State Office of Administrative Hearings

Cathleen Parsley
Chief Administrative Law Judge

May 5, 2009

Les Trobman, General Counsel
Texas Commission on Environmental Quality
PO Box 13087
Austin Texas 78711-3087

Re: SOAH Docket No. 582-08-1804; TCEQ Docket No. 2007-1302-MSW; In Re: Application of IESI TX Landfill, L.P. For A New Type I MSW Permit; Proposed Permit NO. 2332

Dear Mr. Trobman:

The above-referenced matter will be considered by the Texas Commission on Environmental Quality on a date and time to be determined by the Chief Clerk's Office in Room 201S of Building E, 12118 N. Interstate 35, Austin, Texas.

Enclosed are copies of the Proposal for Decision and Order that have been recommended to the Commission for approval. Any party may file exceptions or briefs by filing the original documents with the Chief Clerk of the Texas Commission on Environmental Quality no later than **May 25, 2009**. Any replies to exceptions or briefs must be filed in the same manner no later than **June 4, 2009.**

This matter has been designated **TCEQ Docket No. 2007-1302-MSW; SOAH Docket No. 582 08-1804**. All documents to be filed must clearly reference these assigned docket numbers. Copies of all exceptions, briefs and replies must be served promptly on the State Office of Administrative Hearings and all parties. Certification of service to the above parties and an **original and seven copies** shall be furnished to the Chief Clerk of the Commission. Failure to provide copies may be grounds for withholding consideration of the pleadings.

Sincerely,

Thomas H Walston

for Sarah Ramos
Administrative Law Judge

SGR/cm
Enclosures
cc: Mailing List

SOAH DOCKET NO. 582-08-1804
TCEQ DOCKET NO. 2007-1302-MSW

APPLICATION OF IESI TX LANDFILL, L.P. FOR A NEW TYPE I MSW PERMIT; PROPOSED PERMIT NO. 2332	§ § § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

TABLE OF CONTENTS

SOAH DOCKET NO. 582-08-1804
TCEQ DOCKET NO. 2007-1302-MSW

APPLICATION OF IESI TX LANDFILL, L.P.	§	**BEFORE THE STATE OFFICE**
	§	
	§	**OF**
FOR A NEW TYPE I MSW PERMIT; PROPOSED PERMIT NO. 2332	§	
	§	**ADMINISTRATIVE HEARINGS**
	§	
	§	

PROPOSAL FOR DECISION

I. INTRODUCTION

IESI TX Landfill L.P. (IESI or Applicant) seeks a permit to develop a Type I municipal solid waste (MSW) landfill in Jack County, Texas. Based on three reasons, this Proposal for Decision recommends denial of the permit. First, Applicant did not adequately identify and evaluate all springs and water wells within one mile of the proposed facility's boundaries. In addition, Applicant did not identify an important regional aquifer, and finally, Applicant did not properly identify the impact of the landfill on recharge areas within five miles of the site. With these omissions in the Application, the Applicant did not properly characterize the landfill's potential impact to groundwater resources in the area, and the Application should be denied.

II. PROCEDURAL HISTORY

The City of Jacksboro (the City) and IESI entered into a contract to develop the landfill. The City filed the Application with Texas Commission on Environmental Quality (TCEQ) in April 2005. In July of 2005, IESI and the City amended their contract, and based on the contract changes, IESI became responsible for the landfill's operation. The parties then amended the pending Application to reflect this change.

The Application was declared technically complete on October 25, 2006. On January 31, 2008, the Commission referred specific issues to the State Office of Administrative

Hearing (SOAH) for hearing.[1] Throughout the Application and hearing process, IESI and TCEQ's Chief Clerk published the required notices. Notice and jurisdiction were not contested and are discussed primarily in the Findings of Fact and Conclusions of Law.

At the preliminary hearing on April 3, 2007, in Jacksboro, Texas. Administrative Law Judge (ALJ) Kerry Sullivan designated as parties the Applicant, the City, the Executive Director of the TCEQ, TCEQ's Office of Public Interest Counsel (OPIC), and Two Bush Community Action Group (Protestant).

---

1 The referred issues are whether:

- there was proper notice of the landfill application;
- the site operation plan provides adequate controls for fire protection, odors, dust and air criteria, landfill gas, vectors, scavenging, windblown waste, screening of prohibited waste, ponded water, and site access, and is adequate to train employees and guide day-to-day operations of the facility;
- operation of the landfill will adversely affect the health of the requestors and the requestors' families;
- the proposed landfill is compatible with surrounding land uses and residential growth trends;
- the proposed buffer zones and screening are adequate;
- the application includes adequate transportation information;
- Applicant properly evaluated and presented information on the vertical and horizontal flow characteristics of groundwater;
- the proposed groundwater monitoring system includes the proper number and location of wells, screened at the proper depths, for adequate monitoring;
- the liner and leachate system are adequate to protect against groundwater contamination;
- the geotechnical evaluation is adequate to ensure the stability of slopes and materials used for sidewalls;
- the proposed landfill is compatible with the Regional Solid Waste Management Plan;
- the landfill application provides adequate geologic and hydrologic information;
- the Application includes the required information on soils;
- Applicant provided adequate information regarding proposed surface water controls, floodplains, drainage route runoff from the facility, and off-site storm water contamination, including Jasper Creek; the appropriate rainfall data was used in the calculation of surface drainage;
- the proposed landfill is located in a wetland or an area with faults and fractures;
- Applicant adequately provides for closure and post closure plans and proposes adequate financial assurance;
- Applicant adequately evaluated the presence of and potential adverse effects of the landfill on endangered and threatened species;
- the proposed permit is adequately protective to prevent nuisance conditions;
- Applicant's compliance history warrants the granting of the permit;
- the Application includes adequate proof of property interests;
- the Application adequately identifies and evaluates all springs, water wells, oil and gas wells, homes, churches, and other site specific issues requiring special consideration under Commission rules; and
- the permit term should be for life of the facility.

ALJ Sarah G. Ramos convened the hearing on the merits on October 13, 2008, at SOAH, 300 W. 15th Street, Austin Texas. The hearing continued from day to day at SOAH, and one day of the hearing was conducted at the Jack County Courthouse, 100 Main Street, Jacksboro, Texas. William J. Moltz, R. Steven Morton, Brian J. O'Toole, and Janessa C. Glenn represented Applicant; Arturo D. Rodriguez, Jr., Kerry E. Russell and David L. Spiller represented the City; Marisa Perales and Eric M. Allmon represented Protestant; Anthony C. Tatu represented the Executive Director; and Scott A. Humphrey represented OPIC.

The hearing concluded on October 23, 2008. Upon the parties' requests, the ALJ postponed the briefing deadlines because of a delay in the preparation and filing of the transcript. The record finally closed on March 6, 2009.

Only the Applicant, Protestant, and Executive Director presented witnesses. The Executive Director and the City support the Application on all points. Protestant presented testimony and exhibits to support its position that the Application should be denied. Particularly with regard to groundwater issues, including identification of wells and springs, OPIC agreed with Protestant that the Applicant has not sustained its burden of proof. The primary issues in contention are whether:

- Applicant adequately identified wells and springs within one mile of the site;
- the Application adequately reflects the nature of the underlying geology and hydrology at the site;
- the aquiclude that underlies the site is in the Trinity or Pennsylvanian Canyon Group (PACG) formation;
- the proposed monitoring well system is adequate;
- the surface drainage analysis was adequate; and
- the permit would adequately protect against nuisance conditions.

Protestant did not specifically contest other issues referred by the Commission for consideration, and those issues are discussed only in the Findings of Fact and Conclusions of Law.

III. BACKGROUND

Out of a 652-acre tract that IESI owns, the landfill would be on 274.64 acres with about 202 acres used for actual waste disposal operations. The site is about 50 miles northwest of Fort Worth in southeastern Jack County, 13 miles southeast of the City of Jacksboro, and 1.25 miles south of the intersection of State Highway 199 and Farm-to-Market Road 1156. Applicant expects the facility to serve a population equivalent of 171,000 people in the City, Jack County, and surrounding areas. The facility would receive an initial average of 500 tons of municipal solid waste per day. The landfill's waste would ultimately be composed of 50 million cubic yards of waste and daily cover, and would include household and putrescible waste; Class 2 industrial waste; Class 3 industrial waste; and special waste, as allowed by TCEQ. Applicant expects the facility to last 60 years.[2]

IV. NEARBY WELLS AND SPRINGS

A. Legal Requirements

As provided in the Commission's rules, use of land for an MSW site should not adversely impact human health or the environment. The MSW's impact on a city, community, group of property owners, or individuals must be considered in terms of compatibility of land use, zoning in the vicinity, community growth patterns, and other factors associated with the public interest. That is why the Application must include information that may assist the Executive Director in conducting a land use compatibility analysis, and the Applicant had to describe and discuss all known wells within 500 feet of the site.[3] Similarly, Applicant had to identify, locate, and list the aquifer for all water wells within one mile of the facility's property boundaries.[4]

---

2 App. Ex. 100, Vol. I at 3-4 of 9.
3 30 TEX. ADMIN. CODE (TAC) § 330.53(b)(8)(E).
4 30 TAC § 330.56(d)(4)(J).

B. Applicant's Evidence and Arguments

1. John A. Worrall[5]

Mr. Worrall conducted Applicant's land use compatibility analysis. He said the site is not within any city's corporate limits and is not subject to zoning by a municipality or the county. Within a one-mile radius of the site, land is primarily used for agriculture, including pasture with some cultivation.[6] The Application mentions 26 rural residences within one mile of proposed permit's boundary. In later site visits, Mr. Worrall noted one fewer residence. When the Application was completed, there were no industrial or commercial facilities within a one-mile radius.[7] However, in more recent site visits, Mr. Worrall identified two industrial/commercial facilities, a greenhouse complex and a new recreational vehicle park within one mile of the proposed permit boundary.[8]

2. John Michael Snyder, C.P.G.,[9]

Mr. Snyder and his firm, Biggs and Matthews Environmental, Inc., prepared various parts of the Application, including the general geology and solids summary, groundwater and surface water statements, and drinking water protection narrative.[10] According to Mr. Snyder, the standard of care in locating water wells is to search regulatory agency records and then attempt to identify as many wells as possible on the ground. In this case, Applicant hired a search firm that identified wells from Texas Water Development Board and TCEQ records. These records showed five water wells within one mile of the permit boundary, two of which are within the

---

5 Mr. Worrall holds a B.S. in urban studies and an M.B.A. degree. He has worked as a land use consultant since 1977 and has provided comprehensive community, park system, downtown redevelopment, solid waste, and reclamation project planning to public and private clients. App. Ex. 13 at 2 and Attach. 1.

6 App. Ex. 100, Vol. 1 at II-11; App. Ex. 13 at 8-9.

7 App. Ex. 13 at 10-11.

8 App. Ex. 13 at 9; *see also* Tr. 3 at 54. Each day of the Transcript was labeled as a separate volume. The numeral after Tr. indicates the day of the transcript.

9 Mr. Snyder holds B.S and M.S. degrees in geology and has completed postgraduate work in hydrogeology. He has more than 25 years of professional experience. He served as an MSW permit hydrogeologist for the Texas Water Commission and Texas Department of Health, TCEQ's predecessor agencies. He serves as vice president and a senior hydrogeologist at his firm App. Ex. 1 at 1-4 and Attach. 1.

10 App. Ex. 7 at 5-7.

permit boundary and not used. Mr. Snyder also personally drove on accessible roads in the area and looked for evidence of active water wells.[11]

However, Mr. Snyder made no inquiries or assumptions about the sources of domestic or agricultural water supply for the 25 residences within a mile of the proposed permit boundary.[12] As Mr. Snyder explained it, he has "never known for sure how people get their water."[13] Even if he were to observe a windmill, he would not necessarily conclude that a water well may exist in that location because he knows of several people who have windmills purely for nostalgic purposes.[14] When asked why he did not ask nearby residents about their sources of water, Mr. Snyder said he was concerned for his personal safety and did not want to trespass. In addition, he said that most people do not know details about their wells.[15]

In Mr. Snyder's prefiled testimony, he said there are no springs in Jack County, but when he was called as a witness at the hearing, Mr. Snyder testified that it was not his intent to state that.[16]

3. Charles W. Kreitler, Ph.D.[17]

Dr. Kreitler, who reviewed Applicant's Groundwater Investigation Report, said he had observed "a couple different windmills" when he visited the proposed landfill site.[18] The presence of a windmill generally indicates to him that a water well might be present.[19] Dr. Kreitler agreed that many area residents obtain their water from water wells.[20]

---

11 Tr. 2 at 20 and 32; App. Ex. 100, Vol. II. at 4-6 and 4-7; *see also* Figure 4A.5.
12 Tr. 2 at 34.
13 Tr. 2 at 35.
14 Tr. 2 at 36-37.
15 Tr. 2 at 37-38 and 95.
16 Tr. 2 at 7.
17 Dr. Kreitler, has a Ph.D. in geology and is a registered professional geologist. He holds professional certification from the American Institute of Hydrology and is a fellow in the Geological Society of America. His areas of expertise include groundwater contamination, methods of fault activation, hydrogeology and hydro-geochemistry, and hydrologic aspects of oil and gas exploration and production. App. Ex. 9 at 1-4 and Attach. 1.
18 Tr. 2 at 177.
19 Tr. 2 at 177.
20 Tr. 2 at 178-179.

4. Applicant's Arguments

Applicant argued that if there were significant springs in proposed landfill site's vicinity, they would have been referenced in publications. The only nearby spring mentioned in published materials was Haley Springs, which "failed early and no longer existed." For purposes of landfill design, groundwater characterization, and local uses of water, Applicant asserted that it has adequately described the springs in the area.[21] Mr. Snyder testified that landfill's design will protect the groundwater used by any nearby water well. Applicant argued it properly identified the water wells in the area as required by the applicable rules and specifically designed the proposed Jacksboro landfill to be in compliance with TCEQ rules.[22]

C. Executive Director's Evidence and Argument

Gale Baker, who testified for the ED, agreed with Applicant that the well search was adequate. But he also explained that Staff did not independently verify whether Applicant's information was accurate.[23] The Executive Director argued that Applicant met its burden of proof on this issue.

