

State Office of Administrative Hearings



Shelia Bailey Taylor
Chief Administrative Law Judge

October 10, 2006

Derek Seal
General Counsel
Texas Commission on Environmental Quality
PO Box 13087
Austin Texas 78711-3087

Re: **SOAH Docket No. 582-05-4175; TCEQ Docket Nos. 2004-1474-IHW and 2004-1475-IHW; In Re: Application of Cogema Mining, Inc. for Production Area Authorization Amendments to Authorize the Revision of Restoration Tables**

Dear Mr. Seal:

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 **October 30, 2006**. Any replies to exceptions or briefs must be filed in the same manner no later than **November 9, 2006**.

This matter has been designated **TCEQ Docket Nos. 2004-1474-IHW and 2004-1475-IHW; SOAH Docket No. 582-05-4175**. 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 eleven 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,

A handwritten signature in black ink, appearing to read "William G. Newsham for".

Thomas H. Walston

Administrative Law Judge

THW:ml
Enclosures
cc: Mailing List

William P. Clements Building
Post Office Box 13025 ♦ 300 West 15th Street, Suite 502 ♦ Austin Texas 78711-3025
(512) 475-4993 Docket (512) 475-3445 Fax (512) 475-4994
<http://www.soah.state.tx.us>

STATE OFFICE OF ADMINISTRATIVE HEARINGS

WILLIAM P. CLEMENTS BUILDING, Jr.

300 West Fifteenth Street

Austin, Texas 78701

Phone (512) 475-4993

Facsimile (512) 475-4994

SERVICE LIST

AGENCY: Environmental Quality, Texas Commission on (TCEQ)

STYLE/CASE: COGEMA MINING

SOAH DOCKET NUMBER: 582-05-4175

REFERRING AGENCY CASE: 2004-1474-IHW

**STATE OFFICE OF ADMINISTRATIVE
HEARINGS**

**ADMINISTRATIVE LAW JUDGE
ALJ THOMAS H. WALSTON**

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

CHRISTINA MANN
STAFF ATTORNEY
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
OFFICE OF PUBLIC INTEREST COUNSEL
P.O. BOX 13087 MC-103
AUSTIN, TX 78711-3087
(512) 239-4014 (PH)
(512) 239-6377 (FAX)

OFFICE OF PUBLIC INTEREST COUNSEL

DON REDMOND
STAFF ATTORNEY
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
OFFICE OF LEGAL SERVICES
MC-173 P.O. BOX 13087
AUSTIN, TX 78711-3087
(512) 239-0612 (PH)
(512) 239-0606 (FAX)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

KENNETH RAMIREZ
ATTORNEY
BROWN MCCARROLL, L.L.P.
111 CONGRESS, SUITE 1400
AUSTIN, TX 78701
(512) 479-9711 (PH)
(512) 226-7271 (FAX)
kramirez@mailbmc.com

COGEMA MINING

LESLEY NICHOLS
STAFF ATTORNEY
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
TCEQ ENVIRONMENTAL LAW DIVISION
MC-173 P.O. BOX 13087
AUSTIN, TX 78711-3087
(512) 239-5917 (PH)
(512) 239-0606 (FAX)
lnichole@tceq.state.tx.us

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

MONICA JACOBS
ATTORNEY
BROWN MCCARROLL L.L.P.
111 CONGRESS AVENUE,, SUITE 1400
AUSTIN, TX 78701
(512) 479-9720 (PH)
(512) 226-7273 (FAX)

COGEMA MINING

DONATO RAMOS
5810 SAN BERNARDO AVENUE, SUITE 101 WALKER
PLAZA BLDG.
LAREDO, TX 78041
(956) 722-9909 (PH)
(956) 727-5884 (FAX)

SABT RANCH, LTD. AND SARAH ALICIA B.
TRAUTMANN

EMILIO DAVILA, JR.
1112 SAN AGUSTIN
LAREDO, TX 78040
(956) 723-3639 (PH)
(956) 727-8130 (FAX)

PATRICIA BENAVIDES

xc: Docket Clerk, State Office of Administrative Hearings

**SOAH DOCKET NO. 582-05-4175
TCEQ DOCKET NOS. 2004-1474-IHW & 2004-1475-IHW**

APPLICATION OF COGEMA MINING, INC. FOR PRODUCTION AREA AUTHORIZATION AMENDMENTS TO AUTHORIZE THE REVISION OF RESTORATION TABLES	§ § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS
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**SOAH DOCKET NO. 582-05-4175
TCEQ DOCKET NOS. 2004-1474-IHW & 2004-1475-IHW**

APPLICATION OF COGEMA MINING, INC. FOR PRODUCTION AREA AUTHORIZATION AMENDMENTS TO AUTHORIZE THE REVISION OF RESTORATION TABLES	§ § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS
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PROPOSAL FOR DECISION

I. INTRODUCTION

COGEMA Mining, Inc. (COGEMA) has applied for production area authorization (PAA) amendments under 30 TEX. ADMIN. CODE (TAC) § 331.107 to authorize the revision of groundwater restoration tables for three in-situ uranium mining production areas (PAs) located approximately 4.5 miles east of Bruni in Duval County, Texas. The Executive Director (ED) of the Texas Commission on Environmental Quality (TCEQ) has prepared draft PAA amendments which, if approved, would establish the conditions under which the facilities must operate. Sara Trautmann, SABB Ranch, Ltd., and Patricia Benavides (collectively Protestants), the owners of the property where the facilities are located, oppose COGEMA's application. They contend that COGEMA has not made sufficient effort to restore the underground water to its pre-mining condition. The TCEQ Office of Public Interest Counsel (PIC) agrees with COGEMA and the ED and recommends approval of the applications.

The Commission referred three issues concerning this dispute to the State Office of Administrative Hearings (SOAH) for a contested case hearing. Those issues and the Administrative Law Judge's (ALJ) findings are:

1. Whether an appropriate effort was made to restore groundwater to pre-mining or baseline condition.

The ALJ finds that COGEMA made an appropriate effort to restore groundwater to pre-mining or baseline condition.

2. Whether the proposed amendments to the restoration tables will achieve protection of human health and the environment required by the applicable statutes and rules,

including all criteria enumerated in 30 TAC § 331.107.

The ALJ finds that COGEMA’s proposed amendments will achieve protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 TAC § 331.107.

3. Whether appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of the applications.

The ALJ finds that appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of COGEMA’s applications.

II. PARTIES AND PROCEDURAL HISTORY

The following were designated as parties to this case:

Party	Representative
COGEMA Mining, Inc.	Danny Worrell and Monica Jacobs, Attorneys, Austin, Texas
Patricia Benavides	Emilio Davila, Jr., Attorney, Laredo, Texas
Sara Alicia B. Trautmann and SABT Ranch, Ltd.	Emilio Davila, Attorney, Laredo, Texas
ED	Don Redmond, Staff Attorney, TCEQ
PIC	Christina Mann, Attorney

In its Interim Order of November 10, 2004, the Commission established a deadline to complete this case within six months of the first preliminary hearing, to be held after mediation of the dispute by the Commission’s ADR staff. After mediation proved unsuccessful, SOAH held a preliminary hearing on April 25, 2005, and SOAH’s Order No. 2 established a procedural schedule to meet the Commission’s six-month deadline. However, the parties subsequently filed multiple joint or unopposed motions to extend the procedural schedule and deadline, which the ALJ granted pursuant to 30 TAC § 80.4(c)(17).

The procedural history of this case is summarized as follows:

April 16, 2003	COGEMA applied to TCEQ for Amendment of the Restoration Table of PAA No. 1 (UR02156-011).
May 28, 2003	COGEMA's application for Amendment of the Restoration Table of PAA No. 1 (UR02156-011) declared administratively complete.
July 17, 2003	COGEMA applied to TCEQ for Amendment of the Restoration Table of PAA No. 7 (UR02155-071 & UR02156-071).
August 4, 2003	COGEMA's application for Amendment of the Restoration Table of PAA No. 7 (UR02155-071 & UR02156-071) declared administratively complete.
October 2004	The ED made a preliminary decision that the three PAA restoration-table amendments, if issued, met all statutory and regulatory requirements.
November 10, 2004	The Commission granted requests for hearing filed by Patricia Benavides, Sara Alicia B. Trautmann, and SABB Ranch, Ltd.; referred the case to TCEQ's ADR staff for mediation; and referred the case to SOAH for a contested case hearing if mediation proved unsuccessful.
April 25, 2005	After mediation proved unsuccessful, SOAH held a Preliminary Hearing, established jurisdiction, and designated parties.
May 2, 2005	SOAH Order No. 2 established six-month procedural schedule; however, the procedural schedule was later extended based on agreed or unopposed motions filed by the parties.
February 21, 2006	Prehearing Conference.
June 5-9, 2006	Hearing on the Merits.
August 7, 2006	Parties filed Closing Arguments.
August 21, 2006	Parties filed Replies to Closing Arguments and the record closed.

III. BACKGROUND

COGEMA acquired the El Mesquite and Holiday in situ uranium mines from TOTAL, a multinational energy company. Before TOTAL acquired them, the mines were operated by Mobil Oil Corporation and Malapai Resources Company. The mines are located in Duval County, approximately 4.5 miles east of the Bruni community, north of Highway 359. The Holiday mine is on Ms. Benavides' property and the El Mesquite mine is on the adjacent Trautmann property. COGEMA's predecessors mined uranium at these sites by the in situ process, which used injection wells to inject lixiviants that dissolved the uranium solids located in the Middle Catahoula Formation, approximately 400 feet below the surface. Then production wells pumped the solution to the surface, where it was processed to recover the uranium.

The production zones covered in the permitted areas are subject to aquifer exemptions. Groundwater in exempted aquifers is not considered fresh water or an underground source of drinking water and must not serve as a source of drinking water for human consumption. 30 TAC §§ 331.2(40) and (97); 331.13(c)(2). At the El Mesquite and Holiday permit areas, the uranium producing zone, the Soledad Member of the Catahoula Formation, was designated an exempted aquifer on March 28, 1984, and March 28, 1992, respectively. The aquifer exemptions for both sites were approved by the EPA before in situ uranium mining was conducted at the sites.

The El Mesquite and Holiday mines are authorized respectively by Underground Injection Control (UIC) Permit Nos. UR02155 and UR02156. These permits provide specific requirements for construction and operation of the wells used for uranium mining. COGEMA has terminated the mining operations and is now seeking to close the production wells.

A PAA, as defined in 30 TAC § 331.2(73), is a document issued under the terms of the injection well permit, approving the initiation of mining activities in a specified PA within a permit area. PAAs also include tables providing specifications for groundwater restoration at the conclusion of the mining activities. In this proceeding, COGEMA seeks authority to amend three PA restoration

tables included in the PAAs.¹

For purposes of clarity in describing the PAs at issue, the relationship between the PAA numbers, the corresponding PA number, and COGEMA's designation is shown in the following table:

PAA No.	PA No.	COGEMA's PA Designation
UR02155-071	El Mesquite PA 7	E-7
UR02156-011	Holiday PA 1	H-1(ext)
UR02156-071	Holiday PA 7	H-7

COGEMA has terminated mining in all authorized PAs at the El Mesquite and Holiday sites and has undertaken restoration of the groundwater quality to fulfill its closure requirements. At El Mesquite, groundwater restoration and well closure have been completed in three PAs and in the southern portion of E-7. At Holiday, groundwater restoration and well closure have been completed in six PAs, in the western portion of H-1(ext), and in the southern portion of H-7. All of these restorations and well closures included amendments to the applicable restoration tables. The pending applications for PAA amendments to change groundwater restoration constituent levels concern the three areas which have not yet been closed: E-7 northern portion; H-1 (ext) eastern portion; and H-7 northern portion. Through its applications, COGEMA seeks a determination under 30 TAC § 331.107 that the groundwater has been sufficiently restored in these three areas and that further restoration efforts are not required. The requested PAA amendment would increase the restoration target levels for certain groundwater constituents to the current levels achieved by COGEMA's restoration efforts, which in turn would allow COGEMA to cease further groundwater restoration efforts and initiate well closure.

¹ The three PAAs are: PAA UR02155-071 - issued by TCEQ's predecessor agency on November 1, 1988, and amended June 25, 1993, and September 8, 1999; PAA UR02156-011 - issued January 8, 1979, and amended March 13, 1984, March 11, 1994, and August 8, 2002; and PAA UR02156-071 - issued November 1, 1988, and amended June 25, 1993, and September 8, 1999.

