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GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING



STEVEN E. CHESTER  
DIRECTOR

October 21, 2003

Ms. Susan Carrington  
VP and Executive Director of Michigan Dioxin Initiative  
The Dow Chemical Company  
47 Building  
Midland, MI 48667

Dear Ms. Carrington:

SUBJECT: Work Scope for the Interim Response Activity of Evaluating Wild Game Taken  
From the Tittabawassee River Floodplain for Human Consumption;  
The Dow Chemical Company (Dow), Midland; MID 000 724 724

Staff of the Department of Environmental Quality (DEQ), Waste and Hazardous Materials Division (WHMD), has reviewed the Work Scope for the Interim Response Activity (IRA) of Evaluating Wild Game Taken from the Tittabawassee River Floodplain, submitted by e-mail on October 20, 2003. This document was submitted in accordance with Condition XI.B.3. of the hazardous waste facility operating license issued to Dow on June 12, 2003.

The purpose of this IRA is to determine if human consumption of wild game taken from dioxin- and furan-contaminated areas of the Tittabawassee River flood plain is a human health exposure pathway that requires immediate mitigation.

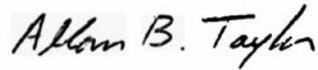
The above referenced Work Scope, enclosed in this letter, is approved subject to the stipulations for approval listed below:

1. The anticipated schedule for the collection of the animals shall be provided to this office so that staffs of the DEQ, Department of Community Health, and Department of Natural Resources have the option of conducting oversight of sampling activities. The work plan must also contain provisions for providing the DEQ with splits of the samples for audit purposes.
2. The percent moisture and lipid content of each sample shall be included in the report (in addition to reporting the data on a wet weight and lipid normalized basis) in order to provide maximum flexibility for using the data in the assessment of human health risk.
3. Elements 7 and 8 of Figure 1 indicate that the DEQ will provide review and conceptual approval of the Draft Detailed Wild Game Study work plan within two days of receipt of the work plan. Because of the need to coordinate this review with multiple agencies, a longer time frame may be necessary. The DEQ, however, will make every effort to work with Dow to achieve conceptual approval of the sampling and analysis components of the draft work plan in as rapid a manner as possible in order to allow sampling to be completed prior to the beginning of firearm deer season.

The draft detailed IRA Work Plan shall be submitted to the DEQ by October 23, 2003, the date indicated in the Work Scope schedule.

Contact me by email at [taylorab@michigan.gov](mailto:taylorab@michigan.gov) or at the below telephone number if you have any questions or concerns regarding this approval.

Sincerely,



Allan B. Taylor, Senior Geologist  
Hazardous Waste and Radiological Protection Section  
Waste and Hazardous Materials Division  
517-335-4799

Enclosure

cc: Mr. John Phillips, Dow  
Dr. Lisa Williams, U.S. Fish and Wildlife Service  
Mr. Dan O'Brien, Department of Natural Resources  
Mr. George Bruchmann, DEQ  
Ms. Brenda Brouillet, DEQ - Saginaw Bay  
Ms. Sarah Hession, DEQ  
Ms. Liane Shekter Smith, DEQ/Corrective Action File  
Mr. Steve Buda, DEQ  
Ms. De Montgomery/Ms. Ginny Himich, DEQ  
Mr. Terry Walkington/Ms. Trisha Peters, DEQ - Saginaw Bay  
Dr. Deb MacKenzie-Taylor, DEQ  
Ms. Cheryl Howe, DEQ  
Mr. Al Taylor, DEQ

## **Work Scope for the Interim Response Activity of Evaluating Wild Game Taken from the Tittabawassee River Floodplain**

**Purpose:** This document is provided as an overview (i.e. Work Scope) from which detailed Interim Response Activity (IRA) work plans will be developed for collecting and evaluating concentrations of polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) in wild game taken from the Tittabawassee River floodplain downstream of Midland compared to wild game taken from a reference area located on the floodplain upstream of Midland. The purpose of this study is to determine if wild game taken from the Tittabawassee River floodplain represents a relevant human exposure pathway to PCDDs and PCDFs or not. This document is supplemental to the *Remedial Investigation Scope of Work for Corrective Action Beyond the Facility Boundary Tittabawassee River and Floodplain*, submitted by Dow to Michigan Department of Environmental Quality (MDEQ) on August 11, 2003. Once this Work Scope is approved by MDEQ, Dow will submit for MDEQ approval, the detailed IRA work plan for the wild game sampling, analysis, and evaluation.