D. Protestant's Evidence and Argument

Protestant canvassed the neighboring landowners, searched well records, and employed a professional geologist to survey water wells within one mile of Applicant's property boundary.[24] As reflected on Protestant's Exhibit 8F, Protestant identified 46 water wells within that area.[25] The parties disagreed whether the Commission rule requires an applicant to identify wells within the one-mile radius of the permit boundary or the Applicant's property boundary. Protestant focused on the wells within one mile of the property boundary.[26] Even so, using Exhibit 8F as a guide, the ALJ counted wells that appear to be within one mile of the requested permit's

---

21 *Citing* App. Ex. 9 at 8-10 (Kreitler).
22 *Citing* Tr. 2 at 89-90; 95 (Snyder).
23 Tr. 7 at 34-35.
24 P. Exs. 8, 8F, 8G, 8H, and 8I.
25 P. Exs. 8 at 18 and 8F.
26 P. Ex. 8 at 18-19.

boundary and found that more than 35 wells are within that radius. The majority of the wells are west of the proposed facility's boundaries.

1. James H. Henderson, Ph.D.[27]

Dr. Henderson is the well-site geologist for more than ten oil and gas wells in the landfill site's vicinity. As such, he has reviewed actual boreholes, well logs, and driller's logs. He owns land near the proposed site and has drilled several water wells. He subscribes to a commercial service that provides him with weekly drilling reports from the area. At times, he also conducts his own research using Texas Railroad Commission files, and he interacts with geologists and agriculturalists who have similar interests.[28]

Dr. Henderson said there are no cooperative water lines in the area; the nearest water line is about ten miles to the east. On Dr. Henderson's property, within one to two miles of the site, he has two water wells that are not documented in the Application.[29] One well is 100 feet deep and the other is 80 feet deep. In addition, several springs on his property bubble up from the bottom of the Jasper Creek bed.[30] Dr. Henderson also said landowners to the west and north of the landfill site draw water from wells in the PACG as well as from recent, Quaternary-age, alluvial fills existing along creeks and rivers.[31]

2. Lauren Ross, Ph.D. [32]

Dr. Ross testified that it is important to identify existing water wells near a landfill in order to characterize local hydrogeology and to understand water supply resources that could be

---

[27] Dr. Henderson is a certified petroleum geologist and certified professional earth scientist. He holds a Ph.D. in soil science and geology and has worked in the geology profession since 1971. He acquired Geochem Data, Inc., in late 1973 for the purpose of acquiring prospective non-producing oil and gas leases with the objective of developing them. For most of his life, Dr. Henderson has also farmed and ranched in Jack County on a part-time basis. P. Exs. 6 at 2 and 6A.

[28] P. Ex. 6 at 2.

[29] P. Ex. 6 at 4-5.

[30] P. Ex. 6 at 3.

[31] P. Ex. 6 at 4.

[32] Dr. Ross holds B.S., M.S., and Ph.D. degrees in civil engineering. She works as an environmental engineer and is an expert on water quality and water quality preservation, groundwater and soil pollution transport, environmental monitoring system design, and statistical analysis or environmental monitoring data. P. Exs. 8 at 4 and 8A.

at risk if the proposed landfill's water protections fail.[33] Dr. Ross testified that the Application fails to reflect the dependence of the rural southeast Jack County community on groundwater supply for all of its domestic and agricultural water use.[34] She explained that when an area has neither a surface water supply nor a cooperative water service, a professional should recognize that residents may get their water from wells.[35]

In Dr. Ross's opinion, the small number of wells Applicant identified, as compared to the actual number that are present, mischaracterized the well density within close proximity to the landfill. While the number of wells Applicant identified may be consistent with state records, many groundwater wells are not registered with the state. To get a more accurate count of the wells, it is common to consult with residents and landowners in the area since they will often be familiar with groundwater wells that may not be included in state records.[36] Beyond that, a professional could search well records, converse with local drillers, observe wells, and sometimes, approach residents to ask them about their wells.[37]

Dr. Ross also noted that the *Springs of Texas, Vol. I,*[38] a publication upon which Mr. Snyder relied to make his determination about springs, identifies more than 20 springs in the county, including those that may be particularly impacted by the landfill because of their location in southeastern Jack County.[39] The two key springs are about half a kilometer southwest of Joplin on a ranch that is now owned by Curtis Benson. Protestant referred to these as Benson Springs. They are located about 845 feet north of Applicant's property boundary.[40]

The *Springs of Texas* states that a spring known as "Haley Spring" failed early due to its high topographical location.[41] But Dr. Ross believes the springs on Mr. Benson's property, which Protestant referred to as Benson Springs, are either the ones described in the publication or

---

33 P. Ex. 8 at 16.
34 P. Ex. 8 at 17.
35 Tr. 6 at 197.
36 P. Ex. 8 at 17-18.
37 Tr. 6 at 197.
38 By Gunner Brune, Texas A&M University Press 2002, cited at P. Ex. 8 at 21.
39 P. Ex. 8 at 19 and 22.
40 P. Exs. 8 at 23 and 8F.
41 Tr. 2 at 47 (Snyder).

are closely related to the historical Haley Springs.[42] In Dr. Ross's opinion, construction and operation of the landfill could diminish or eliminate the water from Benson Springs, and any leachate leakage would threaten its water quality. Furthermore, she said, dewatering possibly will cause local springs to dry up.[43]

3. Curtis Benson

Mr. Benson owns 380 acres directly north of the Applicant's site and has a weekend home for his family there. The spring on his property, Benson Spring (latitude N 33° 5'7.8 and longitude W 98° 0' 2.9) flows out of a hillside and is about 10 to 12 feet wide and four to five feet deep.[44] About 30 head of cattle use the spring's water.[45]

4. Marjorie Anderson

Ms. Anderson's property is approximately ¼ to ½ mile north and east of the entrance of the proposed landfill. She has one 32-foot well that supplies water to her home.[46]

5. Lana Moxley

Ms. Moxley's property is southwest of the proposed site, labeled as Tract No. 5 on the Adjacent Property Owners Map in the Application. Her property is used primarily for grazing livestock. She has two wells on her property, east of Jasper Creek and directly south of the proposed facility.[47] One well has water at 36 feet deep, but it is not working properly due to a malfunctioning windmill. She had a second well drilled in August 2008, and the driller reached water at 90 feet. She plans to use water from the well for cattle.[48]

---

42 P. Exs. 8 at 22 and 8J.
43 P. Ex. 8 at 23.
44 P. Exs. 4 at 1-2, P-4B and 8F.
45 P. Ex. 4 at 2.
46 P. Ex. 1 at 2 and P. Ex. 1A.
47 P. Ex. 3 at 1.
48 P. Ex. 3 at 2.

6. Protestant's Arguments

Protestant argued that Applicant failed to conduct an adequate investigation of water wells within one mile of the proposed facility property boundary. For the few wells that Applicant identified, Applicant discussed neither the underlying aquifers nor their recharge zones. Furthermore, Protestant asserted the evidence clearly showed that there are springs in Jack County, and certain ones will be affected by the landfill.

E. OPIC's Argument

OPIC determined Applicant failed to appropriately investigate wells in the area and the evidence of springs in the area. OPIC found Applicant's reasons for not conducting a more thorough water well search unpersuasive, particularly since Applicant did not even attempt to contact surrounding landowners. Additionally, Applicant misquoted the publication it relied on to identify springs. Even with a minimal field search, Applicant would have identified the spring that is so close to the site. Thus, OPIC asked the Commission to deny the Application.

F. Analysis

The ALJ finds that Applicant did not conduct an adequate search of water wells and springs. The parties disagreed on the standard of care in searching for these water resources. The ALJ finds that, based upon Dr. Ross's testimony and the fact that 25 residences are within one mile of the site, Applicant should have inquired further about the water supply those residents use. A simple request to and response from the City would have alerted Applicant to the fact that residents near the proposed permit boundary do not have water provided by a cooperative service or the City.

Applicant was also required to list the aquifer for all water wells within one mile of the facility's property boundaries. Mr. Snyder stated in the Application that published sources have very little information about regional aquifers. If Applicant's search had been more thorough, Applicant would have gathered valuable information about those aquifers.

On rebuttal, Mr. Snyder testified that the facility's design will adequately protect any wells because the monitoring wells will detect any release of contaminants. Yet, the ALJ does not find Applicant's evidence on this point sufficient. Most of the water wells are west and southwest of the site, and Applicant proposed only one monitoring well each for the south and west boundaries. Furthermore, Applicant did not consider the depth of nearby wells. Based on the nearby residents' testimony and Protestant Exhibit 8G, many of the nearby wells appear to be in the Stratum IA sands. Since monitoring wells will be screened only in Stratum II, there is no system planned to detect contaminants that could travel in the Stratum IA sands.

In addition, because Applicant misread the *Springs of Texas*, the Application does not contain correct information about nearby springs. Even though Applicant's witnesses testified that Benson Spring will not be affected because of groundwater flow, this rebuttal testimony was offered without the opportunity for more thorough study of the possible impact to a spring that is 845 feet from the site. Based on Applicant's failure to property identify nearby wells and springs, particularly in light of the fact that Applicant knew there were 25 residences within one mile of the site, the ALJ finds the Application should be denied.

G. Water Recharge

1. Evidence and Argument

The Application must identify areas of recharge to the aquifers within five miles of the site.[49] According to Dr. Ross, Trinity Group formations crop out at and around the proposed landfill site.[50] The outcrop areas form the recharge zones of the underlying Twin Mountains Aquifer, and it, in turn, provides recharge to the underlying PACG formations.[51] The landfill location serves as a vital recharge area for local wells within both the Trinity and deeper PACG formations.[52]

---

49 30 TAC § 330.56(d)(4)(I).
50 P. Exs. 8 at 12 and 8D.
51 P. Ex. 8 at 12.
52 P. Ex. 8 at 12.

Dr. Ross also cited Mr. Nordstrom's work as illustrating the vulnerability of sands within the Palo Pinto formation to contamination moving from the landfill through the overlying Trinity Group sands to the east. This easterly-moving groundwater in the Trinity Group sands would encounter the subcrop of the PACG within their recharge zone. This groundwater would move vertically downward to the east.[53] Within a short distance from the landfill to the east, the Trinity Group overlies the Palo Pinto formation. Mr. Nordstrom identified this recharge mechanism of Trinity groundwater moving vertically into underlying formations as significant for the PACG groundwater. Any contamination leaking from the proposed landfill would move with groundwater in the Trinity and into the underlying Canyon Group sands, Dr. Ross stated.[54]

Dr. Ross testified that Applicant failed to adequately address the effect dewatering would have on groundwater.[55] Applicant proposes to excavate to a depth of almost 100 feet below the highest measured water level in the piezometers. This will require pumping of groundwater to reduce pressures on the outside of the sidewall liners and on the bottom liner.[56] Water-bearing sands will be excavated and removed to a depth of 74 feet, as indicated by Applicant's boring D-15. The sands that will be excavated or dewatered may be contiguous with sands that supply the many shallow wells located within one mile west of the site. This will affect the recharge and groundwater supply available to local water wells.[57]

On the other hand, Applicant and the City asserted that dewatering will only occur during the excavations of Stratum I and parts of Stratum IA. As water will not flow from Stratum II into the upper strata, the groundwater flows in Stratum II will not be disturbed by any of the dewatering efforts made in the upper stratums.

2. Analysis

Based on the Application, the ALJ agrees with Applicant and the City that, on this particular site, water should flow down into Stratum II. Yet, Applicant has not described **the**

---

53 P. Ex. 8 at 10-11.
54 P. Ex. 8 at 11.
55 Dewatering is removing water from the formations around a landfill, which reduces groundwater pressure in the liner. P. Ex. 8 at 15-16.
56 P. Ex. 8 at 15-16.
57 P. Ex. 8 at 16.

effect dewatering will have on nearby wells or springs, particularly if Applicant completely excavates Stratum I along with the interbedded sands of Stratum IA. Further, even assuming the Twin Mountains Aquifer were the only aquifer of concern, Applicant has not addressed the impact of dewatering or recharge to it.

V. GEOLOGICAL AND HYDROLOGIC INFORMATION

The parties' primary disagreement about the geological and hydrologic information is the Applicant's designation of the formations within the PACG as the aquiclude. Applicant determined the Twin Mountains Aquifer, which is part of the Trinity Aquifer, is the only aquifer in the area.[58] Protestant asserts that the site's location is not accurately reflected on the geologic cross-section and, thus, does not address the potential impact of contamination on the PACG formations. Further, groundwater-bearing aquifers are in the PACG. Applicant should have addressed the hydraulic conductivity and recharge zones for those aquifers.

A. Geology Report

In a geology report, an applicant must discuss the regional physiography and topography in the vicinity and describe the regional geology of the area.[59] An application also must include a geologic map of the region with text describing the stratigraphy and lithology of the map units, and further describe:

> the generalized stratigraphic column in the facility area from the base of the lowermost aquifer capable of providing usable groundwater, or from a depth of 1,000 feet, whichever is less, to the land surface. The geologic age, lithology, variation in lithology, thickness, depth, geometry, hydraulic conductivity, and depositional history of each geologic unit should be described based upon available geologic information. Regional stratigraphic cross-sections should be provided.[60]

An aquifer is a geological formation capable of yielding significant quantities of groundwater to wells or springs.[61] The uppermost aquifer is the geologic formation nearest to

---

58 P. Ex. 15 at 6.
59 30 TAC § 330.56(d)(1) and (2).
60 30 TAC § 330.56(d)(2)(B).
61 30 TAC § 330.2(6).

the natural ground surface that is an aquifer.[62] It includes lower aquifers hydraulically connected with this aquifer within the property boundary.[63]

In addition, an applicant must describe regional aquifers within the vicinity of a facility based on published and open file sources. This description must include aquifer names and their association with geologic units; composition and hydraulic properties of the aquifers; and a regional water-table contour map or potentiometric surface map for each aquifer, if available; an estimate of the rate of groundwater flow; typical values or a range of values for total dissolved solids content of groundwater from the aquifers, as well as any recharge areas within five miles of the site.[64] More specifically, an applicant must indentify the uppermost aquifer and any lower aquifers that are hydraulically connected to it beneath the facility.[65] An applicant must identify areas of recharge to the aquifers within five miles of the site and the present use of groundwater withdrawn from the aquifers in the vicinity of the facility.

