

Health Consultation

Emergency Response to a Fire at
Storage Building of Cranberry Bog

72 Knob Hill Road
Yarmouth, Barnstable County, Massachusetts

**Prepared by the
Massachusetts Department of Public Health**

August 19, 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>

HEALTH CONSULTATION

Emergency Response to a Fire at
Storage Building of Cranberry Bog

72 Knob Hill Road
Yarmouth, Barnstable County, Massachusetts

Prepared By:

Massachusetts Department of Public Health
Bureau of Environmental Health
Environmental Toxicology Program
Boston, Massachusetts

Under a Cooperative Agreement with:
Public Health Service
Agency for Toxic Substances and Disease Registry
U.S. Department of Health and Human Services
Atlanta, Georgia

TABLE OF CONTENTS

I.	SUMMARY	3
II.	BACKGROUND	5
III.	RESULTS AND EVALUATION	6
IV.	DISCUSSION	8
V.	CONCLUSIONS	9
VI.	RECOMMENDATIONS	10
VII.	PUBLIC HEALTH ACTION PLAN	10
VIII.	REFERENCES	11
VIII.	PREPARER	12
IX.	CERTIFICATION	13
X.	FIGURE	14
XI.	APPENDIX	15

I. SUMMARY

INTRODUCTION: This Health Consultation was conducted following an emergency response to a fire on July 10, 2009, in which the Massachusetts Department of Public Health, Bureau of Environmental Health (MDPH/BEH), was notified by the Massachusetts Department of Fire Services HazMat team of a fire at a building containing unknown chemicals at a cranberry bog located at 72 Knob Hill Road in Yarmouth, Massachusetts. The MDPH/BEH Indoor Air Quality (IAQ) and Environmental Toxicology (ETP) programs responded.

The purpose of this health consultation is to evaluate the public health concerns for residents or visitors near the fire who may have come into contact with constituents contained within the burning building. Initial reports indicated that significant amounts of fertilizer was in the burning building.

In response, MDPH/BEH assisted the on-scene responders with determining the specific type of fertilizer and potential health concerns. We also developed a GIS map to identify potential sensitive populations that may have been exposed during the fire (e.g., children participating in outdoor activities at area school). Finally, we advised on-scene responders with final resolution of smoldering fertilizer after the building fire was extinguished.

CONCLUSION: MDPH concludes that breathing fire-related constituents, including those in the fertilizer, was not expected to harm the health of residents or visitors in the area.

BASIS FOR DECISION: The short duration of the fire itself, the favorable meteorological conditions (light winds), the relatively low toxicity of the product involved (N-P-K fertilizer), and the distance of possible sensitive receptors all helped to reduce opportunities for exposure and hence, potential health impacts. In addition, no reports of health impacts or symptoms were reported from any resident, visitor or local health officials to on-scene responders or MDPH/BEH.

NEXT STEPS: At this time, no further public health action is required.

FOR MORE INFORMATION:	If you have concerns about your health, you should contact your health care provider. You may also call MDPH at 617-624-5757 and ask for information on this emergency response to a fire at a cranberry bog storage building or health concerns related to environmental exposures.
--------------------------	--

II. BACKGROUND

At approximately 11:30 AM on Friday, July 10, 2009, the Massachusetts Department of Public Health, Bureau of Environmental Health (MDPH/BEH) received a call from the Massachusetts Department of Fire Services HazMat response team regarding a fire at a storage facility at a cranberry bog located at 72 Knob Hill Road in Yarmouth, Massachusetts. Reportedly, about 20 tons of fertilizer was stored in the burning building.

