



**SECOND ANNUAL REPORT OF PROGRESS ON CHILDREN'S HEALTH ISSUES
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
TOXICS STEERING GROUP**

September 25, 2002

I. INTRODUCTION

This second annual report presents the findings and recommendations of the Michigan Department of Environmental Quality's (MDEQ's) Toxics Steering Group (TSG) to help ensure the protection of children's health. Specifically, this report documents the TSG's progress over the last year in implementing the recommendations from the Michigan Environmental Science Board (MESB) report, entitled *Analysis of the Michigan Department of Environmental Quality's Administered Environmental Standards to Protect Children's Health*, and directives from the March 17, 2000 memorandum from Director Russell J. Harding to Deputy Director Arthur R. Nash Jr., supporting those recommendations. Progress is also reported on additional TSG recommendations and the priority of those recommendations assigned by Deputy Director Nash in the December 20, 2000 report, entitled *Interim Report of Progress on Children's Health Issues* (Interim Report), and the September 25, 2001 report, entitled *First Annual Report of Progress on Children's Health Issues* (First Annual Report), both prepared by the TSG.

II. SUMMARY OF MESB CHILDREN'S STANDARDS INVESTIGATION PANEL (PANEL) RECOMMENDATIONS AND CORRESPONDING TSG ACTIONS AND RECOMMENDATIONS FOR IMPLEMENTATION

The MESB Panel recommendations are summarized under the four main headings below. Specific TSG actions taken in response to these recommendations and to recommendations from the TSG's Interim and First Annual Reports are provided below each MESB Panel recommendation.

- A. *The MESB Panel recommended that the "MDEQ Toxic Steering Group's interactions with toxicological, epidemiological, and risk assessment staff in other state departments" be increased.*

In response to this recommendation, the TSG recommended that efforts to increase the MDEQ's interactions with other state agencies continue. The TSG continues to operate with membership from other state of Michigan departments as directed in the MDEQ Policy and Procedures 09-006, approved on September 22, 2000, by Director Harding. Currently, Dr. Brian Hughes, Michigan Department of Agriculture (MDA), Pesticide and Plant Pest Management Division, represents the MDA on the TSG. The Michigan Department of Community Health (MDCH) representatives are Dr. Linda Larsen and Ms. Christina Bush, both from the MDCH Environmental and Occupational Epidemiology Division, and Dr. Jackie Scott, Director of the Chemistry and Toxicology Division. The MDA and the MDCH members attend meetings and participate in discussions specifically related to children's health issues. They also participate in other meetings, subcommittees, and discussions of interest to them and their departments' programs or where they possess expertise in the issue under discussion. Subcommittee activities are described in Sections II.B, C, D and Section IV of this report. Coordination with other state departments specifically to address children's health issues is as follows.

1. The MDA and MDCH have designated representatives on the Children's Environmental Health Subcommittee of the TSG. Through this coordination with the MDCH, members of the Children's Environmental Health Subcommittee provided comments on child-specific considerations for the MDCH Biomonitoring Planning Grant effort.
2. The Chair of the Children's Environmental Health Subcommittee, along with the MESB Executive Director and a representative from the Michigan Department of Education, participated in the United States Environmental Protection Agency (USEPA), Region 5, Summit, entitled *Children's Environmental Health Summit* (Summit), in March 2002. The Summit focused on the areas of asthma, lead, and school environmental health issues in children. These individuals also have had continued interaction with other Region 5 states via follow-up conference calls organized by the USEPA.
3. The MDCH, in collaboration with the MDEQ, has applied for grant funds to analyze data for possible impacts of air pollutants on childhood asthma and on adverse birth outcomes.

The expanded TSG continues to meet on a regular basis. Members of the TSG from other state agencies participate in several subcommittees, and efforts to coordinate with other agencies will continue to be pursued when opportunities arise, as exemplified above.

- B. *The MESB Panel recommended that the, "MDEQ continue to keep abreast of the new information emanating from the federal government, academia, and scientific literature" regarding the impact of environmental contaminants on children's health.*

In response to this recommendation, the TSG formed the Children's Environmental Health Subcommittee (CEHS) – (Subcommittee Chair: Ms. Mary Lee Hultin, MDEQ).

