Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

November 6, 2008

TO: Persons on the attached mailing list.

RE: Uranium Energy Corp
Permit No. UR03075

**Decision of the Executive Director.**

The executive director has made a decision that the above-referenced permit application meets the requirements of applicable law. **This decision does not authorize construction or operation of any proposed facilities.** Unless a timely request for contested case hearing or reconsideration is received (see below), the TCEQ executive director will act on the application and issue the permit.

Enclosed with this letter is a copy of the Executive Director's Response to Comments. A copy of the complete application, draft permit and related documents, including public comments, is available for review at the TCEQ Central office. A copy of the complete application, the draft permit, and executive director's preliminary decision are available for viewing and copying at County Courthouse, 701 East End Street, Goliad, Texas 77963.

If you disagree with the executive director's decision, and you believe you are an "affected person" as defined below, you may request a contested case hearing. In addition, anyone may request reconsideration of the executive director's decision. A brief description of the procedures for these two requests follows.

**How To Request a Contested Case Hearing.**

It is important that your request include all the information that supports your right to a contested case hearing. You must demonstrate that you meet the applicable legal requirements to have your hearing request granted. The commission's consideration of your request will be based on the information you provide.

The request must include the following:

(1) Your name, address, daytime telephone number, and, if possible, a fax number.

(2) If the request is made by a group or association, the request must identify:
   (A) one person by name, address, daytime telephone number, and, if possible, the fax number, of the person who will be responsible for receiving all communications and documents for the group; and
   (B) one or more members of the group that would otherwise have standing to request a hearing in their own right. The interests the group seeks to protect must relate to the organization's purpose. Neither the claim asserted nor the relief requested must require the participation of the individual members in the case.

(3) The name of the applicant, the permit number and other numbers listed above so that your request may be processed properly.

(4) A statement clearly expressing that you are requesting a contested case hearing. For example, the following statement would be sufficient: "I request a contested case hearing."

Your request must demonstrate that you are an **"affected person."** An affected person is one who has a personal justiciable interest related to a legal right, duty, privilege, power, or economic interest affected by the application. Your request must describe how and why you would be adversely affected by the proposed facility or activity in a manner not common to the general public. For example, to the extent your request is based on these concerns, you should describe the likely impact on your health, safety, or uses of your property which may be adversely affected by the proposed facility or activities. To demonstrate that you have a personal justiciable interest, you must state, as specifically as you are able, your location and the distance between your location and the proposed facility or activities.

Your request must raise disputed issues of fact that are relevant and material to the commission's decision on this application. The request must be based on issues that were raised during the comment period. The request cannot be based solely on issues raised in comments that have been withdrawn. The enclosed Response to Comments will allow you to determine the issues that were raised during the comment period and whether all comments raising an issue have been withdrawn. The public comments filed for this application are available for review and copying at the Chief Clerk's office at the address below.

To facilitate the commission's determination of the number and scope of issues to be referred to hearing, you should: 1) specify any of the executive director's responses to comments that you dispute; and 2) the factual basis of the dispute. In addition, you should list, to the extent possible, any disputed issues of law or policy.

**How To Request Reconsideration of the Executive Director's Decision.**

Unlike a request for a contested case hearing, anyone may request reconsideration of the executive director's decision. A request for reconsideration should contain your name, address, daytime phone number, and, if possible, your fax number. The request must state that you are requesting reconsideration of the executive director's decision, and must explain why you believe the decision should be reconsidered.

**Deadline for Submitting Requests.**

A request for a contested case hearing or reconsideration of the executive director's decision must be **received by** the Chief Clerk's office no later than **30 calendar days** after the date of this letter. You may submit your request electronically at http://www.tceq.state.tx.us/about/comments.html or by mail to the following address:

LaDonna Castañuela, Chief Clerk
TCEQ, MC-105
P.O. Box 13087
Austin, Texas 78711-3087

**Processing of Requests.**

Timely requests for a contested case hearing or for reconsideration of the executive director's decision will be referred to the alternative dispute resolution director and set on the agenda of one of the commission's regularly scheduled meetings. Additional instructions explaining these procedures will be sent to the attached mailing list when this meeting has been scheduled.

**How to Obtain Additional Information.**

If you have any questions or need additional information about the procedures described in this letter, please call the Office of Public Assistance, Toll Free, at 1-800-687-4040.

Sincerely,

LaDonna Castañuela

LaDonna Castañuela
Chief Clerk

LDC/er

Enclosures

MAILING LIST
for
Uranium Energy Corp
Permit No. UR03075

FOR THE APPLICANT:

Harry Anthony, Chief Operating Officer
Uranium Energy Corp
100 East Kleberg, Suite 210
Kingsville, Texas 78363

Craig W. Holmes
8107 Pommel Drive
Austin, Texas 78759

FOR THE EXECUTIVE DIRECTOR:

Shana L. Horton, Staff Attorney
Texas Commission on Environmental Quality
Environmental Law Division MC-173
P.O. Box 13087
Austin, Texas 78711-3087

Don Redmond, Staff Attorney
Texas Commission on Environmental Quality
Environmental Law Division MC-173
P.O. Box 13087
Austin, Texas 78711-3087

David Murry, Technical Staff
Texas Commission on Environmental Quality
Waste Permits Division MC-130
P.O. Box 13087
Austin, Texas 78711-3087

FOR OFFICE OF PUBLIC ASSISTANCE:

Bridget Bohac, Director
Texas Commission on Environmental Quality
Office of Public Assistance MC-108
P.O. Box 13087
Austin, Texas 78711-3087

FOR PUBLIC INTEREST COUNSEL:

Blas J. Coy, Jr., Attorney
Texas Commission on Environmental Quality
Public Interest Counsel MC-103
P.O. Box 13087
Austin, Texas 78711-3087

FOR THE CHIEF CLERK:

LaDonna Castañuela
Texas Commission on Environmental Quality
Office of Chief Clerk MC-105
P.O. Box 13087
Austin, Texas 78711-3087

INTERESTED PERSONS:

See attached list.