1. Applicant's Evidence and Argument

Mr. Snyder prepared Applicant's geology report, and worked closely with his associate, Gregory W. Adams, P.E., in preparing the geology and geotechnical report.[66] Applicant argued that the report is consistent with all applicable TCEQ regulatory requirements. The Executive Director's expert witness on this issue, Gale Baker, agreed with this assessment.

Mr. Snyder testified that the area is near the western extent of the Western Cross Timbers physiographic province that is characteristic Cretaceous Sandstone outcrops, such as the Twin Mountains and Paluxy geologic formations.[67] The topography is gently rolling terrain. The site is bisected by a west-to-east trending ridge with surface slopes away from the ridge to the northern, western, and southern parts of the site on approximately 4-6% slopes. There are no cliffs that would impact the landfill.[68] Mr. Snyder identified the landfill site on numerous maps

---

62 P. Ex. 8 at 30.
63 30 TAC § 330.2(158).
64 30 TAC § 330.56(d)(4)(A) – (J).
65 30 TAC § 330.56(e)(2).
66 App. Ex. 7 at 7-8.
67 App. Ex. 7 at 10.
68 App. Ex. 7 at 16.

from published regional references.[69] In the following table, Mr. Snyder outlined what he determined was the regional geological information:[70]

Era	System	Series	Stratigraphic Unit	Hydraulic Conductivity	Hydrogeologic Unit
Mesozoic	**Lower Cretaceous**	Comanchean	Paluxy	52 gal/day/ft[71]	Trinity Aquifer
			Glen Rose	$2.5x10^{-6}$ cm/sec[72]	
			Twin Mountains	60 gal/day/ft[73]	
Paleozoic	**Pennsylvanian**	Missourian (Canyon)	Home Creek Limestone	Not available[74]	Aquiclude
			Colony Creek Shale		
			Ranger Limestone		
			Placid/Wolf Mountain Shale		
			Chico Ridge Limestone		
			Palo Pinto Limestone		
			Jasper Creek Shale		
			Willow Point Limestone		

In Mr. Snyder's opinion, the Twin Mountains formation is the most important source of groundwater in the region. It yields moderate to large quantities of water to municipal and industrial wells, primarily in counties lying to the west and south of Jack County, and it supplies domestic and livestock wells.[75] He also determined that the PACG formations (including Palo Pinto Limestones) are not known to yield significant quantities **of potable groundwater, and**

---

69 App. Ex. 7 at 8.
70 App. Ex. 7 at 17 and App. Ex. 100, Vol. 2 at 4-2 through 4-4.
71 Nordstrom 1982.
72 Well test North Texas.
73 Well test North Texas.
74 Mr. Snyder testified that published sources have very little information about regional aquifers.
75 App. Ex. 100 at 4-3, citing *Occurrence, Availability and Chemical Quality of Groundwater in the Cretaceous Aquifers of North-Central Texas, Texas Department of Water Resources Report 269, Vol. 1*, by P. L. Nordstrom, (1982).

they serve as an aquiclude to the Cretaceous sands.[76] Mr. Snyder said the Cretaceous sediments at the surface dip to the southwest toward the Gulf Coast. Underlying Pennsylvanian sediments dip westward toward the Permian Basin.[77]

2. Protestant's Evidence and Argument

Protestant contested Applicant's assertion that the Western Cross Timbers is at the western edge of the Cretaceous Twin Mountains outcrop. According to Pierce Chandler, P.E.,[78] the Western Cross Timbers extends well into the Pennsylvanian sandstone outcrops, particularly in the coal-bearing regions.[79] Lignite was collected in the boring samples, and it occurs in the area only in the PACG. Moreover, in the PACG sandstones, groundwater flows both east and west.[80]

According to Dr. Ross, Applicant ignored the potential impact of landfill contamination on the PACG formations by showing the site is east of the area where the top of the PACG formations underlie the Trinity's Twin Mountains formation. [81] The Application includes references to the publication *Occurrence, Availability, and Chemical Quality of Groundwater in the Cretaceous Aquifers of North-Central Texas.*[82] But Protestant relied on a more recent report by the same author, P. L. Nordstrom, who specifically studied Jack County: *Occurrence and Quality of Ground Water in Jack County, Texas* (Report 308).[83] Report 308 says the PACG

---

[76] App. Ex. 7 at 12.
[77] App. Ex. 100, Vol. II at 4-4.
[78] A professional engineer, Pierce Chandler holds a B.S in aerospace engineering and an M.S. in civil engineering. He has more than 30 years engineering experience in siting, investigating, designing, permitting, constructing, operating and remediating solid waste management facilities and has served as engineer of record for several landfill permit applications. He has taught graduate level containment hydrogeology courses with a particular focus on subsurface investigations and characterizations. He also has extensive experience in planning, executing and interpreting soil borings and soil boring information. Mr. Chandler co-authored the two volume 1998 EPA publication, *Evaluation of Subsurface Engineered Barriers at Waste Sites*, which examined and evaluated available containment methodologies to isolate waste from ground and surface water and to prevent migration of contamination. P. Ex. 7 at 2, and 5; EPA 542-R-98-005 (August 1998).
[79] P. Ex. 7 at 6.
[80] P. Ex. 7 at 9-10.
[81] P. Ex. 8 at 9-10.
[82] Citing App. Ex.100 at 4-2, 4-3, and 4-4; *Occurrence, Availability and Chemical Quality of Groundwater in the Cretaceous Aquifers of North-Central Texas, Texas Department of Water Resources Report 269, Vol. 1*, by P. L. Nordstrom (1982).
[83] *See* P. Ex. 8B.

yields small quantities of fresh to slightly saline water.[84] The report also explains that "the most important water-bearing units are of Pennsylvanian age, with minor contributions of groundwater by units of the Trinity Group and alluvium."[85] Both the Canyon and Cisco Groups of Pennsylvanian age consist predominantly of shale, sandstone, mudstone, and limestone. According to Report 308, the sandstone bodies within those groups, provide "what little ground water is available for development to domestic and livestock wells."[86] Therefore, it is clear that the Pennsylvanian includes underlying aquifers, Protestant argued.

Based on her review of Texas Water Development Board records, Dr. Ross was able to identify wells completed in two different aquifers within one mile of Applicant's property boundary. They range in depth from about 70 feet below grade to 500 feet, but most are between 100 and 300 feet deep.[87] The shallower wells are likely completed in the Twin Mountains or Trinity aquifer. The deeper, higher yielding wells are consistent with the depth of the Palo Pinto aquifer in the PACG.[88] Rather than serving as an aquiclude, the PACG is a "critically important source of usable groundwater in the vicinity of the landfill. At many locations, there may be no other available water supply resource," she testified.[89]

In response, Applicant noted that Stratum IA will be almost completely excavated during landfill's construction, and Stratum IA is discontinuous and not correlatable across the site. Thus, Applicant argued that the isolated sands of Stratum IA will not provide significant quantities of water to wells or springs. Furthermore, Mr. Snyder did not think Report 308 was an appropriate source to use for identifying regional aquifers because it is specific to Jack County.[90] As required by the pertinent rule, Applicant included the cross-sections "that underlie or potentially underlie the landfill down to the depth of usable aquifers."[91] Thus, the City argued, Applicant had provided all information that the regulations require.

---

84 P. Ex. 8B at 13.
85 P. Ex. 8B at 14.
86 P. Ex. 8B at 14.
87 P. Exs. 8 at 18-19 and 8G
88 P. Ex. 8 at 18 and Tr. 6 at 171.
89 P. Ex. 8 at 8.
90 Tr. 2 at 28; *see also* App. Ex. 7 at 13; App. Ex. 100 at 4-3.
91 Tr. 6 at 109

3. Analysis

Clearly, there are usable amounts of groundwater in the Pennsylvanian formations. Not only did Report 308 make that determination, Dr. Ross identified wells in the Pennsylvanian by reviewing other available studies. Mr. Snyder did not think it was appropriate to consider Report 308 in determining whether there were regional aquifers, but Mr. Nordstrom's work appears to be a viable source for such research.

Report 308 designates the Pennsylvanian as having the most important water-bearing units in the county. As Applicant noted, the report includes some cautions regarding the groundwater's quality in the Pennsylvanian formations. Yet, many of the wells tested in the southeast of the county had total dissolved solids concentrations below the prescribed upper limits.[92] For these reasons, the ALJ finds that Applicant did not adequately describe regional aquifers within the landfill's vicinity based on published and open file sources.

B. Subsurface Investigation Report

The subsurface investigation report must describe all borings drilled on-site to test soils and characterize groundwater.[93] A sufficient number of borings must be performed to establish subsurface stratigraphy and to determine geotechnical properties of the soils and rocks beneath the facility. Borings must be sufficiently deep to allow identification of the uppermost aquifer and underlying hydraulically interconnected aquifers. They must also penetrate the uppermost aquifer and all deeper hydraulically interconnected aquifers and be deep enough to identify the aquiclude at the lower boundary.

The applicable regulations require soil borings to be conducted in accordance with established field exploration methods. The hollow-stem auger boring method is recommended for softer material, and coring may be required for harder rocks. Other methods may be used as necessary to obtain adequate samples for required soil testing.[94]

---

92 P. Ex. 8 at 63-64.
93 30 TAC § 330.56(d)(5)(A).
94 30 TAC § 330.56(d)(5)(iii); P. Ex. 15.

The Commission's Staff approved Applicant's request to use 26 soil borings for the 260 acres.[95] All 26 borings were advanced deeper than five feet and seventeen were advanced deeper than 30 feet below the elevation of deepest excavation.[96] Fourteen piezometers were installed. The lowest eight of them were screened in Stratum II.[97]

1. Applicant's Evidence and Argument

Based on the boring logs, Mr. Snyder developed Applicant's "Generalized Site Stratigraphy Table":[98]

Geologic Unit	Lithology	Average Depth to Top of Unit (ft)	Average Thickness of Unit (ft)	Hydrogeologic Unit	Hydraulic Conductivity	Number of Piezometers [99]
Stratum I (Trinity Group) [100]	Shale, Clay and Silty Clay w/Silty Sand interbeds	Outcrops at surface	75	None	$4.x10^{-6}$ to $7.18x10^{-7}$ cm/sec.	3
Stratum IA (Trinity Group)	Sandstone and Siltstone lenses within Stratum I clay[101]	Varies	Where present ranges from 1 to › 70 feet	Upper groundwater zones	$4.82x10^{-4}$ to $2.11x10^{-5}$ cm/sec.	3
Stratum II (Trinity Group)	Sandstone and Siltstone	75	55	Uppermost Aquifer[102]	$5.81x10^{-4}$ to $3.77x10^{-5}$ cm/sec.	8
Stratum IIA	Shale to Clayey	Varies	Where present	Aquitard		None

[95] App. Ex. 100, Vol. II, at 4B.1.
[96] App. Ex. 100, Vol. II at 4B.1; App. Ex. 100, Vol. II at 4-12.
[97] App. Ex. 100, Vol. II at Table 4-12, 4-27, and 4B.2.
[98] App. Ex. 100, Vol. II at 4-9; App. Ex. 7 at 36-38 and 50.
[99] The ALJ added this column based on evidence in the Application.
[100] Applicant did not identify the corresponding geologic cross sections by name, but Mr. Chandler testified that what Applicant labeled as Strata I and II would correspond to the Cretaceous Twin Mountains and Stratum III would correspond to the PACG.
[101] App. Ex. 7 at 35.
[102] *Id.* at 38; App. Ex. 100, Vol. 2, Part III, Attach. 4, p. 4-32 (Figure 4H.25)

(Trinity Group)	Shale		ranges from 1 to › 40 feet			
Stratum III (Penn. Canyon Group)	Shale and Clayey Shale	127.5	Not fully penetrated	Aquiclude	$4.5x10^{-8}$ cm/sec.	None

Within the landfill's permitted boundaries, Applicant would excavate Stratum IA almost completely during construction.[103] Mr. Snyder determined Stratum III underlies the entirety of the proposed landfill site and is of sufficient thickness and of low enough permeability (10^{-8} cm/sec) to serve as the aquiclude beneath Stratum II, the uppermost aquifer. Thus, Mr. Snyder determined that groundwater will move laterally in Stratum II rather than downward into Stratum III.[104] Applicant determined that, in Stratum II, groundwater flows to the north and the northeast.[105] To Applicant, this demonstrates that the site overlies the Cretaceous, not the Pennsylvanian. If the proposed site were over the Pennsylvanian, water migration would be to the west.[106]

2. Protestant's Evidence and Argument

Protestant argued that an application must show whether aquifers are hydraulically connected;[107] that IESI failed to address hydraulic connections between the Twin Mountains Aquifer and PACG;[108] and that the Application has inadequate data for the PACG's hydraulic conductivity.[109]

In Dr. Ross's professional opinion, Stratum IA, rather than Stratum II, is the uppermost aquifer because Stratum IA is capable of yielding significant quantities of groundwater to wells

---

[103] App. Ex. 7 at 41.
[104] App Ex. 7 at 40 (Snyder).
[105] App. Ex. 100, Vol. II, Attach. 4 at 4-32.
[106] Groundwater Investigation Report. App. Ex. 100, Vol. II, Attach. 4, at 4-27, *et seq.* and Attach. 5. *See also* App. Ex. 7 at 41.
[107] 30 TAC § 330.56(d)(4)(E).
[108] P. Ex. 8 at 11.
[109] App. Ex. 100 at 4-3 and 4-4.

or springs. Water elevations in all three piezometers in Stratum IA were relatively constant during the monitoring period.[110]

According to Dr. Ross, four geologic formations yield fresh to moderately or slightly saline groundwater in Jack County in the Trinity, the Cisco, the Canyon, and the Strawn geologic formations. Quaternary alluvium (the deposits of gravel, sand, silt and clay that occur along the floodplains and in the bottom of streams) has a maximum thickness of about 60 feet. It also produces small quantities of fresh to moderately saline water to wells.[111]