**Approach:** The IRA work plan will describe the approach to obtain ten deer, turkey, and rabbits<sup>1</sup> from each of two locations within the Tittabawassee River floodplain downstream of Midland and ten deer, turkey, and rabbits from a reference location that is located within the floodplain upstream of Midland. Proposed samples will be representative of legally hunted animals and will therefore include both male and female adult deer, turkeys, and rabbits. The IRA work plan will also propose methodology to develop objective criteria to evaluate the need for active exposure control or risk mitigation for the protection of human health and welfare.

The IRA work plan will describe the process by which representative samples of muscle and liver (deer only) that will be taken from each species and analyzed for PCDDs and PCDFs. It will also describe how the results (i.e. concentrations of PCDDs and PCDFs) from samples (i.e. deer, turkey, and rabbit tissue) taken from the reference location will be compared to sample results taken from the two locations within the floodplain downstream of Midland. These comparisons will first be a mathematical comparison of results, to determine if there is a statistically significant increase in concentrations of PCDDs and PCDFs in wild game samples taken from the floodplain downstream of Midland as compared to wild game taken from the reference area. The results will also be compared to concentrations of PCDDs and PCDFs reported in the national food supply and/or other references for the same or similar species (e.g. beef and chicken). All results will be submitted for MDEQ review. Results will include congener-specific PCDD and PCDF data for each sample on a wet weight and lipid-normalized basis, summary statistics, and a comparison of total TEQs and congener patterns. In addition, a sub-sample of deer muscle will be analyzed for PCBs on a congener-specific basis (including coplanar PCBs). The PCB data will be used to determine the relative contribution of PCBs to total TEQs.

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<sup>1</sup> In the event that rabbits are not abundant (due to habitat suitability-related issues), it may be necessary to substitute squirrels in place of rabbits in the IRA work plan.