While waiting for further details on the developing situation, MDPH/BEH Indoor Air Quality and Environmental Toxicology program staff conducted literature searches on possible types of fertilizer that might be used on cranberry bogs. In addition, the MDPH/BEH Geographic Information Center (GIS) staff prepared a GIS map of the area of the fire, including locations of schools that may have been in use for summer school or recreational activities, as well as possible down-wind residential areas (based on nearest available meteorological data). Staff also called the Massachusetts Department of Agricultural Resources (MDAR) Pesticide Bureau to ask if they had information on typical fertilizers used in cranberry bogs. In addition, MDPH/BEH contacted the Executive Director of the Cape Cod Cranberry Growers Association to determine the owner of the bog and get better information on what specifically was stored in the burning facility.

III. RESULTS AND EVALUATION OF AVAILABLE INFORMATION

Further reports from on-scene responders revealed that the fire at the facility began in the late morning and the fire was out by 12:15 PM, with some residual smoke. GIS mapping revealed three schools within five miles of the facility, including a high school and a middle school; a third school for autistic children was very near the middle school location. Based on available wind direction (S/SW) and wind speed (2-7 mph during the fire), the middle school was determined to be potentially downwind, but it was approximately 2-3 miles from the scene of the fire (see Figure 1). Calls to both the middle school and the high school revealed there was no trace of smoke or fire related odors at either location.

A salt water pond was identified to the east (downwind) of the bog, and Route 6, the major roadway through Cape Cod, was south of the bog and the burning storage building. Thus, directly downwind (to the east), smoke would have had to travel across the salt water pond before reaching residential areas. MDPH/BEH did not receive any reports from residents about health concerns related to the smoke or fire. In addition, on-scene responders reported that they had not received any health complaints from nearby residents or recreational users of the salt water pond or other nearby areas.

Approximately 20-30 responding firefighters were treated with minor injuries at a local hospital and released.

The cranberry bog owner, contacted by the Cape Cod Cranberry Growers Association, reported that the facility contained about 18 tons of N-P-K fertilizer, standard nitrogen, phosphorous and potassium based fertilizer used by many homeowners. No other chemicals or pesticides were stored in the facility.

The on-scene coordinator reported there was still some residual fertilizer smoldering in mid-afternoon. They sought MDPH advice on whether to put the residual smoldering out by applying water. Some on-scene responders were reportedly concerned about the potential to impact groundwater in the area, as fertilizer constituents might migrate to local groundwater. A second concern was the potential release of toxic gases from the smoldering fertilizer. The on-scene coordinator had attempted to contact the manufacturer of the fertilizer product (Triple 13 by Helena Company) but the manufacturer did not provide details beyond those available in a Material Safety Data Sheet (MSDS) for the product due to trade secret considerations. The on-scene coordinator sought public health advice on both points.

MDPH/BEH Environmental Toxicology and Indoor Air Quality program staff reviewed the MSDS for the specific fertilizer (Triple 13), and advised the on-scene coordinator that greater concern existed relative to continued formation (while smoldering) of oxides of the minerals present in the fertilizer (e.g., nitrogen oxides) which could cause acute respiratory irritant effects in those exposed. Oxides of nitrogen, phosphorous and potassium are gases that can be released from the combustion of materials containing these elements. The toxicity of oxidizing agents, such as oxides of nitrogen, is related to an inflammatory response usually from the release of acidic or alkaline radicals. These gases interact with tissue causing irritation of eye, nose and throat but may not dissolve until they are well into the respiratory tract, often reaching the lower airways causing cytotoxic effects in the deep lungs. Short-term exposures can increase susceptibility to respiratory infection by bacterial pneumonia or influenza virus (Casarett & Doull, 2001).

Based on the toxicity information on oxides of the minerals present in the fertilizer we advised that it was important to extinguish the fire completely and prevent further formation of respiratory irritants. Based on public health impact, the on-scene responders proceeded to extinguish the smoldering fertilizer with water and the incident ended.