The following table summarizes the pre-mining levels, current levels, original restoration targets, proposed amended restoration targets, and drinking water quality standards for selenium, uranium, and radium-226 (the primary constituents of concern):

	Selenium (mg/l)	Uranium (mg/l)	Radium-226 (pCi/l)
E-7 pre-mining low	<0.001	0.007	3.0
E-7 pre-mining avg. (original restoration target)	0.012	0.097	10.3
E-7 pre-mining high	0.028	0.238	16.0
E-7 post-restoration high	0.090	1.470	31.9
E-7 post-restoration avg.	0.090	1.360	27.5
E-7 proposed amended restoration target	0.100	1.480	32.0
H-7 pre-mining low	0.002	0.012	1.3
H-7 pre-mining avg. (original restoration target)	0.014	0.100	8.7
H-7 pre-mining high	0.025	0.188	16.0
H-7 post-restoration high	0.112	0.890	21.4
H-7 post-restoration avg.	0.075	0.780	15.2
H-7 proposed amended restoration target	0.113	0.900	21.5
H-1(ext) pre-mining low	0.008	0.012	0.2
H-1(ext) pre-mining avg. (original restoration target)	0.040	0.400	12.5
H-1(ext) pre-mining high	0.096	1.530	38.0
H-1(ext) post-restoration high	0.480	1.300	69.7
H-1(ext) avg. stability sample after restoration	0.042	1.130	60.9
H-1(ext) proposed amended restoration target	0.490	1.310	69.8
EPA Drinking Water Standards	0.050	0.020	20.0
Texas Drinking Water Standards	0.050	NS	5.0

The original restoration target/value was established by using the higher of the pre-mining “Mine Area Average” or the “Production Area Average” constituent levels from monitor wells or PA baseline wells. With respect to selenium, COGEMA’s proposed amended selenium restoration levels were initially approved by the ED, but after receiving public comment, the ED reduced the proposed selenium level for all three PAs to the 0.05 mg/l drinking water standard. However, after considering the discovery and pre-filed testimony in this proceeding, the ED changed the restoration values in the draft permits back to the levels originally proposed by COGEMA (shown in the table above). Mr. John Santos explained that the ED’s original reduction of the selenium restoration level to 0.05 mg/l was based on erroneous information in COGEMA’s applications that groundwater from the PAs had been used for livestock watering and that the U.S. EPA had established a livestock drinking water standard of 0.05 mg/l. Through discovery and prefiled testimony in this proceeding, Mr. Santos learned that groundwater from the three PAs had not been used for livestock watering (or for any other purpose except mining) and that neither the EPA nor the TCEQ had established selenium concentration limits for livestock watering. Because additional selenium restoration efforts would require a large volume of additional clean water, energy, and other resources without making the groundwater suitable for any new type of use, Mr. Santos concluded that COGEMA’s original proposed amended restoration limits for selenium were appropriate.²

IV. APPLICABLE LAW

30 TAC § 331.107(a) and (f) are the Commission’s regulations concerning the establishment and amendment of groundwater restoration tables. They provide:

(a) Restoration table. Upon issuance and renewal, Class III permits and production area authorizations shall contain a restoration table listing restoration goals as provided by § 331.104 of this title (relating to Establishment of Baseline and Restoration Values).

* * *

² Ex. ED-24 (Santos Direct) at 11, 14-16.

(f) Restoration table values not achieved. After an appropriate effort has been made to achieve restoration to levels consistent with values listed in the restoration table for a production area, the permittee may cease restoration operations, reduce bleed and request that the restoration table be amended. With the request for amendment, the permittee shall submit the results of three consecutive sample sets taken at a minimum of 30-day intervals from all production area baseline wells used in determining the restoration table to verify current water quality. Stabilization sampling may commence 60 days after cessation of restoration operations.

(1) In determining whether the restoration table should be amended, the commission will consider the following items addressed in the request:

(A) uses for which the groundwater was suitable at baseline water quality levels;

(B) actual existing use of groundwater in the area prior to and during mining;

(C) potential future use of groundwater of baseline quality and of proposed restoration quality;

(D) the effort made by the permittee to restore the groundwater to baseline;

(E) technology available to restore groundwater for particular parameters;

(F) the ability of existing technology to restore groundwater to baseline quality in the area under consideration;

(G) the cost of further restoration efforts;

(H) the consumption of groundwater resources during further restoration; and

(I) the harmful effects of levels of particular parameters;

(2) The Commission may amend the restoration table if it finds that:

(A) reasonable restoration efforts have been undertaken, giving consideration to the factors listed in paragraph (1) of this subsection;

(B) the values for the parameters describing water quality have stabilized for a period of 180 days;

(C) the formation water present in the aquifer would be suitable for any use to which it was reasonably suited prior to mining; and

(D) further restoration efforts would consume energy, water, or other natural resources of the state without providing a corresponding benefit to the state.

(3) If the restoration table is amended, restoration sampling shall commence and proceed as described in subsection (e) of this section.

V. REFERRED ISSUES

The Commission referred to SOAH three issues that it determined are relevant and material to this proceeding:

- (1) Whether an appropriate effort was made to restore groundwater to pre-mining or baseline condition;
- (2) Whether the proposed amendments to the restoration tables will achieve protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 TAC § 331.107; and
- (3) Whether appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of the application.

Each issue is discussed below.

A. Whether an appropriate effort was made to restore groundwater to pre-mining or baseline condition.

Recommendation: The ALJ finds that COGEMA made an appropriate effort to restore groundwater to pre-mining or baseline condition.

1. Restoration efforts by COGEMA.

Cogema utilized a combination of groundwater sweep, reverse osmosis, and freshwater injection to restore the groundwater in the subject PAs. These techniques are described as follows:³

- Groundwater Sweep - Water of elevated mineral concentration resulting from mining operations is pumped from the mined aquifer in the PA and replaced with clean groundwater that flows in from the same aquifer outside the PA. The water removed from the PA is injected in a waste disposal well (WDW) into a saline bearing formation located significantly deeper than the mined aquifer and isolated from all underground sources of drinking water.

³ Ex. ED-23 (Response to Public Comment) at 4.

- Reverse Osmosis - Groundwater pumped from the mined aquifer in the PA is passed through reverse osmosis equipment, concentrating the dissolved constituents in 10 to 30 percent of the water and leaving 70 to 90 percent of the water clean. The concentrated water is disposed by injection in a WDW into an isolated saline bearing formation and the clean water is recycled by injection back into the PA to promote groundwater restoration.
- Freshwater Injection - Better quality water (relative to the water in the mined aquifer in the PA) from another aquifer is injected into the mined aquifer to promote aquifer restoration. Similar to the process of groundwater sweep, this process usually occurs in conjunction with pumping of mineralized water from the mined aquifer and disposal of such water by injection in a WDW into an isolated saline bearing formation.

For E-7, COGEMA conducted groundwater sweep from November 1994 through November 2000 and reverse osmosis and freshwater injection from December 2000 to April 2002, pumping 138,876,196 gallons (9.28 pore volumes)⁴ of groundwater during the groundwater sweep and reverse osmosis.⁵ For H-1 (ext), COGEMA conducted groundwater sweep from June 1997 to March 1999 and reverse osmosis and freshwater injection from April 1999 to June 2002, pumping 762,579,674 gallons (18.06 pore volumes) of groundwater during the groundwater sweep and reverse osmosis.⁶ For H-7, COGEMA conducted groundwater sweep from November 1994 through July 2001, and reverse osmosis and freshwater injection from August 2001 to July 2002, pumping 106,924,149 gallons (5.13 pore volumes) of groundwater during the groundwater sweep and reverse osmosis.⁷ These efforts, including costs, are summarized on the following table:

⁴ Pore volume is the volume of groundwater contained within a defined volume of porous media (the sandstone aquifer containing the PA production zone). COGEMA Ex.1 (Wichers direct) at 16.

⁵ Ex. A-1C, p. 2, Restoration History.

⁶ Ex. A-1D, p. 3, Restoration History.

⁷ Ex. A-1B, p.2, Restoration History.

PA	Restoration Efforts	Dates	Total Water Pumped	Cost
E-7	groundwater sweep reverse osmosis and freshwater injection	Nov 1994 - Nov 2000 Dec 2000 - Apr 2002	138,876,186 gal. (9.28 pore volumes)	\$850,325
H-1 (ext)	groundwater sweep reverse osmosis and freshwater sweep	Jun 1997 - Mar 1999 Apr 1999 - Jun 2002	762,579,674 gal. (18.06 pore volumes)	\$2,041,000
H-7	groundwater sweep reverse osmosis and freshwater sweep	Nov 1994 - Jul 2001 Aug 2001 - Jul 2002	106,924,149 gal. (5.13 pore volumes)	\$654,675
Total			1,008,380,019 gal.	\$3,546,000

COGEMA ceased restoration efforts in each PA when the chemical constituents monitored were no longer being effectively reduced by the restoration activity. Uranium and conductivity values had “flattened,” and the point of diminishing returns had been reached. COGEMA’s analysis indicated that continued treatment and consumption of groundwater would not significantly improve the groundwater quality. The final restoration samples collected showed that 19 of 26 chemical constituents were consistent with the restoration table for each PA.⁸ To determine if the water quality meets the proposed restoration standards, three sets of samples were collected from the original baseline wells at a minimum of 30-day intervals between sample sets. In addition, a period of 180 days elapsed between cessation of restoration efforts and the final set of samples to ensure water quality stabilization, as required by the Commission’s rules. The ED split the samples with COGEMA for quality assurance concerning the analytical results. Half of the split sample was tested by the state laboratory for the ED and half was kept by the COGEMA for its own laboratory analysis.⁹

⁸ COGEMA Ex.1 (Wichers direct) at 15-18.

⁹ Ex. ED-23 (Response to Public Comment) at 6.

2. Parties' arguments.

COGEMA

COGEMA argues that it made reasonable efforts (described above) to restore the groundwater levels to pre-mining condition. It cites testimony from its witnesses, Dr. Alan Eggleston and Mr. Craig Holmes, and from Staff-witness John Santos, who all agreed that COGEMA's efforts rated average to above-average, based on the time spent and volume of water used. COGEMA notes that its applications followed the format required by the Commission's rules, and Mr. Santos testified that the applications contained all necessary information.¹⁰

With regard to testimony by Protestants' expert witness, Ms. Harclerode-Moore, COGEMA identified the following criticisms she made of the restoration efforts: (1) poorly characterized geology at the site; (2) ineffective well location; (3) location of the screened intervals in the wells; (4) lengths of screened intervals; (5) lack of nested wells; and (6) location of monitoring wells. Concerning the geology characterization, COGEMA's expert witness, Dr. Robert Kier, testified that COGEMA's predecessors—primarily Mobil Oil Company—did an excellent job of characterizing the geology, as confirmed by the successful ore mining at these PAs.¹¹ As to well location, COGEMA stresses that Ms. Harclerode-Moore could provide no examples of how any wells in E-7, H-7, or H-1(ext) could have been relocated for more effective restoration.¹² Further, Dr. Kier testified that the wells were located properly for both effective uranium mining and effective restoration efforts.¹³ In response to the criticism of the location and length of screened intervals in the wells, Dr. Kier testified that these production and injection wells operate under relatively low pressure, and the screened intervals were set at lengths as short as possible in order to direct the injected fluids only

¹⁰ COGEMA's Closing Argument at 28-29; Tr. 803-804.

¹¹ Tr. 977-978.

¹² Tr. 617-618.

¹³ Tr. 978-980.

to the uranium ore body. Thus, screen lengths are typically around five feet, although some are as short as three feet and some as long as thirty.¹⁴ Both Dr. Kier and Ms. Harclerode-Moore stated that restoration screen lengths should be the same length as used in mining.¹⁵ Dr. Kier also explained that it is most effective to use the same production and injection wells in restoration so that the restoration fluids travel the same path as the mining fluid or lixiviant.¹⁶

Ms. Harclerode-Moore's suggestion that "nested wells" could provide better restoration was also rejected by COGEMA. Nested wells, also referred to as "collocated wells," are two wells located adjacent to each other.¹⁷ COGEMA points out that Ms. Harclerode-Moore could not provide a specific example of how nested wells would have made restoration more effective, nor could she point to a specific location where a nested well would have improved COGEMA's restoration effort.¹⁸ In addition, Dr. Kier testified that nested wells were not necessary or warranted and are not required for uranium mine restoration in Wyoming, as asserted by Ms. Harclerode-Moore.¹⁹

As for Ms. Harclerode-Moore's criticism of the location of monitoring wells, COGEMA argues that these wells are for detecting excursions, not for restoration. It stresses that restoration involves groundwater sweep, fresh water injection, and reverse osmosis and argues that no evidence was presented that restoration would have been more effective with different locations for monitoring wells. COGEMA also notes that Ms. Harclerode-Moore has no experience with in situ uranium mining; therefore, it argues that she has no expertise in locating monitoring wells for an in situ uranium mine. Finally, COGEMA points out that the monitoring wells were approved by TCEQ

¹⁴ Tr. 978-979.

¹⁵ Tr. 978, 981 (Dr. Kier); Tr. 633 (Ms. Harclerode-Moore).

¹⁶ Tr. 980, 983.

¹⁷ Tr. 624.

¹⁸ Tr. 627, 635.

¹⁹ Tr. 983-985.

and were installed with the prevailing industry technical understanding at the time.²⁰

COGEMA also disputes testimony from Protestants-witness David Sorrells, who expressed concerns about: (1) lack of uniformity of constituent levels and pore volumes of water used for the different PAs; (2) the percent increase above baseline levels of certain constituents; and (3) COGEMA pumping less water for restoration than it estimated in its applications. COGEMA points out that different PAs have different recorded baseline levels, different pore volumes, and different geology, so it is normal that differences exist in the restoration efforts and results for each PA. Further, COGEMA states, Mr. Sorrells acknowledged that the percent increases of certain constituents in the three PAs at issue were similar to amendments previously approved by the Commission.²¹ Concerning Mr. Sorrells' complaint that COGEMA has not pumped as much water as estimated in its restoration amendment applications, COGEMA argues that Mr. Sorrells fails to recognize that uranium levels do not continue to decline at a steady rate; that is, with a declining improvement rate, more water and effort are required to achieve smaller results. In COGEMA's view, the lost value of wasted water used in further restoration efforts would exceed the potential benefit to be achieved. Further, COGEMA attacks Mr. Sorrells' qualifications because he is not a geologist or hydrologist and lacks experience with uranium mines.²²

Likewise, COGEMA dismisses Protestants' concerns that unplugged boreholes may provide a conduit for contamination of aquifers above the Soledad production zone. First, COGEMA questions whether any unplugged boreholes exist, as a Railroad Commission inspector was onsite and required plugging in accordance with that Commission's rules. Second, Dr. Kier testified that if any uncased boreholes exist, they would likely collapse and plug naturally or would plug with

²⁰ COGEMA's Reply to Closing Arguments at 7-9. In general, monitoring wells now have a smaller screened interval than in the past when COGEMA's monitoring wells were drilled and approved. In the 1980's, it was generally accepted that longer screened intervals increased the chances of detecting contamination that was moving through multiple areas. However, shorter screen are now favored because they avoid diluted samples. Tr. 258-260.

²¹ Tr. 674.