ABRAMEIT , ANDREW
GORDON ARATA MCCOLLAM DUPLANTIS & EA
STE 1300
777 S POST OAK LN
HOUSTON TX 77056-1958

ABRAMEIT , GLEN
6211 WIGTON DR
HOUSTON TX 77096-4623

ABRAMEIT , MIKE PRESIDENT
ANDER-WESER VFD
3306 E FM 1961
GOLIAD TX 77963

ALBRECHT , DOROTHY
1732 POST OAK RD
GOLIAD TX 77963-3321

ALBRECHT , EMMETT
1732 POST OAK RD
GOLIAD TX 77963-3321

ALBRECHT , KATHY & RAY
4792 DANFORTH RD
GOLIAD TX 77963-3541

ALTMAN , DORA
4854 POST OAK RD
GOLIAD TX 77963-3323

ANDRUSS , TIM GENERAL MANAGER
VICTORIA GROUNDWATER CONSERVATION DIS
STE 210
2805 N NAVARRO ST
VICTORIA TX 77901-3917

ANKLAM , MARY & THOMAS
14859 N US HWY 183
YORKTOWN TX 78164

ANKLAM , MARY
14859 US HWY 183 N
YORKTOWN TX 78164

ANKLAM , THOMAS
14859 US HWY 183 N
YORKTOWN TX 78164

ARNECKE , CALTON
1690 NAGEL RD
VICTORIA TX 77905-3119

ARNECKE , SHERILYN
1690 NAGEL RD
VICTORIA TX 77905-3119

ARNOLD , RAYMOND
120 DOBSKYVILLE RD
YORKTOWN TX 78164-5462

ARNOLD , MR & MRS RAYMOND
120 DORKYVILLE RD
YORKTOWN TX 78164

ATZENHOFFER , CG
1801 E LOMA VISTA AVE
VICTORIA TX 77901-4219

BAACKE , CLINTON
PO BOX 1117
GOLIAD TX 77963-1117

BAACKE , RUTH
1358 N SAN PATRICIO ST
GOLIAD TX 77963-3922

BADE , ALDON & BRENDA E
147 FM 1961
YORKTOWN TX 78164-5457

BAIAMONTE , ROB
PO BOX 1091
GOLIAD TX 77963-1091

BAIAMONTE , ROB
5296 OLD GOLIAD RD
GOLIAD TX 77963-3317

BALL , WESLEY
10907 FM 622
GOLIAD TX 77963-3770

BALL, WESLEY & IRWIN,RAULIE
PO BOX 560
GOLIAD TX 77963-0560

BALL, WESLEY & DUKE,JOHN B
PO BOX 562
GOLIAD TX 77963-0562

BARNHART , JOHN N
PO BOX 626
BERCLAIR TX 78107-0626

BEARD , ELIZABETH & MICKEY
1551 FOX CROSSING RD
MEYERSVILLE TX 77974-4121

BEARD , ELIZABETH HAUN
1551 FOX CROSSING RD
MEYERSVILLE TX 77974-4121

BEDNORZ , GLENNETH
10347 FM 622
GOLIAD TX 77963-3612

BEDNORZ , RAY
382 COLETOVILLE RD S
VICTORIA TX 77905-3041

BETTGE , RICHARD
306 BETTGE LN
MEYERSVILLE TX 77974-4154

BILLINGS , JAMI
PO BOX 277
WEESATCHE TX 77993-0277

BLACKBURN JR , JAMES B
BLACKBURN CARTER PC
4709 AUSTIN ST
HOUSTON TX 77004-5004

BLACKBURN , JIM
GOLIAD COUNTY
4709 ALBANS
HOUSTON TX 77004

BLANTON , CAROLYN
611 LEE ALVES RD
YORKTOWN TX 78164-5423

BLANTON , CAROLYN & GARY
611 LEE ALVES RD
YORKTOWN TX 78164-5423

BLUMICH , DARRELL W
106 CREEK DR
GOLIAD TX 77963-3471

BLUMICH , LINDA
106 CREEK DR
GOLIAD TX 77963-3471

BLUNTZER , CHARLES K
208 WESTCHESTER DR
VICTORIA TX 77904-1858

BLUNTZER , JIM
1260 BLUNTZER RD
GOLIAD TX 77963-3403

BLUNTZER , OLTO & RUTH
585 BLUNTZER RD
GOLIAD TX 77963-3530

BOCHAT , ERIKA & MATT
PO BOX 225
GOLIAD TX 77963-0225

BODE , ANNE PETTUS
627 W GARDEN ST
GOLIAD TX 77963

BODE , BILL
107 SCENIC LOOP DR
GOLIAD TX 77963-3820

BODE , CHARLES WILLIAM
107 SCENIC LOOP DR
GOLIAD TX 77963-3820

BODE , JENNY
PO BOX 796
GOLIAD TX 77963

BODE , JUDY
107 SCENIC LOOP DR
GOLIAD TX 77963-3820

BODY , DARRELL
GARY WHITING WELL SERV
1609 E GUADALUPE ST
VICTORIA TX 77901-6294

BOEHM , GLADYS
1429 LEMKE RD
GOLIAD TX 77963

BOLDT , ROBBIE
4626 E FM 884
YORKTOWN TX 78164-1953

BORGFELD , HARVEY J
2973 E FM 884
YORKTOWN TX 78164-5451

BORGFELD , WARREN
7230 STATE HIGHWAY 119
YORKTOWN TX 78164-5437

BOYLE , REBECCA
FORT COLLINS NOW
STE 2
400 REMINGTON ST
FORT COLLINS CO 80524-2983

BRANDT , MRS HAROLD
PO BOX 86
YORKTOWN TX 78164-0086

BRAQUET , SIDNEY J
APT 1
1324 CORTLANDT ST
HOUSTON TX 77008-4290

BREEDEN , DORIS & PAUL
77 STIRRUP RD
VICTORIA TX 77905-2623

BREEDEN , PAUL
77 STIRRUP RD
VICTORIA TX 77905-2623

BREWER , HARVEY & KAREN KNEIP
1885 FOX RD
GOLIAD TX 77963-3416

BRIDGES , CHRIS
1483 E FM 884
YORKTOWN TX 78164-5448

BROWN , GENE & RETA
468 FM 1961
YORKTOWN TX 78164-5456

BROWN , GENE
UIAG
468 FM 1961
YORKTOWN TX 78164-5456

BROWN , RETA
UIAG
468 FM 1961
YORKTOWN TX 78164-5456

BRUMBY , DEBBY & KIRBY
3600 POST OAK RD
GOLIAD TX 77963

BRUMBY , DEBBY
3600 POST OAK RD
GOLIAD TX 77963-3347

BRUNICARDI, CATHY & DECKER,RAYMOND G
PO BOX 300
WEESATCHE TX 77993-0300

BRYSCH , BRENDA & LARRIE
4982 DANFORTH RD
GOLIAD TX 77963-3542

BRYSCH , ROSALYN
4982 DANFORTH RD
GOLIAD TX 77963-3542

BUCHHORN , ALTA & LESLIE L
3100 FANNIN RD
VICTORIA TX 77905-3017

BUELTER , DAPHNE & KENNETH W
8168 FM 2441
GOLIAD TX 77963

BUELTER , KENNETH W
8168 FM 2441
GOLIAD TX 77963-6001

BURNS , CAROL A
4494 FM 622
GOLIAD TX 77963-3752

CALDWELL , JOHN & PEARL J
5501 DANFORTH RD
GOLIAD TX 77963-3546

CALDWELL , JOHN W
5501 DANFORTH RD
GOLIAD TX 77963-3546

CALHOUN , P T
PO BOX 1369
GOLIAD TX 77963

CALHOUN , PAT
PO BOX 576
GOLIAD TX 77963-0576

CARTER , ELLIE
1318 GAY MEADOW LN
GOLIAD TX 77963-4018

CARTER , MARY W
BLACKBURN CARTER PC
4709 AUSTIN ST
HOUSTON TX 77004-5004

CARTER JR , RAYMOND V
601 W GOODWIN AVE
VICTORIA TX 77901

CHAPMAN , GREGORY C
5906 FENWAY DR
CORPUS CHRISTI TX 78413-2716

CHEEK , DAVID
14319 N US HWY 183
YORKTOWN TX 78164-5663

CHRIST , LARRY & MAGGIE
29 GOLIAD N
GOLIAD TX 77963

CHRIST , LARRY
29 GOLIAD N
GOLIAD TX 77963-3447

CHRIST , LAURENCE K
29 GOLIAD N
GOLIAD TX 77963-3447

CHRIST , MARGARET A
29 GOLIAD N
GOLIAD TX 77963-3447

CHRISTOPHER , W W
5300 OLD GOLIAD RD
GOLIAD TX 77963-3317

CITIZENS , CONCERNED
WATER IS LIFE
PO BOX 351
GOLIAD TX 77963-0351

CLARK , H C
GOLIAD COUNTY COMMISSIONERS
2300 BOLSOVER ST
HOUSTON TX 77005-2612

CLEMENTS , THURMAN
VICTORIA GROUNDWATER CONSERVATION
435 CONTI LN
VICTORIA TX 77904-1207

COLLINS , CHRISTINE & LAMAR M
2848 WEBER RD
VICTORIA TX 77905-3130

COOK , GINGER & LYNN
3933 KILGORE RD
GOLIAD TX 77963-3659

COOK , GINGER
3933 KILGORE RD
GOLIAD TX 77963-3659

COPPENOLLE , LORETTA VAN
14115 OAKLAND MILLS ST
SAN ANTONIO TX 78231-1635

COREY , BILL
63 DONDO LN
GOLIAD TX 77963-3210

CUSHING , LARA
PO BOX 830706
SAN ANTONIO TX 78283-0706

DAVIS , FLORINE S
PO BOX 84
GOLIAD TX 77963

DAVIS , FLORINE S
442 E OAK ST
GOLIAD TX 77963

DAVIS , KEVIN
3407 HALLEMANN RD
GOLIAD TX 77963-3374

DE LAY , DON L
7930 S WELLINGTON CT
HOUSTON TX 77055-3511

DE LUNA , JOE M
135 CHERIE BROOK DR
GOLIAD TX 77963-3903

DEFOREST , ALVIN
1545 E FM 1961
GOLIAD TX 77963

DEFOREST , ALVIN
4529 DANFORTH RD
GOLIAD TX 77963-3540

DOHMANN, ART & KOZIELSKI,JOE
PO BOX 560
GOLIAD TX 77963-0560

DOHMANN , ART
PO BOX 562
GOLIAD TX 77963-0562

DOHMANN, ART & KOZIELSKI,JOE
PO BOX 562
GOLIAD TX 77963-0562

DOHMANN , ARTHUR A
PO BOX 117
WEESATCHE TX 77993-0117

DREIER, JOHN & SMITH,BARBARA
PO BOX 560
GOLIAD TX 77963-0560

DREIER, JOHN & SMITH,BARBARA
PO BOX 562
GOLIAD TX 77963-0562

DREIER , JOHN & MARGIE L
3692 FRANKE RD
GOLIAD TX 77963-3617

DREIER , JOHN H
3692 FRANKE RD
GOLIAD TX 77963-3617

DREIER , MARGIE
3692 FRANKE RD
GOLIAD TX 77963-3617

DUDERSTADT , ASHLEY
3703A BILLY DR
VICTORIA TX 77901

DUDERSTADT , ASHLEY
8915 FM 236
CUERO TX 77954-5712

DUDERSTADT , CRAIG
722 DUDERSTADT RD
YORKTOWN TX 78164-5459

DUDERSTADT , CRAIG & LUANN
722 DUDERSTADT RD
YORKTOWN TX 78164-5459

DUDERSTADT , DARWYN
PO BOX 127
WEESATCHE TX 77993-0127

DUDERSTADT , DORIS & WILBURN R
744 ARNOLD RD
GOLIAD TX 77963-3302

DUDERSTADT , LUANN
722 DUDERSTADT RD
YORKTOWN TX 78164-5459

DUDERSTADT , MEGAN
5757 S STAPLES ST
CORPUS CHRISTI TX 78413-3732

DUDERSTADT, WAYNELL &
DUDERSTAND,DARWYN
1708 WEISE RD
YORKTOWN TX 78164

DUDERSTADT , WILBURN R "PETE"
744 ARNOLD RD
GOLIAD TX 77963-3302

DUESER , JEROME C
2844 AFFLERBACH RD
YORKTOWN TX 78164-1964

DUKE , JOHN
PO BOX 560
GOLIAD TX 77963-0560

DUKE , JOHN & WANDA
2900 HENCERLING RD
GOLIAD TX 77963-3449

DUKE , JOHN B
2900 HENCERLING RD
GOLIAD TX 77963-3449

EGGEMEYER , JACQUELINE
341 LEUSCHNER RD
VICTORIA TX 77905-3074

ENGEL , ALEXIS & BUTCH
4843 FM 884
YORKTOWN TX 78164

ENGELKING , GARRETT
REFUGIO GROUNDWATER CONSERVATION DIS
PO BOX 116
REFUGIO TX 78377-0116

FELS , HOWARD
STE 700
500 N SHORELINE BLVD
CORPUS CHRISTI TX 78471-1013

FLORES , JULIAN
GOLIAD COUNTY COMMISSIONER
PO BOX 634
GOLIAD TX 77963-0634

FOERSTER , DARWIN A
508 DUNDEE ST
VICTORIA TX 77904-2877

FOERSTER , HUBERT A
510 DUNDEE ST
VICTORIA TX 77904-2877

FOERSTER , MARY
510 DUNDEE ST
VICTORIA TX 77904-2877

FOLKS , JOAN S
PO BOX 324
WEESATCHE TX 77993-0324

FORD , DIANA & DON G
5287 FM 884
YORKTOWN TX 78164-2094

FRANKE , DOUGLAS & WANDA E
1603 W FM 884
YORKTOWN TX 78164-5167

GASTON , ROBERT W
PO BOX 1800
CORPUS CHRISTI TX 78403

GAYLE , BRIDGET
PO BOX 1310
GOLIAD TX 77963-1310

GAYLE , ROBERT B
PO BOX 1310
GOLIAD TX 77963-1310

GEORGIE , JO & KENNETH
PO BOX 305
NURSERY TX 77976-0305

GIRAUDIN , BETTIE
914 FM 1351
GOLIAD TX 77963-3706

GLEINSER , HAROLD GOLIAD COUNTY JUDGE
PO BOX 1097
GOLIAD TX 77963-1097

GLOOR , GARLAND & SHERRY
2484 FM 622
GOLIAD TX 77963

GLOOR , GARLAND
2484 FM 622
GOLIAD TX 77963-3745

GONZALES , ELIDA
PO BOX 654
YORKTOWN TX 78164-0654

GREESON , MILTON
PO BOX 2509
VICTORIA TX 77902-2509

GRIESER , JOEL & JOYCE
5016 E FM 1961
GOLIAD TX 77963-3443

GRIFFITH , GERALD
4335 DANFORTH RD
GOLIAD TX 77963-3408

GRIFFITH , MR & MRS GERALD A
4335 DANFORTH RD
GOLIAD TX 77963-3408

GUERRA , REFUGIO
PO BOX 194
WEESATCHE TX 77993-0194

GUTHRIE , MACK & SUE N
2262 FANNIN RD
VICTORIA TX 77905-3071

GUTMANN , MR & MRS G A
2432 COLOGNE RD
VICTORIA TX 77905-4155

GUTMANN , G A
2432 COLOGNE RD
VICTORIA TX 77905-4155

HARDT , ANNIE
734 DOBSKYVILLE RD
YORKTOWN TX 78164-1958

HARDT , BRENDA
711 DOBSKYVILLE RD
YORKTOWN TX 78164-1958

HARPER , DIANE
526 NOLL RD
MEYERSVILLE TX 77974-3965

HARTMAN , ELMO & LORRAINE
248 OLD GOLIAD RD
GOLIAD TX 77963-3330

HASTINGS , PATRICIA A
226 ELIOT RD
MEYERSVILLE TX 77974-3976

HAUSMAN , ERNEST
103 OXFORD DR
SAN ANTONIO TX 78213

HAUSMAN , ERNEST & FRANCES M
103 OXFORD DR
SAN ANTONIO TX 78213-4062

HEINE , ROY
237 MIDWAY RD
GOLIAD TX 77963-3314

HENCERLING , DAN & MARILYN
2148 HENCERLING RD
GOLIAD TX 77963-3449

HENDERSON , CLEO & WAYNE
6064 E FM 1961
GOLIAD TX 77963-3443

HENSON , MARSHALL
468 DANFORTH RD
GOLIAD TX 77963-3405

HERWEEK , LINDA
3230 W FM 884
YORKTOWN TX 78164-5161

HIEBNER , DENISE & PERRY
1385 SEILER RD
YORKTOWN TX 78164-5278

HIEBNER , DENISE
1385 SEILER RD
YORKTOWN TX 78164-5278

HILBRICH , MARK
PO BOX 1056
GOLIAD TX 77963-1056

HILBRICH , MARLENE
722 CAMP COLET RD
GOLIAD TX 77963-3439

HILL , DORIS & WILLIAM V
3208 BENT BOW DR
SAN ANTONIO TX 78209-3518

HILL JR , WILLIAM V
3208 BENT BOW DR
SAN ANTONIO TX 78209-3518

HINMAN , MICHELE & ROBERT
PO BOX 354
GOLIAD TX 77963

HOBLIT , KAREN & RANDALL
1768 BERGER RD
GOLIAD TX 77963-3437

HOBLIT , KAREN
1768 BERGER RD
GOLIAD TX 77963-3437

HOFFMAN , DONNA
1500 GREGORY ST
AUSTIN TX 78702

HOFFMAN , DONNA
SIERRA CLUB - LONE STAR
1202 SAN ANTONIO ST
AUSTIN TX 78701-1834

HOLY , ROBIN M
502 CLAY ST
VICTORIA TX 77904-1382

HORNSTEIN , MR & MRS MARVIN
1417 FM 622
VICTORIA TX 77905-3110

HUGHES , CHARLOTTE
526 NOLL RD
MEYERSVILLE TX 77974-3965

HUGHES , PETER
526 NOLL RD
MEYERSVILLE TX 77974-3965

IRWIN JR, GEORGIA & RAULIE L
3148 W FM 884
YORKTOWN TX 78164-5306

IRWIN , GEORGIA ANNE
3148 W FM 884
YORKTOWN TX 78164-5306

IRWIN , RAULIE
PO BOX 562
GOLIAD TX 77963-0562

IRWIN JR , RAULIE L
3148 W FM 884
YORKTOWN TX 78164-5306

JACKSON , KATHLEEN
PO BOX 1
FANNIN TX 77960-0001

JACOB , BETTY & JOE
312 N CHURCH ST
GOLIAD TX 77963-3943

JACOB , DON H
7864 E FM 1961
GOLIAD TX 77963-3401

JACOBS , MONICA
KELLY HART & HALLMAN LLP
STE 2000
301 CONGRESS AVE
AUSTIN TX 78701-2961

JENKINS , CARL
580 WHEELER LN
GOLIAD TX 77963-3640

JENKINS , CARL & DONNA L
580 WHEELER LN
GOLIAD TX 77963-3640

JENKINS , DONNA L
UIAG
580 WHEELER LN
GOLIAD TX 77963-3640

JOHNSTON , MILDRED
2904 KIPLING ST
VICTORIA TX 77901-7621

KARNOWSKI , HENRY & PEGGY
205 CANTERBURY LN
VICTORIA TX 77904-1781

KERSEY , BETTY
PO BOX 32
GOLIAD TX 77963-0032

KERSEY , WILLIAM
PO BOX 32
GOLIAD TX 77963-0032

