



TECHNICAL MEMORANDUM WATER QUALITY INVESTIGATION

DATE: November 22, 2006

TO: Mike Reedy, P.E., TCB, Inc.

FROM: Espey Consultants, Inc. (EC)

RE: Luce Bayou Interbasin Transfer Water Quality Investigation
EC Project No. 5081

Executive Summary

The purpose of this preliminary water quality study as a part of the Luce Bayou Interbasin Transfer Project is to determine what, if any, change in water quality will occur with the storage and mixing of raw Trinity River water with water from the San Jacinto River Basin stored in Lake Houston. The study consisted of data collection, database development, GIS Geodatabase development, a mass balance based on a 200 mgd and a 400 mgd water transfer and a preliminary treatability evaluation. Data and previous studies have been collected from a number of sources. A database has been established and prior studies reviewed to determine their significance to this study. The GIS Geodatabase has been developed and a mass balance performed for a preliminary determination of the significance of imported Trinity River water on the quality of water to be treated at the Northeast Water Purification Plant (NEWPP). The effect of importing Trinity River water on the treatability of the blended Lake Houston water from this interbasin transfer project was assessed in a preliminary manner using the information provided in previous studies and the results of the mass balance evaluation. The results of this analysis are useful in determining whether there will be significant improvements expected in water quality for treatment at the NEWPP resulting in a reduction in treatment costs as a result of the project.

This study has determined that the transfer of raw Trinity River water into Lake Houston will result in some improvement in water quality during those periods of time that water is actually being transferred. The operation of the Luce Bayou Interbasin Transfer Project will require that the transfer of water only occurs when the level of Lake Houston is below the crest elevation of the approximately 3,200 foot long uncontrolled spillway. With this in mind, the water being treated from Lake Houston will have similar water quality to what is being treated today. In other words, the primary source of water during wet times is directly from the San Jacinto River Basin when water is spilling from the lake. The only time potential improvements in water quality will occur is when the Luce Bayou Project is in operation. In addition the quantity of water being transferred may vary based on lake levels, volume of Lake Houston, required treatment levels at the NEWPP and the demand for treated water at any time period.

While some improvement in water quality may occur resulting in some reduction in treatment costs during periods of water transfer, a determination of the actual water quality at the NEWPP intake could only be determined by developing a lake specific hydrodynamic model. That model would need to account for the circulation and mixing in Lake Houston from incoming tributary flow, the imported water flow and the devices for circulation and mixing of the water currently in use at the NEWPP raw water intake. The model would need to use different scenarios for different inflow conditions that occur when

there are no interbasin transfers and for different amounts of transferred water. However, even with this type of modeling, it would be difficult to accurately identify treatment costs that would occur under changing weather conditions and demands for treated water. It is intuitive that improved water quality would result in reduced treatment costs but the magnitude of these cost reductions would only be realized during simultaneous operation of the NEWPP and the Luce Bayou Interbasin Transfer Project.

It is more likely that reduction in treatment costs at the NEWPP would occur when, and if, the treated water quality standards currently imposed by contract are reduced to match the standards imposed by state and federal regulations for use at surface water treatment plants. Any changes in costs may be influenced by imposition of future water quality standards that occur due to revisions to current state and federal regulations.

