

## **Questions and Answers about the Proposed GBE Ethanol Plant near Rogersville, Missouri**

On August 23, 2006, residents of the Rogersville, Missouri area learned that an ethanol manufacturing plant was being proposed for construction on a site east of Rogersville in Webster County.

The same day, the Webster County Commission appointed a study group, named the Webster County Groundwater Impact Committee (or Committee for short), to help research the issues associated with such a manufacturing plant and provide unbiased answers to citizens' concerns and interests about it.

Committee members are:

- Larry Alberty – Fordland area businessman
- Karen Asher – Seymour area farmer
- Joe Blaine – Soil scientist
- Joyce Noland – Webster County Soil and Water Conservation District
- Bob Schultheis – University of Missouri Extension (Committee chair)

On August 30, the Committee was allowed to meet with officials representing Gulfstream Bioflex Energy, LLC, based in Mt. Vernon, MO, to question them about their plans for an ethanol plant. Those representing the company at the meeting were Greg Wilmoth, CEO; Jeff Negre, vice-president; Charles Luna, vice-president; Richard Quint, senior vice-president of Walton Construction based in Springfield MO and general contractor for the project; and Brett Carlgren, one of the engineers assisting with the project.

Based on answers to questions asked at that meeting, plus additional research by the Committee, the following information has resulted.

### **1. Where is the site located?**

The site is a 252-acre property northeast of the junction of U.S. Highway 60 and Porter Crossing Road. The approximate location is the NE¼ of Section 15, Township 28N, Range 19W in Webster County. [Click here for an aerial photo of the site.](#)

### **2. Who are the owners of the company wanting to build the ethanol plant?**

A group of investors, doing business as Gulfstream Bioflex Energy, LLC, (or GBE for short) is a new corporation whose mailing address is P.O. Box 487, Mt. Vernon, MO 65712. The company CEO is Greg Wilmoth, a native of Lawrence County. His family has been in the oil business since 1952, and he said he currently runs 165 gasoline trucks across the U.S.

### **3. What determined the selection of the site near Rogersville, MO?**

According to Greg Wilmoth, GBE is reviewing seven sites, and plans to build ethanol plants on three of those sites in the first phase of their expansion plans. They found the Rogersville site by just going down the highway and noticing the lay of the land, the proximity to a natural gas pipeline, and easy accessibility to rail and four-lane highway for ethanol export. The large livestock industry in southern Missouri was

not one of the reasons from the site selection, and “planning and zoning never came to mind” in their decision.

Plans are to locate the plant somewhere in the middle of the property, to minimize impact on neighboring property owners. Wilmoth stated “I don’t want to do anything that’s not going to preserve the environment.”

Location of the actual facilities may be influenced by the location of the fire protection districts and [school district boundaries](#), which split the property. Locating the plant on the [Fordland](#) side of the school district boundary may result in lower property tax costs to the company, while locating on the [Rogersville](#) side may result in lower fire insurance rates.

#### **4. How much ethanol would the plant produce per year?**

GBE stated the plant would have a rated capacity of 88 million gallons per year (MGY), with no company intentions of expanding beyond that size. The weekly output would be 1,833,000 gallons of ethanol.

#### **5. Why ship in the corn rather than locating in corn country, and where would the corn be shipped in from?**

Wilmoth stated he can ship corn cheaper than he can ship ethanol, and is working with one of the largest corn brokers in the country to ship in the grain. Approximately 90 percent of the grain (which could be corn or milo) would be shipped in by rail and the rest by trucks. The grain would come from the Midwest and possibly the South, and he also intends to buy locally from farmers if possible.

#### **6. Would this be a dry-mill or a wet-mill process plant?**

GBE stated the plant would be primarily dry-mill, but can do both. That means most of the byproduct will be dried-distillers grains (DDGs). Wet-distiller grains (WDGs), will be produced on order from agricultural producers. If an order of WDGs is produced, they expect the buyer to be prompt on pick-up to avoid spoilage issues.

Committee research shows the approximately 194 rail cars of grain processed per week (each containing about 3,500 bushels of grain), the plant would process about 97,000 bushels of grain per day. A bushel of corn weighs 56 pounds and reduces to 17 pounds of DDGs in the ethanol-making process. So about 825 tons of DDGs would be produced by the plant each day.

