August 16, 2001 Meeting of the Houston Ship Channel Dioxin TMDL Stakeholder Group

Stakeholders Present: Chris Barry, Charles Beckman, Linda Broach, Ralph Calvino, Tracy Hester, Pam Kroupa, Kristy Morten, Tina Proctor, Luis Sueiro, Lial Tischler, Jack Wahlstrom, John Westendorf

Support Team Present: Lisa Gonzalez, Sara Hausman, Paul Jensen, Larry Koenig, Carl Masterson, Randy Palachek, Hanadi Rifai, Yu-Chun Su, Monica Suarez, Pris Weeks

Others Present: Louis Brzuzy (Shell-Deer Park), Kirk Dean (Parsons ES), Phyllis Frank (Parsons ES), Joe Phillips (Shell-Deer Park), Tom Weaver (Houston ESA), Chuck Wemple (H-GAC), Bernadette Williams (City of League City)

Materials Distributed:

- March 1, 2001 meeting summary
- *Summary of other Dioxin TMDL Studies in the United States* (Rifai, et al., Aug. 2001)
- *Evaluation of High-Volume Water Sampling to Support Development of TMDL for Dioxins in the Houston Ship Channel* (Rifai, et al., Aug. 2001)
- Dr. Rifai's PowerPoint presentation

1. The meeting for the Houston Ship Channel Dioxin TMDL Stakeholder Group was held from 1:30-4:30 PM at the University of Houston-Clear Lake (UHCL), 2700 Bay Area Blvd., Houston, Texas 77058, Bayou Building 1st Floor, Forest Room. Pris Weeks of the Environmental Institute of Houston (EIH) welcomed the group. Self-introductions were made. Meeting agenda items were re-ordered and approved.

2. The March 1, 2001 meeting summary was approved without further changes. Membership issues were addressed. Stakeholder, Brad Ellis, has left the City of La Porte. It was agreed that his seat would be replaced by inviting Steve Spears with City of Pasadena to serve as a stakeholder. The HSC Dioxin stakeholder meetings will continue to be held at the UHCL campus. However, UHCL has recently changed its parking policy. It will now cost $3 per person to park in Visitor Lot R and $0.75 to park in the visitor lot in Lot D. EIH will have parking tokens available for the $0.75 parking.

3. Clean Rivers Program Update: A sediment and tissue sampling project is being conducted by PBS&J through a contract with the Houston Galveston Area Council (H-GAC). The project wants to emphasize tissue data (oysters, hardhead catfish and blue crab) collection (70%), but also includes sediment sampling data (30%). The focus was on stream segments not sampled in

previous efforts. Sediment sampling stations were located in side bays, the main Houston Ship Channel (HSC) and open bay. The range was similar for hardhead catfish and blue crab sampling as well. Oysters were collected in Galveston Bay below Barbour's Cut. Samples were sent to Wright State University for analysis. Results are expected in 1-2 weeks.

Tropical Storm Allison made some locations difficult to sample for the indicator species. Debris generated by TS Allison and the HSC maintenance-dredging project made is difficult to obtain some samples. Samples may include additional sediment brought in by flows associated with TS Allison. Normally 1-2 feet of sediment accumulates per year in the upper HSC. That much sediment was accumulated in the week after TS Allison event.

Each sediment sample analyzed is a composite of three samples taken from within the same cross-section of the channel. Tissue samples consist of three samples each of blue crab and catfish at a given location. The edible tissue is then analyzed.

TNRCC Update: TMDL Program Leader, Mel Vargas, has left the TNRCC. His replacement has not yet been found.

UH Technical Update: Input from the March HSC Dioxin stakeholder meeting was incorporated into the work plan. This information is included in the report submitted to H-GAC in June 2001 and will be available via the H-GAC website (<http://www.hgac.cog.tx.us/intro/introtmdl.html>). The new workplan and a summary of the 4-6 dioxin TMDL reports distributed to stakeholders in May will be presented today. The final version of the Phase II workplan will be completed in August 2001 and the Phase II work is expected to start September 1, 2001. Initially the work will consist of drafting the QAPP. Sampling may begin in spring 2002 and may take two years to complete.

Fish tissue data generated by the PBS&J study mentioned above should be available in mid September 2001. Some stakeholders would like to see that data before they issue comments on the Phase II work plan.

Break

Some stakeholders suggested that winter would be a better time to collect tissue samples in the upper reaches of segment 1007. Not many fish are present in that area in the summer. High volume sampling and fish sampling were suggested as two activities that could occur in the winter. Stakeholders asked if the lower HSC (segments 1005 or 1006) could be targeted for tissue sampling. Some stakeholders also suggested that more than one year of data be compiled so that long-term trends can be analyzed. Seasonal trends are useful to understand the dynamics of a system.