KEY , MARILYN & W WAYNE
1737 ALBRECHT RD
GOLIAD TX 77963-3432

KEY , WAYNE
1737 ALBRECHT RD
GOLIAD TX 77963-3432

KLINKERMAN , KIRK PE
2561 BAECKER RD
GOLIAD TX 77963

KORNFUEHRER , BARBARA & GAYLON
12922 GOLDEN RAINBOW DR
CYPRESS TX 77429-3804

KRENECK , JANET
6999 OLD GOLIAD RD
GOLIAD TX 77963-3318

KRENECK , JIM
6999 OLD GOLIAD RD
GOLIAD TX 77963-3318

KRUEGER , MARK
939 NOLL RD
MEYERSVILLE TX 77974-3953

LADNER , JAMES & MARY E
5791 S SH 119
YORKTOWN TX 78164

LANGE , LARRY
7483 N US HIGHWAY 183
GOLIAD TX 77963-3522

LANGE , WILLIAM
107 LAUREL OAK CIR
CUERO TX 77954-2147

LEMKE , J W
1029 FM 1351
GOLIAD TX 77963-3705

LENAMON , AUBREY & J AUBREY
237 SANDY LN
VICTORIA TX 77905-3036

LENAMON , JUDY
237 SANDY LN
VICTORIA TX 77905-3036

LESTER , KYLE
1322 COLETOVILLE RD S
VICTORIA TX 77905

LEWIS , SANDRA
PO BOX 677
GOLIAD TX 77963-0677

LINZER , J NAOMI
422 STAGES DR
CORPUS CHRISTI TX 78412-2810

LONG , TED COMMISSIONER PCT 4
GOLIAD COUNTY
358 E FM 1961
GOLIAD TX 77963-4404

LUDE , DOROTHY
271 W FM 884
GOLIAD TX 77963-3304

LULE , MAUREEN
4748 STATE HIGHWAY 119
GOLIAD TX 77963-3326

MANNING , JAN
4791 STATE HIGHWAY 239 W
GOLIAD TX 77963-3850

MARTIN , EDNA
1996 ABRAMEIT RD
GOLIAD TX 77963-3602

MCCRANEY , PATTI
PO BOX 148
GOLIAD TX 77963-0148

MCKINNEY , BELITHA B
962 LEE ALVES RD
YORKTOWN TX 78164-5246

MCKINNEY , BELITHA & MELVIN H
962 LEE ALVES RD
YORKTOWN TX 78164-5246

MCKINNEY , FRANCEY & RICIA
107 TAMPA DR
VICTORIA TX 77904-1654

MCKINNEY , RICKI
107 TAMPA DR
VICTORIA TX 77904-1654

MEYER , MARY
700 WILLOW DR
RICHMOND TX 77469

MEYER , ROBERT W
305 SIMPSON RD
VICTORIA TX 77904-1476

MIKESKA , MR & MRS JASON
14870 US HWY 183N
YORKTOWN TX 78164

MONTAGUE , WM
3339 FM 622
GOLIAD TX 77963-3748

MONTGOMERY , LOUIS & SHARON
1431 LEMKE RD
GOLIAD TX 77963

MORGENROTH , BOB
PO BOX 2431
VICTORIA TX 77902-2431

MOSLEY , DOROTHY J
2150 HENCERLING RD
GOLIAD TX 77963-3449

MOTAL , PAUL D
3315 GALESBURG DR
AUSTIN TX 78745-5811

MULLENIN , MARTHA
CITY OF GOLIAD
PO BOX 1
GOLIAD TX 77963-0001

NEAL , DOROTHY
13747 FM 622
VICTORIA TX 77905-3030

NELSON , LINDA L
166 OLD GOLIAD RD
GOLIAD TX 77963-3330

ORMAND , JAMES & ROSALIE
PO BOX 239
WEESATCHE TX 77993-0239

ORMAND , ROSALIE TETER
PO BOX 239
WEESATCHE TX 77993-0239

ORR , SUSAN
1742 E FM 1961
GOLIAD TX 77963

ORR , WELDON SCOTT
1742 E FM 1961
GOLIAD TX 77963

OVERLANDER , MARY ANN
3744 OLD GOLIAD RD
GOLIAD TX 77963-3315

OVERLANDER , SHANNON
3746 OLD GOLIAD RD
GOLIAD TX 77963-3315

PARKINSON , DONNA
1984 HALLEMANN RD
GOLIAD TX 77963-3352

PARKINSON , ROBERT
1984 HALLEMANN RD
GOLIAD TX 77963-3352

PARMA , JOYCE J
1182 DOBSKYVILLE RD
YORKTOWN TX 78164-1959

PAULSGROVE , STEVEN G
PO BOX 1234
GOLIAD TX 77963-1234

PENA , STACY STOCKTON
1371 HALL RD
GOLIAD TX 77963-3671

PESEK , ROBIN
553 PESEK LN
GOLIAD TX 77963-3639

PETERS , KATHY
345 E FRANKLIN ST
GOLIAD TX 77963-4214

POWER , NORMAN
PO BOX 253
GOLIAD TX 77963-0253

QUILLIAN , JOANN
1444 RUTHERFORD LN
GOLIAD TX 77963-3336

RADER , JIMMIE D
PO BOX 665
GOLIAD TX 77963-0665

REED , CYRUS CONSERVATION DIRECTOR
SIERRA CLUB
PO BOX 1931
AUSTIN TX 78767-1931

REICHERT-GARZA , STEPHANIE
134 TILLEY LN
VICTORIA TX 77905-3124

REITZ , DENNIS & IDA M
PO BOX 126
WEESATCHE TX 77993-0126

RHOTENBERRY , SAM
104 W REUSS BLVD
CUERO TX 77954

RIEBSCHLAEGER , SISTER ELIZABETH
402 2ND ST
CUERO TX 77954-2544

RIEDESEL , GAIL & ROLAND G
312 STATE HIGHWAY 119 S
YORKTOWN TX 78164

RIGGS , RANDY
3163 N 183
GOLIAD TX 77963

RITENOUR , KLAUS & TAMMY
27 NOLL RD
MEYERSVILLE TX 77974-3970

ROESSLER , LAFERN
56 KATHY ST
VICTORIA TX 77905-3641

ROESSLER , LAFERN & MELVIN
56 KATHY ST
VICTORIA TX 77905-3641

ROESSLER , MELVIN
56 KATHY ST
VICTORIA TX 77905-3641

ROSS , ERIC & SHARON
4466 E FM 1961
GOLIAD TX 77963-3441

ROSS , ERIC
4466 E FM 1961
GOLIAD TX 77963-3441

RUTHERFORD , MARGARET A
1256 BLUNTZER RD
GOLIAD TX 77963-3403

SAGEBIEL , MR & MRS OBEL
10218 S US HIGHWAY 183
CUERO TX 77954-6558

SALYER , JEANETTE & MONTE
4595 FRANKE RD
GOLIAD TX 77963-3618

SALYER , JIM
PO BOX 3966
VICTORIA TX 77903-3966

SAMFORD , MONA
5222 KINGS HWY
AUSTIN TX 78745-2862

SAUERMILCH , WILBERT
PO BOX 826
YORKTOWN TX 78164-0826

SAYLER , MONTE
4595 FRANKE RD
GOLIAD TX 77963-3618

SCHEURICH , VENICE
COASTAL BEND SIERRA CLUB
PO BOX 10101
CORPUS CHRISTI TX 78460-0101

SCHNEIDER , LEROY H
2437 ABRAMEIT RD
GOLIAD TX 77963-3717

SCHOENHERR , ELIZABETH
PO BOX 796
GOLIAD TX 77963

SCHUSTEREIT , KENNETH D
275 BAASS LN
VICTORIA TX 77905-3606

SCHUSTEREIT , MICHAEL
505 S CHURCH ST
ROCKPORT TX 78382-2511

SCOTT , DOUG
5415 E FM 1961
GOLIAD TX 77963-3652

SCOTT , JUDITH A
5415 E FM 1961
GOLIAD TX 77963-3652

SCOTT , KAREN
4791 STATE HIGHWAY 239 W
GOLIAD TX 77963-3850

SEAL , RUSSELL
SIERRA CLUB ALAMO GROUP
628 COUNTY ROAD 5711
LA COSTE TX 78039-2301

SEILER , PHIL
346 E FM 884
YORKTOWN TX 78164-5446

SHARP , BETTY
2181 DIEBEL RD
WEESATCHE TX 77993

SHERWOOD , ROBIN
PO BOX 39
FANNIN TX 77960-0039

SIEVERS , BETTY
670 NOLL RD
MEYERSVILLE TX 77974-3954

SIMMONS , DEE ANN
913 WHEELER LN
GOLIAD TX 77963-3644

SIMMONS , WAYLAN A
URAC
913 WHEELER LN
GOLIAD TX 77963-3644

SISSON , LARRY
461 LASSMAN RD
GOLIAD TX 77963-3774

SKIPPER , SHEILA DIANE
5811 E FM 1961
GOLIAD TX 77963-3444

SMITH , BARBARA
GOLIAD COUNTY GROUNDWATER CONS DIST
376 GOLIAD N
GOLIAD TX 77963-3446

SMITH , BARBARA
PO BOX 562
GOLIAD TX 77963-0562

SMITH , MARGIE & WAYNE
4 LOS ROBLES RD
YORKTOWN TX 78164-5184

SMITH , MARGIE
4 LOS ROBLES RD
YORKTOWN TX 78164-5184

SMITH , SHIRLEY D
4167 POST OAK RD
GOLIAD TX 77963-3324

SMITH , WAYNE
4 LOS ROBLES RD
YORKTOWN TX 78164-5184

SMITH JR , WILLIAM G
38 MAIN ST
WEESATCHE TX 77993

SPANN , DONNA & MIKE
1750 NOLL RD
MEYERSVILLE TX 77974-3940

SPEARS , STEPHANIE Y
307 W BRAZOS ST
VICTORIA TX 77901-5105

STACY , ROBERT & ROSEMARY
1214 JANK LN
GOLIAD TX 77963-3417

STANGE , CURTIS
2506 COLETOVILLE RD S
VICTORIA TX 77905-3044

STOCKTON , ADA SUE
800 E JONES ST
BEEVILLE TX 78102-2842

STOCKTON , HEATHER
555 S BURKE ST
GOLIAD TX 77963-4312

STOCKTON , TOM E
1367 HALL RD
GOLIAD TX 77963-3671

STOCKTON , VICTORIA A
1367 HALL RD
GOLIAD TX 77963-3671

STRYKER , PAM & ROBERT
661 ABRAMEIT RD
GOLIAD TX 77963

SUGGS , JUNELL
1483 E FM 884
YORKTOWN TX 78164-5448

SUTER , PAT
COASTAL BEND SIERRA CLUB
1002 CHAMBERLAIN ST
CORPUS CHRISTI TX 78404-2607

SUTER , PATRICIA H PRESIDENT & CHAIRMAN
COASTAL BEND SIERRA CLUB
PO BOX 3512
CORPUS CHRISTI TX 78463-3512

SWANSON , M C
2204 HUTCHINS LN
EL CAMPO TX 77437-2110

SWANSON , MERRILL & REBECCA N
2204 HUTCHINS LN
EL CAMPO TX 77437-2110

SWICKHEIMER , GEORGIA LEE
PO BOX 217
FANNIN TX 77960-0217

THIEME , PATRICIA & ROLAND
118 WEARDEN DR
VICTORIA TX 77904-9630

THURK , CAROL & DORIAN
959 DOBSKYVILLE RD
YORKTOWN TX 78164-1957

TIBILETTI , JOE
KTXN RADIO
PO BOX 7286
VICTORIA TX 77903-7286

TOERCK , KATHY & RUDY
265 CHARCO ST
GOLIAD TX 77963-3701

TOUREILLES , THE HONORABLE & THE HONORABLE YVONNE GONZALES
TEXAS HOUSE OF REPRESENTATIVES
PO BOX 2910
AUSTIN TX 78768-2910

TSAI , TIM
#301
3815 GUADALUPE ST
AUSTIN TX 78751

TUTTLE , WANDA
401 JOSEPHINE RD
VICTORIA TX 77905-3031

UNDERDOWN , WILLIAM R
PO BOX 979
GOLIAD TX 77963

VAUGHN , SANDRA
120 BEECHWOOD DR
VICTORIA TX 77901-4717

VOGEL , MACKEY & ROMAN E
2750 AFFLERBACH RD
YORKTOWN TX 78164-2103

VOGEL , ROMAN E
2750 AFFLERBACH RD
YORKTOWN TX 78164-2103

WALKER , DAVID
PO BOX 1086
GOLIAD TX 77963-1086

WARD , MARTHA & ROY A
PO BOX 1101
YORKTOWN TX 78164

WARREN , CAROL
1235 HALLEMANN RD
GOLIAD TX 77963-3309

WARREN , CAROL & DAVID P
1235 HALLEMANN RD
GOLIAD TX 77963-3309

WEST , CATHERINE
PO BOX 371
GOLIAD TX 77963-0371

WILD , KAY
4511 FM 953
CUERO TX 77954-6218

WILLIAMS , MINA
141 NAPLES ST
CORPUS CHRISTI TX 78404-1828

WUNSCH , GLORIA & THOMAS
1302 FM 622
VICTORIA TX 77905-3106

WUNSCH , LESLIE & TRACE
301 E SOUTH RAILROAD ST
CUERO TX 77954-3031

YEARY , EMILY
1707 BEAUVOIR LN
VICTORIA TX 77901-4281

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
2008 OCT 31 PM 4:02
CHIEF CLERKS OFFICE

**TCEQ UIC PERMIT NO. UR03075**

| | | |
|---|---|---|
| **APPLICATION BY** | § | **BEFORE THE** |
| | § | |
| **URANIUM ENERGY CORP** | § | **TEXAS COMMISSION ON** |
| | § | |
| **FOR TCEQ PERMIT NO. UR03075** | § | **ENVIRONMENTAL QUALITY** |

---

## EXECUTIVE DIRECTOR'S RESPONSE TO PUBLIC COMMENT

---

The Executive Director of the Texas Commission on Environmental Quality (the commission or TCEQ) files this Response to Public Comment (Response) on the underground injection control permit application by Uranium Energy Corp (UEC) for UIC Permit No. UR03075 and Executive Director's preliminary decision on the application. UEC has also submitted a request to the TCEQ to designate an exempted aquifer. An aquifer or portion of an aquifer may be designated as an exempted aquifer if it does not currently serve as a source of drinking water for human consumption and it will not in the future serve as a source of drinking water for human consumption because it is mineral, hydrocarbon or geothermal energy bearing with production capability.[1] The aquifer exemption is required before UEC can operate the proposed injection wells. UEC requests that a portion of the Goliad Formation be designated an exempted aquifer.

As required by Title 30, Texas Administrative Code (TAC), Section (§) 55.156, before an application is approved, the Executive Director (ED) prepares a response to all timely, relevant and material, or significant comments, whether or not withdrawn. The Office of Chief Clerk timely received comment letters and oral comments at a public meeting held on January 24, 2008 in Goliad, Texas.

The following people submitted written comments and/or made formal oral comments at the public meeting:

---

[1] 30 TAC § 331.13.

Abrameit, Mike (AWVFD)
Albrecht, Dorothy
Albrecht, Emmett
Albrecht, Ray and Kathy
Altman, Dora M.
Anklam, Thomas and Mary
Arnecke, Sherilyn
Arnold, Raymond and Karon
Bade, Aldon and Brenda
Baiamonte, Rob (Uranium Resource Advisory Committee)
Ball, Wesley
Barnhart, John N.
Beard, Mickey and Elizabeth
Blackburn, James B. (counsel for Goliad County)
Blanton, Gary and Carolyn J.
Blumich, Darrell W.
Blumich, Linda
Bluntzer, Charles and Kay
Bluntzer, Otto and Ruth
Bochat, Matt and Erika
Bode, Jenny
Bode, Judy
Boehm, Gladys
Boldt, Robbie
Borgfeld, Harvey J.
Borgfeld, Warren
Brandt, Mrs. Harold
Braquet, Sidney J.
Brewer, Harvey and Karen
Bridges, Chris
Brown, Gene and Reta
Brumby, Debby
Brysch, Larrie, Brenda and Rosalyn
Buelter, Kenneth and Daphne
Caldwell, John W. and Pearl
Calhoun, Pat
Carter, Mary W. (counsel for Goliad County)
Carter, Raymond V.
Chapman, Gregory C.
Christ, Larry and Maggie
Collins, Lamar M. and Christine H.
Cook, Lynn and Ginger
Corey, Bill
Cushing, Lara (Southwest Workers' Union)
Davis, Florine S.
Decker, Raymond and Cathy Brunicard
DeForest, Alvin
Dohmann, Art (GCGCD)
Dreier, John
Dreier, Margie
Duderstadt, Ashley
Duderstadt, Craig and Luann
Duderstadt, Mr. and Mrs. Darwyn
Duderstadt, Megan
Duderstadt, Pete
Duderstadt, Wilburn R. and Doris
Duke, John B. and Wanda
Engelking, Garrett (Refugio GCD)
Foerster, Darwin
Foerster, Hubert A.
Foerster, Mary
Folks, Joan S.
Ford, Don and Diana
Gaston, Robert W.
Georgie, Kenneth and Joanne
Giraudin, Bettie
The Honorable Harold Gleisner (County Judge)
Gloor, Garland and Sherry
Goliad County Groundwater Conservation District (GCGCD)
Grieser, Joel and Joyce
Griffith, Gerald A. and Eva Nell
Gutmann, G.A.
Hardt, Annie
Hardt, Brenda Jo
Hardt, Laurie
Harper, Diane
Hausman, Ernest
Hencerling, Dan and Marilyn
Henderson, Wayne and Cleo

