

Meeting Summary
Buffalo & White Oak Bayous Bacteria TMDL Stakeholder Group

November 16, 2004

STAKEHOLDERS PRESENT: Neil Bishop; Claire Caudill; Catherine Elliott; Terry Hershey; Bob Hunt; Tom Ivy; Scott Jones; Trent Martin; David Peters; Kim Phillips; Todd Running; Linda Shead; Mary Ellen Whitworth;

STAKEHOLDERS ABSENT: Delwin Cannon; Rod Hainey; Shane Hunt; Gwang Pyo Ko; Helen Lane; Bill Manning, Sr.; Colleen O'Brien; Kerry Whelan.

SUPPORT TEAM PRESENT: Linda Broach (TCEQ-Houston); Paul Jensen (PBS&J); Kim Laird (TCEQ-Houston); Roy Lehman (TAMU-CC); Carl Masterson (H-GAC); Joanna Mott (TAMU-CC); Mary Jane Naquin; Tina Petersen (UH); Hanadi Rifai (UH); Ron Stein (TCEQ-Austin); Charlie Schwartz (PBS&J); Tom Weber (TCEQ-Austin); Andrea Crumpacker (UH); Yeoseon Choi (UH); Gian Villareal (UH).

OTHERS PRESENT: Karen Atkinson (TCEQ-Houston); Alem Gebriel (TC&B); Lynne Johnson (BPA); Susan Karlins (City of Houston); Linda Pechacek (TC&B); Kathy Ramsey (H-GAC); Amber Thomas (Harris County Storm Water Quality);

WELCOME & INTRODUCTIONS

At approximately 4:00 PM Mary Jane Naquin welcomed participants and opened the meeting by requesting self-introductions of the stakeholders and others.

REVIEW AGENDA

Members accepted the agenda as proposed.

ADOPTION OF MAY 18, 2004 MEETING SUMMARY

There were no changes to the meeting summary and it was adopted by consensus.

RELATED PROJECT BRIEFINGS

Designated Stream Uses. Ron Stein introduced Tom Weber to answer a question posed by Dave Peters (City of Houston). Mr. Peters wanted to know how the state decides on the category of use a stream is designated. Mr. Weber responded that the framework for establishing use categories comes from the state water quality standards. Each state is required to establish standards by the Clean Water Act. The overarching nationwide goal is "fishable, swimmable" for all waters of the United States, but this goal hasn't been reached yet. Every three years Texas goes through a process to revise the standards with public input. So far TCEQ has assessed about 40% of the stream miles in the state and most of the places where uses have been established are larger, more significant water bodies. For example all estuaries in the state have designated uses. There are unclassified waters that probably haven't been assessed and have no designated use. Water quality assessments are done to get a better idea of what kind of uses could be achieved – if an assessment shows high aquatic life use a dissolved oxygen standard will be established for the parameters that will measure whether that use is met. There are some parameters that are universal state wide and a lot of these relate to human health, such as drinking water standards (multiple parameters) and contact recreation, the measure of which is bacteria (E. coli). Since this same health risk could exist anywhere in the state, contact recreations standards are the same statewide, so there are some water body specific uses and some statewide uses. Mr. Peters noted that his concern over how uses are determined arose from his examination of data obtained through Clean Rivers Program sampling. There followed some discussion of the specific numbers of E. coli that constitute the contact recreation standard. This led to some comments regarding the situation of having contact recreation standards upstream (Buffalo Bayou) and downstream (Galveston Bay) of the Houston Ship Channel, and having non-contact recreation standards for the ship channel itself. Carl Masterson noted that at one time the same situation existed with

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Cypress Creek that was designated for non-contact recreation flowing into Lake Houston that was designated for contact recreation. In that case Cypress Creek had its use changed to contact recreation.

The TCEQ Web Site link to water quality standards is

www.tnrcc.state.tx.us/permitting/waterperm/wqstand/index.html

Bacteria Die-off Study. Todd Running presented data produced from the first of six sampling runs by this Clean Rivers study. Hopefully two of the runs will occur during rainfall and another after the rainfall event to show the difference in bacteria levels. This first sampling run was during dry weather.

Project Inventory. Carl Masterson briefed the group on the results of H-GAC's search for projects that could provide valuable and relevant information to the TMDL study. Some of the agencies/organizations have not yet responded. This project was initially intended to be finished in FY 04, but will continue through FY 05 to capture information from the unresponsive agencies/organizations and to continue the search for additional projects that could help with the implementation phase.

