1st Round - Comment Summary Table for
LEON RIVER BELOW PROCTOR LAKE (SEGMENT 1221) - DRAFT MODELING REPORT

Comment	Response
(1) Why has contact recreation designation been assigned to this segment? How can it be changed? ***(Honorable Brent Hagood - Mayor, City of Comanche; Representing Cities of Comanche, Dublin, Hamilton, and Gustine)***	Virtually all classified segments are designated for contact recreation unless elevated concentrations or indicator bacteria frequently occur due to sources of pollution which cannot be reasonably controlled by existing regulations or contact recreation is considered unsafe for other reasons such as ship or barge traffic. Any change in the designated uses that would allow for less stringent criteria requires a use attainability analysis (UAA) as provided by U.S. Environmental Protection Agency (EPA) regulations in Title 40, Code of Federal Regulations, Part 131. The UAA would have to demonstrate that contact recreation is not an existing use, as defined in the EPA regulations, and would also have to meet at least one of the six allowable factors to lower a designated use. Changes to the standards would have to meet all requirements for a rule change including a public meeting, adoption by the TCEQ commissioners, and approval by EPA.
(2) What is the contribution of fecal above the study segment and how much of the downstream concentration can be attributed to it? ***(Honorable Brent Hagood - Mayor, City of Comanche; Representing Cities of Comanche, Dublin, Hamilton, and Gustine)***	The segment upstream of the study segment is Proctor Lake. According to the DRAFT 2004 Water Quality Inventory, Segment ID 1222, Proctor Lake, fully supports contact recreation, with a respective geometric mean from two stations on the lake, of 32 org/100 mL and 6 org/100 mL. Contribution of fecal from Proctor Lake has been factored into the model. Figure 5-12, a pie chart, indicates that the upstream release from Proctor Lake is 4.87% of the fecal coliform sources for the Leon River below Proctor Lake.
(3) Is there any accounting for the water quality out of Lake Proctor in the model? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	Yes. The bacteria released from Lake Proctor are included as an input parameter to the uppermost river reach in the modeling analysis. Per the EPA approved 2002 303d List, Proctor Lake is not listed as impaired for bacteria. The amount of bacteria in Proctor Lake is small. From 56 samples collected from March, 1998 to February, 2003, and taken from the Rush-Copperas Creek arm of the lake indicate 32 org/100 mL. Also, 26 samples taken from the Sabana River arm of the lake indicate 6 org/100 mL. These results show the bacteria water quality standard is met and the lake fully supports the contact recreation use. The amount of bacteria load released through the dam of Proctor Lake has been figured into the model. Proctor Lake and the Leon River Below Leon Reservoir are not impaired for contact recreation.
(4) Please detail all known water-modeling of bacteria indicators for pathogens that are functioning to date and indicate how these models and	The USEPA lists the following URLs to provide technical guidance and assistance. Examples of pathogen TMDLs can be accessed by utilizing the following:

their associated BMPs are performing. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	http://www.epa.gov/owow/tmdl/examples/pathogens.html http://www.epa.gov/owow/tmdl/techsupp.html http://www.tmdls.net/example/example.html James Miertschin and Associates (JMA) prepared a Technical Memorandum describing model evaluation and selection for bacterial TMDL determination. The Technical Memorandum is a deliverable for the project. The purpose of the technical memorandum was to describe the evaluation and selection of candidate modeling tools for the application of the TMDL. Four candidate watershed models (HSPF, SWMM, SWAT, and PRMS) were evaluated. After review and evaluation of the models, it was concluded that HSPF was the watershed model most suitable for the project. The advantages of HSPF that led to its selection are summarized below: ▪ Full capabilities for long-term simulation of hydrologic response ▪ Full capabilities for simulation of dynamic mass transport from the watershed surface ▪ Adaptability to urban and non-urban land uses ▪ Built-in receiving water module with instream source/sink terms ▪ Successful application to bacteria TMDLs demonstrated in other project areas References for determining BMP effectiveness: ▪ Stormwater/Urban (BMP Effectiveness database; Menu of BMPs) ▪ Agriculture (Ag Management Measure Document) ▪ www.bmpdatabase.org/docs.htm (provides a BMP effectiveness table)
(5) Regarding E-coli bacteria, is there any bacteria monitoring data available for the Leon River at the base of Proctor Lake Dam, and, if so, what were the results? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	Water quality station 11934 (Leon river at US 67-377 northeast of Hasse) captures releases from Proctor Lake Dam. Table 3-1 in the Draft Modeling Report shows that from 1996-2004, seventy-three (73) samples were collected. Of the samples collected twenty-four (24) were exceedances. The geometric mean of the seventy-three samples is 133 org/100 mL.
(6) Are there any sampling stations above the Proctor Lake Dam and the beginning of the Leon River, and, if so, did any of the bacteria monitoring data indicate that E-coli counts to be more than 126 colonies/100mL or that the fecal coliform content was close to or exceeded 200 colonies per 100m/L (both expressed as geometric means)? In addition, in single samples, was the E-coli content equal or greater than 394 colonies per 100mL, or alternately, was the fecal coliform content equal or greater than 400 colonies per 100mL? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	Leon River below Leon Reservoir, the stream segment above Proctor Lake has two water quality stations, Station ID 16410 - Leon River at McKinney Rd, 2 mi. south of SH 16 and 3 mi. north of De Leon, and Station ID 11938 - Leon River at SH16 north of De Leon. Data from both stations show that Leon River below Leon Reservoir is meeting the contact recreation use.
(7) If no sampling stations are above the Proctor Lake Dam, would TCEQ be	Leon River below Leon Reservoir, the stream segment above Proctor Lake has two water quality

willing to place some between the beginning of the Leon River and the base of Proctor Lake Dam? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	stations, Station ID 16410 - Leon River at McKinney Rd, 2 mi. south of SH 16 and 3 mi. north of De Leon, and Station ID 11938 - Leon River at SH16 north of De Leon. Data from both stations show that Leon River below Leon Reservoir is meeting the contact recreation use.
(8) Section 3.3 Water Quality Summary Although this section states that there is no correlation between stream flow and bacteria concentrations, it would be useful for stakeholders to be able to confirm this statement. We recommend that stream flows be added to Figures 3-2 through 3-5 so that the measured fecal coliform concentrations can be visually compared to the stream flow on the date the sample was collected and on days preceding the sampling date. The report should also present statistical analysis showing how poorly (or well) the stream flow and fecal coliform data correlate. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	Streamflow can be added to these figures and this will be included in the Final Modeling Report. An analysis of fecal coliform and streamflow was performed in a previous study (August 2002) in the data assessment phase of the project. This information is available upon request.
(9) What area will the TMDL affect? ***(Whit Weems – Texas Cooperative Extension Agent, Hamilton County)***	The impaired reach of the Leon River was determined to extend from approximately 12 miles above FM 1702 down to approximately 12 miles below US Hwy 281, a distance of roughly 50 miles. The model was set up to simulate the entire watershed of Segment 1221. The TMDL will apply to all of the watershed area that contributes flow to impaired reaches.
(10) Is the Cowhouse Creek and its tributaries included in the TMDL? ***(Whit Weems - Texas Cooperative Extension Agent, Hamilton County)***	No, this stream is a tributary of Lake Belton but not of the Leon River.
(11) Size of watershed is not provided in the report other than in Table 5-2. What is the size of the watershed? Table 5-2 indicates a total acreage of 515,604.83 acres in the combined reaches. Individual reaches as presented indicate a total of some 880,000 acres. This is a difference of more than 360,000 acres. Which figure is correct? Forest land is shown as 59,417 acres total by reach. Addition of individual reaches indicates a total of about 144,000 acres of forest land. Other land uses show similar differences. How do you account for these large inconsistencies? ***(Whit Weems - Texas Cooperative Extension Agent, Hamilton County)***	There is a formula error in Table 5-2 of the Draft Modeling Report that gives incorrect totals. The entries in the reach rows are correct, but the total areas of each land use category are incorrect. This will be corrected in the Final Modeling Report.
(12) Does TCEQ have plans to refine the predictive capability of the HSPF model? Explanation: The hydrologic model (HSPF) is stated as having "poor" predictive capability for all of the summer conditions simulated and the average storm peak. Because the highest bacteria concentrations occur during storm events, and summer is more likely to have contact recreation than winter, this lack of calibration for the hydrological model is problematic. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The hydrologic calibration of the model had results within normally accepted criteria. The model's largest percent error in the hydrology calibration is in the category of summer storm volume, but still is very near the criterion. The fact that this criterion is large makes sense, because under summer conditions the prevalence of widely varying scattered thunderstorms is common, and this precipitation is what drives the model hydrology.