The Application shows that the proposed site is in the outcrop of the Cretaceous.[112] However, Applicant reported lignite at numerous depths in 13 of the 26 borings, and it was encountered at 15 feet below ground surface. In Jack County and the surrounding area, "lignite"[113] is found only in Pennsylvanian-age strata, not in the Lower Cretaceous.[114] Mr. Chandler also said sands and sandstones that Applicant showed as occurring below the uppermost lignite interval are actually Pennsylvanian aquifers dipping down to the northwest.[115]

Mr. Chandler determined that Applicant developed an unusual subsurface stratification by relying on wash borings and wash cuttings. Mr. Chandler determined that 12 of Applicant's 26 borings were "wash" or "wet rotary" drilled with no soil sample being recovered. A wash boring is made by advancing a drill bit to cut and grind subsurface materials into small particles or cuttings. Drilling fluid is then circulated down through the drilling rod and brought back to the cutting. Small, low-density particles come up faster while larger, denser particles lag behind, if they come up at all.[116] The Texas Department of Transportation's (TxDOT's) Geotechnical Manual advises against using wash sampling unless absolutely necessary because it can lead to erroneous conclusions about subsurface soils. Mr. Chandler said wash borings have been responsible for many foundation failures.[117] The professional who evaluates the borings sees

---

110 P. Ex. 8 at 31.
111 P. Ex. 8 at 12.
112 *Citing* App. Ex. 100, Vol. 2, Attach. 4, Figure 4A.1.
113 Mr. Chandler used Applicant's characterization of the material even though he noted that what Applicant designated as lignite is probably bituminous or sub-bituminous coal. P. Ex. 7 at 7.
114 P. Ex. 7 at 10.
115 P. Ex. 7 at 8 and 13.
116 P. Ex. 7 at 15-16.
117 P. Ex. 7 at 17.

only a significantly disturbed and mixed sample. Moreover, in this case, the field notes were destroyed, making a peer review impossible.[118]

In addition, Mr. Chandler said the borings were not continuously sampled. Furthermore, Mr. Chandler testified that only 14 of the borings were actually sampled, as that term in used in geotechnical literature, and only a minimal number of samples were obtained from relatively shallow depth. [119] Samples were obtained almost exclusively from Stratum I; a single sample from two borings was taken from Stratum IA, and a single sample was recorded from Stratum II. And even though the boring logs do not show any results for Stratum IIA and III, the laboratory tests results include Stratum III.[120]

3. Applicant's Rebuttal

In rebuttal testimony, IESI witness Dr. Kreitler testified that lignite can be found in the Cretaceous in this area.[121] And Mr. Adams said Mr. Chandler was mistaken in concluding that so many borings were wash borings. He said he would not have been able to record the level of detail shown on the logs if he had used wash borings.[122] Each boring log has a "remarks" section that, according to Mr. Adams, describes the sampling method used for that borehole.[123] The ALJ notes that all 87 logs have the same statement in the remarks section:

> Borehole grouted with tremied bentonite upon completion. Borehole advanced with Shelby tubes pushed to depth of refusal; then wet rotary coring. No water observed prior to introduction of drilling water.[124]

Another section describes the sampling methods:

> Field drilling and sampling of the exploratory borings completed in 2004 were performed using mud-rotary drilling methods and sampling techniques that included thin walled tubes, coring, and cuttings. Borings were continuously

---

118 P. Ex. 7 at 17, 18, and 20.
119 P. Ex. 7 at 18-20, *citing* App. Ex. 100, Attach. 4 and Appen. 4B § 2.3.2.
120 P. Ex. 7 at 20.
121 Tr. 8 at 195-213.
122 Tr. 9 at 40-42.
123 Tr. 9 at 46.
124 App. Ex. 100, Vol. 2, at 4B.4 through 4B.

> sampled from the surface to total depth. Shallow, highly weathered soils were sampled by hydraulically posing 3-inch-diameter, thin walled tubes from the surface to refusal (where the drill rig can no longer push the sample tubes) or to a depth conducive to core sampling. At several locations, after nearby shallow formation layers were characterized as consistent, shallow soils were sampled using rotary wash and a sample catcher until harder formations materials were encountered. Coring then proceeded to total depth as needed. Coring was accomplished using 5 and 10-foot length, double-tube core barrels with mud rotary techniques.[125]

Mr. Adams testified that Applicant made wash borings "at a few selected locations . . . in the areas that [Applicant] had already cored to total depth, either side of it."[126] Wash borings were used only in discrete areas within a boring, particularly in the upper part.[127] Mr. Adams said that, for more than 80% of the total drilling, he had undisturbed samples to look at.[128] Yet, Mr. Adams added, the only way one could determine which borings were made with Shelby tubes and which were made with wash borings is to see whether the borings were cored.

4. City's Arguments

The City argued that the Subsurface Investigation Report is adequate and the destruction of the field notes and omission of any notations on the boring logs was a customary procedure.

5. Analysis

Even though the Application is so difficult to decipher that not even a qualified expert could determine which borings were made with Shelby tubes and which were made with wash borings, Applicant provided acceptable rebuttal evidence to meet its burden of proof on this issue. It appears more likely than not that Applicant made the required 26 borings, and those borings were continuously sampled. At least for 80% of the drilling, Mr. Adams had undisturbed samples to consider. Finally, as the Application states, the wash borings were used after Applicant had cored to depth on either side of the wash boring. For these reasons, the ALJ finds the Applicant's site stratigraphy meets regulatory requirements.

---

[125] App. Ex. 100 at 4-11 § 2.3.2.
[126] Tr. 9 at 46-49.
[127] Tr. 9 at 50-51.
[128] Tr. 9 at 55.

VI. GROUNDWATER PROTECTION

A groundwater monitoring system must have "a sufficient number of monitoring wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer."[129] An applicant must design a system that specifies the number, spacing, and depths of monitoring wells or other sampling points,[130] and these design aspects must be based on site-specific technical information that includes a thorough evaluation of:

- aquifer thickness;
- ground-water flow rate;
- groundwater flow direction including seasonal and temporal fluctuations in flow;
- effect of site construction and operations on groundwater flow direction and rates;
- thickness, stratigraphy, lithology, and hydraulic characteristics of saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials of the uppermost aquifer, and materials of the lower confining unit of the uppermost aquifer.[131]

Rule 30 TAC § 330.56(d)(5)(C)(iv) requires an applicant to provide an analysis of the most likely pathway(s) for pollutant migration in the event the primary barrier liner system is penetrated and 30 TAC § 330.53(b)(11) requires an application to characterize the vertical and horizontal flow characteristics of groundwater beneath the site. The Executive Director's witness on this issue, Teresa McCaine, P.E., agreed that the Applicant complied with these requirements.[132]

A. Applicant's Evidence and Argument

Applicant plans to have eleven groundwater monitoring wells.[133] Nine wells will be downgradient of the site, and the two will be upgradient to monitor background water quality.[134] On the north and northeast sides of the permit boundary, the wells are spaced not more than

---

[129] 30 TAC § 330.231(a).
[130] 30 TAC § 330.231(e).
[131] 30 TAC § 330.231(e)(1).
[132] Executive Director Ex. 1 at 6.
[133] The proposed locations for these wells are shown at Applicant Ex. 100, Vol. 2, Part III, Attach. 5.
[134] App. Ex. 9 at 15 (Kreitler).

600 feet from each other.[135] But Applicant plans to have only one monitoring well for the south and one well for the west boundaries.[136] All the wells are to be screened in Stratum II. Applicant argued that the network of wells should detect a release that could reach the uppermost aquifer.

Protestant argued that Applicant did not tailor its planned groundwater monitoring system to fit the particular site characteristics. In fact, in Protestant's view, Applicant based its groundwater monitoring plan on mistaken assumptions regarding groundwater flow direction.

For Applicant, Dr. Kreitler determined that the Application properly evaluated groundwater characteristics.[137] Groundwater flow was estimated to be to the north-northeast at a rate of about 6.5 feet per year in the sands of Stratum I and to the north-northeast at a rate of about 15.5 feet per year in Stratum II.[138]

Mr. Snyder and his associates checked the piezometers thirteen times between May 2004 and June 2005.[139] They measured water levels to within 0.01 feet using an electronic water-level indicator,[140] and calculated water-level elevations using measured water levels and subtracting the water level from the surveyed well elevations (top of casing).[141] This produced the ground water's elevations above sea level level at that point.[142]

It was difficult to determine flow direction of the groundwater in the Stratum IA sands because the geologic materials do not correlate across the site, Mr. Snyder stated.[143] Nevertheless, he concluded that hydraulic heads were higher on the south portion of the site, descending to lower heads on the north end of the site.[144] Stratum IA becomes less sandy and primarily clayey on the downgradient north and east sides of the site, and the clayey sediment prevents lateral migration of groundwater.[145] From slug tests in Stratum I clay, he determined

---

135 *Id.*; *see also* Tr. 2 at 82.
136 App. Ex. 100 at Fig. 5A.1.
137 App. Ex. 9 at 11-13.
138 *Id.; see also* App. Ex. 7 at 36, in which Mr. Snyder said groundwater flow would be about 15 feet per year.
139 App. Ex. 7 at 33.
140 *Id.* at 34.
141 *Id*; *see also* App. Ex. 100, Vol. 2, Part III, Attach. 4 at 4-28 (Sec. 4.3).
142 App. Ex. 100, Vol. 2, Part III, Attach. 4, Table 4-13 at 4-29.
143 App. Ex. 7 at 35 and App. Ex. 100 at Figures 4H-1 and 4H-2.
144 App. Ex. 100, Vol. 2, Part III, Attach. 4, at 4-31; App. Ex. 7, at 35-36.
145 App. Ex. 7 at 18.

that hydraulic conductivities in that stratum were about two orders of magnitude less permeable than the interbedded Stratum IA sand.[146]

Mr. Snyder also said that if a contaminant moves past the synthetic liners and escapes from the sumps at the bottom of the facility, it would slowly make its way through the lower permeability materials in the upper parts of Stratum II.[147] He added that any contaminant would be detected by the monitoring well at the point of compliance before it has a chance to get to an aquifer.[148]

Groundwater is present in the sandstones and siltstones of Stratum II, but the unit is not totally saturated, Mr. Snyder testified. Groundwater is unconfined in this unit over most of the site, except in the far southeastern portion where it becomes confined when the top of the sand dips below the potentiometric surface. [149]

On rebuttal, Dr. Kreitler said any contaminants that moved through Strata I and II, would follow the topography in a subdued fashion through the sands. To flow to Benson Springs, which is on the northwest side of the site, contaminants would have to move down a valley, up a hill, and back down the other side.[150]

B. Protestant's Evidence and Argument

Applicant's assumption of eastward groundwater migration for purposes of designing the groundwater monitoring system ignores the potential for northern migration of groundwater in Stratum IA, Dr. Ross testified. She also said contaminant could escape from the side of the landfill liner into the IA sands past the point of monitoring in the Stratum II monitoring wells.[151]

While Applicant has characterized Stratum IA as discontinuous from similar layers in adjacent borings, Dr. Ross believes an equally viable and more conservative interpretation

---

146 App. Ex. 7 at 35-36.
147 App. Ex. 7 at 39 (Snyder).
148 Tr. 2 at 93.
149 App. Ex. 7 at 36.
150 Tr. 8 at 209-210 (Kreitler).
151 Tr. 6 at 194.

indicates the potential for hydraulic connection in Strata IA.[152] She said there is no evidence to support Applicant's assumption that this silt and sand is not horizontally connected. By failing to describe the potential for off-site leachate migration in Stratum IA, Applicant has avoided the responsibility to install monitor wells to detect contamination in Stratum IA, she added.[153] Dr. Ross noted:

> . . . the commonly accepted direction of flow in the Canyon Group is not to the east, it is to the west. So, if Stratum II were actually Canyon Group rather than Trinity aquifers, you might wonder whether or not there would be a western component to flow as well as an eastern component of flow in the Twin Mountains Aquifer. That would suggest that there is water moving in two directions underneath the site . . . [d]epending on the level of the screened interval of the well that is monitoring water levels.[154]

In addition, Dr. Ross said the eastern boundary is not the discharge point for Stratum II.[155] The potentiometric surface maps reflect high points at two opposite corners of the site with a trough between them.[156] Therefore, the direction of groundwater flow is not clear from the potentiometric measurements.[157] Some of the highest potentiometric readings are located at the southeastern corner of the site.[158] There is not a smooth flow from east to west as would be expected if this were the in Twin Mountains Formation.[159] The lowest piezometer is in the northeast corner (G-5), and that is the lowest point at which water will flow (1093.86).[160] Points A-5 at 1,113.58 feet and F-20 at 1,112.06 are highest but at opposite ends (northwest and southeast) of the site. And they have a trough between them.[161]

Although Applicant generally characterized the groundwater beneath the landfill site as flowing to the north and east, Protestant's witnesses testified that the site overlies both the Pennsylvanian and Cretaceous formations, and the Pennsylvanian formation flows generally to the west. Protestant further contends that Applicant discounted the significant amount of

---

152 P. Ex. 8 at 29.
153 P. Ex. 8 at 29.
154 Tr. 6 at 185.
155 Tr. 6 at 192.
156 Tr. 6 at 187-188, referring to App. Ex. 100, Section III, Appen. 4H.
157 Tr. 6 at 191
158 Tr. 6 at 191.
159 Tr. 6 at 187.
160 Tr. 6 at 187.
161 Tr. 6 at 187 referencing one of the potentiometric surface maps at App. Ex. 100, Fig. 4H3.

groundwater present in the Stratum IA sands at the site, and this water will flow to the north into Benson Springs.

C. Applicant's Rebuttal

In response, Applicant argued there is no evidence of a significant amount of groundwater in the Stratum IA sands, Stratum II is the uppermost aquifer beneath the site,[162] and the Pennsylvanian is an aquiclude. Report 308, in the table located on page 13, states that only small quantities of fresh to slightly saline water are produced from the Pennsylvanian aquifers.[163] In the PACG, Report 308 found that overall groundwater quality for domestic use is fairly poor. Water from numerous wells in the PACG was used to water lawns and gardens. However, Mr. Nordstrom concluded that, generally, this water is not suitable for extensive irrigation.[164]

D. City's Arguments

The City argued that the potentiometric surface maps reflect groundwater flow to the northeast. The high points on the northwest and southeast set up a strike and equipotential contour northwest-southeast. Groundwater will flow in perpendicular fashion. The lowest point, at the northeast corner of the proposed landfill site, is at least 20 feet lower than at other points. This alone demonstrates the northeasterly flow of groundwater. The contours indicate a trough that flows to the northeast. Water level elevations in D-20 on the central part of the south line are at 1,107.76 ft. The water level at the northeast corner is 1,091.54 ft – more than 16 feet lower, also clearly establishing a northeast flow direction in Stratum II.

