STAKEHOLDER MEETING 11

August 18, 2015
5:30 – 7:30 PM
Double Bayou Community Building

MEETING SUMMARY

Stakeholders: Ron Bentley, Louise Carrington, Tom Douglas, Greg Edwards, Leroy Ezer, Norma Ezer, Clint Fancher, Elga Jackson, Guy Robert Jackson, Charles Johnson, Kim Laird, David Manthei (NRCS), Ollie Mayes, Creola Moore, Alice Rivon, Bob Scherer, Jerry Shadden (TBCD), Bertha White, Pudge Willcox

Team Members: Ryan Bare (HARC), Abby Ficklin (Shead), Stephanie Glenn (HARC), Brian Koch (TSSWCB), Lisa Marshall (GBEP), Brandie Minchew (Shead), Linda Shead

1. Welcome, Introductions, and Agenda Review

Linda Shead welcomed and thanked everyone for attending the meeting. She also thanked Samson Energy for the dinner, as well as Chambers County for its continued support: Precinct 2 for the meeting room, Emergency Management for the screen, the Economic Development Office for the PA system, and the Parks Department for getting inmates to set up the tables and chairs. She then reviewed the evening's agenda, which includes review of previous chapters, presentation of new chapters, and presentation of the latest water quality data (through May 2015). Also, a decision will be needed on a goal for bacteria level reductions in the bayou, to meet the State criteria. Linda then started self-introductions.

2. Review and Comment on Public Participation Chapter

Linda first noted that there is a new two-page summary of acronym definitions for consideration and to provide comments.

She then began a review of the Public Participation chapter (Chapter 3), which was one of three new ones that were presented at the last meeting. The first section of the Public Participation chapter covers the project history and development, which includes how Double Bayou was put on the list for being impaired, what a watershed protection plan is, and how grants were made to collect more data and involve stakeholders in developing a plan for Double Bayou. The second section describes the development of the partnership, the partnership structure, and the meetings. This includes

how the stakeholder group preferred to work as a committee of the whole, rather than having a smaller steering committee, and operated on an informal consensus process. It also describes how workgroups were developed to get into more detail, with those who have expertise on particular subjects. The three workgroups that formed were Agriculture / Wildlife / Feral Hogs, Recreation / Hunting, and Wastewater /Septic Systems. Also in this section are a list of workshops held for stakeholders, and a description of the project team and its role in collecting and providing information for stakeholders. The last section of the chapter describes the future of watershed protection through WPP implementation. Linda asked if there were any questions, suggestions or comments on this chapter; there were none from the group. She reminded everyone that there will also be other chances for input.

3. Review and Comment on Management Measures Chapter

Brian Koch described the content of the Management Measures chapter (Ch. 6), which basically lays out the proposed plan for dealing with the different bacteria sources that have been identified, with specific stakeholder-identified management measures for each.

The first section is the wastewater management overview, with all the measures identified by the Wastewater and Septic Workgroup. The measures include addressing potential improvements to both the collection and treatment phases of the public wastewater systems, which are maintained by the City of Anahuac and the Trinity Bay Conservation District (TBCD), as well as improvements to private systems (Onsite Sewage Facilities, or OSSFs).

The next section covers management measures for nonpoint source pollution from agriculture. The Ag/Wildlife/Feral Hog Workgroup worked on this topic, identifying potential sources and then management measures, which includes describing practices that could be effective in reducing bacteria loading in the bayou from livestock operations. This workgroup also discussed management measures for wildlife and non-domestic plants and animals. Feral hogs are a specific issue. A stakeholder noted that removal of plants and debris had not been included in this section, including mechanical equipment removal and the selective application of herbicides. Linda commented that these omissions might be a result of the notes not being completed from the last meeting. She will finish those and make sure these topics are addressed in the next draft.

The last section of the Management Measures chapter is on recreation and hunting measures, which were developed by the Recreation and Hunting Workgroup.

Brian then asked for any comments on specific items, such as the relationship between the City's system and that of TBCD, and noted that the team would be meeting with the City to get more specifics on their wastewater needs. Brian also reiterated that the Plan is draft until the stakeholders put their stamp of approval on it.

4. Review and Comment on Outreach and Education Chapter

Linda then reviewed the chapter on Outreach and Education Management Measures (Ch. 7), reminding everyone that this chapter pulls together all the outreach and education measures for each potential source. The first section reviews the measures that have been conducted throughout the project: workshops, website, fact sheet, newsletters, trifold brochure, etc.