(13) Does TCEQ propose to collect any-watershed data to validate the bacteria source loading factors used in the model? Would TCEQ be willing to work with stakeholders to collect such data? Explanation: It appears that all of the bacteria loading factors for each land use classification (e.g., accumulation rate, storage limits, surface wash off rate, removal rate, etc.) are literature values and are not based on any site-specific data. Thus, all of the predicted source contributions of bacteria are based on data that have not been validated for the Leon River watershed. Literature rates for loading factors typically have uncertainty ranges that are orders of magnitude; simulations using these loadings may not represent the relative and absolute contribution assumptions, not just the total bacteria concentrations at river stations affected by multiple classes of sources, is essential. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The bacteria source loadings were configured and compared against site-specific data collected at water quality stations to validate loading rates. The loading factors used in the model were developed as part of the water quality calibration process. The water quality calibration process used bacteria data that were collected in the Leon River. Most of the loading factors, such as bacteria accumulation rates from each specific land use surface that are embedded in the model are not things that can be effectively measured in the field. Bacteria source loadings have been based on literature because it would be cost prohibitive to collect such data from a 3,533 square mile watershed. Key model parameters determined via the model calibration process are based upon site-specific data collected in the Leon River. Site specific data includes land-use, precipitation, TPDES permits, and flow. This site-specific data was utilized to calibrate the model.
(14) What plans does TCEQ have to improve the model so that its predictions can be sufficiently reliable to predict cause and effects for development of the TMDL? Explanation: It is noted that site-specific loading function data for major land use categories, may improve model predictive capability. The bacteria concentration simulations presented at the October meeting show poor predictive accuracy; they predicted median fecal coliform concentrations range from 61% to 76% of the median concentrations for three stations and three events that were evaluated. The graphs of predicted versus measured fecal coliform concentration show little correlation between model results and measured concentrations for those measured events with the highest concentrations. Accounting for the inherent difficulty in simulating of highly variable concentrations of fecal coliforms, the poor predictions of both median and peak measured coliform concentrations indicates that the model is not a reliable predictive tool for the TMDL without further improvement. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The water quality model was calibrated to match available instream bacteria data for the Leon River. The modeled bacteria concentrations exhibit good visual agreement with observed bacteria concentrations. This test alone is the test normally applied to the results of the watershed model in similar bacteria TMDLs developed across the nation. Two additional tests were applied to the model results. The results were subjectively categorized into baseflow and runoff compartments and it was determined that the modeled concentrations closely correspond to the median plus 99% confidence ranges of observed bacteria data from the stream. This correspondence would not be expected to be exact, since the model simulates daily mean bacteria concentrations and the historical observed bacteria concentrations are instantaneous grab samples. In addition, the model results were examined to determine the typical simulated mean runoff concentrations. These values were compared to ranges of typical concentrations reported in the scientific literature. It was determined that the bacteria concentrations simulated in the model were within the range of values reported from other studies. In summary, we believe that the model is reliable, based upon the bacteria data currently available. However, improvements to the model can be implemented as additional data is developed. The TCEQ's plan to improve the model is in part based on the review of the Draft Modeling Report provided by stakeholders, the public, and the TCEQ. JMA is in the process of recalibrating the model to achieve further improvement.
(15) Why doesn't TCEQ allocate TMDL loadings to sources based on their contribution to the in-stream bacteria concentrations, rather than base the loadings on the apparent administrative ease of implementing controls? Also,	The watershed model was used to determine the total bacteria loading that could be accommodated by the Leon River in order to meet the geometric mean bacteria criterion. To explore a variety of reduction scenarios, the different land use categories and sources were assigned various percent reductions to

how does TCEQ propose to achieve the bacteria targets when its model predicts that 85.5% of the bacteria loading comes from forest and rangeland? Explanation: The draft model TMDL loading allocations make no sense when they are compared to the model predictions (bacteria source tracking results) of source loadings. The proposed TMDL allocations suggest 30% reduction in loadings from both types of dairy waste application fields (WAFs) simulated in the model. However, the model predicts that WAFs (both Types) account for only 2% of the average fecal coliform loading to the Leon River. Rangeland, which accounts for 80% of the average fecal coliform loadings, is assigned a reduction of 40%. The simulations with the model indicate that even if WAF loads were reduced by 100%, that reduction would only amount to 2% of the total existing fecal coliform loading and only 2.5% of the rangeland loading. Residential average field coliform loadings, which are three times greater than the total WAF loadings, are not assigned any reductions. The proposed TMDL reductions appear to bear no relationship to the contributions. In fact, the model predictions indicate that only significant reductions in bacteria loads from rangeland have any real potential to affect reductions in the Leon River bacteria concentrations. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	illustrate the effect on bacteria concentrations. Several control scenarios were examined, with varying degrees of success for restoration of the stream criterion. At this stage, these are simply modeling exercises to demonstrate that bacteria levels can be reduced by some combination of controls. There are countless combinations of reductions by source that could be run. These hypothetical reductions are not intended to be the final reductions to be incorporated into a TMDL. Instead, the TMDL will contain only an overall reduction requirement for the entire nonpoint source category. The areas and the degree of reduction necessary will be worked out with input from stakeholders during the implementation stage
(16) In what library can we find the references listed as being utilized in creating the current proposed model? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	A summary of the literature references will be provided to all Advisory Committee Stakeholders members.
(17) There are still a lot of questions about the data and the model. If we continue forward without answering these questions, are we really going to fix the problem? Explanation: By listening to the presentations, landowners heard that this portion of the Leon River is impaired because of only 4 events in 4 years. According to published reports, many of the reaches don't have a long term problem at all. The data indicates that storm water events had higher bacteria concentrations but also base flow didn't meet compliance standards. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	TCEQ water quality inventory, representing data collected from 1996 to 02/28/2001, indicates that 7 of the 22 samples collected from the portion of the segment north of Gustine were in exceedance. 6 of the 15 samples collected from the portion of the segment west of US Hwy 281 were in exceedance. The portion of the segment north of Gustine had a geometric mean of 247 org/100 mL, and the portion of the segment west of US Hwy 281 had a geometric mean of 319 org/100 mL. Due to these exceedances, the segment was listed on the 303d list as impaired for contact recreation, and a TMDL project was initiated. It is not possible to remove all uncertainty regarding bacteria concentrations and the modeling analysis. The present model makes use of the data that is currently available. The primary objective is to set the TMDL, then move into the implementation phase to determine how to fix the problem.
(18) It is not possible to gather the needed information to run the model from actual studies in this watershed? Explanation: At each of the presentations, the modeling information is very	The degree of correspondence between determined simulated and observed values is similar to standards of performance exhibited in other TMDLs for bacteria. It would be possible to gather information to run the model from actual studies in the watershed. Though the economic and technical feasibility is questionable, the TCEQ is committed to using such data if it is available. The model is based on the best

