



## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Jennifer Granholm, Governor; Steven Chester, Director

### REMEDIATION AND REDEVELOPMENT DIVISION

INTERNET: <http://www.michigan.gov/deq>

## INFORMATION BULLETIN #3

### TITTABAWASSEE/SAGINAW RIVER FLOOD PLAIN Environmental Assessment Initiative Midland, Saginaw and Bay Counties June 2003

#### Introduction

This is the third in a series of information bulletins intended to inform area communities about progress and future plans regarding the Tittabawassee/Saginaw River Flood Plain Environmental Assessment Initiative. Prior bulletins have included preliminary and/or final results of Phase I (December 2000 to June 2001) and Phase II (April to December 2002) sampling initiatives. Since completion of Phase II sampling in December 2002, the Department of Environmental Quality (DEQ) has developed or is implementing the following:

- **Phase II Report** - comprehensive report presenting the results of flood plain soil sampling from portions of the Tittabawassee and Saginaw Rivers.
- **Soil Movement Advisory** - for private, public, and commercial projects.
- **Ecological Risk Assessment** for Tittabawassee River flood plain soil and sediment downstream of Midland.
- **Hazardous Waste Facility Operating License** developed by the DEQ Waste and Hazardous Materials Division for The Dow Chemical Company (Dow) in Midland, in accordance with Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, (NREPA).
- **Phase III Soil and Sediment Sampling** - a third phase of soil and sediment sampling in the Tittabawassee River flood plain, the Saginaw River, and the Saginaw Bay shoreline areas to gain a greater understanding of the depth and extent of contamination.
- **Tri-County Project Coordination Plan** for enhanced project communication and involvement among the various parties involved in this site.

In addition to DEQ efforts, the Department of Community Health (DCH) continues to evaluate human health risks associated with the identified soil and sediment dioxin contamination. Further, the Department of Agriculture (MDA) continues to assess the potential health risks related to food production within the dioxin contaminated flood plain areas downstream of Midland.

To help clarify issues on any aspect of the dioxin assessment initiative, a glossary is provided at the end of the bulletin, along with a list of DEQ, DCH, and MDA information contacts, and a DEQ web site on *Dioxin Information* and the *Tittabawassee/Saginaw River Flood Plain Contamination*.

#### Public Information Meeting

Representatives of the DEQ, DCH, and MDA will host a public information meeting for community residents at **7:00 p.m. on Tuesday, June 24, 2003**, in the Freeland High School Auditorium, 8250 Webster Road, Freeland. Results of recent dioxin investigation activities and other related issues will be discussed.

#### Phase II Report

Since completion of the Phase II Environmental Assessment in December 2002, DEQ Remediation and Redevelopment staff has compiled all available sampling data into a Phase II Report comprised of the following:

- Executive Summary
- Phase II Flood Plain Sampling Program Objectives
- Sampling Methodology
- Dioxin Overview
- Polychlorinated Biphenyl Congeners
- Estimated 100-Year Flood Plain Contour
- Phase II Sample Results - Soil

- Drinking Water Well Dioxin Data
- Dioxin Congener Profiles
- Grain Size
- Total Organic Carbon
- Other Data
- Conclusions
- Recommendations
- Appendices

Preliminary observations of the Phase II soil and groundwater sample results were shared with community residents in an August 2002, information bulletin and at an October 2002 public meeting in Tittabawassee Township. The final Phase II Report provides a more extensive evaluation of the Phase II sampling initiative (including additional soil sampling data from fall/winter 2002) by the DEQ, DCH, and MDA.

The Phase II Report will be available for viewing and/or copying in its entirety at the following locations on or before June 24, 2003: area libraries; local city, township, and county government offices; local health departments; the DEQ Saginaw-Bay District Office in Bay City; and on the DEQ web site at [www.michigan.gov/deq](http://www.michigan.gov/deq) (select "Quick Links" then [Dioxin Information](#)). A limited number of copies may also be made available at the June 24, 2003, public meeting in Freeland.

### Soil Movement Advisory

Accompanying this information bulletin is a copy of the document entitled "Soil Movement Advisory for Private, Public, and Commercial Projects (Tittabawassee River Furan and Dioxin Flood Plain Soil and Sediment Contamination, Midland and Saginaw Counties)." Prepared by the DEQ, DCH, and MDA, this document advises local businesses, municipalities, and residents of the environmental, regulatory, and public health concerns associated with disturbing and distributing dioxin contaminated soil and sediments, and the importance of ensuring compliance with applicable environmental protection rules and laws.

The Phase I and II flood plain soil data show extensive dioxin contamination within the Tittabawassee River flood plain downstream of the City of Midland. The vast majority of soil samples collected from within the flood plain identify dioxin total toxic equivalent (TEQ) concentrations above the Residential Direct Contact Criteria (RDCC) of 90 parts per trillion (ppt) TEQ, established under Part 201, Environmental Remediation, of the NREPA.