**Work Plan:**

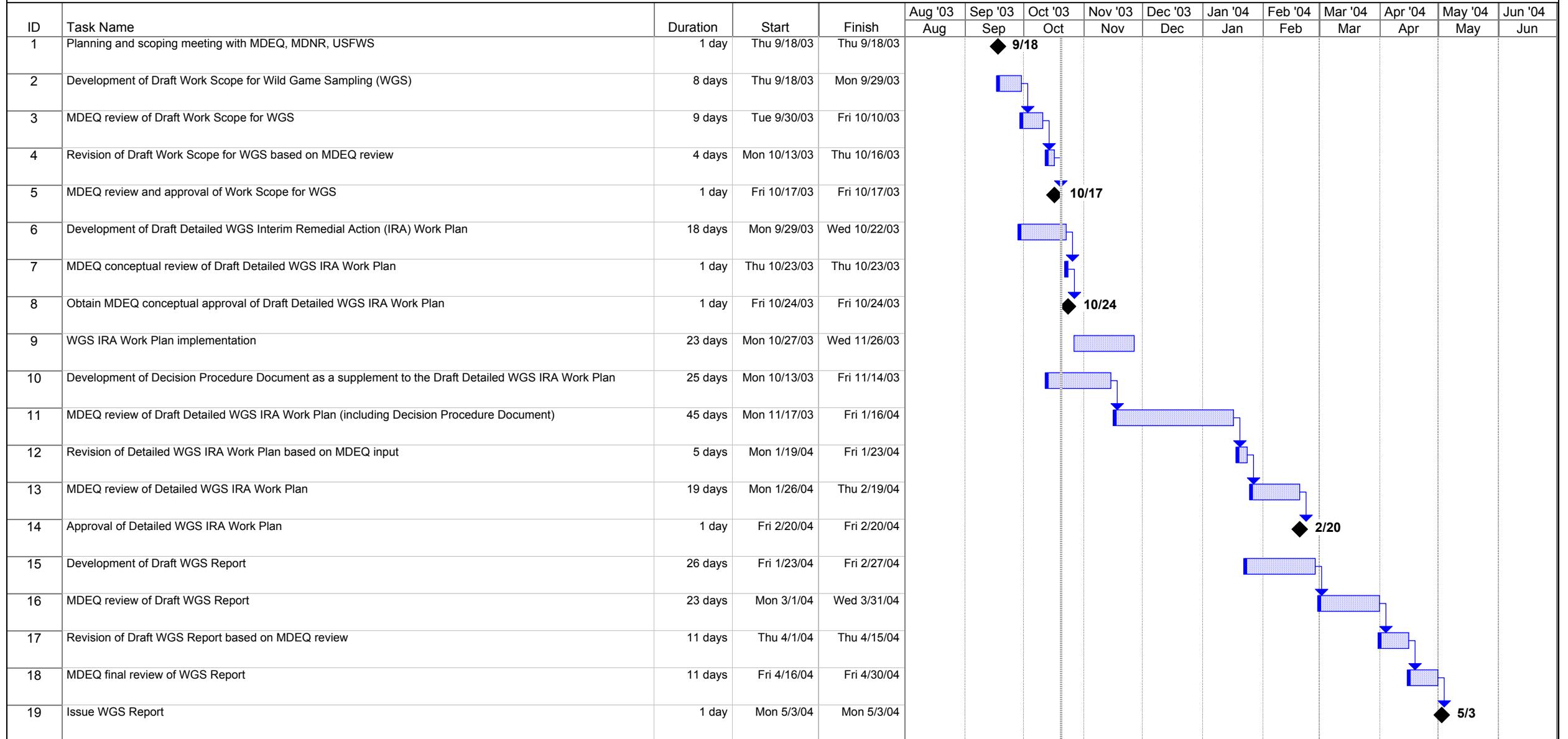
The IRA work plan will propose methodology to develop objective criteria to determine, based upon the results of the investigations, if further wild game sampling is needed or if active exposure control or risk mitigation is immediately needed to protect human health. The IRA work plan will include:

- A description of the specific parcels of property where samples will be taken;
- A physical description of the sampling locations;
- A detailed description of the number and type of samples to be taken, how samples will be processed and analyzed, and how results will be reported;
- A description of existing concentration data for PCDDs and PCDFs from soils in the area where wild game samples are taken and analysis of soils for PCDDs and PCDFs where existing information is not available or is insufficient to characterize the sample locations;
- A description of the comparative statistical tests to be employed for evaluating samples taken within the floodplain to those taken from the reference area (for deer, this may include stratification by sex and perhaps by age if the data allow);
- Proposed methodology to develop criteria for making objective decisions on whether any further data collection and/or analysis is necessary to better understand the situation, including a power analysis based on the observed variability in concentrations within and among locations;
- Proposed methodology to develop criteria for making objective decisions on whether additional Interim Response Activities are needed to mitigate exposure via this pathway; and
- A detailed schedule for implementation of the IRA work plan and submission of the final report for MDEQ review and approval.

In an effort to streamline this process, the IRA work plan will not include formal Project Management Plans, Data Collection Quality Assurance Plans or Data Management Plans. Rather, they will include a Standard Operation Procedure, which will reference existing guidance, e.g., SW-846, or already existing Dow Project Management Plans, Data Collection Quality Assurance Plans and Data Management Plans. Copies of such plans will be provided to MDEQ upon request.

**Schedule:** The wild game sampling plan and its elements are shown in Figure 1. In recognition of the need to collect samples during the targeted sampling window (i.e. Fall of 2003) and provide timely information to all interested stakeholders, sampling may begin after Dow receives conceptual approval of the draft detailed IRA work plan (prior to final MDEQ approval of the draft detailed IRA work plan).

Figure 1. The proposed major elements, sequencing, and estimated timeline for the Wild-Game Sampling.



Project: WGS Timeline Date: Mon 10/20/03	Task		Summary		Rolled Up Progress		Project Summary	
	Progress		Rolled Up Task		Split		Group By Summary	
	Milestone	◆	Rolled Up Milestone	◇	External Tasks			