²² COGEMA Closing Argument at 35-36.

drilling mud used in drilling the hole. And third, Dr. Kier testified that, in any event, no aquifers exist above the Soledad formation, so there are no such aquifers to be contaminated. Therefore, COGEMA rejects Protestants' contention that cross contamination of aquifers could occur from unplugged boreholes in the three PAs at issue.²³

Finally, COGEMA points out that its cost estimates to further restore the three PAs assumes a steady rate of reducing uranium and selenium, but in reality, as restoration progresses, the rate of improvement decreases, and it is unlikely that the pre-mining levels can ever actually be achieved.²⁴

Therefore, COGEMA argues that it has made an appropriate effort to restore groundwater to its pre-mining condition.

Protestants

Protestants argue that COGEMA did not make an appropriate effort to restore the groundwater to pre-mining condition. They stress that COGEMA's representative, Ms. Donna Wichers, testified that she did not recall COGEMA ever restoring uranium, radium 226, or selenium to baseline in any of its U.S. mining operations. She also stated that none of the approximately fifteen well fields on the Protestants' ranches have been restored to baseline, and all of them received restoration table amendments.²⁵ Thus, Protestants argue, COGEMA had no reasonable expectation of restoring their groundwater to baseline.²⁶

Protestants also note that thousands of perforations were drilled on the two ranches (including areas outside the three PAs at issue). They contend that these would penetrate any aquifers existing

²³ COGEMA Reply to Closing Arguments at 6-7.

²⁴ COGEMA Reply to Closing Arguments at 10-12.

²⁵ Tr. 915-916.

²⁶ Tr. 915-917.

above the Soledad (where production occurred) and could provide a pathway for cross-contamination between aquifers.²⁷

Further, Protestants argue that inadequate monitoring wells exist to detect excursions early. Ms. Harclerode-Moore, testified that the location and screen size of COGEMA's monitoring wells are not appropriate. She stated that the large screens sweep multiple producing sands instead of an individual producing sand; consequently, more diluted samples will make it harder to detect and identify the origin of excursions.²⁸ In addition, with the monitoring wells located 400 feet from the PA (the maximum distance allowed) and a groundwater flow rate of 45 feet per year, Protestants complain that it will take nearly nine years for water from the production zone to reach the monitoring wells. In Protestants' view, monitoring wells 400 feet away serve no useful purpose, particularly in detecting excursions during the 180-day stabilization period required by § 331.107(f)(2)(B).²⁹

The significantly elevated levels of constituents proposed by COGEMA also show its restoration efforts were inadequate, according to Protestants. In other words, minimal restoration efforts might be appropriate if COGEMA were seeking to leave constituents minimally elevated above baseline levels, but Protestants complain that is not the case here. Rather, by Protestants' calculations, post-mining selenium concentrations will be elevated nearly eight-fold at E-7 and H-7 and twelve-fold at H-1(ext), and uranium levels will be elevated up to fifteen-fold. Therefore, Protestants argue that COGEMA's "minimal restoration efforts" are inadequate when compared to the elevated concentrations of constituents that COGEMA seeks to leave behind.³⁰

Under these circumstances, Protestants argue that COGEMA's restoration efforts have not

²⁷ Protestants' Closing Arguments at 4.

²⁸ Tr. 632, 650-653.

²⁹ Protestants' Closing Arguments at 6-7.

³⁰ Protestants' Closing Arguments at 8-9.

been appropriate and continued restoration should be required.³¹

Public Interest Counsel

PIC notes that to further restore selenium closer to its pre-mining level, as requested by Protestants, would likely cost over \$2,000,000 and use over 250,000,000 gallons of additional freshwater; yet, even then, the restored water would have very limited potential uses due to naturally occurring levels of various constituents. PIC stresses that restoration efforts should not be taken lightly, even with limited use of the restored water, but it acknowledges that the Commission's rules require a balancing of interests when a permittee has expended significant resources but is no longer experiencing restoration gains. Therefore, PIC concludes that COGEMA has undertaken reasonable restoration efforts.³²

Executive Director

The ED supports a finding that COGEMA made appropriate effort to restore groundwater to pre-mining or baseline condition for the three PAs. The ED points out that Protestant's expert, Ms. Harclerode-Moore, criticized COGEMA for failing to locate the wells and adjust screening lengths to enhance restoration, but she could not show a specific example where COGEMA should have placed a well in a different location,³³ nor where a different screened interval or a nested well would have made restoration more effective.³⁴ Further, the ED notes, COGEMA's witness, Ms. Wichers, testified that nested wells are not required for COGEMA's uranium mines in Wyoming, as claimed by Ms. Harclerode-Moore.³⁵ The ED also emphasizes the testimony of COGEMA's

³¹ Protestants' Closing Arguments at 11.

³² PIC Closing Brief at 6-8.

³³ Tr. 617.

³⁴ Tr. 627.

³⁵ Tr. 874.

witness, Dr. Kier, that injection wells in the PAs are screened with the shortest possible screens in order to direct the injection fluid to the uranium ore. Then the same wells are used during restoration so that the pathways for the restoration fluids are the same as for the mining fluids. In Dr. Kier's view, this is more desirable than new nested wells that might have a different flow path than the wells used for the mining.³⁶ Based on this evidence, the ED recommends a finding that COGEMA's restoration efforts were adequate.³⁷

3. ALJ's Analysis and Recommendation.

The ALJ finds that COGEMA made an appropriate effort to restore groundwater to pre-mining or baseline condition. As discussed above, COGEMA's efforts lasted several years, involved pumping more than a billion gallons of groundwater, and cost approximately \$3.5 million. Considering all of the circumstances, Mr. Santos testified that these efforts rated as average to above-average, and they resulted in 19 of 26 constituents being restored to levels consistent with pre-mining levels. While it would be desirable to restore all constituents to pre-mining baseline levels, it was undisputed that COGEMA ceased its restoration efforts because the remaining constituents were no longer being effectively reduced by the restoration activity. Uranium and conductivity values had flattened, and the point of diminishing returns had been reached. Further, as will be discussed under issue B.8. below, continued treatment efforts would consume at least another 250 million gallons of clean groundwater but would not significantly improve the groundwater quality in the three PAs or change the uses for the groundwater. Specifically, even with full restoration to pre-mining quality, the groundwater in the three PAs would remain unfit for human consumption or for livestock, just as it was before mining operations began, due to high levels of uranium, arsenic, radium 226, and lead.

Protestants' experts testified that restoration could have been done differently, such as nested

³⁶ Tr. 978-984.

³⁷ ED's Closing Arguments at 5-6.

restoration wells with longer screen lengths, or monitoring wells with shorter screen lengths and different locations, but these witnesses could not provide any specific examples of how their suggestions would have improved COGEMA's restoration efforts. Protestants also expressed concern about unplugged boreholes providing a pathway to contaminate overlying aquifers. However, the evidence of actual unplugged boreholes was vague, and the ALJ was persuaded by Dr. Kier's testimony that, in any event, there are no overlying aquifers in these three PAs that would be susceptible to contamination.

The ALJ agrees with PIC that restoration efforts should not be taken lightly merely because of the limited potential uses of the water at fully restored pre-mining constituent levels. However, when the costs of further restoration efforts, in additional money and natural resources, are balanced with the limited additional improvement of the water quality, if any, the ALJ recommends that the Commission find that COGEMA made an appropriate effort to restore groundwater to pre-mining or baseline condition in PAs E-7, H-7, and H-1(ext).

B. Whether the proposed amendments to the restoration tables will achieve protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 TAC Section 331.107.

Recommendation: The ALJ finds that COGEMA's proposed amendments will achieve protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 TAC Section 331.107.

1. Uses for which the groundwater was suitable at baseline water quality levels – 331.107(f)(1)(A).

a. Discussion

The evidence established that the groundwater at baseline water quality was not suitable for human or livestock consumption or for irrigation but was suitable for wildlife watering.

Human Consumption

It was undisputed that groundwater of recorded baseline quality was not suitable for human consumption in any of the three PAs due to naturally elevated levels of uranium, radium-226, lead, and arsenic. The following table shows the average pre-mining baseline levels of these constituents for each PA that exceeded the maximum contaminant level (MCL) allowed under the public drinking water standards.

	Uranium	Arsenic	Radium 226	Lead
MCL	0.03 mg/l	0.01 mg/l	5.0 pCi/l	0.015 mg/l
E-7	0.097 mg/l		10.3 pCi/l	0.084 mg/l
H-1(ext)	0.40 mg/l	0.05 mg/l	12.5 pCi/l	0.020 mg/l
H-7	0.10 mg/l	0.05 mg/l	8.7 pCi/l	

Ms. Harclerode-Moore testified for Protestants that it would be technically possible to remove radium-226 through treatment,³⁸ but COGEMA offered evidence that this would be cost prohibitive and potentially hazardous due to the collection of concentrated radioactive materials.³⁹ Because the treatment, handling, and disposal of the resulting radioactive waste would be costly, require a special license, and create health and safety concerns, COGEMA argues that treatment to make groundwater of baseline quality suitable for human consumption is not a reasonable option for the future.⁴⁰

³⁸ Ex. P-6 (Moore Direct) at 7.

³⁹ Ex. A-2 (Eggleston Direct) at 23-24; Tr. 1084-1086.

⁴⁰ COGEMA Closing Argument at 16-17.

Livestock Drinking Water

COGEMA's expert, Dr. Eggleston, testified that groundwater of baseline quality is suitable for livestock drinking water on a short-term basis of five to ten years, if it is monitored frequently.⁴¹ He noted, however, that such use is not recommended due to concerns about radium-226 and uranium in the food chain. Protestant's witness, Mr. Zupan, suggested that baseline quality groundwater could be used for livestock watering purposes.⁴² Because there are no regulatory or statutory water quality standards for livestock drinking water, the ED states that human drinking water standards for radioactive constituents such as uranium and radium-226 should apply to livestock, precluding use as livestock drinking water.⁴³

Wildlife Drinking Water

Both COGEMA's and Protestants' expert witnesses testified that baseline quality groundwater would be suitable as wildlife drinking water.⁴⁴ The ED notes that although the groundwater may be of suitable quality for wildlife, the water is inaccessible to wildlife unless pumped to the surface from a well.⁴⁵

Irrigation

Dr. Eggleston testified for COGEMA that groundwater of baseline quality is not suitable for

⁴¹ Ex. A-2 (Eggleston Direct) at 16-18; Tr. 350-352.

⁴² Ex. P-5 (Zupan Direct) at 8 and 118-128.

⁴³ Tr. 864, 1065.

⁴⁴ Ex. A-2 (Eggleston Direct) at 21-22; Ex. P-5 (Zupan Direct) at 7-8.

⁴⁵ ED Closing Arguments at 8.

irrigation because constituents such as radium-226 become concentrated in vegetation.⁴⁶ The ED agrees with COGEMA.⁴⁷ For Protestants, Mr. Zupan stated that baseline quality groundwater is suitable for irrigation in the H-7 and E-7 areas, but he was uncertain as to the H-1(ext) area.⁴⁸

b. ALJ's Analysis and Recommendation

The ALJ finds that, without treatment, the groundwater in the three PAs was not suitable at baseline water quality levels for any reasonable use, other than terrestrial wildlife drinking water. As noted in the chart above, all three PAs had baseline levels of uranium and radium-226 that exceeded the MCLs for public drinking water systems. In addition, H-7 and H-1(ext) exceeded the MCL for arsenic, and E-7 and H-1(ext) exceeded the MCL for lead. Because no water quality standards exist for private water wells, comparisons with the MCLs used for public water supplies is appropriate to determine if the water is suitable for human consumption. Indeed, all parties agreed that groundwater at baseline constituent levels was not fit for human consumption without treatment.

There are no applicable regulatory or statutory water quality standards for livestock drinking water.⁴⁹ For the radioactive constituents uranium and radium-226, the ED recommends applying the same levels used for humans due to the concern of radioactive materials entering the food chain.⁵⁰ Protestant's witness gave conflicting testimony on the suitability of baseline quality for livestock. In deposition, Mr. Zupan, indicated that the groundwater was not suitable for livestock drinking water,⁵¹ while in prefiled testimony, Mr. Zupan suggested that baseline constituent levels

⁴⁶ Ex. A-2 (Eggleston Direct) at 23.

⁴⁷ ED Closing Argument at 8.

⁴⁸ Ex. P-5 (Zupan Direct) at 77.

⁴⁹ Ex. ED-24.

⁵⁰ Tr. 864, 1065.

⁵¹ Ex. P-5 (Zupan November 2005 deposition) at 71.

do not preclude use for livestock watering.⁵² COGEMA's witness, Dr. Eggleston, testified that when the baseline levels are compared to the agricultural publications upon which Mr. Zupan relied, various baseline constituents exceed the recommended levels for all three PAs.⁵³ However, he stated that the water could be used for "short-keep" livestock watering.

Based on a preponderance of the evidence, the ALJ finds that groundwater at baseline constituent levels was not reasonably suitable for human or livestock consumption without treatment. In addition, treatment of groundwater of baseline quality is not a reasonable option because the treatment, handling, and disposal of the resulting radioactive waste would be too costly and create health and safety concerns.⁵⁴ Further, the ALJ finds that groundwater at baseline quality was not suitable for irrigation because the radioactive constituents would concentrate on the surface, in plants, and in the soil.⁵⁵ However, pre-mining quality groundwater was suitable for terrestrial wildlife.⁵⁶ In summary, the ALJ finds that groundwater at pre-mining baseline constituent levels was not reasonably suitable for human or livestock consumption or for irrigation, but it was suitable for terrestrial wildlife.

2. Actual existing use of groundwater in the area prior to and during mining – 331.107(f)(1)(B).

a. Discussion

It is undisputed that, before mining began, no water wells existed in the E-7, H-7, or H-1(ext)

⁵² Ex. P-5 (Zupan Direct) at 7-8.

