State Office of Administrative Hearings

Cathleen Parsley
Chief Administrative Law Judge

March 4, 2009

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

Re: SOAH Docket No. 582-08-0690; TCEQ Docket No. 2007-1178-MWD; In the Matter of the Application by Lerin Hills, Ltd. for Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0014712001

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 March 24, 2009. Any replies to exceptions or briefs must be filed in the same manner no later than April 3, 2009.

This matter has been designated **TCEQ Docket No. 2007-1178-MWD; SOAH Docket No. 582-08-0690**. 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,

Shannon Kilgore
Administrative Law Judge

SK/ap
Enclosures
cc: Mailing List

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: **LERIN HILLS, LTD**

SOAH DOCKET NUMBER: **582-08-0690**

REFERRING AGENCY CASE: **2007-1178-MWD**

STATE OFFICE OF ADMINISTRATIVE HEARINGS	**ADMINISTRATIVE LAW JUDGE** **ALJ SHANNON KILGORE**
REPRESENTATIVE / ADDRESS	**PARTIES**
DOCKET CLERK TEXAS COMMISSION ON ENVIRONMENTAL QUALITY OFFICE OF THE CHIEF CLERK PO BOX 13087 AUSTIN, TX 78711 (512) 239-3300 (PH) (512) 239-3311 (FAX)	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
GARRETT ARTHUR STAFF ATTORNEY TEXAS COMMISSION ON ENVIRONMENTAL QUALITY OFFICE OF PUBLIC INTEREST COUNSEL MC-175 P.O. BOX 13087 AUSTIN, TX 78711-3087 (512) 239-5757 (PH) (512) 239-6377 (FAX)	OFFICE OF PUBLIC INTEREST COUNSEL
DAVID O FREDERICK LOWERRE, FREDERICK, PERALES, ALLMON & ROCKWELL 707 RIO GRANDE, SUITE 200 AUSTIN, TX 78701 (512) 469-6000 (PH) (512) 482-9346 (FAX)	RICK WOOD

KATHY HUMPHREYS
ATTORNEY
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087, MC-175
AUSTIN, TX 78711-3087
(512) 239-3417 (PH)
(512) 239-0606 (FAX)

EXECUTIVE DIRECTOR

DANNY G WORRELL
ATTORNEY
BROWN MCCARROLL, L.L.P.
111 CONGRESS, SUITE 1400
AUSTIN, TX 78701
(512) 479-1151 (PH)
(512) 479-1101 (FAX)

LERIN HILLS, LTD.

---

xc: Docket Clerk, State Office of Administrative Hearings

SOAH DOCKET NO. 582-08-0690
TCEQ DOCKET NO. 2007-1178-MWD

IN THE MATTER OF THE	§	BEFORE THE STATE OFFICE
APPLICATION BY	§	
LERIN HILLS, LTD.	§	OF
FOR TEXAS POLLUTANT DISCHARGE	§	
ELIMINATION SYSTEM (TPDES)	§	
PERMIT NO. WQ0014712001	§	ADMINISTRATIVE HEARINGS

TABLE OF CONTENTS

SOAH DOCKET NO. 582-08-0690
TCEQ DOCKET NO. 2007-1178-MWD

IN THE MATTER OF THE	§	**BEFORE THE STATE OFFICE**
APPLICATION BY	§	
LERIN HILLS, LTD.	§	**OF**
FOR TEXAS POLLUTANT DISCHARGE	§	
ELIMINATION SYSTEM (TPDES)	§	
PERMIT NO. WQ0014712001	§	**ADMINISTRATIVE HEARINGS**

PROPOSAL FOR DECISION

Lerin Hills, Ltd. (Lerin Hills or Applicant) has applied to the Texas Commission on Environmental Quality (TCEQ or Commission) for Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0014712001. The permit would authorize the discharge of treated wastewater effluent from a new proposed municipal wastewater facility that would be located in Kendall County, approximately four miles west of the City of Boerne. The Commission referred the application to the State Office of Administrative Hearings (SOAH) for a contested case hearing on seven specific issues.[1] The Administrative Law Judge (ALJ) recommends that the application be denied because Lerin Hills has failed to prove that the draft permit and proposed discharge would satisfy the requirements of the Commission's antidegradation rule.

I. PROCEDURAL HISTORY

Lerin Hills filed its application for a new TPDES permit on May 3, 2006. The Commission's Executive Director (ED) declared the application administratively complete on May 26, 2006. The ED completed the technical review of the application and prepared an initial draft permit. The application was declared technically complete on August 16, 2006. The combined Notice of Application and Preliminary Decision and Public Meeting was published on September 22, 2006. A public meeting was held October 24, 2006, in Boerne. Following receipt of several requests for a contested case hearing, the Commission referred this matter to SOAH on October 24, 2007.

---

[1] While Lerin Hills has also applied for, and received preliminary authorization for, a permit for use of reclaimed water under Chapter 210 of the Commission's rules, *see* Tr. at 706-707, all referred issues in this case relate solely to the application for the TPDES permit.

The Commission established a nine-month deadline for the proposal for decision (from the date of the preliminary hearing), and referred seven issues:

A. Whether the proposed discharge will be in compliance with regulations that are intended to protect groundwater and surface water;

B. Whether the effluent limitations in the draft permit are protective of water quality and the designated uses of the receiving streams;

C. Whether the permit would authorize Applicant to discharge the appropriate amount of wastewater based on the service area projections;

D. Whether the proposed facility would comply with the siting requirements in 30 Texas Administrative Code § 309.12;

E. Whether the facility will meet the rule requirements intended to reduce nuisance odor conditions;

F. Whether Applicant's compliance history is such that the permit should not be issued; and

G. Whether Other Requirement No. 1 and Operational Requirement No. 4[2] of the draft permit with regard to plant operator and safety requirements are sufficient to ensure compliant plant operations.

The preliminary hearing was held on January 8, 2008, in Austin. After determining that proper notice had been given and that the Commission and SOAH have jurisdiction over this matter, the ALJ designated the following parties: Lerin Hills, represented by Danny Worrell and Jackson Battle; the ED, represented by Kathy Humphreys and Tim Reidy; the Commission's Office of Public Interest Counsel (OPIC), represented by Amy Swanholm; and protesting party Rick Wood, represented by David Frederick and Eric Allmon.

The hearing on the merits was held in Austin on November 18, 19, and 20, 2008.[3] The record closed on January 12, 2009, with the submission by the parties of their final closing arguments.

---

[2] The draft permit is at Exhibits LH-1C and ED-8.

II. PROPOSED FACILITY AND DRAFT PERMIT CONDITIONS

The proposed wastewater treatment facility would serve a new development, and would be located approximately 4 miles west of Interstate 10, as measured along State Highway 46, and then approximately 200 feet due west from that point. The draft permit would authorize the discharge of treated domestic wastewater at a daily average flow not to exceed 0.18 million gallons per day (MGD) in the Interim I Phase, 0.36 MGD in the Interim II Phase, and 0.5 MGD in the Final Phase.[4]

The effluent would discharge into an unnamed tributary, then approximately 0.5 mile to the headwaters of an impoundment on Deep Hollow Creek (the SCS impoundment)[5], then to Deep Hollow Creek, then to Frederick Creek, then to Upper Cibolo Creek in Segment No. 1908 of the San Antonio River Basin.[6] The immediate receiving stream, the unnamed tributary, is presumed intermittent due to its minimal watershed and steep gradient; the Lerin Hills discharge would probably comprise the total flow in the creek most of the time.[7] Deep Hollow Creek is an intermittent stream[8] and has an estimated low flow of 0.1 cubic feet per second (cfs).[9] There is a pond on Deep Hollow Creek upstream of where the discharge route enters the creek. There is a pond (the Hahnfeld pond) downstream of the SCS pond, prior to the confluence of Deep Hollow Creek

---

[3] The hearing originally convened on June 30, 2008. On that date, at the outset of the hearing, the parties broke for negotiations and announced that they had reached an agreement in principle. The hearing was therefore abated. On August 29, 2008, the parties informed the ALJ that their negotiations had failed to yield a final settlement, and they then proposed a hearing schedule, which the ALJ adopted. The parties waived the deadline established by the Commission for the completion of the hearing process.

[4] The daily average flow amounts are based on flow amounts determined on at least four separate days within a calendar month.

[5] The SCS impoundment is also sometimes referred to in the record as the "Webster Pond."

[6] Frederick Creek joins Upper Cibolo Creek approximately seven miles downstream from the proposed discharge point.

[7] Exhibit ED-5 at 4.

[8] Exhibit LH-4 at 7-8 (Price testimony).

[9] Exhibit ED-5 at 4, 8.

with Frederick Creek; this pond is used by Mr. Wood and his family for swimming and fishing.[10] The parties dispute whether the proposed discharge site is in the contributing zone of the Edwards Aquifer.

The plant would be an activated sludge process plant operated in the complete mix mode with nitrification. Treatment units would include bar screens, aeration basins, final clarifiers, aerobic sludge digesters, sand filters, and chlorine contact chambers. According to Lerin Hills, the proposed wastewater treatment process described in the permit application will be modified to include coagulant addition facilities to precipitate phosphorus upstream of the clarifier and dechlorination facilities prior to discharge.[11]

The draft permit includes the following daily average effluent limitations: 5 milligrams per liter (mg/L) 5-day carbonaceous biochemical oxygen demand (CBOD), 5 mg/L total suspended solids (TSS), 1 mg/L ammonia nitrogen (NH_3-N),[12] 0.5 mg/L total phosphorus (P),[13] and 6.0 mg/L minimum dissolved oxygen (DO).[14] The draft permit also requires reporting of nitrate-nitrogen and total nitrogen levels.

The draft permit also includes requirements that the effluent be dechlorinated and that sludge be taken to a recycling center wastewater treatment facility for disposal. TCEQ staff added these requirements in response to public comments.

---

[10] The "Hahnfeld pond" is on the "Hahnfeld property," which is owned by Mr. Wood's relatives but used by Mr. Wood and his wife and children. Mr. Wood lives on property adjacent to the Hahnfeld property. Mr. Wood's home, unlike the Hahnfeld property, is not directly on Deep Hollow Creek.

[11] Exhibit LH-1 at 5 (Harris testimony); Tr. at 429-430 (Knowles testimony).

[12] Expressed in pounds, the limit is 4.2 pounds per day (lbs/day).

[13] Expressed in pounds, the limit is 2.1 lbs/day.

[14] The daily average concentration is the average of at least four separate representative measurements within a calendar month. According to the ED, the permit parameters were developed to be protective at low flow conditions, when little or no ambient flow is occurring in the receiving stream. Exhibit ED-5 at 28.

III. BURDEN OF PROOF

Applicant has the burden to prove that the proposed discharge permit will comply with the applicable statutes and rules regarding wastewater discharges into or adjacent to the waters of the State.[15]

IV. ISSUE A: COMPLIANCE WITH REGULATIONS INTENDED TO PROTECT GROUNDWATER AND SURFACE WATER
ISSUE B: PROTECTION OF WATER QUALITY AND DESIGNATED USES

Because the first and second issues referred by the Commission have substantial overlap, the ALJ considers them together. The chief contested issue in this case with respect to water quality protection is nutrient loading, and its potential to cause excessive algal and aquatic plant growth and lowered DO in surface water, and detrimental effects on groundwater. [16]

A. Protection of Surface Water

1. TCEQ Regulations and Implementation Procedures

Chapters 307 (Texas Surface Water Quality Standards) and 309 (Domestic Wastewater Effluent Limitations and Plant Siting) of the Commission's rules establish the regulatory framework for protection of surface water quality in the permitting of domestic wastewater treatment plants.[17] The issue of nutrient loading is properly analyzed with reference to the requirements of Chapter 307 concerning designated uses of water bodies, instream water quality standards, and the Commission's policy concerning antidegradation.[18]

---

[15] 30 TEX. ADMIN. CODE § 80.17(a).

[16] The discussion in this Proposal for Decision focuses on matters that actually generated controversy in the hearing process.

[17] 30 TEX. ADMIN. CODE chs. 307 and 309.

[18] Contested issues under Chapter 309 are addressed under the discussions below of groundwater protection and of issues D and E referred by the Commission.

Designated uses and numerical and narrative criteria. Section 307.4 sets forth the general criteria for waste discharges, including aesthetic parameters, toxic substances, nutrients, aquatic life uses and dissolved oxygen (DO), aquatic life uses and habitat, and aquatic recreation. In particular, § 307.4(b) states, "Surface waters shall be maintained in an aesthetically attractive condition." Section 307.4(e) provides, "Nutrients from permitted discharges or other controllable sources shall not cause excessive growth of aquatic vegetation which impairs an existing, attainable, or designated use."

Further, § 307.4(h) provides, "Dissolved oxygen concentrations shall be sufficient to support existing, designated, and attainable aquatic life uses." As noted above, the immediate receiving stream for the proposed Lerin Hills facility has been deemed by TCEQ staff as an unclassified receiving water with contact recreation but no significant aquatic life uses; the corresponding DO requirement as determined by the ED is 2.0 mg/L.[19] The SCS impoundment on Deep Hollow Creek, Deep Hollow Creek itself, and Frederick Creek have been designated for contact recreation and high aquatic life uses, and the designated uses for Upper Cibolo Creek Segment No. 1908 are high aquatic life uses, public water supply, aquifer protection, and contact recreation; TCEQ staff has established a DO minimum standard of 5.0 mg/L for all of these water bodies.[20]

Section 307.4(i) states, "Vegetative and physical components of the aquatic environment will be maintained or mitigated to protect aquatic life uses." And § 307.4(j) provides, "Existing, designated, and attainable uses of aquatic recreation will be maintained, as determined by criteria that indicate the potential presence of pathogens."

---

[19] Exhibit ED-9 at 6 (Schaefer testimony).

[20] Exhibit ED-9 at 6 (Schaefer testimony); Exhibit ED-12; Tr. at 547. Segment No. 1908 of Upper Cibolo Creek is the only classified stream segment in the proposed Lerin Hills discharge route. A "classified" water body is one that corresponds to a segment number and name as described in Appendix A of the Texas Surface Water Quality Standards. 30 TEX. ADMIN. CODE § 307.10; Exhibit ED-9 at 14. Appendix A indicates the uses and numerical criteria applicable to each classified stream segment. When TCEQ has before it a matter affecting a particular unclassified water body, such as a pending waste discharge application, the characteristics of the affected water body are reviewed by the agency to determine which uses are appropriate. 30 TEX. ADMIN. CODE § 307.4(l).

Antidegradation. The Commission's antidegradation rule, § 307.5, establishes a multi-tiered policy. Only two tiers are applicable to the Lerin Hills application. Tier 1 review, performed by TCEQ staff on all new and renewal permit applications, provides that existing uses and water quality sufficient to protect those uses will be maintained.

Tier 2 review is applicable only where the background level of water quality exceeds that necessary for a water body to be fishable and swimmable.[21] Tier 2 provides:

> No activities subject to regulatory action which would cause degradation of waters which exceed fishable/swimmable quality will be allowed unless it can be shown to the commission's satisfaction that the lowering of water quality is necessary for important economic or social development. Degradation is defined as a lowering of water quality by more than a de minimis extent, but not to the extent that an existing use is impaired. Water quality sufficient to protect existing uses will be maintained. Fishable/swimmable waters are defined as waters which have quality sufficient to support propagation of indigenous fish, shellfish, and wildlife and recreation in and on the water.[22]

Determinations about whether water bodies exceed fishable and swimmable quality, and about whether a proposed activity will impair existing uses or degrade water quality, are to be made in accordance with procedures set out in the standards implementation procedures.[23]

The standards implementation procedures – "Procedures to Implement the Texas Surface Water Quality Standards"[24] – provide guidance concerning the execution of the Commission's antidegradation policy.[25] According to these implementation procedures (also known as "IPs"),

---

[21] 30 TEX. ADMIN. CODE § 307.5(c)(2)(b)

[22] 30 TEX. ADMIN. CODE § 307.5(b)(2).

[23] 30 TEX. ADMIN. CODE § 307.5(c). The rule goes on to say that authorized discharges will not lower water quality to a point that Texas surface water quality standards will be violated. 30 TEX. ADMIN. CODE § 307.5(b)(4). And, the anti-degradation rule states that anyone discharging wastewater which would constitute a new source of pollution will be required to provide a level of wastewater treatment consistent with the provisions of the Texas Water Code and the federal Clean Water Act. 30 TEX. ADMIN. CODE § 307.5(b)(5).

[24] Exhibit ED-11.

[25] Anti-degradation is addressed in Exhibit ED-11 at 23-37.

Tier 1 review ensures that designated uses and numerical and narrative criteria established pursuant to chapter 307 of the Commission's rules will be met. Therefore, the uses established by TCEQ staff for each affected stream segment (*e.g.*, contact recreation, high aquatic life uses, aquifer protection, or public water supply), as well as numerical criteria (*e.g.*, for DO), plus narrative criteria (*e.g.*, for aesthetics, nutrients, DO necessary to protect aquatic life, aquatic life habitat, and aquatic recreation) must all be protected under Tier 1 review.