The DDGs are a medium-protein feed that typically has a 12 percent moisture content, and can be fed to a variety of livestock and poultry. Beef cows typically would use 1-2 pounds per day in their diet, and dairy cows would use 3-4 pounds per day in their diet. The WDGs typically have a 50 percent moisture content and are harder to handle and store.

Questions about the numbers of livestock produced in southwest Missouri that could benefit from the use of DDGs in their ration are still being researched by the Committee.

**7. Where would the ethanol and distillers grains be shipped out? How far?**

GBE stated the majority of the ethanol would be shipped by rail (about 24,000 gallons per railcar) to the East Coast and Atlanta, GA. The plant would have a "load rack" for trucks and the fuel would go by truck to Kansas City and St. Louis, and possibly to the fuel terminal at Brookline, MO. Regarding safety issues, Wilmoth said they will not accept overweight trucks.

GBE is not yet sure about who will get the DDGs to be shipped by rail, but mentioned Arkansas, Mississippi and Alabama, and perhaps the poultry companies of Tyson's and George's in Arkansas and southwest Missouri. Local agricultural producers would also be able to stop at the plant to pick up loads of DDGs or WDGs.

**8. How will the plant be fueled?**

GBE stated the plant will be fueled by natural gas. No coal will be used.

**9. Has the land been purchased yet?**

No. GBE has an option-to-buy based on the results of the test well they are drilling for water availability and a gridwork of soil borings on the property to determine soil suitability for construction and absence of sinkholes, caves, or other geologically-hazardous formations. They are not going to commit to the property unless these tests come back favorably.

**10. Assuming the tests are favorable, when would the company hope the plant is up and operating?**

GBE said they hope to be operating 16-18 months from the time leveling dirt on the site begins.

**11. The company plans have the capability to pump up to 2,000 gallons per minute from wells. What will be the effect on water tables from this amount of water withdrawal?**

GBE's plan is to drill four wells on the premises, capable of extracting 2,000 gallons per minute (GPM) of groundwater. According to GBE, the actual gallons used by the plant would be about 880 GPM or 1.26 million gallons per day. Use of the wells would be rotated, with only three in operation at any given time. The wells would be kept 2,000 feet apart from each other to reduce their influence on each other. Based on the shape of the property, the wells would need to be drilled near the property lines to achieve this separation distance.

According to Jim Vandike, Groundwater Section Chief with the Missouri Department of Natural Resources (or MoDNR for short) at Rolla, MO, a demand of 2,000 GPM will have "some impact" on the water table. The wells will likely have a [2-mile radius of impact](#). To get the required gallonage, the wells would need to be drilled into the [Potosi geologic formation of the Ozark Aquifer](#) some 1,300-1,500 feet deep. An aquifer is a water-bearing rock formation. The wells would likely have 300-400 feet of 10-inch diameter steel casing pressure-grouted into a 14-inch diameter bore hole. A 200-300 foot water level drop is possible in the drawdown cone around each well. These wells could be pumped for several years before the water table re-stabilizes at a lower level.

The Committee cautions these are very general estimations. The actual influence and level of impact could be significantly different. The effect of these wells will depend upon variables such as the amount of groundwater under the site and rate of recharge. Actual rates of recharge are not, and will not be, known until the wells are in operation for an extended period of time and well testing is conducted in the area.

The Northview geologic formation has a restrictive shale layer that is anticipated to be about 100 deep at the site, typically blocking surface water from going to deeper levels. Below the Northview shale, there are no other restrictive layers, so trying to case out shallower wells would not be effective. The drawdown would affect groundwater supplies from below the Northview shale through the 1500-foot level.

Most residential wells in the area are drilled 500-700 feet, so it is possible some wells in the influence area may be lost, and new deeper wells would need to be drilled to replace them. Other wells may need to have their pumps lowered, and possibly changed to larger-horsepower pumps. Deepening existing wells can be risky, due to casing problems or loss of the drilling equipment. If a new well is drilled, the existing well must be [properly plugged](#) if it is no longer going to be used, so it does not cross-contaminate the new well or other groundwater. Plugging an abandoned well is the responsibility of the landowner, following the procedures outlined in the [Missouri Code of State Regulations 10 CSR 23-3.110](#).