The next section brings in outreach and education measures suggested by stakeholders, with the first part being about broad-based programs, such as the Texas Watershed Steward Training, and then going into programs for specific sources.

For wastewater, measures would include participating in GBF's Cease the Grease program. For agriculture, measures would include promoting Lone Star Healthy Streams programs. Residential, wildlife and non-domestic plant/animal programs, and litter and dumping programs round out this chapter.

Linda then asked if there were specific programs that stakeholders would like to see more of during implementation. Programs on feral hogs and livestock were specifically noted as beneficial. The Texas Watershed Steward Training was identified as a good way to start. Another suggestion was to combine workshops and field activities, such as an herbicide/pesticide collection day along with a workshop that provides continuing education credits.

5. Presentation of WPP Chapters on Water Quality and Implementation

Stephanie next presented a quick overview of the Water Quality chapter (Ch. 4). This chapter discusses the results of all the monitoring that has been done since the beginning of the project. It focuses on dissolved oxygen and bacteria results, because those are the two constituents of interest in terms of being listed as impaired. It finishes with a discussion of chlorophyll-A and nutrients, which have also been monitored during the project. More monitoring results will be presented in the next item on the meeting agenda, and more data are yet to come, once everything has been quality-assured.

The final chapter in the WPP is on Implementation (Ch. 8). This chapter lays out what is planned for implementing management measures, including funding needed (and sources)and timing, as far as these are known at this time. All the stakeholder-recommended measures are presented in tables, and more input is needed to complete these tables. The last parts of this chapter are about the load reductions needed to meet the criteria and about monitoring, to see how well the management measures are doing to improve water quality.

Stephanie asked for comments on these chapters; none were offered by attendees.

6. Presentation on New Water Quality Monitoring Results

Stephanie presented the water quality data from October 2013 through May 2015, some of which had been seen before. The focus will be on dissolved oxygen and bacteria. The handout also includes nutrients, which will not be discussed at this meeting, except to answer any questions.

Stephanie first described the basic monitoring process – the five sampling stations, the routine sampling (twice per month), and the targeted event sampling, which is sampling while it is raining. Next, she covered the dissolved oxygen sampling methods. Grab samples are when a water sample is taken and the dissolved oxygen is figured out at the moment. The other is 24-hour sampling, when an instrument (called a sonde) is placed in the water and left, measuring the dissolved oxygen every 15 minutes for 24 hours. This type of sampling gives a more complete picture, because it shows the absolute minimum and the average over a day. TCEQ prefers to set criteria by this sampling method because of its accuracy. 24-hour sampling is more expensive than grab samples.

<u>Dissolved Oxygen</u>. Stephanie then presented the grab sample results of dissolved oxygen (D.O.) for each stream, and the WWTP outfall, also showing that the screening level of D.O. for grab samples is 3 mg/L. D.O. below that level is when the stream is in danger of impairment, because low D.O. is not healthy for aquatic life. Both the East and West forks have times when the D.O. comes in below the screening level. The D.O. at the WWTP was always above the screening level. A stakeholder noted that the D.O. levels were better in the winter, and Stephanie responded that increased temperature does affect the D.O.

Next came the 24-hour results for D.O. She explained how to read the graphs for the minimum, maximum and average levels of D.O. for each of the sampling dates at each station. She also noted that criteria are set for the average and the absolute minimum. The average criterion for freshwater is 5 mg/L, and for tidal water it is 4 mg/L. The minimum criterion is 3.0 ml/L for both tidal and freshwater. The 24-hour sampling results show that the fluctuations throughout the day result in lows that are problematic for aquatic life. The results also show that, as would be expected, the summer/fall values are lower than those in the cooler months.

Bacteria. Stephanie next presented the bacteria results. The results are based on *E. coli* for freshwater at the Upper East Fork station. It was also used for the wastewater treatment plan (to be able to compare with their permit monitoring). Enterococcus (or "Entero") is the indicator used for tidal waters, and thus used for the other sampling stations. The units are CFU (colony forming units) or MPN (most probably number), with MPN used in the laboratory. These units are equivalent. Targeted rain event sampling was conducted to determine the worst case for bacteria, to help with identifying possible sources and possible placement of management measures. For assessment related to exceedances and listing, TCEQ only uses routine sampling when calculating geomeans. The results will be discussed by sampling station. For bacteria, values *above* the benchmark indicate possible impairment (the flip of D.O. results).