Phase II of the study will generate a large amount of congener data that can be analyzed later in the project. Eventually, PBS&J would like to analyze fish gut tissue to determine the source of dioxin e.g., from the food chain or from water. This will be possible if composite samples comprised of tissue from several catfish are used. At the least, consumption advisory species (hardhead catfish and blue cab) will be analyzed. It may be possible to incorporate other organisms as well.

Since future work plans and QAPPs will be based on the Phase II work plan, stakeholders would like to have a chance to review and make comments. The QAPP is due three months after project initiations. Comments on the work plan are needed by August 24, 2001.

Tischler had two suggestions: 1) identify stations so that reference stations are identified, 2) be careful when looking at concentrations in water versus concentrations in fish tissue since standards are based on fish and crab tissue.

4. **Hanadi Rifai** presented an update on the HSC Dioxin TMDL sampling methodology and available models. A handout of the presentation slides was made available.

Major tasks for work order # 3 (Summer 2001):
Additional information and data from other national studies was reviewed. Here are some good studies going on in other parts of the country. Existing models suitable for dioxin analyses were reviewed to see if anything can be added to the models that will be utilized for this study. Dioxin emission data and information from other TNRCC programs was reviewed to obtain information on wet and dry deposition from air sources. The Phase II work plan was refined and will be presented today. Stakeholder suggestions were incorporated.

Previous dioxin TMDL studies:
The UH team has looked at and has made available the report on the TMDL for total 2,3,7,8-TCDD for the Ohio River. This study was based on high-volume water sampling data. The modeling for this study was straightforward. This study over-simplified the sediment pathway and neglected to consider the air deposition pathway. Three or four other national studies used a simple water based approach. Dr. Rifai will e-mail a summary document when all the information on models used for TMDL is available.

The UH team has also made available the report on the TMDL for total 2,3,7,8-TCDD for the Kanawha River, Pocatalico Creek and Armour Creek (West Virginia). This study used the same endpoint (0.013 pg/L) and flow conditions (greater or equal to a 7Q10) as the study mentioned above for the Ohio River. One point source was identified, as were 70 potential sources.

This study found that contaminated groundwater as well as soil and sediments may have been contributors to the dioxin contamination.

A report on the TMDL for total 2,3,7,8-TCDD in the Columbia River Basin has also been reviewed by the UH team and made available. This study utilized a simple approach and no modeling.

Dr. Rifai explained the approach behind high-volume water sampling (HVS), a methodology utilized by some studies. UH and TNRCC are intrigued by this methodology and would like to find a way to incorporate into the HSC Dioxin TMDL workplan. HVS is a fairly simple concept, but can be expensive. The HVS method allows one to look at both the dissolved and filtered components. In this method 200-1,000 liters of water are processed. Particle-associated dioxins are collected on a glass fiber filter. Dissolved dioxins are trapped on a resin placed after filtering. Dioxin is then recovered from both the filter and the resin.

Problems associated with HVS include possibility that the filter and resin can miss some of the dioxin in the sample. The method to obtain the non-filterable solids is labor intensive.

Dr. Rifai recommends the use of HVS for the HSC Dioxin TMDL project. Costs of this sampling methodology could be $4,000 to $5,000 per sample. However, bulk sampling could reduce that cost. **Tischler** thought that the analytical costs might be a little cheaper- possibly around $3,000. **Palachek** said the cost per sample could be $2,000 or more.

Dr. Rifai then resented UH findings from their analyses of dioxin emissions data obtained from Risk Burn Reports. This is not the same as Toxic Release Inventory (TRI) data. The data was self-reporting data from 30 units around the HSC. The data is generated when a unit does a risk/trial burn for their permit renewal. The data is used by the TNRCC to generate risk assessments. Only one facility has a completed risk assessment. **Koenig** added that one risk assessment is close to being published. The UH team would have liked to model fate and transport, but could not base a model on only one facility's numbers. This risk burn data does, however, give an approximate figure for a HSC endpoint.

From the Risk Burn Report analysis the UH team estimated that dioxin air emissions totaled 24 g TEQ per year. This is approximately 10 times the load from direct discharges into water. It should be noted, however, dioxin air emission cannot be directly compared to direct discharges into water.

Dr. Rifai then presented the proposed Phase II-III work plan. Phase I ended in June 2001. Phase II should begin at the end of August.

Phase II will consist of:

- Identifying the water quality target
- High volume water sampling
- Sediment and tissue sampling
- Screening models.