E. Analysis

The ALJ finds that Applicant met its burden of proof on this issue. While Applicant did not adequately indentify regional aquifers, its methods for evaluating the particular site were standard and reasonable. Given the non-correlatable nature of the Stratum IA sands across the site and the lack of significant groundwater in them, it is reasonable to find **groundwater in the**

---

[162] Hydrology and groundwater conditions beneath the site are shown in Volume II at Attach. 4.
[163] *See* P. Ex. 8B at 13.
[164] P. Ex. 8B at 63.

site will generally flow to Stratum II. A point of some concern is the possibility that contaminant could escape from the side of the landfill liner into the IA sands. However, if the Application were granted, this point could be addressed with monitoring wells screened in those sands.

F. Liner and Leachate Systems

Gregory W. Adams, P.E.[165] designed Applicant's leachate collection system using EPA's Hydrologic Evaluation of Landfill Performance (HELP) model, which internally calculates rainfall data for specified U.S. cities. Of those cities in the model, Abilene and Dallas are geographically closest to Jacksboro. The Dallas data produced an overall slightly higher leachate generation rate, but it underestimated the total hydrostatic head on the liner.[166] Mr. Adams used the Abilene data because he thought it was more conservative.[167] Based on his testimony, Applicant argued that, even if Dallas rainfall data has been used to design the leachate collection system, the system is more than adequate to meet regulatory requirements.

In Protestant's view, the Dallas data was more suitable for the HELP model analysis. Dr. Ross compared the average monthly rainfall in Jacksboro, Abilene, and Dallas and found the rainfall in the landfill's vicinity more closely matched the Dallas rainfall data.[168] The average annual rainfall rate in Jacksboro is 30.4 inches, compared to 24.4 inches for Abilene. According to Dr. Ross, the difference of six inches, or about 25%, is significant. The predicted lateral drainage and maximum head were significantly higher for the same cover soil permeability when updated weather data was used in the model.[169] Also, the differences between Abilene and Jacksboro average monthly rainfall amounts were largest from October to May, and those months have the lowest evapo-transpiration rates. Higher rainfall amounts in those months will cause more leachate to be generated than higher rain amounts in June through September

---

[165] Mr. Adams has more than 20 years experience in civil and geotechnical engineering and has managed a wide variety of heavy civil construction projects. He was directly responsible for preparing several parts of the application. In accordance with 30 TAC § 330.305, Mr. Adams determined that the site is not located within an unstable area. App. Ex. 6 at 1, 3 and 6 and Attach. 1

[166] Tr. 1 at 180, 205-206, and 231.

[167] Tr. 1 at 180.

[168] P. Exs. 8 at 36 and 8Q.

[169] P. Exs. 8 at 36 and 8P.

would.[170] Therefore, Dr. Ross concluded, Applicant should have designed the leachate collection system based on Dallas rainfall data.

In response, Mr. Adams said he typically over-designs leachate collection systems to provide an added measure of security. The leachate collection system is designed to have six-inch diameter collection pipes and other components in gravel-filled trenches. As designed, the system could accommodate rainfall in excess of the results produced by either the Dallas or Abilene data.[171]

G. ALJ's Analysis

The ALJ agrees with Applicant and the City that Mr. Adams used an appropriate approach. He thought it more important to use the Abilene data because of the hydrostatic head on the liner. While Dr. Ross's point appears to be well-taken in that Jacksboro rainfall data more closely parallels the Dallas rainfall data, there was no evidence to effectively controvert Mr. Adams' testimony that, even if the Dallas data were used, the leachate collection system would not be changed. Therefore, the ALJ finds that the system's design is appropriate.

VII. SURFACE WATER PROTECTION

Protestant asserted that the Applicant provided two incompatible peak flow rates in its discussion of natural drainage patterns and relied on peak flow rates that are higher than what exists under natural, pre-developed conditions. As a result, the surface water draining from the proposed landfill site will exacerbate existing erosion problems and increase the potential for flooding off-site.

---

[170] P. Exs. 8 at 37, 8R, and 8Q.
[171] Tr. 1 at 206-207.

A. Applicable Standards

An applicant for a municipal solid waste permit application must demonstrate that natural drainage patterns will not be significantly altered.[172] The key difference between the Applicant's and Protestant's surface drainage calculations are the models they used. Protestant relied on the Rational Method while Applicant used the HEC-HMS method. Commission rule 30 TAC § 330.55(b) provides, in part:

> (3) The owner or operator shall design, construct, and maintain a run-off management system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
> . . .
>
> (5) Drainage calculations are as follows.
>
> (A) **Calculations for areas of 200 acres or less shall follow the Rational Method** and shall utilize appropriate surface run-off coefficients, as specified in the [TxDOT] Bridge Division Hydraulic Manual. Time of run-off concentration as defined within the said manual generally shall not be less than 10 minutes for rainfall intensity determination purposes.
>
> (B) **Calculations for discharges from areas greater than 200 acres shall be computed by using** USGS/DHT hydraulic equations compiled by the United States Geological Survey and TxDOT Administrative Circular 80-76, the HEC-1 and HEC-2 **computer programs developed through the Hydrologic Engineering Center of the United States Army Corps of Engineers [USACE], or an equivalent or better method approved by the executive director.** [173]

In addition, TCEQ's "Guidelines for Preparing a Surface Water Drainage Report for a Municipal Solid Waste Facility" (August 2006) (Guidelines) read, in part:

> Because of the lack of volume run-off determination and hydrograph development, the Rational Method is recognized as being limited in providing information that is required to show that there is no significant change to natural drainage patterns. To compensate for the limitations of the Rational Method, the owner/operator must determine the run-off volume by using one of the methods from the NRCS *Technical Release 55* (TR-55) ...

---

[172] 30 TAC § 330.55(b)(5)(A), (D); 30 TAC § 330.56(f)(4)(A)(iv).
[173] Emphasis added.

> The Rational Method is needed for small drainage areas of less than 200 acres (note that the 200-acre standard applies to **the total area** of the watershed(s) above and including the **proposed landfill permit boundary**).
>
> For areas larger than 200 acres, you can demonstrate that there is no significant alteration to natural drainage patterns using the HEC computer programs developed through the Hydrologic Engineering Center of the [USACE].[174]

B. Applicant's Evidence and Argument

Kenneth J. Welch, P.E.,[175] was the engineer of record for this Application. Mr. Welch testified that there will be no alteration of natural drainage patterns. [176] The surface elevation ranges from approximately 1,260 above mean sea level (msl) on the southwestern part of the site to 1,140 msl at the creek bottom on the southeastern portion of the site.[177] The site is located in the West Fork of the Trinity River drainage basin. At present, the site has pasture, cultivated areas, and three drainage areas.

Mr. Snyder testified that drainage generally flows from the northwest into Little Beans Creek, northeast and southeast to Jasper Creek, and eventually into the west fork of the Trinity River. Surface water runoff enters the boundary at two points on the east and one point on the south. It exits the permit boundary at two discharge points on the west, five points on the north, two points on the east, and two points on the south. Runoff enters and exits the site as sheet flow, and at some locations, as concentrated flow in existing tributaries.[178] The creeks are tributaries to Lake Bridgeport, located approximately twelve miles northeast of the permit boundary. Run off from the south flows into a series of smaller tributaries of Jasper Creek south

---

[174] Emphasis added.
[175] Mr. Welch is a senior civil engineer and project manager with the firm Biggs and Mathews Environmental, Inc. The company is a consulting engineering firm that specialized in several areas including the permitting, design-engineering, and construction-phase engineering for landfills and other municipal solid waste projects. He has more than 25 years civil engineering and solid waste management experience, and he has been involved in a number of projects at over 20 landfill sites.
[176] App. Ex. 1 at 84-86; App. Ex. 100, Vol. II , Attach. 6A at 6.A-A.4 through 6A-A.7; Tr. 9 at 20.
[177] App. Ex. 7 at 16.
[178] App. Ex. 1 at 85.

of the permit boundary and eventually enters a Jasper Creek tributary east of the site. The existing streams or creeks running through or adjacent to the site are intermittent streams.[179]

Runoff will increase if the landfill is constructed as designed. But, according to Mr. Welch, the ten detention ponds will hold the runoff until the discharge structure releases the runoff at eleven discharge points over a period of time so as to not alter natural drainage patterns. He designed the perimeter drainage channels and detention ponds to accommodate not only the 25-year rainfall event but also a 100-year rainfall event.[180] For his design, Mr. Welch used:

- USACE's HEC-HMS model to evaluate peak flow rates for the pre-developed conditions;
- USACE's HEC-RAS model to develop hydraulic models for the pre-developed conditions to evaluate water surface elevations for the Jasper Creek tributary under peak flow conditions;
- HEC-HMS to evaluate peak flow rates for the post-developed conditions, including the perimeter drainage channel and detention ponds;
- HEC-RAS to develop hydraulic models for the post-developed conditions to evaluate water surface elevations for the Jasper Creek tributary under peak flow conditions; and
- TxDOT Bridge Hydraulic Manual method to evaluate final cover drainage systems for capacity and erosion loss using the Rational Method.[181]

Mr. Welch testified that the HEC-HMS is a superior computer model for determining the impact to drainage patterns because it allows calculation of volume, velocity, and, in a hydrograph, the changes in those parameters with time. He also said the Rational Method does not allow an engineer to account for post-development structures, such as detention ponds.[182] Mr. Welch compared the peak flow rates derived from the Rational Method with those derived from the HEC-HMS computer model and the HEC-HMS models produced a more conservative design.[183] Mr. Welch's calculations were based on evaluating the total drainage area contributing to the landfill or "the entire watershed."[184] He said the total watershed is 1,354 acres.[185]

---

[179] App. Ex. 100, Vol. II, Attach. 6A at 6A-5 and 6A-A.1; App. Ex. 1 at 84-85.
[180] App. Ex. 1 at 86-87.
[181] App. Ex. 100, Vol. II, Attach. 6A at 6A-3.
[182] Tr. 1 at 70-72 and 35-36.
[183] App. Ex. 100, Vol. II , Attach. 6A at 6A-4 and Attach. 6A-B at 6A-B-77a.
[184] Tr. 1 at 35-36, 70-72, 98, 141, 149-150.
[185] Tr. 1 at 100.

Applicant argued that Mr. Welch used the correct method in light of the relevant rule and the Guidelines. The analyses showed that the proposed landfill design and operation would not result in any significant change to natural drainage patterns. The City agreed, noting particularly that the Rational Method does not account for the effect of detention ponds on natural drainage patterns.[186]

C. Protestant's Evidence and Argument

Protestant's witness on this issue, Larry Dunbar,[187] testified that the landfill will significantly alter the natural drainage patterns and cause or increase flooding and erosion on nearby properties, in violation of TEX. WATER CODE ANN. § 11.086(a).[188] Noting that specific drainage areas in the site are much less than 200 acres, Mr. Dunbar testified that Applicant should have used the Rational Method, rather than the HEC-HMS models, to calculate pre- and post-development drainage patterns for those areas.[189] In addition, he said the site is in a rural area, and the Rational Method was developed for rural areas.

Also, Mr. Dunbar said Applicant used higher pre-development rates based on the HEC-HMS model and did not calibrate those rates to the Rational Method rates. Consequently, Applicant over-predicted rates for natural conditions at the site, and the detention ponds will be too small.[190]

After correcting Mr. Welch's Rational Method calculations to incorporate the proper Time of Concentration variable, Mr. Dunbar adjusted Mr. Welch's HEC-HMS pre-development peak flow rates so that they were compatible with the Rational Method calculations. He then made the same adjustment to the HEC-HMS post-developed peak flow rates. The results showed a significant alteration in natural drainage patterns.[191] His comparison of the pre- and post-development conditions show post-development flows as much as 50% higher than pre-

---

[186] Tr. 1 at 29.
[187] Mr. Dunbar holds a B.S. degree in civil engineering and an M.S. degree in environmental engineering; he is also a licensed Texas attorney. Mr. Dunbar has worked in the engineering and environmental fields since 1975.
[188] P. Ex. 9 at 4.
[189] P. Ex. 9 at 6; Tr. 8 at 10-11.
[190] P. Ex. 9 at 7-10.
[191] P. Ex at 9 and Attached Tables.

development flows.[192] Furthermore, even the Applicant's calculated runoff volumes show significant increases at certain points, such as Comparison Point No. 7 to the south of the site.[193]

Dr. Ross further testified that the Application understated the potential impact of erosion on water resources.[194] The U.S. Department of Agriculture Soil Survey for the county indicates that most of the soils mapped at the landfill location have high erosion potential. The soils are generally very fine sandy loams with little to no cohesion.[195] At the landfill site, she noticed deeply cut stream channels with fine-grained soils.[196]

Adjoining property owner Lana Moxley is also concerned that discharge will increase erosion. She has observed significant erosion due to surface water movement on her property, and crossing the eroded places is almost impossible in a vehicle. Areas wash out when there is rainfall.[197]

Protestant argued that, while Mr. Welch said he evaluated the entire drainage area, he did not actually use a 1,354 acre-area. Instead, the pre-developed flow summary table lists the peak flow rate for 17 drainage areas, only one of which exceeds 200 acres.[198] Moreover, Protestant noted that Mr. Welch used the Rational Method for every other drainage calculation, including his final cover system, with its drainage swells and down shoots.[199] Thus, to comply with TCEQ's rule, Applicant should have followed the Rational Method.