unclear. There are tremendous amounts of assumptions used in the model and most of the information to make assumptions has been done in other parts of the country. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	data available. Any water quality modeling analysis involves the use of numerous assumptions. The challenge is to use all of the available data and apply best professional judgment to assumptions where data is not available. The site-specific data for the Leon watershed consisted of instream measurements of bacteria concentrations at several monitoring stations. This is the same type of data that is routinely applied in similar modeling studies across the nation.
(19) How was that number arrived at when it was not a factor before? Explanation: In October, cities in the affected area were not even included in the modeling. Then after some complaints, they were added into the model for the January presentation. At this January meeting, cities in this area were told that the model predicts that they must reduce bacteria from their waste water treatment plants as much as 90%. According to one city official, they are doing everything they can now and cannot afford costly renovations to their plant. This kind of change does make the model a suspect. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	Municipalities, also referred as the Water Load Allocation, have always been factored into the model. It wasn't until the model was further developed and presented at the Jan 12, 2006, meeting that the WLAs were referenced as cities and loads and reductions were associated with them. Between the referenced October and January meetings, an additional assumption regarding overflows was added to the modeling analysis. This addition was developed based upon a review of municipal compliance records provided by TCEQ, which indicated routine problems with bypasses, overflows, and line breaks. Nearly all reduction scenarios assigned to municipalities in the modeling of allocation scenarios would require that cities develop a plan to minimize bypasses, overflows, and line breaks. Reductions in terms of what's expected to achieve the Waste Load Allocation (WLA) will be determined with stakeholder input and the TCEQ during the implementation phase to provide a number of possible controls to achieve compliance with the TMDL. Some of those controls could include: improvements to sewage collection systems to minimize leaks and overflows, improvements to disinfection processes, a higher degree of operator awareness and plant maintenance, and technical advice and training via the Texas Water Rural Association and a Circuit Rider Program. Funding exists and can be secured by pro-actively working with State and Federal programs to initiate the application process.
(20) These discrepancies should be resolved before running the model, will that be done? Explanation: The model does not seem to take into account the BMP's that have been established over the last few years. Dairies now much have 100 foot buffers around fields next to waterways. Land use has changed dramatically since the mid 90's when land use information was formulated. Septic system installation and management has now come under regulation and even education. Cities have upgraded or are upgrading treatment facilities and there is a shift in land ownership to more absentee land ownership, with a corresponding loss of land use for livestock into wildlife. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The model is based upon the information and data currently available. The water quality calibration covered the period 2001 to 2004 in the draft modeling report. Any BMPs or controls that were in place during that calibration time period are assumed to be reflected in the instream bacteria data collected at the various monitoring stations during that time. If there are in existence any newer BMPs whose beneficial effects have not yet been evident in the collected bacteria data, these would then be taken into consideration during the implementation phase as improvements that are already in place, with expected reductions in bacteria loadings.
(21) If the water quality modeling, which is based on conservative modeling assumptions, fails to produce the desired results over time, what remedies will	Once the implementation phase is reached, control measures will be formulated and implemented. Then, additional monitoring will be used to confirm the success of control measures. This process would be

be sought to solve the water quality problem? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	expected to evolve over several years. If the stream does not meet bacteria criteria after implementation of controls, additional controls could be needed, or, evidence may be available to initiate a revision to the stream criteria. Preliminary information and estimates can be modified and corrected over time if necessary. The TCEQ will continue to coordinate with other programs to measure water quality improvements and identify innovative opportunities to make progress and build momentum.
(22) Is TCEQ willing to work with the stakeholders to develop site-specific input data to improve the model predictive ability? What is needed in order to extend the current TMDL schedule? Explanation: In summary, the modeling results and proposed TMDL presented at the October 2005 meeting indicated that the modeling is not sufficiently developed to provide reliable simulations for a TMDL. This will require extending the schedule for TMDL so that additional data can be collected. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The model is in its draft form. In an effort to work with stakeholders and maximize public input, the TCEQ posted the Draft Modeling Report on it's project web-page. The TCEQ extended the report comment period from February 6th to March 14th. The TCEQ will re-assess the project's schedule as it progresses through the modeling phase. TCEQ management is considering stakeholder input to make a decision regarding an extension of the current TMDL schedule. While TCEQ believes that the existing model is sufficient for TMDL development and has considered available site specific data, the agency has provided this opportunity for interested parties to provide additional data that could be used to improve the draft.
(23) Mr. Niemann: here are some comments from the city of Comanche regarding the TMDL on the Leon River. (pardon my typing erros). the 90 per cent reduction in the fecal coliform to the city's wwtp still is a concern. our engineer had mentioned this in a letter on 1-31-06. at a meeting in hamilton recently a 20 per centr reduction was mentioned along with a handout at the comanche meeting. is the alternative for compliance an overall 20% reduction with a 90 per cent reduction by point source contributors? has someone suggested a method for achieving this removal? is the thinking to modify permits with a zero bacteria discharge? will the city of anyone else have input in an implementation phase? by the way, in speaking with faith at the comanche meeting we would be interested in the i & i study/grant that the tceq provides. also, if i read the map correctly was comanche emptying into the leon river (via indian creek) at a segment not impaired? my question is why not concentrate efforts on those impaired areas? are there any plans to solve the wildlife problem? finally, any reductions on overflows at manholes-how is this measured to assist us with source reduction? thanks for your help. ***(Bill Flannery, City Secretary, City of Comanche)***	The Draft Modeling Report examined several hypothetical scenarios with different levels of reduction assigned to various sources in the watershed. No reductions have been finalized at the present time. Preliminary assumption for Comanche includes the following. First, the City would have to comply with its existing TPDES discharge permit and maintain a properly operating disinfection system that could handle peak flows at the wastewater treatment plant. Second, the City may need to study or examine its sanitary collection system to determine how to minimize overflows, exfiltration, or line breaks. Accomplishment of this second item would probably provide any assigned reduction in loading. Any assignment of loading reduction would be finalized in the implementation phase with participation of the stakeholders. Comanche discharges into Indian Creek, which does contribute bacteria to the impaired area.
(24) Specifically, the assumptions and methods used in determining the amount of fecal contributed by the point sources (Cities) and the assignment of the stated goal for reduction are of concern. The report essentially states that an overflow scenario was assigned to each City for every 0.5 inch of rainfall. Furthermore, the assumption is made that in each of these events, the plant capacity is exceeded and chlorination facilities fail. While our	Bacteria loadings from municipalities take different forms in the modeling analysis. First, there is wash-off of bacteria from urban land uses. Second, there are discharges of bacteria from wastewater treatment plants, which as stated below, is either "normal discharge loading" or "overflow/bypass". The municipal point sources were represented in the model with two different types of discharges. The first type consisted of routine or "normal discharge loadings" of bacteria from the treatment plants,

