

Groundwater Impact Statement
Concerning the Proposed Ethanol Plant near Rogersville, MO
from the Webster County Groundwater Impact Committee
10/8/2006

The Webster County Groundwater Impact Committee (or Committee for short) has provided factual information on a wide range of factors associated with ethanol plant development. However, the committee's primary responsibility was to provide unbiased information and analysis of the groundwater impact. Therefore, this statement and any conclusions that are made are limited to groundwater. In addition, the committee is not authorized to make any statements or recommendations pertaining to whether the plant should be constructed at this site.

Concerning the potential for groundwater contamination, Gulfstream Bioflex Energy (or GBE for short) officials told the Committee there would be no discharge from the plant site. Greg Wilmoth, CEO of the company, stated to the Committee, "I don't want to do anything that's not going to preserve the environment." However, GBE also stated there would be 700 gallons per minute (GPM) of cooling water discharged into retention ponds for evaporation and/or irrigation. Committee research of climatic and soils data shows evaporation ponds and irrigation on 252 acres of land is not sufficient to dispose of that quantity of water. We therefore have to conclude there will be a significant amount of cooling water discharged into drainage-ways.

The discharge of any "treated" wastewater is a significant concern because of soil and geological characteristics of this part of the Ozarks, which is among the most fragile and susceptible land to pollution in the U.S. Any discharged water will either end up in the groundwater or resurface in a stream, most likely James River, without any assurance of further treatment. Therefore, the quality of discharge water is a significant concern, even if it meets Missouri Department of Natural Resources (MoDNR) discharge limits for the contaminants still present within the water, and even if it is comparable to other wastewater plants discharging partially-treated wastewater. The specified quantity of discharge water would be equivalent to the wastewater for a population of 16,800 people, which is an even more serious concern since most of the water is anticipated to go below ground, due to the losing streams and karst bedrock in the area.

In our Committee's preliminary report, we stated that, based upon GBE's information, wastewater did not appear to present a serious problem at this time. This comment was based primarily on GBE's statement that they were not aware of any chemicals that would be added to the cooling water, and they would furnish the Committee with the specific wastewater data. Since the Committee has not received any wastewater data from GBE, we have no choice but to rely on data from other plants that are utilizing chemicals such as algaecides and rust inhibitors in the cooling water. Due to algaecides and other possible chemicals that may be in the discharge water and the area's high potential for groundwater contamination, the discharge of the plant's cooling water is a serious concern.

Another concern is the accidental spillage of any industrial chemicals or ethanol, since the geology and lower subsoils have severe limitations for mitigating such a spillage. The Committee recommends that the area residents, especially those between the plant site and Springfield, specifically test their water for all of the chemicals present in any water discharged

into the drainage-ways. If or when the plant becomes operational, we will attempt to have a list of these chemicals available at a county office.

Regarding the impact on groundwater availability, GBE's position was that there would be no impact since their wells would be cased through the shallower geologic rock formations that most others are using. This is an incorrect assumption that any environmental study of the proposed site would have revealed. Area wells receive water from the geological formations between the Northview Shale Formation downward through the deep Potosi Formation. All of these formations constitute one aquifer known as the Ozark aquifer. Hydrogeologists will confirm that it cannot be assumed that water extracted from one formation will not affect the other.

Below the Potosi Formation is a zone of low-permeability carbonate rock and shale including the Derby-Doerun dolomites and Davis Formation. Together they form the St. Francois confining unit. This unit is not considered a significant aquifer. Instead, it greatly limits the interchange of water between the Ozark aquifer and the St. Francois aquifer below. Very few wells in this area produce from the St. Francois aquifer, so information on this aquifer is limited. Most wells that are deep enough to produce from this formation in this area also produce from the shallower and more prolific Ozark aquifer. Depending on location, yields of from 70 to more than 125 gallons per minute are possible from the St. Francois aquifer. By comparison yields of from 300 to 1000 gallons per minute are possible from the Ozark aquifer.