⁵³ Exhibit A-2 (Eggleston Direct) at 20.

⁵⁴ Treatment would generate a radioactive waste, would require special handling of the waste, require licensing for the handling and disposal of the waste, would be dangerous, and would have costs that exceed the benefits produced. Ex. A-2 (Eggleston Direct) at 24.

⁵⁵ Ex. A-2 (Eggleston direct) at 23; Ex. ED-24 (Santos direct) at 16.

⁵⁶ Of course, the groundwater is not available to terrestrial wildlife unless a 400-foot deep well is installed and the water is pumped to the surface. Tr. 552.

PAs for any purpose. Likewise, during mining, the wells drilled in the PAs were used only for mining purposes. However, the parties dispute the phrase “in the area” contained in § 331.107(f)(1)(B). COGEMA contends that “the area” refers only to the geographic limits of the PAs where groundwater was used only for mining purposes, while Protestants and PIC contend that “the area” refers to the general surrounding area, where groundwater was used for human consumption and livestock and wildlife watering.

COGEMA argues that the logical interpretation of the phrase must consider the context in which it is used—a regulation that addresses the constituent levels in the production zone of a specific PA. Thus, COGEMA states, in this context, “in the area” refers to the geographic limits of the PA that is the subject of the application for a restoration table amendment. COGEMA further argues that Protestants’ claim that people and livestock drank water from what is now the exempt portion of the Soledad Member of the Catahoula Formation should be disregarded because the water was not suitable for human consumption; lack of human consumption was a prerequisite for the exempt aquifer designation; and Protestants gave conflicting information on the location of wells on their property.⁵⁷

Protestants argue that the word “area” in the rule is not limited to “production area.” They also point to their affidavits, which state that water on their ranches was used for human, livestock, and wildlife consumption prior to and during mining.⁵⁸

PIC observes that the aquifer mined by COGEMA was properly exempted during mining and is, therefore, unsuitable for human consumption. And although water wells for human consumption exist in the general area, they are outside the exempted portion of the aquifer and, according to Ms. Wichers, are either upgradient or a significant distance from any production zone.⁵⁹

⁵⁷ COGEMA’s Closing Arguments at 25-27.

⁵⁸ Protestants Closing Arguments at 12-13.

⁵⁹ PIC Closing Arguments at 5; Tr. at 119-125.

The ED does not argue the extent of “the area” covered by the rule but does conclude that groundwater in the subject PAs was not used prior to or during mining for any purpose other than mining; groundwater outside these PAs but in the mine permitted areas was used for mining, groundwater restoration, wildlife, and livestock; and groundwater in the general area, but outside the mine permitted areas, was used for wildlife, livestock, and human consumption.⁶⁰

b. ALJ’s Analysis and Recommendation

The ALJ does not believe that the phrase “in the area” in subsection (f)(1)(B) is limited to the boundaries of the PAs, as asserted by COGEMA. In other parts of § 331.107, specific reference is made to “production areas,” “permit areas,” and “mine areas,”⁶¹ but no such limitation is contained in subsection (f)(1)(B). Further, because of migration of groundwater, contamination in the groundwater of a PA could affect groundwater beyond the PA boundary. Therefore, the actual uses of groundwater within the PAs, outside the PAs but within the permit areas, and outside the PAs and permit areas but within the general area of the PAs should be considered.

As for groundwater within the three PAs, parties agreed that no water wells existed within the PA boundaries prior to mining; consequently, there was no actual use of the groundwater in the PAs prior to mining. Likewise, during mining, groundwater in the three PAs was used only for mining purposes.

Prior to and during mining, water wells did exist outside the PAs but within the mine permitted areas. COGEMA’s applications state that the groundwater in the permitted area was used primarily as livestock drinking water prior to and during mining.⁶² Considerable testimony focused on the water well designated as BW6. This well is located on the Holiday mine (Benavides

⁶⁰ ED’s Closing Arguments at 9.

⁶¹ See 30 TAC § 331.107(b), (c), (d), and (f).

⁶² Ex. A-1B at 4; Ex. A-1C at 4; Exhibit A-1D at 4.

property), near and upgradient from PA H-6 (not a PA at issue in this proceeding).⁶³ It is powered by a windmill and has been used to fill troughs for livestock and wildlife consumption.⁶⁴ In addition, COGEMA's witness, Ms. Wichers, stated that a water well designated as E-3 on the El Mesquite mine (Trautmann property) was drilled by COGEMA for mining and restoration purposes and is now used by the Trautmanns for livestock.⁶⁵

Water wells in the general area, but outside the three PAs and outside the mine permitted areas, were also used for human consumption. For El Mesquite, Ms. Wichers identified water wells at the Trautmann ranch house and at the hunters' camp that she believes are outside the permit area.⁶⁶ Protestants' witness, Mr. Zupan, testified that the hunter's camp well is within the permitted area.⁶⁷ In rebuttal testimony, however, COGEMA's witness, Mr. Holmes, testified that the hunter's camp well is outside of the permit area and outside the area included in the aquifer exemption. Mr. Holmes also testified that the Trautmann ranch house well is outside the permit area and outside the area included in the aquifer exemption.⁶⁸

Therefore, based on the evidence presented at hearing, the ALJ finds that: (1) prior to mining, no wells existed and groundwater was not used for any purpose within the area of PAs E-7, H-7, and H-1(ext); (2) during mining, groundwater within the area of the three PAs was used for mining purposes only; (3) prior to and during mining, groundwater outside the three PAs but within the permitted area was used for livestock and wildlife watering; and (4) prior to and during mining, groundwater in the general area but outside the three PAs and outside the permitted areas was used

⁶³ Ex. P-6A, Attachment C; Tr. 51.

⁶⁴ Tr. 59.

⁶⁵ Tr. 88-89.

⁶⁶ Tr. 88-89.

⁶⁷ Tr. 555.

⁶⁸ Tr. 1176.

for human consumption and livestock and wildlife watering.

3. Potential future use of groundwater of baseline quality and of proposed restoration quality – 331.107(f)(1)(C).

a. Discussion

All parties agree that groundwater of baseline and proposed restoration quality remains unsuitable for human consumption. COGEMA argues that the potential future uses of proposed restoration quality remain unchanged from the potential uses of the groundwater at baseline levels. That is, COGEMA states that at quality levels both before and after mining, the groundwater was suitable for non-aquatic wildlife and for livestock on a short-term basis, if monitored regularly, but unsuitable for human consumption, irrigation, or aquatic wildlife (in stock tanks).⁶⁹

Protestants agree that groundwater of proposed restoration quality cannot be used for human consumption, livestock, or irrigation without treatment. However, Protestants contend that groundwater in the area was used for human consumption and livestock watering at baseline quality levels.⁷⁰

PIC points out that levels of several constituents are significantly higher post-mining than at baseline. Nonetheless, PIC states, due to the poor water quality even at baseline levels, the formation water of proposed restoration quality would be suitable for any use to which it was *reasonably* suited at pre-mining quality. In PIC's view, the regulations look to broad use categories and allow for some variance in specific constituent levels.⁷¹

⁶⁹ COGEMA Closing Arguments at 21-24.

⁷⁰ Protestants' Closing Arguments at 13-14.

⁷¹ PIC's Closing Arguments at 6.

The ED agrees with COGEMA, stating that because the pre-mining water quality was so poor, there is no difference in the types of uses for which the groundwater of proposed restoration-quality is suitable. In fact, the ED states, if COGEMA had done no restoration at all, the pre-mining and post-mining potential uses would remain unchanged because of the inherently high pre-mining radium-226 concentrations.⁷²

b. ALJ’s analysis and recommendation

The ALJ finds that there are no potential future uses of groundwater of baseline quality or of quality as proposed in the amended restoration table values, other than terrestrial wildlife drinking water. As discussed previously, without treatment, groundwater of baseline quality was not suitable for human consumption, livestock consumption, or irrigation, but was suitable for terrestrial wildlife. Further, treatment of the water was not reasonable due to the radioactive constituents that would be concentrated by the treatment. Because of the pre-mining groundwater’s poor quality, there is no difference in the types of uses for which the groundwater of quality as proposed in the amended restoration table values is suitable. Although the post-restoration groundwater will have some constituents elevated above pre-mining baseline levels, COGEMA’s witness, Dr. Eggleston, testified that water quality levels proposed by COGEMA are nevertheless suitable for terrestrial wildlife.⁷³ Therefore, the ALJ finds that the only reasonable potential future use of groundwater of baseline quality and of proposed restoration quality is for terrestrial wildlife.

4. The effort made by the permittee to restore the groundwater to baseline – 331.107(f)(1)(D).

COGEMA made an appropriate effort to restore groundwater to baseline constituent levels. See discussion under Issue No. 1.

⁷² ED’s Closing Arguments at 10; Tr. 126, 192, 382.

⁷³ Ex. A-2 (Eggleston direct) at 39.

5. Technology available to restore groundwater for particular parameters – 331.107(f)(1)(E).

a. Discussion

COGEMA listed numerous technologies in its applications but states that their effectiveness varies in different geographic areas and with different types of in situ mining. For South Texas, COGEMA believes that the three techniques it used—groundwater sweep, freshwater injection, and reverse osmosis—are the most appropriate. It rejects Protestants’ suggestion that hydrogen sulfide gas (H₂S) should be injected as a reductant to precipitate solute minerals and metals to solids. Dr. Eggleston testified that H₂S injection is not particularly effective in South Texas because H₂S is naturally occurring in the PAs and was the primary agent responsible for the formation of the uranium bodies in the first place. Dr. Eggleston also stated that use of H₂S gas is extremely dangerous.⁷⁴ Further, COGEMA dismisses the testimony of Protestants’ experts on this issue due to their lack of any experience in restoring of uranium production mining zones.⁷⁵

Protestants state that COGEMA’s applications listed H₂S as a technology that it considered, and they point out that all parties agreed H₂S is a reducing agent that could lower uranium concentrations. And although H₂S and other artificial reducing agents may be dangerous, Protestants state that people are available who have experience in using such gasses. Protestants complain that COGEMA has not even consulted with such people to determine the feasibility of these alternate technologies. In addition, Protestants argue that COGEMA should more closely monitor the PAs to determine whether natural attenuation is occurring from the naturally occurring H₂S, as COGEMA claims.⁷⁶

⁷⁴ Ex. A-2 (Eggleston Direct) at 31-33.

⁷⁵ COGEMA’s Closing Arguments at 37-38.

⁷⁶ Protestants’ Closing Arguments at 15-16.

The ED notes that the technology available to restore groundwater after in situ uranium mining operations include groundwater sweep, reverse osmosis, freshwater injection, filtration, H₂S reduction, and bio-remediation, used individually or in combination. In the ED's view, COGEMA applied the appropriate techniques for the three PAs at issue.⁷⁷

b. ALJ's analysis and recommendation

As discussed previously, COGEMA utilized groundwater sweep, reverse osmosis, and freshwater injection in its efforts to restore the groundwater in PAs E-7, H-7, and H-1(ext). H₂S injection is a technique that creates a reducing environment within the mining zone to chemically precipitate constituents that have been solubilized by the lixivants used in the in situ mining process. But because handling H₂S gas is very dangerous,⁷⁸ H₂S injection is not a recommended technology for groundwater restoration.⁷⁹ And, in any event, the PAs will benefit from the upward migration of naturally occurring H₂S from nearby oil and gas fields,⁸⁰ so it is unclear whether the injection of additional H₂S would help.

There was little evidence concerning bioremediation, filtration (other than reverse osmosis treatment), or chemical treatments. The evidence did show that lime treatment can be used to reduce ammonia levels after an ammonium lixiviant was used during mining, but COGEMA did not use an ammonium lixiviant, so lime treatment would not be an effective restoration method in this case.⁸¹ COGEMA's witness, Dr. Eggleston, testified that other chemicals and reducing agents are available to eliminate and remove oxidizing agents within a mined formation, but those options have not been

⁷⁷ ED's Closing Arguments at 10-12.

⁷⁸ Tr. 316, 993.

⁷⁹ Ex. ED-24 (Santos direct) at 17.

⁸⁰ Tr. 992-993.

⁸¹ Ex. A-1B at 6-7.

demonstrated to be particularly successful in South Texas.⁸²

Dr. Eggleston also testified that other uranium mining operations utilize barium chloride to precipitate radium out of water so that the wastewater can be treated for disposal.⁸³ But because COGEMA utilized a deep disposal well for its wastewater, use of barium chloride treatment was not needed for COGEMA's restoration efforts.⁸⁴ In addition, physical filtration is generally not effective for removing constituents in a dissolved form, and Dr. Eggleston testified that bioremediation is an experimental technology that has not been demonstrated on a commercial scale for in situ leachate uranium mines.⁸⁵

Therefore, based on the evidence, the ALJ finds that the three techniques used by COGEMA—groundwater sweep, freshwater injection, and reverse osmosis—are the most appropriate for PAs E-7, H-7, and H-1(ext).

6. The ability of existing technology to restore groundwater to baseline quality in the area under consideration – 331.107(f)(1)(F).

a. Discussion

COGEMA states that, with existing technology, it is extremely rare to restore production zone groundwater for an in situ uranium mine to recorded baseline quality for all constituents. Dr. Eggleston testified that this has less to do with available technology than with recorded baseline values that, in his opinion, are artificially low due to traditional sampling techniques that did not take samples near or within the ore body. He also explained that parts of the PA will naturally continue

⁸² Tr. 311, 314-315.

⁸³ Tr. 321-322.

⁸⁴ Tr. 323.