D. ED's Evidence and Argument

Testifying on behalf of the TCEQ Executive Director, Ms. McCaine agreed that the Application meets regulatory requirements regarding surface drainage. Ms. McCaine said that because the permit boundary includes more than 200 acres, Applicant's methodology was

---

192 P. Ex. 9 at 9; *see also* P. Ex. 9 at 7.
193 P. Ex. 9 at 10.
194 P. Ex. 8 at 25.
195 P. Ex. 8 at 26.
196 P. Exs. 8 at 27 and 8M, 8N, and 8O.
197 P. Ex. 3 at 3-5 and P-3A, 3B, 3C, and 3-D.
198 App. Ex. 100 at 6-A-B-2, 6-A-B-12, 6-A-B-13, and 6-A-B-18. Similar examples can be found throughout App. Ex. 100 in Attach. 6-A-B.
199 *Citing* Tr. 1 at 29.

consistent with TCEQ'S Guidelines.[200] She had no opinion regarding the different methodologies and added that she did not independently verify the calculations in the model.[201] Instead, she relied on Applicant's engineer to do so in a correct manner.[202]

E. Analysis

Applicant has complied with the Commission's rule and Guidelines in calculating the landfill's impact on surface drainage. Although Protestant challenged the HEC-HMS method that Applicant used, this method is allowed by the Guidelines. The watershed is more than 200 acres. While there is some basis for concluding that the HEC-HMS method overstated pre-development flow, the overstatement should be consistent across both pre- and post-development calculations, thus allowing a reasonable comparison between the two. Because the issue is not necessarily the actual flow, but rather a comparison between the pre-and post-development flow so as to determine whether the landfill's construction will cause a "significant alteration" of drainage, potential overstatement is acceptable, so long as the method is valid and applied consistently in both pre- and post-development calculations. The evidence reflects that Applicant did this. Therefore, Applicant's HEC-HMS method was an appropriate model upon which to calculate parameters for the surface drainage design. Applicant has demonstrated that which the landfill will not significantly alter natural drainage patterns.

VIII. GEOTECHNICAL EVALUATION

The area where a landfill will be constructed must provide a stable foundation for the landfill. The area cannot be susceptible to forces that would impair the integrity of the landfill liner or any other component intended to prevent a release of contaminants. An example of an unstable area would include an area with poor foundation strength. An applicant for a new landfill must demonstrate that the integrity of the components of the landfill will not be disrupted by any unstable characteristics of the soils or material at the proposed site.[203]

---

[200] Tr. 8 at 102.
[201] Tr. 8 at 107.
[202] Tr. 8 at 110-111.
[203] 30 TAC § 330.2(157); 30 TAC § 330.305.

This report must include engineering data describing the geotechnical properties of the subsurface materials at the landfill site, and the suitability of those materials for purposes such as sidewall liner support or excavation support. Tests to obtain this data must be performed in accordance with industry practice and the procedures recognized within the TCEQ rules. Soil characteristics must be determined by using at least one soil sample from each soil layer or stratum that will form the bottom and side of the proposed landfill.[204]

Protestant argued that Applicant has not presented an adequate geotechnical evaluation to demonstrate that the proposed location has sufficiently stable soils and materials to support the landfill as designed, particularly for intermediate slopes that will exist as the landfill is being constructed. The final-slope analysis does not address these slopes. That analysis assumes a buttressing effect by the excavation walls, but those walls will not be present for intermediate slopes. Additionally, Protestant contends, Applicant has not demonstrated that it applied an adequate factor of safety. Furthermore, because of the inadequate geologic evaluation, Applicant could not have accurately characterized the geotechnical properties of the materials involved in developing slopes.

According to Mr. Chandler, the Cretaceous and Pennsylvanian strata have significantly different geotechnical properties. Wash borings cannot identify the critical layers for a stability analysis. Applicant plans to excavate the site significantly into the Pennsylvanian but slope stability is an issue with the Pennsylvanian materials. There have been two dam-related stability failures in both the PACG and Strawn Groups in the area, including the Jacksboro Lake dam.[205] The stability analysis did not analyze the most critical sections (the intermediate slopes prior to fill completion) and did not analyze stability using translation or "block" analyses, which is the most probable mode of instability involving landfills with geosynthetic liner components. In addition, due to the deep excavation slopes, sidewall liner stability will be a significant challenge and fill sequence will be critical to stability; yet, the Application does not address these issues.[206]

---

[204] 30 TAC § 330.56(d)(5)(B).
[205] P. Ex. 7 at 8.
[206] P. Ex. 7 at 8.

Mr. Adams analyzed the excavation slopes for both short-term and long-term conditions by circular failure surfaces and evaluated the stability of the sideslope liner and final cover systems. To select soil parameters, he relied on boring logs, laboratory test results, and engineering judgment and experience with similar materials. The bottom of the landfill actually has a two percent cross slope and transition slopes between sectors that will provide a buttressing effect for the intermediate waste slopes. Mr. Adams testified that the proposed slopes will be stable under the conditions analyzed. [207] He used recommended minimum factors of safety selected from the USACE *Design and Construction of Levees* manual and the EPA's *Technical Guidance Manual for Design of Solid Waste Disposal Facilities*.[208] Mr. Adams based the strength parameters not only on compressive strength test results, but also on the results of the classification tests, dry unit weight tests, moisture content tests, and split spoon sample blow counts.[209]

Even though the issues Mr. Chandler raised merit consideration, the ALJ finds that Applicant's geotechnical evaluation meets regulatory requirements. Mr. Adams tested the actual soils at the site, and his results showed that the proposed slopes would be stable under the conditions analyzed. Thus, Applicant met its burden of proof on this issue.

IX. NUISANCE CONDITIONS, VECTORS, AND SCAVENGING

A MSW site must control on-site populations of disease vectors using proper compaction and daily cover procedures and any other approved methods when needed. The general methods and performance-based frequencies for disease vector control must be specified in the site Operating Plan.[210] The need for vector control must be minimized through daily site operations which will include placement and compaction of daily, intermediate, and final cover. Landfill personnel will conduct daily inspections as required by Section 8.24 of the Site Operating Plan to observe waste disposal operations and to remove areas that may be conducive to insects and

---

[207] Tr. 9 at 1.
[208] *See* App. Ex. 100, Vol. II , Attach. 4, Appendix 4G at 4G-1.
[209] Tr. 1at 161-162.
[210] 30 TAC § 330.126.

rodents. If the daily site operations are not able to control vectors, a licensed professional will apply pesticides to ensure that proper chemicals are used and properly applied.[211]

A. Kim Rife

Mr. Rife has lived in Jack County for 52 years. He is a professional feral hog trapper and has worked in 33 counties in Texas. He has 400 customers, mostly ranchers with large numbers of acres, and he traps about 6,000 feral hogs per year.[212] In Jack County, Mr. Rife traps, on average, five to six hogs a day, 365 days a year. He traps on both sides of S.H. 199 near the landfill site.[213] Mr. Rife said a hog can smell food three feet below the ground and five miles through the air. If a landfill accepts food wastes, dead animals, and slaughterhouse wastes, the site will attract feral hogs. The hogs are also attracted to water sources and have been known to travel seven miles in a night to find water.[214] The landfill will be an ideal location for feral hog scavenging and nesting, Mr. Rife testified. The hogs cause major property damage by destroying fences and digging up fields. Often, the damage is so extensive that a tractor or hay baler cannot drive across the property without being damaged. With their snouts, the hogs can dig holes eight inches to three feet deep and as much as six feet wide. Sixty hogs can demolish as much as five acres in a night.

The hogs can easily get over a five-foot fence. In Mr. Rife's experience, he has seen only one type of fencing that is effective against the hogs—an electric, high-rise fence. Barbed wire is not sufficient because the hogs will tear through it.[215] To control the hog population at the landfill, Applicant would also need personnel to check fencing around the clock because a small hole in a fence will quickly become a large one, given the force of a hog's 400-pound body. Mr. Rife also traps coyotes, bobcats, skunks, and raccoons in the area of the landfill and said they, too, would also be attracted to the site.[216]

---

211 App. Ex. 100, Vol. III at IV-36 and 37.
212 P. Ex. 5 at 2-3 and 5A.
213 P. Ex. 5 at 3.
214 P. Ex. 5 at 4.
215 P. Ex. 5 at 5.
216 P. Ex. 5 at 6.

B. Bryson K. Sewell

Although he is Jack County's Commissioner for Precinct 2, Mr. Sewell testified in his personal capacity and not as a representative of the county. Mr. Sewell is concerned about the hogs on the Applicant's site if a landfill is constructed there because hogs will find where the food is.[217] He has seen feral hogs in the vicinity of the proposed landfill.[218] He said it is common to see signs of hog activity on Two Bush Road, Shawver Road, and at his step-father's land about ½ mile from the proposed landfill on the south side of S.H. 199. He usually sees two or more hogs together at a time but has seen as many as ten together. He helps his step-father bait and trap the hogs, and they have trapped as many as five at a time.[219]

Mr. Sewell has seen fences torn up by the hogs, including those made of game wire, mesh wire, barbed wire, and goat wire. He has also seen evidence of the hogs burrowing holes into the ground where they look for grubs, other insects, and roots to eat. The hogs will eat anything, including meat, vegetation, and insects. He has used hog traps about the size of a pick up truck's bed but has seen traps as large as a small city block.[220]

Protestant argued that Applicant's procedure for controlling feral hog scavenging at its site is wholly inadequate with respect to fulfilling the requirements in 30 TAC §§ 330.126 and 330.128 (which relates to salvaging). The Applicant's Site Development Plan provides only for limitation of access by a barbed-wire fence.[221] Furthermore, Applicant's Site Inspection and Maintenance Schedule requires the operator to inspect the perimeter fence on a weekly basis.[222] The design and inspection of a fence is significant, Protestant argued. Fencing is rarely a permanent solution, because feral hogs can find their way through most fences, regardless of the design. The Texas Cooperative Extension advises that mesh wire combined with electric fencing is the most successful.[223] Applicant has not properly addressed the risks of scavenging, particularly by feral hogs, in the design or operating plans for its landfill. A reactionary approach

---

[217] P. Ex. 2 at 3.
[218] P. Ex. 2 at 1.
[219] P. Ex. 2 at 1-2.
[220] P. Ex. 2 at 2.
[221] App. Ex 100 Vol. I, SDP Narrative at III-8.
[222] App. Ex 100 Vol. I, SOP, at IV-39.
[223] P. Ex. 10 at 19.

of waiting until an infestation has occurred and only then calling an expert is insufficient to protect nearby residents

C. Joseph Vieceli

Mr. Vieceli, an officer with Applicant, testified that he had never seen a feral hog at one of IESI's facilities.[224] With proper operating techniques, vectors should not cause problems because the operator will compact and cover trash as it comes in. Employees will perform daily inspections of the perimeter. If vectors do become an issue, IESI would contact an exterminator or another expert who can take care of the problem.[225]

D. Analysis

Although the evidence shows the feral hogs would be attracted to the landfill, break the facility's planned barbed wire fencing, and possibly damage neighboring properties, the Commission's rule requires only compaction and daily cover to address disease vectors. Other approved methods are to be employed "when needed."[226] Therefore, the rule requires a response only when a problem arises. The rule pertaining to salvaging and scavenging describes human, not animal activity, *e.g.*, "the owner shall remove the salvaged items. . . "[227] Additionally, the rule describing nuisance conditions, 30 TAC § 330.127, does not refer to animal nuisance. Therefore, the ALJ finds Applicant has met its burden of proof on this issue.

X. TRANSCRIPT COSTS

The assessment of transcription costs is governed by 30 TAC § 80.23(d), which provides:

> (1) Upon the timely filed motion of a party or upon its own motion, the commission may assess reporting and transcription costs to one or more of the parties participating in the proceeding. The commission shall consider the following factors in assessing reporting and transcription costs:

---

[224] Tr. 9 at 10.
[225] Tr. 9 at 12.
[226] 30 TAC § 330.126.
[227] 30 TAC § 330.128.

(A) the party who requested the transcript;
(B) the financial ability of the party to pay the costs;
(C) the extent to which the party participated in the hearing;
(D) the relative benefits to the various parties of having a transcript; . . . and
(G) any other factor which is relevant to a just and reasonable assessment of costs

Protestant noted that IESI and the City of Jacksboro were not officially aligned parties, even though their goals are the same. Both IESI and the City of Jacksboro as a whole, used more time at the hearing for their benefit, and Protestant argued that those parties should bear the cost of the transcript.

The transcript was required because of the length of the hearing. Applicant and the City asked that Protestant be assessed 50% of the transcript costs. All parties had a role in initiating the proceedings. They also participated substantially in the hearing and benefitted from having a transcript for use in preparing their briefs.

The ALJ recommends assessing half the transcript cost against Applicant since Applicant owns and operates other landfills and as a commercial entity has funds available to pay the costs. Of the remaining amount, the City should be assessed 25% and the Protestant should be assessed 25%.

XI. SUMMARY

The parties presented well-qualified experts and extensive amounts of reasonable evidence to support their arguments. For the most part, Applicant met its burden of proof. However, Applicant did not properly consider published materials that identified the Pennsylvanian formation as having aquifers with usable amounts of water. While Applicant knew there were residences within one mile of the landfill site, Applicant did not further inquire

about what water resources were available to those residents. Third, Applicant did not adequately describe the areas of recharge for regional aquifers and the landfill's potential impact on those aquifers, particularly the Pennsylvanian Canyon formation. Consequently, the ALJ recommends that the Application be denied.