Henson, Marshall
Hiebner, Perry and Denise
Hill, William V. (Jr.) and Doris Ann
Hinman, Robert and Michele
Hoblit, Karen
Hoffman, Donna (Sierra Club—Lone Star Chapter)
Hughes, Charlotte
Hughes, Peter
Irwin, Raulie and Georgia Anne
Jackson, Kathleen
Jenkins, Carl and Donna L.
Key, W. Wayne and Marilyn
Klinkerman, Kirk
Kozielski, Joe (GCGCD)
Kreneck, Janet
Kreneck, Jim (County Comm'r)
Krueger, Mark
Lange, Larry
Lenamon, Judy
Lester, Kyle
Lewis, Sandra (Uranium Resource Advisory Committee)
Long, Ted (County Comm'r)
Linzer, J. Naomi
Lude, Dorothy
Lude, Maureen
Manning, Jan
McCraney, Patti
McKinney, Dr. M.H. "Mack" and Belitha
Meyer, Robert
Mikeska, Mr. and Mrs. Jason
Montgomery, Louis W. and Sharon
Mosley, Dorothy
Ormand, James and Rosalie
Orr, Susan
Orr, Weldon Scott
Ousley, Billy R.
Parma, Joyce J.
Reed, Cyrus (Sierra Club—Lone Star Chapter)
Reitz, Ida M. and Dennis
Rhotenberry, Sam
Riebschlaeger, Sister Elizabeth
Riedesel, Roland G. and Gail
Ritenour, Klaus and Tammy
Roessler, LaFern
Roessler, Melvin
Ross, Eric and Sharon
Rutherford, Margaret
Sagebiel, Obert
Salyer, Monte and Jeanette
Sauermilch, Wilbert
Scheurich, Venice (Coastal Bend Sierra Club)
Schoenherr, Elizabeth
Schustereit, Kenneth
Scott, Doug
Scott, Judy
Sherwood, Robin
Sievers, Betty
Sisson, Larry
Skipper, Shiela Diane
Smith, Barbara
Smith, Shirley D.
Smith, Wayne and Margie
Spann; Mike and Donna
Stacy, Robert C. and Rosemary
Stryker, Robert and Pam
Suggs, Junell
Suter, Pat (Coastal Bend Sierra Club)
Swanson, Merrill and Rebecca
Thieme, Roland and Patty
Thurk, Dorian and Carol
Underdown, William R. (Bob)
Van Copenolle, Loretta (Sierra Club—Alamo Group)
Vaughn, Sandra
Vaughn, Mrs. S.G.
Vogel, Mr. and Mrs. Roman E.
Ward, Roy A. and Martha G.
Warren, David P. and Carol C., DsVM
Water Is Life (organization—multiple signatories)

West, Catherine
Wild, Kay (Pecan Valley GCD)
Williams, Mina (Coastal Bend Sierra Club)
Wunsch, Thomas and Gloria
Wunsch, Trace and Leslie

If you need more information about this permit application or the permitting process, please call the TCEQ Office of Public Assistance at 1-800-687-4040. General information about the TCEQ can be found at our website at www.tceq.state.tx.us.

## I. Description of Facility

UEC has applied to the TCEQ for a new Class III underground injection control area permit to authorize an *in situ* uranium mining operation. The facility where the proposed activity would take place is located approximately 13 miles north of the city of Goliad, about 0.9 miles east of the intersection of State Highway 183 and Farm-to-Market Road 1961 in Goliad County, Texas. The permit would authorize UEC to construct and operate Class III injection and production wells for recovery of uranium from a certain portion of the Goliad Formation within the permit area. The area within the proposed permit boundary is approximately 1,139.4 contiguous acres, including a 100-foot buffer zone.[2]

UEC's application also includes a request for an aquifer exemption. The requested aquifer exemption would apply from a depth of 45 to 404 feet and would extend over the approximately 423.8 acre area within the proposed permit area in Goliad County.

UEC proposes to mine uranium deposits in the sands of the Goliad Formation using the *in situ* leach recovery method.[3] *In situ* mining is accomplished by use of Class III underground injection control wells operating for both the injection and production of fluids. Class III wells inject fluid (lixiviant) from the surface into underground deposits of uranium ore. The lixiviant oxidizes the uranium and makes it mobile. Class III wells functioning in a production mode lift the solution bearing the uranium to the surface where resin beads remove the uranium from the solution. Reverse osmosis then reconditions the water for reuse as lixiviant for continued mining. Reverse osmosis will also be used to restore water in the mine area after the mining operation ends.

In order to mine within the requested zone, UEC must also obtain an aquifer exemption. An aquifer exemption can only be issued if the portion of the aquifer does not currently serve as a

[2] Under 30 TAC § 331.82(g), designated monitor wells shall be installed at least 100 feet inside any permit area boundary, unless excepted by written authorization from the executive director.
[3] *In situ* leach (ISL), *in situ* recovery (ISR), and *in situ* mining are different names for the same process and are used interchangeably.

source of drinking water for human consumption and, until exempt status is removed, it will not in the future serve as a source of drinking water for human consumption.[4]

The current application for which this Response to Comments is prepared is for Class III underground injection control wells and for an aquifer exemption. There are several other authorizations required for the other aspects of UEC's proposed operation. For example, prior to this application, UEC has been exploring the formation to learn about the uranium deposits in it. In order to drill exploration wells, UEC obtained the required exploration permit from the Texas Railroad Commission. This permit is not under the TCEQ's jurisdiction; therefore, the permit and activities regulated by it will not be discussed in detail in this Response to Comments.

In addition, for each production area within the production zone, TCEQ rules require UEC to obtain a Production Area Authorization (PAA).[5] A PAA contains localized restoration and monitoring requirements for a particular production area contained within a larger permit area. A PAA lists the monitor wells to be sampled, requires detection limits and remedial action for excursions of fluids from the production area, establishes restoration requirements, and provides an estimate of when mining and restoration will be completed. A PAA includes a mine plan, a restoration table, a baseline water quality table, control parameter upper limits, monitor well locations, and any special provisions the Commission determines are appropriate.[6] UEC submitted an application for PAA No. 1 on September 3, 2008. That application is currently under review by the Executive Director's staff. The PAA application is available for review and copying by the public at the Goliad County Courthouse, and is subject to public notice requirements, a public comment period, and the opportunity for a contested case hearing.[7]

UEC also proposes to locate a facility at the site to process the uranium after it is recovered. The processing facility will require a radioactive materials license (RML), which authorizes the recovery, possession, and processing of source material (uranium) and processing and disposal of by-product material (waste from uranium recovery).[8] If there will be emissions into the air from the facility, it may also require a separate permit from the TCEQ's Air Permitting program.[9]

---

[4] 30 TAC § 331.13(c)(1) and (2).

[5] 30 TAC § 331.2 (82) Production area authorization—A document, issued under the terms of an injection well permit, approving the initiation of mining activities in a specified production area within a permit area.

[6] 30 TAC § 305.49(b).

[7] 30 TAC § 39.653 and Ch. 55, Subch. E and F (§ 55.150 et. seq.); Tex. Water Code §§ 27.0513(a) and 27.018.

[8] Although applications for a radioactive materials license under Tex. Health & Safety Code Ch. 401 are not subject to the House Bill 801 administrative and public participation procedures in Subchapters E and F of 30 TAC Ch. 55, they are subject to Subchapter G, Requests for Contested Case Hearing and Public Comment on Certain Applications (§§ 55.250-55.256). Tex. Health & Safety Code § 401.264 provides for notice and a contested case hearing.

[9] Applications for air permits are generally subject to House Bill 801 procedures except for Permits by Rule (PBRs), which are specifically exempt under 30 TAC § 39.043(c)(6).

Finally, UEC proposes to dispose of wastewater produced during the process in a Class I waste disposal well. Nonhazardous operational and restoration wastewaters may be disposed of in a Class I waste disposal well. Operational wastewater includes a lixiviant bleed stream, resin wash stream, filter press wash stream and reverse osmosis brine stream. Restoration wastewater includes a simple "bleed" of the mining area (i.e., pumping more water from the mine area than is injected to ensure that mining waters do not move beyond the mine area), a reverse osmosis brine stream from restoration, or a combination thereof. UEC filed an application for a Class I waste disposal well on September 23, 2008. That application is under review by the Executive Director's staff. The Class I injection well application is currently available for review and copying by the public at the Goliad County Courthouse, and is subject to public notice requirements, a public comment period, and the opportunity for a contested case hearing.[10]

This Response to Comments does not address any of the additional authorizations UEC may require other than the Class III underground injection control well application and the request for an aquifer exemption. Persons with questions or comments regarding other authorizations should raise those concerns during the comment period designated for the authorization to which the comment applies. Doing so will ensure that the concerns can be considered as issues in any contested case hearing on those authorizations, in accordance with the rules.[11]

## II. Procedural Background

On August 7, 2007, TCEQ received this application for new Underground Injection Control Permit No. UR03075. On August 29, 2007, the Executive Director declared the application administratively complete. On September 19, 2007 and September 26, 2007, the Notice of Receipt of Application and Intent to Obtain a New Underground Injection Control Permit No. UR03075 was published in *The Texan Express* and the *Victoria Advocate*.

A public meeting was held on January 24, 2008, in Goliad.

On June 17, 2008, the Executive Director completed the technical review of the application and prepared a draft permit. On June 20, 2008 and June 25, 2008, the Notice of Application and Preliminary Decision for Class III Injection Well for Permit No. UR03075 was published in *The Texan Express* and the *Victoria Advocate*. The notice for the proposed aquifer exemption was provided with the Notice of Application and Preliminary Decision.

On July 25, 2008, the public comment period ended.

[10] 30 TAC § 39.651 and Ch. 55, Subch. E and F (§ 55.150 et. seq.) and Tex. Water Code § 27.018.
[11] 30 TAC § 55.201(d)(4).

## III. Access to Rules, Laws and Records

The following Web sites contain rules, statutory law, and other information that applies to this application.

| | |
|---|---|
| Texas statutes | http://www.state.tx.us |
| TCEQ rules, codified in Title 30, Texas Administrative Code | www.tceq.state.tx.us and www.sos.state.tx.us/tac |
| Secretary of State | www.sos.state.tx.us |
| Federal statutes and rules | http://www.epa.gov |

Commission records for this facility are available for viewing and copying at TCEQ's main office in Austin, 12100 Park 35 Circle, Building F, 1st Floor, Office of Chief Clerk. The application has also been available for review and copying at the Goliad County Courthouse since the publication of Notice of Receipt of Application and Intent to Obtain a New Underground Injection Control Permit No. UR03075, and the technical summary and draft permit have also been available at that location since publication of the Notice of Application and Preliminary Decision.

## IV. Comments and Responses

Comments have been grouped under the following subject-matter headings:

A. Procedural Issues and Concerns
B. Uranium Industry, generally
C. Laws and Rules, generally
D. Data Concerns/Requests for additional data
E. Public Interest Requirements
F. Economic Impacts and Quality of Life
G. Land Use/Site Selection
H. Health and Welfare
I. Groundwater Quality
J. Groundwater Quantity/Availability
K. Concerns related to mining in a USDW or unconfined aquifer
L. Aquifer Exemption
M. Geology/Hydrology of Aquifer
N. Baseline Determination
O. Degradation of Water Quality during Exploration Phase
P. Monitoring
Q. Control of Migration
R. Spill and Excursion Response and Cleanup
S. Contamination of Surface Water, Air, and Soil
T. Restoration of Aquifer: Feasibility and Enforcement
U. Financial Assurance, Bankruptcy, and other Liability Concerns
V. Compliance History
W. Enforcement: Inspections and Penalties
X. Miscellaneous

## A. Procedural Issues and Concerns

**Comment 1:** Several commenters requested that a second public meeting be held in Goliad County, or made a request for a public meeting that was submitted after the first meeting had already transpired. Some specifically requested a meeting to discuss the request for an aquifer exemption.

**Response 1:** According to 30 TAC § 55.154, the TCEQ may hold a second public meeting on this application if it is determined there is sufficient public interest or if a public meeting is requested by a member of the state legislature. The Executive Director has determined that a second public meeting will not be held for this application. The TCEQ held a public meeting on this application on January 24, 2008 in the meeting hall of the Immaculate Conception Church in Goliad, Texas. Approximately 350-400 people attended this meeting. Extensive comments have been received regarding this application, including the request for an aquifer exemption.

**Comment 2:** Jim Blackburn, on behalf of Goliad County, Lynn and Ginger Cook, Luann Duderstadt, Robin Sherwood, Wayne and Margie Smith, and Gene and Reta Brown expressed concern that the process for permitting the type of business the Applicant wishes to operate consists of several separate proceedings and permit applications at different agencies.

Jim Blackburn commented that the UIC permit and Aquifer Exemption request are inextricable and should be considered in the same proceeding. He further requests a single proceeding for: UIC Class III permit, Aquifer Exemption, Radioactive Material License, UIC Class I permit, and radioactive disposal permit. Lynn and Ginger Cook and Robin Sherwood commented that the entire process from exploration permitting to mining and decommissioning should be governed by a single regulatory agency. Many commenters expressed concern that the stress level from the legal process is the cause of extreme unhappiness and may lead to or has led to physical and emotional health problems among many members of the community.

**Response 2:** Before *in situ* leach mining for uranium can begin, an applicant must obtain several required permits and authorizations. These authorizations apply to the various parts of the proposed activity, including exploration, production, processing, transportation of radioactive materials, and disposal of waste produced in the process. Each of the necessary permits or authorizations has a unique set of rules and the opportunity for public participation in the process.