For the East Fork Upper station, most of the results above the benchmark are from targeted rain events, with just a few in routine sampling. As described before, the rain effects can be seen more when a big rain event occurs after a drier spell, during which bacteria can build up. For East Fork Upper, some of the results above the benchmark are not associated with large rain events.

For East Fork Lower, some of the higher rain days also had some of the higher bacteria events.

For the Anahuac wastewater treatment plant, the targeted rain events were when the bacteria levels are so high (180,000 in one case). During routine sampling, the wastewater plant appears to be operating the way that it should, but then appearing to get overwhelmed when there is a lot of rain. A stakeholder asked whether it's overflowing during the rainfall, to make the bacteria so high. Stephanie responded that we don't know for sure, but it is a distinct possibility. Infiltration and inflow could be causing it. When viewing the graph with the rainfall amounts, a very high rainfall does not always correlate with very high bacteria. Instead, it appears that it's the accumulation of multiple rain events that pushes the bacteria levels up.

For the West Fork, Entero is the indicator. At the West Fork Upper station, there are many samples that are above the benchmark, not just those during targeted rain events. At the West Fork Lower station, there are several routine samples that are above the benchmark, but not by much. The highest bacteria levels follow the pattern of being on high rainfall days.

Next was a figure showing the bacteria exceedances by sampling station, with the amount of red in the pie chart corresponding to the number of single routine samples that exceeded the benchmark. (The most is at West Fork Upper, followed by West Fork Lower, then East Fork Lower. East Fork Upper and the treatment plant have the lowest number of exceedances.)

A stakeholder noted that the bacteria issue is not unique to Double Bayou – that beaches were closed in April/May. Stephanie agreed, and reminded folks, from the Watershed Steward training, that something over 90% of Texas waters have problems with bacteria.

The map with bar charts of targeted rain events also has the amount of rainfall at the Anahuac rain gauge. The results show that some of the stations responded directly to the size of the rainfall, whereas others seem to have more of a response to the number of days since last rain.

The next slide was the geomean graph. TCEQ uses geomean for bacteria assessment, which is a kind of average that filters out some of the higher highs and lower lows. The geomean criteria for Entero (tidal waters) and *E. coli* (freshwater) are different – 35 (MPN/100 ml) for Entero and 126 (MPN/100 ml) for *E. coli*. All of the tidal stations have geomeans above the 35 criterion. The East Fork Upper station is not above 126 yet, but higher than in previous sampling results. The West Fork Upper has the highest geomean, which also matches what the SELECT model had indicated might be a problematic subwatershed, and may help focus management measures.

Linda noted the fact that the levels are not way out of line means that implementing some management measures could really make a difference, unlike nontidal areas of Buffalo Bayou, which will require many actions to even get close.

Stephanie proceeded to the bacteria conclusions. Three out of our five stations have high geomeans, and high percent exceedances: West Fork Upper, West Fork Lower, and East Fork Lower. Note that these do not include targeted rain event samples. Another conclusion – that it's not just the amount of precipitation, but the number of days since last rain event and what is building up on the ground. Also, a seasonal analysis showed that the highest percent exceedances for routine sampling occurs in the fall (that is, September-November), which might help in targeting management measures.

7. Presentation on Goals for Load Reductions

Stephanie presented the next concept: Load Duration Curves – what they are, why it is necessary for us to understand them, why it is necessary to develop them, and then some input needed regarding what the curves show us.

A Load Duration Curve (LDC) is used to determine what is called pollutant loading. It is looking at amount of bacteria combined with flow. Traditionally, LDCs are developed for non-tidal stations, and next month we will have a discussion on the tidal stations. The East Fork Upper station is the only nontidal station we have. Because there are no continuous stream flow gauges on the upper East Fork, flow values were analyzed each time samples were taken at the East Fork Upper station. It's an arduous process, but necessary for doing the analysis we need.

The first step is to create a Flow Duration Curve. All the flow data (in cubic feet per second) are ranked from highest to lowest flow, and then graphed for the percent of days that each particular flow was exceeded. (That is, the lowest recorded flow would be exceeded 100% of the time, and the highest recorded flow would be exceeded 0% of the time.)

