please contact Mr. Christopher Doroski of the DOH at 518-402-7860 or 1-800-458-1158.

BACKGROUND AND STATEMENT OF ISSUES

Statement of Issues

The ATSDR and DOH are responsible for evaluating human exposures to chemicals released into the environment, evaluating the public health implications of such exposures, making recommendations to protect public health, and determining the need for further public health actions. The ATSDR released a Health Consultation in May of 2003 (ATSDR 2003) based, in part, on an evaluation that the DOH completed for Rensselaer County Environmental Management Council in 2000 regarding health concerns from exposure to PCBs in residential soils and in Nassau Lake (DOH 2000).

Since the final release of the 2003 Dewey Loeffel Health Consultation, additional environmental sampling has produced data for off-site groundwater and private well water. This health consultation updates previously identified exposure pathways and identifies soil vapor intrusion as an additional exposure pathway that needs to be evaluated for the site. Additionally, this update is required because the United States Environmental Protection Agency (EPA) nominated the site to the National Priorities List (NPL) in March of 2010 and added it to the NPL on March 10, 2011.

Background

Nassau Lake is a man-made, 172-acre impoundment of the Valatie Kill Creek. Although the properties that surround the lake are all privately owned, the lake is used for recreation by the public as well as residents. In the late 1970s, fish and sediment in the lake were found to be contaminated with PCBs from the Dewey Loeffel Landfill site, which is about 2.5 miles upstream from the lake (DOH, 2003). The levels of PCBs in Nassau Lake sediments range from less than 0.08 milligrams per kilograms (mg/kg) to 9 mg/kg. The average PCB concentration in the lake's sediment is 0.86 mg/kg.

The Dewey Loeffel Landfill site is a landfill that operated from 1952 until around 1970, prior to regulations governing such activities. Operations ceased in the early 1970s and the site was covered with local soil and graded. In the late 1970s, after the New York State Inactive Hazardous Waste Site Registry was established, the DEC, along with the DOH and the Rensselaer County Health Department (RCHD), initially investigated the site and the potentially affected area, including Nassau Lake.

This effort resulted in a 1980 agreement between the State and the responsible parties to further investigate and remediate the site. In 1984, a clay barrier wall, a cap, and a leachate collection system within the barrier wall (to control the level of leachate within the cell) were completed. Since that time, an investigation confirmed that groundwater is contaminated by volatile organic compounds in the area south of the site. Under DEC oversight, the General Electric Company (GE) provided carbon filters on private drinking water wells to the south and to the north of the site.

In 1980, because of elevated levels of PCBs (primarily Aroclor 1260), found in certain species of fish, DOH issued fish consumption advisories for three water bodies affected by contamination from the landfill: the Valatie Kill, Nassau Lake, and Kinderhook Lake (DOH 2011). Women under 50 years of age and children under 15 years of age should not eat any fish from the Valatie Kill from County Route 18 downstream to Nassau Lake or between Nassau Lake and Kinderhook Lake, and Nassau and Kinderhook Lakes. All others should follow the water body specific advice below.

- “Don’t Eat” any fish species taken from the Valatie Kill from County Route 18 downstream to Nassau Lake and Nassau Lake itself.
- “Eat up to one meal per month” for American eel, bluegill and redbreasted sunfish from the Valatie Kill from Nassau Lake to Kinderhook Lake
- “Eat up to one meal per month” for American eel taken from Kinderhook Lake.

Additional information related to the DOH fish advisory can be obtained at:
<http://www.health.state.ny.us/environmental/outdoors/fish/docs/fish.pdf>

Between 1978 and 1980, preliminary investigations of the Dewey Loeffel Landfill site were done by the DEC, DOH, and the RCHD. Since 1980, GE and an environmental consulting firm under contract with GE have done more extensive investigation of the on-site and off-site areas. More information on these investigations can be found at:
<http://www.epa.gov/region02/superfund/npl/dewey/>

Community Health Concerns

Public informational meetings have been held by the Town of Nassau, the Nassau Lake Improvement Association, and the State throughout the time when these site investigations were being conducted. In 1988, further environmental sampling was performed and the State initiated a lawsuit, the resolution of which ultimately required GE to investigate off-site contamination.