communities, like many other small communities, experience significant inflow/infiltration during high rainfall events, it does not always result in overflows of their collection systems or treatment plant. Some of the plants have excess capacity that absorb some or all of these excess flows. It is also not the case that existing chlorination facilities do not treat adequately in every rainfall event above 0.5 inches or that the existing treatment facilities are not adequate under these circumstances. It appears from the draft report that only 0.86% of the total fecal coliform contribution is attributed to the point sources, yet a reduction of 90% has been assigned to these sources. This is in comparison to much lower reductions in the larger contributors. It is not clear to us in the report how the 90% reduction was developed even though the fecal contribution is unrealistically high based on the assumptions that were used. Even if this is not the case, a 90% reduction or our actual contribution would be extremely difficult, if not impossible. Since there is no practical way to measure the contribution due to system or plant overflows, we are worried that permits would be established to force compliance. A 90% reduction through the effluent discharges alone would definitely not be possible. Also, strictly from a cost standpoint, we could not afford to meet this type of reduction even if overflows were considered and measurable. In way of addressing these concerns, we would like clarification as to how the 90% reduction was arrived at, and how compliance is expected to be achieved. We also request that additional consideration be given to the assumptions that were used to determine their fecal contribution to begin with. Regardless of what reduction goal from point source contributors is recommended, how and when would it be implemented, if ever, and over what period of time. ***(Honorable Brent Hagood - Mayor, City of Comanche; Representing Cities of Comanche, Dublin, Hamilton, and Gustine)***	estimated based upon a low concentration of bacteria and the average daily flow. The second type of discharge consisted of an "overflow" scenario that was developed to represent periodic discharges from the treatment plants. It should probably be more correctly labeled as a "bypass" scenario. The concept of the "bypass" scenario was developed after review of compliance reports and data for the municipal systems. The compliance histories vary greatly in the amount of information available, making it difficult to define the frequency, magnitude, and duration in which they occur. The information that was available for review suggested that the municipal treatment plants sometimes release effluent with higher fecal coliform concentrations under wet weather conditions. For example, in one instance spilling as much as 4.3 million gallons of untreated wastewater into the watershed. We triggered the bypass loading on those days when rainfall was greater or equal to 0.5 inch. We estimated the volume of the bypasses as 6 hours of flow at the daily average flow rate adjusted by the ratio of the permitted peak 2-hour flow divided by the average daily flow. We then assigned a nominal bacteria concentration of 1000 org/100 mL to the bypass, assuming that some treatment and disinfection occurred. Monitoring of municipal effluents showed occasional high fecal coliform counts, for example, 5 grab samples collected at the Comanche wastewater treatment plant under runoff conditions showed one value of *E. coli* as high as 3600 org/100 mL, indicating that occasional discharges of effluent with relatively high bacteria concentrations do occur. We could modify our estimates if better information becomes available. Reductions will be based on the amount of bacteria a plant can and has historically contributed to the impairment. The reductions in terms of what's expected to achieve the Waste Load Allocation (WLA) will be determined with stakeholder input and the TCEQ during the implementation phase to provide a number of possible controls to achieve compliance with the TMDL. Some of those controls could include: improvements to sewage collection systems to minimize leaks and overflows, improvements to disinfection processes, a higher degree of operator awareness and plant maintenance, and technical advice and training via the Texas Water Rural Association and a Circuit Rider Program. Funding exists and can be secured by pro-actively working with State and Federal programs to initiate the application process.
(25) Section 5.3.1 Point Sources This section states that as fecal coliform concentration of 1,000 organisms/100mL was used to represent municipal discharger overflows, which includes overflows from lift stations, breaks in sewer lines, and hydraulic overloading of treatment plants. The report states that this concentration was based on "empirical evidence" of fecal coliform concentrations from wastewater treatment plants. This fecal coliform concentration may be acceptable for estimating loadings from hydraulically-overloaded treatment plants if disinfection processes are continuing to function; it is not a realistic estimate of the fecal coliform concentrations in lift stations overflows, manhole overflows, or sewer line breaks. The U.S. Environmental Protection Agency's (EPA) Report to congress on Sanitary Sewer Overflows cites as concentration range of	For the purposes of this analysis, assuming that some partial treatment and disinfection occurs, a nominal bacteria concentration of 1000 org/100mL was assigned to bypass/overflows. Monitoring of municipal effluents showed occasional high fecal coliform counts, for example, 5 grab samples collected at the Comanche wastewater treatment plant under runoff conditions showed one value of *E. coli* as high as 3600 org/10 mL. It is difficult to quantify releases from collection systems. Therefore, it was assumed that the overflow waste loading component could also represent these items. It is true that raw sewage from collection systems, including overflows from lift stations and line breaks would have a much greater bacteria concentration. Therefore, we think we can make improvements to the model in the following way: The existing point source load for RCHs 10-80 (the impaired reach) is 0.04% of the total load, which is the combination of the "normal discharge load" plus the "overflow/bypass" load. If we multiply the

30,000-10,000,000 *E. coli* organisms/100 mL in sanitary sewer overflows. Corresponding fecal coliform concentrations would be greater than this. TAD believes that sanitary sewer overflows could be a very significant source of bacteria concentrations to the Leon River. These include both wet weather and dry weather overflows. The contribution of bacteria from these sources need to be further evaluated because the 1,000 bacteria/100 mL that is used in the model for this class of source seems to be greatly at odds with reported concentrations in the technical literature. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	overflow point source load by 30 to reflect an increase in concentration from 1000 org/100mL to 30,000 org/100mL, the revised point source load would represent 1.07% of the total load.
(26) Section 5.6.2 Water Quality Calibration While TAD recognizes that the high degree of variability of bacteria data make a statistical evaluation of model calibration impractical, we believe that there are data analysis approaches that would give a clearer picture of how well the model predicts bacterial concentrations in the river. For example, Figure 5-11 compares model predicted fecal coliform concentrations to grab samples concentrations. Visually, the comparison of most measured values to model predictions are good, but there are clearly some very high measured concentrations that are not predicted by the model. If both the model predictions and measured data were presented as a moving geometric mean (as is done for model predictions in Figures 6-1 through 6-4. In fact, it may be possible to perform a statistical analysis on a moving geometric mean to compare measured to model-predicted fecal coliform concentrations. Figure 5-12, which presents the comparison of the relative contributions of fecal coliform by source type, is not very useful in the absence of any information that shows the relative precision of the source estimates. This precision can be estimated if TCEQ provides a thorough sensitivity analysis of the model. TAD is particularly concerned that the estimates of the contributions of sanitary sewer overflows during both wet and dry weather could be underestimated. As stated earlier, if a bacteria concentration 1,000 organisms/100 mL were used to estimate the importance of this source, the true contribution could be grossly underestimated. We do not know how good the records of overflows are for the communities in the watershed that have sanitary sewers. However, it would be prudent for TCEQ and JMA to attempt to better define the potential contributions of sanitary sewer overflows to the bacteria loading in the river. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	A sensitivity analysis will be prepared and included in the Final Model Report. With respect to a different measure of the degree of calibration, the visual approach employed in the present modeling study is the approach usually employed in bacteria TMDLs across the nation. A few studies have attempted other methods of correlation, with little success. A fundamental problem is that the available bacteria data from the receiving stream consists of instantaneous grab samples, whereas the bacteria concentrations simulated with the model are mean daily values. As stated previously, for the purposes of this analysis, assuming that some partial treatment and disinfection occurs, a nominal bacteria concentration of 1000 org/100mL was assigned to bypass/overflows. Monitoring of municipal effluents showed occasional high fecal coliform counts, for example, 5 grab samples collected at the Comanche wastewater treatment plant under runoff conditions showed one value of *E. coli* as high as 3600 org/10 mL. It is difficult to quantify releases from collection systems. Therefore, it was assumed that the overflow waste loading component could also represent these items. It is true that raw sewage from collection systems, including overflows from lift stations and line breaks would have a much greater bacteria concentration. Therefore, we think we can make improvements to the model in the following way: The existing point source load for RCHs 10-80 (the impaired reach) is 0.04% of the total load, which is the combination of the "normal discharge load" plus the "overflow/bypass" load. If we multiply the overflow point source load by 30 to reflect an increase in concentration from 1000 org/100mL to 30,000 org/100mL, the revised point source load would represent 1.07% of the total load.
(27) Does TCEQ have plans to validate the loads from these "direct" non-point sources for the Leon River watersheds so that this variable is actually	At this time the TCEQ does not have plans to validate loads by collecting site-specific data. By their nature, these direct nonpoint source loads would be very difficult, if not impossible, to measure. For