The CEHS is charged with tracking developments in the area of children's environmental health and making recommendations to the TSG for incorporation into human health risk assessment procedures, as appropriate. The CEHS Chair regularly updates the TSG on current activities of the CEHS. The objectives of the CEHS and associated actions since the last annual report include the following:

1. The CEHS continues to actively track the latest scientific findings related to children's environmental health. The MDEQ librarian monitors new literature for publications in this area. All members of the CEHS monitor the literature via periodical reviews and the Internet. A database has been developed listing reports and studies reviewed and critiqued by the group. The current contents of this database are included as Appendix A to this report.
2. Efforts continue to identify activities in other states in the area of children's environmental health:
 - a) The Association for State and Territorial Health Officials (ASTHO) and the Environmental Council of the States (ECOS) survey of state activities on children's environmental health was reviewed. A final report has not been released.
 - b) The California report, entitled *Prioritization of Toxic Air Contaminants under the Children's Environmental Health Protection Act*, was reviewed and briefly discussed. This report contains in-depth descriptions of children's unique environmental exposure and response.

- c) Information on a new Minnesota legislation also was reviewed. The new law requires that safe drinking water and air quality standards include a margin of safety to adequately protect the health of infants and children.
3. CEHS members continue to track activities at the federal level, including:
 - a) A 2000 report summarizing the federal Science Advisory Board (SAB) review of the 1996 USEPA proposed cancer guidelines was initially reviewed.
 - b) A preliminary review also was conducted of the proceedings of a recent workshop, entitled *Workshop on Information Needs to Address Children's Cancer Risk*, held in March 2000. The workshop was sponsored jointly by the USEPA's Office of Research and Development and the National Institute of Environmental Health Sciences.
 4. Several USEPA officials have provided presentations via the Minnesota Department of Health. The CEHS has acquired tapes and transcripts of those presentations and has made them available to the TSG members. The CEHS received training material from the following Minnesota presentations:
 - a) *Cancer Risk Assessment Guidelines and Children* (Dr. Jim Cogliano, USEPA).
 - b) *Reference Doses and Reference Concentrations: An Expanded View*, (this presentation discusses a review of the USEPA's oral reference dose [RfD] and inhalation reference concentration [RfC] processes) (Dr. Carole Kimmel, USEPA).
 - c) *The National Children's Study on Environmental Effects on Child Health and Development* (Dr. Carole Kimmel, USEPA).
 - d) *Neurotoxic Effects Resulting from Developmental Exposure: Human and Animal Data* (Dr. Deborah Rice, USEPA).
 5. The USEPA's *Strategy for Research on Environmental Risks to Children* has been reviewed for areas of potential interest to the various TSG department representatives. Members of the CEHS are charged with tracking results of the individual research findings pertinent to their department's areas of responsibility. However, given other program priorities of staff, limited attention has been devoted to this effort.
- C. *The MESB Panel recommended that the "MDEQ continue to incorporate the best available science in the development and review of its environmental standards," and identified specific areas in which to focus initial efforts.*
1. The MESB Panel made two specific recommendations concerning the MDEQ soil direct contact criteria (chemical criteria protective of soil exposure through incidental ingestion and dermal contact), developed under the authority of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). First, the MESB Panel recommended that occasional high intakes of soil, rather than average daily chronic intakes, might be more appropriate in the development of these criteria in some cases. Second, the MESB Panel recommended that the MDEQ consider "...exposure to the same substances through other exposure routes, such as water and food..." in the development of soil direct contact criteria.

The following addresses the TSG's progress on the MESB Panel's recommendations:

- a) The TSG recommended that the MDEQ identify those compounds for which an occasional high intake of soil may pose an acute health risk and develop direct contact criteria protective of this exposure scenario. This recommendation was assigned a low priority. Although it has been discussed and a process drafted for identification of acutely toxic hazardous substances, no additional work has been completed to date to systematically evaluate the current criteria. This issue will be considered as criteria are revised or new criteria are developed. As an example, development of acute toxicity-based direct contact criteria for cyanide was previously completed in response to a request to reevaluate the cyanide criteria. A systematic reevaluation of the current criteria will be done as time and resources allow.
 - b) The TSG recommended that algorithms for the calculation of direct contact criteria be developed for a child-only receptor and that these algorithms be considered for use in developing criteria for land uses where children are expected to be present (e.g., the residential scenario). This recommendation has been assigned a low priority. A survey of how other states were addressing this exposure pathway was requested prior to recommending implementation of this approach. Child-only direct contact criteria have been drafted by the MDEQ; however, because it is a low priority, finalization of these criteria has not been pursued.
 - c) To address the MESB recommendation to consider other routes of exposure for some substances that are frequently present in food and water, the TSG recommended that a relative source contribution factor less than one (i.e., less than 100 percent) be used to develop soil direct contact criteria when chemical-specific information is available. This option is provided for pursuant to Section 20120a(4) of Part 201 of Act 451. However, an update of the scientific literature has not been conducted to determine if more chemical-specific relative source contribution factors can be developed. This recommendation also has been assigned a low priority. An alternative relative source contribution factor will likely be considered for some chemicals as criteria are revised or new criteria are developed.
2. The MESB Panel recommended that it be a high priority for the MDEQ to collect high quality hazardous air pollutant data and conduct a risk assessment. It also noted that, "The recommended risk assessment should be used to prioritize the hazardous air pollutants based on estimated relative risk and the contribution that air exposures make to overall risk from the hazardous air pollutants." The MESB Panel recommended that a periodic update schedule for screening level reevaluation and "total risk" be assessed.