From 1988 to the present, considerable community involvement regarding the site has taken place. The DOH and DEC have had extensive interaction with the community regarding their concerns over potential environmental contamination and specific health concerns. During this twenty-three year period, meetings were held with the Nassau Lake Association, the Citizens Environmental Coalition (CEC), the Rensselaer County Legislature, the Town of Schodack, the Town of Nassau supervisors and boards, the Town of Nassau Toxic Waste Committee, the citizen's group UNCAGED (United Neighbors Concerned about GE and the Dewey Loeffel Landfill), and the general public. The DOH has worked closely with the stakeholders (including representatives from the Towns of Nassau and Schodack, CEC, Nassau Lake Association, and UNCAGED) to address concerns about the PCB contamination of Nassau Lake and volatile organic compound contamination in private drinking water wells.

Nassau Lake Fish

The DOH has undertaken several initiatives to inform the public about the Nassau Lake fish advisory. A variety of outreach and education efforts have been made by the DOH and local community groups to make sure that people who live around Nassau Lake are aware of the fish advisory and risks of eating fish taken from the lake. Fish advisory information and signage has been distributed to property owners by the DOH as well as posted in public access areas around the lake. Additional outreach and education efforts have been made regionally to anglers who may travel to these water bodies to fish. Annual fish sampling is required by the 2002 Record of Decision for the Dewey Loeffel Landfill site (DEC 2002).

Private Drinking Water Wells

Citizens living downgradient of the landfill are concerned with volatile organic compounds contaminating the drinking water they obtain from their private wells. No sample of private well water has ever contained detectable PCB contamination. Monitoring by the DOH around the landfill began in the late 1970's. By 1992, five private homeowner wells (referred to as wells A through E in this health consultation) were found to be contaminated from the Dewey Loeffel landfill. All but one of those wells are still in use and, since discovery of exposures to contamination, have had water treatment systems installed and maintained on a periodic schedule by GE's consultant, under DEC and DOH oversight (for more details, see ATSDR 2003).

Recent Site Visit

In August of 2010, DOH inspected and sampled the system that treats Wells B and C after receiving an odor complaint from the homeowner. Laboratory results of the sampling confirmed the integrity of the treatment system and no site related contaminants were present in the finished drinking water.

DISCUSSION

A. Environmental Contamination and Exposure Pathways

Media of Concern and Exposure Pathways

Exposure pathways are summarized in Appendix A, Table 1.

Nassau Lake Soils, Sediments, Outdoor Air and Surface Water

The DOH (2000) evaluated potential exposures to PCBs in Nassau Lake sediments and soil. DOH estimated exposures based on the levels of PCBs detected in lake sediments as well as soils on lake properties that were prone to flooding, assuming a child is exposed by ingestion and absorbing PCBs through the skin. The estimated

exposures were about 500 times lower than exposures that have caused adverse health effects in animals. DOH (2000) also reviewed several studies that measured PCB levels in serum from people who lived near sites having soil or sediments containing PCBs at levels generally higher than those detected at Nassau Lake. PCB levels in the people's serum were not above those of the general population unless they had eaten PCB-contaminated fish. These evaluations (DOH, 2000) suggested that exposures to PCBs in Nassau Lake sediments and soil are likely to be small and people are unlikely to have health effects that can be associated with such exposures. However, the DOH could not rule out that people exposed through these pathways may have some, although difficult to detect, increases in PCB body burdens (DOH 2000).

PCBs were not detected in air at Nassau Lake (detection limit 0.004 micrograms per cubic meter - mcg/m³), and also were not detected in surface water except for one sample during heavy runoff. The level of PCBs in this sample was below the state drinking water standard. Therefore, exposures to PCBs through inhalation or while swimming are unlikely to be harmful. The ATSDR (ATSDR 2003) reviewed the DOH analysis and concurred with the DOH conclusions.

Private Drinking Water Wells

In 2003, ATSDR evaluated exposure to site-related contaminants found in private drinking water wells (for more details, see ATSDR 2003). The estimated exposures indicate that persons who used water from two wells for up to four years would have a low increased risk of experiencing an adverse health effect. Wells B&C were first found to be contaminated in 1992, having been found to be free from site-related contamination in 1988. No one is believed to have consumed contaminated water from the other private wells before treatment was installed.

Five private wells near the Dewey Loeffel Landfill site (including the two mentioned above) were still contaminated with site-related volatile organic compounds in 2010. Specifically, these volatile organic compounds include trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*cis*-1,2-DCE), 1,2-dichloroethane (1,2-DCA), tetrachloroethene (PERC), methylene chloride, chlorobenzene, benzene and toluene. PCBs have never been detected in a sample of private well water from around the landfill.