The MoDNR has a groundwater observation well near Marshfield, MO which is drilled into the Potosi geologic formation of the Ozark Aquifer, the same formation that the company proposes to use for their wells. The [Marshfield observation well](#) is at 1,485 feet land surface elevation and drilled to a 1,315 foot depth, with a depth to water level that ranges from 210-290 feet below the land surface. The land surface elevation of the proposed plant site is about 1,520 feet, but the geographical distance of Marshfield to Rogersville is great enough that there could be considerable difference in the water table depth at the proposed ethanol plant site.

The MoDNR is currently seeking a location to drill a 6-inch diameter monitoring well near the proposed plant site. They hope to have it in and working before operation of the plant might begin.

Anyone with a water source and equipment capable of producing 100,000 gallons of water per day (or 70 gallons per minute) falls under [Missouri Statute 256.400 Major Water Users Act](#). It requires major water users to register with MoDNR and report their yearly water use.

**12. Is the company willing to financially assist those who must drill new wells or lower pumps due to the plant's water usage?**

Greg Wilmoth stated he does not believe GBE has any responsibility to provide financial assistance.

Committee research shows Missouri follows the riparian water doctrine. This means there are no state laws, regulations or policies that specify the quantity of water

that any diverter may use. All landowners have a right to a “reasonable use” of the water resources. Reasonable use requires that other users and landowners not be overly adversely impacted. Water disputes are typically settled in circuit court by lawsuit.

Any landowner concerned about their well water level dropping due to influences by nearby wells is encouraged to contact their pump installer and have a water depth gauge installed in their well. This is a simple device that uses a pressure gauge and plastic tubing secured to the drop pipe in the well. Cost to do this ranges from \$300-\$400. That way the landowner will have proof of lost capacity on the well.

Should the project go forward, the Committee suggests GBE financially assist landowners with restoring their well water supplies, if the landowners can document their well water levels were affected. This would potentially be less expensive than court litigation.

**13. Considering the area’s dependence upon the finite resource of groundwater and the proposed plant use of over 440 million gallons of water per year that would supply the needs of 21,000+ people, is this the best allocation or utilization of groundwater?**

The Committee advises that this is a question that goes beyond the construction of an ethanol plant or any other type of high-water-use facility. All the groundwater in the Ozarks comes from rainfall and takes several years to percolate to the deeper rock formations, unless the water finds a fault line, [sinkhole](#) or [solution channel](#) to move rapidly down without filtering. The Ozarks with its [karst \(soluble limestone\) topography](#) is geologically among the most fragile and susceptible to pollution in the U.S.

Due to the county’s high elevation, it has the headwaters of seven major streams with no streams entering the area. Therefore, the county will likely be dependent upon groundwater for growth due to the absence of any substantial streams. This question of water utilization is a general planning issue. Does the county want to start a trend of high-water-demand industrial growth or maintain a primarily residential population and light manufacturing businesses? Industrial use of groundwater is unlikely to inhibit growth any time in the near future, but will have some impact on the degree of accessibility of that water. This is evident by the lowering of water tables being experienced now from the extraction of water for current demands.

**14. What is the expected population growth in Webster County, and how will the lack of a comprehensive sewage ordinance affect water availability and ability to retain quality drinking water?**

Webster County is rapidly growing in population ([see graph](#)), according to data provided by the [Office of Social and Economic Data Analysis](#). The county currently has no organized method in place to manage this growth. Properties are routinely being subdivided into 3-acre and larger building sites to avoid sewage ordinances that regulate proper management of rural residential waste. Each of these properties typically is served by its own private water well. As this pattern of growth continues, there will be greater demand on groundwater supplies and an

expected higher percentage of contaminated drinking water wells. Evidence of this pattern is documented in the [1999 Water Testing Survey](#) done by the Webster County Health Unit, which showed 44 percent of randomly-sampled private water wells testing positive for coliform bacteria, and 28 percent of sewage systems with open discharge and surfacing effluent.

**15. Would the cooling water and the wastewater be mixed together or kept separate? Would the cooling water be recycled? Are there algaecides or other chemicals added to the water before it is released?**

GBE states the cooling water would be kept separate from the wastewater. The cooling water would be recycled back through the plant until the mineral content becomes high enough that it needs to be discharged to avoid fouling the plumbing lines of the plant.

