

## **DRAFT – Subject to Revision**

### **Meeting Report Buffalo & White Oak Bayous Bacteria TMDL Stakeholder Group February 19, 2003**

**STAKEHOLDERS PRESENT:** Neil Bishop, Latrice Babin, Catherine Elliott, Theo Glanton, Terry Hershey, Lynne Johnson for Claire Caudill Scott Jones, Helen Lane, Trent Martin, Mike O'Brien, Todd Running, Linda Shead, Mary Ellen Whitworth

**STAKEHOLDERS ABSENT:** Bennie Billington, Brenda Bradley, Dale Cannon, Cynthia Chappell, Rod Hainey, Carole Lenz, Mark Lowery, Mike McClellan, Monroe Morton, Mike Montgomery, Colleen O'Brien, Kim Phillips, Donna Phillips, Evelyn Born Shanley, Kerry Whelan

**SUPPORT TEAM PRESENT:** Linda Broach, Paul Jensen, Earlene Lambeth, Carl Masterson, Mary Jane Naquin, Tina Petersen, Hanadi Rifai, Yu-Chun Su, Monica Suarez, Ron Stein

**OTHERS PRESENT:** Kirk Dean (Parsons), Linda Pechacek (TC&B), Bruce Heiberg (Citizen), Kirk Fleener (TCEQ), Kim Laird (TCEQ), Tom Ivy (Citizen), Marty Kelly (TCEQ), Amber Thomas (Harris County Storm Water Quality)

#### **MATERIALS DISTRIBUTED:**

- 6/26/02 meeting summary
- 2/19/03 meeting agenda
- Dr. Rifai's PowerPoint presentation

#### **WELCOME & INTRODUCTIONS**

The meeting for the Buffalo and White Oak Bayous Bacteria TMDL Stakeholder Group was held on Wednesday, February 19, 2003 from 6:40 to 9:10 P.M. at the H-GAC offices, 3555 Timmons Lane, Houston, Texas 77227, 2<sup>nd</sup> Floor, Conference Room A. Facilitator Mary Jane Naquin welcomed participants and self-introductions were made.

#### **ADMINISTRATIVE ISSUES**

1. The June 26, 2002 Meeting Summary was presented for approval by the group. There were no comments and the report was accepted by consensus.
2. Ron Stein, TCEQ Project Manager, initiated a discussion on expanding the group to include representatives from the upper part of the reservoir (above Barker and Addicks Dams). Sampling has been conducted in the upper watershed but it was not included in the official TMDL study. There will not be a detailed TMDL study done, though TCEQ will look at potential point source (wastewater treatment plants) contributors of bacteria and ask them to modify their loads. A question was raised as to how there could be a stakeholder from an area that will be unregulated and whether a request from TCEQ to voluntarily dampen down on their point source discharge would be effective or have any power of authority behind it. Ron Stein responded that it would be important to have participants from the reservoir watershed because cooperation from them will be important to improve the bacteria content of Buffalo Bayou because it is likely that the output from the reservoirs will need to be improved. Ron Stein also pointed out that as we develop an Implementation Plan for the project, a wide variety of options would be discussed by the stakeholders and the public for improving water quality.

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There was also discussion about the allowable size of advisory committees to TCEQ that came from the last Legislative Session. It seems the limit is 24 and Earlene Lambeth volunteered to send a copy of the rules to Carl Masterson who would then distribute them. This could affect who remains on the official stakeholder group to balance representation of various stakeholder groups.

### **TMDL OVERVIEW**

Ron Stein briefed the group on recent TMDL activities, noting that a bacteria-source study is being developed to identify what bacteria loads are from human sources and what are from non-human sources, what needs to be done about the loads and what is controllable for TCEQ. He said we now have a well-developed model and we can show what are the effects if some of the sources are eliminated.

### **PROJECT SUMMARY**

Dr. Hanadi Rifai, University of Houston and Principal Investigator for the technical study began her presentation with an introduction of the technical team (see above). Introducing the project summary, Dr. Rifai began with a brief review of the water quality standards for E. Coli and Fecal Coliform bacteria. She then reviewed the issues addressed in the first two phases of the project. Phase I looked at how bad the situation is, what is known, determining what models to use and creating a Quality Assurance Project Plan. Phase II expanded the scope of work to include assessment of sources and developing models. The project is now in Phase III – developing the TMDL and how to allocate loads using the models that were developed in Phase II.