The five contaminated residential wells have consistently shown site related contaminants and their break down products at concentrations above New York State public drinking water standards (see Table 1). The DOH drinking water standard (Part 5, Subpart 5-1, 10NYCRR, Public Drinking Water Systems, Public Health Law, Section 225) for these chemicals is five micrograms per liter. Wells B and C are located on the same property. However, Well B is the only well that provides potable drinking water to two separate occupied dwellings on that property. Although Well C is currently used for monitoring purposes the potential exists for it to be reactivated and used as a potable source.

Table 1. Site Related Chemicals Detected in Samples Collected from Private Wells from 2004-2010. Water Samples were taken prior to the Water Treatment System.

(All values in micrograms per liter.)

| Chemical | Well A | Well B | Well C* | Well D | Well E |
|----------------------------------|-----------|-----------|------------|-----------|----------|
| 1,1 - dichloroethene | ND** | ND - 13 | ND - 3.4 | ND - 4.5 | ND - 1.8 |
| 1,2 - dichloroethane | ND - 0.5 | ND - 52 | 2.0 - 11 | ND - 9.5 | ND - 0.8 |
| benzene | ND - 4.5 | ND - 195 | 11 - 68 | 1.6 - 60 | ND - 13 |
| chlorobenzene | ND | ND - 15 | 1.1 - 9.7 | ND - 8.6 | ND - 25 |
| <i>cis</i> -1,2 - dichloroethene | 0.6 - 1.8 | ND - 114 | 4.1 - 36 | ND - 43 | ND - 1.1 |
| methylene chloride | ND -0.8 | ND - 2.4 | ND - 3.7 | ND - 32 | ND -1.7 |
| tetrachloroethene | ND | ND - 4.6 | ND - 2.1 | ND - 3.1 | ND |
| trichloroethene | 0.5-57 | 26 - 1450 | 250 - 1100 | ND - 1300 | ND - 35 |

* Well C is only used for monitoring, not for drinking.

** ND - chemical not detected in sample. Detection limits generally 0.5 micrograms per liter.

Current Exposure to Site Related Contaminants in Private Wells

All private potable water wells with contaminants from the Dewey Loeffel Site have had, since 1992, water treatment systems installed and maintained on a periodic basis by GE's consultant under the oversight of DEC and DOH. To ensure the effectiveness of the water treatment systems, post treatment water samples are collected and submitted for laboratory analysis periodically. No chemical detections above laboratory method detection limits have been reported to date in the post treatment water samples.

Groundwater Investigation and Sampling

A comprehensive groundwater investigation and sampling program has been undertaken by GE since the release of the 2003 ATSDR Health Consultation. This includes further delineation of the extent of site related contaminants in the shallow and deep groundwater aquifers and the sampling of private wells. No additional private wells beyond Wells A-E were found to be affected. More information about the groundwater investigations can be found at <http://www.epa.gov/region02/superfund/npl/dewey/>.

Soil Vapor Evaluation

Volatile organic compounds in groundwater or soil may move into the air spaces within the soil (called soil vapor). This vapor may migrate into overlying buildings and affect indoor air quality (DOH 2006a). This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor

intrusion. In May and December of 2010, shallow groundwater samples were collected at two homes one-half mile south of the site. The absence of site related chemicals in the shallow groundwater indicate that soil vapor intrusion is not likely to occur at these locations, although the deeper aquifer, from which the private wells take water, is contaminated. However, the lack of site related chemicals in the shallow groundwater data collected south of the site does not preclude the need to further evaluate the potential for soil vapor intrusion in other areas. A separate shallow groundwater/soil vapor media investigation is needed in the other directions from the landfill before conclusions about the possibility of completed and potential future exposure pathways via soil vapor intrusion can be made.

B. Public Health Implications – Adult and Children’s Health Concerns

In the 2003 Health Consultation, ATSDR performed an evaluation of exposure to site-related contaminants found in private drinking water wells. The evaluation concluded that persons who used water from these wells would have a low increased risk (see Appendix B) for adverse health effects in part because of the limited duration of exposure to trichloroethene from 1988 when wells first contained contamination to 1992 when the chemicals were first discovered and addressed (for more details, see ATSDR 2003).