The MDEQ has recently completed development of an air toxics monitoring strategy to address the need for high quality data on toxic air contaminants. To address the MESB Panel's recommendations, the TSG recommended that the MDEQ's air toxics monitoring strategy effort be continued. This was identified as a high priority recommendation. The details of this strategy are provided in the document, entitled *The Development of an Air Toxics Monitoring Strategy for Michigan*, dated June 27, 2002. The projected goal of the strategy is to combine Michigan-specific data with data compiled through various USEPA efforts (e.g., National Air Toxic Assessment, Cumulative Exposure Projects) to support a rationale for prioritizing screening level updates. However, a comprehensive strategy is needed for a routine update of all screening levels, not just for those compounds for which monitoring data are available. The MDEQ anticipates that this strategy will be

used as a guide to help implement an expanded air toxics monitoring program, as funding allows. Currently, funding is not available to implement this strategy.

To further implement the MESB Panel's recommendation, the TSG recommended that a procedure be developed for a routine update of all screening levels considering all new and relevant information. This was identified as a high priority recommendation. Little activity has taken place this year on this recommendation due to other responsibilities and program priorities. A general outline for a procedure will be developed by the TSG by March 2003 highlighting what might be needed to routinely update the screening levels.

3. The MESB Panel recommended that the MDEQ continue to monitor the USEPA's efforts to assess drinking water and surface water standards for protection of children's health and "...consider application of new USEPA approaches to Michigan standards as they are validated."

To address the MESB Panel's recommendations, the TSG recommended that the MDEQ continue to track new and revised federal drinking water and surface water standards and incorporate these as appropriate. This was identified as a high priority recommendation. Several MDEQ divisions routinely monitor federal and state drinking water and federal surface water standards and incorporate new or revised standards into Michigan programs as appropriate. Consistency across MDEQ divisions and programs is a primary objective when incorporating new or revised standards so that all MDEQ programs that rely on a set of standards or criteria are using the same values. Activities to implement the MESB Panel's recommendation include the following:

- a) The MDEQ currently tracks all changes in federal surface water quality standards, and incorporates these changes into rules when appropriate.
- b) The MDEQ currently monitors the promulgation of both federal and state drinking water standards. Section 20a (5) of Part 201 of Act 451 states that if a state drinking water standard exists for a hazardous substance, the drinking water criterion is the more restrictive of either the state standard or the aesthetic criterion, if one is available. It generally takes a minimum of one year for a federal drinking water standard to be promulgated as a state standard. Therefore, because Part 201 of Act 451 specifically refers to a "state standard," a Part 201 of Act 451 drinking water criterion may not be consistent with the federal Safe Drinking Water Act. No state standards were promulgated over the course of the past year; however, the MDEQ continues to monitor both the federal and state drinking water standards.

The TSG also recommended that the MDEQ monitor the USEPA's efforts to revise methods for calculation of drinking water and surface water standards for protection of children's health and incorporate these revised methods as appropriate. This was identified as a high priority recommendation. The MDEQ routinely monitors information from the relevant USEPA offices in the area of children's health issues. Other sources that would provide information regarding children's health and risk assessment methods are also monitored on a routine basis. As of August 2002, no information regarding specific changes by the USEPA to standards or risk assessment methods had been identified.