The IPs specifically address Tier 1 review for discharges that will affect water bodies listed on the "303(d) list" as not meeting instream water quality standards.[26] The IPs state that permits for discharges to listed water bodies will not allow:

- an increase in the loading of a listed pollutant that will cause or contribute to the violation of water quality standards; or
- other conditions that will cause or contribute to the violation of water quality standards.[27]

Specifically with respect to DO, the IPs provide that effluent limitations will be established to avoid an increase in BOD loading unless it is demonstrated that water quality standards for DO will be attained in the affected area or the proposed discharge will not lower instream concentrations of DO in areas that are not meeting DO standards.

The IPs clarify that water bodies that exceed fishable/swimmable quality generally include those with presumed uses of contact recreation and high aquatic life uses. Parameters of concern for purposes of Tier 2 review include, *inter alia*, those for DO and nutrients (phosphorus and nitrogen). The IPs state that the potential for the degradation of water quality involves comparing the effect of

---

[26] Segment No. 1908 was listed by TCEQ staff for "depressed dissolved oxygen" on the Texas Inventory of Impaired and Threatened waters (also known as the "Clean Water Act § 303(d) list" or "303(d) list") for 2002 and 2004. However, Segment No. 1908 has since been de-listed. Exhibit ED-3 at 2; Exhibit ED-15; Exhibit ED-12; and Exhibits LH-9 through LH-11. Subsegment 02 of Segment No. 1908 is presently listed in connection with bacteria levels. Exhibit LH-11. However, as discussed below, the evidence indicates that subsegment 02 is upstream from the confluence of Frederick Creek and Upper Cibolo Creek, and is therefore not in the discharge route.

[27] Exhibit ED-11 at 26.

the proposed discharge to baseline water conditions as of November 28, 1975. The baseline conditions are estimated from current conditions, unless there is information indicating that ambient water quality has degraded since 1975.[28]

For constituents like nutrients (for which there are no numerical criteria in the water quality standards) and for minimal DO, the IPs offer little further guidance about analyzing the potential for degradation; the only guidance is in the form of lists of short hypothetical factual scenarios entitled, "Examples Where Degradation is Unlikely to Occur" and "Examples Where Degradation is Likely to Occur."[29] Two of the "unlikely" scenarios are relevant to this case:

- Increased loading of oxygen-demanding materials – if the dissolved oxygen in the "sag zone"[30] is lowered by less than 0.5 mg/L from baseline instream concentrations, and if the potentially affected aquatic organisms are not unusually sensitive to changes in DO; and

- Increased loading of total phosphorus, nitrate, or total nitrogen – if it can be reasonably demonstrated that detrimental increases to the growth of algae or aquatic vegetation will not occur.[31]

In addition, the "likely" scenarios include:

- Increased loading of oxygen-demanding substances that is projected to decrease dissolved oxygen by more than 0.5 mg/L for a substantial distance in a water body that has exceptional quality aquatic life and a relatively unique and potentially sensitive community of aquatic organisms; and

- Increased loading of phosphorus and/or nitrogen into a reservoir that supplies public drinking water, if that loading would result in significant elevations in algae or potentially detrimental aquatic vegetation over a substantial area.[32]

---

[28] Exhibit ED-11 at 31.

[29] Exhibit ED-11 at 32-34.

[30] The "sag zone" or "DO sag" is the dip in the DO level of the receiving stream that occurs at the point of discharge to some point downstream where oxygen-consuming constituents have decreased and the DO level has come back up to the normal ambient level. Tr. at 589-590 (Schaefer testimony).

[31] Exhibit ED-11 at 33.

[32] Exhibit ED-11 at 34.

Finally, the IPs briefly address the evaluation of alternatives and economic justification in cases in which degradation of water quality will be expected.[33]

2. Evidence

ED's Witnesses

Peter Schaefer, an aquatic scientist with TCEQ's Water Quality Division, performed the antidegradation review for the Lerin Hlls application. Mr. Schaefer explained that Tier 2 review would apply to all of the discharge route for the Lerin Hills project, except for the immediate receiving stream – the intermittent, unnamed tributary that enters Deep Hollow Creek.[34] In his prefiled testimony, he stated that in the context of a Tier 2 review, degradation would be a decrease, by more than a *de minimis* extent, in water quality, but not to the extent that an existing use is impaired. He defined a "*de minimis*" decrease as one that is less than noticeable.[35] Noticeability could mean visible, or ascertainable by instruments.[36]

He stated that initially, some algal growth resulting from the Lerin Hills discharge could occur. Continued sustained growth would depend on "the limiting nutrient,[37] species of algae present, temperature, light, time of day, flow, background concentrations, presence of chlorine, turbidity, suspended solids, micronutrients or any combination thereof."[38] According to Mr. Schaefer, an increase in algal growth would not necessarily mean that the receiving water had been degraded. Any change in water chemistry would have to be greater than *de minimis* to be

---

[33] Exhibit ED-11 at 34-35.

[34] Tr. at 579 (Schaefer testimony).

[35] Exhibit ED-9 at 11 (Schaefer testimony).

[36] Tr. at 578 (Schaefer testimony).

[37] Deep Hollow Creek is considered "phosphorus-limited," in that phosphorus scarcity is what limits the growth of aquatic plants in the creek. Tr. at 576, 613 (Schaefer testimony).

[38] Exhibit ED-9 at 12 (Schaefer testimony).

considered degradation under Tier 2 review. Mr. Schaefer alluded to, but did not discuss, the examples in the IPs of scenarios demonstrating likely and unlikely degradation.[39]

At hearing, Mr. Schaefer testified that a Tier 1 review antidegradation ensures that existing uses will be maintained, and Tier 2 goes further and ensures no degradation beyond a *de minimis* extent.[40] However, in his discussion of Tier 2 review, he also alluded to the maintenance of uses -- saying that Tier 2 review determines whether or not fishability and swimmability would be degraded by more than a *de minimis* extent.[41] He went on to say that, even if the proposed discharge were to result in a noticeable increase in the growth of algae and macrophytes, he expected that there would be no greater than *de minimis* degradation of the fishability and swimmability of the receiving waters, such as the Hahnfeld pond.[42] He went on to say that he had no reason to believe that the Lerin Hills discharge would cause the Hahnfeld pond to be choked with vegetation.[43]

In his prefiled testimony, Mr. Schaefer stated that his Tier 1 review yielded a determination that existing water quality uses would not be impaired by the Lerin Hills project. As for the Tier 2 review, Mr. Schaefer's prefiled testimony said that, with the addition of a total phosphorus limit of 0.5 mg/L, there would be no significant degradation of the high aquatic life uses of impounded Deep Hollow Creek and Deep Hollow Creek.[44] In contrast, Mr. Schaefer testified at hearing that the phosphorus limitation was necessary in order for the Lerin Hills application to satisfy Tier 1 review.[45]

---

[39] Exhibit ED-9 at 13 (Schaefer testimony).

[40] Tr. at 548-549 (Schaefer testimony).

[41] Tr. at 551 (Schaefer testimony).

[42] Tr. at 551-552 (Schaefer testimony). Mr. Schaefer clarified that there could be degradation of the water even if it were possible to catch a fish in it or swim in it. Tr. at 576-577 (Schaefer testimony).

[43] Tr. at 608 (Schaefer testimony).

[44] Exhibit ED-9 at 9-10 (Schaefer testimony). *See also* Exhibit ED-12.

[45] Tr. at 549 (Schaefer testimony).

Mr. Schaefer stated that he added an effluent limit for phosphorus because Deep Hollow Creek, including the SCS impoundment, is a clear hill country water body with limited assimilative capacity for nutrients.[46] The reporting requirements for nitrate-nitrogen and total nitrogen would provide additional protection, allowing the TCEQ to impose additional permit requirements in the future if necessary.[47] About 17 to 20 mg/L total nitrogen is what one might expect in the effluent of a wastewater discharge plant.[48]

According to Mr. Schaefer, the 0.5 mg/L phosphorus limitation is adequately protective, and a lower limitation is not necessary.[49] He could not say whether a limitation of 1.0 mg/L would be sufficient.[50] While the permit would allow the discharge of 2.1 pounds of phosphorus per day, or over 700 pounds per year, the agency staff determined that this would not be too much; according to Mr. Schaefer, staff looked at other discharge permits that discharge to clear hill country streams and how the permit limits or lack of limits have affected those streams.[51] However, he stated that staff had not actually performed any before-and-after comparative analyses.[52] He does not know the assimilative capacity of Deep Hollow Creek for phosphorus, which would vary over time.[53] He stated that, with respect to other nutrients, like total nitrogen, staff had likewise determined that there would be no detrimental increases in algal or aquatic vegetation growth, based on staff's experience with other discharges into hill country streams. However, staff had not compiled such information about other discharges.[54]

---

[46] Exhibit ED-9 at 13 (Schaefer testimony). Indeed, he stated that Frederick Creek and Cibolo Creek are also clear hill country water bodies with little assimilative capacity. Tr. at 567 (Schaefer testimony).

[47] Exhibit ED-9 at 14 (Schaefer testimony).

[48] Tr. at 571-572 (Schaefer testimony).

[49] Tr. at 552 (Schaefer testimony).

[50] Tr. at 552 (Schaefer testimony).

[51] Tr. at 582 (Schaefer testimony).

[52] Tr. at 582 (Schaefer testimony).

[53] Tr. at 585, 602 (Schaefer testimony).

[54] Tr. at 591 (Schaefer testimony).

As to the scenario in the IPs stating that a DO sag of less than 0.5 mg/L might mean that degradation is unlikely, Mr. Schaefer testified that he did not look at the DO sag indicated by the modeling. Staff only uses the modeling to indicate whether numerical water quality standards will be met, and does not employ the modeling in the antidegradation review.[55]

With respect to upper Cibolo Creek, Mr. Schaefer stated that he did not attempt to establish 1975 baseline conditions against which to compare future conditions after commencement of the proposed discharge.[56]

Mary Ann Airey, an engineer with TCEQ's Water Quality Division, testified that the effluent limitations in the draft permit for TSS, BOD, ammonia nitrogen, and total phosphorus are more stringent than in most domestic wastewater permits in Texas.[57] She stated that most such permits do not include any limit for total phosphorus, and most limits for total phosphorus are based on a daily average of 1.0 mg/L (as opposed to the 0.5 mg/L limitation in the Lerin Hills draft permit).[58] The ED believes that the stringent permit limits will ensure that all numerical and narrative criteria in the Texas Water Quality Standards will be met, including those designed to protect contact recreation and high aquatic life uses.[59] Ms. Airey did acknowledge that the ED has prepared a draft permit for a facility in Hays County that includes a total phosphorus limit of 0.15 mg/L.[60]

The ED's Statement of Basis/Technical Summary and Executive Director's Preliminary Decision concerning the Lerin Hills application states:

> [A]n antidegradation review was performed. Upper Cibolo Creek Segment No. 1908 has been listed in the 2002 305(b) Texas Water Quality Inventory for nutrient

---

[55] Tr. at 587-588 (Schaefer testimony).

[56] Tr. at 564, 566-567 (Schaefer testimony).

[57] Exhibit ED-1 at 15; Tr. at 491.

[58] Exhibit ED-1 at 15 (Airey testimony).

[59] Exhibit ED-5 at 25-26.

[60] Tr. at 517-519 (Airey testimony).

> enrichment concerns for Orthophosphorus.[61] Additionally, the segment is also listed on the 2002 303(d) List of Impaired Waterbodies for depressed dissolved oxygen.[62] To help preclude degradation and more closely monitor wastewater, an effluent limit of 0.5 mg/L Total Phosphorus and monitoring requirements for Nitrate-Nitrogen and Total Nitrogen are required in the draft permit. With the incorporation of these requirements in the draft permit, the Water Quality Standards Team has preliminarily determined that no significant degradation of high quality waters is expected and that existing uses will be maintained and protected.

Charles Marshall is a modeling and assessment specialist with the TCEQ's Division. He evaluates the effects of wastewater discharges on DO levels in receiving streams, and recommends permit limits on DO-demanding constituents. He performs modeling, using a program called "QUAL-TX," to arrive at permit limitations that will maintain a predetermined DO criterion. According to Mr. Marshall, the QUAL-TX model predicts instream DO concentrations that can be adjusted by changing the effluent limits for oxygen-demanding constituents. He stated that QUAL-TX is the "preeminent dissolved oxygen model in the State of Texas."[63]

Mr. Marshall's Lerin Hills modeling for DO was done in June 2006.[64] It assumed headwater flow of 0.1 cfs in Deep Hollow Creek and effluent flow of 0.5 MGD.[65] It also assumed background DO of 6.45 mg/L at the point of discharge.[66] His memo reporting his modeling results states:

---

[61] This listing is still in effect for subsegment 01 of Segment No. 1908, on the draft 2008 305(b) inventory. Exhibit RW-9; Tr. at 609-610 (Schaefer testimony about draft status of 2008 list). Orthophosphorus is the form of phosphorus that is biologically available to be used by aquatic organisms. Tr. at 571 (Schaefer testimony). Subsegment 01 is also listed for having concerns related to "impaired habitat." Exhibit RW-9.

Also, subsegment 02 of Segment No. 1908 is presently listed as having concerns related to ammonia. Exhibit RW-9. Ms. Airey testified that it appears subsegment 02 is upstream of the confluence of Frederick Creek and Upper Cibolo Creek, and therefore not in the discharge route. Tr. at 537-538 (Airey testimony); see also Tr. at 413 (Slade testimony).

According to Mr. Schaefer, the 305(b) list concerns waters that might become impaired, as opposed to waters listed on the 303(d) list, which generally are already deemed impaired. Tr. at 555, 605-606 (Schaefer testimony).

[62] The listing of Segment No. 1908 on the 303(d) list for dissolved oxygen is no longer in effect. Exhibits LH-10 and LH-11.

[63] Exhibit ED-13 at 4 (Marshall testimony).

[64] The modeling outputs are at Exhibit RW-12. For the correlation between reach and element numbers in the modeling with geographic points in the receiving stream, *see* Exhibit RW-11.

[65] Exhibit ED-15. Effluent flow of 0.5 MGD is the same as 0.775 cfs. The 0.1 cfs headwater flow is the minimum assigned to perennial creeks in the State of Texas. Exhibit ED-13 at 6 (Marshall testimony).

> Based on model results, the proposed effluent set of 5 mg/L $CBOD_5$, 1 mg/L NH_3-N, and 6 mg/L DO, is adequate to ensure that the dissolved oxygen level will be maintained above the criterion established by the Standards Team for Deep Hollow Creek (5.0 mg/L).[67]

As to Segment No. 1908 of Upper Cibolo Creek, which at the time of Mr. Marshall's evaluation was on the 303(d) list for depressed dissolved oxygen, modeling indicated that the concentration of these constituents in Lerin Hills' discharge would achieve background levels before entering the impaired portion of Upper Cibolo Creek.[68] Mr. Marshall's memo went on to say that recent sampling results had led to a preliminary decision to de-list the dissolved oxygen impairment from Segment 1908 on the draft 303(d) list.[69]

Comparing his DO modeling to that of James Miertschin, Ph.D., who performed modeling on behalf of Applicant, Mr. Marshall noted that he had used an initially higher DO concentration at the point of discharge than had Dr. Miertschin. Dr. Miertshcin used 6.25 mg/L for the DO input at the point of discharge, in contrast with Mr. Marshall's 6.45 mg/L.[70] Paradoxically, in the SCS impoundment, Mr. Marshall's modeling predicted a *lower* DO sag at 5.03 mg/L, compared to the DO sag at 5.27 mg/L in Dr. Miertschin's.[71] Mr. Marshall was not sure why his modeling produced a lower DO sag, other than to surmise it might be due to some additional details about the impoundment that Dr. Miertschin added in his model.[72] Mr. Marshall acknowledged that, had he

---

[66] Tr. at 634-635 (Marshall testimony).

[67] Exhibit ED-15.

[68] Exhibit ED-15. In his Response to Public Comment on the Lerin Hills application, the ED stated that, given the 7-mile distance between the discharge point and Segment No. 1908 of Cibolo Creek, "dissolved oxygen impacts to Segment 1908 from this discharge will be non-existent." Exhibit ED-5 at 11.

[69] Exhibit ED-15. As noted above, Segment No. 1908 has indeed been de-listed for dissolved oxygen. Mr. Marshall also testified that Segment No. 1908 is currently on the 303(d) list for bacteria, but this fact does not affect his DO analysis. Exhibit ED-13 at 5 (Marshall testimony).

[70] Mr. Marshall testified that in his analysis, he started with a standard default DO of 6.0 mg/L upstream in Deep Hollow Creek, but the model added oxygen through aeration, making the DO at the point of discharge 6.45 mg/L. Tr. at 635-636 (Marshall testimony).

[71] Exhibit ED-13 at 4-5; Tr. at 636-637 (Marshall testimony).

[72] Exhibit ED-13 at 4; Tr. at 637 (Marshall testimony).

used the lower DO input at the point of discharge, his prediction of the DO sag in the SCS impoundment would probably have been lower as well.[73]

Mr. Marshall stated that TCEQ staff usually does not employ the algae or phosphorus subroutines in the model; the algae subroutine does not seem very reliable, and use of both could overestimate DO.[74] He also indicated that there might be problems associated with the QUAL-TX Chlorophyll A subroutine.[75] He stated that in his June 2006 DO modeling, he did not activate any options for inclusion of phosphorus or nonconservative material.[76] Mr. Marshall testified that the model does not reflect diurnal fluctuations in DO; DO tends to go down at night because there is no sunlight to cause photosynthesis.[77] He further acknowledged that the model assumes linear downstream flow, even in reservoirs, when the flow patterns in reservoirs may in fact be more complicated.[78]

In addition to the DO modeling, Mr. Marshall performed a second, unusual modeling exercise at Mr. Schaefer's request.[79] Mr. Schaefer wanted modeling of the likely concentration of nitrate-nitrogen in the receiving stream. The modeling was done in February 2007. Using the QUAL-TX model's "nonconservative" option, Mr. Marshall modeled the concentration change of a constituent that started at 20 mg/L at the discharge point to see what concentrations might be expected, given a particular decay rate, at various points downstream.[80] Mr. Marshall used a decay rate of 0.14 per day, supplied by Mr. Schaefer.[81] A "conservative constituent" is one that remains in

---

[73] Tr. at 637-638 (Marshall testimony).