based on known, controllable sources? If not, how will TCEQ verify or otherwise validate this source of bacteria, which is significant and for which the proposed TMDL allocations assume can be controlled? Explanation: The model uses "direct non-point sources" (identified as failing septic systems, direct wildlife contributions and leaking sewer lines) to simulate bacteria loadings to partially account for dry weather loadings and as a significant contributor to the total bacteria loading during wet weather. It appears that this loading source is not based on any site-specific data or even on any national database, but rather is used to adjust the model predictions for unknown sources so that better calibration of the model can be achieved (i.e., these loadings are adjusted to make calibration better.) ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	example, it would be very difficult to actually measure a loading from a leaking septic system, and it would be similarly difficult to measure direct contributions from wildlife. Models are utilized to account for loads difficult to measure. We could modify our estimates if better information becomes available. Water quality calibration indicates that modeled concentrations of fecal coliform closely correspond with observed values of fecal coliform. In Table 5-5 observed and simulated fecal coliform concentrations show that most median values are within the 99% confidence range. We believe that the model is reliable, based upon the bacteria data currently available. However, improvements to the model can be implemented as additional data is developed. The TCEQ's plan to improve the model is in part based on the review of the Draft Modeling Report provided by stakeholders, the public, and the TCEQ. JMA is in the process of recalibrating the model to achieve further improvement. Implementation strategies will address controllable sources.
(28) The assumed number of septic systems appears to be low for our area. This seems to be one of the easier sources to control and should result in more reduction. ***(Honorable Brent Hagood - Mayor, City of Comanche; Representing Cities of Comanche, Dublin, Hamilton, and Gustine)***	The total number of On-Site Sewage Facilities (OSSFs) was originally based on preliminary information offered to the project team. In response to this comment the total number of OSSFs will be revised based upon the most recent Census data. Malfunctioning OSSFs, and the compliance process is addressed in Texas Health & Safety Code Chapter 366. Repairs, alterations, extensions, or installations must be done in compliance with Title 30 Texas Administrative Code Chapter 285. In this watershed the rules and regulations are enforced by the Authorized Agents (Erath, Comanche, Hamilton, and Coryell Counties).
(29) All of the bacteria loading factors for each land use classification (e.g., accumulation rate, storage limits, surface wash off rate, removal rate, etc.) are based on literature values and are not based on any site-specific data for particular categories of land use. Thus, the modeling of bacteria concentrations as a function of flow is strictly a parameterization approach, wherein the loadings for different categories of sources are arrived at by a trial-and error method to fit the observed bacteria data at the Leon River stream stations (see page 5-19, Model Report). Thus, all of the predicted relative source contributions of bacteria are based on data that have not been validated for the Leon River watershed. As shown in the Model Report, literature rates for loading factors typically have uncertainty ranges that are orders of magnitude (e.g., Table 5-7); contributions of any of these sources because there are multiple combinations of sources that can result in the predicted in-stream concentrations. Therefore, site-specific validation of the source contribution assumptions, not just the total bacteria concentrations at river stations affected by multiple classes of sources, is essential. TAD recommends that TCEQ develop and implement a sampling program for this summer and fall to collect data to attempt to validate the coliform loadings used in the model for the major source categories that are predicted in the	The water quality calibration process used bacteria data that were collected in the Leon River. Most of the loading factors that are embedded in the model are not things that can be effectively measured in the field. The loading factors used in the model were developed as part of the water quality calibration process. Bacteria source loadings are based on literature because it would be cost prohibitive to collect such data from a 3,533 square mile watershed. The bacteria source loadings are then configured and compared against site-specific data collected at water quality stations to validate loading rates. Site specific data includes land-use, precipitation, TPDES permits, and flow. This site-specific data was utilized to calibrate the model. The loading factors used in the model were developed as part of the water quality calibration process. For example, you cannot effectively measure the bacteria accumulation rate on each specific land use surface. At this time, TCEQ has not proposed to collect any additional watershed data. But, the TCEQ would be willing to discuss this prospect with the stakeholders and consider what may be unique or what data could most greatly affect the TMDL WLA or LA.

draft Model Report as the major contributions to bacteria concentration. TAD does not believe that the Model Report should be considered final until site-specific loading data for major land use categories in the model have been collected. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	
(30) Section 5.3.3 Livestock This section clearly states that all of the livestock source contributions are based on unverified assumptions about the size of the source and its characteristics. For example, the relative contributions of dairy waste application fields were divided into two equal size (by land area) categories: those that apply solid manure (WAF1) and those that apply liquid by sprinklers (WAF2). It should not be difficult for TCEQ to obtain this information from dairies in the affected watershed. The key point is that this assumption (equal areas for WAF1 and WAF2) is typical of many waste load assumptions in the model and is based entirely on best professional judgement and is not verified by any site-specific information. This fact makes it mandatory that the sensitivity of the predicted bacteria concentrations in the river to changes in the loading assumptions be determined and evaluated. It is possible that very different assumptions could result in equally good or better calibration of the model to the available bacteria data. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	The model was calibrated to reflect available bacteria data in the Leon River. A full sensitivity analysis will be prepared and included in the Final Modeling Report. With respect to the breakdown in area between WAF1 and WAFs, the CAFO permits obtained from TCEQ typically state the areas that will receive either liquid or solid waste deposition. In many cases, waste application fields are designated for both liquid and solid waste disposal, and year-to-year records of actual disposal are not available from TCEQ. This necessitated an assumption regarding the breakdown for liquid and solid waste disposal. Alternatively, the model could be set up with just a single waste application field category, subject to both liquid and solid waste disposal, and equivalent calibration parameters obtained. Improvements to the model can be implemented as additional data is developed. The TCEQ's plan to improve the model is in part based on the review of the Draft Modeling Report provided by stakeholders, the public, and the TCEQ. JMA is in the process of recalibrating the model to achieve further improvement.
(31) The data presented for wildlife is unclear and appears to be incomplete. There is little or no census data available for wildlife species in the watershed with the possible exception of whitetail deer. Opossum populations are projected to be in excess of raccoon populations by 400 percent. Is any data available to support such a projection? Several species such as beaver and nutria are directly associated with water bodies and are not included in the study. How many of these species exist and what are their numbers? ***(Whit Weems - Texas Cooperative Extension Agent, Hamilton County)***	Population estimates for representative wildlife species were used to arrive at an initial loading factor for each source category. Exact counts are not available for any species in the watershed. Since wildlife populations are not precisely known, all loading parameters that represent wildlife were adjusted in the model calibration process.
(32) Other segments of the study indicate a significant contribution of wildlife to the *E. coli* loading of the Leon River. Estimates appear to indicate that wildlife may be contributing up to about 40% of the loading. Avian species are projected to contribute about one half of this amount. Table 4-5 indicates a total population of 451 ducks in the watershed and is the only data presented for avian species. Some 362,000 other species are projected to inhabit the watershed. How do you account for the amount of avian contribution to stream loading with such low waterfowl numbers? These comments are only concerned with the land use and wildlife aspects of the study. If other parts of the study are as incomplete and inaccurate as these	Population estimates for representative wildlife species were used to arrive at an initial loading factor for each source category. Exact counts are not available for any species in the watershed. Since wildlife populations are not precisely known, all loading parameters that represent wildlife were adjusted in the model calibration process.