SIGNED May 5, 2009.

for Thomas H Walston

SARAH G. RAMOS
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS

STATE OFFICE OF ADMINISTRATIVE HEARINGS

AUSTIN OFFICE
300 West 15th Street Suite 502
Austin, Texas 78701
Phone: (512) 475-4993
Fax: (512) 475-4994

SERVICE LIST

AGENCY: **Environmental Quality, Texas Commission on (TCEQ)**

STYLE/CASE: **IESI TX LANDFILL LP**

SOAH DOCKET NUMBER: **582-08-1804**

REFERRING AGENCY CASE: **2007-1302-MSW**

STATE OFFICE OF ADMINISTRATIVE HEARINGS	**ADMINISTRATIVE LAW JUDGE** **ALJ SARAH G. RAMOS**
REPRESENTATIVE / ADDRESS	**PARTIES**
SCOTT HUMPHREY ATTORNEY TEXAS COMMISSION ON ENVIRONMENTAL QUALITY OFFICE OF PUBLIC INTEREST COUNSEL P. O. BOX 13087, MC-103 AUSTIN, TX 78711-3087 (512) 239-0574 (PH) (512) 239-6377 (FAX) shumphre@tceq.state.tx.us	TCEQ PUBLIC INTEREST COUNSEL
ANTHONY TATU STAFF ATTORNEY TEXAS COMMISSION ON ENVIRONMENTAL QUALITY ENVIRONMENTAL LAW DIVISION MC-173 P.O. BOX 13087 AUSTIN, TX 78711-3087 (512) 239-5778 (PH) (512) 239-0606 (FAX) atatu@tceq.state.tx.us	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
MARISA PERALES ATTORNEY AT LAW LOWERRE, FREDERICK, PERALES, ALLMON & ROCKWELL 707 RIO GRANDE, SUITE 200 AUSTIN, TX 78701 (512) 469-6000 (PH) (512) 482-9346 (FAX) marisa@lf-lawfirm.com	TWO BUSH COMMUNITY ACTION GROUP

KERRY E. RUSSELL
RUSSELL & RODRIGUEZ, LLP
1633 WILLIAMS DR., BUILDING 2, SUITE 200
GEORGETOWN, TX 78628
(512) 930-1317 (PH)
(866) 929-1641 (FAX)

CITY OF JACKSBORO

RON OLSON
STAFF ATTORNEY
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ENVIRONMENTAL LAW DIVISION
P.O. BOX 13087, MC-173
AUSTIN, TX 78711-3087
(512) 239-0608 (PH)
(512) 239-0606 (FAX)
rolson@tceq.state.tx.us

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

WILLIAM J. MOLTZ
MOLTZ MORTON O'TOOLE, L.L.P.
THE LITTLEFIELD BUILDING
106 EAST 6TH STREET, SUITE 700
AUSTIN, TX 78701
(512) 439-2170 (PH)
(512) 439-2165 (FAX)

IESI TX LANDFILL LP

---

xc: Docket Clerk, State Office of Administrative Hearings

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AN ORDER
DENYING THE APPLICATION OF IESI TX LANDFILL, L.P., FOR PERMIT NO. 2332
FOR A NEW TYPE 1 MUNICIPAL SOLID WASTE PERMIT
SOAH DOCKET NO. 582-08-1804
TCEQ DOCET NO. 2007-1302-MSW

On _____, the Texas Commission on Environmental Quality (Commission or TCEQ) considered the application of IESI TX Landfill L.P. (IESI or Applicant) for Permit No. MSW-2332 to authorize Applicant to construct a new landfill in Jack County, Texas. Sarah G. Ramos, Administrative Law Judge (ALJ) with the State Office of Administrative Hearings (SOAH), presented a Proposal for Decision (PFD), which recommended that the Commission deny the application. After considering the ALJ's PFD, the Commission adopts the following Findings of Fact and Conclusions of Law:

FINDINGS OF FACT

Introduction and Procedural History

1. On April 5, 2005, the City of Jacksboro (City) filed an application for a new Type I municipal solid waste landfill (the landfill). The application was designated as TCEQ Permit No. 2332.
2. The permit application was declared administratively complete on April 29, 2005.

3. In August 2006, a revised application was submitted to the TCEQ to reflect IESI TX Landfill L.P. (IESI or Applicant) as the Applicant.

4. At TCEQ's open meeting on January 30, 2008, the Commission evaluated requests for hearing on the application. The Commission granted the hearing requests of Dr. James Henderson, Gloria Sprencel, and the Two Bush Community Action Group.

5. Notice of the preliminary hearing was sent to interested parties on February 27, 2008 The notice included the time, date, and place of the hearing, the matters asserted, and the applicable statutes and rules.

6. On April 2, 2008, ALJ Kerry Sullivan held a preliminary hearing in Jacksboro, Texas, at the Jack County Courthouse at which he concluded that the Commission had jurisdiction to consider and act on IESI's permit application, SOAH had jurisdiction to conduct a hearing and to prepare a Proposal for Decision (PFD).

7. At the preliminary hearing, the following parties were admitted: IESI TX Landfill, LP, represented by William J. Moltz, R. Steven Morton, Brian J. O'Toole, and Janessa C. Glenn; the City of Jacksboro, represented by Arturo D. Rodriguez, Jr., Kerry E. Russell, and David L. Spiller; the Protestants, Two Bush Community Action Group, represented by Eric M. Allmon and Marisa Perales; TCEQ's Office of Public Interest Counsel, represented by Scott A. Humphrey; and TCEQ's Executive Director, represented by Anthony C. Tatu.

8. On April 18, 2008, ALJ Sullivan issued Order No. 1, Confirming Action Taken at Preliminary Hearing and Setting Procedural Schedule.

9. On June 13, 2008, ALJ Sullivan issued Order No. 3, Granting Unopposed Motion to Revise Procedural Schedule and Hearing on the Merits. The order set the date, time, and location for the hearing on the merits.

10. ALJ Sullivan's orders were sent to all parties by either facsimile transmission or regular mail.

11. ALJ Sarah G. Ramos convened the hearing on the merits on October 13, 2008, at SOAH, 300 W. 15th Street, Austin Texas. The hearing continued from day to day at SOAH, except that one day of the hearing was conducted at the Jack County Courthouse, 100 Main Street, Jacksboro, Texas. The hearing concluded on October 23, 2008. The record closed on March 6, 2009.

12. The landfill would be a new Type I municipal solid waste (MSW) landfill located in southeast Jack County, Texas.

13. The facility would serve a population equivalent of 171,000 people in the City, Jack County, and surrounding areas.

14. The landfill would be located approximately 13 miles southeast of the City and 1.25 miles south of State Highway 199.

15. The landfill's proposed site would consist of approximately 275 acres, with a landfill footprint of approximately 202 acres.

16. The landfill would accept waste generated from residential, commercial, institutional, municipal, manufacturing, industrial, recreational, and construction sources within the landfill service area.

17. The facility would receive an initial average of 500 tons of municipal solid waste per day. The landfill's waste would ultimately be composed of 50 million cubic yards of waste and daily cover, and would include household and putrescible waste; Class 2 industrial waste; Class 3 industrial waste; and special waste, as allowed by TCEQ.

18. Applicant expects the facility to last 60 years.

Surface Water Protection

19. The landfill would be located in southeast Jack County in the West Fork of the Trinity River drainage basin.

20. The landfill permit boundary consists of three drainage areas in its undeveloped condition.

21. Under existing conditions, the stormwater runoff from the landfill property runs off into unnamed tributaries of Little Beans Creek to the west and Jasper Creek to the east.

22. Under existing conditions, runoff from the west portion of the landfill contributes to an existing tributary of Little Beans Creek just west of the proposed permit boundary.

23. The north part of the site contributes to small tributaries of Jasper Creek to the north of the proposed permit boundary.

24. The south part of the site runs off into a series of smaller tributaries of Jasper Creek south of the permit boundary and eventually enters a tributary of Jasper Creek east of the site.

25. Little Beans Creek and Jasper Creek are tributaries to Lake Bridgeport, located approximately 12 miles northeast of the landfill permit boundary.

26. The existing streams or creeks running through or adjacent to the site are intermittent streams.

27. When constructed, the facility's stormwater runoff would be collected in swales located near the upper grade break on the landfill and on the four (horizontal) to one (vertical) side slopes, leading to drainage let-down structures or chutes on the 25% slopes and to the perimeter drainage system.

28. The perimeter drainage system would be constructed as each sector is developed and is designed to convey the 25-year/24-hour runoff from the developed landfill consistent with TCEQ regulations.

29. The perimeter channels and detention ponds were designed to convey the runoff from a 100-year rainfall event.

30. Stormwater drainage from developed areas would be directed to detention ponds before being discharged offsite.

31. The detention ponds were designed to reduce the peak runoff from the developed landfill to pre-developed flow rates.

32. The detention pond outlet structures are designed as energy dissipaters to reduce the velocity and turbulence of the flow leaving the detention ponds.

33. Applicant would file a Notice of Intent with the TCEQ to discharge stormwater runoff consistent with a Texas Pollutant Discharge Elimination Systems (TPDES) General Permit No. TX05000 relating to stormwater discharges associated with industrial activity.

34. The final cover drainage system swales and chutes are designed to convey the 25-year peak flow rate.

35. The stormwater outfall locations along the permit boundary remain consistent with the pre-development outfall locations.

36. The 25-year and 100-year discharge rates for post-development conditions would be approximately equal to the pre-development discharge rates.

37. Applicant used the United States Army Corps of Engineers (USACE) HEC-HMS and HEC-RAS computer models to determine and compare pre- and post-development drainage patterns.

38. The HEC-HMS and HEC-RAS models were proper and appropriate under TCEQ rules and "Guidelines for Preparing a Surface Water Drainage Report for a Municipal Solid Waste Facility" (August 2006).

39. The natural drainage conditions at the permit boundary would not be significantly altered by the proposed landfill development

40. A separate stormwater and surface water system has been designed to keep ponded waters that have not come in contact with solid waste at the landfill separated from leachate and contaminated water.

41. While a small area at the southeast corner of the site where Jasper Creek is located would be in the 100-year floodplain of Jasper Creek, that floodplain is not in an area where any construction of improvements or other activities are proposed.

42. The landfill would not significantly alter the 100-year floodplain of Jasper Creek at any location.

43. The landfill is located in an unincorporated area of Jack County and the Federal Emergency Management Agency has not defined the limits of the 100-year floodplain for this part of the county.

44. Applicant properly used USACE HEC-RAS and HEC-HMS models to define the pre- and post-development 100-year floodplain for Jasper Creek.

45. Temporary containment berms would be constructed around the active face to collect and contain surface water that has come into contact with waste.

46. Daily cover and intermediate cover would be placed over filled areas to minimize the area of exposed waste.

47. The containment berms would provide storage for the 25-year, 24-hour storm event.

48. Contaminated water would be transported along with leachate to publicly owned treatment works.

49. Contaminated water would not be discharged into waters of the United States.

50. The Application adequately describes a leachate management plan.

51. Applicant provided adequate information regarding surface water controls, floodplains, drainage route runoff from the facility, and off-site stormwater contamination, including Jasper Creek.

52. Applicant used Abilene rainfall data within the EPA Hydraulic Evaluation of Landfill Performance (HELP) model to evaluate the leachate collection system.

53. Of those cities in the model, Abilene and Dallas are geographically closest to Jacksboro.

54. Dallas has more average annual rainfall than Abilene; however, the Dallas data may actually underestimate the maximum head on the liner.

55. The Abilene rainfall data was an appropriate choice to include in the HELP model.

Groundwater Protection

56. Three principal geologic units underlie the site, which Applicant described as Stratum I (primarily of clay and shale), Stratum II (sandstone and siltstone), and Stratum III (shale and clayey shale).

57. Stratum I has interbeds of sandstone and siltstone identified as Stratum IA.

58. The geologic materials in Stratum IA are discontinuous and uncorrelatable across the site.

59. Applicant would excavate Stratum IA sands almost completely during the landfill's construction.

60. Water is contained at discontinuous points in the Stratum IA sands.

61. Water levels from Stratum IA indicate higher hydraulic heads on the south portion of the site descending to lower heads on the north end of the site.

62. Stratum IA becomes less sandy and primarily clayey on the downgradient north and east sides of the site, preventing lateral migration of groundwater in Stratum IA.

63. Stratum II has interbedded lenses and seams of clay and shale identified as Stratum IIA.

64. Groundwater is present in the sandstones and siltstones of Stratum II.

65. Groundwater generally flows to the north-northeast in Stratum II at about 15 feet per year.

66. Stratum II sandstones and siltstones have hydraulic conductivity ranging from 5.81×10^{-4} to 3.77×10^{-5} cm/sec.

67. Stratum II is the uppermost aquifer underlying the site.

68. Stratum III is correlatable across the site and is the lower confining unit.

69. Stratum III is a reddish-brown to greenish-gray, hard shale and clayey shale with interbedded silty shale and occasional silt parting and is correlatable across the site.

70. Stratum III has a hydraulic conductivity of 4.5×10^{-8} cm/sec

71. Applicant properly evaluated the site stratigraphy.

72. Following the drilling and grouting of the site exploration borings, fourteen piezometers were installed.

73. Eight of these piezometers (A-5, A-20, C-10, D-5, D-20, F-15, F-20, and G-5) were screened in Stratum II.

74. Three piezometers (B-15, D-10S, and D-15) were used to characterize the groundwater in Stratum IA.

75. Three piezometers (D-10C, E-20, and F-10) were screened in the clays and shales of Stratum I to characterize hydraulic head within the upper clay unit.

76. The piezometers were monitored thirteen times during the course of a year, and measurements of water levels were made to within 0.01 feet using an electronic water-level indicator.

77. A total of eleven groundwater monitoring wells are proposed for the site. Nine would be distributed on the north and east boundaries, and Applicant would place them no more than 600 feet apart.

78. The nine wells would be screened in Stratum II at the north and east ends of the site, consistent with Applicant's characterization of the uppermost aquifer and the groundwater flow direction.

79. Two additional wells, one on the south boundary and one on the west boundary, have been proposed in upgradient positions.

80. If any leachate escaped from the sumps at the bottom of the facility, a contaminant would travel through the lower permeability materials in the upper parts of Stratum II and then downward into the more permeable sands of Stratum II.

81. Recharge of groundwater to Stratum II at the site is from the outcrop of Stratum II to the west of the site.

82. Groundwater would move laterally in Stratum II rather than downward into the shale and clay of Stratum III.

83. Stratum IA is not present across the entire site, it occurs in discontinuous lenses of sand, and it would be almost entirely removed during excavation of the site.

84. Liner and Leachate System

85. The composite liner system would have a two-foot-thick compacted soil liner, a 60-mil flexible membrane liner, and a two-foot-thick layer of protective cover.

86. The compacted soil liner, the lower unit of the composite liner system, would have a two-foot-thick layer of relatively homogeneous cohesive materials. The compacted soil liner material would have a plasticity index of at least 15, a liquid limit of at least 30, at least 30% passing the No. 200 sieve, and 100% passing the one-inch sieve.

87. The compacted soil liner would be compacted to at least 95% of the standard Proctor at or above the optimum moisture content and would have a laboratory permeability of 1×10^{-7} cm/sec or less.