[74] Tr. at 618, 620 (Marshall testimony).

[75] Tr. at 619 (Marshall testimony).

[76] Tr. at 639 (Marshall testimony).

[77] Tr. at 647 (Marshall testimony).

[78] Tr. at 645-646 (Marshall testimony).

[79] Tr. at 572 (Schaefer testimony). The outputs for this run are at Exhibit RW-13. For the correlation between reach and element numbers in the modeling with geographic points in the receiving stream, *see* Exhibit RW-11.

[80] Exhibit ED-13 at 6-7 (Marshall testimony).

[81] Tr. at 572 (Schaefer testimony); Exhibit RW-10.

the water column, with no losses due to chemical reactions or biochemical degradation. A "nonconservative constituent," in contrast, is one that is removed to some degree from the water column through transformation or decay.[82] This was a steady state modeling exercise, meaning that it did not reflect the accumulation of nutrients in the system.[83] It did, through the decay rate, reflect the removal of nutrients from the water column. Mr. Marshall testified that if you are concerned that there might be cumulative effects, you might want to revise the model to account for that.[84]

Lerin Hill's Witnesses

Dr. James Miertschin is an environmental engineer who testified for Lerin Hills concerning water quality issues associated with the proposed discharge. He stated, generally, that: he agrees with the ED's conclusions in the Tier 1 and 2 reviews, he believes that the discharge will be protective of water quality standards, he does not believe that the discharge will have a negative effect on fish and wildlife, and he sees the terms of the draft permit as protective of human health.[85] He stated that the phosphorus limitation is very stringent and "expected to preclude any potential problems with oversupply of nutrients and algal growth in the receiving stream."[86]

Dr. Miertschin conducted QUAL-TX water quality modeling,[87] similar to Mr. Marshall's modeling, and concluded that the draft permit would be protective of the applicable minimum

---

[82] The modeler can employ the "nonconservative option" for any constituent subject to removal from the water column. Tr. at 626-627.

[83] Dr. Miertschin also testified about how the QUAL-TX model is steady-state rather than dynamic, and does not reflect the accumulation of constituents. Tr. at 88-90, 139-140 (Miertrschin.testimony).

[84] Tr. at 621-622 (Marshall testimony).

[85] Exhibit LH-2 at 13-14 (Miertschin testimony).

[86] Exhibit LH-2 at 13 (Miertschin testimony).

[87] The modeling was actually done by his staff, at his direction and under his supervision. Exhibit LH-2 at 15 (Miertschin testimony). The modeling results are at Exhibit LH-2E. While Applicant's closing argument states that Dr. Miertschin employed the LAQUAL model, *see* Lerin Hill Ltd.'s Closing Arguments at 7, Dr. Miertschin testified that he employed the QUAL-TX model. Exhibit LH-2 at 15 (Miertschin testimony). The two models are nearly identical.

instream standard of 5.0 mg/L for DO.[88] Dr. Miertschin explained his findings based on the modeling:

> [T]he proposed effluent discharge would not cause conditions in the receiving stream to fall below the applicable dissolved oxygen criterion. For the unnamed tributary channel that is the immediate receiving stream, the predicted minimum dissolved oxygen is 5.65 mg/L, compared to the assigned stream criterion of 2 mg/L. For Deep Hollow Creek, the predicted minimum dissolved oxygen is 5.27 mg/L, compared to the assigned criterion of 5.0 mg/L established by the TCEQ. Conditions return to background by the time water reaches the Hahnfeld pond. Therefore, for Frederick Creek, no impacts are predicted. Further, for upper Cibolo Creek, no impacts are predicted.[89]

Dr. Miertcshin's modeling also predicted total phosphorus concentrations by using a straight decay formula under the nonconservative option.[90] He explained that he used the nonconservative option rather than the model's phosphorus subroutine because the built-in phosphorus model does not produce results as accurate as those achieved using the nonconservative option; for the same reasons, Mr. Marshall chose to use the nonconservative option when modeling nitrate nitrogen.[91] Using his best professional judgment about phosphorus concentrations in streams, Dr. Miertschin assumed a background concentration of phosphorus of 0.05 mg/L.[92] Under the model, at the headwaters of the SCS impoundment the total phosphorus concentration is 0.42 mg/L, but by the time the water exits the impoundment, total phosphorus has returned to a background concentration of 0.05 mg/L.[93] In the modeling, most of the decay of phosphorus occurs in the SCS reservoir because the residence time in the reservoir is long, and the model assumes that most of the

---

[88] Exhibit LH-2 at 14-15. For simulation of DO, only the BOD and ammonia nitrogen subroutines are employed. Exhibit LH-12 at 1-2 (Miertschin rebuttal testimony).

[89] Exhibit LH-2 at 15-16 (Miertschin testimony).

[90] He used a kinetic rate of 0.1 per day representing the net rate of phosphorus removal from the water column. Dr. Miertschin testified that the decay rate is based on actual water quality data collected in central Texas streams. Exhibit LH-12 at 3 (Miertschin rebuttal testimony).

[91] Tr. at 133-136 (Miertschin testimony); Exhibit LH-12 at 2-3 (Miertschin rebuttal testimony).

[92] Tr. at 94-99 (Miertschin testimony).

[93] Tr. at 100 (Miertschin testimony); Exhibit LH-2E.

phosphorus will be removed from the water column and retained in the impoundment.[94] The phosphorus really does not "decay"; the model assumes that it is removed from the water column through processes like sedimentation and biological uptake, but in fact it remains in the water body system (and is sometimes resuspended).[95]

Dr. Miertschin explained that there are dynamic, as opposed to steady-state, models that attempt to reflect changing stream conditions over time. However, since the steady-state models can reflect worst case scenario conditions – high temperatures, low flow – it is not necessary to use a dynamic model.[96] Dr. Miertschin acknowledged that those conditions are only worst case conditions for dissolved oxygen and nitrate nitrogen, and not necessarily for phosphorus.[97]

Dr. Miertschin testified that he visited the site of the proposed treatment plant. He also visited and sampled three ponds on Deep Hollow Creek: the Blanch pond upstream of the discharge, the SCS impoundment, and the Hahnfeld pond. He observed mature macrophytes in the ponds, as well as algal growth along the sides of the ponds.[98] Analysis of sampling from the SCS impoundment, about 3,000 feet below the proposed discharge, showed the following concentrations: total phosphorus of 0.035 mg/L and total nitrogen of 0.65 mg/L. Sampling of the Hahnfeld pond, located about 8,500 feet below the proposed discharge point, produced these results: total phosphorus below the detection limit of 0.02 mg/L and total nitrogen of 0.15 mg/L.[99]

According to Dr. Miertschin, the plant growth in the ponds indicates that the nutrient loading to the water is fairly high. The primary sources of nutrients under existing conditions are fecal

---

[94] Tr. at 101-102 (Miertschin testimony).

[95] Tr. at 142 (Miertschin testimony); Exhibit LH-12 at 3 (Miertschin rebuttal testimony).

[96] Tr. at 137-138 (Miertschin testimony).

[97] Tr. at 140-142 (Miertschin testimony).

[98] Exhibit LH-2 at 17-18 (Miertschin testimony).

[99] Exhibit LH-2 at 16-17 (Miertschin testimony).

material from wildlife and livestock, and erosion of sediment.[100] When asked to estimate nutrient loading from these sources, he stated that the necessary data – the number of livestock and wildlife in the watershed – is unavailable. However, he did state that 100 head of cattle in the watershed would represent approximately 10 pounds of phosphorus and 30 pounds of nitrogen per day, some portion of which could be deposited into, or wash into, the water.[101] He acknowledged that he does not know how much of the fecal matter would remain in the soil or be taken up by terrestrial plants and not washed into the creek.[102] Still, because he believes that there is already a significant supply of nutrients to the stream, he does not believe the proposed discharge would cause a measurable effect. He stated, "The impoundments will continue to have aquatic macrophytes and algal mats, which will be expected to utilize most of the supplied nutrients."[103]

Dr. Miertschin stated that, as to the Lerin Hills project, he has not tried to convert the projected concentrations of nutrients in the effluent to a quantitative measure of any projected increase in the growth of aquatic plants.[104] He has made such projections in other cases, however, by attempting to correlate an assumed concentration of phosphorus in a receiving stream with a response in the aquatic community expressed in terms of chorlophyll A, which is an indicator of algal and plant biomass.[105] He did not recall any of the details about the correlations. He stated that one can try to develop a site-specific correlation between nutrient loading and resulting biomass, or one can take relationships established in the literature and use them to try to predict biomass from some concentration of a nutrient.[106] Dr. Miertschin is aware that there are rules of thumb to attempt to correlate pounds of a nutrient in a receiving stream and pounds of resulting plant growth, but he does not know the exact numbers.[107] He reiterated that, while the proposed discharge will stimulate

---

[100] Exhibit LH-2 at 18-19 (Miertschin testimony).

[101] Exhibit LH-2 at 19-20 (Miertschin testimony).

[102] Tr. at 126-127 (Miertschin testimony).

[103] Exhibit LH-2 at 20 (Miertschin testimony).

[104] Tr. at 66 (Miertschin testimony).

[105] Tr. at 66 (Miertschin testimony).

[106] Tr. at 66 (Miertschin testimony).

[107] Tr. at 67-68 (Miertschin testimony).

plant growth, and he cannot say how much plant growth, he does not believe it will be significant.[108] He acknowledged that he has never performed a pre- and post-discharge analysis to measure effects on algal and plant growth.[109]

Dr. Miertschin testified that he does not believe that accumulated phosphorus will cause conditions to be different in year 2 following the start of the discharge, as opposed to year 1. This is because, he stated, the plants that grow in one year die and settle to the bottom, and new ones grow. He testified that phosphorus in the dead plant will likely accumulate in the sediment at the bottom and stay resident on the bottom. And, although the phosphorus in the sediment is available to stimulate the growth of new plants, Dr. Miertschin stated, "[Aquatic vegetation does not] build up year after year. It's a cycle of plants and nutrients each year. And what we're simulating here with the modeling analysis is what we believe will be the worst case under any of those future years."[110] He testified further:

> Q: But none of these future years, as you have modeled it, has any inkling that there was ever a year before it. There was never a predecessor year. Right?
>
> A: Well, correct. The model has no memory of those types of conditions.
>
> Q: So we're 10 years down the road on this permit and there has been – whatever that works out to be – you know, 7,500 pounds of phosphorous deposited in this SCS reservoir, and it will look just like it does today?
>
> A: That's my opinion, yes, sir.
>
> Q: Do you have any study or report, textbook, that you can actually tell me about that demonstrates what you've just told me to have happened at some other stream or river?
>
> A: The literature has articles, journal articles, reports of systems that have been enriched by nutrients and what the response has been, but I can't think of the title of any of them right offhand.

---

[108] Tr. at 105-109 (Miertschin testimony).

[109] Tr. at 130 (Miertschin testimony).

[110] Tr. at 110-111 (Miertschin testimony).

> Q: Do you honestly remember having read one, even if you can't remember the name of it, that told you that there could be 750 pounds a year or 7,500 pounds in ten years of phosphorus added to a – it looks like three- or four-tenths of a kilometer pond – and not significantly change the aquatic vegetation, the density of the aquatic vegetation in the pond, do you really think you've read something like that?
>
> A: I don't know that I've read a specific report like that, but I've read the reports that have – the general science of algal growth and nutrition and phosphorous dynamics, and those are the principles that are incorporated into this modeling analysis.
>
> Q: . . . But the principles, this modeling analysis doesn't have anything about the principles of what happened in any prior year in it, does it?
>
> A: That's not what this model is designed to do.[111]

As for the phosphorus limitation of 0.5 mg/L in the draft permit, Dr. Miertschin does not believe it is necessary. He asserted that TCEQ, when it imposes a phosphorus limitation, typically sets it at 1.0 mg/L, and went on to say that he thought a limit of 1.0 mg/L would be sufficient in this case to prevent excessive nutrient loading and substantially increased algal blooms.[112]

With respect to nitrate nitrogen and total nitrogen, Dr. Miertschin characterized the proposed monitoring requirements in the draft permit as "standard" for similar treatment plants.[113] He testified that he had not, other than perhaps to review Mr. Marshall's modeling of nitrate nitrogen concentrations, done any analysis with respect to nitrate nitrogen concentrations because he did not believe they would pose an issue.[114] He acknowledged that he was unaware of any instance in which the TCEQ has imposed reporting requirements for nitrogen and then later, based on the reporting, imposed permit limitations for total nitrate or nitrate nitrogen.[115]

---

[111] Tr. at 111-112 (Miertschin testimony).

[112] Exhibit LH-2 at 21 (Miertschin testimony).

[113] Exhibit LH-2 at 23 (Miertschin testimony).

[114] Tr. at 120-121 (Miertschin testimony); Exhibit RW- 8.

[115] Tr. at 124-125 (Miertschin testimony).

Paul Price is a zoologist and aquatic ecologist who testified on behalf of Lerin Hills. Mr. Price stated that he believes that the effluent limitations in the draft permit would not result in violations of the 5.0 mg/L DO stream standard and would protect the fish populations, and the increased flow in Deep Hollow Creek will benefit the flora and fauna populations, including fish.[116] He went on to state:

> Some changes in absolute and relative abundance among species may occur as a result of differential species responses to the additional water and nutrients supplied by the proposed discharge. The basic composition of the plant assemblage will not change significantly; it will remain a rooted plant-periphyton[117] community, composed primarily of green algae and diatoms,[118] assuming no changes other than the addition of the proposed discharge. . . .The potential for the development of large populations of problematic algal species is generally associated with the occurrence of an abundance of dissolved phosphorus unavailable for growth due to a lack of oxygen. This condition, given appropriate levels of light and temperature, can lead to the development of large populations of nitrogen-fixing blue-green alga. . . .However, in this case, given the very stringent phosphorus limit specified by the Draft Permit (0.5 mg/L),[119] and the levels of nitrogen commonly seen in treated wastewater effluent (i.e., 6-20 mg/L), the proposed discharge would have little potential for stimulating the growth of undesirable algal species.[120]

Mr. Price has concluded that the discharge would not adversely affect aquatic life or affect the aquatic life uses of the receiving stream.[121] When asked about nutrient loading, he stated that he

---

[116] Exhibit LH-4 at 11 (Price testimony).

[117] Organisms that live in water attached to rocks and other submerged objects.

[118] A type of unicellular algae.

[119] At the hearing, Mr. Price explained that he had testified in his deposition that the phosphorus limit in the draft permit was 50 parts per billion (ppb), which would have been 0.05 mg/L. However, he stated at the hearing that he had misspoken in his deposition, and he had meant to say 500 ppb, which would have been the actual limit of 0.5 mg/L in the draft permit. Tr. at 197-200 (Price testimony).

Apparently, Mr. Price also stated in his deposition that he did not believe that the phosphorus concentration in the creek would ever get as high as 0.28 mg/L, even though he had reviewed Dr. Miertschin's preliminary modeling results. Tr. at 200 (Price testimony). The modeling showed levels as high as 0.42 and 0.28mg/L in the SCS impoundment. Exhibit LH-2E (Miertschin modeling results). In his testimony at the hearing, Mr. Price seemed to reaffirm his statement that his analysis had assumed the phosphorus concentration would not reach 0.28 mg/L. Tr. at 200.

[120] Exhibit LH-4 at 12-13 (Price testimony).

[121] Exhibit LH-4 at 14 (Price testimony).

is unaware of any rule of thumb that could predict biomass resulting from various levels of phosphorus, as the question is too site-specific.[122] He did say that very heavy loads of milligrams per liter levels will certainly result in excess algal growth, especially in impoundments.[123] According to Mr. Price, although the permit would authorize the discharge of up to 765 pounds of phosphorus per year into Deep Hollow Creek, much of that phosphorus would not be biologically available because it would be sequestered in the sediments or chemically combined with calcium.[124] The phosphorus from the Lerin Hills discharge would increase plant growth in the SCS impoundment, and although he cannot quantify the increased growth, he believes it will not be noticeable.[125] With respect to the Hahnfeld pond, he thinks there may be an increase in vegetation, but it will likely be less than would occur in the SCS impoundment because the phosphorus concentrations will be lower at the Hahnfeld pond.[126]

Mr. Price stated that he has assumed the loss rate used by Dr. Miertschin in his modeling accurately reflects the removal of phosphorus from the water column and, therefore, the loss of biologically available phosphorus.[127] Mr. Price stated that he understood Dr. Miertschin's decay rate to have been based on existing upstream/downstream data about phosphorus concentrations in several Texas streams.[128] Mr. Price did a study once measuring phosphorus loss rates in the Red River. He testified that the phosphorus concentrations declined rapidly downstream, although there was still elevation in phosphorus 20 miles downstream from the discharge.[129]

---

[122] Tr. at 194-196 (Price testimony).

