DIOXIN/PCB TMDL STAKEHOLDER MEETING
Draft Meeting Summary

April 4, 2012
1:30 – 4:00 PM

Members Present: Latrice Babin (Harris County Pollution Control), Brent Dyer (Shell Chemical), Carolyn Murphy (USACE), Bob Stokes (Galveston Bay Foundation), Lial Tishler (E. Harris Co. Manufacturer's Assoc)

Members Absent: Robby Byers (CCA Texas), Nikki Harrison Caffey (Harris County Pct. 2), Daya Dayanada (City of Pasadena), Winston Denton (Texas Parks & Wildlife), George Guillen (Environmental Institute of Houston), Tracy Hester (Bracewell-Patterson), Nicole Hausler (Port of Houston), Ed Matuszak (Private Citizen, with URS), Gordon Pederson (Gulf Coast Waste Disposal Authority), David Ramsden (URS Corp), Gerardo Ruiz (City of Baytown), Jay Stokes (City of Deer Park), John Westendorf (Occidental Chemical Corp), Kirk Wiles (Texas Department of Health),

Support Staff Present:

Linda Broach (TCEQ), Kristi Corse (H-GAC), Will Merrell (H-GAC), Gary Miller (EPA), Brian Mueller (EPA Water Quality Protection Division), Jeff Murray (H-GAC), Jim Neece (TCEQ), Rachel Powers (H-GAC), Hanadi Rifai (UH), Ron Stein (TCEQ), Donn Walters (EPA)

Others Present:

Brad Beless (UH)
Cecilia Dykes (Air Alliance Houston)
Phyllis Frank (GCWDA)
Brandon Georgetown (UH)
Linda Henry (Port of Houston Authority)
Nathan Howell (UH)
Steve Hupp (Bayou Preservation Association)
Scott Jones (GBF)
Carol Lamont (Harris County)
Mark Landress (Project Navigation)
Brandon Mannchen (Houston Sierra Club)
Alice Melendez (Galena Park Resident)
Maria Modelska (UH)
Norman Mollavlo (Lubrizol)
Jay Moore (Resident)
Melanie Oldham (Resident)
Will Petit (representing GBF)
Bob Piniewski (Project Navigation)
Kathy Richols (GCWDA)
Michael Ruger (Texans Together)
Toylaine Spencer (CBW)
Crystal Taylor (TCEQ)
Matthew Tejada (Air Alliance Houston)
Taft Tucker (UH)
Mel Vargas (Parsons)
Cecilia Vancas (HCPC)

Welcome and Introductions

Rachel Powers called the meeting to order at approximately 1:35 PM. She thanked everyone for coming. Self- introductions of stakeholders, public participants, and H-GAC staff followed.

Review Agenda

Rachel informed the audience that Robin Brinkmeyer would not be able to attend the meeting and sent her regrets.

Adopt Meeting Summary from August 17, 2012

The meeting notes were adopted as written.

Consider Updates to the Stakeholder Group Roster

Committee members in attendance had no objections to the roster, which had been updated to reflect retirements, replacements, vacancies, etc. By the next meeting, H-GAC will propose replacements for the following categories of representatives:

- Commercial fishing
- Citizen/environmental justice
- Clean Rivers Program
- Industrial wastewater treatment

H-GAC has received several nominations for the citizen/environmental justice category, including representatives from the Bayou Preservation Association and the San Jacinto River Authority. Rachel encouraged stakeholders to submit nominations for any of the vacancies.

Update on the Draft Houston Ship Channel Dioxin TMDL and the PCB TMDL Projects, *Ron Stein, TCEQ*

Ron Stein listed the three projects related to the TMDLs: the Dioxin TMDL, the PCB TMDL, and the Galveston Bay Survey. Funding is in place for these projects. This year, the Galveston Bay Survey involves a lot of sampling to try to describe concentrations in Galveston Bay. Next year, TCEQ will be analyzing data and drawing conclusions from the data.

Over the last year-and-a-half, TCEQ has been working to craft the Dioxin TMDL. Dioxin that is already in the sediment is the primary issue. A TMDL to reduce current dioxin loads does not neatly fit the main source of bacteria, which is from historical sources and in the sediment. A TMDL cannot be crafted that would reduce loads sufficiently to meet water quality standards.

