OIL & GAS DOCKET NO. 09-0238914

THE APPLICATION OF GERALD'S WATER SERVICE TO CONSIDER A COMMERCIAL LANDFARM, WISE COUNTY FACILITY, WISE COUNTY, TEXAS

HEARD BY: Donna K. Chandler, Technical Examiner
Mark J. Helmueller, Hearings Examiner

PROCEDURAL HISTORY OF CASE:

Application filed:	February 4, 2004
Protest received:	January 23, 2004
Request for hearing:	February 9, 2004
Notice of Hearing:	June 9, 2004
Hearing Held:	July 6 &15, 2004
Transcript received:	August 4, 2004
PFD Issued:	August 30, 2004

APPEARANCES:	**REPRESENTING:**
APPLICANT:	
Jack Wilhelm	Gerald's Water Service
Robin Cosgrove	
Phil Bullock	
PROTESTANT:	
Joseph Hoover	Himself
Gary Schmalian	Himself
Astrid St. John	Herself
Joseph St. John	Himself
David Cooney	RRC, Environmental Services
Steve Seni	

EXAMINERS' REPORT AND PROPOSAL FOR DECISION

STATEMENT OF THE CASE

Gerald's Water Service requests authority to operate a commercial landfarm facility for disposal of water-based drilling fluid in Wise County. The proposed landfarm site consists of 40 acres owned by Gerald and Mary Stephens near the community of Greenwood, Texas.

Numerous written protests were filed to the application. Four protestants who own or live on property adjacent to the proposed facility appeared at the hearing and presented evidence.

Additionally, the application was administratively denied by Environmental Services. The transmittal memo from Environmental Services dated May 20, 2004 indicates that the application was administratively denied "..because landfarming at the site offers potential for pollution. The Antlers Sand, which comprises part of the Trinity Aquifer, outcrops at the referenced location. The Antlers Sand is also a recharge zone of the aquifer. The Trinity Aquifer yields fresh water at depths as shallow as 30 feet below the land surface in this area." Environmental Services appeared at the hearing and submitted evidence to support its position that applicant did not present sufficient quantitative evidence that the proposed facility would not pose a threat to useable quality water.

DISCUSSION OF THE EVIDENCE

Applicant's Evidence

The proposed commercial landfarm is situated on 40 acres out of a 187 acre tract owned by Gerald and Mary Stephens. The proposed facility would consist of three treatment cells, covering 11, 12 and 13 acres, each of which would be completely enclosed by earthen berms. Each cell would have a 100' X 50' catchment basin for collection of run-off liquids. A plat of the proposed facility layout is found in Applicant's Exhibit No. 3 and is included as Attachment 1 to this Proposal for Decision.

Applicant estimates that an average of 1,500 barrels of water-based drilling fluids would be accepted for disposal each month. No oil-based drilling fluids would be accepted and no water-based drilling fluids with a chloride concentration greater than 3,000 mg/l would be accepted. The drilling fluids would come primarily from new wells drilled to the Barnett Shale.

The maximum proposed application rate of drilling fluid is 2,000 barrels per acre of land over the life of the facility. Drilling fluid would be applied after tilling to a depth of 8-12 inches. After application of the fluid using a vacuum truck, the area would be re-tilled to a depth of 6-12 inches to mix the waste into the soil. The proposed maximum thickness of waste to be applied in a single application is 3.1 inches. The estimated life of the landfarm

is five years, at which time the closure plan would be implemented. The estimated closure cost is $34,028. Stephens already has $25,000 in financial security with the Commission and would be required to post additional financial security of $9,028.

The direction of groundwater flow in this area is northwest to southeast. Applicant would install three groundwater monitoring wells, one on the northwest boundary and two on the southeast boundary of the site. Water samples from these wells would be analyzed on a scheduled basis to demonstrate that landfarming is not adversely affecting the groundwater.

Applicant submitted a map as Exhibit 4 which depicts the various lithologic units in the area of the landfarm. This map indicates that the Antlers Sand outcrops at, or very near, the location of the landfarm area. Applicant believes that the landfarm site is actually covered by the Walnut Clay, which overlies the Antlers Sand. Applicant contends that the presence of this clay makes the site suitable for landfarming. In support of this position, Applicant submitted a soil survey of Wise County prepared by the US Department of Agriculture. The map associated with the soil survey indicates that the soil in the area of the landfarm site is largely Ponder Clay loam, with some Venus loam. The Ponder Clay loam is described in the literature as having low permeability and the Venus loam is described as having moderate permeability.