[123] Tr. at 195 (Price testimony).

[124] Tr. at 201, 214 (Price testimony).

[125] Tr. at 215-216 (Price testimony).

[126] Tr. at 216-220 (Price testimony). He stated that although a major rainfall event might resuspend phosphorus from the sediment of the SCS impoundment and flush it downstream to the Hahnfeld pond, its concentration would be diluted. Tr. at 220.

[127] Tr. at 208 (Price testimony).

[128] Tr. at 203 (Price testimony).

[129] Tr. at 204-206 (Price testimony). Mr. Price initially characterized the elevation in phosphorus concentration 20 miles downstream as "substantial," but then said it was just "some" elevation. *Compare* Tr. at 206 *with* Tr. at 207.

With respect to nitrate nitrogen, Mr. Price testified that he assumed that, since the receiving waters are phosphorus-limited, the phosphorus would be exhausted first, and the nitrogen would have no further fertilizing effect.[130]

Rick Wood's Witnesses

Mr. Wood, whose family uses the Hahneld pond for swimming and fishing, stated:

> We never, now, have the murky green-tinged water that one sometimes sees in ponds elsewhere, where it looks like small algae are growing [in] the water, itself (i.e., not attached to rocks or growing in the soils beneath the water). Increased algae anywhere in the pond or Creek would be especially devastating to the appearance, smell, and aquatic life in the pond, thereby eliminating our enjoyment and use of the pond and Creek.[131]

Mr. Wood went on to say that the algal growth in the pond is confined to the edges in the shallow reaches.[132] He stated that for a time an upstream landowner had a large number of horses on the property adjacent to the SCS impoundment; during that time, algal growth increased to the point that there was a fish and vegetation kill, but after the removal of the horses the system has rebounded.[133] Mr. Wood also testified that he has about 15 head of cattle on his family's 150 acres.[134]

Roger Lee, who testified on behalf of Mr. Wood, holds a Ph.D. in geochemistry and hydrology.[135] Dr. Lee reviewed Mr. Marshall's and Dr. Miertschin's modeling and had several criticisms, primarily about the phosphorus and nitrogen modeling.[136]

---

[130] Tr. at 212 (Price testimony).

[131] Exhibit RW-1 at 5 (Wood testimony).

[132] Exhibit RW-1 at 7 (Wood testimony).

[133] Exhibit RW-1 at 6 (Wood testimony).

[134] Exhibit RW-1 at 7 (Wood testimony).

[135] Dr. Lee has no QUAL-TX or LAQUAL modeling experience; nor does his associate, George Krallis, who assisted him in evaluating the modeling in this case. Tr. at 279-280 (Lee testimony).

As to phosphorus, Dr. Lee testified that TCEQ's modeling did not employ either the phosphorus subroutine or the algae subroutine. Not only does this failure mean that there are no predictions for instream phosphorus concentrations, he stated, but it also means that the DO modeling done by Mr. Marshall failed to take into account the effects of phosphorus.[137] Dr. Lee also testified that Dr. Miertschin did not use the phosphorus and algae subroutines, and instead relied on the nonconservative option in modeling phosphorus. The problem with this approach, according to Dr. Lee, is that the model's phosphorus and algae options provide a more sophisticated analysis than does the nonconservative option. Dr. Lee suggested that the phosphorus and algae subroutines might yield reliable results if actual instream, site-specific data were developed and used as inputs.[138]

Further, Dr. Lee stated, he could not find any support for Dr. Miertschin's background input of 0.05 mg/L for phosphorus. Dr. Lee did, however, acknowledge that Dr. Miertschin had sampled Deep Hollow Creek upstream of the proposed discharge route and found a phosphorus concentration of 0.02 mg/L.[139] Finally, he stated that if Dr. Miertschin's modeling yielded credible phosphorus concentrations, those concentrations are "eight times background in Deep Hollow Creek immediately after the discharge enters the creek, are five times background in the SCS pond, and are more than 50 percent higher than measured background in the Hahnfeld pond."[140] Dr. Lee, who is not a biologist, opined that these increases would probably not, in the short term, cause a harmful chemical imbalance resulting in a fish kill, but suggested that long-terms effects might be greater.[141]

---

[136] Dr. Lee had little criticism of the DO modeling. Tr. at 324 (Lee testimony). He acknowledges that in general the DO modeling was conservative except that he believes the modeling fails to sufficiently address the overall effects of plant growth in the ponds resulting from higher nutrient levels. Tr. at 337 (Lee testimony).

[137] Exhibit RW-2 at 3-4 (Lee testimony). On cross-examination, Dr. Lee acknowledged that turning on the phosphorus and algae subroutines of the QUAL-TX model would not necessarily be predictive of a worst case scenario for DO. Tr. at 291 (Lee testimony).

[138] Tr. at 295-297 (Lee testimony).

[139] Tr. at 297-299 (Lee testimony).

[140] Exhibit RW-2 at 7 (Lee testimony).

[141] Tr. at 300 (Lee testimony).

Concerning nitrogen, Dr. Lee again criticized the TCEQ staff's and Dr. Miertschin's modeling.[142] Dr. Lee testified that TCEQ staff had performed two sets of modeling runs concerning nitrogen – the first in February 2007 (Mr. Marshall's QUAL-TX exercise, discussed above) and the second in August 2007 (using the LAQUAL model, a model similar to the QUAL-TX model).[143] Dr. Lee stated that, while the nitrogen modeling in more credible than the phosphorus modeling done in this case, it is still insufficient.

Dr. Lee questioned the use by Mr. Marshall, in the February 2007 QUAL-TX run, of a background concentration for nitrate nitrogen of about 20 mg/L in the total nitrogen subroutine; Dr. Lee characterized this level as high and stated that it was unclear where the number came from.[144] He also stated that the model predicts a stream flow total nitrogen concentration of 18.52 mg/L entering the Hahnfeld pond, or 120 times the measured background.[145] This number, he testified, is questionable. Dr. Lee also criticized the results of Mr. Marshall's attempt to use the nonconservative option to model nitrogen. Dr. Lee stated that even if the use of the nonconservative option produced accurate results, it showed 10 times the measured present concentration in the Hahnfeld pond and 12 times the measured present concentration in the SCS pond.[146] He indicated that the accuracy of the use of nonconservative option was related to the accuracy of the decay rate chosen for the particular stream system involved.[147]

---

[142] Dr. Miertschin's QUAL-TX modeling activated the ammonia nitrogen option. Exhibit LH-2E.

[143] Exhibit RW-2 at 7 (Lee testimony). The ALJ does not find the August 2007 LAQUAL exercise discussed in any testimony by TCEQ staff or experts testifying for Applicant. The LAQUAL outputs can be found at Exhibit RW-2H.

[144] Exhibit RW-2 at 7-8 (Lee testimony). On cross-examination, Dr. Lee stated that he did not know what would be a realistic estimate of the nitrogen concentration for a wastewater discharge such as the proposed Lerin Hills discharge. Tr. at 302-304 (Lee testimony). Dr. Lee also criticized Dr. Miertschin's use of a background level of zero for his nitrogen modeling. Tr. at 338.

[145] Exhibit RW-2 at 8 (Lee testimony). Under the same modeling run's nonconservative option, which has a decay rate, the predicted concentration of nitrate nitrogen is 1.64 mg/L. Tr. at 309-312 (Lee testimony).

[146] Exhibit RW-2 at 8-9 (Lee testimony).

[147] Tr. at 319-320. He also noted, however, that the model's built-in subroutines require inputs that, in the absence of actual site-specific data, must be assumed. Tr. at 320 (Lee testimony).

According to Dr. Lee, TCEQ's LAQUAL run and Dr. Miertschin's modeling assume that all nitrogen in the discharge is ammonia nitrogen and predict concentration levels in the Hahnfeld pond of about six times the present measured concentration.[148]

Dr. Lee also based his opinion on the insufficiency of the nitrogen modeling on the fact that the algae subroutine was not employed. However, he stated that he has since learned that the algae option in the model has not been calibrated, verified, or subjected to quality assurance.[149]

Dr. Lee made several more points about the modeling done by TCEQ and Dr. Miertschin.[150] First, he noted that neither activated the algae growth option. Second, he pointed out that the modeling assumes a steady flow rate for Deep Hollow Creek, which is intermittent. Finally, he stated that the modeling does not account for diurnal DO fluctuations.

Overall, Dr. Lee's primary criticism of the modeling done by the TCEQ and Dr. Miertschin was that their modeling did not employ site-specific instream data that could have made the model's built-in subroutines (for nitrogen, phosphorus, and algae growth, for example) produce results more reliable than those obtained under the nonconservative option. He acknowledged that the development of such data is expensive and, perhaps, not typically done in connection with wastewater permitting in Texas.[151]

Dr. Lee concluded that the modeling data, which he believes is incomplete and potentially unreliable, and which in any event shows high concentrations of nutrients compared to background levels, fails to show that the proposed discharge would not cause more than *de minimis* degradation of the water quality in the receiving stream.[152] He stated that he has some experience in evaluating

---

[148] Exhibit RW-2 at 9 (Lee testimony).

[149] Tr. at 301-302 (Lee testimony).

[150] Exhibit RW-2 at 9-10 (Lee testimony).

[151] Tr. at 322-324 (Lee testimony).

[152] Exhibit RW-2 at 11 (Lee testimony).

the effects of nutrient loading in one water body in Texas, but no expertise in aquatic plants.[153] He further testified that he believes phosphorus loading would, over time, overload the ecosystem with plant and algal growth and impair the water quality of the SCS impoundment.[154]

Raymond Slade, Jr., is a hydrologist who testified on behalf of Mr. Wood about, *inter alia*, the potential effects of the discharge on the DO levels in Upper Cibolo Creek. He testified that Upper Cibolo Creek has been listed as impaired for dissolved oxygen for three cycles of the 303(d) program.[155] He noted that the U.S. Environmental Protection Agency designated the cause of the low DO as "organic enrichment/oxygen depletion," and he stated that the effluent, which will add nutrients to the water, could cause increased algal growth that might further lower the DO.[156] He also stated that existing data indicates the water quality of the Upper Cibolo is generally better than the permitted quality of the Lerin Hills effluent.[157] Mr. Slade stated, however, that he did not know what concentrations or mass of constituents of concern would remain in the water at the point Frederick Creek enters Upper Cibolo Creek,[158] and he had not reviewed Dr. Miertschin's phosphorus modeling.[159] Mr. Slade did note that, since the creek channel had little vegetation, he did not believe the phosphorus in the discharge would be totally taken up prior to Cibolo Creek.[160]

Daryl Knowles is a biologist who testified that there are several treatment technologies that are capable of reducing levels of phosphorus in domestic wastewater to 0.15 mg/L or less. One such technology is bioreactive filtration.[161] Mr. Knowles referenced an EPA study of wastewater

---

[153] Tr. at 341, 343-344 (Lee testimony).

[154] Tr. at 342 (Lee testimony).

[155] Exhibit RW-3 at 13 (Slade testimony). He acknowledged that the segment has been de-listed. Tr. at 414-415 (Slade testimony).

[156] Exhibit RW-3 at 13-14 (Slade testimony).

[157] Exhibit RW-3 at 14-15 (Slade testimony).

[158] According to Mr. Slade, it is 6.43 stream miles from the proposed discharge point to the confluence with Upper Cibolo Creek. Tr. at 397-398 (Slade testimony).

[159] Tr. at 386-390 (Slade testimony).

[160] Tr. at 391 (Slade testimony).

[161] Exhibit RW-4 at 4-5 (Knowles testimony).

treatment plants around the country that have demonstrated exemplary phosphorus removal through their treatment processes; the permit limitations for phosphorus (and the actual concentrations of phosphorus in the effluent) for those plants were, in most cases, quite a bit lower than the 0.5 mg/L limitation for Lerin Hills.[162]

3. ALJ's Analysis

The contested issue to be decided is: would the proposed discharge cause prohibited degradation of the water quality of the receiving stream?

Unnamed Tributary

The immediate receiving stream, the intermittent unnamed tributary leading to Deep Hollow Creek, has a designated use of contact recreation (but no significant aquatic life uses) and the minimal DO requirement set by the ED is 2.0 mg/L. The evidence indicates that the proposed discharge, with its DO minimal limit of 6.0 mg/L, will not likely cause of breach of the water quality standards applicable to this stream segment. As the water quality of this stream is not deemed to exceed the fishable/swimmable level, Tier 2 protection does not apply.

Deep Hollow Creek, Frederick Creek

Mr. Wood does not seem to dispute that the draft permit would ensure Deep Hollow Creek and Frederick Creek would meet the applicable numerical stream standards. And, while he may have concerns about the draft permit's ability to maintain the narrative standards and protect existing uses, the primary thrust of his argument revolves around Tier 2 antidegradation review.[163] The waters of both Deep Hollow Creek (including the SCS impoundment and the Hahnfeld Pond) and Frederick

---

[162] Tr. at 464-466 (Knowles testimony), *citing* Exhibit LH-8 at 7-8 (Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus).

[163] *See* Responsive Closing Arguments of Rick Wood at 3. OPIC may contend that the draft permit fails to maintain stream standards and protect existing uses. *See* Public Interest Counsel's Closing Argument at 4-5.

Creek – with their designated uses of contact recreation and high aquatic life uses – exceed fishable/swimmable quality. Therefore, Tier 2 antidegradation protections apply. As discussed above, Tier 2 review goes beyond assuring that insteam numerical and narrative criteria are met, and further requires that the discharge not cause or contribute to any degradation of the water quality beyond a *de minimis* extent. Mr. Wood and OPIC argue that, with respect to nutrient loading and associated DO levels, the proposed Lerin Hills discharge has not been shown to satisfy the requirements of the Commission's antidegradation rule and, in particular, the requirements of Tier 2 antidegradation review. Lerin Hills and the ED argue that the draft permit is adequately protective of water quality. The ALJ, after carefully reviewing the rule, the IPs, and the evidence, determines that Lerin Hills has failed to meet its burden of proof as to this issue.

The following matters are clear:

- modeling of the effects of the proposed discharge indicates that the lowest DO level in Deep Hollow Creek would be between 5.03 mg/L (Marshall modeling) and 5.27 mg/L (Miertschin modeling), compared to a presumed background of 6.25 mg/L (Miertschin) and 6.45 mg/L (Marshall);

- these streams are phosphorus-limited, meaning that the scarcity of phosphorus is what limits the growth of algae and aquatic plants;

- these streams have little assimilative capacity for nutrients;

- the proposed Lerin Hills discharge could (at the maximum permitted concentration) add about 750 pounds per year of phosphorus to the stream system;

- under Dr. Miertschin's modeling of the effects of the discharge,[164] the concentrations of phosphorus in the SCS impoundment would be 0.42 mg/L, 0.28 mg/L, 0.12 mg/L, and 0.05 mg/L (upstream to downstream), compared to the background of 0.035 mg/L in Dr. Miertschin's sampling of the impoundment;

[164] The ALJ is not persuaded by Dr. Lee's criticisms of the choices Dr. Miertschin made in setting up his phosphorus modeling exercise; Dr. Miertschin articulated reasoned justifications for his decision to use the nonconservative option, his decision not to employ the phosphorus and algae subroutines, his inputs, and his chosen decay rate. Nevertheless, as Dr. Miertschin himself readily acknowledged, the QUAL-TX modeling is not designed to estimate nutrient loading over time.

- under Dr. Miertschin's modeling of the effects of the discharge, the concentrations of phosphorus in the Hahnfeld pond would be 0.04 mg/L and 0.03 mg/L, compared to the background of less than the detectable limit of 0.02 mg/L in Dr. Miertschin's sampling of the pond;

- the phosphorus modeling uses a uniform decay rate to attempt to reflect removal of phosphorus from the water column, but the modeling does not attempt to reflect cumulative phosphorus loading over time;

- the record in this case includes no attempt to estimate quantitatively the amounts of phosphorus that will be biologically available in the stream system over time as the discharge continues;

- the proposed Lerin Hills discharge would also add nitrate-nitrogen, which has the potential to stimulate algal and plant growth, to the receiving stream;[165]

- an increase in plant and algal growth as a result of the proposed Lerin Hills discharge is likely;

- the record in this case includes no attempt to estimate quantitatively the amounts of algal and plant growth that may result from the increased nutrient loading from the proposed discharge.

The difficulty here is that Tier 2 antidegradation protection is extremely stringent: it prohibits *any* greater-then-*de minimis* degradation in water quality, even if the degradation has no effect on the uses of the water body. Nowhere do the rule or the IPs spell out precisely what constitutes greater-than-*de minimis* degradation, but it is clear that degradation is not merely coextensive with impairment of use. In this case, as set forth above, the evidence shows that the discharge would lower the DO level in the SCS impoundment. Further, the evidence shows that the phosphorus concentrations in the Hahnfeld pond and SCS impoundment could be as much as 150 percent to 1,200 percent of measured background.[166] It is undisputed that increased algal and plant growth

[165] There is no limitation for nitrate-nitrogen or total nitrogen in the draft permit, so it is not possible to estimate from the permit how much nitrogen would be discharged into the stream system from Lerin Hills. Mr. Wood, relying on testimony in the record that it would be reasonable to assume that the concentration of nitrogen in the discharge would be about 20 mg/L, estimates that Lerin Hills could discharge as much as 15 tons (about 30,000 pounds) of total nitrogen per year. Closing Arguments of Rick Wood at 1; Responsive Closing Argument of Rick Wood at 1.