The agency has decided to move forward with the TMDL, maintaining the focus on sediment. TCEQ plans to begin development of an Implementation Plan. More information, including a possible timeline, might be available early in the next fiscal year, which starts on September 1, 2012.

Ron encouraged stakeholders to contact him with any questions.

Q: Is TCEQ looking at other TMDLs, such as Minnesota's statewide TMDL for mercury [http://www.pca.state.mn.us/wfhy9ef] or TMLDs that address legacy pollutants or aerial deposition, or that do not have waste load allocations?

A: TCEQ is looking at nonconventional models and is, in essence, identifying appropriate strategies.

PCB TMDL Projects – Project Updates, *Dr. Hanadi Rifai, UH*

Dr. Rifai began by explaining that the PCB and Dioxin sampling and modeling work began in about 2000 in response to a fish advisory for catfish. Since then, advisories have been issued for additional fish and aquatic species. Also, the geographic scope of the original project has increased to include both the Houston Ship Channel System and Upper Galveston Bay. Currently there are two TMDLs:

TMDL for Dioxins in the Houston Ship Channel System

- Data collected in 2002, 2003, 2004, 2005, and 2011
- TMDL draft was developed in 2006
- Dr. Rifai has been working with the TCEQ to bring the TMDL process to a conclusion.

TMDL for PCBs in the Houston Ship Channel and Upper Galveston Bay

- PCB data has been collected in 2002/03, 2008/09, and 2011/12. Concentrations changed noticeably after Hurricane Ike, in fall of 2008.
- Additional sampling will be done this summer.
- Samples include water, sediment, and fish tissue.
- Sample results often exceed water quality standards.
- Analysis has raised an interesting question about whether constituents are dissolved or suspended. PCBs tend to be more dissolved while PCDDs and PCDFs tend to be suspended.

Dr. Rifai mentioned that there are significant behavioral differences between PCBs and Dioxin. PCBs are hydrophobic, meaning that they separate from water molecules. Dioxins tend to attach to particulate matter. She also said that Dioxins are more manifested and exhibiting their presence bay wide. PCBs are located in what could be referred to as hot spots or localized areas.

PCBs and Dioxin also differ in terms of concentrations found in nongame fish such as catfish and croaker and game fish. Game fish tend to have higher lipid or fat content as compared to nongame fish. Game fish tend to have higher concentrations of Dioxin and non game fish tend to have higher concentrations of PCBs. Catfish also have a higher bioaccumulation potential, meaning they have a greater likelihood of absorbing organic compounds as compared to different

species of fish. She also said that when analyzing the toxic equivalency quantity (TEQ) calculations, it appears that there is a strong relationship between specific constituents that can be associated to specific activities that are ongoing in the bay.

Dr. Rifai also said that for PCBs, the exceedances of the standards found in both Atlantic Croaker and trout are limited to certain locations, which is a good method of identifying hot spots. She also mentioned that levels of PCBs and Dioxin in the San Jacinto and Hunting Bayou are remaining stable; however, levels in the Turning Basin are increasing. The increasing levels could be due to the drought, or for Dioxin, the stirring of sediment brought on by Hurricane Ike. When looking at the data, it seems that between ’08, 09, and ’11, the increases in concentrations were due to environmental stressors.

She said that her group plans on being out in the field this summer. She said that they will be integrating new sampling plans, which have new standards for sampling both PCBs and Dioxin. They will be sampling bay wide, and they will be developing a new, robust dataset.

Q: To Summarize, does the data collected for Atlantic Croaker illicit a cause for concern?
A: No, not really. The numbers are all consistent; however, there have been a couple samples that were pretty high.

Q: Could the higher numbers in Dioxin be due to a new source or redistribution?
A: I have not studied that specifically, but would suspect redistribution.

Q: Regarding PCBs being found in sediment or the water column, is there a specific reason why we are not seeing PCBs in sediment?
A: It could be that the PCBs are attaching to finer particles, which are passing through our sampling filters. We are also looking at source differentiations. The PCBs could be truly dissolved.

Q: Nothing has really changed?
A: In terms of Dioxin, no. We have noticed a PCB congener differentiation. There is an overlap within the region; however, the different congeners do not behave that differently. Other reasons could be in play for congener overlap. We are still studying this.