4. The following TSG subcommittees were active over the last year and charged with incorporating best available science into the development and review of environmental standards:

a) Cancer Risk Assessment Subcommittee - (Subcommittee Chair: Mr. Marco Bianchi, MDEQ)

The Cancer Risk Assessment Subcommittee conducted a thorough review of the USEPA's 1999 document, entitled *Guidelines for Carcinogen Risk Assessment*, and drafted comments to the USEPA stressing the need for further clarification in addressing the practical aspects of conducting a cancer dose/response assessment. These clarification points, as they relate to children's health risk assessment, included the following:

- i) Provide practical methods for appropriately setting risk-based standards when using the "margin of exposure (MOE)" approach.
- ii) Provide clarification as to how risk assessors and managers may appropriately evaluate total cancer risk for complex mixtures of carcinogens in media or proposed emissions/discharges, while considering MOEs for multiple substances. Substances with large MOEs may be considered to not contribute to the total risk, while those with small MOEs may require inclusion in a total risk estimate or characterization. It is unclear if that inclusion could be quantitative or qualitative only.
- iii) Provide clearer, more detailed guidance regarding cancer risk assessment for children, specifically addressing differences in adults and children in both sensitivity and exposure.

The comments on the proposed document were submitted to the USEPA by Deputy Director Nash on January 25, 2002. To date, no formal response has been received from the USEPA.

b) Uncertainty Factors in Non-cancer Risk Assessment Subcommittee (UFRAS) – (Subcommittee Chair: Mr. Jeffrey Crum, MDEQ)

The UFRAS is charged with determining if an uncertainty factor (UF) for database deficiencies should be considered and applied, if appropriate, by MDEQ toxicologists when deriving non-cancer toxicity values, such as RfDs and RfCs. This database uncertainty factor (UF_d) is designed to account for the potential of deriving an under-protective RfD/RfC as a result of an incomplete characterization of a hazardous substance's toxicity. For example, traditional toxicity studies for specific chemicals or groups of chemicals often do not adequately evaluate reproductive, developmental, neurological, and immune system effects. These types of effects are those for which pregnant mothers, children, infants, and fetuses may be more susceptible and may occur at lower doses than the effects evaluated in traditional studies. If such data gaps exist, the UF_d (most often a value between one and three) may be applied to account for this uncertainty in calculating the chronic RfD/RfC. The USEPA frequently applies an UF_d when deriving RfDs and RfCs for chemicals determined to have inadequate information to characterize the risk for these effects. Current MDEQ practice for applying UFs in deriving *de novo* RfDs and RfCs does not include consideration of an UF_d .

Other UFs, generally a value between one and ten, used by MDEQ toxicologists, if appropriate, are intended to account for (1) the variation in sensitivity among the members of the human population (i.e., inter-individual variability) (2) the uncertainty in extrapolating animal data to humans (i.e., interspecies uncertainty) (3) the uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure to lifetime exposure (i.e., extrapolating from subchronic to chronic exposure) and (4) the uncertainty in extrapolating from a lowest-observed-adverse-effect level rather than from a no-observed-adverse-effect level.

The UFRAS has completed its review of the issue. Over 70 scientific publications were reviewed. A report is currently being drafted for presentation to and review by the TSG.

c) Dioxin Review Subcommittee (DRS) – (Subcommittee Chair: Ms. Christine Flaga, MDEQ)

The DRS is charged with reviewing the MDEQ standards and criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin and related compounds (dioxin). The DRS has reviewed the draft chapters of the USEPA's report, entitled *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin and Related Compounds* (Dioxin Reassessment), the USEPA peer review panel report on the Dioxin Reassessment, and the USEPA's SAB review of the Dioxin Reassessment. The DRS has been following the progress of the Dioxin Reassessment, which has included a briefing by Mr. Dwain Winters, Director of the Dioxin Policy Project, by teleconference from the USEPA, Region 5, on May 5, 2002, and presentations on dioxin toxicity by Dr. Linda Birnbaum of the USEPA. Currently, the DRS is waiting for the USEPA's final version of the Dioxin Reassessment prior to making recommendations on any standards or criteria for dioxin and dioxin-like compounds. This past year, the DRS has also reviewed several other significant reports and articles and is now in the process of conducting a scientific literature review to identify those significant articles that were published since the 2000 version of the Dioxin Reassessment. Ultimately, the information will be used to update the MDEQ Toxicity Assessment for dioxin and the resulting Part 201 of Act 451 cleanup criteria. The scientific literature indicates that the developing fetus appears to be much more sensitive to alterations in reproductive, immune, and nervous system development from dioxin exposure than are adult animals to effects in these systems.