She opened with a discussion of the water quality in Buffalo and White Oak Bayous. Looking at existing (includes historical) water quality data the technical team followed it from upstream to downstream to see what was happening. From this they noted that the downstream bacteria levels rise and that both bayous behaved in a similar way, and that the geometric means of the bacteria samples all exceed the standards.

### **Potential Sources of Bacteria**

**Incomplete Disinfection** – In 2001 the technical team visited all wastewater treatment plants with less than 1 million gallons per day (MGD) discharge. This amounted to over 70 facilities. Of note here is that the percent of plants violating their discharge standard for bacteria was small and that operators had advanced notice of the visits.

***Dry Weather Pipe Discharge*** - The team surveyed all dry weather discharges by foot or by canoe (below the Addicks and Barker Reservoirs along Buffalo Bayou). About 50% exceeded the standards usually by a large margin – apparently these were episodic rather than constant violations and occurred in both Buffalo and White Oak Bayous.

***Upstream Sources*** – This applies only to Buffalo Bayou and the Addicks and Barker Reservoirs. Flows in the bayou were measured and entered into the model. {Linda Shead asked if permitted flows were subtracted and the answer was yes}. {Theo Glanton asked about upper detection limits and the answer is where a limit was the result, it was used directly}. The reservoirs supply the majority of instream flow during dry weather. The team looked at the operation of the reservoirs and found that the gates were closed when the flow reached 2,000 cubic feet per second (cfs) at Piney Point. As far as median flow, the only historical study the team found was a 1987 USGS work that showed median flow at Barker Dam of 32 cfs and at Addicks Dam it was 40 cfs. Buffalo Bayou at Dairy Ashford showed a median flow of 70 cfs. The USGS data showed the reservoirs reduced bacterial levels about 50%, but again, this is old data. Fecal Coliform data at four stations from Barker Dam downstream to West Belt exceeded the standard from 52% to 72% of the time sampled.

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**Nonpoint Sources** – Pollutant loads in runoff were taken from a review of literature including the National Urban Runoff Program (1970s) and from work done for the Galveston Bay National Estuary Program (early 1990s). Sediment sampling was done in this TMDL study that found high bacteria levels in the sediment. An attempt was made to correlate bacteria levels in water samples to levels of suspended solids in water, with varied success.

{Question: do solids correspond with bacteria levels and the answer was yes, bacteria are a form of suspended solids}. {Question: were bottom sediments sampled and were they loose or compact and the answer was that recent deposition was sampled and it was all loose material}.

**Bypasses & Overflows** – information was derived from dischargers' reports to TCEQ as part of the required self-reporting system. To achieve a number to enter into the models, the self-reporting volume was multiplied by a Fecal Coliform concentration of 500,000 cfu/dL (a literature value for raw sewage) and times 126/200 to convert Fecal Coliform to E. Coli. {Question: where did you get the raw sewage number and was plant flow included in self reports and the answer was that the raw sewage number was based on different technical papers and some wastewater treatment plant flows were included in the collection system overflows}. Theo Glanton, City of Houston, remarked that the City tries to be diligent in reporting to determine how the collection system is behaving and identify where maintenance/repair work needs to be done.

**Solids Releases from WWTPS** – information was collected from TCEQ Houston office on solid release occurrences and the data did not include volume discharged or bacteria levels. No substantiated statements could be made on this potential source.

**Relative Loads from Point Source & Nonpoint Source** – Dr. Rifai showed a slide that listed the potential sources and the bacteria loads in Most Probable Number/Year (MPN/year). What is striking about this slide is that the loads from Nonpoint Source overwhelm the loads from point sources and dry weather pipe discharges.

### **Modeling Results**

In a series of slides (starting with page 9 of the presentation handout), Dr. Rifai showed what the HSPF TMDL Model looks at (build-up and wash-off of E. Coli in the watershed, first-order decay of E. Coli in sediment and water, scouring and deposition of sediments in the bayous) and went through the steps of model development. The conceptual model brings in the contributions of all potential sources, is calibrated based on field data, and, in brief, gives a picture of what happens to the bacteria in the bayous.