⁸⁵ Tr. 329, 331.

to have different levels of constituents because ore pods continue to exist in the PAs.⁸⁶ Further, COGEMA argues that this inquiry concerns whether groundwater can be restored to uses that are consistent with pre-mining uses rather than whether exact pre-mining constituent levels can be achieved. COGEMA also stresses that pre-mining baseline levels are averages of recorded values, which are both higher and lower than the average; consequently, it is not realistic to expect all areas to be restored exactly to the average. Thus, COGEMA states that the same pre-mining uses of the PA groundwater exist without further restoration, and it believes Protestants' contention that all constituents must be returned to recorded baseline levels cannot be taken seriously.⁸⁷

Protestants reiterate that H₂S is a known reducing agent for uranium. In addition, they point out that Dr. Eggleston testified that other artificial reducing agents could be introduced, but Protestants complain that COGEMA has not even attempted to use them. They also criticize COGEMA's reliance on natural attenuation of the elevated constituents because no one can state how long it will take or how far out of the production zone water must travel to reach a redox zone.⁸⁸

The ED notes that COGEMA was not able to restore all groundwater constituents to baseline conditions despite using a combination of groundwater sweep, reverse osmosis, and freshwater injection. The ED also states that restoration amendments are common in the uranium mining industry as miners often are unable to restore all constituents to baseline levels. In the ED's view, the record supports a finding that continued use of groundwater sweep, freshwater injection, and reverse osmosis will not achieve baseline conditions for all constituents.⁸⁹

⁸⁶ Ex. A-2 (Eggleston Direct) 13-15; Tr. 359-363.

⁸⁷ COGEMA's Closing Arguments at 38-39.

⁸⁸ Protestants' Closing Arguments at 15-18.

⁸⁹ ED's Closing Arguments at 12-13.

b. ALJ’s analysis and recommendation

For each PA, COGEMA ceased restoration efforts when the chemical constituents were no longer effectively reduced by the restoration activity. Uranium and conductivity levels had flattened and the point of diminishing returns had been reached. In addition, as will be discussed in more detail below, continued treatment and consumption of groundwater would not significantly improve the groundwater quality and would waste resources. And even if the pre-mining baseline levels could be reached with extraordinary efforts, the groundwater would remain unusable for human consumption, livestock watering, or irrigation. Therefore, the ALJ finds that reasonable continued use of groundwater sweep, freshwater injection, and reverse osmosis treatment will not achieve baseline conditions for all constituents.

7. The cost of further restoration efforts – 331.107(f)(1)(G).

a. Discussion

COGEMA estimated that additional restoration would take three years and would incur direct costs as follows:

PA	Cost
H-1(ext)	\$505,200
E-7	\$955,200
H-1	\$607,200
Total	\$2,067,600

COGEMA states that its estimates are conservative, particularly in light of the assumption that uranium and other constituents will decrease at a steady rate, which is highly unlikely to actually occur. In general, the other parties agree with COGEMA’s estimates.

However, these estimated direct costs do not include labor and overhead, and COGEMA would also spend \$50-\$75,000 to re-install its equipment and re-establish the restoration process.⁹⁰ Also, COGEMA's cost estimates are based on the restoration of the uranium constituent only, and they assume that uranium levels would continue to decrease at a steady rate.⁹¹ In addition to direct costs, Protestant's expert, Mr. Sorrells, estimated labor and overhead for E-7 at \$764,800; H-1(ext) at \$404,800; and H-7 at \$486,400.⁹²

Protestants agree that COGEMA's restoration efforts should be evaluated in light of the estimated costs required to achieve baseline levels. But, Protestants point out, COGEMA received a \$15-20 million dollar reclamation credit for these leases in its asset purchase with TOTAL.⁹³ Therefore, Protestants argue that requiring COGEMA to spend an additional \$3 million is not unreasonable.

The ED does not dispute COGEMA's estimates but states that the costs of re-installing equipment and re-establishing the restoration process should not be considered in evaluating the costs under § 331.107(f)(1)(G). In ED's view, COGEMA exercised its own business judgment in removing the restoration equipment before a final decision on its applications and should not benefit from the consideration of additional costs for re-establishing equipment that COGEMA chose to remove. Therefore, with the addition of labor and overhead to COGEMA's estimates, the ED concludes that the total cost of additional restorations to achieve baseline levels is at least \$3,723,600.⁹⁴

⁹⁰ Tr. 900.

⁹¹ Ex. A-1 at 24.

⁹² Ex. P-7F.

⁹³ Tr. 908-910.

⁹⁴ ED's Closing Arguments at 13.

b. ALJ's analysis and recommendation

The ALJ agrees with the ED that the costs COGEMA would incur to re-establish the restoration process should not be considered in evaluating the costs under § 331.107(f)(1)(G) as COGEMA made a calculated business decision to remove its equipment. Adding COGEMA's estimated direct costs and Protestants' estimated overhead and labor costs, produces a total estimated cost of \$3,723,600, which the ALJ finds would be the cost of additional restoration efforts. However, the ALJ notes that these estimates are based on the assumption that constituent levels would continue to decrease at a steady rate, which is very unlikely to occur, and it is questionable whether baseline levels could ever actually be achieved through such additional restoration efforts.

8. The consumption of groundwater resources during further restoration – 331.107(f)(1)(H).

a. Discussion

COGEMA estimated the amount of additional groundwater that would be pumped and treated for further restoration efforts. As with the monetary cost estimates, these groundwater consumption estimates assume that uranium levels would continue to decrease at a steady, uniform rate and that 30 per cent of the groundwater would be contaminated and rejected in the reverse osmosis treatment process. The water rejected during reverse osmosis would be directed to the waste disposal injection well and lost as a resource.

The amounts of groundwater estimated by COGEMA for further restoration are:⁹⁵

PA	Gallons Pumped	30% Loss (gal.)
E-7	398,000,000	119,400,000
H-7	253,000,000	75,900,000
H-1(ext)	210,500,000	63,150,000
Total	861,500,000	258,450,000

COGEMA argues that with continued reverse osmosis, a huge volume of groundwater would be consumed with no guarantee of a corresponding improvement in the quality of the production zone groundwater.⁹⁶

While acknowledging that additional groundwater would be consumed with additional reverse osmosis treatment, Protestants note that no additional groundwater would be required for alternative restoration techniques such as H₂S gas injection, lime chemical treatment, or simply monitoring natural attenuation.⁹⁷

In response to Protestants' comments that alternative restoration techniques such as H₂S injection, lime chemical treatment, or monitoring natural attenuation would not consume additional groundwater, COGEMA reiterates Dr. Kier's testimony that H₂S injection is dangerous and is not helpful because it is already present in the formation. COGEMA also points out that lime is not feasible because it is used in mines where an ammonium lixiviant has been used, but only bicarbonate solutions and oxygen have been used in the wellfields at issue, and monitoring is not an

⁹⁵ Ex.A-1B at 9; Ex. A-1C at 9; Ex. A-1D at 10.

⁹⁶ COGEMA's Closing Argument at 41-42.

⁹⁷ Protestants Closing Arguments at 18-19.

alternative restoration technique but is simply the monitoring of a natural process.⁹⁸

PIC questions whether it would be useful to permanently remove over 200 million gallons of additional useable water to restore the PAs to pre-mining constituent levels when the pre-mining uses of the water were extremely limited due to the naturally occurring constituent levels. PIC emphasizes that restoration efforts should not be taken lightly simply because of limited use of the water, but the Commission's rules require a balancing of interests when a permittee has expended significant resources but is no longer achieving significant restoration gains.⁹⁹

The ED concludes that the record establishes that additional restoration efforts consistent with COGEMA's applications would consume additional groundwater as shown on the table above.¹⁰⁰

b. ALJ's analysis and recommendation

The ALJ finds that over 250 million gallons of additional groundwater would be consumed with further restoration efforts. However, even with the consumption of that amount of groundwater, it is doubtful that all constituents in the groundwater in the three PAs would be restored to pre-mining baseline conditions. And even with restoration, the only reasonable use of the groundwater would be providing water to terrestrial wildlife.

⁹⁸ COGEMA's Reply Brief at 19-20; Tr. 993-997, 1051, 1137-1141.

⁹⁹ ED's Closing Arguments at 7-8.

¹⁰⁰ ED's Closing Arguments at 14.

9. The harmful effects of levels of particular parameters – 331.107(f)(1)(I).

a. Discussion

COGEMA states that levels of certain constituents are higher than pre-mining levels while others are lower than pre-mining levels. However, because the groundwater of the exempt aquifer is, by definition, not suitable for human consumption, COGEMA suggests that the “real point” of this inquiry involves potential harmful effects of the constituents to livestock and wildlife. COGEMA acknowledges that arsenic and lead can be harmful, but it notes that radium-226 and uranium are the elements that led to an exempt aquifer classification because of their elevated pre-mining levels. COGEMA also states that uranium and radium-226 are carcinogens, uranium is also a kidney toxin, and selenium, which is an essential element, can be toxic at high levels.¹⁰¹

COGEMA rejects Protestants’ reliance on a Texas Agricultural Extension Service Study that recommends a maximum 0.004 mg/L selenium for certain wildlife species because the study concerns *aquatic* wildlife, and all of the PAs had a pre-mining selenium levels well above 0.004 mg/L. It also disputes Protestants’ complaints about selenium levels in Benevides Well No. 6 (BW6) because that well is up-gradient of the H-6 PA,¹⁰² no pre-mining water quality data exists for the well to determine if selenium levels have changed over time, PA H-6 is not at issue in this proceeding, and that well is likely located in the middle of an ore trend.¹⁰³

Protestants complain that COGEMA proposes to leave selenium levels eight to twelve times higher than pre-mining levels and that high levels of selenium can have adverse health effects on humans. In addition, Protestants state that excessive selenium can adversely affect quail, which drink from cattle troughs, and any fish that might be placed in stock tanks that might be supplied by

¹⁰¹ COGEMA Closing Arguments at 42.

¹⁰² Tr. 986-988.

¹⁰³ Tr. 247.

groundwater. Finally, Protestants point out that well BW6 has the highest selenium concentrations of the 23 Benavides water wells, and that it is closest to the permitted area.¹⁰⁴

The ED states that the constituents of concern are uranium, radium-226, selenium, arsenic, and lead. In the ED’s view, determining whether a constituent is harmful requires comparing the level of the constituent with the MCL, which is the maximum level a public water system can have in water provided to the public for human consumption. The ED prepared the tables below to show the baseline average, proposed value, and MCL for these constituents for each PA.¹⁰⁵

PA E-7

Constituent	Baseline	Proposed	MCL
Uranium	0.097 mg/l	1.48 mg/l	0.03 mg/l
Radium-226	10.3 pCi/l	32.0 pCi/l	5.0 pCi/l
Selenium	0.012 mg/l	0.10 mg/l	0.05 mg/l
Arsenic	0.001 mg/l	0.001 mg/l	0.01 mg/l
Lead	0.084 mg/l	0.084 mg/l	0.015 mg/l

PA H-1 (ext)

Constituent	Baseline	Proposed	MCL
Uranium	0.4 mg/l	1.31 mg/l	0.03 mg/l
Radium-226	12.5 pCi/l	69.8 pCi/l	5 pCi/l
Selenium	0.04 mg/l	0.49 mg/l	0.05 mg/l
Arsenic	0.05 mg/l	0.05 mg/l	0.01 mg/l
Lead	0.02 mg/l	0.02 mg/l	0.015 mg/l

¹⁰⁴ Protestants’ Closing Arguments at 19-20.

¹⁰⁵ ED’s Closing Arguments at 14-15.

PA H-7

Constituent	Baseline	Proposed	MCL
Uranium	0.1 mg/l	0.9 mg/l	0.03 mg/l
Radium-226	8.7 pCi/l	21.5 pCi/l	5 pCi/l
Selenium	0.014 mg/l	0.113 mg/l	0.05 mg/l
Arsenic	0.05 mg/l	0.05 mg/l	0.01 mg/l
Lead	0.003 mg/l	0.003 mg	0.015 mg/l

b. ALJ’s analysis and recommendation

As shown by the ED’s charts, E-7 currently has elevated levels of uranium, radium-226, selenium and lead; H-1(ext) has elevated levels of uranium, radium-226, selenium, arsenic, and lead; and H-7 has elevated levels of uranium, radium-226, selenium, and arsenic. Uranium and radium-226 are carcinogens, uranium is also a kidney toxin, and selenium, which is an essential element, can be toxic at high levels. Likewise, arsenic and lead can cause health problems at elevated levels, but it should be noted that the proposed levels for arsenic and lead are the same as their baseline levels. Likewise, both uranium and radium-226 exceeded the MCL even at baseline levels for all three PAs, although their proposed levels are more elevated. Thus, selenium is the only constituent that did not exceed the MCL prior to mining but will exceed the MCL at the proposed amended restoration table levels. However, this does not alter the potential uses of the groundwater, as it was not fit for human consumption, livestock watering, or irrigation even at pre-mining baseline levels.

10. Reasonable restoration efforts have been undertaken, giving consideration to the factors listed in paragraph (1) of § 331.107(f) – 331.107(f)(2)(A).

COGEMA performed reasonable restoration efforts. See discussion of restoration efforts under Issue No. 1.

11. The values for the parameters describing water quality have stabilized for a period of 180 days – 331.107(f)(2)(B).

COGEMA's applications provide restoration stabilization results for each PA.¹⁰⁶ For PA E-7, COGEMA ceased restoration on April 15, 2002, and conducted stability sampling on June 18, 2002, August 20, 2002, and October 22, 2002.¹⁰⁷ For PA H-1 (ext), COGEMA ceased restoration on June 27, 2002, and conducted stability sampling on August 28, 2002, October 29, 2002, and December 30, 2002.¹⁰⁸ For PA H-7, COGEMA ceased restoration on July 26, 2002, and conducted stability sampling on October 3, 2002, December 3, 2002, and February 6, 2003.¹⁰⁹

The results show little variation in the water quality concentrations. TCEQ staff were present for some of the stability sampling events to split samples with the applicant.¹¹⁰ The ED's witness, Mr. Santos, testified that he reviewed the stability sampling documented in the application and found that the water quality parameters were stabilized for a period of 180 days.¹¹¹ Protestants did not dispute that stability sampling occurred or that the water quality has stabilized.