**Area of Concern:** The "estimated 100-year flood plain" of the Tittabawassee River is the area of land located adjacent to the river that is expected to flood once every 100 years, or has a one percent chance of flooding in any given year. The Tittabawassee River 100-year flood plain downstream of Midland is generally bordered to the west and south by River Road and Stroebel Road. Properties located to the west and south of these roads are not expected to be located within the flood plain and, therefore, are not expected to be impacted by dioxin contamination above the Part 201 RDCC. Likewise, downstream of Midland the 100-year flood plain can generally be understood as being bordered to the east and north by Midland Road, St. Andrews Road, and Michigan Avenue. Properties located to the east and north of these roads are not expected to be in the flood plain and are not expected to be impacted by dioxin above Part 201 RDCC. Site-specific differences in elevation, such as the filling of a home-site in preparation for home construction, can result in significant variations from these general observations.

**Liability:** In general, an owner or operator of property downstream of Midland onto which dioxin contamination has migrated is not liable under Part 201 to conduct response actions to cleanup the property (Section 20126(4)(c) of the NREPA). However, a person may incur liability if the person exacerbates existing contamination or, otherwise by their actions, causes a new release of the dioxin contamination.

**Concerns:** Human activities occurring within the flood plain can disturb, move, and redistribute dioxin contaminated flood plain soil and river sediments. These soil movement activities can increase human exposure to dioxin, increase the release of dioxin to the air, increase the release of dioxin to the Tittabawassee River, and potentially result in the distribution of dioxin contaminated soil and sediment onto previously uncontaminated property. The Soil Movement Advisory provides guidance on how to avoid such problems.

### Ecological Risk Assessment

Phase I and II data and an August 2002 DEQ report entitled *Baseline Chemical Characterization of Saginaw Bay Watershed Sediments* have documented extensive dioxin contamination of Tittabawassee River flood plain soils and sediment downstream of Midland. In addition to public health concerns, significant concerns also exist regarding the impact of the dioxin contamination on wildlife and aquatic species that reside or feed within this area.

During the spring and summer 2002, specimens from five fish species, representative of both transient and resident fish, were collected from five areas of the Tittabawassee River downstream of Midland. Sample results identified elevated levels of dioxin in fish tissues for all species in all areas. The DEQ is working with an ecological risk assessment specialist to evaluate the data and assess the risk posed to aquatic and terrestrial species. A final ecological risk assessment report should be available in spring 2004.

### **Dow Hazardous Waste Facility Operating License**

During the preceding two years, the DEQ has been engaged in developing the content of a draft hazardous waste facility operating license (license) under Part 111 of the NREPA for waste handling operations and corrective action at the Dow Midland chemical manufacturing facility (Midland Facility). A draft license was made available for public review and comment from October 7 to December 9, 2002. The DEQ reopened the public comment period from January 27 to February 26, 2003, and accepted additional public comments on the license. The license was issued on June 12, 2003. Copies of the license and the Responsiveness Summary will be available at several public review locations in the tri-county area in late June. The license will also be discussed at the June 24, 2003, public meeting.

The license establishes enforceable provisions requiring Dow to implement the following response actions to address off-site dioxin releases from its Midland Facility:

- Investigate the nature and extent of dioxin contamination in City of Midland soil and evaluate release sources in the Midland Facility.
- Investigate the nature and extent of dioxin contamination downstream of Midland in the Tittabawassee River sediments and the Tittabawassee River flood plain soil.
- Concurrent with the above work, other administrative options will be pursued by the DEQ, in coordination with the United States Environmental Protection Agency, namely: to investigate and, if necessary, conduct response actions for Saginaw River sediments and flood plain soil and Saginaw Bay sediments and shoreline areas for a four-year period. At the end of this period, the license requires Dow to continue or commence the corrective action process for any off-site releases in the Saginaw River and Saginaw Bay for which Dow is responsible unless the license is modified to

provide an alternate administrative mechanism for corrective action in the Saginaw River and Saginaw Bay. The license reserves the DEQ's right to seek cost recovery from Dow for corrective action work conducted by the DEQ.

- Develop and expeditiously implement interim response activities to address immediate public health risks.
- Develop and implement a final remedy that is protective of public health and the environment, in accordance with state and federal law.

### **Health Consultations**

The DCH is continuing its efforts to respond to the United States Agency for Toxic Substances and Disease Registry (ATSDR) petitioners' and local residents' concerns regarding the public health risks posed by dioxin contamination of flood plain soil and river sediments. The DCH efforts are currently focused on conducting an exposure investigation, developing guidelines for the collection and analysis of human biological samples, and providing appropriate notice about dioxin concentrations in public use areas. The DCH will provide updates and share information with the public in accordance with its policies and priorities. The DEQ will continue to coordinate its efforts with those of the DCH.