After discussions with Environmental Services about possible aquifer contamination, applicant took soil samples from four excavation sites within the confines of the landfarm. The excavations were made with a backhoe to a depth of 8-9 feet. Two samples were taken from three of the excavation areas from the bulk excavation materials, one sample attributed to be from the upper 2-3 feet and one sample from a deeper interval. For pit #1 only one sample was taken, and that sample reportedly came from the top ten inches of the excavation. The field descriptions made by Applicant's geologist are similar for each sample, with notes that the excavated soils are clays, or silty clays, which contain some chalky limestone clasts. The descriptions of the excavated soils are consistent with the Walnut Clay.

Samples from the excavations were also sent to Fugro Consultants for laboratory testing of the soils. This laboratory analyzed the samples to determine moisture content, liquid limit, plastic limit and plasticity index of each sample, as well as a sieve analysis. Based on these various properties, each sample was given an ASTM classification “clay”.

Applicant also relied on drilling records for 14 water wells within two miles of the landfarm. The oldest of the wells was drilled in 1959. Five of these water wells are less than 2,000 feet from the landfarm site. From the records of the 14 water wells, Applicant found the shallowest water level to be 30 feet in a well about 1,000 feet from the landfarm site. Additionally, Applicant interpreted the drilling records of the wells and determined that Walnut Clay was drilled through in each well, to a minimum depth of five feet below the surface, with indications in some wells that the thickness of the Walnut Clay was 90 feet.

The site of the landfarm slopes from an elevation of about 950 feet in the north to about 890 feet in the south. With this much relief in topography, it is expected that thickness of surface soil units could vary substantially. However, applicant contended that the excavations

demonstrate at least 8½ feet of clay across the entire landfarm site.

The material to be landfarmed is water-based drilling mud, which is composed largely of bentonite clay. Applicant submits that application of this drilling fluid at the landfarm will serve to reduce the already low natural permeability of the soil.

Gerald's Water Service believes there is a need for the landfarm facility due to the ongoing drilling in the Barnett Shale in the area. Gerald's Water Service submitted a letter from the **Texas Alliance of Energy Producers** which supports that position that there is a need for waste disposal facilities in the area of the proposed landfarm.

Protestants' Position

Environmental Services

The subject application was administratively denied by Environmental Services for two reasons: 1) protests to the application were received and 2) the site for the landfarm appeared to be on the outcrop belt of the Trinity Aquifer. Environmental Services contended that applicant failed to demonstrate that landfarming operations at the site would pose no threat of pollution to the Trinity Aquifer, which has very low chlorides of about 30 parts per million.

Environmental Services noted that the proposed facility is located in an area identified in the Geologic Atlas of Texas, Sherman Sheet as directly atop an outcrop of the Antler Sands. Environmental Services contended that applicant failed to provide sufficient quantitative data to establish that the surface soils over the entire site are actually impervious clays. Environmental Services was critical of the data submitted by applicant in several respects: 1) applicant did not provide any measured permeability data for the surface soils at the site; 2) the characterizations of the soils by the geologist in the field and in the lab were inconsistent with USDA Soil Service literature; 3) the analysis of the soils samples from the southernmost excavation showed a significant amount of coarser material even though it was identified as a clay; 4) the test pits were not deep enough, having only excavated to the depth of 8-9 feet; and 5) the water well data did not conclusively support applicant's contention that the impervious Walnut Clay was present over the entire site to a depth of at least 8½ feet

Environmental Services contended that the application should not be approved unless applicant provides measured permeability data of the soils present at the landfarm site. Environmental Services asserted that additional permeability data is necessary to determine that the landfarming operations will not pollute the aquifer. This permeability data could be obtained using a falling head permeameter in several boreholes drilled to a depth of 40 feet on the site. Such tests would confirm that the soils are sufficiently impermeable to prevent drilling fluids from seeping into the aquifer.

Environmental Services also disagreed with the geologist's characterization of the soils observed at the site and the lab report. Both the field notes and the lab analyses of the soil samples identified the soils as "clay", but USDA Soil Service literature classifies the soils in this area as "loams", which are mixtures of sand, silt and clay. Further, though the lab analyses of the soils from the excavations indicated all samples to be "clay", the physical

descriptions made by the lab for all samples contain the word “sandy” or “sand”.