GBE has not provided the Committee with the exact amount of discharge water to make an accurate determination about how much would be recycled, how much would be evaporated to the atmosphere, and how much would go to retention pond(s) dug into the soils at the site.

It is unclear at this time whether GBE will use [ICM technology](#), or something similar, in their plant design. Such technology could significantly reduce the amount of discharge water.

GBE stated that they are not aware of any plans for the use of algaecides in the water, and they would provide the Committee with a list of the chemicals coming out of the plant when the engineering firm completes its design of the plant. The company doing the engineering on this is [C. J. Schneider in Omaha, Nebraska](#).

**16. What is the nature of the wastewater and how will it be treated?**

GBE provided the Committee the following information: The discarded "non-contact" cooling water would be separated from the wastewater. The water would have an abnormally high concentration of minerals due to the plant's cooling process. They are not aware of any algaecides or other chemicals in the cooling water. All of the "mash water" from the process of producing ethanol will be recycled. The effluent of the wastewater plant will be "as good or better than the Rogersville Waste Treatment Plant." Discarded water will either be evaporated from evaporation retention ponds or irrigated onto their land or other property. There will be no open discharge water into waterways or streams. There will be domestic sewage from the fifty employees.

The Committee is also aware there will be laboratory chemical waste, and there may be other plant wastewater due to cleaning practices. The domestic sewage will be permitted by the local Department of Health since the design flow would be less than 3,000 gallons per day (50 employees x 25 GPD/person = 1,250 GPD). Under MoDNR's wastewater permitting process, domestic sewage would not be allowed to be combined with the industrial waste. Consequently, there will be at least three categories of discarded water: coolant water, domestic wastewater, and laboratory/cleaning wastewater. For reasons given below under the retention pond

section, it is likely that open discharge into the waterways and stream channels will be needed for the coolant water.

**17. What is the potential impact of the plant's cooling water and wastewater on surface and groundwater resources?**

Based upon the information provided by GBE to date, wastewater does not appear to present a serious problem at this time. This conclusion hinges on the following data:

- a. The only discharge water will be from the "non-contact" coolant water, containing no added chemicals and MoDNR will have oversight on the mineral content and any discharge of the cooling water.
- b. The domestic wastewater and the industrial wastewater systems' output will not be high enough to necessitate open discharge.
- c. The quantity of industrial waste (coolant water excluded) is relatively small, and MoDNR will require that proper precautions are taken in the construction of any proposed wastewater lagoons to guard against leakage or collapse.

The Committee needs to emphasize that this assessment is only as good as our data from GBE, and we are waiting for confirmation of this data from the firm doing the engineering for this project, which is [C. J. Schneider in Omaha, Nebraska](#).

The discharge of any "treated" wastewater is a significant concern because of soil and geological characteristics of this part of the Ozarks which, as stated above, is among the most fragile and susceptible land to pollution in the U.S. The drainage channels and streams they flow into are considered "[losing streams](#)," and the lower soil residuum and bedrock is permeable. Due to the restrictive shale layer of the Northview geologic formation, present below the more permeable formations above it, there is some protection for the aquifers. However, due to improperly-cased wells, abandoned wells, and bedrock fractures and faults, groundwater contamination is always a significant concern with "treated" wastewater.

Any discharged water will either end up in the groundwater or resurface in a stream, most likely James River, without any further treatment. Therefore the quality of discharge water is a significant concern, even if it meets MoDNR's discharge limits for the contaminants still present within the water, and even if it is comparable to other wastewater plants discharging partially-treated water.

**18. Are the soils suited to building a retention pond for the cooling water or for a wastewater lagoon? How big will the retention pond be and how will it be built to keep it from leaking or collapsing?**

Committee research shows the [soils on the site](#) are [09B Captina-Needleye Silt Loams](#) and [10 Bado Silt Loams](#), and have a moderate limitation for pond construction due to seepage below the fragipan (hardpan). Below the restrictive fragipan at approximately 24 inches deep, the soils will be red and yellow clays that, in their natural state have areas of moderate to high permeability. The soil would need to be worked while moist, compacted in several 6-inch thick lifts, and kept moist to keep the pond from leaking.