[166] Lerin Hills argues that Dr. Miertschin's predicted phosphorus concentrations should be compared, not to the actual measured concentration of 0.035 mg/L of phosphorus in the SCS impoundment, but to the presumed background

could be expected. It is also undisputed that these streams are phosphorus-limited with little assimilative capacity for nutrients. Given these facts, the onus is on Applicant to show, and the ED to ensure through his review, that the lowered DO, and the increases in nutrient concentrations and resulting biomass, will not degrade water quality more than a *de minimis* extent.

In support of their position that there will be no greater-than-*de minimis* degradation, Lerin Hills and the ED point out that the draft permit includes a phosphorus limitation, which is unusual and has been characterized by Dr. Miertschin and Mr. Price as "very stringent." Dr. Miertschin testified that he thought, because there is already plant and algal growth indicating a significant supply of nutrients to the stream, the added nutrients in the discharge would have no measurable effect. He also stated that much of the phosphorus would be biologically unavailable due to sedimentation. Mr. Price agreed that much of the phosphorus would be sequestered in the sediment, and he also opined that the increased plant and algal growth would be less than noticeable.

There are several problems with the adequacy of Lerin Hills' evidence and arguments. First, the increases in phosphorus concentrations predicted above already account for the phosphorus limitation in the draft permit. Second, although the phosphorus limitation of 0.5 mg/L is characterized by witnesses as "very stringent," the ED has considered (and the Commission has authorized) a far more stringent phosphorus limitation (0.15 mg/L) in the context of another wastewater discharge application in the hill country.

Third, although Dr. Miertschin and Mr. Price believe that much of the nutrients added to the stream system over time will be biologically unavailable, they have not quantified how much. Nor have they tried to quantify how much biomass might result from the increased nutrients. They did no modeling of nutrient loading over time. They did not, as Dr. Miertschin apparently has in the past, try to correlate phosphorus concentrations with chlorophyll A, an indicator of algal and plant

---

used by Dr. Miertschin in his phosphorus modeling. Even if one compares the predicted concentrations with the presumed background (which is 0.05 mg/L, not 0.5 mg/L, as Applicant states in its brief), the predicted concentrations in the upper and middle reaches of the SCS impoundment are still about 250% to 850% of the presumed background. *Compare* Lerin Hills, Ltd.'s Reply to Closing Arguments at 5 *with* Tr. at 98-99 (Miertschin testimony).

biomass. They offered no specific data to support their opinions about loading over time and resulting biomass. Further, Dr. Miertschin, while clearly a highly experienced and capable engineer, is not a biologist. Mr. Price is a biologist, but the reliability of his opinion was somewhat undermined by testimony in which he seemed to say that his analysis had assumed the phosphorus concentration in the creek would never get as high as 0.28 mg/L.

Lastly, Lerin Hills' arguments improperly conflate Tier 1 analysis with Tier 2 analysis. According to Lerin Hills, if the uses of a water body are protected, then any degradation is *de minimis*. Applicant's closing argument states:

> The record is replete with testimony, prefiled and live, by highly qualified professionals that, in their judgment, whatever small amount of additional aquatic plant growth might occur in the SCS Pond and, much less likely, in the Hahnfeld Pond and in the unimpounded portions of Deep Hollow Creek, *it will not be detrimental to the uses or aesthetic qualities of these waters and that, therefore, any lowering of water quality will be de minimis.*[167]

As discussed above, the Commission's antidegradation rule prohibits even degradation that does *not* rise to the level of impairing uses.[168] Since the record in this case shows that the water chemistry of the receiving stream will be affected and increased algal and plant growth is likely to occur, Lerin Hills must show that these changes, even if they do not affect the water's uses, would be so trifling as to be subject to being disregarded under the law.[169] Without showing how much nutrient loading and how much increased biomass growth there is likely to be, Lerin Hills cannot persuasively demonstrate that the changes will be trifling.

---

[167] Lerin Hils, Ltd.'s Reply to Closing Arguments at 6 (emphasis added).

[168] Further, given the lack of evidence about nutrient loading over time and the resulting quantity of biomass, the ALJ cannot find with confidence that the narrative standards for aesthetics and nutrients/excessive aquatic vegetation would be protected by the draft permit. 30 TEX. ADMIN. CODE § 307.4(b) and (e).

[169] "De minimis" is Latin for "trifling." Webster's New Millennium Dictionary of English, Preview Edition (v 0.9.7), Copyright 2003-2009 Dictionary.com, LLC.

As for the ED's evidence, Mr. Schaefer's testimony suggests that the ED did not perform a Tier 2 analysis that strictly complies with the Commission's rule. In his written prefiled testimony, Mr. Schaefer correctly stated that the rule prohibits greater-then-*de minimis* degradation even if uses are not impaired. He also offered a working definition of greater-than-*de minimis* degradation as that which is "noticeable." However, in his discussion at hearing of Tier 2 review, he spoke of uses, and specifically testified that even if the proposed discharge were to result in a noticeable increase in the growth of algae and plants, he expected there would be no greater-than-*de minimis* degradation of the "fishability" and "swimmability" of the receiving stream.[170] Mr. Schaefer's testimony indicates that his Tier 2 review did not add meaningfully to his Tier 1 analysis of protection of uses. Like Dr. Miertschin and Mr. Price, Mr. Schaefer also opined generally that 700 pounds of phosphorus per year would not be too much. In support of his opinion, he cited to the TCEQ staff's experience with permit limitations and hill country streams. However, he acknowledged that staff had not actually performed any before-and-after comparative analyses, and he offered no quantitative data in support of his opinion.

Finally, the "degradation unlikely" and "degradation likely" scenarios in the IPs do not answer the question whether there would be prohibited degradation in this case, because the circumstances of the proposed Lerin Hills discharge do not precisely match any of the examples given. As for the "degradation unlikely" scenarios, one provides that degradation is unlikely if the DO in the sag zone is lowered by less than 0.5 mg/L from baseline stream conditions and if potentially affected aquatic organisms are not unusually sensitive to changes in DO. The predicted DO level in the sag zone in the SCS impoundment is indeed lowered by *greater than* 0.5 mg/L from the presumed background. Another "degradation unlikely" scenario provides that there probably will

[170] Further, the ED's closing argument seems to assert that the ED, in his antidegradation review, is not required to ensure that a proposed discharge would not degrade the quality of the receiving stream over time. Rather, states the ED, he must only ensure that "a discharge will not lower water quality to the extent that the [Texas Surface Water Quality Standards] are not attained." Executive Director's Reply to Rick Wood's and OPIC's Closing Arguments at 4-5. This position by the ED ignores the clear language of the antidegradation rule's Tier 2 portion: "No activities subject to regulatory action which would cause degradation of waters which exceed fishable/swimmable quality will be allowed unless it can be shown to the commission's satisfaction that the lowering of water quality is necessary for important economic or social development. Degradation is defined as a lowering of water quality by more than a de minimis extent, but not to the extent that an existing use is impaired." 30 TEX. ADMIN. CODE § 307.5(b)(2).

not be prohibited degradation from increased loading of phosphorus and nitrogen *if* it can be reasonably demonstrated that detrimental increases in algal or aquatic vegetation growth will not occur; as discussed above, the ALJ has determined that Lerin Hills failed to make such a showing. Among the "degradation likely" scenarios is one involving increased loading of oxygen-demanding substances projected to decrease DO by more than 0.5 mg/L for a substantial distance in a water body that has exceptional quality aquatic life and a relatively unique and potentially sensitive community of aquatic organisms. While the DO sag in this case will likely exceed 0.5 mg/L, Mr. Price's testimony suggests that the receiving stream does not have exceptional or potentially sensitive organisms. In sum, the evidence concerning the Lerin Hills discharge falls somewhere in between the clear "unlikely" and "likely" scenarios.

The ALJ appreciates the difficulty that Applicant and the ED face in trying to ensure that Tier 2's stringent, yet vague, standard is met. Furthermore, the rule imposes on Lerin Hills the challenging task of proving a negative: that there will be no greater-than-*de minimis* degradation.[171] The burden of proof on this issue is substantial. The ALJ cannot, based on this record, find that there will be no prohibited degradation of the water quality of Deep Hollow Creek and Frederick Creek as a result of the proposed discharge.[172]

Upper Cibolo Creek

Upper Cibolo Creek, below the confluence with Frederick Creek, is part of the receiving stream.[173] Because Upper Cibolo Creek is about seven miles downstream from the proposed

---

[171] Because Lerin Hills asserts that there will be no degradation, it has not offered evidence to attempt to show that the lowering of water quality is necessary for an important economic or social development. 30 TEX. ADMIN. CODE § 307.5(b)(2).

[172] OPIC makes a general argument that the evidence fails to show the draft permit will adequately protect water quality. Based on evidence in the record that tighter parameters are technologically feasible, OPIC urges the ALJ to recommend permit limitations of 0.2 mg/L for total phosphorus(down from 0.5 mg/L), 2 mg/L for TSS (down from 5 mg/L), and 2 mg/L for CBOD (down from 5 mg/L). The ALJ declines to adopt this approach, as there is no basis in the record for OPIC's recommended permit parameters.

[173] Earlier in the Lerin Hills application process – in 2002 and 2004 – Segment 1908 was on the 303(d) list as impaired for DO. Such a listing would have affected the antidegradation review of the Lerin Hills project; however, the segment has been de-listed.

discharge point, the effects of nutrient loading will likely be attenuated. Still, the same gaps that characterize Applicant's case concerning Deep Hollow Creek and Frederick Creek – the lack of specific evidence estimating nutrient loading over time and predicting resulting biomass – are likewise fatal to a an antidegradation review of the effects of the proposed discharge on Upper Cibolo Creek. Further, the fact that Segment No.1908 is presently on the draft 2008 305(b) list for concerns about orthophosphorus lends weight to the need to examine the effects of nutrient loading on that portion of the stream system.

Lerin Hills argues that the seven-mile distance from the discharge to Upper Cibolo Creek is so great that there should be some reason to suspect that the lowering of water quality in Segment No. 1908 is a realistic possibility before a full-blown Tier 2 analysis is triggered.[174] The ALJ agrees that a permit should not be denied because a Tier 2 analysis was not performed on a highly remote, obviously unaffected segment downstream of a discharge. However, the ALJ is not sure that Segment No. 1908 is so remote and obviously unaffected. The ED specifically talked about Segment No. 1908, and the orthophosphorus in that segment, in the Statement of Basis/Technical Summary and Executive Director's Preliminary Decision concerning the Lerin Hills application. Applicant's own witness, Mr. Price, testified that he did a study once measuring phosphorus loss rates in the Red River. He stated that the phosphorus concentrations were still elevated 20 miles downstream from the discharge. Given that there are currently concerns about phosphorus levels in Segment 1908,[175] the ALJ cannot conclude that it is unnecessary for Segment No. 1908 to undergo, and pass, a Tier 2 review in connection with the Lerin Hills application.[176]

---

[174] Lerin Hills, Ltd.'s Reply to Closing Arguments at 9 ("[A] rigorous Tier 2 antidegradation review does not have to be conducted on every downstream segment from Deep Hollow Creek to the Gulf of Mexico.")

[175] *See* Exhibit RW-9.

[176] One of the designated uses of Upper Cibolo Creek is "aquifer protection." This issue is addressed under the discussion of groundwater issues, below.

B. Protection of Groundwater

1. TCEQ Regulations

There are two primary rules relating to the protection of groundwater at issue in this case. First is the antidegradation rule, discussed above, that requires that the existing uses of a water body be protected.[177] One of Upper Cibolo Creek's designated uses is "aquifer protection."[178]

The second rule of importance, rule 309.12, addresses the siting of domestic wastewater effluent and plants and reads:

> The commission may not issue a permit for a new facility or for the substantial change of an existing facility unless it finds that the proposed site, when evaluated in light of the proposed design, construction or operational features, minimizes possible contamination of surface water and groundwater. In making this determination, the commission may consider the following factors:
>
> (1) active geologic processes;
>
> (2) groundwater conditions such as groundwater flow rate, groundwater quality, length of flow path to points of discharge and aquifer recharge or discharge conditions;
>
> (3) soil conditions such as stratigraphic profile and complexity, hydraulic conductivity of strata, and separation distance from the facility to the aquifer and points of discharge to surface water; and
>
> (4) climatological conditions.[179]

---

[177] 30 TEX. ADMIN. CODE § 307.5(b)(1).

[178] Mr. Wood asserts that Applicant must show the Lerin Hills discharge would not cause greater-than-*de minimis* degradation *as to aquifer protection.* Rick Wood's Closing Arguments at 18. This is a misreading of the rule. Applicant must show as part of the Tier 1 antidegradation analysis that the "aquifer protection" use will be protected by the draft permit, but the very stringent greater-then-*de minimis* standard is part of the Tier 2 analysis, and is separate and apart from the question of protection of existing uses.

[179] 30 TEX. ADMIN. CODE § 309.12. Compliance with this rule's requirements concerning erosion is discussed below under Section VI.

2. Evidence

Lerin Hill's Witness

Robert Kier, Ph.D., is a geologist who testified on behalf of Lerin Hills. Dr. Kier testified that the groundwater resources in the area of the proposed facility and discharge site are: the Upper Trinity Aquifer, comprising the Upper Glen Rose Formation; the Middle Trinity Aquifer (including the Lower Glen Rose formation); and the Lower Trinity Aquifer.[180] According to Dr. Kier, in general the Upper Glen Rose in the vicinity of the site yields only small quantities of highly mineralized water. There are several shallow wells in the Upper Glen Rose near the site, and they are most likely drawing from perched groundwater zones that provide water of better quality. These perched groundwater zones, Dr. Kier testified, discharge to surface water as springs and seeps and support a base flow to streams and tanks in the area of Deep Hollow Creek. They are not hydraulically connected to the Upper Trinity, and recharge it only slowly by seepage through strata of low permeability. Dr. Kier believes that the Middle Trinity Aquifer is the source for the two wells on the Hahnfeld property. He stated that although the Trinity Aquifer System as been described as "leaky," in fact the amount of transfer from the Upper Trinity to the Middle Trinity is miniscule.

A third rule protecting groundwater that applies to this case relates to unsuitable site characteristics for domestic wastewater effluent and plants. 30 TEX. ADMIN. CODE § 309.13. This rule prohibits the location of such plants in proximity to floodplains, wetlands, public water wells, and the like. It provides that a wastewater treatment plant unit may not be located closer than 250 feet from a private water well. No one disputes that the private water wells at issue in this case are farther than the required 250 feet from the treatment plant, and no one has raised any other issue about the requirements of this rule in connection with the Lerin Hills application. For testimony generally supporting Applicant's compliance with this rule, *see* Exhibit LH-1 at 11-12 (Harris testimony). For a discussion of this rule's requirements concerning nuisance odors, see Section VII below.

In addition, the Commission has promulgated a special set of rules for the protection of the Edwards Aquifer. 30 TEX. ADMIN. CODE ch. 213. Because Cibolo Creek crosses the San Antonio segment of the Edwards Aquifer and is a source of recharge to the Edwards Aquifer, the Deep Hollow Creek watershed can be seen as in the contributing zone of the Edwards Aquifer. Exhibit LH-3 at 9 (Kier testimony). However, the Commission's rules define the contributing zone in such a way as to exclude Kendall County. 30 TEX. ADMIN. CODE § 213.22(2). Further, the Commission's Edwards Aquifer rules requiring particular permit parameters for wastewater treatment plants for dischargers upstream of the discharge zone are not applicable here because the site of the proposed Lerin Hills discharge is over five miles from the recharge zone. 30 TEX. ADMIN. CODE § 213.6(c). Nevertheless, the parameters in the draft permit are equal to or more stringent than those required by § 213.6(c).

[180] Exhibit LH-3 at 6-8 (Kier testimony).

Dr. Kier went on to say that water infiltrating the surface in the area of Deep Hollow Creek does not truly recharge the Upper Trinity Aquifer, but rather moves into perched aquifers that again become surface water through seeps and springs.[181] In the absence of solution channels or open fractures, which were not observed along Deep Hollow Creek, the vertical hydraulic conductivity of the unweathered Upper Glen Rose is very low.[182] He testified that water from the discharge point would have to move vertically through 400 to 500 feet of Upper Glen Rose before reaching the upper part of the Middle Trinity Aquifer, the principal local water supply.[183] Indeed, he calculated that it would take more than 100,000 years for a constituent in the discharge to reach the top of the lower Glen Rose.[184]

Cibolo Creek, stated Dr. Kier, flows across the lower Glen Rose and may discharge the Middle Trinity Aquifer. However, Dr. Kier noted that this is at least four to five miles downstream from the discharge point.[185] Cibolo Creek then crosses and recharges the Edwards Aquifer. The distance between the proposed discharge and the Edwards Aquifer Recharge Zone is 12-15 miles, and the distance to the Edwards Aquifer about 20-25 miles.[186]

Dr. Kier believes that the draft permit will protect groundwater resources in the area. He cites to several reasons: the low conductivity of the unweathered Upper Glen Rose (such that constituents are not likely to reach the Middle Trinity Aquifer); the treatment levels required in the draft permit (which are equal to or more stringent than those required of dischargers closer to the Recharge Zone); the fact that Dr. Miertschin and the TCEQ determined that surface water quality standards will be met; the fact that TCEQ staff has determined nitrate concentrations in Deep Hollow Creek will meet maximum contaminant levels (MCLs) for drinking water; the lack of observed

---

[181] Exhibit LH-3 at 8-9 (Kier testimony).