Environmental Services also specifically questioned the lab analyses of the soil samples from excavation pit No. 3, the southernmost pit on the site. The sieve testing in the lab analysis showed the soil sample taken between 3 and 8 feet from the No. 3 pit to be much coarser material than in the other three excavations. For this sample, 53% of the material did not pass through the No. 200 sieve. Based on the reported sieve test results, Environmental Services asserted that the southern portion of the landfarm site may have higher permeability soil than the other areas of the site and that the surface soils are a combination of Walnut Clay and Antlers Sand.

Environmental Services also contended that the depth of the test pits was not sufficient. The same 40' boreholes which would be used to conduct falling head permeameter tests would allow for a more representative sampling of the soils.

Finally, Environmental Services disagreed with the conclusions applicant drew from the water well drilling reports. Environmental Services prepared its own schematic which suggests that the Walnut Clay may not be consistently present in the southernmost portion of the landfarm site based on the same water well drilling reports.

Joseph and Astrid St. John

Joseph and Astrid St. John own property directly offsetting the proposed landfarm to the north, as well as property in the immediate vicinity to the northeast and southeast of the landfarm. When the St. John's bought the property to the north, it had been a gravel pit. The St. John's intended to have two stock tanks on this property, but neither would hold water. The soils on Mr. St. John's property to the northeast, which does not directly adjoin the proposed landfarm, are very sandy, and a water well on that property produces drinking water from 35 feet. The St. John's property to the southeast has a variety of soils, at the surface including sandy loam and a red sandy clay.

Joseph Hoover

Mr. Hoover lives on property he rents from Mr. St. John adjacent to the proposed landfarm. Mr. Hoover submitted information from the Soil Survey indicating that the Ponder Clay Loam has slight limitations for ponds, with slight seepage, but has severe limitations for dikes and levees, being hard to pack. Mr. Hoover therefore suggests that the soil on the proposed landfarm is not suitable for constructing the dikes for the facility as proposed by applicant.

About two years ago, Mr. Hoover tested water samples from eight water wells surrounding the proposed landfarm site, many of which were not included in the survey of water well drilling reports submitted by applicant. The water wells range in depth from 35 feet to 185 feet. The water samples tested negative for lead, nitrates and nitrites, and had an average pH of 8.25.

Mr. Hoover also testified about his observations at the landfarm site over the past 1-2 years. He observed bulldozing operations about 1 ½ years ago, in which some areas of the

landfarm site were flattened. Soils were hauled in and tilled into the flattened areas, but Mr. Hoover believes the grasses planted on the flattened areas did not grow, because the native soils were too sandy. Mr. Hoover also recently observed water trucks entering the property and dumping liquids on the flattened areas.

EXAMINERS' OPINION AND DISCUSSION

The examiners recommend that the application be denied because Gerald's Water Service failed to submit sufficient evidence to show that operation of the proposed landfarm would not harm groundwater resources, as required by Statewide Rule 8. Rule 8 (d) (6) states as follows:

> "A permit to dispose of oil and gas wastes by any method, including disposal into a pit, may only be issued if the Commission determines that the disposal will not result in the waste of oil, gas, or geothermal resources or the pollution of surface or subsurface water."

It is undisputed that the Geologic Atlas of Texas Sherman Sheet places the location of the proposed landfarm very near, if not directly atop an outcrop of the Antlers Sand, as shown on Applicant's Exhibit No. 4. It is also undisputed that soils directly adjacent to the landfarm site vary significantly. Even the photos of the excavated soils on the landfarm site indicate different soil types within the boundary of the proposed facility. Accordingly, the concerns expressed by Environmental Services requiring applicant to conclusively establish that the soils for the proposed site are impervious clays are entirely appropriate.

The examiners do not believe that the evidence submitted by applicant adequately addresses these concerns. Applicant's evidence indicates two samples were taken from each of the four excavation areas from the bulk excavation materials, one sample attributed to the upper 3 feet and one sample from a deeper interval between 3 and 8 feet. For pit #1, the first sample reportedly came from the top ten inches of the excavation. The examiners do not believe that the sampling was reliable for determination of soil type at the site, because only small samples were taken from the bulk excavation material, with no specific depth information. Both the manner in which the samples were obtained and the incomplete depth information call into question the validity of the conclusions drawn from the excavation pits and the soil samples attributed to those pits.