The ALJ finds that the values for the parameters describing water quality have stabilized for a period of 180 days, as required by 30 TAC § 331.107(f)(2)(B).

¹⁰⁶ Ex. A-1B, Table 4; Ex. A-1C, Table 4; Ex. A-1D, Table 4.

¹⁰⁷ Ex. A-1C, at 3, Restoration Stabilization Monitoring Results.

¹⁰⁸ Ex. A-1D, at 4, Restoration Stabilization Monitoring Results.

¹⁰⁹ Ex. A-1B, at 3, Restoration Stabilization Monitoring Results.

¹¹⁰ Ex. A-1C, at 3, Restoration Stabilization Monitoring Results; Tr. 804.

¹¹¹ Ex. ED-24 at 8.

12. The formation water present in the aquifer would be suitable for any use to which it was reasonably suited prior to mining – 331.107(f)(2)(C).

As discussed previously, groundwater at the proposed restoration-table levels for the three PAs would be suitable for any use to which the water was reasonably suited prior to mining. The pre-mining water quality was poor and not suitable without treatment for any use other than wildlife drinking water, because the groundwater flowed through a uranium ore body and had high levels of uranium and radium-226 and other constituents. The radioactive constituents are carcinogens and treatment to remove them would generate a radioactive waste, would be a regulated activity, and would be cost prohibitive. The groundwater also contains other elements associated with uranium ore bodies, such as selenium and arsenic. Because the pre-mining quality was so poor, the ALJ finds that the quality of the water as proposed by COGEMA's amended restoration tables would be suitable for any use to which it was reasonably suited prior to mining.

13. Further restoration efforts would consume energy, water, or other natural resources of the state without providing a corresponding benefit to the state – 331.107(f)(2)(D).

The record supports a finding that further restoration efforts would consume groundwater and monetary resources without providing a corresponding benefit to the state. The pre-mining quality of the groundwater was poor, and the parties' estimates of cost in dollars and gallons of groundwater for additional restoration was discussed previously. Further, it is not likely that further restoration efforts would achieve baseline quality for all parameters in any event. The production zone of the three PAs is situated in an exempted aquifer and should not be used for human drinking water. Thus, further attempts to restore groundwater to a quality already unsuitable for human consumption would expend resources without providing a corresponding benefit. Therefore, the ALJ finds that large quantities of higher-quality groundwater outside of the production zones and outside of the PAs should not be consumed to restore the water of the production zones of these PAs to a level that would remain unusable for human consumption, livestock watering, or irrigation.

14. Summary.

In summary, the ALJ finds that COGEMA's efforts and proposed amendments satisfy all criteria listed in 30 TAC Section 331.107 and will achieve protection of human health and the environment required by the applicable statutes and rules.

C. Whether appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of the application.

Recommendation: The ALJ finds that appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of COGEMA's application.

All parties agree that 30 TAC § 331.107(f) is the appropriate rule under which to consider COGEMA's applications. In addition, Protestants contend that TEX. WATER CODE § 26.401 applies. COGEMA disagrees, arguing that § 26.401 does not apply to this case because TEX. WATER CODE § 26.135(a) provides: "Nothing in this chapter [26] affects the process and duties of the commission and the Railroad Commission of Texas with respect to injection wells as provided in Chapter 27 of the Code." Therefore, COGEMA states, none of Chapter 26, including § 26.401, trumps or affects the Commission's rules at 30 TAC Chapter 331, which implement the Injection Well Act contained in Chapter 27 of the Water Code.¹¹²

Protestants state that TEX. WATER CODE § 26.003 refers to all waters of the state, including the groundwater involved in this case. Thus, Protestants argue, the policies and notification, cleanup, and other requirements of TEX. WATER CODE Chapter 26 related to spills should apply to COGEMA's mining and restoration efforts. Protestants also contend that regulations such as the Texas Risk Reduction program (30 TAC Ch. 350) and the Spill Prevention and Control program (30 TAC Ch. 327) should apply to this matter. Further, Protestants state that it is difficult to determine

¹¹² COGEMA's Closing Arguments at 10-11.

whether TCEQ Staff applied any standards in the evaluation of COGEMA's applications because, they complain, Mr. Santos accepted the applications at face value without performing any independent verification of COGEMA's information and because the Commission has never denied a restoration amendment application in the past.¹¹³

Further, Protestants' experts do not believe that COGEMA made a sufficient demonstration under § 331.107(f). Mr. Zupan testified that COGEMA's applications did not provide an adequate demonstration that they satisfied the criteria to amend.¹¹⁴ Similarly, Protestant witness, Mr. Sorrells, testified that he does not believe the regulatory standards are appropriate, and that COGEMA did not demonstrate meeting the remedial target levels was not technically infeasible, that the costs or remedial time frames are excessive, or how the use of additional water resources to meet restoration targets will adversely impact the state.¹¹⁵

The ED points out that TEX. WATER CODE § 26.401 contains legislative findings, determinations, and policies, but it provides no substantive requirements to which COGEMA's applications can be subjected. The policies stated in § 26.401(b) and (c) are similar to the policies stated in the Injection Well Act at TEX. WATER CODE § 27.003. Further, the ED states, the Commission's injection well rules in 30 TAC Chapter 331 in general, and in § 331.107(f) in particular, implement the Injection Well Act and the policies described in TEX. WATER CODE § 27.003. Thus, the policies and concerns articulated by the legislature in TEX. WATER CODE § 26.401 are also reflected in the Commission's rules implementing the Injection Well Act in TEX. WATER CODE Chapter 27, according to the ED.¹¹⁶ PIC agrees with the ED.¹¹⁷

¹¹³ Protestants' Closing Arguments at 20-24; Tr. 827, 850-851.

¹¹⁴ Ex. P-5 (Zupan Direct) at 7.

¹¹⁵ Ex. P-7 (Sorrells Direct) at 5.

¹¹⁶ ED's Closing Arguments at 19.

¹¹⁷ PIC's Closing Arguments at 8.

As a legal matter, the ALJ finds that § 331.107(f) is the appropriate standard for protection of human health and the environment for evaluating COGEMA's applications to amend its restoration tables. The ALJ does not agree with Protestants' argument that 30 TAC Chapters 327 and 350 should also apply to this proceeding. Both of those chapters deal with unauthorized discharges or spills, but this proceeding deals with amendments to restoration tables, not discharges or spills. Further, 30 TAC § 350.2(d) expressly provides that Chapter 350 does not apply to injections of mining solutions at in situ mining operations. The ALJ also finds that TEX. WATER CODE Chapter 26 does not apply to this case. As pointed out by COGEMA, TEX. WATER CODE § 26.135(a) provides that nothing in chapter 26 affects the process and duties of the commission with respect to injection wells as provided in Chapter 27 of the Water Code. Further, § 27.019 requires the Commission to adopt rules reasonably required to perform its duties under Chapter 27 related to injection wells. In accordance with that requirement, the Commission adopted 30 TAC § 331.107(f), which is the controlling standard and rule concerning amendment to restoration tables for an in situ mining operation.

Therefore, the ALJ finds that appropriate standards for protection of human health and the environment are being applied by the TCEQ in evaluating COGEMA's application. Moreover, as a factual matter, appropriate standards to protect human health and the environment have been applied to the application. As discussed at length above, in accordance with 30 TAC § 331.107(f), further restoration is not needed to protect human health or the environment. Due to the extremely poor quality of water in the formation before any mining began, that water was not suitable for human or livestock use. Thus, further restoration to baseline levels would not allow human or livestock use. Terrestrial wildlife could use water of the proposed quality, so no further restoration is needed for that use.

VI. ASSESSMENT OF REPORTING AND TRANSCRIPTION COSTS

By Order No. 12, the ALJ required a transcript to be prepared in this case because the hearing was scheduled to last longer than one day. *See* 30 TAC § 80.23 (b)(4). COGEMA paid transcription costs totaling \$9,809.00 (including two copies), while Protestants purchased a copy of the transcript from the court reporter service at a cost of \$2,209.70. Protestants request that the Commission require that COGEMA pay any outstanding transcript costs; COGEMA requests that transcript costs be assessed 45% to COGEMA and 55% to Protestants. The ALJ recommends that the Commission assess 75% of the reporting and transcription costs against COGEMA and 25% against the Protestants, including and giving credit for the costs Protestants paid for their copy of the transcript.

The Commission's rules at 30 TAC § 80.23(d) list the factors that the Commission shall consider in assessing reporting and transcription costs. The factors relevant to this case include the following:

- (A) "The party who requested the transcript." The ALJs ordered the transcript.
- (B) "The financial ability of the party to pay costs." COGEMA is part of a multi-billion-dollar for-profit corporate entity. The Protestants are property owners with large land holdings that contain oil and gas production, uranium mining production, and cattle operations. Further, Protestants were financially able to hire attorneys to represent their interests. Thus, while both COGEMA and Protestants have the financial ability to pay for the transcript, COGEMA has the greater financial ability to pay costs.
- (C) "The extent to which the party participated in the hearing." COGEMA states that, when compared to each other (*i.e.*, not including the ED or PIC) Protestants efforts involved 55% of the lines in the transcript while COGEMA's efforts involved 45%. Protestants emphasize that COGEMA asked for several days of hearing and that COGEMA's rebuttal alone consumed over 300 pages of transcript. The ALJs find

that the questioning of witnesses by all of the attorneys was generally to the point and directed towards relevant issues. Therefore, the ALJ finds that the extent of participation by all the parties was appropriate and that none of the parties unduly burdened the transcript with frivolous arguments or unnecessary questioning of witnesses.

- (D) “The relative benefits to the various parties of having a transcript.” Protestants contend that COGEMA benefitted most from the transcript as it had the burden of proof. COGEMA argues that all parties benefitted and that there is no objective way to quantify this factor. The ALJ find that, as the party bearing the burden of proof, COGEMA could anticipate the greatest potential benefit from an ability to cite and reassemble the information within the record. However, all parties benefitted from having a transcript in preparing their closing statements.
- (E) “The budgetary constraints of a state or federal administrative agency participating in the proceeding.” The broad responsibilities and limited budgets of the agency parties in this case make it unreasonable to assess costs against them. The rules also preclude the Commission from assessing costs against parties that cannot appeal a Commission decision (the ED and the PIC). 30 TAC § 80.23(d)(2).
- (F) This factor is inapplicable.
- (G) “Any other factor which is relevant to a just and reasonable assessment of costs.” COGEMA and Protestants have a federal lawsuit pending over their disputes, and both parties can anticipate some benefit from the use of this transcript in that proceeding. Otherwise, the ALJ does not find any other factor that should affect the assessment of transcription costs.

Considering all of the factors set out in the Commission’s rules, the ALJ finds that

COGEMA's potential benefit from having a transcript weighs in favor of assessing a greater portion of the transcription costs against COGEMA. Therefore, the ALJs recommend that the Commission allocate 75% of the transcription costs to COGEMA and 25% to Protestants, including and giving credit for the costs Protestants paid for their copy. Under this calculation, Protestants will be required to reimburse COGEMA \$794.98.¹¹⁸

VII. CONCLUSION AND RECOMMENDATION

The ALJ agrees with COGEMA, the ED, and the PIC that: (1) COGEMA made an appropriate effort to restore groundwater to pre-mining or baseline condition; (2) COGEMA's proposed amendments will achieve protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 TAC § 331.107; and (3) appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of COGEMA's application. Therefore, the ALJ recommends that the Commission approve COGEMA's applications to amend its PAA restoration tables. The ALJ also recommends that the Commission allocate transcript costs 75% to COGEMA and 25% to Protestants.

Signed October 10, 2006.

**THOMAS H. WALSTON
ADMINISTRATIVE LAW JUDGE
STATE OFFICE OF ADMINISTRATIVE HEARINGS**

¹¹⁸ COGEMA's paid costs of \$9,809.00 plus Protestants' paid costs of \$2,209.70 equals total costs of \$12,018.70. COGEMA's 75% share equals \$9,014.02 and Protestants' 25% share equals \$3,004.68. Giving credit for the payments made by both parties leaves a balance due from Protestants to COGEMA of \$794.98.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY



AN ORDER granting the application of COGEMA Mining, Inc. for production area authorization amendments to authorize the revision of restoration tables; Docket Nos. 2004-1474-IHW & 2004-1475-IHW; SOAH Docket No. 582-05-4175

On _____, 2006, the Texas Commission on Environmental Quality (Commission or TCEQ) considered the application of COGEMA Mining Inc. (Applicant or COGEMA) to amend the restoration tables contained in its Production Area Authorizations (PAA) UR02155-071, UR02156-011 and UR02156-071. The application was presented to the Commission with a proposal for decision by the Honorable Thomas H. Walston, Administrative Law Judge (ALJ) with the State Office of Administrative Hearings (SOAH).

After considering the ALJ's proposal for decision and the evidence and arguments presented, the Commission makes the following Findings of Fact and Conclusions of Law:

I. FINDINGS OF FACT

Introduction, Notice, and Procedural History

1. COGEMA submitted an application for an amendment of the restoration table to PAA UR02156-011 to the TCEQ on April 16, 2003.
2. COGEMA submitted an application for an amendment of the restoration table of PAA UR02155-071 and an application for amendment of the restoration table of PAA UR02156-071 to the TCEQ on July 16, 2003.