[182] Exhibit LH-3 at 9 (Kier testimony).

[183] Exhibit LH-3 at 11 (Kier testimony).

[184] Exhibit LH-3 at 11 (Kier testimony).

[185] Exhibit LH-3 at 9 (Kier testimony).

[186] Exhibit LH-3 at 10 (Kier testimony).

recharge features or active geologic processes in the area; and the fact that the facility will not employ surface impoundments.[187]

Specifically with regard to the wells on the Hahnfeld and Wood property, Dr. Kier stated that there are three such wells. Well H1 (just south of the Hahnfeld pond) is 141 to 150 feet deep. Dr. Kier stated that it appears to be hydraulically connected to one of the shallow perched water zones in the upper Glen Rose. He does not believe that it is the same perched water zone that discharges into Deep Hollow Creek, because in 2006 Mr. Wood reportedly made a statement that the well was dry, but at that time the Hahnfeld pond on Deep Hollow Creek contained water.[188] Further, the direction of the groundwater flow causes Dr. Kier to believe that H1 does not receive water from the direction of Deep Hollow Creek or the proposed discharge.[189] For these reasons, Dr. Kier does not believe the discharge would affect the well. He acknowledged that if a cone of depression were to form around the well, there would be a potential for surface water to reach the well; however, given the nature of the flow in the aquifer and where he thinks the well is screened, Dr. Kier does not believe that a cone of depression is likely.[190]

Well H2 (just north of the Hahnfeld pond) is the water supply well for the Hahnfeld house and is 635 feet deep. According to Dr. Kier, it appears to be completed in the Middle Trinity Aquifer.[191] Well W1 (on Mr. Wood's property, west of Deep Hollow Creek) is the water supply well for the Wood house and is 765 feet deep. It also taps the Middle Trinity Aquifer.[192] Dr. Kier does not believe there is any discernable possibility that the discharge would affect either well.[193]

---

[187] Exhibit LH-3 at 10-12 (Kier testimony).

[188] Exhibit LH-3 at 16 (Kier testimony). Dr. Kier, when asked to assume that H1 had never gone dry, testified that it would make no sense for it never to have gone dry, because it is in a perched aquifer higher than the level of the rest of the Glen Rose around it. Tr. at 161-165 (Kier testimony).

[189] Exhibit LH-3 at 16-17 (Kier testimony).

[190] Tr. at 155-157 (Kier testimony).

[191] Exhibit LH-3 at 17 (Kier testimony).

[192] Exhibit LH-3 at 17-18 (Kier testimony).

[193] Exhibit LH-3 at 18 (Kier testimony).

Dr. Kier further testified that, in groundwater, nitrate is a fairly persistent contaminant in that it does not tend to degrade. As for phosphorus in groundwater, there is a debate concerning the degree of its persistence.[194]

ED's Witnesses

Ms. Airey testified that, because the proposed discharge would not be located in the Edwards Aquifer Contributing Zone as defined by the Commission's rules, the chapter 213 Edwards Aquifer rules do not apply to this application.[195] She noted that the effluent limitations for $CBOD_5$, TSS, ammonia nitrogen, and phosphorus in the Lerin Hills draft permit are equal to or more stringent than those required in Chapter 213 for dischargers within five miles upstream of the recharge zone.[196]

Stephanie Saldaña is a TCEQ staff geologist who ordinarily reviews "no discharge" permits but who was asked to assist in responding to public comments concerning groundwater in connection with the Lerin Hills application. In particular, Ms. Saldaña was asked to prepare a response to concerns voiced by Mr. Robert Webster regarding his shallow wells located near Deep Hollow Creek,[197] as well as to questions related to groundwater conditions at the plant and discharge sites.[198]

According to Ms. Saldaña, the plant and discharge are over the upper Glen Rose formation of the Trinity Aquifer, and the discharge route (Cibolo Creek) reaches the edge of the Edwards Aquifer Recharge Zone[199] more than 14 miles from the discharge point. Further, she stated that the discharge route moves over the Edwards Aquifer at a point about 30-35 stream miles from the discharge

---

[194] Tr. at 167 (Kier testimony).

[195] Exhibit ED-1 at 17 (Airey testimony). Mr. Marshall said the same thing. Exhibit ED-13 at 5 (Marshall testimony).

[196] Exhibit ED-1 at 17-18 (Airey testimony).

[197] Mr. Webster owns the property where the lower portion of the SCS impoundment is located. Exhibit LH-1B, Exhibit No. 3 (Affected Landowners map and accompanying list).

[198] Exhibit ED-16 at 6 (Saldaña testimony).

[199] Ms. Saldaña uses the definition of "Edwards Aquifer Recharge Zone" in chapter 213 of the Commission's rules. 30 TEX. ADMIN. CODE § 213.3(27).

point.[200] Using the definition of "Edwards Aquifer Contributing Zone" in chapter 213 of the Commission's rules, Ms. Saldaña calculated that the discharge point is over 15 miles from the contributing zone.[201] She also stated that neither published sources nor the applicant's and protestant's experts had identified any recharge features in the area of the discharge. However, she noted that the actual watercourse could be considered a recharge feature to shallow, perched groundwater.[202] She opined that the proposed discharge would not negatively affect the Trinity or Edwards Aquifer. As to the Edwards, she cited the 14-mile distance to the recharge zone and the fact that nitrate concentrations would be less than MCL just 0.5 mile downstream of the discharge point. With respect to the Trinity, she noted that no recharge features were observed and she stated that the effluent limits in the draft permit are protective.[203]

On cross-examination, Ms. Saldaña stated that, although in her written prefiled testimony she had opined that the draft permit appears to meet the rules and regulations pertaining to the discharge, she had not reviewed the permit for compliance with TCEQ rules; she could only refer to the fact that her colleagues had issued a draft permit so they must have decided that it complied with the applicable rules.[204] She was unable to say whether the Commission considers perched aquifers to be "groundwater," although she stated that in reviewing "no discharge" permits she did consider groundwater not contained in aquifers.[205] She stated that she did not look at MCL levels for any constituents other than for nitrate, although other constituents could be harmful.[206] She did not consider the direction of groundwater flow.[207] Further, she was unsure whether the ED performs reviews to ensure that a segment's designated use of "aquifer protection" would be protected.[208]

---

[200] Exhibit ED-16 at 9 (Saldaña testimony).

[201] Exhibit ED-16 at 11 (Saldaña testimony).

[202] Exhibit ED-16 at 12 (Saldaña testimony).

[203] Exhibit ED-16 at 12-13 (Saldaña testimony).

[204] Tr. at 653-654 (Saldaña testimony).

[205] Tr. at 655-657 (Saldaña testimony).

[206] Tr. at 657 (Saldaña testimony).

[207] Tr. at 658 (Saldaña testimony).

[208] Tr. at 661-662 (Saldaña testimony).

The ED's response to Mr. Webster's inquiry, to which Ms. Saldaña alluded in her testimony, was as follows:

> ED staff generally agrees that Mr. Webster's wells are shallow, not fully cased, and one is located within 20 feet of Deep Hollow Creek. Therefore, the groundwater that supplies the wells may be hydraulically connected to the creek. Water quality modeling indicated that a first order decay constituent (such as nitrate), assuming a starting concentration of 20 [mg/L], a discharge would travel 900 meters to the impoundment on Mr. Webster's property [sic]. The Executive Director's staff estimates that the when [sic] Lerin Hills is discharging, the concentration of the constituent in the impoundment will be 3.76 mg/L. At the outlet from the impoundment dam into Deep Hollow Creek, approximately 200 meters upstream from Mr. Webster's well, the concentration is estimated at 1.64 mg/L. These concentrations are less than the [MCL] for nitrate, 10 mg/L and contamination of the wells is not expected. However, it is not advisable to use untreated surface water as a drinking water source, regardless of whether or not there is a permitted discharger into the waterbody.[209]

Rick Wood's Witnesses

Mr. Wood testified about the wells on his and the Hahnfeld property.[210] He stated that there is one (about 765 feet deep) on his property, about 2,200 feet north-northeast of the discharge point, used for domestic household purposes.[211] There are two wells on the Hahnfeld property. One is about 3,300 feet northeast of the discharge point, and is used as an emergency well to fill tanks on the property and has been used in the past for irrigation.[212] The other well (about 650 feet deep), located about 3,600 feet northeast of the discharge point, is used for domestic purposes.[213] In response to Dr. Kier's assertion that Mr. Wood had once stated to someone that well H1 was dry, he testified that in fact the well has never been dry during his residence on the property dating back to

---

[209] Exhibit ED-5 at 7.

[210] Exhibit RW-1 at 4-5 (Wood testimony); Tr. at 264-265 (Wood testimony).

[211] The ALJ believes this is well "W1."

[212] The ALJ believes this is well "H1."

[213] The ALJ believes this is well "H2."

1997.[214] Mr. Wood also stated that H1 has the potential to produce water from very near the surface, and that the groundwater elevation in the well is about eight to ten feet above the water level in the adjacent pond.[215] Further, Mr. Wood agreed with Dr. Kier that perhaps usual groundwater flow in the area is from the well toward the stream, but when the well is pumping it pulls water toward the pump.[216] Mr. Wood acknowledged that he had never seen the level of the Hahnfeld pond do down in response to pumping at the H1 well.[217]

Mr. Slade testified that the proposed discharge point is in the contributing zone of the Edwards Aquifer, in that the effluent flows to and mixes with local runoff in Cibolo Creek and discharges to the Edwards Aquifer recharge zone, where most of the total discharge in Cibolo Creek enters the Edwards Aquifer.[218] Maps attached to Mr. Slade's prefiled testimony show Deep Hollow Creek, Frederick Creek, and Cibolo Creek in proximity to the Edwards Aquifer recharge zone; they indicate that, from the confluence of Frederick Creek with Cibolo Creek, it is 7.61 miles to the upstream end of the recharge zone.[219] Mr. Slade summarized the stream distances cumulatively as follows:

> Cumulative miles via main streambed from the effluent discharge point to its first encounter with the Edwards aquifer recharge zone are as follows: Stream mile 0.5 miles to the confluence with Deep Hollow Creek; stream mile 2.22 to the confluence

---

[214] Exhibit RW-1 at 7 (Wood testimony).

[215] Exhibit RW-1 at 8 (Wood testimony).

[216] Exhibit RW-1 at 8-9 (Wood testimony). Mr. Wood acknowledged that he is not providing expert testimony in this case. Tr. at 262 (Wood testimony).

[217] Tr. at 267-268 (Wood testimony).

[218] Exhibit RW-3 at 6 (Slade testimony). He noted that under the narrative definition of "contributing zone" in rule 213.22(2) ("[t]he area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer"), the discharge point is included. However, he also noted that on the map that is part of the definition in § 213.22(2), Kendall County is not included. Tr. at 364 (Slade testimony). But Mr. Slade also pointed out that, according to a map that is part of a 2006 report of hydrologic data issued by the Edwards Aquifer Authority, southern Kendall County, where the Lerin Hills plant would be located, is in the "drainage area" – i.e., contributing zone – of the Edwards Aquifer, although not within the jurisdictional area of the Adwards Aquifer Authority. Exhibit RW-E at 21; Tr. at 406-408 (Slade testimony).

[219] Exhibit RW-3C and RW-3D.

with Frederick Creek; stream mile 6.43 to the confluence with Cibolo Creek and then stream mile 14.04 to the upstream end of the Edwards aquifer recharge zone.[220]

Mr. Slade went on testify that recharge from Cibolo Creek represents about 16 percent of total recharge to the Edwards Aquifer. By comparing the flow at United States Geological Survey streamflow gages, Mr. Slade determined that about 79 percent of the flow of Cibolo Creek is lost to recharge downstream of Boerne.[221] Looking at data about how often the lower-end gage was dry, Mr. Slade determined that about 90 percent of the time, all the Lerin Hills effluent entering the recharge zone would be lost as recharge to the Edwards Aquifer.[222] Further, he stated that if there are faults in the Trinity Aquifer west of the Edwards Aquifer recharge zone, water from Cibolo Creek could recharge the Edwards Aquifer without reaching the portion of Cibolo Creek that crosses the mapped recharge zone.[223] He agreed that the "aquifer protection" use of Cibolo Creek only applies to those parts of the creek that are found in the contributing zone, recharge zone, or transition zone of the Edwards Aquifer as defined in chapter 213 of the Commission's rules.[224]

According to Mr. Slade, major contaminants of concern with respect to the Edwards Aquifer are BOD, TSS, nitrogen, and phosphorus.[225] As to these four constituents, he stated, the water quality in Upper Cibolo Creek is generally better than the permitted values in the Lerin Hills draft permit; in other words, most of the time the existing water quality in Upper Cibolo Creek is better than that of the effluent.[226] Mr. Slade acknowledged that he did not consider the question of how much the concentrations of those constituents might decrease through decay prior to the discharge's entry into Cibolo Creek.[227] He stated that if the overflow of untreated effluent or the rupture of a

---

[220] Exhibit RW-3 at 8 (Slade testimony).

[221] Exhibit RW-3 at 9-10 (Slade testimony).

[222] Exhibit RW-3 at 11 (Slade testimony).

[223] Tr. at 354-355 (Slade testimony).

[224] Tr. at 424-425 (Slade testimony).

[225] Exhibit RW-3 at 11 (Slade testimony).

[226] Exhinit RW-3 at 15 (Slade testimony).

[227] Tr. at 382 (Slade testimony).

pipe occurred at the treatment plant location, additional pollutant loading to the Edwards Aquifer could result.[228]

Mr. Slade calculated that, assuming the maximum permitted average discharge of 0.5 MGD, the Lerin Hills discharge would constitute about 0.5 percent of the mean annual recharge to the Edwards Aquifer of Cibolo Creek.[229]

In addition, in response to Dr. Kier's testimony that the water in Deep Hollow Creek meets the nitrate MCL, Mr. Slade stated that the MCLs do not address the four water quality constituents that are limited by the draft permit for Lerin Hills.[230] Further, there are MCLs for other constituents, too, that may or may not be met by the water in Deep Hollow Creek.[231]

3. ALJ's Analysis

Applicant has adequately shown that the draft permit and proposed discharge comply with the applicable rules concerning the protection of groundwater.

As to the Edwards Aquifer, Lerin Hills must show two things: (1) that the siting of the facility will minimize the contamination of groundwater; and (2) that Cibolo Creek's "aquifer protection" use will not be impaired.[232] The evidence shows that, in a hydrological sense, the location of the

---

[228] Exhibit RW-3 at 15. He acknowledged that the draft permit requires measures to safeguard against spills of untreated or partially treated effluent during electrical failures. Tr. at 400-401 (Slade testimony).

[229] Tr. at 379 (Slade testimony). Mr. Slade cautioned, however, that the percentage could be higher in dry periods when the mean flow would not be occurring. Tr. at 379-380 (Slade testimony). He also agreed that some of the discharge might be lost to evaporation and transpiration upstream of the Cibolo, although constituents like nutrients do not evaporate. Tr. at 380-381, 409 (Slade testimony).

[230] Tr. at 352 (Slade testimony).

[231] Tr. at 352 (Slade testimony). And, he testified that ammonia nitrogen in the Lerin Hills discharge could decay into nitrite, for which EPA has an MCL of 1.0 mg/L. Tr. at 356 (Slade testimony). However, the nitrite could then decay into nitrate with further oxygen. Tr. at 356-357 (Slade testimony).

[232] As discussed above, the Tier 2 antidegradation standard (that there must be no greater-than-*de minimis* degradation) is not applicable to this inquiry.

plant and proposed discharge is in the contributing zone of the Edwards Aquifer. However, the following factors strongly indicate that contamination of the Edwards by the Lerin Hills discharge would be minimal:

- the discharge site is at least 14 miles from the Edwards Aquifer recharge zone;
- the effluent limitations in the draft permit for $CBOD_5$, TSS, ammonia nitrogen, and phosphorus are equal to or more stringent than those required in chapter 213 for dischargers located only up to five miles upstream of the Edwards Aquifer recharge zone;
- the Lerin Hills discharge, assuming maximum flow and assuming that all of it reached Cibolo Creek, would constitute about 0.5 percent of the mean annual recharge volume to the Edwards over the length of Cibolo Creek;[233] and
- recharge from Cibolo Creek represents 16 percent of total recharge to the Edwards Aquifer.

Mr. Wood argues that the proximity of the Lerin Hills site to the Edwards Aquifer means that available treatment technology must be employed to drive the phosphorus concentrations in the effluent to levels of 0.2 mg/L or lower. This, argues Mr. Wood, would minimize contamination of groundwater, as required. However, Mr. Wood's argument ignores the fact that the Commission has determined a limitation for phosphorus of 1.0 mg/L – twice as high as the limitation in the Lerin Hills draft permit – is adequate for dischargers just zero to five miles upstream from the recharge zone.