The examiners also do not believe that the lab analysis of the samples conclusively establishes the presence of an impermeable clay to the depth of at least 8½ feet over the entire proposed site. While the lab analyses of the samples of the excavated soil result in a determination that all samples are "clay", the sieve test on the sample from the southernmost excavation (No. 3) between 3 and 8 feet indicated a much coarser material than samples from the other excavations. For this sample, 53% of the material did not pass through the No. 200 sieve. For the No. 2 excavation from 3-8 feet, only 15% did not pass through the No. 200 sieve. Further, the laboratory physical descriptions of all of the samples contain the word "sand" or "sandy". This evidence contradicts applicant's assertion that the entire site is covered by at least 8½ feet of clay.

In addition to questioning the soil study provided by applicant, the testimony in the

record from persons who live adjacent to the landfarm reflects that soils in the area vary substantially, from very sandy to clay. Testimony also reflects that stock ponds on properties adjacent to the facility will not hold water. Applicant did not conduct a field survey of the surrounding area or even a field survey of the entire proposed site. Accordingly, there is no direct evidence to dispute the protestants' testimony

Finally, the examiners believe that the water well reports do not support applicant's position regarding the soils on the proposed site. The water well reports indicate that water was encountered as shallow as 30 feet in the area. The examiners recognize that these water well reports are likely not precise as to the type of soil encountered during drilling of the wells up to 40 years ago. However, it was the only evidence submitted. Additionally, the water well report for the well closest to the facility was drilled in 1975 and notes that the driller found "brown sand" from surface to a depth of 10 feet.

Based on the foregoing, the examiners believe that applicant failed to submit sufficient evidence to show that operation of the proposed landfarm would not harm groundwater resources, as required by Statewide Rule 8. Accordingly, the examiners recommend that the application be denied.

FINDINGS OF FACT

1. Notice of this hearing was given to all affected persons at least ten days prior to the date of hearing.

2. Gerald's Water Service has applied for a permit to operate a commercial landfarm to dispose of water-based drilling mud in Wise County, pursuant to Statewide Rule 8.

3. The application was administratively denied by Environmental Services "..because landfarming at the site offers potential for pollution. The Antlers Sand, which comprises part of the Trinity Aquifer, outcrops at the referenced location. The Antlers Sand is also a recharge zone of the aquifer. The Trinity Aquifer yields fresh water at depths as shallow as 30 feet below the land surface in this area." The application was also protested by persons who live adjacent to the landfarm site.

4. The proposed commercial landfarm is situated on 40 acres out of a 187 acre tract owned by Gerald and Mary Stephens.

5. The Antlers Sand outcrops at, or very near, the location of the landfarm area.

6. Applicant did not prove that soils at the proposed landfarm site are suitable to prevent migration of fluids into the underlying aquifer.

    a. Ground water is found as shallow as 30 feet in the vicinity of the landfarm site.

    b. The drilling report from the nearest water well to the site indicates the

presence of “brown sand” from surface to 10 feet.

c. Though soil samples from excavations on the landfarm site are classified as “clay” based on lab analyses, the descriptions of the samples indicate the presence of sand in the samples.

d. The soil sample from the southernmost excavation contains courser material than other samples, indicating less shale/clay.

e. The USDA Soil Service literature classifies the soils in this area as “loams”, which are mixtures of sand, silt and clay.

f. Stock ponds on adjacent properties do not hold water, indicating the absence of clay.

CONCLUSIONS OF LAW

1. Proper notice was issued as required by all applicable codes and regulatory statutes.

2. All things have occurred and been accomplished to give the Commission jurisdiction to decide this matter.

3. Gerald's Water Service failed to submit sufficient evidence to show that operation of the proposed landfarm would not harm groundwater resources, and therefore failed to meet the requirements of Statewide Rule 8.

EXAMINERS' RECOMMENDATION

The examiners recommend that the application of Gerald's Water Service to operate a commercial landfarm in Wise County at the proposed location be denied.

Respectfully submitted,

Donna K. Chandler
Technical Examiner

Mark J. Helmueller
Hearings Examiner