On November 14, 2001, Exponent, Inc., submitted a report, entitled *Estimation of the Oral Bioavailability of Dioxins/Furans in Soil from Midland, Michigan*. Exponent, Inc., conducted this study under contract for the Dow Chemical Company (Dow). An *in vitro* study was conducted to determine the bioavailability of dioxins and furans in Midland soils. The DRS reviewed the report and developed preliminary comments on the study for the TSG. The comments were sent to Dow on April 8, 2002. Dow responded to the comments and is planning to proceed with an *in vivo* study in both rats and swine, since they do not believe they can resolve the concerns with the *in vitro* study in a reasonable amount of time. Study designs have been submitted to the MDEQ. A special scientific review committee has been established by the MDEQ to evaluate the *in vivo* studies. Two meetings of the committee have been scheduled for 2002. The first meeting on September 11, 2002 evaluated the proposed protocols, and the second meeting in early December 2002 will evaluate the results of the study. The TSG will have TSG members attend the meetings and track the results of the work of the committee and the study.

Dow also submitted to the MDEQ a report, entitled *Calculation of a Site-Specific Soil Criterion for Midland, Michigan*. This report was received on April 11, 2002. The TSG DRS is reviewing the report and will comment on pertinent sections of the report.

d) Trichloroethylene Toxicity Assessment Review Subcommittee (TTARS) –
(Subcommittee Chair: Mr. Jeffrey Crum, MDEQ)

The formation of the TTARS was necessary to address public comments received regarding the Part 201 of Act 451 criteria for trichloroethylene (TCE) proposed in the draft Part 201 of Act 451 Administrative Rules. The objective of the subcommittee was to conduct an expedited review of an external review draft document published by the USEPA (2001), entitled *Trichloroethylene Health Risk Assessment: Synthesis and Characterization* (USEPA HRA), to determine if the current oral and inhalation toxicity values that were used to develop the Part 201 of Act 451 generic cleanup criteria should be updated prior to promulgation in the Part 201 of Act 451 Administrative Rules. The toxicity values recommended in the USEPA HRA indicate considerably greater toxicity of TCE than is currently reflected in the Part 201 of Act 451 generic cleanup criteria. Criteria based on the USEPA's proposed toxicity values would result in more stringent (i.e., lower) generic criteria than currently proposed for promulgation in the Part 201 of Act 451 Administrative Rules.

Information in the USEPA HRA also suggests that infants and children may be more susceptible to TCE's toxicity. Recent presentations by Dr. Jim Cogliano, USEPA Office of Research and Development, have recommended the treatment of early life exposure as a risk factor and support the use of the high end of the cancer risk range currently recommended by the USEPA to account for early life exposure. Dr. Cogliano qualified his recommendation by stating that the high end of the risk range was not based on actual evidence suggesting children may be more sensitive. The TTARS will continue to evaluate and consider evidence of the toxicity of TCE to children as part of its ongoing review.

Due to time constraints imposed by the schedule for promulgation of the generic cleanup criteria in the Part 201 of Act 451 Administrative Rules, the TTARS was unable to complete a thorough review of the USEPA HRA and associated scientific documentation. As a result, several key tasks necessary to providing scientifically supported recommendations could not be completed. Following the TTARS's recommendations, it was determined that a recommendation to adopt the USEPA's recommended toxicity values from the draft USEPA HRA was premature given that the USEPA values had not undergone review by the USEPA's SAB. The SAB began its review of the USEPA HRA in June 2002.

The TTARS is currently monitoring the progress of the USEPA SAB review of the draft USEPA HRA on TCE. The TTARS Chair participated in the first public teleconference held by the SAB TCE Review Panel on June 5, 2002. A draft report from the SAB was released July 15, 2002. The TTARS has not completed its review of this document, but will in the near future. Members of the TTARS also participated in a public teleconference July 18, 2002, held by the USEPA's SAB TCE Review Panel, to learn of preliminary findings of the panel and the status of its draft report. The TTARS intends to continue tracking the developments of the SAB review, the USEPA HRA document, and current findings in the scientific literature.

Recommendations and updates to the TSG will be presented as events and findings warrant.