Site Status Report, Patrick Bayou Superfund Site, Deer Park, TX, *Phil Allen, EPA*

Mr. Allen began by stating that the Patrick Bayou Superfund Site is located in a highly industrialized portion of Deer Park and drains into the Houston Ship Channel. The EPA has already conducted some modeling, remedial investigations, field investigations, and other evaluations of the site. Right now they are working on a risk assessment for human and ecological health. He stated that different companies and agencies have formed a Joint Defense Group concerning the Patrick Bayou Superfund Site. He also mentioned that with the initial run

of sampling at the site they found PCBs, which they did not expect to find. He did say that this site is prone to air deposition from the surrounding industry. There are areas within the site with a higher velocity for deposition and also there is scouring occurring.

Because of the inclusion of PCBs, they conducted more sampling of sediment and fish tissue. Based on their conceptual model, the ecology of the system is what could be expected. There are still issues remaining with the potential to affect human health; however, unlike the San Jacinto Site, there are virtually no trespassers accessing this site. So far they have not found any evidence of human activities, such as beer bottles and fishing lures. Human health could only be affected with direct contact with fish or sediment.

Mr. Allen stated that the next steps are to initiate a feasibility study and to begin on a draft work plan. They will be evaluating different alternatives for the site. He stated that much is going on currently and a lot has been going on with this site in the past. They will be doing metals sampling this summer.

Q: How far up does the tidal portion of the bayou go?
A: A third of the limit of the bayou.

Q: I have read that there are fifty two contaminates and concerns within this site. How do you deal with synergistic aspects of contaminates?
A: The biggest risks at this site are the PCBs and Dioxin.

Q: Is there any threat to me? I live in Deer Park.
A: It's in the sediment, unless it is direct contact, you are safe. Remember that during the 1950s and 60s, it was common practice to dump indiscriminately. At that time we did not have stringent laws or regulations.

Q: You mentioned that scouring is occurring in parts of the bayou, are the contaminants still contained in bayou?
A: Yes

Q: Have you considered a short term solution or an early action?
A: We have discussed early action; however, we are so far along in the process that we will move forward with a permanent solution. We have considered an early action, but we are not going to do one.

Q: I have heard the term soft sediment. What is the general significance of soft sediment?
A: All sediment is soft to about 8 feet. Contamination is concentrated in about 4 to 5 feet of the sediment. The upper ten centimeters of the sediment is the active zone for benthic activity.

Update on the San Jacinto Waste Pits Superfund Site, *Gary Miller, EPA, Stephen Tzhone, EPA*

Mr. Miller reported that the draft of the final report for the San Jacinto River Waste Pits site is due in the middle of 2012. EPA has been sampling sediment, soil, and fish tissue. A preliminary report on the sampling results is available. Just this past Thursday, EPA sampled for dioxin in residential areas. EPA should have the results of the sampling in three weeks. Additional sampling of the southern impoundments, the area south of I-10, will be done soon. The cover on the waste pits has been completed. They are working on a developing a monitoring and inspection plan.

Q: Could you describe the location of the southern impoundments? It was not discussed at the last meeting.
A: The southern impoundments are south of I-10, and south of a little surface road. In 1965, paper mill waste was placed in those impoundments. Cores in the northern part of the southern impoundments found some dioxin. EPA is sampling the sediment and ground water further south and will continue to sample in the future.

Q: Has the "blue line," the representation shown at previous meetings of the border around the project area, changed?
A: Not yet, but EPA will review data report. We will make sure we identify the full extent of the contamination.

Q: Can you give us an update on the Patrick Bayou Superfund Site? Have you conducted studies, clean ups, or determined who the responsible parties are?
A: I am not involved. At this point, our agency is not officially commenting on it. We are figuring out any relationships between the Patrick Bayou Site and the Waste Pits.

Q: In what stage of the process is the NPL site?
A: Efforts have been made by the Patrick Bayou Task force, and we are working on getting a better picture. We are studying connection to the site, if there is one. We are working on the connection and deciphering what the connection is.

Q: Both PCB and Dioxin contamination is occurring at that site. Where does that site stand in the clean up process? Is something going on? Can you provide general information about what to expect in that process and where is it in the process?
A: I do not know. In terms of the SJRWP site, the waste pits were used for placing waste from a paper mill. Over time, due to subsidence and other factors, the San Jacinto River began to cover the pits. In terms of what we have done, we have placed various membranes and fabrics, and different sizes of rock over the pits. This was done as a temporary measure. Eventually, a final measure will be selected for the site once we have completed the feasibility study.