The next step is to incorporate the bacteria criteria into the graph to show the maximum amount of bacteria that the stream can carry at each flow and still meet the criteria. (This is done by multiplying the observed flow rates, in volume per time, times the bacteria limit, in CFU per volume.) The resulting bacteria "load" is thus calculated in CFU/day. The changes in the slope of this Load Duration Curve (red line) identifies changes in flow regimes. In our case, we have three main different flow regimes – high flow conditions, mid-range flow conditions, and low flow conditions – separated by the vertical black lines on the graph (where the red line changes slope).

Then, the observed bacteria concentrations are multiplied times the flow and plotted on the graph. The result shows when the bacteria loads did or did not exceed the water quality standard.

The reason for doing this is that it can be useful in evaluating point or nonpoint sources. If most of the exceedances occur during high flows, which are usually linked to higher rainfall events, then the exceedances are usually tied to nonpoint sources. If the exceedances are weighted more toward the low flow conditions, then the bacteria loads are not tied to runoff, and are thus more likely to result from point sources.

The next step is to develop a best-fit curve of the monitored data, using a statistical (regression) analysis. This curve is shown as a blue line on the graph. The blue line above the red line means that the monitoring data are not in compliance with water quality.

During high flow conditions, for this Load Duration Curve of the East Fork Upper station, it will take an 84% reduction in load to be in compliance – to move the blue line down to the red line. Most watershed protection plans do not plan for meeting that extreme high flow load. During mid-range flow conditions, a 30% reduction in load is needed at this station to bring the blue line down to the red line. During low flow conditions, no reduction is needed – the blue line is below the red line. Again, the idea behind doing this is that, as a group, we can come up with a goal for load reduction – How low do you want to try to get the bacteria in the stream?

The next concept is Margin of Safety. Some watershed protection plans have voted to put a margin of safety in their plans. So, instead of a 30% load reduction to meet a goal of a water quality standard of 126 (CFU/100 ml), you might take it down a notch, to 5% or 10% lower. This is not required. The reason that people do this is to give room if something goes wrong – such as a certain management measure failing or breaking, or the loads being bigger than currently expected. It's a more conservative approach.

In this case, a 5% margin of safety would change the goal to 120 instead of 126, which is a 34% reduction instead of 30%. A 10% margin of safety changes the goal to 113, which is a 38% reduction instead of 30%.

The team added additional comments about the margin of safety:

- Linda: Adding the margin of safety would mean adding more management measures, or making them stronger, so that it wouldn't be as worrisome if something failed.
- Brian: Not all management measures will work at 6-8 inches of rainfall, so the margin of safety gives a cushion.
- Stephanie: A heavy rainfall could rip out a newly planted riparian zone, and other management measures could help carry the load at that time.
- Linda: A margin of safety is required in TMDLs, because the real world just isn't that perfect.
- Brian: Even with a margin of safety, the standard stays the same – the goal is to get below 126.
- Linda: A management measure might turn out to be too expensive to maintain, and a margin of safety would give a cushion until you figure out something else to use.
- Brian: A margin of safety allows you to ask for more funding for more measures, beyond meeting just 126.

Stakeholders had questions and comments about the margin of safety:

~ It would make sense to do the easier items first, to see if they made a difference.

~ Can the goal be changed if it turns out to be too low (to be achievable)? Answer: Yes, it's your plan.

~ Will EPA give a bigger nod if you aim for a lower goal? Answer: It gives more flexibility in asking for grant money.

~ What did Cedar Bayou do? Answer: 10% margin of safety

Linda asked the group for a thumbs up straw poll on the current thinking of the group – whether 0%, 5%, 10%, 15%. Based on those results, it appeared that more folks were supportive of 10%. To a follow-up question, no one expressed real discomfort with 10%. Linda reiterated that when a final decision is made, it will be important that everyone agree.

8. Wrap-Up, Next Steps, and Announcements

Linda reminded everyone that HARC had submitted an application for implementation funding, knowing that it was contingent on the stakeholders being happy with the plan, and on EPA finding the plan to be consistent. If the grant is funded, it could start as early as June of the coming year. However, the Soil Board had more applications than ever before – 43 compared to the usual 20 or 25.

Brian reminded folks that EPA is not "approving" anything – only the stakeholders are the approval entity. EPA will just say whether it meets the guidelines. A margin of safety of 10% will probably be looked at more favorably, but the main thing is for the group to be willing to meet the standard.

Linda noted plans for the upcoming meeting schedule: 3rd Tuesday of September (9/15), 2nd Tuesday of October (10/13), and 2nd Tuesday of November (11/10). The last meeting of this cycle of the planning process will be in January. She closed by thanking everyone for being there.