**Flows** - regarding the modeling of flows, the sources include rainfall runoff, WWTP effluent (avg. 5-year self-reporting data), Dry weather pipe discharges (summer 2001), and reservoir discharges. Historical flow data from USGS gauging stations was used to calibrate the hydraulics of the model. The stations in the Buffalo Bayou watershed are at West Belt, Piney Point and Shepherd. For the White Oak watershed the stations are Cole Creek @ Diehl and White Oak Bayou at Heights. It was suggested that it would be better to use a delta (change in flow) rather than a median flow using actual flow data from USGS gauge stations. {Question: were flows from WWTPs during rainfall events considered and the answer was yes as part of the 5-year average flows, but the WWTP flows were not increased during rain events}. Dr. Rifai mentioned that there is still some question as to the flows measured at the Shepherd and Heights gauge stations, but overall, the model is doing a good job with flows. A series of slides showed how well the modeled flows measured up to the actual flows.

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**Water Quality** – regarding the water quality data for the model, Dr. Rifai pointed out there were 200 data points vs. the 22,000 flow data points. For the Buffalo Bayou watershed, data to calibrate the water quality element of the model came from stations at West Belt, Briar Forest, Voss and Shepherd. For the White Oak watershed the data came from stations at Cole Creek @ Bolivia and on White Oak Bayou at West 43<sup>rd</sup>, Little White Oak Bayou and Heights. The sources of E. Coli used in the model include nonpoint sources (runoff and sediment), WWTP effluent (summer 2001), dry weather discharges (summer 2001) and reservoir contributions. The majority of WWTPs in the model are located in the upper parts of both watersheds. The geometric mean of E. Coli in both Buffalo and White Oak Bayous consistently exceeded the standard.

In an attempt to allocate loads several scenarios were modeled –

1. Eliminate WWTP and Dry Weather E. Coli discharges
2. Eliminate all NPS (except sediment)
3. Eliminate Reservoir E. Coli Load (Buffalo Bayou)

For Buffalo and White Oak Bayous, eliminating E. Coli from WWTP and dry weather pipe discharges made very little difference. For Buffalo Bayou, the geometric means of E. Coli remained above the standard, with the exception of number 3, and that only until further downstream at about River Kilometer 20 where levels went above the standard. In White Oak Bayou the levels exceeded the standard until about River Kilometer 1 where the elimination of nonpoint source (number 2) resulted in the standard being met.

It was noted that more work would be needed to understand the source of bacterial concentrations at both lower flows, where the values are several times higher than the criteria, and during runoff events, where the concentrations are ten to one hundred times higher than the criteria. A Bacterial Source Tracking study was noted to be useful in this regard. Also mentioned were the need to understand better the source of sediment bacteria, the possible effect of regrowth of bacteria after disinfection of point source discharges, the contributions from birds, small mammals, and soil.

Two issues of note that were brought up for future consideration were the development of Buffalo Bayou – referring to the Buffalo Bayou Project and withdrawal of water from White Oak Bayou by the City of Jersey Village. There was a question raised about the water quality standard itself, a regulatory issue that Ron Stein said should be addressed in the Triennial Review of the Texas Surface Water Quality Standards. One problem here is that EPA still has not approved the Year 2000 standards, so it is not certain when the triennial review would start. Another question was raised in the comments on the draft summary that inflow water quality from the reservoir, even after controls were imposed, would contain the allowable level of bacteria and not the “0” level currently modeled.

### **NEXT STEPS**

Ron Stein told the group that at some point in time we must accept the information we have and make decisions. We still have to refine the modeling efforts and we still have not enough information. One option, he remarked, would be to develop a broad Watershed Action Plan to implement measures to improve water quality over time.

### **WRAP UP**

A number of items were brought to light by the group – that we need to look at questions such as “what is a dry weather flow?” and it was suggested and agreed that there should be a brainstorming session to develop questions that need to be asked before decisions are made. Also, it was suggested that a meeting to include representatives from the upper Buffalo Bayou

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watershed be held to have Dr. Rifai's presentation. Consensus was that many from this meeting would attend as there was such a high load of information to ingest, a second showing would be beneficial. Ron Stein suggested that this should happen 30 days or more from this meeting.

### **ADJOURN**

The meeting was adjourned at approximately 9:10 PM.