Some studies of people exposed for long periods of time to high levels of TCE in workplace air, or elevated levels of TCE in drinking water, show an association between exposure to TCE and increased risks for certain types of cancer, including cancers of the kidney, liver and esophagus, and non-Hodgkin’s lymphoma (Wartenberg et al., 2000). One study showed an association between elevated levels of TCE in drinking water and effects on fetal development. Other studies suggest an association between workplace TCE exposure and reproductive effects (alterations in sperm counts) in men (DOH, 2006b). We do not know if the effects observed in these studies are due to TCE or some other possible factor (for example, exposure to other chemicals, smoking, alcohol consumption, socioeconomic status, lifestyle choices). Because all of these studies have limitations, they only suggest, but do not prove, that exposure to TCE can cause cancer in humans and can cause developmental and reproductive effects as well. In laboratory animals, exposure to high levels of TCE has damaged the central nervous system, liver and kidneys, and adversely affected reproduction and development of offspring (ATSDR, 1997; DOH 2006b). Lifetime exposure to high levels of TCE has caused cancer in laboratory animals (ATSDR, 1997; DOH 2006b).

Based on the available data, additional exposure to site-related contaminants has not occurred since water treatment systems were provided to affected households. No new data have been presented to the DOH or ATSDR that would require a further evaluation of public health implications from exposure to site related contaminants.

The DOH and ATSDR consider children when evaluating all exposure pathways and potential health effects from environmental contaminants. Exposure of children and any potential increased sensitivity to PCB and TCE exposures was taken into account when evaluating the health risks associated with the site (DOH 2000).

C. Health Outcome Data Evaluation

ATSDR (ATSDR 2003) reviewed DOH's evaluation of cancer incidence among residents of the geographic areas (zip codes) that include or are adjacent to Nassau Lake and the site and agreed with the evaluation methods and findings. Based on the evaluation methods, the DOH concluded that the overall number of cancers diagnosed among residents of the study area during the period 1989-1998 was not elevated above the number of cancers that would have been expected. DOH's conclusion was also true for individual cancers except for lung cancer among females who lived within zip code 12062 (East Nassau) for which there was a statistically significant excess. According to the DOH evaluation, cancer of the lung and bronchus is one of the most common cancers in the state, with smoking being the most common cause. Of these residents for whom DOH could ascertain smoking status, all were identified as either current or former smokers at the time of diagnosis.

In addition, the ATSDR evaluated the soil, sediment, surface water, air, and drinking water exposure pathways related to the Dewey Loeffel Landfill and the most current scientific literature related to the potential health effects of exposure to PCBs and TCE to determine the need for follow-up health studies or investigations. ATSDR did not believe that any follow-up health study or investigation was indicated (ATSDR 2003).

No further health study or investigation has been done in this area and there are no new environmental data or public health findings that indicate that further work is warranted at this time.

CONCLUSIONS

The DOH and ATSDR conclude that volatile organic compounds found in private wells are not expected to harm people's health because exposures are being mitigated by the use and maintenance of treatment systems (see Appendix C).

The DOH and ATSDR conclude that data are sufficient within one half mile south of the site to indicate that soil vapor intrusion is not occurring in this direction. Recent shallow groundwater sampling data indicate that there are no site related contaminants in this media and, therefore, soil vapor intrusion in this direction is unlikely.

The DOH and ATSDR conclude that eating fish from Nassau Lake and other affected waters could harm people's health if people do not follow the DOH fish consumption advisories for these waters.

Exposures to PCBs in soils and sediments in and along the shoreline of the lake, outdoor air, and surface water are likely to be small and are not expected to harm people's health.

RECOMMENDATIONS

Continue maintaining and monitoring water treatment systems on private wells to prevent exposure to site related contaminants.

Assess the potential for exposure to site related contaminants in the soil vapor in areas north, east and west of the site.

The public should follow the DOH's health advisory for consumption of fish in Nassau Lake and the other affected water bodies. The fish consumption health advisory is as follows:

Women under 50 years of age and children under 15 years of age should not eat any fish from the Valatie Kill from County Route 18 downstream to Nassau Lake or between Nassau Lake and Kinderhook Lake, and Nassau and Kinderhook Lakes.