IV. DISCUSSION

The entire incident regarding a fire at a storage facility containing N-P-K fertilizer lasted approximately 6-7 hours in terms of the MDPH/BEH assistance to on-scene responders. MDPH/BEH staff conducted time-sensitive evaluations of possible exposures to downwind receptors and determined that exposure opportunities would have been low or non-existent based on wind direction and speed; distance of downwind sensitive receptors (i.e., children at schools); lack of highly toxic chemicals or pesticides in the cranberry bog storage facility; and short-duration of the fire itself. No offsite ambient air testing

was conducted during or after the response, but no health complaints by any residents or visitors were reported to on-scene responders, to MDPH/BEH, or to the local board of health, whom MDPH/BEH staff also called during the response. Thus, no short or long term effects from exposure opportunities as a result of the fire would be expected.

V. CONCLUSIONS

ATSDR requires that overarching conclusion category statements be used to summarize the findings of a health consultation. Conclusion category statements are selected from site-specific conditions such as the degree of public health hazard based on the presence and duration of human exposure, contaminant concentration, the nature of health effects associated with sited related contaminants, presence of physical hazards, and community health concerns. Therefore, based on the MDPH's evaluation of the available information of constituents possibly released during and after the fire, MDPH concludes that breathing constituents associated with the fire was unlikely to harm the health of nearby residents, children participating in activities at schools located down wind, or other visitors. The reasons for this conclusion included the short duration of the fire, the favorable wind conditions (low wind speed), the distance of the fire from residents and schools where children were participants in outdoor activities, and the lack of any report from residents or visitors of health complaints or symptoms. In addition, MDPH received an MSDS for the fertilizer stored in the burning building and recommended that firefighters promptly extinguish smoldering fertilizer to ensure no further potential exposure could occur to irritant oxide of minerals present in the fertilizer.

VI. RECOMMENDATIONS

MDPH provided recommendations to on-scene responders during the entire event, including possible health effects of burning fertilizer. The MDPH recommends no further evaluation with respect to the fire.

MDPH/BEH programs provide ongoing assistance to Commonwealth residents for chemical or radiological emergency responses, as well as exposures to hazardous materials. Individuals with additional information or questions regarding this health consultation should contact the MDPH/BEH, Environmental Toxicology Program, at 617-624-5757.

VII. PUBLIC HEALTH ACTION PLAN

The purpose of the Public Health Action Plan is to ensure that this health consultation not only identifies potential public health hazards, but also provides a plan of action designed to mitigate and prevent adverse health effects resulting from exposure to hazardous substances in the environment. Included is a commitment on the part of ATSDR/MDPH to follow up on this plan to ensure that it is implemented. At this time, there is no specific public health action to be implemented by ATSDR/MDPH. Copies of this report will, however, be distributed to the local board of health, the Massachusetts Department of Environmental Protection, and the Massachusetts HazMat team for their records.

VIII. REFERENCES

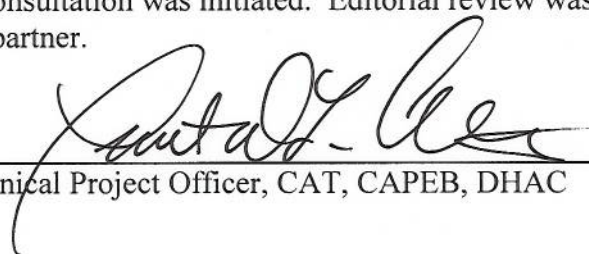
Casarett and Doull's toxicology: the basic science of poisons. 2001. Edited by LJ Casarett, CD Klaassen, J Doull. MacMillan Publishing Company, New York.

IX. PREPARER

This document was prepared by the Bureau of Environmental Health of the Massachusetts Department of Public Health. If you have any questions about this document, please contact Suzanne K. Condon, Director of BEH/MDPH at 250 Washington Street, 7th Floor, Boston, MA 02108

X. CERTIFICATION

The Health Consultation, *Emergency Response to a Fire at Storage Building of Cranberry Bog, 72 Knob Hill Road, in Yarmouth, Barnstable County, Massachusetts* was prepared by the Massachusetts Department 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 that the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.