Q: Can you provide an updated fact sheet and maps of new pits? It would help for gathering some orientation to the site.

A: We will provide an updated fact sheet and maps of the new pits for the next meeting.

It was noted that the EPA has great website, which is up to date on the SJWP. However, it does not provide much information on the southern impoundments.

Q: Is there a risk assessment?
A: Not yet

Q: Is one of the exposure pathways the consumption of seafood?
A: Food ingestion is one of the pathways.

Q: Is there an eco-risk assessment?
A: Yes

Q: Will the cleanup standards for the site be consistent with the cleanup standards in the TMDLs?
A: Our number one priority is developing a "cleanup plan." We still have questions regarding sediment and residual soils.

Q: Is the southern impoundment a single pit or more than one pit?
A: We do not know. It could be one pit or two pits with divider. We do not have an historical aerial photo.

Fingerprinting Dioxin: a geospatial analysis of the distribution of dioxin congeners in the Ship Channel and Galveston Bay, *Dr. Linda Broach, TCEQ*

Dr. Linda Broach began by stating that dioxin is a term for a family of chlorinated aromatic compounds. The different variants of dioxin are referred to as congeners. Congeners are identified by the number of attached chlorine molecules, meaning that octadioxin is a congener with eight attached chlorine molecules and tetradioxin is a congener with four attached chlorine molecules. All dioxin congeners are toxic; however, the degree of toxicity is determined by the amount of attached chlorine molecules. A congener with a low number of chlorine molecules is more toxic than a congener with a higher amount of chlorine.

For Dr. Broach's analysis, she conducted congener fingerprinting or identification and comparative analysis for both dioxins and furans at the San Jacinto Waste Pitts Site, Patrick Bayou, The Houston Ship Channel, the side bays, Cedar Bayou, and Galveston Bay. For this analysis, she conducted multiple sediment samples at each location and averaged the results. If there was a non-detect she assigned a value of zero.

The first site she provided data for was Banana Bend, which is around Highway 90. Most of the dioxin found was octadioxin. Octadioxin is a product of internal engine combustion. Cedar

Bayou also had a similar fingerprint with a majority of octadioxin, which is not surprising given that Cedar Bayou is in close proximity to an urban area.

The San Jacinto Waste Pits site had a very high TEQ. There were tetradioxins, tetrafurans, and also other furans and dioxins which are associated with industry. What was found within the waste pits was consistent with what is to be expected with sampling paper mill waste.

Dr. Broach stated that there were many samples taken at Patrick Bayou, which also had very high TEQ concentrations. The most common congener found at Patrick Bayou was octafuran. Octafuran is a byproduct of many industrial activities. Samples that were taken close to the mouth of Patrick Bayou were very high in octafuran. Octafuran was also prevalent around the HSC. Tetrafuran and tetra dioxin were both found in high concentrations at Vince Bayou. Over ninety percent of the congeners collected in Galveston Bay were octadioxin.

To summarize, Dr. Broach found that octadioxin could be considered a background congener, given that it is byproduct of combustion and is found in waterways through airborne deposition. Tetradioxin and tetrafuran are indicative of paper mill waste. Also, Patrick Bayou had high concentrations of octafuran, with the highest concentrations being found at the mouth of the bayou.

Q: What TEQ value should we be concerned with?
A: The clean up level for residential soil is 1ppb. This number is based on risk and it is the only published number that we have currently.

Q: How old is the data?
A: The data was accumulated in ’02, ’03, and ’05. I can re-fingerprint in the future.

Q: Have you begun to do a new fingerprinting?
A: Not yet. I will be getting more data soon from Hinadi (Dr. Rifai).

Dredged material evaluation of sediments in Houston Shipping Channel proposed for dredging: Bioaccumulation of dioxin in sediment invertebrates, *Jeffery Steevens, US Army Corps of Engineers, Engineer Research and Development Center*

Mr. Steevens began by stating that it is the United States Army Corps of Engineers (USACE) responsibility to ensure navigation paths are kept free, clear, and open, which means that periodically navigation paths must be dredged. Annually the USACE dredges 40 million cubic yards of material, with about 2 to 5 million cubic yards dredged annually from the Houston Ship Channel. In every instance that the USACE dredges they must evaluate the suitability of the dredged material before depositing it in the ocean. There are laws which prevent the deposition of materials that will degrade an ocean floor ecosystem. If material is suitable to be deposited, it must be placed in designated oceanic sites of deposition. If the material is not suitable, the material must be placed on land in order to be monitored and controlled. If material is placed on

land, the material is regulated by the Clean Water Act (CWA). If the material is placed in the ocean, the material is regulated by the Marine Protection, Research, and Sanctuaries Act.