data appear to be it calls the entire study into question. Models are not better than the data which is included in them. ***(Whit Weems - Texas Cooperative Extension Agent, Hamilton County)***	
(33) Model Uncertainty and Sensitivity One missing element in the draft Model Report is any information on the uncertainty of the modeling predictions. At a minimum, a detailed sensitivity analysis is needed to examine the model predictions of bacteria concentrations using the uncertainty ranges associated with each major model input - e.g., accumulation of bacteria on the land surface (ACQOP), maximum accumulation (SQOLIM), and the rate of surface runoff that will remove 90% of the accumulated bacteria (WSQOP) as identified in the Model Report. The assumptions related to the frequency and quantity of discharge and concentrations of bacteria in overflows from municipal sewer systems, the quantities of bacteria contributed by failing septic tanks, the size of the riparian zone used to estimate wildlife source inputs, and all similar major assumptions. The sensitivity analysis is needed to allow TCEQ and stakeholders to understand the importance of the assumptions that underpin all of the basic components of the bacteria model. The sensitivity analysis will identify areas where additional data should be collected to improve predictive capability, and will also allow quantitative estimates of model uncertainty. TAD believes that the model development cannot be considered as completed until a thorough sensitivity analysis has bee performed on all key model bacteria source contribution assumptions and estimates of prediction uncertainty have been generated. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	A full sensitivity analysis will be developed and included in the Final Modeling Report.
(34) Where can the list of references used to compile the data for the current model be found? ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	A list of all the references used to calibrate the model will be provided to the Advisory Stakeholder Committee.
(35) If I understand the data on coliform loads (pervious) on pg. 4 (01/12/06 powerpoint presentation), and WLA on pg. 7, it looks like the total simulated loads from waste application fields in RCH RES 20, 30, and 60 all exceed the loads of the combined sewage plants. I'd guess the total simulated loads from waste application fields are several times the estimated loads of the treatment plants. However, the BST data show that humans are greater contributors of fecal coliform from all cattle! This argues for additional model calibration ***(Allan Jones - TAMU)***	The TCEQ has been on the forefront of establishing Bacteria Source Tracking (BST) as a reference tool to develop bacteria TMDLs. The TCEQ, Texas Farm Bureau, Texas State and Water Conservation Board, and Texas A&M University collaborated to develop a state-wide library of bacteria isolates to reference with BST. To date, several TMDL bacteria projects have utilized the science of BST. The BST data provided by Texas A&M El Paso Agricultural Research and Extension Center (AREC) provides an indication of the sources of bacteria in the study area. The BST results are expressed as percentages of various source categories, but these percentages are not precise. It would not be appropriate to translate them into a load. As shown in AREC's report, the capability of the method for discrimination of different sources is such that the results are two to three times better than random. In other words, the fact that the human source was detected in 18 percent of the samples and cattle in 14

	percent of the samples should not be interpreted as hard numbers, but instead as a general confirmation that both human and cattle sources were detected. The AREC researchers also noted in their report that instream sampling data should be used for decisions on relative contributions of sources. JMA is recalibrating the model. Despite the fact that the BST results are not precise, results will be taken into consideration during model recalibration.
(36) How does TCEQ propose to use the BST results to assist in model validation? Explanation: The bacteria source tracking (BST) studies generally confirm the result that dairy WAFs are not a significant contributor to the bacteria concentrations in the Leon River. The BST studies indicate that cattle (including rangeland) constitute about 12% to 14% of the E. coli found in the river samples. Thirty-one (31) to 41% of the bacteris are from wild mammals and birds, and domestic sewage constitutes 15% to 19% of the E. coli in the river samples. These BST results need to be used to reconcile the modeling results before the model predictions can be considered sufficiently accurate to allow TMDL allocations to source categories. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The BST data provided by AREC provides an indication of the sources of bacteria in the study area. The BST results are expressed as percentages of various source categories, but these percentages are not precise. It would not be appropriate to translate them into a load. As shown in AREC's report, the capability of the method for discrimination of different sources is such that the results are two to three times better than random. In other words, the fact that the human source was detected in 18 percent of the samples and cattle in 14 percent of the samples should not be interpreted as hard numbers, but instead as a general confirmation that both human and cattle sources were detected. The AREC researchers also noted in their report that instream sampling data should be used for decisions on relative contributions of sources. Despite the fact that the BST results are not precise, the results were taken into consideration during model calibration
(37) What steps are being taken to calibrate the model using the new science of BST? Explanation: Bacterial source tracking (BST) technology indicates that 73% of the bacteria is from wildlife (birds and mammals), domestic sewage, 100 animals and domestic pets. Livestock producers are being asked to take on the financial burden of reducing much of the watershed problem through practices on their land. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The TCEQ has been on the forefront of establishing BST as a reference tool to develop bacteria TMDLs in Texas. The TCEQ, Texas Farm Bureau, Texas State Soil and Water Conservation Board, and Texas A&M University collaborated to develop a state-wide library of bacteria isolates to reference with BST. To date, several TMDL bacteria projects have utilized the science of BST. The BST data provided by AREC provides an indication of the sources of bacteria in the study area. The BST results are expressed as percentages of various source categories, but these percentages are not precise. It would not be appropriate to translate them into a load. As shown in AREC's report, the capability of the method for discrimination of different sources is such that the results are two to three times better than random. In other words, the fact that the human source was detected in 18 percent of the samples and cattle in 14 percent of the samples should not be interpreted as hard numbers, but instead as a general confirmation that both human and cattle sources were detected. The AREC researchers also noted in their report that instream sampling data should be used for decisions on relative contributions of sources. JMA is recalibrating the model. Despite the fact that the BST results are not precise, results will be taken into consideration during model recalibration.
(38) Is a standardized test being used by these various entities to collect such bacteria?	The collection of samples, either ambient water or BST, has followed the protocol of standards and methods outlined in a TCEQ and EPA approved Quality Assurance Project Plan (QAPP), which follows