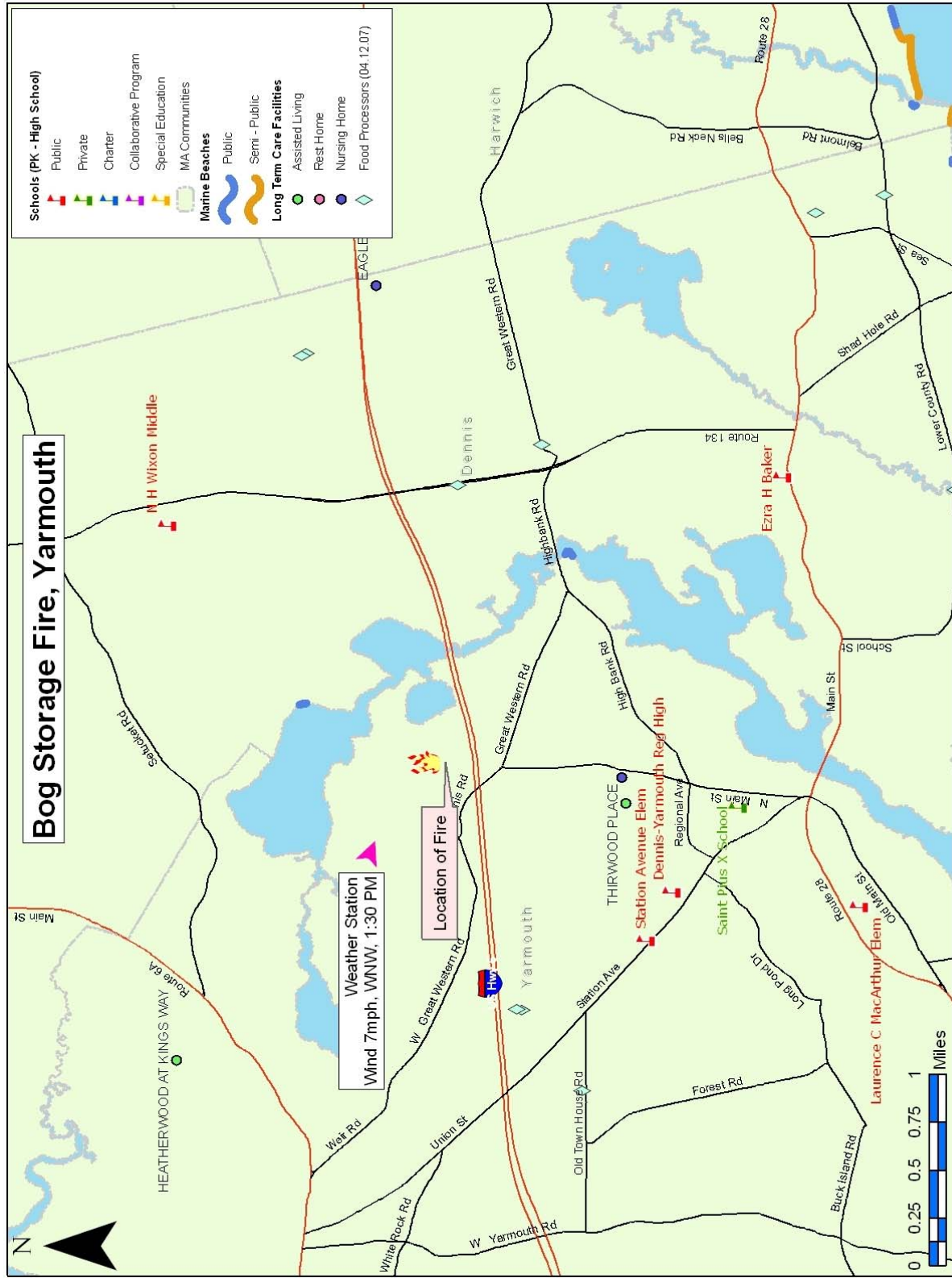
Technical Project Officer, CAT, CAPEB, DHAC

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

XI. FIGURE



XII. APPENDIX