This UEC application combines two of the authorizations that UEC must obtain prior to beginning mining operations: (1) the UIC Class III injection well permit and, (2) the designation of an exempt aquifer. The Executive Director has reviewed them together. While UEC must obtain other authorizations from the TCEQ before uranium recovery can begin, UEC is not

required to consolidate the various activities and approvals under a single permit. Under the provisions of 30 TAC Chapter 33, whether to use a consolidated permit, which authorizes activities under more than one program, is the option of an applicant.[12] Depending on the timing of the processing of different applications and the determination of any requests for hearing, contested case hearings on the various applications could be consolidated if it will not prejudice any party and may save time or expense or otherwise benefit the public interest and welfare.[13]

The Texas Legislature has conferred regulatory responsibility for exploration activities to the Railroad Commission of Texas. The Texas Legislature has conferred regulatory responsibility to the TCEQ for injection wells used for uranium recovery, wells used in the development of an injection well permit application, and for the licensing of uranium recovery.[14]

The Executive Director acknowledges citizens concerns regarding what can be a lengthy and arduous legal process. To facilitate citizens' participation, the TCEQ endeavors to provide the public with information regarding *in situ* mining and the permitting process for *in situ* mining. Notices will be issued regarding the various applications and permitting actions, and applications are required to be made available at a public place in the local area.

**Comment 3:** Jim Blackburn and Wayne and Margie Smith expressed concern about whether the notice provided to the public of the Applicant's request for an aquifer exemption was adequate.

**Response 3:** In accordance with the requirements of 30 TAC § 331.13(a), the commission may designate an aquifer or a portion of an aquifer as exempt only after notice and opportunity for public hearing. There are no other specific requirements for the public notice of a proposed aquifer exemption. The notice for the proposed aquifer exemption was provided with the Notice of Application and Preliminary Decision for the Class III injection well permit application published on June 20, 2008 and June 25, 2008 in *The Texan Express* and the *Victoria Advocate.*

**Comment 4:** By letter dated October 3, 2007, Mary Carter, attorney for Goliad County, informed TCEQ that the application was not available for viewing and copying at the County Courthouse as stated in the Notice of Receipt of Application and Intent to Obtain a Class III Underground Injection Control Permit. Mary Carter requested that a copy of the application be mailed directly to her or that she be provided with information regarding where the application may be reviewed and copied.

**Response 4:** Under 30 TAC § 39.405(g), the applicant must make a copy of the application available to the public for review and copying at a public place in the county in which the facility

[12] 30 TAC § 33.11.
[13] 30 TAC §80.13.
[14] TCEQ's jurisdiction over UIC wells is provided by Chapter 401 of the Texas Health & Safety Code and Chapter 27 of the Texas Water Code.

is proposed to be located. On October 9, 2007, the Executive Director's staff contacted a UEC representative regarding this matter. The representative responded on October 10, 2007 that the application was available for public viewing at the Goliad County Courthouse, and had been available. The Executive Director confirmed with a clerk at the courthouse that the application was available.

**Comment 5:** Karen Hoblit requested that a map be posted on the internet depicting all areas that are within and adjacent to permit areas. She commented that this will help residents determine if they are in a zone that may potentially be affected.

**Response 5:** The TCEQ's Underground Injection Control rules do not require the submission of a permit application in an electronic format suitable for website publication. A map depicting all areas within and adjacent to the permit area is part of the application that is available for review at the Goliad County Courthouse. The map is Figure 1.3-Project Map, and is located in Appendix C of the application.

**Comment 6:** In regard to the public meeting held in Goliad on January 24, 2008, GCGCD commented that the parking situation was a mess due to parking areas being blocked off by Department of Public Safety officers and local law enforcement. GCGCD stated that only after the meeting had begun were people informed that handicapped parking was available in front of venue. Finally, GCGCD expressed concern that the public was not allowed to provide water, coffee, or snacks during the meeting. GCGCD asked if UEC influenced the event in not allowing refreshments and in requesting the presence of law enforcement.

**Response 6:** All public meetings are arranged and conducted by the TCEQ's Office of Public Assistance (OPA), which serves to provide information to the public on pending applications. OPA scheduled the January 24, 2008 public meeting in Goliad and made arrangements for it to be held in the meeting hall at the Immaculate Conception Church. Personnel from OPA also provided the public address system used for the meeting, conducted the meeting, and collected written comments provided by people attending the meeting. However, no one from the TCEQ requested the presence of any law enforcement officers at the meeting or had any involvement in the parking arrangements. Also, no one from the TCEQ prohibited anyone from providing water, coffee, snacks, or other refreshments.

**Comment 7:** Wayne and Margie Smith commented that they do not understand how the permit process can progress this far without all the data being processed and made public knowledge.

**Response 7:** All of the data required to be submitted for this Class III UIC well application has been processed and evaluated by the TCEQ. The application has been available for review and copying at the Goliad County Courthouse since the publication of Notice of Receipt of Application and Intent to Obtain a New Underground Injection Control Permit No. UR03075, and the technical summary and draft permit have also been available at that location since

publication of the Notice of Application and Preliminary Decision. All materials and data submitted to TCEQ are subject to the Public Information Act, which ensures the public's access to all information the TCEQ has unless the information is subject to certain narrow exceptions.[15]

Not all of the data that will be required before the Applicant can begin its proposed mining activities has been provided to the TCEQ yet. This is because even if this permit is issued, the applicant still needs several additional authorizations, including Production Area Authorizations, a radioactive materials license, and a Class I disposal well permit, prior to beginning mining.[16] Each of these requires submission of additional information and data and will receive separate evaluation by the TCEQ. Some of the additional testing and data commenters have requested is not required to be submitted for this permit, but must be submitted in applications for other required authorizations. Each of these applications, if submitted, will be available to the public and is subject to the public comment and contested case hearing process.[17]

**Comment 8:** Lara Cushing of the SWWU commented that TCEQ needs to involve the community in the decision of whether or not to issue a draft permit from the beginning.[18]

**Response 8:** The TCEQ welcomes public participation in the TCEQ's decision-making process. Applicants for any type of permit are also encouraged to meet with members of the community to discuss their plans and to seek public input. In addition, when applications for permits are submitted to the TCEQ, the TCEQ may conduct a public meeting, provides an opportunity for the public to submit formal comments on the application, and provides an opportunity for members of the public to request a contested case hearing on the application.

A draft permit is issued by the Executive Director and does not authorize the applicant to begin activities associated with the permit. The Executive Director is required to prepare a draft permit consistent with all applicable commission rules, unless a recommendation is made not to grant an application. The draft permit must be filed with the commission to be included in the consideration of the application and is subject to change during the course of the proceedings on the application.[19] The draft permit contains requirements that meet statutory and rule requirements and may be site-specific. In this manner, the draft permit is the Executive Director's proposal for requirements, in addition to the applicable laws and rules, that would be protective of human health and safety and the environment considering the circumstances of the proposed activity and site. The requirements of the rules and the requirements of the draft permit are considered together by the commission when it decides whether or not to grant the permit.

---

[15] Tex. Gov't Code Ch. 552
[16] 30 TAC §§ 331.7(b), 336.203, and 331.7(a), respectively.
[17] *See* footnotes 3, 4, and 6, above. The applications for PAA No. 1 and the UIC Class I disposal well were submitted in September and are available for public review and copying at the Goliad County Courthouse.
[18] *See also* Comment and Response 67, *infra*.
[19] 30 TAC § 281.21(b).

**Comment 9:** Some commenters expressed concern regarding the accuracy of information from the Applicant. John W. and Pearl J. Caldwell expressed concern that UEC has made inaccurate statements to the press. Brenda Jo Hardt, Annie Hardt, and Laurie Hardt questioned whether UEC has been acting in good faith and stated that UEC has demonstrated they are not to be trusted.

**Response 9:** The Executive Director is not aware of any inaccurate statements submitted by the applicant to the TCEQ. There are a number of statutes and rules designed to help ensure the accuracy and truthfulness of all information submitted to the TCEQ. The draft permit incorporates 30 TAC § 305.125(19), which requires the permittee to promptly submit facts or information to the TCEQ when the permittee becomes aware that it failed to submit any relevant facts in the permit application or submitted incorrect information in the application. Under 30 TAC § 331.21, all geoscientific information submitted to the TCEQ in the application must be prepared and sealed by a professional geoscientist or licensed professional engineer. This helps ensure truthful and accurate data because a professional geoscientist or licensed professional engineer is subject to a code of conduct that forbids submission of false data.[20] Additionally, as provided by state law, an applicant is subject to administrative, civil, and criminal penalties for knowingly making any false statement, representation, or certification on any report, record, or document submitted or maintained for governmental use. The TCEQ aggressively pursues suspected falsification because it affects program integrity. Criminal prosecution for falsification can carry penalties of fines up to $10,000 per violation and/or 10 years' imprisonment.

## B. Uranium Industry, generally

**Comment 10:** Several commenters expressed concern about the general history of contamination resulting from past uranium mining projects. More specifically, Carol Warren commented that with past projects, surface spills and aquifer contamination have been common. Margaret Rutherford commented that in past uranium mining, there have been leaks from broken pipes and faulty valves. Pat Suter of the Coastal Bend Sierra Club noted that in Kleburg County, a county in which uranium mining has been conducted, residents are still unable to drink groundwater. Mrs. S.G. Vaughn stated that uranium mining has caused devastation in Kingsville and Karnes City. Craig Duderstadt asked, given the history of uranium mining, whether TCEQ believes this the one instance in which problems will not occur.

**Response 10:** The Executive Director is not authorized to consider the success of past uranium mining projects, but rather, must evaluate the current application on its own merits. The Texas Legislature adopted the Texas Injection Well Act (Texas Water Code Chapter 27), which specifically provides that the commission may issue a permit that authorizes the construction and

[20] 22 TAC §§ 851.104(a) and 137.57.

operation of two or more similar injection wells within a specified area for mining of uranium.[21] The legislature and the commission have adopted statutes and rules designed to protect the quality of fresh water in the vicinity of an injection well. The Executive Director reviewed UEC's application for a Class III injection well permit and determined that it meets all applicable requirements for this type of permit. Based on the information in this application and on applicable requirements in 30 TAC Chapter 331, the Executive Director has prepared a draft permit with requirements protective of groundwater in the area. If the applicant abides by all statutes, rules, and permit requirements, the Executive Director does not expect that problems such as those cited by commenters will occur at the proposed site.

The Executive Director does not agree that Kleberg County residents cannot drink well water because of *in situ* uranium mining. In 2004, the EPA and TCEQ notified residents in the Garcia Hill area approximately eight miles southeast of Kingsville in Kleberg County that two water wells in the Garcia Hill area had levels of uranium and gross alpha radiation higher than maximum concentration levels allowed for public water systems and that residents should use an alternative source of drinking water. The situation was raised as an issue in the contested case hearing on an application by URI, Inc. for a production area authorization. No scientific evidence was submitted at the hearing to demonstrate that *in situ* uranium mining affected the quality of the Garcia Hill wells. Evidence in the record did suggest that the Garcia Hill wells were located in or near natural uranium deposits, causing the higher levels of uranium and uranium-related alpha radiation. The Garcia Hill area has since connected to a public water system.

**Comment 11:** Several commenters stated that renewable energy resources should be pursued rather than nuclear energy, which requires uranium. Some added that safer alternatives are feasible and available or that the cost of nuclear power is problematic for its use as a solution to energy needs.

**Response 11:** An applicant for a Class III injection well permit is not required to submit an analysis of alternatives to the use of the uranium produced from the proposed operations or an economic analysis of nuclear energy generation. *In situ* recovery of uranium by use of injection wells is an activity that is recognized and authorized by the Texas Legislature. The Texas Injection Well Act (Texas Water Code Chapter 27) specifically provides that the commission may issue a permit that authorizes the construction and operation of two or more similar injection wells within a specified area for mining of uranium.[22] The application does include analysis of alternative methods for recovering the uranium, including surface and underground mining.[23] It concludes that the *in situ* method causes less physical destruction of the production

[21] Tex. Water Code § 27.0513(a).
[22] Tex. Water Code § 27.0513(a).
[23] Tex. Water Code § 27.051(d)(2) requires the commission to consider whether there is a practical, economic, and feasible alternative to an injection well reasonably available.

zone aquifer and overlying land because it does not use heavy machinery and minimizes solid waste because it does not require removal of overburden.[24]

**Comment 12:** Ginger Cook asked, what are some of the advances in procedures and technology in uranium mining, other than reverse osmosis?

**Response 12:** In the past, mining for uranium was accomplished by open pit mining or more traditional underground mining using tunnels. Open pit mining entails surface destruction and requires disposal of large amounts of overburden. Underground mining is more dangerous for workers than other methods because of exposure to gases trapped in underground mining tunnels. For either type of conventional mining, the aquifer must be dewatered in order to allow machines and people in to work, which affects water availability. *In situ* leach mining is a modern, more advanced procedure, and is by far the most common used in Texas today. Because the digging involved is limited to wells, the surface landscape is not destroyed and underground formations maintain their integrity. The less invasive nature of the *in situ* method makes it possible to restore the surface and aquifer. Conventional mining techniques do not require restoration. Additionally, *in situ* mining produces less waste to dispose of and is safer for workers.

Recently, there have also been improvements in how *in situ* mining technology is applied. Reverse osmosis technology is used to clean water in both recovery and restoration activities. Industry closely monitors the composition of the mining fluid and uses reverse osmosis to reduce the concentration of constituents that could interfere with recovery of uranium. Chloride concentrations also are closely monitored to ensure adequate chloride content for efficient ion exchange, which is used to precipitate the uranium from the mining fluids. Periodically during the mining process, mining fluids may be treated with reverse osmosis to reduce the concentration of constituents, rather than waiting until mining is complete. Also, aquifer restoration activities are commenced after a portion of an ore body is mined, rather than waiting until the entire ore body is mined. By doing this, a company can devote more time to aquifer restoration, allowing the company to more quickly identify and address any problems that might arise during restoration activities. Other restoration techniques include groundwater sweep, in which water is pumped out of the aquifer without treatment to move cleaner water into mined area, and freshwater injection, in which another source of water from a separate formation or a surface water supply is pumped into the mining area. Companies have also been investigating the feasibility of introducing reduction agents to the aquifer during restoration to more efficiently return the mined zone to the reducing conditions that existed prior to mining.

**Comment 13:** Sandra Lewis asked that the TCEQ consider the impact permitting uranium mining operations may have on the long-term future of the entire state.

---

[24] See Application, page ix.