3. At the TCEQ's open meeting on November 10, 2004, the Commission evaluated requests for hearing on the applications for amendment of the restoration tables for PAAs UR02156-011, UR02155-071, and UR02156-071. (TCEQ Docket Nos. 2004-1474-IHW and 2004-1475-IHW.)
4. On November 16, 2004, the Commission issued an interim order that: (1) granted the hearing requests of Patricia Benavides, Sara Alicia Benavides Trautmann, and SABT Ranch, Ltd. with regard to the issues specified in the order; (2) referred the matter to the Commission's Alternative Dispute Resolution staff for mediation; and (3) referred the matter to SOAH for a contested case hearing, if mediation did not result in settlement; and (4) established a six-month maximum duration of the hearing from the first day of the preliminary hearing to the date the proposal for decision and recommended order issued by SOAH.
5. The Commission's interim order of November 16, 2004, referred the following issues to SOAH for hearing:
 - a. Whether an appropriate effort was made to restore the groundwater to pre-mining or baseline condition;
 - b. Whether the proposed amendments to the restoration table will achieve the protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 Texas Administrative Code (TAC) § 331.107; and
 - c. Whether appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of the applications.
6. Notice of Receipt of Application and Intent to Obtain Restoration Table Amendment to a Production Area Authorization for UR02156-011 was mailed to the application mailing list on May 28, 2003, and was published in the Duval County *Picture* on June 11, 2003.
7. Notice of Receipt of Applications and Intent to Obtain Restoration Table Amendments to Production Area Authorizations for UR02155-071 and UR02156-071 was mailed to the

application mailing list on August 4, 2003, and published in the Duval County *Picture* on August 17, 2003.

8. Notice of Application and Preliminary Decision for Restoration Table Amendment to a Production Area Authorization for UR02156-011 was mailed to the application mailing list on March 31, 2004, and was published in the Duval County *Picture* on April 7, 2004.
9. Notice of Application and Preliminary Decision for Restoration Table Amendment to a Production Area Authorization for UR02155-071 and UR02156-071 was mailed to the application mailing list on April 1, 2004, and published in Duval County *Picture* on April 7, 2004.
10. The Notice of Hearing on all three applications was issued and mailed to the application mailing list on March 9, 2005. The Notice of Hearing was published in the Jim Hogg County *Enterprise* on March 24, 2005; the Laredo *Morning Times* on March 22, 2005; the Corpus Christi *Caller Times* on March 21, 2005; the Duval County *Picture* on March 23, 2005; and the San Antonio *Express-News* on March 21, 2005.
11. All public notices were in proper form and given to the required notice recipients in the required manner.
12. The ED filed a response to public comment on the applications for amendment of the restoration tables of PAAs UR02156-011, UR02155-071 and UR02156-071.
13. On April 25, 2005, a prehearing conference was held at the SOAH facilities in Austin, Texas. At the prehearing conference, the ALJ took notice that jurisdiction was established and admitted the following parties: the Applicant; the Office of Public Interest Counsel (PIC) of the TCEQ; the Executive Director (ED) of the TCEQ; intervenor (Protestant), Patricia

Benavides; intervenor (Protestant), Sara Alicia B. Trautmann; and intervenor (Protestant), SABT Ranch, Ltd.

14. The ALJ issued Order No. 2 on May 2, 2005, establishing the schedule for discovery and a hearing on the merits to comply with the Commission's six-month deadline. The parties subsequently filed multiple joint or unopposed motions to extend the procedural schedule and deadline, which the ALJ granted pursuant to 30 TAC § 80.4(c)(17).
15. ALJ Thomas Walston conducted the hearing on the merits on June 5-9, 2006, at the SOAH hearing facilities in Austin, Texas. The ALJ aligned Protestants Patricia Benavides, Sara Alicia B. Trautmann, and SABT Ranch, Ltd. for purposes of the hearing. Each party was allowed to respond and to present evidence on each issue referred in the Commission's Interim Order of November 16, 2004.

Background

16. COGEMA acquired the El Mesquite and Holiday in situ uranium mines from TOTAL, a multinational energy company. Before TOTAL acquired them, the mines were operated by Mobil Oil Corporation and Malapai Resources Company.
17. The mines are located in Duval County, approximately 4.5 miles east of the Bruni community, north of Highway 359. The Holiday mine is on Protestant Benavides' property and the El Mesquite mine is on the adjacent Protestant Trautmann's property.
18. COGEMA's predecessors mined uranium at these sites by the in situ process, which used injection wells to inject lixiviants that dissolved the uranium solids located in the Middle Catahoula Formation, approximately 400 feet below the surface. Then production wells pumped the solution to the surface, where it was processed to recover the uranium.

19. The production zones in the permitted areas are in an exempted aquifer. Groundwater in exempted aquifers is not considered fresh water or an underground source of drinking water. 30 TAC § 331.2(40) and (97). Under the aquifer exemption, the aquifer must not serve as a source of drinking water for human consumption. 30 TAC § 331.13(c)(2).
20. The El Mesquite and Holiday mines are authorized respectively by Underground Injection Control (UIC) Permit Nos. UR02155 and UR02156. These permits provide specific requirements for construction and operation of the wells used for uranium mining. COGEMA has terminated the mining operations and is now seeking to close the production wells.
21. In Situ Uranium Mine permit numbers UR02155 and UR02156 were issued July 24, 1978.
22. A PAA, as defined in 30 TAC § 331.2(73), is a document issued under the terms of the injection well permit, approving the initiation of mining activities in a specified production area (PA) within a permit area. PAAs also include tables providing specifications for groundwater restoration at the conclusion of the mining activities. In this proceeding, COGEMA seeks authority to amend three PA restoration tables included in the PAAs.
23. The relationship between the PAA numbers, the corresponding PA, and COGEMA's designation is shown in the following table:

PAA No.	PA No.	COGEMA's PA Designation
UR02155-071	El Mesquite PA 7	E-7
UR02156-011	Holiday PA 1	H-1(ext)
UR02156-071	Holiday PA 7	H-7

24. COGEMA has terminated mining in all authorized PAs at the El Mesquite and Holiday sites and has undertaken restoration of the groundwater quality to fulfill the closure requirements.

The pending applications for PAA amendments to change groundwater restoration levels concern the three areas which have not yet been closed: E-7 northern portion; H-1(ext) eastern portion; and H-7 northern portion.

25. Through its applications, COGEMA seeks a determination under 30 TAC § 331.107 that the groundwater has been sufficiently restored in these three areas and that further restoration efforts are not required. The requested PAA amendment would increase the restoration target levels for certain groundwater constituents to the current levels achieved by COGEMA’s restoration efforts, which in turn would allow COGEMA to cease further groundwater restoration efforts and initiate well closure.
26. The quality of the production zone groundwater varies significantly even within an individual production zone.
27. The following table shows the pre-mining levels, current levels, original restoration targets, proposed amended restoration targets, and drinking water quality standards for selenium, uranium, and radium-226, the primary constituents of concern:

	Selenium (mg/l)	Uranium (mg/l)	Radium-226 (pCi/l)
E-7 pre-mining low	<0.001	0.007	3.0
E-7 pre-mining avg. (original restoration target)	0.012	0.097	10.3
E-7 pre-mining high	0.028	0.238	16.0
E-7 post-restoration high	0.090	1.470	31.9
E-7 post-restoration avg.	0.090	1.360	27.5
E-7 proposed amended restoration target	0.100	1.480	32.0
H-7 pre-mining low	0.002	0.012	1.3
H-7 pre-mining avg. (original restoration target)	0.014	0.100	8.7

	Selenium (mg/l)	Uranium (mg/l)	Radium-226 (pCi/l)
H-7 pre-mining high	0.025	0.188	16.0
H-7 post-restoration high	0.112	0.890	21.4
H-7 post-restoration avg.	0.075	0.780	15.2
H-7 proposed amended restoration target	0.113	0.900	21.5
H-1(ext) pre-mining low	0.008	0.012	0.2
H-1(ext) pre-mining avg. (original restoration target)	0.040	0.400	12.5
H-1(ext) pre-mining high	0.096	1.530	38.0
H-1(ext) post-restoration high	0.480	1.300	69.7
H-1(ext) post-restoration avg.	0.042	1.130	60.9
H-1(ext) proposed amended restoration target	0.490	1.310	69.8
EPA Drinking Water Standards	0.050	0.020	20.0
Texas Drinking Water Standards	0.050	NS	5.0

28. With respect to selenium, COGEMA's proposed amended selenium restoration levels were initially approved by the ED, but after receiving public comment, the ED reduced the proposed selenium level for all three PAs to the 0.05 mg/l drinking water standard.

29. After considering the discovery and pre-filed testimony in this proceeding, the ED changed the restoration values in the draft permits back to the levels originally proposed by COGEMA (shown in the table above).

30. The ED's original reduction of the selenium restoration level to 0.05 mg/l was based on erroneous information in COGEMA's applications that groundwater from the PAs had been used for livestock watering and that the U.S. EPA had established a livestock drinking water standard of 0.05 mg/l.

31. Groundwater from the three PAs had not actually been used for livestock watering (or for any other purpose except mining), and neither the EPA nor the TCEQ have established selenium concentration limits for livestock watering. Because additional selenium restoration efforts would require a large volume of additional clean water, energy, and other resources without making the groundwater suitable for any new type of use, the ED decided that COGEMA's original proposed amended restoration limits for selenium are appropriate.
32. COGEMA's compliance history classification is average. The compliance history classification for the El Mesquite site is high, and the compliance history classification for the Holiday site is average.

Appropriate effort to restore groundwater to pre-mining or baseline condition.

33. COGEMA utilized a combination of groundwater sweep, reverse osmosis, and freshwater injection to restore the groundwater in the subject PAs.
34. Groundwater sweep is a restoration process in which water of elevated mineral concentration resulting from mining operations is pumped from the mined aquifer in the PA and replaced with clean groundwater that flows in from the same aquifer outside the PA. The water removed from the PA is injected in a waste disposal well (WDW) into a saline bearing formation located significantly deeper than the mined aquifer and isolated from all underground sources of drinking water.
35. Reverse osmosis is a restoration process in which groundwater pumped from the mined aquifer in the PA is passed through reverse osmosis equipment, concentrating the dissolved constituents in 10 to 30 percent of the water and leaving 70 to 90 percent of the water clean. The concentrated water is disposed by injection in a WDW into an isolated saline bearing formation and the clean water is recycled by injection back into the PA to promote groundwater restoration.

36. Freshwater injection is a restoration process in which better quality water (relative to the water in the mined aquifer in the PA) from another aquifer is injected into the mined aquifer to promote aquifer restoration. Similar to the process of groundwater sweep, this process usually occurs in conjunction with pumping of mineralized water from the mined aquifer and disposal of such water by injection in a WDW into an isolated saline bearing formation.
37. For E-7, COGEMA conducted groundwater sweep from November 1994 through November 2000 and reverse osmosis and freshwater injection from December 2000 to April 2002, pumping 138,876,196 gallons (9.28 pore volumes) of groundwater during the groundwater sweep and reverse osmosis.
38. For H-1(ext), COGEMA conducted groundwater sweep from June 1997 to March 1999 and reverse osmosis and freshwater injection from April 1999 to June 2002, pumping 762,579,674 gallons (18.06 pore volumes) of groundwater during the groundwater sweep and reverse osmosis.
39. For H-7, COGEMA conducted groundwater sweep from November 1994 through July 2001, and reverse osmosis and freshwater injection from August 2001 to July 2002, pumping 106,924,149 gallons (5.13 pore volumes) of groundwater during the groundwater sweep and reverse osmosis.
40. COGEMA's restoration efforts are summarized on the following table:

PA	Restoration Efforts	Dates	Total Water Pumped	Cost
E-7	groundwater sweep reverse osmosis and freshwater injection	Nov 1994 - Nov 2000 Dec 2000 - Apr 2002	138,876,186 gal. (9.28 pore volumes)	\$850,325

H-1(ext)	groundwater sweep reverse osmosis and freshwater sweep	Jun 1997 - Mar 1999 Apr 1999 - Jun 2002	762,579,674 gal. (18.06 pore volumes)	\$2,041,000
H-7	groundwater sweep reverse osmosis and freshwater sweep	Nov 1994 - Jul 2001 Aug 2001 - Jul 2002	106,924,149 gal. (5.13 pore volumes)	\$654,675
Total			1,008,380,019 gal.	\$3,546,000

41. COGEMA ceased restoration efforts in each PA when the chemical constituents monitored were no longer being effectively reduced by the restoration activity. Uranium and conductivity values had “flattened,” and the point of diminishing returns had been reached.
42. When COGEMA ceased restoration efforts, continued treatment and consumption of groundwater would not significantly improve the groundwater quality.
43. The final restoration samples collected showed that 19 of 26 chemical constituents were consistent with the restoration table for each PA.
44. COGEMA made an appropriate effort to restore groundwater to pre-mining or baseline condition in PAs E-7, H-7, and H-1(ext).

Protection of human health and the environment required by the applicable statutes and rules, including all criteria enumerated in 30 TAC Section 331.107.

Uses for which the groundwater was suitable at baseline water quality levels – 331.107(f)(1)(A).

45. The following table shows the average levels of uranium, arsenic, radium-226, and lead for

each PA that exceeded the maximum contaminant level (MCL) allowed under the public drinking water standards.

	Uranium	Arsenic	Radium 226	Lead
MCL	0.03 mg/l	0.01 mg/l	5.0 pCi/l	0.015 mg/l
E-7	0.097 mg/l		10.3 pCi/l	0.084 mg/l
H-1(ext)	0.40 mg/l	0.05 mg/l	12.5 pCi/l	0.020 mg/l
H-7	0.10 mg/l	0.05 mg/l	8.7 pCi/l	

46. Treatment of groundwater at baseline water quality standards to remove radium-226 would be cost prohibitive and potentially hazardous due to the collection of radioactive materials; consequently, such treatment of groundwater of baseline quality is not a reasonable option for the future.
47. Groundwater of baseline quality was not suitable for human consumption.
48. No federal or Texas groundwater standards exist for livestock watering.
49. The level for radium for livestock recommended by the National Academy of Science (NAS) is zero.
50. In the absence of livestock watering standards, it is reasonable to apply human drinking water standards dealing with radioactive materials to livestock, because livestock are generally raised for human consumption.
51. Based on human drinking water standards, groundwater of baseline quality was not suitable for livestock watering.