Women over 50 years old and men over 15 years old should follow the waterbody specific advice below:

- “Don't Eat” any fish species taken from the Valatie Kill from County Route 18 downstream to Nassau Lake and Nassau Lake itself.
- “Eat up to one meal per month” for American eel, bluegill and redbreasted sunfish from the Valatie Kill from Nassau Lake to Kinderhook Lake
- “Eat up to one meal per month” for American eel taken from Kinderhook Lake.
- The general health advisory of “eat up to four one-half pound fish meals per month” applies to other fish species in the Valatie Kill from Nassau Lake to Kinderhook Lake and in Kinderhook Lake.

DOH should update the advisory as needed to inform people about the risks of exposure to contaminants in fish taken from the affected water bodies and consumed.

PUBLIC HEALTH ACTION PLAN

DEC or EPA will continue to oversee monitoring and maintenance of potable water treatment systems to minimize exposure to site related contaminants in drinking water. DOH will continue to review these results and make recommendations if further action is needed.

DEC or EPA will delineate and evaluate the potential for future exposure to site related contaminants in the soil vapor media north, east and west of the site. DOH will review the results of this work and make recommendations if further public health actions are needed.

The DOH will continue to support, re-evaluate as needed and encourage people to adhere to the DOH health advisory for consumption of fish in Nassau Lake and the

other affected water bodies. DOH will continue to make fish consumption advisory signs available to organizations wishing to further post signs for these water bodies.

The DOH will continue to work with the DEC and EPA on the investigation and additional remedial actions at the Dewey Loeffel Landfill and make public health recommendations to the environmental agencies as needed.

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APPENDIX A
Tables

Table 1 Exposure Pathways Summary Table for Dewey-Loeffel Landfill site

| Pathway | Pathway Exposure Pathway Elements | | | | Pathway Classification |
|------------------------------------|------------------------------------|-----------------------|--|------------------------------|---|
| | Environmental Medium | Route of Exposure | Location | Exposed Population | |
| Groundwater | Private Residential Wells | Ingestion, Inhalation | Residences | Adults and Children | Past - Completed for several homes to the south Present & Future - Mitigated and monitored |
| Soil Vapor Intrusion | Indoor Air | Inhalation | Residences | Adults and Children | Past & Current - Eliminate to the south, data Gap to the east, west and north |
| Fish Consumption | Fish | Ingestion | Valatie Kill, Nassau Lake, Kinderhook Lake | Anglers, Adults and Children | Past, present & future completed, but mitigated with fish advisory |
| Ambient Air | Outdoor Air | Inhalation | near Nassau Lake | Adults and Children | Past, present & future -eliminated |
| Surface water, sediments and soils | Surface water, sediments and soils | dermal, ingestion | Nassau Lake and Shore line | Adults and Children | Past, present & future -eliminated |

APPENDIX B

DOH Procedure for Evaluating Potential Health Risks
for Contaminants of Concern

Appendix B

DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Dewey Loeffel Landfill site, the DOH assessed the risks for cancer and non-cancer health effects.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by the EPA or, in some cases, by the DOH. The following qualitative ranking of cancer risk estimates, developed by the DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low," then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Qualitative Descriptors for Excess Lifetime Cancer Risk

| <u>Risk Ratio</u> | <u>Qualitative Descriptor</u> |
|--|-------------------------------|
| equal to or less than one per million | very low |
| greater than one per million to less than one per ten thousand | low |
| one per ten thousand to less than one per thousand | moderate |
| one per thousand to less than one per ten | high |
| equal to or greater than one per ten | very high |

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper-bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk. There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk may be judged acceptable. An increased lifetime cancer risk of one in one million or less is generally considered negligible and not a public health concern. The level of risk is typically used as a "target level," "screening level," or "goal", which when exceeded does not necessarily

imply that risk reduction measures should be pursued but will trigger more careful evaluation of the situation. Cancer risks greater than one in ten thousand (10^{-4}), on the other hand, typically trigger actions to lower exposures. When cancer risk estimates are between one in one million (10^{-6}) and one in ten thousand (10^{-4}), a risk management decision must be made on a case-by case basis whether or not to pursue risk reduction measures. The one in one million (10^{-6}) risk level is used as a starting point for analysis of remedial alternatives which reflects a preference for managing risks at the more protective end of the risk range, all other things being equal. The ultimate risk management decision should consider judgments on not only the strength of the scientific evidence regarding carcinogenicity, but also the actual potential for chronic or lifetime exposure, other sources and levels of everyday exposure, our ability to detect the chemical, the availability and costs of risk reduction options, the societal benefits of the regulated activity, compliance with existing regulations, and, in many cases, the risks, benefits and costs of alternatives.