- e) Probabilistic Risk Assessment Subcommittee (PRAS) – (Subcommittee Chair: Dr. Deborah MacKenzie-Taylor, MDEQ)

The PRAS is charged with assisting in the development of staff guidance for evaluating probabilistic risk assessments (PRA) submitted to the MDEQ and to assist with the review of this type of risk assessment as needed. A draft guidance on Monte Carlo analysis, a specific type of PRA, has been developed. Mr. Andrew Campbell, a recent Michigan State University graduate student with expertise in Monte Carlo analysis, was contracted to develop the draft guidance and work with other PRAS members, who provided expertise in toxicology, risk assessment, and statistics to draft the guidance. The draft staff guidance will go through external peer review. Once the final guidance is completed, it is anticipated that it will be used by MDEQ staff to evaluate Monte Carlo risk assessments. The PRAS is currently reviewing a Monte Carlo risk assessment for development of dioxin criteria that is contained in a report from Dow, entitled *Calculation of a Site-Specific Soil Criterion for Midland, Michigan*.

5. The MDEQ toxicologists are continuing to incorporate new information on specific chemicals into environmental standards when there is scientific evidence that children may be more susceptible to a chemical's toxic effects. As an example, the USEPA Integrated Risk Information System used a twofold uncertainty factor in the quantitative cancer risk estimate for vinyl chloride because of the added risk from early-life exposure. The same approach was used to update human health criteria for vinyl chloride. Developmental studies continue to be used to derive criteria when developmental effects are the most sensitive effect.
 6. Specific information on recent USEPA guidance for sampling lead in soils has been discussed by the CEHS and identified as a potential children's health issue. This issue will be brought to the full TSG.
 7. Efforts are continuing to coordinate the CEHS with other subcommittees of the TSG to ensure that issues pertaining to children's environmental health are comprehensively addressed. Members of the CEHS also serve on the TSG's Uncertainty Factors in Non-cancer Risk Assessment, Dioxin Review, TCE Toxicity Assessment Review, Probabilistic Risk Assessment, Mixtures and Cumulative Risk, and Cancer Risk Assessment Subcommittees.
- D. *The MESB Panel recommended that the MDEQ "incorporate the concepts of mixtures and cumulative risk into its regulatory risk assessment process as the science matures."*
1. In response to this recommendation, the TSG formed the Mixtures and Cumulative Risk Subcommittee (MCRS) to evaluate the available approaches for performing toxicological risk assessment for exposures to mixtures of substances as well as cumulative exposure and risks. The Chair of the MCRS is Mr. Robert Sills, MDEQ.

The MCRS is charged with evaluating the available approaches for performing toxicological risk assessment for exposures to mixtures of substances as well as cumulative exposure and risks. Staff is reviewing recent USEPA guidance updates on risk assessments for complex mixtures and cumulative risk. Reports on how each MDEQ

program area has handled these issues in the past and present are being developed. This will lead to discussions later this year regarding future needs and directions, including consideration of the available risk assessment tools and regulatory authority.

MCRS members and other members of the TSG participated in a USEPA workshop on July 29, 2002, via teleconference, entitled *Methods and Guidance for Health Risk Assessment of Chemical Mixtures*.

2. The MDEQ Environmental Response Division had requested that the TSG review a proposal for development of Part 201 of Act 451 cleanup criteria for total petroleum hydrocarbons. The proposal includes an approach to address the non-carcinogenic risks associated with exposure to mixtures of petroleum hydrocarbons, as well as an approach to address the carcinogenic risks associated with exposures to mixtures of polycyclic aromatic hydrocarbons.

The TSG recommended that the MDEQ Environmental Response Division's proposals be reviewed for incorporation into the MDEQ programs, if appropriate. The TSG recommendation was forwarded to Deputy Director Nash. This issue was considered a low priority. Deputy Director Nash requested that before any recommendations were made on this issue, a review of the scientific literature be conducted to identify the state of the art on these subjects, as well as how other states' cleanup programs are managing total petroleum hydrocarbons and polycyclic aromatic hydrocarbons. Other program priorities and staffing limitations have restricted additional progress on these issues.

III. SUMMARY OF TSG ACTIONS IN RESPONSE TO THE DIRECTIVES CONTAINED IN THE MARCH 17, 2000 MEMO FROM DIRECTOR HARDING TO DEPUTY DIRECTOR NASH

Director Harding indicated that the TSG should "seek outside expertise from both industry and environmental health organizations as needed for specific issues." As an initial step to comply with this directive, a memorandum under Deputy Director Nash's signature was mailed to a list of industrial associations, academic institutions, and environmental organizations. The memo requested assistance in identifying a pool of scientific experts in the areas of children's health, risk assessment, and toxicology from which the TSG could request outside expert advice. The response to this request was minimal. One response was received from a university identifying one individual. Another response was received from a company that identified an individual to serve as a liaison between that company and the TSG. No other responses have been received to date.