52. Groundwater at baseline quality was not suitable for irrigation because the radioactive constituents would concentrate on the surface, in plants, and in the soil.
53. Pre-mining, baseline quality groundwater was suitable for terrestrial wildlife.

Actual existing use of groundwater in the area prior to and during mining – 331.107(f)(1)(B).

54. Prior to mining, no wells existed and groundwater was not used for any purpose within the area of PAs E-7, H-7, and H-1(ext).
55. During mining, groundwater within the area of the three PAs was used for mining purposes only.
56. Prior to and during mining, groundwater outside the three PAs but within the permitted area was used for livestock and wildlife watering.
57. Prior to and during mining, groundwater outside the three PAs and outside the permitted areas but in the general area was used for human consumption, livestock watering, and wildlife watering.

Potential future use of groundwater of baseline quality and of proposed restoration quality – 331.107(f)(1)(C).

58. Because of the pre-mining groundwater's poor quality, there is no difference in the types of uses for which the groundwater of quality as proposed in the amended restoration table values is suitable.

59. Although the post-restoration groundwater will have some constituents elevated above pre-mining baseline levels, the water quality levels proposed by COGEMA are nevertheless suitable for terrestrial wildlife.
60. The only reasonable potential future use of groundwater of baseline quality and of proposed restoration quality is for terrestrial wildlife.

***The effort made by the COGEMA to restore the groundwater to baseline –
331.107(f)(1)(D).***

61. COGEMA's efforts to restore groundwater to baseline quality standards are described in Findings of Fact Nos. 33 to 44.

***Technology available to restore groundwater for particular parameters –
331.107(f)(1)(E).***

62. Groundwater sweep, reverse osmosis, and freshwater injection were reasonable technologies to restore groundwater in PAs E-7, H-7, and H-1(ext).
63. Hydrogen sulfide (H₂S) injection is a technique that creates a reducing environment within the mining zone to chemically precipitate constituents that have been solubilized by the lixiviants used in the in situ mining process.
64. Because handling H₂S gas is very dangerous, H₂S injection is not a recommended technology for groundwater restoration. In addition, the three PAs in question will benefit from the upward migration of naturally occurring H₂S from nearby oil and gas fields.

65. Lime treatment can be used to reduce ammonia levels after an ammonium lixiviant was used during mining. However, COGEMA did not use an ammonium lixiviant in these PAs, so lime treatment would not be an effective restoration method in this case.
66. Some uranium mining operations utilize barium chloride to precipitate radium out of water so that the wastewater can be treated for disposal. Because COGEMA utilized a deep disposal well for its wastewater, use of barium chloride treatment was not needed for COGEMA's restoration efforts.
67. Physical filtration is generally not effective for removing constituents in a dissolved form.
68. Bioremediation is an experimental technology that has not been demonstrated on a commercial scale for in situ leachate uranium mines.
69. Groundwater sweep, freshwater injection, and reverse osmosis are the most appropriate restoration techniques for PAs E-7, H-7, and H-1(ext).

The ability of existing technology to restore groundwater to baseline quality in the area under consideration – 331.107(f)(1)(F).

70. COGEMA was not able to restore all groundwater constituents to baseline conditions despite using a combination of groundwater sweep, reverse osmosis, and freshwater injection.
71. Continued treatment and consumption of groundwater would not significantly improve the groundwater quality and would waste resources.
72. Even if the pre-mining baseline levels could be reached with extraordinary efforts, the groundwater would remain unusable for human consumption, livestock watering, or irrigation.

73. Reasonable continued use of groundwater sweep, freshwater injection, and reverse osmosis treatment will not achieve baseline conditions for all constituents.

The cost of further restoration efforts – 331.107(f)(1)(G).

74. Additional restoration would take three years and would incur at least the following direct costs (not including labor and overhead):

PA	Cost
H-1(ext)	\$505,200
E-7	\$955,200
H-1	\$607,200
Total	\$2,067,600

75. COGEMA's cost estimates are conservative because they based on the restoration of the uranium constituent only, and they assume that uranium levels would continue to decrease at a steady rate, which is unlikely to actually occur.
76. COGEMA would also incur estimated labor and overhead costs for E-7 of \$764,800; H-1 (ext) of \$404,800; and H-7 of \$486,400.
77. Estimated direct costs and estimated overhead and labor costs, produces a total estimated cost of \$3,723,600 for additional restoration efforts.

The consumption of groundwater resources during further restoration – 331.107(f)(1)(H).

78. Thirty per cent of the groundwater used in reverse osmosis treatment would be rejected, directed to a waste disposal injection well, and lost as a resource.

79. The estimated amounts of groundwater needed for further restoration are:

PA	Gallons Pumped	30% Loss (gal.)
E-7	398,000,000	119,400,000
H-7	253,000,000	75,900,000
H-1(ext)	210,500,000	63,150,000
Total	861,500,000	258,450,000

80. Even with the consumption of the estimated amount of groundwater, it is doubtful that all constituents in the groundwater in the three PAs would actually be restored to pre-mining baseline conditions.

The harmful effects of levels of particular parameters – 331.107(f)(1)(I).

81. E-7 currently has levels of uranium, radium-226, selenium and lead greater than the MCLs, that a public water system can have in water provided to the public for human consumption.

82. H-1(ext) has levels of uranium, radium-226, selenium, arsenic, and lead greater than the MCLs.

83. H-7 has elevated levels of uranium, radium-226, selenium, and arsenic greater than the MCLs.

84. Uranium and radium-226 are carcinogens.
85. Uranium is also a kidney toxin.
86. Selenium, which is an essential element, can be toxic at high levels.
87. Arsenic and lead can cause health problems at elevated levels.
88. The proposed levels for arsenic and lead are the same as their baseline levels.
89. Both uranium and radium-226 exceeded the MCLs even at baseline levels for all three PAs, although their proposed levels are more elevated.
90. Selenium is the only constituent that did not exceed the MCL prior to mining but will exceed the MCL at the proposed amended restoration table levels.

Reasonable restoration efforts have been undertaken, giving consideration to the factors listed in paragraph (1) of § 331.107(f) – 331.107(f)(2)(A).

91. COGEMA's efforts to restore groundwater to baseline quality standards are described in Findings of Fact Nos. 33 to 44.

The values for the parameters describing water quality have stabilized for a period of 180 days – 331.107(f)(2)(B).

92. To determine whether the water quality of the PAs met the proposed amended restoration standards, three sets of samples from the baseline wells were collected at a minimum of 30-day intervals between sample sets. In addition, a period of 180 days elapsed between cessation of restoration efforts and the final set of samples to ensure water quality

stabilization, as required by the Commission's rules.

93. The ED split the samples with COGEMA for quality assurance concerning the analytical results. Half of the split sample was tested by the state laboratory for the ED and half was kept by the COGEMA for its own laboratory analysis.
94. The values for the parameters describing water quality have stabilized for a period of 180 days.

The formation water present in the aquifer would be suitable for any use to which it was reasonably suited prior to mining – 331.107(f)(2)(C).

95. Pre-mining water quality was poor and not suitable without treatment for any use other than terrestrial wildlife drinking water, because the groundwater flowed through a uranium ore body and had high levels of uranium and radium-226.
96. Uranium and radium-226 are radioactive constituents and carcinogens, and treatment to remove them would generate a radioactive waste, would be a regulated activity, and would be cost prohibitive.
97. Pre-mining groundwater also contained other elements associated with uranium ore bodies, such as selenium and arsenic.
98. Because the pre-mining quality was so poor, the quality of the water under COGEMA's amended restoration tables would be suitable for any use to which it was reasonably suited prior to mining.

Further restoration efforts would consume energy, water, or other natural

resources of the state without providing a corresponding benefit to the state – 331.107(f)(2)(D).

99. The cost in dollars and gallons of groundwater for additional restoration are contained in Findings of Fact 74 to 80..
100. It is not likely that further restoration efforts could achieve baseline quality for all parameters.
101. The production zone of the three PAs is situated in an exempted aquifer and should not be used for human drinking water.
102. Further restoration efforts would consume large quantities of higher-quality groundwater outside of the production zones and outside of the PAs in order to restore the groundwater of the production zones of the PAs to a level that would remain unusable for human consumption, livestock watering, or irrigation.
103. Further attempts to restore groundwater that was already unsuitable for human or livestock consumption would expend significant resources without providing a corresponding benefit.

Whether appropriate standards for protection of human health and the environment are being applied by the TCEQ in the evaluation of the application.

104. The ED relied on 30 TAC § 331.107(f) as the appropriate rule under which to consider COGEMA's applications.
105. 30 TAC Chapters 327 and 350 deal with unauthorized discharges or spills, but this proceeding deals with amendments to restoration tables, not discharges or spills.

106. 30 TAC § 350.2(d) expressly provides that Chapter 350 does not apply to injections of mining solutions at in situ mining operations.
107. TEX. WATER CODE § 26.135(a) provides that nothing in Chapter 26 of the Water Code affects the process and duties of the Commission with respect to injection wells as provided in Chapter 27 of the Water Code.
108. TEX. WATER CODE § 27.019 requires the Commission to adopt rules reasonably required to perform its duties under Chapter 27 related to injection wells. In accordance with that requirement, the Commission adopted 30 TAC § 331.107(f).
109. Appropriate standards for protection of human health and the environment are being applied by the TCEQ in evaluating COGEMA's application.

Transcription Costs

110. The ALJ required a transcript be prepared in this case because the hearing was scheduled to last longer than one day. *See* 30 TAC § 80.23 (b)(4).
111. COGEMA paid transcription costs totaling \$9,809.00 (including two copies).
112. Protestants purchased a copy of the transcript from the court reporter service at a cost of \$2,209.70.
113. The reporting and transcription costs paid by COGEMA and Protestants totaled \$12,018.70.
114. COGEMA is part of a multi-billion-dollar for-profit corporate entity.
115. Protestants are property owners with large land holdings that contain oil and gas production, uranium mining production, and cattle operations.

116. Both COGEMA and Protestants have the financial ability to pay for the transcript, but COGEMA has the greater financial ability to pay costs.
117. The extent of participation by all the parties was appropriate and none of the parties unduly burdened the transcript with frivolous arguments or unnecessary questioning of witnesses.
118. As the party bearing the burden of proof, COGEMA could anticipate the greatest potential benefit from an ability to cite and reassemble the information within the record. However, all parties benefitted from having a transcript in preparing their closing statements.
119. COGEMA and Protestants have a federal lawsuit pending over their disputes, and both parties can anticipate some benefit from the use of this transcript in that proceeding.
120. COGEMA's potential benefit from having a transcript weighs in favor of assessing a greater portion of the transcription costs against COGEMA. Therefore, 75% of the transcription costs should be allocated to COGEMA and 25% to Protestants, including and giving credit for the costs Protestants paid for their copy. Under this calculation, Protestants should reimburse COGEMA \$794.98.

II. CONCLUSIONS OF LAW

1. The Commission has jurisdiction over COGEMA's applications for amendment of PAAs UR02156-011, UR02155-071 and UR02156-071 as part of the Commission's authority to permit Class III injection wells, pursuant to TEX. WATER CODE §§ 5.013(a)(8) and 27.011.
2. The Commission has authority to hold hearings concerning COGEMA's applications, pursuant to TEX. WATER CODE §§ 5.102(b) and 27.018.

3. SOAH has jurisdiction to conduct a hearing and to prepare a proposal for decision in this matter pursuant TEX. GOV'T CODE ANN. § 2003.047 (West 2005).
4. Public notice of COGEMA's applications for amendment of PAAs UR02156-011, UR02155-071 and UR02156-071 was given as required by the TEX. WATER CODE and Title 30 of the TAC, and affected persons were provided an opportunity to request a hearing on COGEMA's applications in the manner required by law.
5. Proper notice of the hearing and the prehearing conference was given to affected persons pursuant to TEX. GOV'T CODE §§ 2001.051 and 2001.052 and TEX. WATER CODE § 27.018.
6. COGEMA has the burden of proving that its applications for amendment of PAAs UR02156-011, UR02155-071 and UR02156-071 comply with applicable law by a preponderance of the evidence. 30 TAC § 80.17(a).
7. COGEMA's compliance history does not warrant denial of its applications, additional permit conditions or provisions, or any additional oversight necessary to improve environmental compliance. 30 TAC §60.3(a).
8. Based on the above findings of fact and conclusions of law, COGEMA proved by a preponderance of the evidence that it made an appropriate effort to restore groundwater to pre-mining or baseline conditions in PAs E-7, H-7, and H-1(ext).
9. Based on the above findings of fact and conclusions of law, COGEMA proved by a preponderance of the evidence that its proposed amendments to PAA restoration tables for PAs E-7, H-7, and H-1(ext) will achieve protection of human health and the environment required by the applicable statutes and rules, including the criteria enumerated in 30 TAC § 331.107.

10. Based on the above findings of fact and conclusions of law, the TCEQ is applying the appropriate standards for the protection of human health and the environment in the evaluation of COGEMA's applications.
11. COGEMA's applications to amend the PAA groundwater restoration tables for PAs E-7, H-7, and H-1(ext) should be granted.
12. Transcript costs should be allocated 75% to COGEMA and 25% to Protestants.

NOW, THEREFORE, IT IS ORDERED BY THE TEXAS COMMISSION ON ENVIRONMENT QUALITY THAT:

1. COGEMA's applications to amend the groundwater restoration tables for PAs E-7, H-7, and H-1(ext) contained in PAAs UR02155-071, UR02156-011, and UR02156-071 should be granted.
2. Protestants shall reimburse COGEMA for transcript costs of \$794.98.
3. 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.
4. The effective date of this Order is the date the Order is final, as provided by 30 TAC § 80.273 and Gov't Code § 2001.144.
5. The Commission's Chief Clerk shall forward a copy of this Order to all parties.

6. If any provision, sentence, clause, or phrase 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

Kathleen Hartnett White, Chairman
For the Commission