According to the ED, the "aquifer protection" use only applies to those portions of Cibolo Creek located in the contributing, recharge, or transition zones of the Edwards Aquifer. Executive Director's Reply to Rick Wood's and OPIC's Closing Arguments at 7-8, *citing* 30 TEX. ADMIN. CODE § 307.10, Appendix A, footnote 3 to Table of Designated Segments in the San Antonio River Basin. As there seems to be a difference between the boundaries of the contributing zone as defined for jurisdictional purposes in the Commission's rules and the boundaries based on hydrological data, the ALJ assumes for the sake of analysis that all of Upper Cibolo Creek downstream from its confluence with Frederick Creek has the use of "aquifer protection."

[233] Mr. Wood argues that mean or median flows are not relevant here, and instead the frequent low-flow conditions in Cibolo Creek are more important. He correctly notes that the Texas surface water quality standards require compliance in low-flow conditions. Responsive Closing Arguments of Rick Wood at 5-6. But the analysis here is about groundwater quality, and the point is that the Lerin Hills discharge would be but a small percentage of the overall annual recharge to the aquifer from Cibolo Creek. Low flow conditions are important with respect to the analysis of surface water conditions, but, again, this portion of the analysis concerns groundwater.

With respect to the Trinity Aquifer, Lerin Hills has likewise shown that the siting of the facility minimizes contamination of groundwater. The record indicates that the plant and discharge site is situated over the upper Glen Rose formation, which has a depth of 400 to 500 feet and relatively low vertical hydraulic conductivity. The principal local water supply, the Middle Trinity, lies below the upper Glen Rose. Wells W1 and H2 draw their water from the Middle Trinity. No expert in the case found, through personal observation or literature research, any recharge features in the area relating to the Trinity Aquifer.

When it comes to the matter of shallow perched groundwater in the area, the case is a bit closer. Dr. Kier and Ms. Saldaña agree that the area of Deep Hollow Creek has perched groundwater zones unconnected to the Trinity. Of particular significance is the fact that these perched zones communicate with Deep Hollow Creek. However, the key to whether the discharge in Deep Hollow Creek is likely to contaminate perched groundwater in the area is Dr. Kier's repeated testimony that Deep Hollow Creek in the area of the discharge is a "gaining stream." This means that it is topographically lower than the nearby perched zones, and receives water from them but does not communicate surface water to them.[234]

For these reasons, the ALJ determines that Applicant has met its burden of proof as to groundwater protection.

V. ISSUE C: WHETHER THE PERMIT WOULD AUTHORIZE APPLICANT TO DISCHARGE THE APPROPRIATE AMOUNT OF WASTEWATER BASED ON THE SERVICE AREA PROJECTIONS

Teague Harris, a consulting engineer on the Lerin Hills project, testified about Lerin Hills' projected service area. He stated that Lerin Hills owns approximately 866 acres of land that is proposed to be developed into single-family homes, an elementary school, and some commercial

[234] LH-3 at 6-7, 8-9, 16, 18 (Kier testimony). Ms. Saldaña stated that Deep Hollow Creek could be considered a recharge feature to local, perched groundwater. However, the ALJ finds Dr. Kier's testimony more credible because Ms. Saldaña's review did not seem very thorough, and she testified that she did not consider the direction of groundwater flow in the area. Exhibit ED-16 at 12; Tr. at 658 (Saldaña testimony).

development, with a projected number of 1,667 equivalent development units (EDUs) (1,475 EDUs for single family housing, 45 EDUs for the school, and 147 EDUs for commercial development). According to Mr. Harris, the proposed average daily flow at build-out for the 1,667 EDUs is 500,000 gallons per day (GPD) (300 GPD per EDU).[235] Mr. Harris testified that he selected the 300 GPD/EDU number based on his experience, and based on the fact that the San Antonio Water System uses this criterion.[236] He believes that the 500,000 GPD authorization would be sufficient for the proposed service area. The ED argues that the estimated flows appear consistent with wastewater usage rates in the Commission's rules.[237] As Applicant has put forth a prima facie case on this issue and Mr. Wood has not offered any specific evidence or argument that this discharge amount would be inappropriate for the service area,[238] the ALJ determines that Lerin Hills has met its burden as to this issue.

VI. ISSUE D: WHETHER THE PROPOSED FACILITY WOULD COMPLY WITH THE SITING REQUIREMENTS IN 30 TEXAS ADMINISTRATIVE CODE § 309.12

As noted above, § 309.12 of the Commission's rules provides:

> The commission may not issue a permit for a new facility or for the substantial change of an existing facility unless it finds that the proposed site, when evaluated in light of the proposed design, construction or operational features, minimizes possible contamination of surface water and groundwater. In making this determination, the commission may consider the following factors:
>
> (1) active geologic processes;
>
> (2) groundwater conditions such as groundwater flow rate, groundwater quality, length of flow path to points of discharge and aquifer recharge or discharge conditions;

---

[235] Exhibit LH-1 at 5, 15 (Harris testimony).

[236] Exhibit LH-1 at 15-16 (Harris testimony).

[237] Executive Director's Closing Argument at 11, *citing* 30 TEX. ADMIN. CODE §§ 285.91(3), 317.4(a).

[238] Mr. Wood does argue that the likely nature of the influent was not adequately considered by Lerin Hills, but the argument does not seem to address the amount of influent. *See* Rick Wood's Closing Arguments at 29-31.

(3) soil conditions such as stratigraphic profile and complexity, hydraulic conductivity of strata, and separation distance from the facility to the aquifer and points of discharge to surface water; and

(4) climatological conditions.[239]

Applicant's compliance with this rule as it specifically pertains to groundwater protection is discussed under Section IV.B above. Mr. Wood has, however, made the additional argument that Lerin Hills has failed to demonstrate its compliance with this rule as it concerns erosion.

As Mr. Wood points out, the Commission's rules define "active geologic processes" as including erosion.[240] Mr. Wood argues that both the construction of the facility and the effluent flow – with a permitted peak of 2 MGD – create the potential for erosion. He points to a photo of the unnamed tributary and asserts that it shows soil.[241] Mr. Harris testified that he did not do any specific evaluation of the potential for erosion, other than to make a site visit, at which he concluded that the area is not susceptible to excessive erosion.[242] Dr. Kier testified that he examined photos of the area of the discharge and concluded that the upper reaches of the receiving stream, on the Lerin Hills property, was mostly rock and would not have much erosion. However, he said that if he were wrong it would be comparatively easy to install erosion controls like rock berms or silt fences. Closer to the SCS impoundment, he stated, there is erosion from storm events and the discharge would have a negligible effect on that process. With respect to the treatment plant site, he stated that there is little soil, but at the time of excavation and construction erosion control measures can be put in place.[243]

The ALJ concludes that Applicant has met its burden to show the proposed facility and discharge site fulfills the requirements of rule 309.12. Both Mr. Harris and Dr. Kier testified that

---

[239] 30 TEX. ADMIN. CODE § 309.12.

[240] 30 TEX. ADMIN. CODE § 309.11(1).

[241] See Exhibit LH-1B, Exhibit 5, at 2.

[242] Tr. at 33, 48-49 (Harris testimony).

[243] Tr. at 152-154 (Kier testimony).

they do not believe the site is susceptible to much erosion because there is little soil at the site. Indeed, the photo cited to by Mr. Wood shows a rocky location with apparently limited topsoil. The preponderance of the evidence supports a finding that the siting of the facility at the proposed location would minimize water contamination due to erosion.[244]

VII. ISSUE E: WHETHER THE FACILITY WILL MEET THE RULE REQUIREMENTS INTENDED TO REDUCE NUISANCE ODOR CONDITIONS

Commission rule 309.13(e) requires applicants to adopt one of several specified alternatives to abate and control nuisance odors prior to construction of a new wastewater treatment plant unit.[245] A plant like the proposed Lerin Hills facility would be required to maintain a 150-foot buffer from the nearest property line. The evidence shows that the planned facility will beet the 150-foot buffer requirement; the plant site and required buffer zone are owned by Lerin Hills and therefore Lerin Hills does not have to acquire easements or other property interests. If for some reason the entire buffer zone is not conveyed to the Lerin Hills MUD, then Lerin Hills will dedicate a buffer zone easement to the MUD.[246] Mr. Wood offered no evidence or argument on this issue, other than to assert that he and his family would suffer.[247] Based on this record, the ALJ concludes that Lerin Hills has met its burden to show that it would comply with the requirements intended to reduce nuisance odor conditions.

VIII. ISSUE F: WHETHER APPLICANT'S COMPLIANCE HISTORY IS SUCH THAT THE PERMIT SHOULD NOT BE ISSUED

Ms. Airey prepared the compliance history for Lerin Hills, which received a classification "average by default" because the facility does not yet exist.[248] Mr. Wood agrees that this applicant

---

[244] And, the ED has pointed out Lerin Hills would be required to comply with the general permit requirements for discharges from a construction site into surface waters. Exhibit ED-5 at 22.

[245] 30 TEX. ADMIN. CODE § 309.13(e).

[246] 30 TEX. ADMIN. CODE § 309.13(e)(1), (e)(3). *See* Exhibit LH-1 at 11-12 (Harris testimony).

[247] Rick Wood's Closing Arguments at 28.

[248] Exhibit ED-4; Exhibit ED-1 at 9-10 (Airey testimony); Tr. at 504 (Airey testimony).

has no compliance history.[249] There is no indication in the record that Applicant's compliance history is such that a permit should not be issued.

IX. ISSUE G: WHETHER OTHER REQUIREMENT NO. 1 AND OPERATIONAL REQUIREMENT NO. 4 OF THE DRAFT PERMIT WITH REGARD TO PLANT OPERATOR AND SAFETY REQUIREMENTS ARE SUFFICIENT TO ENSURE COMPLIANT PLANT OPERATIONS

A. Draft Permit Provisions

Other Requirement No. 1 of the draft permit reads:

> The permittee shall employ or contract with one or more licensed wastewater treatment facility operators or wastewater system operations companies holding a valid license or registration according to the requirements of 30 TAC [Texas Administrative Code] Chapter 30, Occupational Licenses and Registrations and in particular 30 TAC Chapter 30, Subchapter J, Wastewater Operators and Operations Companies.
>
> This Category C facility must be operated by a chief operator or an operator holding a Category C license[250] or higher. The facility must be operated a minimum of five days per week by the licensed chief operator or an operator holding the required level of license or higher. The licensed chief operator or operator holding the required level of license or higher must be available by telephone or pager seven days per week. Where shift operation of the wastewater treatment facility is necessary, each shift which does not have the on-site supervision of the licensed chief operator must be supervised by an operator in charge who is licensed not less than one level below the category for the facility.[251]

---

[249] Rick Wood's Closing Arguments at 28.

[250] There are four categories of operator license, with Class C being third in terms of required education and experience required. 30 TEX. ADMIN. CODE § 30.340(a).

[251] Exhibit LH-1C at 23.

Operational Requirement No. 4 of the draft permit reads:

> The permittee is responsible for installing prior to plant start-up, and subsequently maintaining, adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources, standby generators, and/or retention of inadequately treated wastewater.[252]

B. Design Issues Raised by Mr. Wood

Mr. Wood raises design issues potentially affecting the performance of the facility that, he argues, are not resolved by the above operational requirements. The issues are: that the application in general includes only conceptual design features, with details to be worked out later; that the application does not include the details of a pressurized pipe that would transport the effluent from the treatment plant to the higher discharge point; that Applicant used an assumed BOD strength[253] for the influent instead of seeking actual data from nearby developments (and Applicant's assumed number failed to account for the planned restaurants in the development); that the peak capacity of facility elements has not been determined; and that the plant may not have much excess storage capacity in the first interim phase.

Lerin Hills contends that Mr. Wood's arguments about facility design are beyond the scope of the Commission's referred issues. Further, Lerin Hills argues that particular design issues, including calculation of influent BOD strength, are properly addressed by the ED in his review of the plans and specifications under chapter 217 of the Commission's rules regarding design criteria for domestic wastewater systems.

The ALJ agrees with both of Lerin Hills' points. The issues referred by the Commission cannot fairly be read to include the design matters raised by Mr. Wood. Further, the Commission's

---

[252] Exhibit LH-1C at 10.

[253] The assumed number is 200 parts per million.

rules specifically state, "An owner is not required to submit collection system or treatment facility plans and specifications for approval prior to the commission issuing the facility's wastewater permit."[254] The design of the pressurized effluent pipe, the BOD strength of the influent, and the capacity of various treatment units are issues properly addressed in the design phase. Under chapter 217, a successful wastewater discharge permit applicant must submit to the ED for approval the detailed plans and specifications of the facility. The rules provide, "A treatment facility's plans and specifications must be based on a design that will produce effluent that will at least meet the requirements and effluent limits in the associated wastewater permit."[255]

C. Adequacy of the Draft Permit Provisions

1. Other Requirement No. 1

Specifically with respect to Other Requirement No. 1, which establishes requirements for the plant operator, Mr. Wood makes two arguments: (1) the lack of design detail for the facility and concerning peak capacity justifies a greater level of operational attention than is required by the draft permit, which does not mandate 24-hour attendance by an operator;[256] and (2) the proposed use of effluent filters, which are not standard, requires a more skilled operator. Neither of these arguments is persuasive. As discussed above, the lack of design detail at this stage is contemplated by the process; that the facility has not yet been designed is not justification for a higher level of operational attention. And there is nothing in evidence supporting the argument that the filtration at the proposed plant is so unusual as to necessitate a more educated and experienced operator. Mr. Harris testified that a Category C operator is appropriate for this facility, and his testimony was uncontroverted.[257] The ALJ therefore determines that Other Requirement No. 1 is adequate to ensure compliant plant operations.

---

[254] 30 TEX. ADMIN. CODE § 217.6(a).

[255] 30 TEX. ADMIN. CODE § 217.6(b).

[256] Tr. at 476 (Knowles testimony).

[257] Exhibit LH-1 at 19 (Harris testimony).

2. Operational Requirement No. 4

Mr. Wood argues that Operational Requirement No. 4, which requires alternate power sources, standby generators, and/or retention of inadequately treated wastewater, is inadequate. First, Mr. Wood noted that during the hearing Applicant indicated it was willing to install standby generators and to agree to a permit requirement to that effect.[258] Mr. Wood urges that the draft permit, accordingly, include such a requirement. Second, Mr. Wood points to Mr. Knowles' testimony that even with on-site generators, plant upsets can occur due to equipment failure.[259] Given this fact, asserts Mr. Wood, the draft permit should require additional retention capacity to allow the facility to hold untreated or partially treated wastewater during the event of an equipment failure. Mr. Wood asks that the language of the permit provision be altered to read:

> The permittee is responsible for installing prior to plant start-up, and subsequently maintaining, adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources *such as standby generator(s), and retention capacity for inadequately treated wastewater.*[260]

OPIC urges that the draft permit be altered to require enough backup electricity generation to power the facility for at least 24 hours.[261]

Lerin Hills responds that equipment failures unrelated to electrical outages are not germane to the issues referred to SOAH by the Commission. Further, Lerin Hills points to numerous provisions in the chapter 217 design criteria rules that require redundancy as to various elements of the treatment system.[262] One of the cited chapter 217 requirements mandates an explanation of bypass control measures in the final engineering design report, including:

---

[258] Tr. at 30 (Harris testimony).

[259] Rick Wood's Closing Argument at 35, *citing* Tr. at 466 (Knowles testimony).

[260] Rick Wood's Closing Argument at 35 (emphasis added).

[261] Public Interest Counsel's Closing Argument at 9.

[262] Lerin Hills, Ltd.'s Reply to Closing Arguments at 38 and Attachment B.

(i) information and data describing features to prevent bypassing such as auxiliary power, standby and duplicate units, holding tanks, storm water clarifiers, or flow equalization basins; and

(ii) operational arrangements such as flexibility of pipes and valves to control flow through the treatment units and reliability of power sources to prevent unauthorized discharges of untreated or partially treated wastewater.[263]

Because Lerin Hills is agreeable to the inclusion in the permit of a provision requiring a standby generator or generators, the ALJ recommends that any permit issued include such a requirement. Even if the issue of possible upsets caused by equipment failures other than power outages is within the scope of Commission Issue G, successful permit applicants are required to develop, in the context of their facility design, measures to prevent bypasses and unauthorized discharges. Therefore, the ALJ finds no reason to recommend the provision requiring additional retention capacity urged by Mr. Wood.

X. TRANSCRIPTION COSTS

Lerin Hills argues that a 50-50 allocation of transcription costs between itself and Mr. Wood would be reasonable. Mr. Wood contends that Lerin Hills should bear all of the transcription costs in this case.

The Commission's rules require consideration of the following factors in assessing transcription costs:

(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;

---

[263] 30 TEX. ADMIN. CODE § 217.10(f)(2)(E).

(E) the budgetary constraints of a state or federal administrative agency participating in the proceeding;

(F) in rate proceedings, the extent to which the expense of the rate proceeding is included in the utility's allowable expenses; and

(G) any other factor which is relevant to a just and reasonable assessment of costs.[264]

Both Applicant and Mr. Wood participated in the hearing and benefitted from having a transcript. Lerin Hills is a business partnership, while Mr. Wood is a private individual; under ordinary circumstances, it would make sense to assume that Lerin Hills would have a much greater capacity to pay than would Mr. Wood. However, there is evidence that an unspecified amount of Mr. Wood's legal expenses in this case are being paid by Tapatio Springs, a development in Kendall County.[265] Lerin Hills asserts that Tapatio Springs is a rival to Lerin Hills. While the record does not reflect how much of Mr. Wood's expenses are being covered by Tapatio Springs, the involvement of this other development does militate toward a greater share of the costs being assessed to Mr. Wood than would otherwise be the case.