### **Phase III Soil and Sediment Sampling**

Implementation of the Phase I, Phase II, and river sediment investigations resulted in the sampling of numerous locations along three rivers in an area extending from eight miles upstream of Midland to approximately 22 miles downstream of Midland at the confluence of the Tittabawassee and Saginaw Rivers. The information generated from these investigation activities has provided a general understanding of the concentration and distribution of dioxin within flood plain soil and river sediments. However, additional information is needed to: 1) better understand dioxin distribution within certain areas of the Tittabawassee River flood plain, 2) establish the vertical extent of the dioxin contamination, and 3) identify the downstream extent of the contamination. Planned investigation activities include:

- **Additional investigation in Saginaw River sediments and Saginaw River shoreline and flood plain areas:** The highest flood plain dioxin concentration, 7,200 ppt TEQ (Phase I), was identified at the confluence of the Saginaw and Tittabawassee River. The United States Army Corps of Engineers (USACE) data collected during 1998-1999 show that sediments located throughout the Saginaw River shipping

channel contained elevated concentrations of dioxin. Based on currently available data, it appears likely that dioxin contamination has migrated from the Tittabawassee River into the Saginaw River.

- **Additional investigation along inner Saginaw Bay shoreline areas:** USACE data collected during 1998-1999 also show that sediments located within the inner Saginaw Bay portion of the shipping channel contained elevated concentrations of dioxin. Based on currently available data, it appears likely that dioxin contamination has migrated from the Tittabawassee River into the Saginaw River, and from there into the inner portion of Saginaw Bay.
- **Additional deep soil borings are needed from Phase I/Phase II sample sites:** This additional sampling is needed to better understand the vertical extent of dioxin contamination.

The additional soil samples (Phase III) will be collected during the summer 2003.

### Public Access

It may be necessary for the DEQ to gain access to private property to implement post-Phase II investigation activities. The DEQ will contact landowners beforehand to obtain permission to access the property to collect soil samples or other needed information as necessary.

### Glossary

**Dioxin:** for the purpose of this bulletin, dioxin is a generic term for a specific group of chemical compounds or congeners that are waste by-products of a variety of chemical production processes, industrial manufacturing processes, and incineration.

**Total Toxic Equivalent (TEQ):** toxic equivalency factors (TEF) have been developed to compare the relative toxicity of other dioxins and dioxin-like compounds to that of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), the most toxic chemical in the dioxin group. The concentrations of other dioxin-like compounds are multiplied by a TEF to produce a 2,3,7,8-TCDD TEQ. The TEQs for all dioxin-like compounds in a sample are then added together to determine the total TEQ for that sample. This method provides information on the combined toxicity of multiple dioxin congeners and provides a useful comparison of the relative congener concentrations at different sample locations (congener profiles). In samples collected to date from Tittabawassee River flood plain soil and sediment, Saginaw River, and Saginaw Bay shipping channel sediments, it is the group of dioxin compounds known as "furans" that contribute the vast majority of dioxin TEQ.

**Residential Direct Contact Criteria (RDCC):** a soil concentration that is safe for direct contact at a residential use property in Michigan; in other words, a concentration that is protective against adverse health effects due to long-term incidental ingestion of and/or dermal (skin) exposure to contaminated soil for residential land uses.

### For More Information

#### Environmental sampling/analysis:

DEQ Remediation and Redevelopment Division  
Sue Kaelber-Matlock, Project Manager  
Saginaw-Bay District Office  
503 North Euclid Avenue, Suite 9,  
Bay City, MI 48706  
989-686-8025/ext. 8303; [matlocks@michigan.gov](mailto:matlocks@michigan.gov)

#### Hazardous waste facility license and Tri-County Project Coordination Plan:

DEQ, Waste and Hazardous Materials Division  
Cheryl Howe, Permit Engineer  
P.O. Box 30241, Lansing, MI 48909  
517-373-9881; [howec@michigan.gov](mailto:howec@michigan.gov)

#### Public health and ATSDR:

Department of Community Health (DCH)  
Dr. Linda Dykema, Toxicologist  
Environmental & Occupational Epidemiology  
P.O. Box 30195, Lansing, MI 48909  
1-800-648-6942; [dykema@michigan.gov](mailto:dykema@michigan.gov)

#### Residential/commercial agriculture/gardening:

Department of Agriculture (MDA)  
Dr. Brian Hughes, Toxicologist  
Pesticide & Plant Pest Management  
P.O. Box 30017, Lansing, MI 48909  
517-241-3267; [hughesb9@michigan.gov](mailto:hughesb9@michigan.gov)

#### DEQ dioxin web site:

From the right navigational bar of the DEQ web site: [www.michigan.gov/deq](http://www.michigan.gov/deq), scroll down the "Quick Links" column and select **Dioxin Information** for health advisory and general dioxin data. For site-specific data, scroll down the "Quick Links" column from the Dioxin Information page and select **Tittabawassee River Flood Plain Contamination**.

*The Michigan Department of Environmental Quality (MDEQ) will not discriminate against any individual or group on the basis of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. Questions or comments should be directed to the MDEQ Office of Personnel Services, P.O. Box 30473, Lansing, MI 48909.*