Phase III will consist of:

- Air sampling
- Sophisticated model development
- Load allocation.

The Phase II task of identifying water quality targets has two possible approaches:

1) Water concentration target based on high volume water sampling;
2) Water quality standards based on bioaccumulation factors; link water and sediment concentrations to tissue concentrations

The second would require a more sophisticated approach to analyze sediment. **Rifai** stated that they do not have sufficient information at this point to decide which approach would be best. However, a simplistic approach could not be realistically used for the HSC. The national studies tended to look only at water concentrations. If that same route is taken for the HSC it would be simpler and less expensive, but it may not solve the problem.

Tischler stated that the first approach gives no way to determine if the problem is solved. Not much would be gained given that HSC water concentrations do not exceed water quality standards for dioxin, but blue crab tissue samples do exceed the standards.
Koenig suggested that the first approach might be helpful to get the bureaucratic process going.
Tischler stated that the information collected by the first approach is important, but it does not foster enough confidence on which to base an implementation plan.
West stated that one must understand the system to identify a source.
Rifai agreed by saying that uncertainty must be reduced to some degree.

The Phase II task of monitoring and data collection includes two basic elements:

- Assess current status and trends in the study area
- Assess major sources

To assess current status and trends, 34 locations have been identified for sediment sampling, 8 locations identified for sediment core sampling, 32 locations identified for water sampling (particulate and dissolved; spread out across both project phases) and 41 locations identified for tissue sampling. Maps in the report detail the locations of these sampling stations.

Major sources will be assessed by analyzing effluent and sludge, analyzing sediment and water from tributaries, conducting runoff sampling, assessing wet/dry deposition and sampling the stacks at 40 units in the HSC area.

West and **Tischler** suggested that sludge be obtained from the treatment unit rather than from a landfill to obtain the best representation of what is being discharged.
Rifai stated that sludge will be analyzed in Phase II, if there is a "hit", then the effluent will be analyzed using high volume water sampling.
Westendorf asked if Harris County Flood Control ditches would be sampled. He also stated that there are some sources that generate dioxin, but are not required to do stack sampling (e.g. burn barrels). Some people do not know that they generating dioxin.
Tischler asked if more sources would be seen on the Toxic Release Inventory.
Weeks asked about the mention that runoff and wet/dry deposition sampling will be done on a pilot scale.
Rifai stated that yes in Phase II it will be conducted on a smaller scale to assess the relevance of air deposition. If it is found to be relevant, then it will be pursued in Phase III.

West inquired about sediment sampling locations.
Jensen stated that sediments will be sampled at the mouth and in the tidal portions of the tributaries.

Dr. Rifai stated that information gathered in Phase II will be used to eliminate those parameters that are not important. The project will then proceed into Phase III.

Dr. Rifai then presented a preliminary conceptual model (see presentation handout). The conceptual model will be refined. High volume data will be used. Runoff loadings will be estimated. Some simple mass balance model might be used to determine which parameters are most important to model. BSAFs will be calculated and the preliminary load allocations will be developed. The goal of the TMDL is the allocation. An allocation amount must be found and linked to a source(s) to come up with the needed reduction.

The UH team is continuing its work with stakeholders to develop a project timeline, informational materials, technical presentations. The UH team also responds to questions and information requests and incorporates stakeholder recommendation into their strategy.
Dr. Rifai then discussed Phase II-IIO work plan costs. The estimated total for both phases is $4.1 million, but could be anywhere from $2-5 million depending on how in-depth the TNRCC would like to go.
Koenig stated that he hopes the TNRCC can come up with the money to do a good job on the project. The project may need to be stretched out.

Dr. Rifai summarized by saying that Phase II will incorporate two complimentary approaches: high volume water sampling and sediment-tissue sampling with screening models. Phase III will involve air sampling and sophisticated modeling with four complimentary models. She stated that the simple approaches taken in the national studies are not applicable for the more complex HSC. But the best ideas from those studies- high volume sampling will be incorporated. The contribution of air deposition will also be looked at. Sampling will take approximately two years.

5. **Weeks** than enquired as to when the next meeting could be held. Rifai suggested the next be held 3-6 months after they begin Phase II. The final report for the work done over the summer will be available in September 2001. QAPPs will be placed on the Internet. Stakeholders will be sent a request to review the QAPP and make comments.

   Rifai asked if the UH team could see the report for the sediment and tissue sampling project conducted by PBS&J for the Clean Rivers Program. **Jensen** stated that it would be available upon its submission to H-GAC.

6. Meeting adjourned.