Based on the available information, the ALJ recommends that 85 percent of the costs of transcription be assessed to Lerin Hills, and 15 percent to Mr. Wood.

XI. CONCLUSION

The ALJ determines that Lerin Hills has failed to prove that the draft permit and proposed discharge would satisfy the requirements of the Commission's antidegradation rule in connection with the waters of Deep Hollow Creek, Frederick Creek, and Cibolo Creek. The ALJ further determines that Lerin Hills has met its burden of proof with respect to all other issues referred to SOAH by the Commission. Because the ALJ concludes that Lerin Hills has not met its burden to show that the draft permit would protect water quality to the degree required by the Commission's

---

[264] 30 TEX. ADMIN. CODE § 80.23(d).

[265] Tr. at 271 (Wood testimony).

rules, the ALJ recommends that the application be denied. If the permit is issued, however, the ALJ recommends that it include a requirement that the permittee will install, prior to plant start-up, a standby generator sized to provide adequate power to the facility during electrical power failures. The ALJ further recommends that the Commission adopt all Findings of Fact and Conclusions of Law in the Proposed Order on these issues.

SIGNED March 4, 2009.

SHANNON KILGORE
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

ORDER
CONCERNING THE APPLICATION BY
LERIN HILLS, LTD.,
FOR TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) PERMIT
NO. WQ0014712001

On _____ , the Texas Commission on Environmental Quality (TCEQ or Commission) considered the application of Lerin Hills, Ltd., (Lerin Hills) for a permit to discharge treated wastewater effluent in Kendall County, Texas. A Proposal for Decision (PFD) was presented by Shannon Kilgore, Administrative Law Judge (ALJ) with the State Office of Administrative Hearings (SOAH).

The following are parties to the proceeding: Lerin Hills; the Executive Director (ED); Rick Wood; and the Office of Public Interest Counsel (OPIC).

After considering the Proposal for Decision, the Commission makes the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

1. Lerin Hills, Ltd. (Lerin Hills or Applicant) has applied to the Texas Commission on Environmental Quality (TCEQ or Commission) for Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0014712001.

2. The permit would authorize the discharge of treated wastewater effluent from a new proposed municipal wastewater facility that would be located in Kendall County, approximately four miles west of the City of Boerne.

Procedural History

3. Lerin Hills filed its application for a new TPDES permit on May 3, 2006.

4. The Commission's Executive Director (ED) declared the application administratively complete on May 26, 2006.

5. Lerin Hills published the Notice of Receipt of Application and Intent to Obtain Water Quality Permit on June 9, 2006.

6. The ED completed the technical review of the application and prepared an initial draft permit. The application was declared technically complete on August 16, 2006.

7. The combined Notice of Application and Preliminary Decision and Public Meeting was published on September 22, 2006.

8. A public meeting was held October 24, 2006, in Boerne.

9. Following receipt of several requests for a contested case hearing, the Commission considered the requests in an open meeting on October 24, 2007.

10. On October 26, 2007, the Commission referred this matter to the State Office of Administrative Hearings (SOAH) on October 24, 2007. The Commission established a nine-month deadline for the proposal for decision (from the date of the preliminary hearing), and referred seven issues.

11. The preliminary hearing was held on January 8, 2008, in Austin. After determining that proper notice had been given and that the Commission and SOAH have jurisdiction over this matter, the ALJ designated the following parties: Lerin Hills, represented by Danny

Worrell and Jackson Battle; the ED, represented by Kathy Humphreys and Tim Reidy; the Commission's Office of Public Interest Counsel (OPIC), represented by Amy Swanholm; and protesting party Rick Wood, represented by David Frederick and Eric Allmon.

12. The hearing originally convened on June 30, 2008. On that date, at the outset of the hearing, the parties broke for negotiations and announced that they had reached an agreement in principle. The hearing was therefore abated.

13. On August 29, 2008, the parties informed the ALJ that their negotiations had failed to yield a final settlement, and they then proposed a hearing schedule, which the ALJ adopted. The parties waived the deadline established by the Commission for the completion of the hearing process.

14. The hearing on the merits was held in Austin on November 18, 19, and 20, 2008. The record closed on January 12, 2009, with the submission by the parties of their final closing arguments.

Proposed Facility and Draft Permit Conditions

15. The proposed wastewater treatment facility would serve a new development, and would be located approximately 4 miles west of Interstate 10, as measured along State Highway 46, and then approximately 200 feet due west from that point.

16. The draft permit would authorize the discharge of treated domestic wastewater at a daily average flow not to exceed 0.18 million gallons per day (MGD) in the Interim I Phase, 0.36 MGD in the Interim II Phase, and 0.5 MGD in the Final Phase.

17. The effluent would discharge into an unnamed tributary, then approximately 0.5 mile to the headwaters of an impoundment on Deep Hollow Creek (the SCS impoundment), then

to Deep Hollow Creek, then to Frederick Creek, then to Upper Cibolo Creek in Segment No. 1908 of the San Antonio River Basin.

18. The immediate receiving stream, the unnamed tributary, is presumed intermittent due to its minimal watershed and steep gradient; the Lerin Hills discharge would probably comprise the total flow in the creek most of the time.

19. Deep Hollow Creek is an intermittent stream and has an estimated low flow of 0.1 cubic feet per second (cfs).

20. There is a pond on Deep Hollow Creek upstream of where the discharge route enters the creek.

21. There is a pond (the Hahnfeld pond) downstream of the SCS pond, prior to the confluence of Deep Hollow Creek with Frederick Creek; this pond is used by Mr. Wood and his family for swimming and fishing.

22. The plant would be an activated sludge process plant operated in the complete mix mode with nitrification. Treatment units would include bar screens, aeration basins, final clarifiers, aerobic sludge digesters, sand filters, and chlorine contact chambers.

23. The proposed wastewater treatment process will include coagulant addition facilities to precipitate phosphorus upstream of the clarifier and dechlorination facilities prior to discharge.

24. The draft permit includes the following daily average effluent limitations: 5 milligrams per liter (mg/L) 5-day carbonaceous biochemical oxygen demand (CBOD), 5 mg/L total suspended solids (TSS), 1 mg/L ammonia nitrogen (NH_3-N), 0.5 mg/L (or 2.1 pounds per day) total phosphorus (P), and 6.0 mg/L minimum dissolved oxygen (DO). The draft permit also requires reporting of nitrate-nitrogen and total nitrogen levels.

25. The draft permit includes requirements that the effluent contain a chlorine residual of at least 1.0 mg/L and shall not exceed a chlorine residual of 4.0 mg/L after a detention time of at least 20 minutes (based on peak flow). Subsequent to disinfection, the effluent shall be dechlorinated to less than 0.1 mg/L chlorine residual.

26. The draft permit requires that pH shall not be less than 6.0 standard units, nor greater than 9.0 standard units.

27. The draft permit requires sludge to be taken to a recycling center wastewater treatment facility for disposal.

28. Operational Requirement No. 4 on page 10 of the draft permit specifies that the permittee is responsible for installing, prior to plant setup, adequate safeguards to prevent discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources, standby generators, and/or retention of inadequately treated wastewater.

29. Other Requirement No. 1 on page 23 of the draft permit requires that the permittee employ or contract with one or more licensed wastewater treatment facility operators or wastewater system operations companies holding a valid license or registration according to the rules of the TCEQ. Because it would be a Category C facility, it must be operated by a chief operator or an operator holding a Class C license or higher. The facility must be operated a minimum of five days per week by the licensed chief operator or an operator holding the required level of license or higher, who must be available by telephone or pager seven days per week.

Surface Water Quality

30. The draft permit would ensure that the Commission's numerical standards applicable to all segments of the receiving stream would be met.

31. The draft permit would ensure that the narrative standards applicable to the immediate receiving stream, the unnamed tributary, would be met.

32. Modeling of the effects of the proposed discharge indicates that the lowest DO level in Deep Hollow Creek would be between 5.03 mg/L and 5.27 mg/L, compared to a presumed background of 6.25 mg/L or 6.45 mg/L.

33. Deep Hollow Creek, Frederick Creek, and Cibolo Creek are phosphorus-limited, meaning that the scarcity of phosphorus is what limits the growth of algae and aquatic plants.

34. Deep Hollow Creek, Frederick Creek, and Cibolo Creek have little assimilative capacity for nutrients.

35. The proposed Lerin Hills discharge could (at the maximum permitted concentration) add about 750 pounds per year of phosphorus to the stream system.

36. Predicted concentrations of phosphorus in the SCS impoundment would be 0.42 mg/L, 0.28 mg/L, 0.12 mg/L, and 0.05 mg/L (upstream to downstream), compared to the measured background of 0.035 mg/L or the presumed background of 0.05 mg/L.

37. Predicted concentrations of phosphorus in the Hahnfeld Pond would be 0.04 mg/L and 0.03 mg/L, compared to the measured background of less than the detectable limit of 0.02 mg/L.

38. The phosphorus concentrations in the Hahnfeld pond and SCS impoundment after the commencement of the proposed discharge could be as much as 150% to 1,200% of measured background.

39. Lerin Hills' phosphorus modeling uses a uniform decay rate to attempt to reflect removal of phosphorus from the water column, but the modeling does not attempt to reflect cumulative phosphorus loading over time.

40. The record in this case includes no attempt to estimate quantitatively the amounts of phosphorus that will be biologically available in the stream system over time as the discharge continues.

41. The proposed Lerin Hills discharge would also add nitrate-nitrogen, which has the potential to stimulate algal and plant growth, to the receiving stream.

42. An increase in plant and algal growth as a result of the proposed Lerin Hills discharge is likely.

43. The record in this case includes no attempt to estimate quantitatively the amounts of algal and plant growth that may result from the increased nutrient loading from the proposed discharge.

44. Segment No. 1908 of Upper Cibolo Creek is presently on the draft 2008 305(b) list for concerns about orthophosphorus.

45. Lerin Hills has failed to show that there would not be greater-then-*de minimis* degradation of the waters of Deep Hollow Creek, Frederick Creek, and Upper Cibolo Creek as a result of the proposed discharge.

46. Lerin Hills has not shown that any lowering of water quality resulting from the proposed discharge would be necessary for an important economic or social development.

Groundwater Quality

47. The proposed Lerin Hills plant and discharge site is situated over the upper Glen Rose formation, which has a depth of 400 to 500 feet and relatively low vertical hydraulic conductivity.

48. The principal local water supply, the Middle Trinity Aquifer, lies below the upper Glen Rose.

49. Wells W1 (on Rick Wood's property) and H2 (near the Hahnfeld pond) draw their water from the Middle Trinity Aquifer.

50. No expert in the case found, through personal observation or literature research, any recharge features in the area relating to the Trinity Aquifer.

51. The proposed Lerin Hills discharge site is at least 14 miles from the Edwards Aquifer recharge zone.

52. The effluent limitations in the draft permit for $CBOD_5$, TSS, ammonia nitrogen, and phosphorus are equal to or more stringent than those required in chapter 213 for dischargers located only up to five miles upstream of the Edwards Aquifer recharge zone.

53. The Lerin Hills discharge, assuming maximum flow and assuming that all of it reached Cibolo Creek, would constitute about 0.5% of the mean annual recharge volume to the Edwards over the length of Cibolo Creek.

54. Recharge from Cibolo Creek represents 16% of total recharge to the Edwards Aquifer.

55. Cibolo Creek's "aquifer protection" use will not be impaired.

56. The area of Deep Hollow Creek has perched groundwater zones unconnected to the Trinity Aquifer.

57. Wells on the Webster property near the SCS impoundment and well H1 (near Deep Hollow Creek in the vicinity of the Hahnfeld pond) are sourced by shallow, perched groundwater zones.

58. Deep Hollow Creek in the area of the discharge is a "gaining stream," meaning that it is topographically lower than the nearby perched zones, and receives water from them but does not communicate surface water to them.

59. The siting of the Lerin Hills facility would minimize the contamination of groundwater.

Amount of Wastewater

60. The draft permit would allow Lerin Hills to discharge the appropriate amount of wastewater based on service area projections.

Siting Criteria

61. The proposed Lerin Hills facility site is a rocky location with limited topsoil.

62. The siting of the facility at the proposed location would minimize water contamination due to erosion.

Nuisance Odors

63. A plant like the proposed Lerin Hills facility would be required to maintain a 150-foot buffer from the nearest property line.

64. The planned facility will meet the 150-foot buffer requirement; the plant site and required buffer zone are owned by Lerin Hills and therefore Lerin Hills does not have to acquire easements or other property interests.

65. If for some reason the entire buffer zone is not conveyed to the Lerin Hills MUD, then Lerin Hills will dedicate a buffer zone easement to the MUD.

Compliance History

66. The compliance history classification for Lerin Hills is "average by default," with a compliance rating of 3.1.

Other Requirement No. 1 and Operational Requirement No. 4

67. That the Lerin Hills facility has not yet been designed is not justification for a higher level of operational attention mandated in the permit.

68. A Class C operator is appropriate for the proposed Lerin Hills facility.

69. Lerin Hills will install, prior to plant start-up, a standby generator sized to provide adequate power to the facility during electrical power failures.

70. Lerin Hills is agreeable to the inclusion in the permit of a provision requiring a standby electrical generator or generators.

71. Successful permit applicants are required to develop, in the context of their facility design, measures to prevent bypasses and unauthorized discharges.

Transcription Costs

72. Reporting and transcription of the hearing on the merits was warranted because the hearing lasted three days.

73. All parties fully participated in the hearing by presentation of witnesses and cross examination.

74. All parties benefitted from preparation of a transcript.

75. There was no evidence that any party subject to allocation of costs was financially unable to pay a share of the costs.

76. Lerin Hills is a business partnership.

77. Mr. Wood is a private individual.

78. An unspecified amount of Mr. Wood's legal expenses in this case are being paid by Tapatio Springs, another development in Kendall County.

CONCLUSIONS OF LAW

Jurisdiction

1. The Commission has jurisdiction over this matter. TEXAS WATER CODE chs. 5 and 26.

2. SOAH has jurisdiction over this hearing process and the authority to issue a proposal for decision with findings of fact and conclusions of law. TEXAS WATER CODE §§ 5.311 and 26.021; TEXAS GOV'T CODE ch. 2003.

Notice

3. Notice of the Lerin Hills application and the hearing was properly provided to the public and to all parties. TEXAS WATER CODE §§ 5.115 and 26.028; TEXAS GOV'T CODE §§ 2001.051 and 2001.052; 30 TEX. ADMIN. CODE §§ 39.405 and 39.551.

Burden of Proof

4. Applicant had the burden to prove, by a preponderance of the evidence, that the proposed discharge permit will comply with the applicable statutes and rules. 30 TEX. ADMIN. CODE § 80.17(a).

Surface Water Quality

5. The draft permit and proposed Lerin Hills discharge would satisfy the requirements of the Commission's numerical stream standards. 30 TEX. ADMIN. CODE ch. 307.

6. The draft permit would ensure that the narrative standards applicable to the immediate receiving stream, the unnamed tributary, would be met. 30 TEX. ADMIN. CODE § 307.4.

7. The evidence fails to support a conclusion that, as to nutrients and their effects on surface water quality, the draft permit and proposed discharge would satisfy the requirements of

the Commission's antidegradation rule in connection with the waters of Deep Hollow Creek, Frederick Creek, and Cibolo Creek. 30 TEX. ADMIN. CODE § 307.5.

Groundwater Quality

8. The draft permit and proposed Lerin Hills discharge would satisfy the Commission's requirements as to groundwater protection. 30 TEX. ADMIN. CODE §§ 307.5, 309.12, 309.313.

Amount of Wastewater

9. The draft permit authorizes an appropriate amount of wastewater to be discharged based on service area projections.

Siting Criteria

10. The proposed Lerin Hills facility meets the siting requirements for domestic wastewater effluent and plants. 30 TEX. ADMIN. CODE § 309.12.

Nuisance Odors

11. The proposed Lerin Hills facility would comply with the requirements intended to reduce nuisance odor conditions. 30 TEX. ADMIN. CODE § 309.13(e).

Compliance History

12. The compliance history of Lerin Hills is suitable for issuance of the permit sought in this case.

Other Requirement No. 1 and Operational Requirement No. 4

13. Other Requirement No. 1 of the draft permit is adequate to ensure compliant plant operations.

14. Operational Requirement No. 4 is adequate to ensure compliant plant operations.

Transcription Costs

15. Allocating 85 percent of reporting and transcription costs for the hearing on the merits to Lerin Hills and 15 percent of the costs to Rick Wood is a reasonable allocation of costs under the factors set forth in 30 TEX. ADMIN. CODE § 80.23(d).

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 Lerin Hills, Ltd., for Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0014712001is denied.
2. All other motions, requests for entry of specific Findings of Fact or Conclusions of Law, and any other requests for general or specific relief, if not expressly granted herein, are hereby denied.
3. The effective date of this Order is the date the Order is final, as provided by TEX. GOV'T CODE § 2001.144 and 30 TEX. ADMIN. CODE § 80.273.
4. The Commission's Chief Clerk shall forward a copy of this Order to all parties.
5. If any provision, sentence, clause, or phase of this Order is for any reason held to be invalid, the invalidity of any provision shall not affect the validity of the remaining portions of this Order.

ISSUED:

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Buddy Garcia, Chairman
For the Commission