MoDNR would decide if the site requires an artificial liner to prevent leakage. This would especially be a critical decision for any proposed wastewater lagoon. Risk of collapse is unknown until results of soil test borings at the site are completed. If sinkholes are identified in the area, this could preclude the use of lagoons or retention ponds altogether. The size of the coolant water retention pond(s) is unclear at this time because design of the plant has not been finalized.

**19. How will the water from the retention pond(s) be disposed? Are the soils on the site suited for irrigation?**

GBE indicated they plan to irrigate the water to fields on the 252-acre site, and perhaps to fields of consenting neighboring landowners. They are also counting on evaporation from the retention pond(s).

Committee research shows the predominant [09B Captina-Needleye](#) soils have limitations for irrigation due to wetness, slow percolation and a finite water holding capacity due to a restrictive layer approximately two feet below the surface. The [10 Bado](#) soil has greater limitations for irrigation due to the greater significance of the same features listed above for the [09B Captina-Needleye](#) soils. The area soils have a moderate limitation for harvest equipment operability due to seasonal wetness and low soil strength.

[Climatological data for Missouri](#) show historical rainfall at 40 inches per year near at that site, and evaporation rates on an annual basis are similar, so minimal evaporation annually would occur from the pond if it is properly sealed.

Based on the 880 GPM water use rate of the plant, the Committee estimates a worst-case scenario of about 47 acre-inches of water would be produced per day. It is estimated the soils present over 200 acres could receive 20 days of water at this rate under ideal circumstances before becoming saturated. Therefore, the data indicate the site would not be able to handle this volume of water due to soil characteristics and the limited area. As a result, unless there is a major network set up for dispersing this large volume of water to other properties, the cooling water from the retention pond(s) would need to be surface-discharged to waterways and streams. Therefore, it is imperative the cooling water not be contaminated with any other wastewater or chemicals.

**20. How would the roads be built to minimize “haul road” emissions?**

GBE stated the roads would be paved to minimize [fugitive dust](#).

Committee research indicates they must meet MoDNR air quality standards for PM10 particulate standards. The same rules would apply for the dust produced from unloading the rail cars of grain.

**21. What about noise and light pollution?**

GBE officials state the facility would be fenced, and noise would be contained inside the buildings. The site would have lighting equivalent to a well-lit shopping mall parking lot.

Site visits by Committee members to existing ethanol plants at Malta Bend and Laddonia, MO suggest the noise level will be a low roar, easily detectible at a distance of one-half mile. The noise would mostly come from the hammer mills and distillers-grain dryers inside the buildings.

## **22. How would odors be managed?**

The ethanol manufacturing plant will be in enclosed buildings, and according to GBE Vice-President Jeff Negre, people would not be able to smell odors more than 200 yards away. The plant would have an exhaust stack 75 feet in height and the dried distillers grains (DDGs) would be stored under roof.

Site visits by Committee members to existing ethanol plants at Malta Bend and Laddonia, MO suggest the odor level is like a yeast smell of a bread factory, detectible at the main gate of the plants.

[Wind rose data](#) recorded at the Springfield, MO, Regional Airport was obtained by the Committee and indicates the predominant wind direction for the warmer months of April through September will be from the south-southeast toward the north-northwest. This data collection site is the nearest location to the proposed ethanol plant site.

## **23. How many tons per year of particulate matter, volatile organic compounds (VOCs), carbon dioxide (CO<sub>2</sub>), nitrogen oxides, and Hazardous Air Pollutants (specifically acetaldehyde) do you expect the plant to emit? Will you install scrubbers to minimize these emissions?**

Greg Wilmoth dismissed the question of particulate matter, VOCs, nitrogen oxides, and HAPs, but stated GBE plans to recover all the CO<sub>2</sub> and sell it.

According to Kendall Hale, New Source Review Unit Chief of MoDNR's Air Pollution Control Program, in Jefferson City, MO, air quality permits would need to be obtained from them. Ethanol plants that produce less than 100 million gallons per year (MGY) can apply for a "minor permit" rather than a "major permit." With a minor permit, no formal public notice period is required. A company also has the option to request a [pre-construction waiver](#), which allows them to be building the plant before a MoDNR construction permit is issued. In other words, they can clear the ground, but cannot do other construction until the pre-construction waiver is approved by MoDNR.