For non-carcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects) developed by the EPA, ATSDR and/or DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptors for Non-carcinogenic Health Risks

| Ratio of Estimated Contaminant Intake to Risk Reference Dose | Qualitative Descriptor |
|--|------------------------|
| equal to or less than the risk reference dose | minimal |
| greater than one to five times the risk reference dose | low |
| greater than five to ten times the risk reference dose | moderate |
| greater than ten times the risk reference dose | high |

Non-carcinogenic effects, unlike carcinogenic effects, are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number that reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive sub-populations (for example, children or the elderly), extrapolation from animals to humans and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to

be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for non-cancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential non-cancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure and the strength of the toxicologic data.

APPENDIX C

Conclusion Categories and Hazard Statements

Conclusion Categories and Hazard Statements

ATSDR has five distinct descriptive conclusion categories that convey the overall public health conclusion about a site or release, or some specific pathway by which the public may encounter site-related contamination. These defined categories help ensure a consistent approach in drawing conclusions across sites and assist the public health agencies in determining the type of follow-up actions that might be warranted. The conclusions are based on the information available to the author(s) at the time they are written.

1. Short-term Exposure, Acute Hazard “ATSDR concludes that...could harm people’s health.”

This category is used for sites where short-term exposures (e.g. < 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid public health intervention.

2. Long-term Exposure, Chronic Hazard “ATSDR concludes that...could harm people’s health.”

This category is used for sites that pose a public health hazard due to the existence of long-term exposures (e.g. > 1 yr) to hazardous substance or conditions that could result in adverse health effects.

3. Lack of Data or Information “ATSDR cannot currently conclude whether...could harm people’s health.”

This category is used for sites in which data are insufficient with regard to extent of exposure and/or toxicologic properties at estimated exposure levels to support a public health decision.

4. Exposure, No Harm Expected “ATSDR concludes that ... is not expected to harm people’s health.”

This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.

5. No Exposure, No Harm Expected “ATSDR concludes that ...will not harm people’s health.”

This category is used for sites that, because of the absence of exposure, are not expected to cause any adverse health effects.

APPENDIX D

**Draft Health Consultation - Comment Form
Dewey Loeffel Landfill**

**New York State Department of Health
Draft Health Consultation - Comment Form
Dewey Loeffel Landfill**

Thank you for reviewing the draft health consultation. The public comment period gives you a chance to let us know if you have questions or additional information related to the site that should be included in this report. This reply form is broken into three sections - optional information (to update our mailing list), general comments (how helpful is the information to you) and specific comments (specific to the main sections in the report). Please write any questions or comments in the appropriate spaces below.

Please return your completed form by February 29, 2012. Additional information and documents about this site can be found at the New York State Department of Health (DOH) website at:
<http://www.health.ny.gov/environmental/investigations/deweyloeffel/>

Optional Information

First Name _____ Last Name _____

Address _____

Contact number (with best time to reach you) _____

E-mail Address _____

General Comments

1. Was the information in this health consultation clear and understandable? (Rate on a scale of 1 to 5, please circle your choice)

Not clear and understandable 1 2 3 4 5 Very clear and understandable

2. Does the document take into account all relevant site information? (Check one) Yes No Not sure

If no, please tell us what's missing _____

3. Does the document identify and respond to community concerns, including your own concerns? (Check one)

Yes No Not sure

If no, please tell us what concerns are missing _____

4. After reading this document, do you have a better understanding of how the site might affect your or your community's health? (Rate on a scale of 1 to 5, please circle your choice)

Do not have a better understanding 1 2 3 4 5 Have a much better understanding

Specific Comments

Note: Please refer to page numbers in the report when writing your comments

SUMMARY Section: _____

BACKGROUND AND STATEMENT OF ISSUES Section: _____

DISCUSSION Section: _____

CONCLUSIONS Section: _____

RECOMMENDATIONS Section: _____

PUBLIC HEALTH ACTION PLAN Section: _____

OTHER: _____

Please return your completed comment form to:

New York State Department of Health
Bureau of Environmental Exposure Investigation
Flanigan Square, 547 River Street, Room 300
Troy, NY 12180-2216

Fax#: (518) 402-7859

For questions, please call the DOH at (518) 402-7880 or email documentcomments@health.state.ny.us