TMDL PROJECT STATUS

Dr. Hanadi Rifai reviewed the project with the group starting with freshwater bacteria standards, study area and the major tasks completed under Work Order 6 including stakeholder involvement, QAPP development, finalizing Bacteria Source Tracking sampling plan, assessing the impact of biosolids releases to the bayous, assessing sediment contributions and investigating E. coli levels from the Addicks and Barker Reservoirs, quantifying loads of E. coli to the bayous from bypasses and overflows, assessing the impact of effluent discharges on instream E. coli levels, expanding the TMDL model to include biosolids, overflows and bypasses, expanding Antibiotic Resistance Profiling (ARP) database, and conducting bacteria source tracking sampling and analysis. She then briefed the group on the method used to analyze the contribution of biosolids.

Dr. Paul Jensen, PBS&J then spoke to the group on sediment contributions. There are three major areas of contribution – (1) bacteria in soils, (2) stream sediments with and without upstream wastewater treatment plants (WWTPs), and (3) sediment in the water. (1) The Harris County Flood Control District sampled soils along drainage channels. Different types of soils were sampled and showed that soils rich in organic matter support large numbers of bacteria used as indicator organisms. (2) Results of sampling sediments with and without upstream WWTPs showed there is a difference but doesn't tell us whether or not poorly operated WWTPs are affecting the in stream sediments. The results tell us that the three WWTPs looked at don't have an affect on bacteria in sediments but the meaningfulness of this was questioned by stakeholders based on there being so many more WWTPs than the three involved in this sampling that we can't use the results to make a statement about WWTPs in general. (3) Sampling was done to better understand the relation between high solids and bacteria in runoff, and removal in settling. The sampling showed that bacteria are removed by settling, there were short term spikes in E. coli concentrations and more data is coming.

Tina Petersen, U. of Houston, presented the information on E. coli levels coming from Addicks and Barker Reservoirs. Sampling was done from June to August 2004 beginning after June rains to investigate the impact of water releases from the reservoirs. Three wet weather and three dry weather events were sampled. Results (total from the reservoirs) showed wet weather contributions from the reservoirs were much higher than dry weather events but that **even the** dry weather contributions from Addicks Reservoir exceeded the water quality standards. Also, while pools existed in the reservoirs **after the June rains**, E. coli levels discharged to Buffalo Bayou were below the **long-term** standards (**126 MPN/dL**), but when the pools disappeared, the levels in Buffalo Bayou were higher than the **long term** standards.

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without upstream WWTPs showed there is a difference but doesn't tell us whether or not poorly operated WWTPs are affecting the in stream sediments. The results tell us that the three WWTPs looked at don't have an effect on bacteria in sediments but the meaningfulness of this was questioned by stakeholders based on there being so many more WWTPs than the three involved in this sampling that we can't use the results to make a statement about WWTPs in general. (3) Sampling was done to better understand the relation between high solids and bacteria in runoff, and removal in settling. The sampling showed that bacteria are removed by settling, but there were short-term spikes in E. coli concentrations.

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Dr. Jensen presented results from the effort to quantify the loads of E. coli from bypasses and overflows. He first addressed bypasses, saying that the City of Houston's 69th Street WWTP is the only major facility that has the technical capability of bypassing the treatment process. The point was raised that bypasses are still a potential contributor of bacteria. Dr. Jensen noted that there are two types of sanitary sewer overflows (SSOs) – dry and wet weather – dry weather from failure or blockage of collection lines at normal flows and wet weather from exceedance of collection line capacity that is driven by infiltration and inflow. Dry weather overflow data was obtained from the City of Houston and TCEQ confirmed it has the same data. Dr. Jensen described the methodology used for the dry weather SSO characterization, including the assumption that all flows and bacteria loads reached the bayous in dry weather. One of the major points of this effort is that the available data suggest that even complete elimination of SSOs will not greatly change ambient bacteria levels. Dr. Jensen's summary also noted that collection systems with raw sewage need to be maintained and periodically rebuilt. And that continued and improved efforts to control SSOs must be part of the TMDL.

Dr. Rifai presented information on E. coli levels upstream and downstream of ten selected WWTPs. Samples were taken upstream and downstream, at the effluent outfall and within the mixing zone of the outfall in both Buffalo and Whiteoak Bayous. Dr. Rifai summarized the effort by saying that overall not much of an effect was observed. With a couple of exceptions, the sampling showed lower levels downstream than upstream and this was probably a result of dilution by the wastewater discharges. In general it was not a clear picture at all.