Since all plants are different in their emissions, air quality data prior to construction must be determined. This "ambient air quality analysis" is typically done by the engineering firm designing the plant, using computer modeling software.

Once the waiver is approved, a company can be building the plant and simultaneously be completing an application for a "construction permit." [\(Supplemental information to assist a company in preparation of a construction permit application is available in a 51-page MoDNR document.\)](#) They cannot start up the plant until they have submitted the construction permit application and received approval of it from MoDNR, which takes a maximum of 90 days from when a complete application is received. Once the plant is operational, the company

would then submit an application for an “operating permit.” The permit would state what level of emissions the plant has, and is a matter of public record.

State standards for air emissions are currently not allowed to be more strict than federal standards. An example of an approved air quality construction permit is the [Missouri Ethanol, LLC ethanol plant, at Laddonia, MO](#).

Issues about air emission quantities and quality for ethanol plants are still being researched by the Committee.

**24. Will the site have any storage tanks with hazardous materials or fuels? If so, what kind of containment structures will they have in case of failure?**

GBE stated there would be fuel stored on-site away from the plant. This would include an E95 (95% ethanol/5% gasoline) blend to mix with the ethanol made by the plant before the ethanol is shipped out. Company officials downplay safety issues from explosion, citing the [U.S. Energy Partners, LLC](#) ethanol plant within the town of Russell, KS, but acknowledge that pressure release is the only risk. The Committee has learned that the Russell, KS ethanol plant is currently seeking to double its production capacity from its current 48 million gallons per year, but is having difficulty locating enough water to do it.

Spill containment of fuel storage structures are required to meet MoDNR standards.

**25. What will be the electrical demand on created when the plant is running?**

GBE stated the plant will have a 10,000 Kilowatt-Hour demand. They are looking at the possibility of using natural gas turbines to supply some of the power.

**26. The railroad crossing at Porter Crossing Road is a concern for school bus safety. How will the company maintain safety at that intersection?**

Greg Wilmoth stated that is a responsibility of the Burlington Northern Railroad, which intends to increase their rail traffic from 48 trains per day to 70 trains per day. The Gulfstream Bioflex Energy (GBE) plant would be two trains per week of that total.

Committee conversations with Webster County Presiding Commissioner Paul Ipock indicate Burlington Northern Railroad may require GBE to pay for rail crossing lights and crossing arms.

Similarly, to alleviate congestion at the U.S. Highway 60 and Porter Crossing Road junction, the Missouri Department of Transportation may require GBE to help pay for turn lane improvements.

**27. What kinds of jobs would the ethanol plant create?**

Greg Wilmoth stated GBE would employ 35-45 people with a \$2.1 million per year payroll. Salaries would be \$35,000 or more per person per year in jobs like rail car loading/unloading, scale operators for weighing trucks, laboratory personnel and clerical workers. They would be willing to hire from within Webster County if people

have the skills. An additional 200-300 outside workers would be coming in during the construction phase of the ethanol plant.

The Committee advises that for permanent plant employees to benefit the county the most, the employees would need to own homes in the county and spend their take-home salaries on products provided by Webster County businesses. Economic benefit to the county from the construction workers would mostly be to eating places.

**28. What economic benefit will the county receive in general revenue funds?**

Committee research shows that due to the roll-back of the county portion of the general revenue property tax when the county sales tax was passed in November 2005, the county would receive no general revenue from this plant. Property taxes associated with the road and bridge department, schools, libraries, health department, etc. would still apply.

**29. Would the environmental impact concerns be the same for other locations, thereby making concerns about the ethanol plant just a matter of 'not in my backyard' mentality?**

The Committee advises that the environmental concerns definitely are not the same in all other areas.

Missouri is one of the most diverse states in terms of soils and geology. Other ethanol plants in Missouri are in areas that do not have a significant groundwater threat and are not in residential areas competing for groundwater. Another contrasting area would be the southeast Missouri Bootheel, where there is virtually unlimited supply of water from a different type of groundwater source and minimal wastewater impact from an ethanol plant.

This proposed location of this plant is unique not just because of distance from corn, but because it is the first one proposed in the part of the state that is most susceptible to groundwater contamination and in an area with a high demand for residential water from individual wells.

Created: 2006-09-07 Last revised: 2006-11-13