

Letter Health Consultation

ENVIRONMENTAL CONCERNS AT 334 CHESTER STREET
FORMER STATE STREET DUMP
ST PAUL, MINNESOTA

CERCLIS #MND985678994

OCTOBER 25, 2012

Prepared by:
Minnesota Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Health Consultation: A disclaimer

The Minnesota Department of Health (MDH) Site Assessment and Consultation (SAC) unit collaborates with the Agency for Toxic Substances and Disease Registry (ATSDR), the lead federal public health agency, to prepare health consultation documents to determine if exposure to contaminants can harm people's health and to prevent and reduce exposures and illnesses. A health consultation is a written response to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material, and considers the levels of hazardous substances at a site, whether people might be exposed to contaminants, by what pathways, and what potential harm the substances might cause to people. In order to prevent or mitigate exposures, a consultation may lead to specific actions and recommendations, 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 or exposure studies to assess exposure, conducting health studies, characterizing demographics, and/or providing health education for health care providers and community members.

ATSDR provides technical assistance and funding to MDH to help identify and evaluate environmental health threats to communities using the best science, taking responsive public health actions, and providing trusted health information. While this health consultation was supported by funds from a cooperative agreement with ATSDR, it was not reviewed by ATSDR.

The conclusions and recommendations presented in this health consultation are based on an analysis of the environmental sampling data and information made available to MDH within a limited time frame. The availability of additional sampling data, new information and/or changes in site conditions could affect the conclusions and recommendations presented in this document. MDH will consider reviewing additional future data related to the site, if made available and deemed appropriate.



Protecting, maintaining and improving the health of all Minnesotans

October 25, 2012

Tim Myers, Facilities Management
Minnesota Department of Health
625 Robert St. N.
St. Paul, MN 55164-0975

Subject: Environmental Concerns at 334 Chester Street, Former State Street Dump

Mr. Myers,

This Letter Health Consultation is in response to a request to look into environmental issues that may be present at 334 Chester Street due to its location on top of a former city dump, the State Street Dump. MDH is looking for warehouse and office space and is considering this space which is known as Building D in a larger complex called the Riverview Business Plaza.

Previous investigations in the area of the former State Street Dump have shown that wastes and/or the natural organic material in the soil are generating methane which is migrating in or near many buildings designed for either commercial, office, warehouse, or light industrial use.

Methane in soil gas presents a safety concern since it can accumulate in structures to concentrations that are explosive. Methane forms an explosive atmosphere when present at concentrations between 50,000 parts per million (ppm) or 5% (lower explosive limit) and 150,000 ppm or 15% (upper explosive limit) in air. At concentrations greater than 5%, methane may displace enough oxygen in enclosed atmospheres to be an asphyxiant. Methane is not generally considered to have direct chemical toxicity. Volatile organic compounds (VOCs) in soil gas may also enter structures and accumulate to levels that may present a health concern. The health effects from exposures to VOCs vary and often are the result of long-term exposures at low-concentrations. Methane detected within buildings may indicate the potential for entry of significant concentrations of other VOCs and the need for their evaluation.

The 1993 Phase I site assessment conducted for the Riverview Business Park noted that a previous report recorded a petroleum odor in a boring of the fill material at seven to nine feet for the "south building along Chester Street." It was also reported that another boring at 13 feet had a strong odorous gas which was later tested and found to be methane. Since methane is odorless, other gases, possibly including hydrogen sulfide, may have been present.

Data collected in the early 1990s reported methane in soil gas at 25% just outside of Building D. Methane has previously been detected at levels of concern in indoor air in Building D and therefore a passive venting system was installed. A passive system relies on the convective flow of air upward in a

vent pipe to exhaust the methane gas or other VOCs out a roof vent. A methane alarm has been installed in the mechanical room of Building D. Bi-annual air screenings are conducted for methane at 57 interior locations and the three roof vents in Building D. Below are the ranges of results of the methane monitoring since December of 2007, both at the passive venting system roof vents and in indoor air:

Building D Bi-Annual Methane Monitoring

	roof vents (ppm)	interior (ppm)
July 2012	0	0-7
December 2011	0-2,982	0
June 2011	0-192	0
November 2010	0-2,2887	42-203
May 2010	0-3,066	0-22
November 2009	0-5,420	46-233
June 2009	2-247	2-41
December 2008	1-6,338	52-326
July 2008	0	0-120
December 2007	1,385-4,205	8-248
June 2007	0-1,007	0
December 2006	0-2,672	113-388

It appears from the methane monitoring data that the passive venting system is working as designed. The highest indoor air measurement in the past six years has been 388 ppm methane, which is less than 1% of the lower explosive limit. Elevated methane concentrations are found at the roof vents, which shows that methane in soil gas is being pulled into the vent piping and discharged to the roof. Concentrations at both the roof vents and interior air are higher in the winter. Heating systems tend to cause buildings to be more negatively pressured as they are designed to keep warm air inside. Snow cover or frozen ground can also trap soil gas beneath the ground causing it to migrate further.