**Response 13:** As stated in a previous response, the policy decision to allow *in situ* recovery of uranium by use of injection wells was made by the Texas Legislature, which has authorized the activity in statute. The Texas Injection Well Act (Texas Water Code Chapter 27) specifically provides that the commission may issue a permit that authorizes the construction and operation of two or more similar injection wells within a specified area for mining of uranium.[25] In addition to the application, the law requires the TCEQ to consider: the map submitted with the technical report; a tabulation of reasonably available data on all wells within the area of review which penetrate the proposed injection zone; the vertical and lateral limits of the of the aquifer, its position relative to the injection formation, and the direction of water movement; the geologic structure of the local area; the regional geologic setting; proposed operating data; a proposed formation testing program to obtain an analysis of the physical, chemical, and radiological characteristics of the receiving formation; a proposed stimulation program; the proposed operation and injection procedure; surface and subsurface construction details; plans for meeting minimum monitoring requirements; expected changes in pressure, native fluid displacement, and direction of movement of injection fluid; contingency plans to cope with shut-ins or well failures; corrective actions proposed to be taken; financial assurance; closure plans; and any additional information the executive director may reasonably require. The rules are designed to protect human health and welfare in the local area through the closure of the site and restoration of the aquifer.

**Comment 14:** Several people commented that no one can prove and/or there is no guarantee that mining is safe and will not contaminate the aquifer. John W. and Pearl J. Caldwell and members of the group Water Is Life noted that UEC declined to make a guarantee that there will be no contamination of the aquifer.

Gregory C. Chapman asked whether TCEQ has definitive scientific evidence or studies that substantiate that *in situ* uranium mining is safe for the environment and aquifers. Mr. Chapman also asked whether the TCEQ can guarantee no contamination or damage will result if it grants the permit. Similarly, Gerald Griffith asked what proof and guarantee TCEQ can give that water will not be contaminated by uranium mining.

Lynn and Ginger Cook asked, if there is no guarantee that the aquifer will not be jeopardized, what justification can there be in allowing *in situ* uranium mining in the recharge zone of our drinking water aquifer?

Several commenters expressed concern about the general uncertainty and dangers associated with uranium mining and fear that they may be forced to move away from their properties to ensure their safety. Luann Duderstadt commented that it will be impossible for her to move because of financial constraints.

---

[25] Tex. Water Code § 27.0513(a).

Mark Krueger asked if it is possible that one single well that provides drinking water for human consumption could be negatively affected by *in situ* uranium mining in Goliad County.

GCGCD asked, given all of the uncertainties, how there can be any assurance that groundwater quality can be protected.

**Response 14:** While there is no guarantee that *in situ* uranium mining will not impact the aquifer or a single well, in over 30 years of *in situ* uranium mining at over 30 sites in Texas, there is no evidence that off-site groundwater has ever been contaminated due to *in situ* uranium mining. The laws and rules that govern this process have been developed through open processes, with input from legislators, other elected officials, professionals from regulatory bodies, citizen groups, industry and the public, to protect groundwater from contamination and ensure that people can live and work safely in the vicinity of such operations.

## C. Laws and Rules, generally

**Comment 15:** Several people commented that the current laws and TCEQ rules are generally inadequate to ensure protection of human health and the environment.

Lynn and Ginger Cook commented that the laws are not sufficiently protective of citizens, ground and surface waters, and the natural environment, and that there should be no mining until more stringent and protective legislation is in place. Robin Sherwood commented that TCEQ should implement regulations that keep these situations from ever happening. Elizabeth Haun Beard requested that there be strict regulations in place prior to mining.

Brenda Jo Hardt, Annie Hardt, and Laurie Hardt expressed concern that laws and rules have not adapted to address problems with uranium mining that have occurred in the past. They commented that this type of mining should have been improved on years ago or scrapped altogether; that uranium mining companies have no reason to make significant changes, and therefore keep making the same mistakes; and that TCEQ keeps issuing mining permits with no regard to anything except extracting the uranium.

**Response 15:** The Executive Director is required to review submitted permit applications according to the rules and present them to the commission. The decision whether or not to grant any permit for uranium mining activities under TCEQ's jurisdiction rests with the commission.

The statutes governing the issuance of this Class III UIC permit, which are found in Chapter 27 of the Texas Water Code, were adopted into law by the Texas Legislature. The TCEQ implements its program in accordance with the statutes. TCEQ rules regarding this permit, which are found in 30 TAC Chapter 331, are adopted through an open rulemaking process as

required by the Administrative Procedure Act.[26] In evaluating this permit application, the Executive Director's duty is to determine whether it complies with the statutes and rules. Persons wishing to affect change to statutory law must address those concerns to the appropriate state legislator. Persons wishing to affect change to TCEQ rules may file a petition for rulemaking under the provisions of 30 TAC § 20.15 and are encouraged to participate in the public process for any TCEQ rulemaking project.

**Comment 16:** Carol Warren asked what regulations will be in place to protect residents, who will form them, and who will enforce them.

**Response 16:** The primary regulations in place to protect residents are found in Chapter 27 of the Texas Water Code and Chapter 331 of Title 30 of the Texas Administrative Code, as stated in Response 15, above. The Water Code statutes are adopted through the legislative process, and the Administrative Code rules are promulgated by the TCEQ through a formal administrative rulemaking process, which includes opportunities for public input. The TCEQ enforces these regulations through its Office of Compliance and Enforcement, which includes local field offices throughout the state.

**Comment 17:** Carol Warren asked who will monitor the TCEQ and RRC and whether citizens can form oversight committees to monitor and enforce activities of TCEQ and RRC.

**Response 17:** The Executive Director cannot address who monitors the RRC, as it is a separate state agency independent of the TCEQ. The TCEQ's underground injection control program, which includes Class III injection wells, is under the oversight of the EPA. In 1982, the EPA granted Texas the authority to administer this UIC program, and the EPA conducts annual reviews and audits of the TCEQ UIC program.

Citizens are encouraged to participate in TCEQ proceedings. However, individuals are not authorized to enforce the laws and rules of the TCEQ. A person affected by a ruling, order, or decision of the TCEQ may file a petition in a district court in Travis County to review, set aside, modify, or suspend the act of the TCEQ.[27] Also, a person affected by the failure of the commission or the Executive Director to perform any duty with reasonable promptness may file a petition in a district court in Travis County to compel the commission or the executive director to show cause why it should not be directed by the court to take immediate action.[28]

**Comment 18:** Kenneth W. Buelter asked whether TCEQ has ever denied a Class III permit of this type for mining anywhere in the state.

---

[26] Tex. Gov't Code Ch. 2001
[27] Tex. Water Code § 5.351.
[28] Tex.Water Code § 5.352.

**Response 18:** The TCEQ and its predecessor agencies have been regulating *in situ* uranium mining since 1975. The Executive Director is not aware of an instance in which the commission or a predecessor governing board has denied a permit application of this type for this purpose. To date, 36 Class III injection well area permits have been issued. There may be instances in which an application was developed and submitted to the agency but later withdrawn or abandoned by the applicant before a final decision was made on the application by the agency.

**Comment 19:** Chris Bridges commented that the health and safety of people, specifically, his child, is more important than economic benefit to corporation.

**Response 19**: Under Texas Water Code § 27.003, it is the policy of this state and the purpose of the Injection Well Act to maintain the quality of fresh water in the state to the extent consistent with the public health and welfare and the operation of existing industries, taking into consideration the economic development of the state, to prevent underground injection that may pollute fresh water, and to require the use of all reasonable methods to implement this policy. The purpose of the rules adopted by the TCEQ enabled by Chapter 27 of the Water Code is to protect groundwater quality, and thus protect both human health and safety and the environment.

**Comment 20:** Chris Bridges commented that individual rights are more important than the national good.

**Response 20:** The Executive Director is required to review the application in accordance with state law and TCEQ rules. The draft permit specifically incorporates 30 TAC § 305.122(c) which provides that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations.[29]

**Comment 21:** Pat Calhoun, Brenda Jo Hardt, Annie Hardt, and Laurie Hardt expressed concern that the Applicant's business could infringe upon their rights. Pat Calhoun stated that his neighbor's business cannot infringe on his rights and suggests that reduction of quantity and quality of groundwater available to him would do that. Brenda Jo Hardt, Annie Hardt, and Laurie Hardt commented that UEC has no right to expose its neighbors to cancer-causing chemicals, take away their livelihoods and ruin Goliad County groundwater.

**Response 21:** Texas Water Code § 27.104 provides that the fact that a person has an injection well permit does not relieve the person from any civil liability. The permittee may be subject to civil liability for injury to persons or property or other economic damages. The draft permit specifically incorporates 30 TAC § 305.122(c), which provides that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations.[30]

---

[29] See Draft Permit at Section VIII. F.
[30] *Id.*

## D. Data Concerns/Requests for additional data

**Comment 22:** GCGCD commented that it does not agree with the statement in the application that the Goliad Sand yields small quantities of variable water quality. GCGCD also disagreed with the statement that the San Antonio is the only permanent stream in Goliad County.

**Response 22:** The Executive Director acknowledges the district's disagreement with UEC's statement on page 6-5 of the application that the Goliad Sand yields small quantities of water of variable quality to wells in Goliad County. The Executive Director notes this statement is based on information from Table 1 in Ground-water Resources of Goliad County, Texas, (Bulletin 5711, 1957, Texas Board of Water Engineers, 93 pages).

The Executive Director acknowledges the disagreement with UEC's statement on page 6-5 of the application that the San Antonio River is the one permanent stream in Goliad County. The Executive Director notes this statement is made on page 4 of Bulletin 5711, and that only the San Antonio River is represented as a perennial stream on the Beeville-Bay City Sheet of the Geologic Atlas of Texas (Bureau of Economic Geology, University of Texas at Austin, 1975).

**Comment 23:** Robin Sherwood asked whether TCEQ does its own research or relies on the companies who are in the business of making millions to provide the information that is used.

**Response 23:** The Executive Director reviews application materials submitted by the applicant. In the application form for a Class III injection well area permit, the commission requests specific information and the applicant is responsible for providing that information.[31] This information is necessary to determine if the applicant is meeting all applicable regulatory requirements. No permit will be issued until all required information is submitted. Additionally, the commission relies on other sources of information in evaluating the information submitted in an application.

There are several legal mechanisms in place to ensure the accuracy of information submitted to the commission in an application. The draft permit incorporates TCEQ rule in 30 TAC § 305.125(19) which requires the permittee to promptly submit facts or information to the TCEQ when the permittee becomes aware that it failed to submit any relevant facts in the permit application or submitted incorrect information in the application. Under 30 TAC § 331.21, all geoscientific information submitted to the TCEQ in the application must be prepared and sealed by a professional geoscientist or licensed professional engineer. This helps ensure accurate data because a professional geoscientist or licensed professional engineer is subject to a code of

[31] TCEQ form no. TCEQ-10313, which can be accessed at: http://www.tceq.state.tx.us/comm_exec/forms_pubs/search_forms.html

conduct that disallows submission of false data.[32] As provided by state law, a permittee is subject to administrative, civil, and criminal penalties, for knowingly making any false statement, representation, or certification on any report, record, or document submitted or maintained for governmental use. The TCEQ aggressively pursues suspected falsification because it affects program integrity. Criminal prosecution for falsification can carry penalties of fines up to $10,000 per violation and/or 10 years' imprisonment.

**Comment 24:** According to GCGCD, UEC has stated that "Extensive radiological modeling has shown that potential impacts to the public health and environment are not significant." GCGCD commented that it disagrees with this conclusion and requested a copy of these models. GCGCD also requested that no mining permit approval be granted by TCEQ until the public has had ample time to review and comment on these models and supporting data.

**Response 24:** The Executive Director reviewed UEC's application for a Class III injection well area permit and determined that it meets all applicable regulatory requirements. Based on this review, the executive director recommends issuance of the draft permit. Radiological modeling is not required for a Class III injection well area permit, but is required for a radioactive materials license.[33] UEC has not yet submitted an application for a radioactive materials license. UEC will be required to maintain a copy of its license application at a public location in Goliad County.[34]

**Comment 25:** GCGCD requested that no permit be issued until the mining area is accurately and firmly delineated (in terms of layers, sands, and faults) and all aquifer questions are answered. GCGCD also requested that no permit be issued until comprehensive hydrologic tests to address aquifer issues have been completed and evaluated and the public has had time to comment on them.

**Response 25:** The Executive Director reviewed UEC's application for a Class III injection well area permit and determined that it meets all applicable regulatory requirements. Based on this review, the Executive Director recommends issuance of the draft permit. Hydrologic testing is not required for this type of permit, although an applicant must provide a description of the proposed hydrologic testing program.[35] The results of the hydrologic testing program must be submitted with an application for a production area authorization, which is needed to mine an ore body within a permit area.[36] UEC submitted an application for Production Area Authorization No. 1 on September 3, 2008, and the application is under review.

---

[32] 22 TAC §§ 851.104(a) and 137.57.
[33] 30 TAC § 336.512 (10).
[34] 30 TAC § 39.707(b).
[35] 30 TAC § 331.122(2)(G).
[36] 30 TAC § 305.49(b)(6).

**Comment 26:** GCGCD requested that the applicant be required to provide an Environmental Impact Statement that should describe and evaluate:

1. The purpose of and need for the proposed *in situ* mining of uranium ore from the Evangeline and Gulf Coast Aquifers;
2. To explore and evaluate alternative methods of mining uranium ore in these aquifers;
3. To evaluate the potential effect on environmental resources, which include livestock, wildlife, vegetation, habitat, water resources, and the air, that could be affected by the proposed *in situ* mining and processing;
4. To determine and evaluate the potential environmental consequences of the proposed *in situ* mining and alternative methods on livestock, wildlife, vegetation, habitat and water resources;
5. To determine and evaluate the economic costs and benefits associated with the proposed *in situ* mining and alternative methods;
6. To determine and evaluate the cultural and historical effects on the characteristics of Goliad County;
7. To determine and evaluate the effects from the emissions, if any, of radon and other particles from the production and processing of uranium ore on the residents of Goliad County;
8. To determine the long-term effects, if any, from the ingestion of radon or radium-226 by the humans, livestock, and wildlife of Goliad County; and
9. To determine if *in situ* mining of uranium ore will in fact be beneficial to our habitat and the residents of Goliad County.

Craig Duderstadt and Luann Duderstadt also requested than an environmental impact statement assessing the risks be required prior to issuing a permit.

Lynn and Ginger Cook asked if comprehensive environmental assessments are required of a mining company, inclusive of hydrology modeling and geological surveys, and if not, why not.