88. The leachate system was designed with six-inch diameter pipes in gravel-struck trenches.

89. The leachate collection system could accommodate rainfall in excess of the amounts estimated for Dallas or Abilene.

90. The liner and leachate systems would be adequate to protect against groundwater contamination beneath the site.

Geological Requirements

91. The proposed facility location is near the western edge of the Western Cross Timbers physiographic province that is characteristic of Cretaceous sandstones.

92. The Cretaceous sandstones dip generally to the east and sit atop older Pennsylvanian System sediments such as the Canyon Group.

93. Regional Aquifers

94. The Trinity Aquifer's Twin Mountains Formation of the Cretaceous System is the most important source of groundwater in the region.

95. Site Specific Geology and Subsurface Investigation

96. Applicant's boring plan included 26 bore holes at various points throughout the proposed permit site.

97. Approximately 80% of the borings produced undisturbed core samples.

98. Applicant used wash borings in particular holes after it had determined sediment was consistent in the area.

99. Applicant classified the soils according to the Unified Soil Classification System to aid in the evaluation of the engineering properties of the soils.

100. Applicant performed physical property testing to determine the parameters used in the slope stability, settlement, and heave analyses.

101. Applicant tested the site's physical properties to determine the parameters used in the dewatering system design and to evaluate the onsite material for use as compacted clay liner.

102. The Application includes the required information on soils.

103. No wetlands are present in the landfill area.

104. Applicant conducted a fault study by reviewing aerial photographs of the site, reviewing available geologic literature and maps of the area, conducting site reconnaissance, and examining the subsurface boring data.

105. There was no evidence of surface faulting in the area or any lineament crossing the site.

106. There is no active faulting within 200 feet of the site.

Slope Stability

107. Slope stability calculations were performed to evaluate the stability of the sideslope liner and final cover systems.

108. Soil parameters were selected based on a review of boring logs, laboratory test results, and on engineering judgment and experience with similar materials.

109. The geotechnical evaluation was adequate to ensure the stability of slopes and materials used for sidewalls.

110. The Applicant assumed even lower than average strength values for slopes.

111. Even if the landfill were located in the Pennsylvanian formation, the slope stability analyses would not change.

Land Use Issues

112. The Application included a legal description and surveys of the approximately 652-acre tract of land Applicant owns and upon which it would construct the landfill.

113. The Application included adequate proof of property interests.

114. The Application properly identified the approximately 25 residences within one mile of the proposed landfill site.

115. The land use of the surrounding area is primarily agriculture pasture-land, with some oil and gas development and rural residents.

116. There are no schools, licensed day-care facilities, churches, cemeteries, or recreational areas within one mile of the proposed site.

117. There are no churches within the one mile of the proposed facility.

118. There are no airports or significant business operations nearby.

119. The location does not raise any significant archeological concerns.

120. An unpaved public road, two industrial/commercial facilities, a greenhouse complex, and a new recreational vehicle park are within one mile of the proposed permit boundary.

121. The roads leading to the landfill are adequate without any need for improvement (other than the driveway entrance itself).

122. There are no zoning restrictions or any land-use variances needed for the operation of the landfill.

123. The recorded oil and gas wells within one mile of the site are shown in the Application.

124. No oil and gas wells would be allowed on the landfill.

Wells and Springs

125. The Application identified five water wells within one mile of the permit boundary, two of which are within the permit boundary and not used.

126. For the few wells that Applicant identified, Applicant discussed neither the underlying aquifers nor their recharge zones.

127. Applicant identified 25 residences within one mile of the facility.

128. No regional or area water system is available for those residences.

129. Within one mile of Applicant's property boundaries, there are 46 wells, the majority of which are within one mile of the proposed permit's boundaries.

130. The wells range in depth from about 70 feet below grade to 500 feet, but most are between 100 and 300 feet deep.

131. The shallower wells are likely completed in the Twin Mountains or Trinity aquifer.

132. The deeper, higher yielding wells are consistent with the depth of the Palo Pinto aquifer in the Pennsylvanian formation.

133. Most of the water wells are west and southwest of the site, and Applicant proposed only one monitoring well each for the south and west boundaries.

134. Many of the nearby wells appear to be in the Stratum IA sands.

135. Since monitoring wells will be screened only in Stratum II, there is no system planned to detect contaminants that could travel in the Stratum IA sands.

136. There are more than 20 springs in Jack County, including those that may be particularly impacted by the landfill because of their location in southeastern Jack County.

137. Two springs are about 845 feet north of Applicant's property boundary.

138. Applicant's planned dewatering and excavation of Stratum I and IA may cause local springs and wells to dry up.

Usable Aquifer

139. The Pennsylvanian formation is critically important source of usable groundwater in the vicinity of the landfill; at many locations, there may be no other available water supply resource.

140. The most important water-bearing units in the county are Pennsylvanian age, with minor contributions of groundwater by units of the Trinity Group and alluvium.

141. Within one mile of the landfill site, there are usable amounts of groundwater in the Pennsylvanian formations.

142. Applicant did not adequately describe regional aquifers within the landfill's vicinity based on published and open file sources.

Site Operating Plan

143. The Site Operating Plan (SOP) contains a Fire Protection Plan, which includes Fire Prevention Procedures, General Rules for Fires, Specific Fire-Fighting Procedures, Fire Protection Training, and the TCEQ Notification process.

144. The Jacksboro Fire Department would be charged with responding to fire emergencies at the landfill.

145. The Jacksboro Fire Department has adequate personnel and equipment for fire emergencies.

146. The fire procedures implemented as part of the SOP are in compliance with the TCEQ's published guidance on how to draft SOPs.

147. The SOP contains provisions including prohibiting the open burning of waste, daily covering of newly deposited landfill waste, controlling ponded water, the proper management of leachate and contaminated water, and the use of all-weather roads.

Odors, Dust, and Air Criteria

148. The SOP sections on air criteria, odors, and dust comply with the applicable TCEQ regulations and are adequate to protect against these conditions.

Landfill Gas Management

149. The Landfill Gas Management Plan (LGMP) includes specific monitoring and maintenance procedures and shows the quarterly reporting forms required for the probes and facility structures.

150. The LGMP accounts for and describes response measures and a remediation plan in the event concentrations of methane exceed regulatory limits either within facility structures or at the permit boundary.

151. The design includes a landfill gas venting system as part of the final cover system to prevent excessive pressures from developing under the geomembrane cap.

152. The SOP provides adequate controls for landfill gas.

Vectors and Scavenging

153. The SOP describes measures that would be taken to control vectors such as daily, intermediate, and final cover and compaction, as well as more specific measures such as pesticides.

154. Human salvaging and scavenging would not be permitted.

155. The SOP adequately addresses the prevention and response to human salvaging and scavenging.

156. The SOP provides adequate controls for vectors and human salvaging and scavenging.

Windblown Waste

157. The SOP describes the measures that would be taken to control windblown waste, such as requiring adequate covers on waste transportation vehicles; limiting the size of the active working face; applying daily cover as frequently as needed; erection of litter control fences,; collection of windblown waste; and the utilization of earth berms as needed.

158. The SOP provides adequate controls for windblown waste.

Screening of Prohibited Wastes

159. The SOP outlined in the Application includes a screening program for the detection and prevention of the disposal of prohibited wastes.

160. All incoming loads would be visually monitored at the gatehouse and working face.

161. Site personnel would be properly trained to identify any prohibited wastes, and to perform random inspections and know what to do in the event prohibited wastes are identified.

162. Detection of a prohibited waste would trigger an investigation and appropriate measures.

163. The SOP requires the maintenance of records of load inspection reports and regulated hazardous or PCB waste notifications.

164. Prohibited wastes would be properly segregated, protected against the elements, secured against unauthorized removal, isolated from other waste and activities, and returned to the hauler for proper disposition.

165. The SOP provides adequate controls for screening of prohibited wastes.

Ponded Water

166. The SOP includes procedures for dealing with ponded water, including requiring any ponded water to be removed and the depressions filled as quickly as possible, but no later than seven days after ponding.

167. Because of the site grading and maintenance, ponded water would be minimal.

168. The SOP provides adequate controls for ponded water.

Site Access

169. The SOP would provide adequate controls for site access.

170. The only access point through the perimeter fence would be a gated entrance to the main property, and a gate attendant at the permit boundary.

171. Entry to the active portion of the site would be restricted to designated personnel, approved waste haulers, and properly identified persons whose entry is authorized by site management.

Employee Training

172. The SOP includes provisions related to training employees, including training for record keeping, license requirements, detection, prevention of disposal of prohibited wastes, fire protection and response, site inspection, site safety, site access, and maintenance.

173. The landfill personnel would receive training through a combination of classroom instruction and on-the-job training in procedures relevant to the position for which they are employed.

174. The landfill would have a program for the detection and prevention of the disposal of prohibited wastes, including regulated hazardous and PCB wastes.

175. Site personnel would receive site-specific safety training.

176. In order to enhance site safety, access to the active areas would be limited to authorized personnel and equipment would be kept well-maintained.

177. The SOP would adequately provide for training of employees and guide the facility's day-to-day operations.

Health of Protestants and their Families

178. Because the wells and springs within one mile of the site were not adequately identified and considered, it is not clear whether the landfill would adversely affect the health of the Protestants and their families.

Buffer Zones

179. The landfill design shows the buffer zone from the disposal footprint to the permit boundary to be a minimum distance of 200 feet, which exceeds the TCEQ's applicable regulation requiring a 50-foot buffer.

180. The buffer zones and screening proposed in the Application would be adequate.

Nuisance Conditions

181. The site would have an entrance gate, and appropriate traffic control signs to direct and control traffic.

182. Applicant plans to confine the unloading areas to a minimum size.

183. The SOP has measures to control odors such as prompt landfilling of waste, daily covering of freshly landfilled waste, controlling ponded water, and the proper management of leachate and contaminated water.

184. There would be all-weather access maintenance of all roads, including internal roads, in a reasonably dust-free and liter free condition.

185. The SOP includes provisions for the use of the existing topography and vegetation as site buffers to screen the waste.

186. The site would have a barbed wire perimeter fence.

Transportation

187. The Application includes a discussion of the availability and adequacy of the roads, the volume of vehicular traffic on the access roads, the volume of vehicular traffic generated by the facility, and the proposed entrance road plan.

188. The Application includes a discussion of the driveway permit that would be issued by the Texas Department of Public Safety if the Application is approved.

189. The Application includes adequate transportation information.

Regional Coordination

190. The Nortex Regional Planning Commission has determined that the proposed landfill is compatible with the local Regional Solid Waste Management Plan.

Endangered and Threatened Species

191. Applicant provided the relevant technical data, a mitigation plan, and correspondence with the appropriate state and federal agencies regarding endangered and threatened species.

192. While no threatened or endangered species were observed at the proposed landfill site, because some areas of the landfill could serve as habitat for the Texas horned lizard and the timber rattlesnake, a proactive mitigation plan was developed.

193. The mitigation plan includes appropriate steps to be taken during both during construction and operation of the landfill to protect those species and to relocate the species if an animal is found.

194. Applicant adequately evaluated the presence of and potential for adverse effects of the landfill on endangered and threatened species.

Compliance History

195. Applicant owns and operates multiple waste facilities of various types throughout Texas.

196. Applicant's compliance history reflects an overall "average" classification.

Closure and Post Closure Plans

197. The Application contains evidence of financial responsibility.

198. The financial assurance would be by surety bond to be filed upon issuance of the MSW permit to IESI.

199. The closure and post-closure plans are set out in the Application.

200. Applicant adequately provided for closure and post closure plans and proposed adequate financial assurance.

Permit Term

201. There was no evidence that, if the Application were granted, the permit's term should be other than for the life of the facility.

Transcript Costs

202. All parties had a role in initiating the hearing.

203. A transcript was required because of the length of the hearing.

204. All parties participated substantially in the proceedings and benefitted from having a transcript for use in preparing their briefs.

205. The transcript costs should be assessed 50% to Applicant, 25% to Protestant, and 25% to the City.

CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the disposal of MSW and the authority to consider this permit under TEX. HEALTH & SAFETY CODE ANN. § 361.061.

2. Notice was provided in accordance with TEX. HEALTH & SAFETY CODE ANN. § 361.0665, 30 TEX. ADMIN. CODE (TAC) §§ 39.5 and 39.101, and TEX. GOV'T CODE ANN.§§ 2001.051 and 2001.052.

3. SOAH has jurisdiction to conduct a hearing and to prepare a Proposal for Decision. TEX. GOV'T CODE ANN. § 2003.047.

4. Applicant did not submit a complete permit application, as required by TEX. HEALTH & SAFETY CODE ANN. §§ 361.066 and 361.068 and 30 TAC §§ 330.4(m) and 330.51(b)(1).

5. The application was processed and the proceedings described in this Order were conducted in accordance with applicable law and rules of the TCEQ, specifically 30 TAC § 80.1 *et seq.*, and the SOAH, specifically 1 TAC § 155.1 *et seq.*, and Subchapter. C of the TEX. HEALTH & SAFETY CODE ANN. Ch. 361.

6. The Application does not meet all requirements of the Solid Waste Disposal Act, TEX. HEALTH & SAFETY CODE ANN. Ch. 361 and 30 TAC Ch. 330.

7. Transcript costs should be assessed 50% to Applicant, 25% to the City, and 25% to Protestant.

8. Based on the foregoing Findings of Fact and Conclusions of Law, the TCEQ Permit No. 2332 for a municipal solid waste landfill should be denied.

NOW, THEREFORE, BE IT ORDERED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, IN ACCORDANCE WITH THESE FINDINGS OF FACT AND CONCLUSIONS OF LAW THAT:

1. The Application of IESI TX Landfill L.P. for Permit No. MSW-2332 is denied

2. Transcript costs will be paid 50% by Applicant, 25% by the City, and 25% by Protestant.

3. The Chief Clerk of the Commission shall forward a copy of this Order to all parties.

4. All other motions, requests for specific Findings of Fact or Conclusions of Law, and other requests for general and specific relief, if not expressly granted, are denied for want of merit.

5. If any provision, sentence, clause, or phrase of this Order is for any reason held to be invalid, the invalidity of any portion shall not affect the validity of the remaining portions of this Order.

6. The effective date of this Order is the date the Order is final, as provided by 30 TAC § 80.273 and TEX. GOV'T CODE ANN. § 2001.144.

ISSUED:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

_____

Buddy Garcia, Chairman

For the Commission