The USACE has developed an effects based tiered approach in determining the placement of dredged material. For the Houston Ship Channel, the USACE collected water and sediment from 49 channel sites, 6 placement sites, and 3 reference sites. In order to determine the suitability of the sediment, the USACE analyzed the total TEQ of the sediment and conducted both Suspended Particulate Phase Bioassays and Benthic Toxicity Bioassays. Both bioassays expose animals to the sediment and animal mortality is monitored. The Suspended Particulate Bioassay exposes grass shrimp and silver side fish to a "slurry" of water and sediment for a duration of 48 to 96 hours. The Benthic Toxicity Bioassays exposes larger clams and worms to sediment for up to 28 days. From the bioassay analyses, the findings were consistent with what could be considered normal ambient conditions, meaning that the sediment was not considered overly toxic to prevent ocean floor deposition.

Q: Many years ago, material was dredged from the Houston Ship Channel and was placed in unlined pits that are adjacent to our communities. Our potable water source is groundwater. Should we be concerned about plumes of pollution that could seep into the groundwater from these unlined pits?
A: That could be a concern. It depends on many variables such as geology and pressure.

Q: You mainly sampled at the lower end of ship channel. As we have seen from previous presentations, most of the contamination is upstream in the ship channel. Do you have plans to sample upstream?
A: That would be something to look at in the future.

Q: Does the USACE do similar testing upstream?
A: We have a similar approach, but the regulations are different. Upstream testing uses more chemistry screening criteria.

Panel of Resource Agencies and Stakeholders

The panel began by talking about the sediment data for the Houston Ship Channel system. The system has several hotspots. The proportions of different congeners varies depends of sampling locations. The proportions in Patrick Bayou are not the same as in the San Jacinto River Waste Pits site.

Q: In terms of the correct terminology, we are talking about hot spots and hotter spots?
A: When we did the fingerprinting, results showed a range of concentrations. The areas next to pits and around the San Jacinto Monument had concentrations in the hundreds, while concentrations in the pits themselves had concentrations in the thousands. The area around the San Jacinto Monument is in 100s. We are concerned with anything over twenty/twenty one.

Q: Was this talked about at the meeting this morning? [Note: EPA and several resource agencies meet regularly to discuss progress on the SJRWP superfund site.]
A: This was brought up at the meeting this morning. It is difficult to describe this in the abstract. We did decide this morning that we need pictures.

Q: Is there a defined categorical segregation?
A: We found 17 different congeners. There are different chemical processes that result in different congeners.

Ms. Patel stated that Harris County considers this to be an important public health and environmental issue. They county is working closely with the Superfund team. A big piece of this effort is public and community awareness.

GBF is working to increase communication with the general public. They are currently working on signage. The will place 120 signs around the bay, especially near the waste pits. The signs will have graphics warning the public of the different advisories. They should be in the ground in the next month or so. They are also working through the EPA on a technical assistance grant for an independent review of the data. They want to interpret the data and communicate the findings to citizens. They do not way anyone to feel left out of the cleanup process.

Q: What are the next steps for the Patrick Bayou Site?

A: The fingerprinting data was of immediate interest to the EPA and other agencies because one of the questions is if the Patrick Bayou Site had anything to do with the SJWP site. We are going to continue to collect data and analyze data.

Other Business

Rachel passed around the current roster of stakeholders, which has three vacancies. She explained that some people have moved on or have left the stakeholder group. She is looking for appropriate people to be invited for the stakeholder process. She would welcome recommendations for replacements to be considered at the next meeting. She will follow up with an e-mail request.

Next Meeting

Rachel stated that the next meeting will be within 6 months. The next meeting should be in February unless the TCEQ or this process comes to a significant milestone, in which case, we would meet sooner. EPA has agreed to share information about the Patrick Bayou Site at the next meeting.

Q: Dr. Rifai, during the interim period could you share any new data?
A: Yes, we will circulate it.

Adjourn

The meeting adjourned.