**Response 26:** The National Environmental Policy Act (NEPA)[37] requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, federal agencies must, for certain federal actions, prepare a detailed statement known as an Environmental Impact Statements (EIS). An EIS is not required for state authorizations such as this Class III injection well permit.

An Environmental Analysis under Texas Health and Safety Code § 401.263 may be prepared in association with an application for a radioactive material license authorizing source material recovery and processing and by-product material processing and disposal.[38] The environmental

[37] 42 U.S.C. 4332.
[38] Tex. Health & Safety Code § 401.263, 30 TAC § 281.21(f).

assessment would include information on general geology, including seismic analysis and geologic hazards, and subsurface hydrology. UEC has not yet submitted an application for a radioactive materials license.

**Comment 27:** Several commenters expressed concerns regarding whether the research available is sufficient to make an informed decision and requested that additional research be performed first. Ashley Duderstadt and Robin Sherwood commented that not enough research has been performed to ascertain the effects on the health and well-being of neighbors of previous mining sites to assure the neighbors of the site proposed in this application. Margaret Rutherford requested a period of a year to study and investigate the safety of proposed activities. Thomas Anklam commented that there should be a lengthy study done on what will happen to the water level of the aquifer before the permit should even be considered, and that the results of that study should guarantee that wells will not go dry or be contaminated.

**Response 27:** The TCEQ underground injection control rules do not require additional research or investigation to be performed for the pending application. With regard to research on the effects of similar mining projects on neighbors, the Executive Director is not aware of a documented case of off-site groundwater contamination from a Class III injection well operation in over 30 years of *in situ* uranium mining in South Texas. Also, the Executive Director is not aware of any other scientific evidence that *in situ* uranium mining in Texas has led to adverse health effects on the public.

**Comment 28:** Barbara Smith commented that there is not enough information about groundwater travels in the area and requested that more studies be done prior to beginning mining. Kirk Klinkerman expressed concern that he has not been given enough unbiased information about the underground geology of the proposed permit area. Margaret Rutherford suggested that a detailed study of the watershed and aquifer should be conducted and should involve independent experts, the GCGCD, EPA, and the State. Jim Blackburn commented that the application does not describe the geology in sufficient detail to determine compliance with rules.

**Response 28:** The TCEQ underground injection control rules do not require additional research or investigation to be performed for the pending application. The Executive Director has reviewed the permit application and determined that the applicant has provided all application requirements relating to groundwater movement.

**Comment 29:** Kathleen Jackson asked whether a certain cancer study was funded by the uranium industry.

**Response 29:** The Executive Director presumes the commenter is referring to the study "Cancer mortality in a Texas county with prior uranium mining and milling activities, 1950-2001," by

John D. Bolce, Jr., Michael Mumma, Sarah Schweitzer, and William J. Blot.[39] As acknowledged by the authors in the publication, the study was funded by the Texas uranium mining industry. In this study, the authors compared deaths from cancer in Karnes County, where extensive uranium mining and milling activities took place, to cancer rates in four other Texas counties with age, race, urbanization, and socioeconomic distributions similar to those for Karnes County. Based on this study, the authors concluded there was no difference in cancer rates for Karnes County as compared to cancer rates in the other four counties. In particular, there was no difference for deaths due to cancer of the lung, bone, liver, and kidneys, which are organs in which uranium is expected to concentrate. The authors also concluded that cancer rates in Karnes County prior to uranium mining and milling activities were not different from cancer rates in the county during uranium mining and milling activities.

**Comment 30:** Jim Blackburn commented that the permit should not be approved because the applicant will not be able to prove its restoration plan will work until a pilot demonstration 18 months after mining has begun.

**Response 30:** A pilot demonstration of restoration is not required by the TCEQ rules. UEC has committed in Section 12 of the application to provide a restoration demonstration within 18 months of the beginning of *in situ* operations. Demonstration of the restoration technique would require injection of fluids into the formation. No injection activities are authorized unless and until the permit is issued. Therefore, this demonstration cannot be made prior to issuance of an injection permit.

**Comment 31:** GCGCD commented that in its response to Notice of Deficiency dated January 30, 2008, UEC refers to additional acreage being delineated. GCGCD comments that the application must have a defined and fixed boundary in order for the public to be able to comment on it.

**Response 31:** The additional acreage refers to additional production areas. Additional production areas must be authorized under their own production area authorizations. These will be subject to the public notice, comment, and contested case hearing process. The rules do not require the Applicant to delineate boundaries of all production areas in a Class III injection well application.

**Comment 32:** GCGCD asked for the results of the comprehensive pump tests planned for the area around the fault to determine transmissivity, vertical confinement, and communication.

**Response 32:** Results of the pump tests were provided with the application for PAA No. 1, which was submitted on September 3, 2008. TCEQ staff is currently reviewing this application. It is available for review and copying at the Goliad County Courthouse.

---

[39] Journal of Radiological Protection, Vol. 23, at 247 (2003).

**Comment 33:** Jim Blackburn commented that the application was incomplete and should therefore be returned to the applicant.

**Response 33:** Under 30 TAC § 281.18, the Executive Director must return an incomplete application if he determines that the materials submitted are not administratively complete and the applicant does not timely respond to notices of deficiency. The Executive Director reviewed the application materials and the applicant's response to a Notice of Deficiency in accordance with the rules and determined that all required information has been submitted.

## E. Public Interest Requirements

**Comment 34:** Jim Blackburn, representing Goliad County Commissioners Court, expressed concern that the application does not meet the public interest requirements of Texas Water Code § 27.051. He asked the Executive Director to address the applicability of *Texas Citizens for a Safe Future and Clean Water and Mr. James G. Popp v. Railroad Commission of Texas and Pioneer Exploration, Ltd. (Texas Citizens)*,[40] discussing broad interpretation issues, specifically, groundwater resource protection, operation of the site, compliance history, public safety concerns, the availability of alternatives and whether restoration will use more groundwater than is available. Mr. Blackburn further comments that protecting Goliad County's drinking water is clearly in the public interest. Finally, Mr. Blackburn commented that Goliad County is concerned about trucks using gravel roads that may be inadequate to support truck traffic, and that the trucks will be using some of the same roads as school buses and some of these roads have dangerous ditches along the sides.

GCGCD noted that in its response to a Notice of Deficiency, UEC refers to "a negative regulatory climate" which is not "in the public's best interest," and GCGCD asks for an explanation of the meaning and intent of this statement.

GCGCD asked what guidelines TCEQ uses to determine what is "in the public's best interest".

**Response 34:** On December 6, 2007, the Third District Court of Appeals issued an opinion in *Texas Citizens* that helps define the meaning of the term "public interest" in Texas Water Code § 27.051. This statute requires the commission to find that the use or installation of an underground injection well is in the public interest prior to granting a permit. The Court held that the Railroad Commission[41] erred by interpreting the term "public interest" too narrowly because it failed to consider evidence related to public safety concerns that was raised at hearing.

---

[40] 254 S.W.3d 492 (Tex. App.—Austin, 2007).

[41] The case relates to a UIC well regulated by the RRC. The TCEQ and RRC have identical statutory requirements under Tex. Water Code § 27.051 to consider whether a UIC well under its jurisdiction is in the public interest.

The public safety concerns in that case specifically centered around trucks traveling on roadways frequented by children and pedestrians.

In a response to a Notice of Deficiency, the Applicant provided additional information regarding how the Class III well is in the public interest. The response addresses compliance history, alternatives to the use of an injection well, maintenance of the quality of freshwater and prevention of its pollution, public health and welfare, and economic development. The Executive Director has reviewed the application and determined that the application, together with the Applicant's Response to Notice of Deficiency No. 1, dated January 30, 2008, includes all the information required by commission rules. The holding in *Texas Citizens* does not affect the Executive Director's determination of the application's completeness under applicable rules.

## F. Economic Impacts and Quality of Life

**Comment 35:** Several people expressed concern that the proposed uranium mining operations would have a negative effect on the regional economy. Specifically, many expressed concern that tourism would decrease and that agricultural, wildlife and hunting business operations in the area would suffer. Eric and Sharon Ross commented that the facility will cause the area to lose more jobs than it will create for area residents. The GCGCD expressed concern that the facility could have a negative effect on the growth rate of the county's population. Robin Sherwood noted that businesses in this area depend on the groundwater for their livelihood. Kenneth Schustereit commented that the facility will destroy the tax base and economic development in three counties. Dorian and Carol Thurk noted that their business creates considerable sales tax revenues, which would be lost if the business suffered or had to shut down. J. Naomi Linzer expressed concern that tourism will decrease throughout the Coastal Bend, including Corpus Christi.

**Response 35:** The TCEQ administers the Underground Injection Control Program consistent with the purpose and policy of the Texas Injection Well Act.[42] It is the policy of this state and the purpose of the Texas Injection Well Act to maintain the quality of fresh water in the state to the extent consistent with the public health and welfare and the operation of existing industries, taking into consideration the economic development of the state, to prevent underground injection that may pollute fresh water, and to require the use of all reasonable methods to implement this policy.[43] UEC's application states that UEC intends to employ approximately 80 people and that the proposed project will benefit the South Texas economy by providing added economic diversity and high paying jobs. Quantifying the effects this proposed operation will have on the local economy with regard to tourism, hunting, agriculture, taxes, development, and population growth is difficult. Other South Texas communities in which *in situ* uranium mining

[42] Tex. Water Code Ch. 27
[43] Tex. Water Code § 27.003.

projects have been conducted have not experienced significant detrimental effects on the regional economy.

**Comment 36:** Several commenters expressed concern about the economic impact the proposed activities could have on individuals and families in the area. Specifically, many expressed concern about the value of livestock and crops they sell for profit, that a lack of water would cripple agricultural and ranching businesses, that ranchers leasing land will decline to renew their leases, and that cattle may have to be removed, resulting in the loss of the agricultural tax exemption. Many expressed concern that residents will be forced to pay out of pocket to test private wells, bring in water, or to pay for increased health care expenses for themselves and their animals. Some have already paid for well testing, filters, and bringing in water. Bettie Giraudin expressed concern that her RV park will lose business if RV owners do not have a reliable source of clean water. Thomas and Mary Anklam state that the Boer goats that they raise and sell for profit have already gone down in value due to exploration activities.

**Response 36:** In the Anklam's specific case, UEC analyzed a sample of the groundwater from the Anklam's water well and provided the results in Table 5.1 of the application. These results indicate that at the time this well was sampled, water from the Anklam's well met the primary drinking water standards for inorganic constituents provided in 30 TAC Chapter 290, Subchapter F.[44] The Executive Director regrets that public fears regarding the proposed activity may be impacting the price of the Anklam's livestock and affecting their business. Such perceptions are not consistent with the history of *in situ* uranium mining in South Texas. Nevertheless, the proposed permit does not authorize UEC to cause economic injury. The rules and draft permit specifically provide that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations, but the TCEQ does not have jurisdiction over the award of civil damages from injury to persons or property.

According to information presented in Section 10 of UEC's application, the proposed *in situ* mining operation will result in disposal of 2,417 acre-feet of water over about an 8-year period. The Executive Director does not believe that the withdrawal of this amount of water over this time period will adversely affect agricultural operations in the area or affect wildlife. Injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations. Protection of groundwater quality is the most significant concern in regulating *in situ* mining. The purpose of both the underground injection control rules in 30 TAC Chapter 331 and the proposed draft permit is to protect underground sources of drinking water and fresh water from pollution. If permitted to conduct *in situ* uranium mining operations, UEC would be required to restore groundwater in the mining zone under the requirements of 30 TAC § 331.107. The Executive Director does not believe that

[44] The Executive Director notes that these standards apply to public drinking water systems. Private water wells are not regulated by the TCEQ.

the proposed mining and restoration activities conducted in accordance with the proposed draft permit and TCEQ rules will adversely affect livestock or wildlife.

The TCEQ injection well rules and proposed draft permit do not require an off-site water well owner to test his or her own water well. Private water wells are not regulated by the TCEQ and any decision as to testing frequency is the decision and responsibility of the well owner. If UEC is granted authorization to conduct *in situ* mining operations at this site, UEC will be required to meet all regulatory requirements for *in situ* mining of uranium. These requirements include operating the wells in a manner than confines the mining fluids to the production zone within the area of the designated monitor wells, monitoring of the production zone and overlying fresh water zones, aquifer restoration, and plugging and abandonment of wells. These requirements are designed to protect the groundwater quality in the vicinity of the mining operations.

The Executive Director is aware that several private water wells in the vicinity of the proposed mine have become contaminated with iron bacteria. This contamination has resulted in hardships for well owners. In at least one case, the well owners now have to buy bottled water. The proximity of these wells to the exploration has led to the conclusion by some that the presence of iron bacteria in these wells is related to UEC's exploration drilling. Exploration drilling is regulated by the RRC, not the TCEQ. The Executive Director understands that this matter was investigated by the RRC and that the RRC found no evidence to indicate iron bacteria contamination in these wells was related to UEC's exploration drilling in this area.

The Executive Director acknowledges that many business owners rely upon a dependable water source for their business' success. If UEC obtains authorization to conduct *in situ* mining operations in this area, UEC will be required to meet all regulatory requirements for conducting *in situ* mining operations. These regulations are designed to protect groundwater quality in the vicinity of an *in situ* mining operation so that business owners will not lose their water source due to contamination.

**Comment 37:** Several commenters expressed concern that property values will decrease and that without a source of clean water, their properties will be worthless.

**Response 37:** The TCEQ's jurisdiction is established by the legislature and is limited to the issues set forth in statute. Accordingly, the TCEQ does not have jurisdiction to consider the effects on property values when determining whether to approve or deny a permit application.

The regulations and proposed permit requirements are designed to ensure that properties that currently have a source of clean water will not lose that water source due to contamination. The proposed permit does not authorize off-site migration of mining solutions. Injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations.

**Comment 38:** Many commenters expressed concern that the proposed mining activities could result in the degradation of the quality of life in Goliad County, its natural beauty, or its landscape.