Dr. Rifai introduced Joanna Mott and Roy Lehman, who addressed the initial phase of the bacteria source tracking task. Fecal samples were collected in June-July 2004 at locations within the watershed that were identified by UH personnel and the animals included were based on a UH sanitary survey. All samples were analyzed at TAMU-CC. Dr. Mott described the Antibiotic Resistance and Dr. Lehman described the Pulse Field Gel Electrophoresis analyses for the group. The sources evaluated were bird, cow, dog, horse, bat and human. The results of the analysis are entered into a database, called a library that can then be used to identify sources of E. coli from water/sediment samples by comparing profiles. E. coli isolates from water and sediment samples have been verified and stored for future analysis.

Dr. Rifai then concluded the technical team presentation with a discussion of amendments to Work Order 6 (WO 6) addressing various issues that have been raised during the TMDL study. Amendment 1 included expansion of the TMDL model for Buffalo Bayou to include the reservoirs (data is being collected), and refining the model using time-varying WWTP flows. The results of the time-varying flows (TVF) **modification** show that even with the TVF the model still over-predicts low flows and low flow volumes in the bayous are not matched. A new method to match the hourly and daily flows from WWTPs is now **under development**. Dr. Rifai then discussed the matter of water withdrawals and diversions and what effect they may have on bacterial levels. More work on this will occur. In fact, future plans for the TMDL study include:

- * Sampling for biosolids releases

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- * Sampling sediment downstream of WWTPs
- * Sampling overflows and bypasses
- * Complete the Bacteria Source Tracking analyses
- * Finalizing the TMDL models for low flows
- * Refining the analysis of water withdrawal and diversion from the bayous
- * Complete load allocation scenarios
- * Select Best Management Practices.

Ron Stein noted that the TMDL team is interacting with the water supply section of TCEQ to be sure we are getting valid information regarding the withdrawal and diversion issue. He then discussed the FY 2005 work schedule (9/1/04 – 8/31/05), which is to complete everything that has been started and get ready for the implementation phase starting in September 2006. One of the tasks is a project to evaluate enteric viruses that developed from a presentation by a professor from TAMU-Galveston who has been looking at enteric virus content of shellfish, fish, etc. **The** evaluation of the enteric virus content of Buffalo and Whiteoak Bayou could tell us something to help assess the risk to human health. It could also help in source tracking by looking at the DNA of enteric viruses. TCEQ will use this as a check and look at it in terms of human health risk of discharge of waste to the bayous. This is not definitive and will not contribute to the TMDL but more considered as an accessory investigation. This year's work will lead to the refinement of load allocation scenarios and have a completed TMDL before the end of this fiscal year. Mr. Stein noted that he would begin development of the final TMDL document sometime toward the beginning or middle of next summer, and working its way through TCEQ about this time next year. Parallel with that, and beginning this year, we will begin looking at BMPs and strategies for reducing bacteria loads from nonpoint sources and point sources (costs, sources of funding, etc.). Starting, maybe at the next meeting, we will talk about what we can do and what may be available to us as far as strategies for successful implementation. One source of funding would be the 319 Nonpoint Source funding. Check the TCEQ's TMDL web site for relevant information.

A question was asked as to the presence of onsite sewage facilities (septic tank systems) within the watersheds and if they are being taken into consideration. Mr. Stein replied that there are few if any.

Another question was how development above Addicks and Barker Reservoirs would be handled. Would BMPs be implemented? Mr. Stein responded that since the discharge from the reservoirs is already above standard, it is likely we will have to look at what needs to be done upstream of the dams, so it is possible BMPs will have to be looked at, but this is not certain and depends upon a decision by TCEQ management.

A stakeholder asked if sampling should be done at certain mile intervals along Buffalo Bayou while the reservoirs are discharging for a length of time. We could see where increases in bacteria occur. Dr. Rifai responded that logistically it has proven to be a problem – accessibility, number of sampling teams needed, dam operation and cost and that most of the bacteria detected **could potentially be attributable to** resuspending sediments.

Another question was about the flow regime that would be the focus of implementation. The response was that it would be low flow, as that is when contact recreation would happen.

The point was raised that we need to look at a whole range of possible strategies and not limit ourselves.

MEMBERSHIP ISSUES

Carl Masterson announced there are now three vacancies to fill. Tom Ivey has inquired to serving on the stakeholder group and this was presented to the group. Mr. Ivey was unanimously welcomed to the group. Attempts to reach Houston Parks Department and Houston Canoe Club have been fruitful. There is a possibility that someone from Harris County Pct. 3 would serve as that precinct covers a great deal of the watersheds, and will be continuing contacts.

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NEXT MEETING

No specific date was set, but possibly in February.

ADJOURN

The meeting was adjourned at approximately 7:45 PM.