The company's projected water use is 880 GPM with the capacity to pump 2,000 GPM. The best estimation of the impact on water table levels in the immediate area comes from Jim Vandike, Groundwater Section Chief with the MoDNR at Rolla, MO. He stated that there would be "some impact" on the water table and anticipates that there may be a significant drop in the water table of 200-300 feet within a two-mile radius of the plant, if the maximum of 2,000 GPM was extracted. The Committee cautions these are very general estimations. The actual influence and level of impact could be significantly different.

Jim Vandike also stated it may take several years of pumping before the water table stabilizes at a lower level. The overall impact cannot be known because of variables such as the quantity of water currently present and especially the rate of recharge. Although "test well" pumping can provide information on the quantity of water initially present, the rate of recharge and the impact upon the water table would not be known until the wells are in operation for an extended period of time and may not be known for years to come and well testing is conducted in the area.

If the above estimations on the impact of the water table are accurate, then the wells in the designated zone would either need to have pumps lowered, wells deepened, or new deeper and more costly wells drilled. GBE has stated they don't think it is their responsibility to compensate residents for affected wells. Greg Wilmoth, CEO of the company, also stated to the Committee, "We are not going into a location where we're not wanted." Available information indicates there is a high probability that the wells adjacent to the plant site will be adversely impacted. It is highly recommended for these residents, along with others within several miles of the plant site, to install a well depth gauge to monitor their water levels as a means to prove damages in the event their wells are diminished by the plant's water extraction.

Southwest Webster County has experienced a long-term lowering of water tables and stream levels. In this area, it has been a common occurrence in recent years to lower well pumps and to drill new wells, due to declining water tables. ***The extraction of water by wells is the principle factor in the long-term lowering of our water tables.*** Lowering of the water table is also a contributing factor in the reduction of spring flow and stream levels. In many areas, landowners are essentially mining groundwater, since they are extracting the water at a faster rate than it can be recharged. This means that any additional removal of water in areas of declining water tables will likely result in further lowering of the water table.

It may be helpful to use an analogy given by the highly-regarded hydrogeologist, Thomas Aley, of the Ozark Underground Laboratory near Protem, MO. He suggests thinking of our groundwater resource as a bank reserve, where groundwater recharge is a deposit and our wells are withdrawals from that reserve. He has stated in many areas, such as the Rogersville area, we are operating at a deficit, since our withdrawals are exceeding our deposits. Continuing his analogy, it has to be assumed we are on a fixed income, since our deposits, over the long term, are not going to increase and we are certain our withdrawals are going to increase at a rapid rate. Many people in southern Webster County are aware of the situation we have with respect to our groundwater, and that is why there is so much concern when a high water demand industry wants to make a corporate withdrawal from our residential reserve.

It needs to be noted that the projected water use of the plant at 880 gallons *per minute* would be equivalent to the gallons of water used by approximately 21,000 residents *per day*. In Webster County, with a population of 34,000 residents, this is a significant increase in water withdrawal from the Ozark aquifer. This has the potential of having some additional impact on the water table and the availability of water over a larger area than a two-mile radius from the plant site. It is also likely that the overall impact of the plant's water extraction may not be known for years to come, until the water table has stabilized at some lower level.

Missouri is one of the most diverse states in terms of soils and geology and the potential for environmental impact from an ethanol plant. For example, groundwater contamination is not a serious threat in northern Missouri, and water availability is not an issue in the Bootheel region of southeast Missouri. There are also many areas in Missouri suitable for lake construction which is a low-impact alternative for supplying the large quantities of water needed for this type of industry. By contrast, southwest Webster County has an extremely high potential for groundwater contamination in an area of rapid residential growth, reliant upon private water wells drawing from a declining groundwater resource. Therefore, it is difficult to refute the fact that southwest Webster County is among the portions of Missouri where an ethanol plant would have the greatest potential for negatively impacting groundwater quality and availability.

Webster County Groundwater Impact Committee
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