Explanation: The TCEQ developed guidance for TDML's that incorporates the key elements from EPA guidance (TNTCC, 1999). The TCEQ's steps for TMDL development include the assessment of current watershed and water quality conditions including the use of available data (e.g. BST) or collection of additional data. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	ASTM Standards. Quality assurance was demonstrated and verified throughout the monitoring phase of the project.
(39) Because the general public in the affected watershed is just now becoming knowledgeable of the fecal coliform impairment of the Leon River, is it possible for your timetable to be extended to allow for additional public/stakeholder participation in the modeling process, i.e., more time for additional public/stakeholder education and responses to voiced or written public/stakeholder concerns? ***(Honorable Fred Cox - Hamilton County Judge)***	In total we have had five (5) public/stakeholder meetings. The first meeting presented an overview of the project, its process and its intention. The second meeting summarized historical data and shared the results of monitoring activities. The last three (3) public/stakeholder meetings were held to present the draft TMDL model, and received a great deal of involvement and comment from the stakeholders. All meetings were well attended, over 40 people attended the October 05 meeting, and over 60 people attended the January 06 meeting, and over 150 people attended the February 06 meeting. After the fourth meeting, on Jan 21, 2006, we posted the DRAFT Modeling Report on the project webpage, and sent an e-mail to stakeholders to call their attention to the report in order to provide the public the opportunity to submit formal comments. State Rep Sid Miller asked that the deadline to receive comments be extended from Feb 6 to March 14. We are, and will, continue to solicit public input.
(40) There seems to be a real push to stay on a timetable, but does this really serve to improve water quality and, ultimately, the quality of people's lives who live in the watershed? Explanation: The process is three years old and yet it wasn't until this past October that the main affected area even knew about the TMDL process or a meeting was scheduled in the area. Many officials and landowners that will have a major impact in improving the water quality are just now becoming acquainted with the process or aren't even aware of it. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	In total, the TMDL project has had five (5) public/stakeholder meetings. The first meeting (Aug 19, 2003), in Temple, presented an overview of the project, its intention, and the public/stakeholder process. Based on attendance and interest, a stakeholders group was formed (per HB 2912). The second meeting (Aug 26, 2004), in Temple, summarized historical water quality data and shared the results of monitoring activities. Based on input from stakeholders, subsequent meetings were located upstream in the watershed. The third meeting (Oct 10, 2005, > 40 people), in Hamilton, provided a background to the study, the review of historical data, our modeling approach, proposed allocations, and bacteria source tracking results. Per the ground rules, members of the stakeholder committee were added and removed. The fourth meeting (Jan 12, 2006, > 60 people), in Hamilton, focused on additional modeling with an emphasis on simulated bacteria concentrations and calibration. ***After the fourth meeting, on Jan 12, 2006, the DRAFT Modeling Report was posted on the project webpage. Stakeholders were sent e-mails to call their attention to the report in order to provide the opportunity to submit formal comments. State Rep Sid Miller asked that the deadline to receive comments be extended from Feb 6 to March 14. A technical subcommittee meeting was scheduled on

	April 24, 2006, to provide responses and work through any issues or concerns, before another public stakeholders meeting is held. The fifth meeting (Feb 28, 2006, > 150 people), in Comanche, was held at the request of State Rep Sid Miller to provide the public the opportunity to voice their concerns and allow the TCEQ to present information and provide clarification. Three additional members were added to the stakeholder advisory committee. A document handed out at the meeting, "Reducing Bacteria to Improve Water Quality in the Leon River: What You Need to Know", was posted on the project webpage. Completion of a TMDL does not directly affect landowners and regulated entities. This occurs as a result of making choices to implement the TMDL during implementation.
(41) I object to two aspects of the TMDL project as I understand it, even though I agree with the ultimate objective. First, I feel the TCEQ was particularly negligent in upholding the public's trust and perhaps even deceitful in failing to well publicize their TMDL program for the Leon River in the area likely to be most directly affected by cleanup measures. Holding poorly advertised meetings in Temple, far removed in both effects and media coverage, is, at best, making only a token effort at complying with public involvement requirements. At worst, it is insulting and deceitful to the public that will have to deal with the cleanup process. Also, telling me that the local area public is getting involved in the TMDL process at just the right time, seems to be both incorrect and insulting. From what I can observe, many of the missteps that the TCEQ TMDL project team has made could have been avoided if they had been up front with the people in the area where the bacterial contamination is occurring, rather than being sneaky downstream about their efforts for two or three years. This ill-advised procedure has created much ill will and distrust, and needlessly so. Second, I feel the modeling used in the TMDL project as the basis for allocation of presumed sources of bacterial contamination of the Leon River is, at best, a highly sophisticated guess. From what I can determine in the draft report, it seems to predict the hydrology of the river with reasonable accuracy, but certainly not perfectly. It's ability to predict the observed levels of bacterial contamination seem to my eye to be much less reliable. That alone would serve as a reasonable basis for objection. My concern goes further, however. Since there are nine different land use types used in the model, each with differing assumed levels of bacterial loading and varying allocations among 15 different reaches of the river watershed in the non-attainment area, it would seem to me that there are at least 135 different bacterial input variables in the model that can be tweaked (I reject the term calibrated since it implies measured precision) or guessed at again until the model's projections achieve some degree of	In total, the TMDL project has had five (5) public/stakeholder meetings. In total we have had five (5) public/stakeholder meetings. The first meeting (Aug 19, 2003) in Temple, presented an overview of the project, its process and its intention. The second meeting (Aug 26, 2004) in Temple, summarized historical data and shared the results of monitoring activities. Based on input from stakeholders, the meeting location was moved further upstream in the watershed. The last three (3) public/stakeholder meetings were held to present the draft TMDL model, and received a great deal of involvement and comment from the stakeholders. All meetings were well attended, over 40 people attended the October 05 meeting in Hamilton, and over 60 people attended the January 06 meeting in Hamilton, and over 150 people attended the February 06 meeting in Comanche. A document handed out at the Comanche meeting, "Reducing Bacteria to Improve Water Quality in the Leon River: What You Need to Know", was posted on the project webpage. After the fourth meeting, on Jan 21, 2006, we posted the DRAFT Modeling Report on the project webpage, and sent an e-mail to stakeholders to call their attention to the report in order to provide the public the opportunity to submit formal comments. State Rep Sid Miller asked that the deadline to receive comments be extended from Feb 6 to March 14. We are, and will, continue to solicit public input. The BST data provided by AREC provides an indication of the sources of bacteria in the study area. The BST results are expressed as percentages of various source categories, but these percentages are not precise. It would not be appropriate to translate them into a load. As shown in AREC's report, the capability of the method for discrimination of different sources is such that the results are two to three times better than random. In other words, the fact that the human source was detected in 18 percent of the samples and cattle in 14 percent of the samples should not be interpreted as hard numbers, but instead as a general confirmation that both human and cattle sources were detected. The AREC researchers also noted in their report that instream sampling data should be used for decisions on relative contributions of sources.