Buildings in the former dump area have experienced floor settlement, which may cause cracks in floors and walls. If cracks are present they may create pathways for potential movement of methane soil gas into buildings.

No VOC monitoring has been done near or inside of Building D, or any other buildings on or near the former State Street Dump site. If VOCs were in the soil gas and intruding into the building, they would also be venting with the methane to the roof. However, since not all of the methane is vented to the roof, it is reasonable to look closer at the possibility of VOC contamination. According to the EPA, municipal solid waste landfill gas is roughly 50 percent methane and 50 percent carbon dioxide and water vapor. It contains less than 1 percent non-methane organic compounds.

At roughly 200 ppm methane, as reported in the interior air in November of 2010, and assuming VOCs at <1% of the highest value of 400 ppm total gas (i.e. 4 ppm) there is some potential for VOCs to be present. VOC air screening values are very low, measured in tenths to hundredths of parts per million. Therefore, it is possible that there could be health concerns with VOCs even at less than 1% of total

landfill gases that are intruding into Building D. Below are the current MPCA Intrusion Screening Values for workplace exposures for common contaminants that have been converted to ppm.

Common air pollutants identified in landfill gases and their health screening values in ppm

	Workplace screening value $\mu\text{g}/\text{m}^3$ *	Workplace screening value in ppm
Benzene	13	0.004
Ethylbenzene	3000	0.7
Tetrachloroethylene (PCE)	60	0.009
Toluene	10,000	2.7
Trichloroethylene (TCE)	8	0.001
Vinyl Chloride	3	0.001
Xylene	300	0.07

*Current MPCA Industrial Intrusion Screening Values

Virtually no investigation of VOC contamination at the site has occurred. Limited groundwater monitoring conducted in 1995 found low levels of two VOCs (benzene at 1.2 ppb and n-butylbenzene at 1 ppb). With limited resources and without further justification it has not been a priority for MPCA to pursue investigation. However, the lack of VOC analysis is only due to the time period this site was investigated. If a parcel within the dump impact boundary were to be redeveloped today, a VOC vapor intrusion investigation would be required. Current MPCA landfill gas guidance, "Guidelines for Monitoring for Landfill Gas at and Near Former Dumps," recommends that if combustible gas is found in ambient air it should be determined if the elevated readings are associated with VOCs, even at methane levels as low as 10 to 50 ppm.

We joined you for a site visit on October 23, 2012. We located the three passive venting pipes on the roof of the building. Two of the three pipes were visible in the interior space. There were cracks in the foundation near the vent pipes. We observed the evidence of the floor sinking, which appeared to have sunk approximately 2.5-3 inches since the last time the concrete floor had been replaced 15-18 years ago. We were told that the previous tenant used the space to assemble circuit boards, which to our knowledge wouldn't have included the use of heavy machinery that may promote floor settling. It is unknown if the floor settling has impacted or could impact underground utilities. The building was adjacent to a flood berm and we speculated that nearby flood water could put pressure on the building. Both the use of heavy equipment on the floor and groundwater movement can increase the amount of sub-slab vapors entering the building.

It is our recommendation that the building be investigated for VOC vapor intrusion. Since the building is currently vacant, indoor air sampling can be done without interference from products and materials typically found in warehouse or office buildings. It is recommended that at least three samples be taken initially: a sub-slab soil gas sample, an indoor air sample, and an air sample from one of the roof vents. They should be analyzed for the Method TO-15 VOC list that is commonly used for vapor intrusion investigations. If vapors are found, fans may need to be installed to actively draw the soil gas vapors to the roof vents. Sealing of all of the perimeter cracks and joints in the foundation would need to be completed for the vent fans to properly vent the sub-slab soil gas. The sealant will need to be

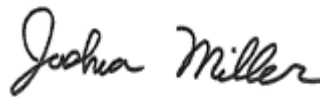
monitored to ensure that the floor movement does not affect the sealing. If fans are installed, confirmation sampling would need to be done to make sure the system is working effectively.

Please don't hesitate to contact us for additional support.

Sincerely,



Emily Hansen, Site Assessment and Consultation Unit



Josh Miller, Indoor Air Unit

cc: Tom Hogan, Assistant Division Director, MDH
Stephen B. Wellington, Jr., President, Wellington Management, Inc.
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ATSDR did not review this document and is not responsible for the content.