Since the initial effort to identify a pool of outside experts did not produce a significant response, the TSG recommended that efforts be made to identify qualified outside experts as specific issues arise.

An opportunity became available to invite Dr. Linda Birnbaum, Director of the Human Studies Division of the USEPA's National Health and Environmental Effects Research Laboratory, to present information on dioxin toxicity. This world-renowned expert on the toxicity of dioxin provided a presentation to the TSG on January 31, 2002.

IV. GENERAL MESB PANEL RECOMMENDATIONS FOR FUTURE MDEQ ACTIONS

In addition to the recommendations described previously, the MESB Panel indicated that the MDEQ "...risk assessors maintain their scientific strengths by taking advantage of education opportunities offered through various scientific societies, symposia, and the federal government.

Such efforts would allow the scientific staff at the MDEQ to continue to appropriately use the most current risk assessment techniques." The MDEQ supported this recommendation.

TSG members participated in a number of conferences/workshops on issues related to children's environmental health and risk assessment. The members brought information back to the TSG and its subcommittees to expand the TGS's knowledge base. Participation in these events allowed for information sharing between other states and countries in the area of children's environmental health.

- A. A TSG member participated in the initial USEPA/State/Tribal Risk Assessment Workshop (January 2002). This workshop covered many risk assessment topics relevant to TSG activities including children's health risk, cancer risk assessment, mixtures and cumulative risk, bioavailability, and probabilistic risk assessment. Workshop materials were made available to all TSG members. It is highly recommended to have TSG participation in these workshops in the future.
- B. A CEHS member participated in the initial conference (August 2001) of the ASTHO and the ECOS, entitled *Catching Your Breath: Strategies to Reduce Environmental Factors that Impact Asthma in Children*. Information was presented on the ASTHO/ECOS survey of state activities. In addition to scientific data on asthma, some conference materials focused on coalition building. Although the focus of this presentation was specifically on asthma, some of the tools might be useful for coalition building in the general area of children's environmental health. Another CEHS member participated in the subsequent ASTHO/ECOS breakout workshop on environmental data and children's asthma in May 2002.
- C. A CEHS member attended the Children's Environmental Health II: A Global Forum for Action that was sponsored jointly by the Children's Environmental Health Networks and the Canadian Institute of Child Health in September 2001. Numerous presentations were provided over four days covering a broad spectrum of topics ranging from local to international issues and efforts in the area of children's environmental health.
- D. A CEHS member attended the *Second International Conference on Pharmaceuticals and Endocrine Disrupting Chemicals in Water* in October 2001. A speaker from the USEPA focused on emerging approaches for assessing the exposure of children to endocrine disrupting chemicals. An upcoming three-year pilot study, entitled *The Children's Total Exposure to Persistent Pesticides and Other Persistent Organic Pollutants*, was discussed.
- E. TSG members participated in the *Federal-State Toxicology and Risk Analysis Committee Spring 2002 Meeting* via teleconference in May 2002. This included sessions on the new USEPA Cancer Guidelines and the Food Quality Protection Act 10X Safety Factor.
- F. TSG members attended a satellite broadcast from the Centers for Disease Control and Prevention on children's environmental health information resources.
- G. TSG members attended the following presentations sponsored by the environmental group, LocalMotion:
 - *Dioxin, Are We All at Risk?* (Dr. Linda Birnbaum, USEPA, December 2001).
 - *Intellectual Impairment in Michigan Children from PCB-Contaminated Food* (Dr. Joseph Jacobson, Wayne State University, April 2002).