approximating observed reality. I would submit that there are thousands of possible unique combinations of guesses that could yield similar end results, yet have vastly differing implications upon who bears the burden of the cleanup. I strongly agree with State Representative Sid Miller's assessment that what is needed here is not a "guess" but "solid science", in other words, measurements that accurately determine where all the pollution is originating and then address the problem. Bacterial source tracking, even though not a perfect tool, is much more of a solid science that Dr. Miertschin's sophisticated hydrology model with a bunch of guesses for bacterial loading grafted thereon. In other words, your project has been poorly handled from a public relations perspective from the start, and it is based on what appears to be "junk science". I call for the entire project to be thrown out and started again from the beginning, on a fast track if needed, and using the hard data already collected, but do the forensics work and find the sources, rather than guess at them. ***(DeLeon Free Press)***	Despite the fact that the BST results are not precise, the results were taken into consideration during model calibration. The fact that the human component was detected with some frequency led to an increase in the estimated bacteria loading from domestic wastewater treatment plants.
(42) Do you already have criteria established for data collections to be in compliance with an approved TMDL? If so, what are they? ***(Honorable Fred Cox - Hamilton County Judge)***	No, TMDL implementation has not yet occurred. Sample locations, and a strategy to sample watershed reaches, to measure progress toward meeting the TMDL and bringing the segment into compliance with its water quality standard, will be decided with stakeholders input during the development of the Implementation Plan.
(43) After a TMDL is set, is there a plan in place for adjusting the model during implementation of best management practices resulting from new research and newly collected data? ***(Honorable Fred Cox - Hamilton County Judge)***	As a program we support adaptive management toward the implementation of the TMDL and expect a certain degree of flexibility as data is collected during the IP to show whether efforts to reduce loads are working. If warranted, a revised model and TMDL could be needed.
(44) What does TCEQ propose to do to address the dry weather non-compliance with the bacteria standard? Explanation: Both the storm water sampling in June of 2004 (2 events) and the base flow sampling in August 2004 (2 events) show consistent failures to achieve the bacteria (E. coli) criteria. Although the storm water events had higher bacteria concentrations, the fact that the base flow events also show that the criteria are not achieved indicates that the current TMDL model focus on runoff events is not sufficient to achieve compliance with the standard. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	Baseflow, or dry weather non-compliance, is generally associated with point source pollution. The TCEQ is responsible for regulating point source pollution to ensure that there is compliance with State water quality standards and respective permits. Reductions in point source pollution will be addressed through implementation.
(45) It has been proposed that cost share will help pay for these Best Management Practice's (BMP) but what about the loss of income? Explanation: Proposed reductions in the river have landowners reducing 40% of the bacteria from rangeland, 30% of waste application to fields, and 30% of waste application to pastureland. There is confusion about how this would	Percent reductions represented in Table 6-3 of the Draft Modeling Report are scenarios. Stakeholders will be involved in decisions to determine specific source reductions in implementation. These hypothetical reductions will not be included in the TMDL document. Any actual reductions to be proposed will come during the implementation phase which will be guided by stakeholder input. At this point in time, TCEQ is not advocating any specific BMPs for the Leon.

be done. Suggestions have included destocking, establishing bufferstrips, using alternative water sources, and the ultimate – fencing off the rivers and streams from livestock, This would mean a tremendous reduction in land use and value with a corresponding reduction in farm income. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The TCEQ has not suggested fencing off rivers from livestock. Agricultural non-point source implementation will be a voluntary incentive based effort.
(46) Please identify all known programs and initiatives which currently have the ability to reduce pollutants from point and non point sources. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	The following list is not exhaustive and is not intended to be totally inclusive. **Point Sources**: Texas Water Development Board grant and loan programs Office of Rural Community Affairs grant and loan programs (State Agency) USDA Office of Rural Development grant and loan programs Direct appropriation from Texas Legislature **Non-point Sources**: United States Department of Agriculture-Natural Resources Conservation Service ▪ Cropland Reserve Program ▪ Grassland Reserve Program ▪ Environmental Quality Incentives Program ▪ Wetland Preserve Program ▪ Wildlife Habitat Improvement Program Texas State Soil and Water Conservation Board ▪ Clean Water Act Section 319 program ▪ SB 503 Water Quality Management Plan Program Texas Commission on Environmental Quality ▪ Clean Water Act Section 319 program Texas Water Development Board ▪ State Revolving Loan program ▪ Agricultural Conservation grant and loan program
(47) Please identify and describe all known incentive base approaches to implementation of load allocations for point and non point sources. ***(Honorable Sid Miller - State Representative District 59; David DeJong - TAD)***	There are numerous publications and documents on this topic. New ideas and approaches are being developed all the time through product development in the private sector and research by universities and government agencies. The following list is not exhaustive and is not intended to be totally inclusive. **Point Sources**: Upgrade of wastewater treatment facilities and improve collection systems to reduce infiltration/inflow. Improved management procedures to ensure proper operation of treatment and collection systems and reduce overflow from retention structures at CAFOs. Larger or expanded facilities to improve redundancy and reduce problems created by equipment failure. Diversion of wastewater from stream and ditches by increased use of regional systems.

	Non-point Sources: Vegetative buffers along waterways, ditches, and runoff collection areas. Alternate water sources for grazing livestock. Improved management for irrigation disposal systems. Improved management for beneficial use of waste and application of fertilizer to improved pasture and cropland.
(48) I understand what areas are being tested but will the BMP's include the entire Leon Watershed from Proctor Lake Dam to Lake Belton? ***(Whit Weems - Texas Cooperative Extension Agent, Hamilton County)***	Controls and BMPs will be addressed in implementation.
(49) Section 6.3 Load Allocations TAD believes that the load allocations presented in the modeling report are premature. Until the TCEQ and stakeholders have a more complete understanding of the sensitivity of the model predictions to variations in the assumed source contributions, it is impossible to predict with any accuracy which source categories require the most control in order to assure compliance with the water quality criteria for bacteria. TAD also believes that the bacteria TMDL should be implemented as a phased TMDL (as this approach is described by EPA), with continuing data collection and analysis to evaluate the effectiveness of controls. ***(Dr. Lial Tischler P.E. - TAD & TK Environmental Engineers)***	A full sensitivity analysis will be prepared and included in the Final Model Report. The modeling analysis explores hypothetical control scenarios in order to arrive at a total bacteria loading allocation for the Leon. The purpose of the model at this stage is to establish the TMDL, and to allocate loads broadly to source categories. It would establish a total allocation for both point and all non-point contributions. Allocation of loads will occur during the implementation phase, with participation from the stakeholders. Implementation through an adaptive management (phased) approach is assumed for the Leon River impairment. This will be addressed in further detail when the implementation plan is developed.
(50) Ladies and Gentlemen: I write to supplement my comments of February 6, 2006. I believe that the sources of the fecal coliform and *E coli* pollution in Segment 1221 of the Leon River are located in the Walnut Creek and Resley's Creek watersheds. Prior to Creating a model for the entire 173 mile course of Segment 1221, and prior to contemplating enforcement procedures for the entire 173 mile course, I urge the Texas Commission on Environmental Quality and the Stakeholders to undertake an intensive investigation of Walnut Creek and Resley's Creek to determine the sources of the high fecal coliform and *E coli* readings on these creeks. This result would result in substantial reductions in expenditures and would eliminate the need for regulation of citizens and entities who are not polluting Segment 1221. ***(Andy J. McMullen, Hamilton County Attorney)***	The TMDL was set up to examine the entire watershed of the impaired reach of the Leon River. The historical bacteria data does indicate potential source loadings from Walnut Creek, Resley Creek, and the Leon River, all of which are included in the modeling analysis. Bacteria allocation assignments to sources are anticipated to occur during the implementation phase with participation from stakeholders. It is quite possible that the stakeholders could elect to focus control efforts on Walnut and Resley Creeks during this phase. However, all sources of bacteria pollution are being assessed considered.