- H. CEHS members attended the Spring 2002 MDCH Epidemiology Discussion Group seminar presented by Dr. Wilfried Karmaus of Michigan State University. The seminar was entitled, *Is the Susceptibility for Asthma Influenced by In Utero Conditions?*
- I. A CEHS member attended the federal Agency for Toxic Substances and Disease Registry (ATSDR) Program 1043 Partners' Meeting in March. Presentations attended included: *Woburn and Toms River Childhood Cancer Investigations: What Have We Learned*, presented by the New Jersey Department of Health and Senior Services; *Hazardous Waste Near Schools*, facilitated by the ATSDR with reports from Florida, Washington, Massachusetts, California, and Texas; and a discussion by the Behavioral Science Workgroup regarding the lead contamination of soil in Herculaneum, Missouri, and subsequent child blood-lead testing.
- J. A TSG member participated on a panel discussing vapor intrusion modeling for the indoor air exposure pathway at the *Midwestern States Risk Assessment Symposium*, which was sponsored by the Indiana Department of Environmental Management in July 2002. Other topics related to TSG actions and recommendations included: (1) risk assessment and analytical methods for total petroleum hydrocarbon mixtures; (2) differential sensitivity of children and adults to chemical toxicity; and (3) application of uncertainty factors to address child risk and deficiencies in the toxicity database.

The TSG recommended that outside speakers from academia/industry/federal government could be invited to conduct in-service training sessions for TSG members. This would provide a more cost-effective method of training than sending a number of staff to out-of-state training.

In November 2001, CEHS members sponsored a seminar for Community Action Against Asthma – a component of the Michigan Center for the Environment and Children's Health. Presenters included four researchers and staff from the University of Michigan and two community partners from Detroit. Information on this innovative, community-based participatory research project on children's asthma was useful to audience members. Attendees came from within MDEQ, as well as from the USEPA, University of Michigan-Flint, and the Ingham County Health Department.

The TSG is pursuing training from the USEPA on its *Guidelines for Cancer Risk Assessment* and probabilistic risk assessment at this time. Other topics of interest for in-service training are the use of epidemiology data for human health risk assessment and the application of the USEPA's *Inhalation Reference Concentration Methodology*.

V. NEW RECOMMENDATIONS FOR THE SECOND ANNUAL REPORT

A review of the TSG recommendations from its Interim and First Annual Reports indicate all are still applicable. Efforts should continue to implement these recommendations as program priorities, staff time, and resources allow.

Another area that the TSG recommends to help ensure the protection of children's environmental health is to take advantage of education and outreach opportunities as they arise. In addition to the TSG web site, activities identified this year are as follows:

- A. Outreach and education efforts began when a CEHS member was an invited speaker, in conjunction with the USEPA Region 5, Children's Health Team Manager, to the annual conference of the Mott Children's Health Center in October 2001.

- B. The MDEQ, in cooperation with local health departments, is posting up-to-date water quality monitoring data for beaches on the Michigan Beach Water Monitoring web site. A member of the CEHS presented information about the website to local health departments at the Michigan Environmental Health Association's *Recreational Swimming Waters Conference*. The web site also provides general information about public beaches. *Escherichia coli* is the bacterial indicator that is used to determine if the water is safe for full body contact. As of the end of June 2002, 617 test results were posted on the website for the public beaches. The data posted on the website are useful for parents to determine whether it is safe for their children to swim in the water when they are visiting public beaches.

VI. SUMMARY

The TSG has made progress on addressing the following issues related to children's environmental health in the 2001-2002 fiscal year:

- A. The TSG has continued interactions with other state agencies including regular participation in the TSG and its subcommittees by representatives of the MDCH and the MDA.
- B. The TSG's CEHS has been actively tracking changes made by other states and the federal government to address differences in children's exposure and sensitivity. Many TSG members have attended seminars, symposia, and other training opportunities to stay abreast of risk assessment and children's health issues.
- C. The TSG will have a recommendation within a few months to address additional uncertainty for health effects not frequently evaluated such as reproductive, developmental, neurological, and immunological effects.
- D. The TSG's PRAS is determining how to use Monte Carlo analysis to better assess the variability in human exposure, including children's exposure.
- E. Review of dioxin and TCE toxicity values is ongoing to ensure that criteria for these chemicals are adequately protective of children's health using the best available science.
- F. The TSG is tracking proposed regulatory changes and research initiatives by the USEPA to better address exposure to chemical mixtures and cumulative risk.
- G. The TSG has provided comments to the USEPA on its proposed *Guidelines for Cancer Risk Assessment* and the draft *TCE Health Risk Assessment* to assist the USEPA in making these documents transparent and useful for state risk assessors to apply the best available science.
- H. The TSG CEHS members held a seminar featuring an innovative, community-based research and intervention project on environmental factors and childhood asthma.
- I. Outreach and education efforts began in an effort to reduce environmental risks to children through increased community participation.