**Response 38:** The Executive Director acknowledges the appreciation of the natural beauty of the central coastal plains that characterizes Goliad County. The Executive Director also acknowledges that many people live in this area because of the quality of life that can be enjoyed in a rural setting. Many residents fear UEC's proposed *in situ* mining operation will disrupt that quality of life, especially with regard to how the proposed operation may affect the groundwater on which they depend for this way of life. The Executive Director notes that the advantages of *in situ* mining techniques as compared to surface mining or underground mining are that surface destruction is minimized and there are fewer tailings or overburden wastes produced. This enables the land to be decommissioned and reclaimed back to its pre-mining character. The focus of the TCEQ's underground injection control program and requirements in 30 TAC Chapter 331 is to protect underground sources of drinking water and fresh water from pollution, which also furthers the goal of protecting the quality of life and natural beauty of the area.

## G. Land Use/Site Selection

**Comment 39:** Charles K. Bluntzer and Mr. and Mrs. Jason Mikeska commented that uranium should be mined in less populated areas of the state. Craig Duderstadt and Ernest Hausman commented that there are other areas to mine that would not jeopardize citizens' drinking water, land values, livestock and the air they breathe. Others commented that this area is unsuitable for this type of mining because of a high concentration of private water wells used for human consumption.

**Response 39:** Much of the uranium mined using *in situ* methods has been in Karnes, Live Oak, Duval, and Jim Hogg counties. Currently, *in situ* mining is being done in Kleberg, Brooks, and Duval counties. The TCEQ injection control rules apply statewide and are designed to protect the water quality. Texas statutes specifically authorize injection well permitting for *in situ* uranium and the TCEQ cannot specify where an applicant must propose a facility. In order to grant a Class III UIC permit application, the commission must find that the installation or use of the injection well is in the public interest and that with proper safeguards, both ground and surface fresh water can be adequately protected from pollution.[45]

[45] Tex. Water Code § 27.051(a)(1) and (3).

## H. Health and Welfare

**Comment 40:** Several commenters expressed concern about the effects of the proposed uranium mining activities on human health and welfare, generally. Several of these commenters stated that uranium-238 (U-238) and high levels of arsenic pose increased risks of certain cancers and U-238 can damage organs and may affect reproduction and fetuses. Many expressed grave concern about increased risk of cancer. Several commenters expressed concern not only for their own health and welfare, but also for children, grandchildren, and future generations. One commenter expressed fear that when UEC starts mining uranium, she will be drinking uranium, lead, arsenic, and other heavy metals that will destroy her kidneys and give her, her family and her neighbors cancer. Mike Abrameit, on behalf of the Ander-Weser Volunteer Fire Department, asked what the health effects on firefighters would be if the water they use becomes contaminated.

**Response 40:** The EPA's Office of Ground Water and Drinking Water is a valuable source of information on the health effects of contaminants in drinking water and information on private drinking water wells.[46] Lead, arsenic and all isotopes of uranium pose health risks. Lead poses both short and long-term health effects, including interference with red blood cell chemistry, delays in mental and physical development, strokes, kidney disease and cancer. Arsenic can cause circulatory system disorders, damage skin, and may raise cancer risks. Uranium is a carcinogen and a kidney toxin. *In situ* mining dissolves uranium (and other formation constituents, such as arsenic and lead) into the mining solution. The purpose of state regulations and permit requirements that apply to *in situ* mining is to prevent the escape of mining fluids from the production zone of a production area, to detect any escape of these fluids from the production zone of the production area, and to ensure any escape of mining fluids is promptly addressed. While the TCEQ does not regulate the water quality of a private water well, the TCEQ encourages households to take appropriate precautions and work with federal, state, and local health agencies to ensure the protection and maintenance of their drinking water supplies.

**Comment 41:** With reference to the section entitled "Public Health & Welfare" in UEC's January 30, 2008 response to a Notice of Deficiency, GCGCD asked what measures will protect workers and what measures will protect the public.

**Response 41:** If UEC applies for and is issued a radioactive materials license, it must comply with 30 TAC Chapter 336, Subchapter D (§ 336.301 et. seq.), relating to Standards for Protection Against Radiation. These health standards must be addressed in greater detail if UEC applies for this license.

---

[46] For information on groundwater contaminants: http://www.epa.gov/safewater/contaminants/index.html . For more information on private water wells: http://www.epa.gov/safewater/privatewells/index2.html .

**Comment 42:** Many commenters expressed general concern regarding the effects of the proposed uranium mining activities on the health and welfare of livestock and wildlife. Specifically, Lynn and Ginger Cook are concerned that livestock will graze on grass contaminated with molybdenum and contract molybdenosis, a potentially fatal disease. Also, many are concerned that wildlife and livestock are consumed by humans and may be unsafe if contaminated. Commenters also expressed concern that the water may be unfit for livestock and wildlife consumption because of mineral levels.

**Response 42:** The groundwater within the uranium mineralized zones may presently be unsuitable for livestock or wildlife consumption. Groundwater in the vicinity of uranium ore bodies may have high levels of uranium and radium-226. Under the requirements in 30 TAC § 331.107, the operator must restore the groundwater to pre-mining conditions. In the event an operator requests an amendment to increase restoration values for constituents in the groundwater, the commission considers the uses for which the groundwater was suitable at baseline water quality levels and the actual uses of the groundwater prior to mining. The commission may amend the restoration values if it finds that the current formation water would be suitable for any use to which it was reasonably suited prior to mining.[47]

The Executive Director acknowledges that excessive molybdenum can cause a copper deficiency in livestock. Although the natural concentration of molybdenum in the groundwater in this area is relatively low (less than 0.1 mg/L based on data in Table. 5.1 of UEC's application), molybdenum concentrations in groundwater within uranium mineralized zones range from less than 0.1 mg/L to 1.9 mg/L, and *in situ* mining could result in elevated molybdenum concentration in the groundwater within the zone being mined. Depending on the tolerance livestock have for molybdenum, the groundwater within the uranium mineralized zones may be unsuitable for livestock due to naturally-occurring molybdenum concentrations. However, mining fluids may not be discharged to the surface and groundwater within the mined zone must be restored in accordance with the requirements of 30 TAC § 331.107. With regard to surface water contamination, the draft permit does not authorize the discharge of fluids into the surface waters of the state. Additionally, livestock should not be able to roam and graze at the facility. Although it is not required, most Class III well sites are fenced in. Under a radioactive materials license, which will be required for the processing facility associated with this site, a permittee must institute access controls such as fencing.[48]

The Executive Director is not aware of effects of human consumption of wild game that has been contaminated due to uranium mining. However, the Executive Director emphasizes that the state rules that apply to *in situ* uranium mining are designed to protect groundwater in the vicinity of the area in which *in situ* mining is being conducted. The operator is required to confine mining solutions within the production zone and restore groundwater to the restoration

[47] For more on these topics, see Section T, below.
[48] 30 TAC § 336.1221(a)(4).

table values for each production area authorization. The draft permit does not authorize the discharge of fluids to a surface water body where fluids could be consumed by livestock or wildlife.

## I. Groundwater Quality

**Comment 43:** Most commenters expressed concerns regarding the protection of groundwater quality, especially as it relates to human consumption, farming, ranching, and fire department uses, and fear that if UEC is permitted to mine, the aquifer and well water will become contaminated. Several specifically cited the following constituents of concern: uranium, arsenic, molybdenum, selenium, radon and radium-226. GCGCD stated that the major issue with the permit requested is the impact on groundwater, and Margaret Rutherford stated that groundwater contamination was one of the greatest fears documented in a survey of Goliad citizens.

**Response 43:** The Executive Director acknowledges the concerns raised by Goliad County residents regarding groundwater contamination that could result from *in situ* mining for uranium within the proposed permit area. If the injection well permit is granted, UEC must meet all applicable regulatory requirements to conduct *in situ* mining operations. The focus of these requirements in 30 TAC Chapter 331 and the Underground Injection Control Program, in general, is to protect underground sources of drinking water and fresh water from pollution.

The *in situ* mining process involves injecting a mining fluid into a mineralized zone, circulating this fluid through the zone to dissolve uranium minerals from the aquifer material, and then pumping the mining fluid to the surface where it can be processed to recover the uranium. In addition to uranium, other constituents, such as arsenic, molybdenum, and radium-226, may also be dissolved from the aquifer material into the mining fluid. This results in an increase in the concentration of certain constituents in the groundwater within the mineralized zone and area being mined. To provide protection of groundwater outside of the zone and area being mined using *in situ* techniques, the permittee must, in accordance with the requirements of 30 TAC § 331.102, confine the mining solutions to the production zone within the area of designated production zone monitor wells. To ensure protection of the areas outside of the mining zone an applicant/permittee must:

- Identify existing wells that could serve as a conduit for mining solutions to move outside the production zone or the production area (30 TAC § 331.42);
- Construct wells in accordance with construction requirements (30 TAC § 331.82);
- Maintain mechanical integrity of all Class III wells (30 TAC § 331.4);
- Implement corrective action standards to prevent or correct pollution of a USDW (30 TAC § 331.44);

- Obtain Executive Director approval of construction and completion of wells (30 TAC § 331.45);
- Operate wells in accordance with operation requirements (30 TAC § 331.83);
- Monitor wells in accordance with monitoring requirements (30 TAC § 331.84);
- Submit reports in accordance with reporting requirements (30 TAC § 331.85); and
- Close wells in accordance with a plugging and abandonment plan in a manner which will not allow the movement of fluids through the well, out of the injection zone, or to the land surface (30 TAC §§ 331.46 and 331.86).

Additionally, when making a decision to issue or deny a request for a Class III well permit, the executive director takes into consideration all the factors detailed in 30 TAC § 331.122:

- All injection wells, dry holes, surface water bodies, quarries, public water systems, private water wells, and faults in the area of review;
- All data reasonably available on all wells in the area of review;
- Vertical and lateral limits of USDWs in the area of review;
- Maps and cross sections illustrating regional geology;
- Proposed operating data;
- Proposed formation testing program;
- Proposed stimulation program;
- Proposed operation and injection procedure;
- Engineering drawings of surface and subsurface construction details of the system;
- Plans for meeting minimum monitoring requirements;
- Expected changes in pressure, fluid displacement, direction of movement of injected fluid;
- Contingency plans to cope with all shut-ins or well failures;
- Corrective action procedures;
- Adequacy of financial assurance;
- Closure plan; and
- Other information reasonably required by the executive director.

Before the Applicant can begin mining, it must also obtain a Production Area Authorization (PAA) from the TCEQ.[49] A PAA is a document, issued under the terms of an injection well permit, approving the initiation of mining activities in a specified production area within a larger permit area.[50] A PAA contains localized restoration and monitoring requirements for a particular production area.[51] The PAA requires mining solutions to be confined in the production zone

[49] Draft Permit, Section V.A.
[50] 30 TAC § 331.2(75).
[51] 30 TAC Ch. 331, Subchapter F (§§ 331.101 et. seq.).

within the area of designated production zone monitoring wells.[52] When the permittee applies for a production area authorization (PAA), the application must address:

- Production area monitor well requirements (30 TAC § 331.103);
- Establishment of baseline and restoration values (30 TAC § 331.105);
- Monitoring standards (30 TAC § 331.105);
- Remedial action for excursion (30 TAC § 331.106); and
- Aquifer restoration (30 TAC § 331.107).

In addition to requirements of the rules, if the permit is issued, it would require the permittee to ensure that no mining fluids are leaving the production zone by regularly testing groundwater samples from monitor wells. The draft permit requires the permittee to take water samples at least twice each month at two-week intervals from all monitor wells and analyze them for specific control parameters.[53] The draft permit also contains provisions to ensure samples are taken, preserved, and analyzed in a manner that will yield valid results.[54] If an excursion is detected, monitoring frequency must increase.[55] By complying with monitoring requirements, the applicant can ensure that there are no excursions of mining fluid that could contaminate water outside the production zone and if one is detected, it will be detected right away, enabling the applicant to take immediate action to stop the excursion, as required by the rules.[56]

Protection of groundwater quality is the most significant concern in regulating *in situ* mining, but there is never a 100% guarantee that any activity will not adversely affect the environment. The rules cited above were adopted to protect underground sources of drinking water and fresh water in the state and the proposed permit also contains requirements to ensure that mining fluids will not contaminate water off-site. The Executive Director is not aware of a documented case in over 30 years of *in situ* mining of off-site groundwater contamination from *in situ* uranium mining in South Texas.

**Comment 44:** Pat Calhoun stated that historical evidence is that no unconfined aquifer can be mined without degrading quality of water.

**Response 44:** During mining, mining activities will affect the quality of water within the area of the aquifer for which the aquifer exemption is requested. This water is not currently being used for human consumption, nor will it be during mining. After mining, UEC will be required to return the aquifer's water quality to pre-mining conditions. Historically, mining projects in South Texas have not restored the aquifer to pre-mining conditions. Restoration table values

[52] 30 TAC § 331.102.
[53] Draft Permit, Section V.G.1.
[54] Draft Permit, Section V.F.
[55] Draft Permit, Section V.G.2.
[56] 30 TAC § 331.106.

have been amended pursuant to an application to amend the production area authorization through the process established in 30 TAC § 331.107(f)(1) and (2).[57]

There is no historical evidence that the quality of water outside the production area will be degraded at any time. The permit prohibits the permittee from allowing mining fluids to leave the production zone; therefore, no off-site wells or portions of the aquifer being used for drinking water may be contaminated. The Executive Director is not aware of any documented off-site contamination of groundwater in over 30 years of *in situ* mining in Texas.

**Comment 45:** According to Aldon and Brenda Bade, at a meeting held on July 12, 2007, a UEC representative said the water would be suitable for private consumption but not suitable for public consumption. The Bades inquired as to the difference between private and public consumption.

**Response 45:** TCEQ staff was not present at the meeting on July 12, 2007, and cannot respond with specificity to UEC's statement. The Executive Director offers the following general information in response: In regulating *in situ* uranium mining, the TCEQ rules in 30 TAC Chapter 331 make no distinction between the suitability or protection of water for "public" consumption or the suitability of water for "private" consumption. All underground sources of drinking water and fresh water require protection under the UIC program. Under 30 TAC Chapter 290, the TCEQ does regulate the quality of water supplied through a public water system. A public water system is defined in 30 TAC § 290.38(63) as:

> A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, which includes all uses described under the definition for drinking water. Such a system must have at least 15 service connections or serve at least 25 individuals at least 60 days out of the year.

Water supplied though a public system as defined above must meet the requirements of 30 TAC Chapter 290. 30 TAC § 290.104 contains a list of constituents and the maximum concentration (or radioactivity for radionuclides) levels allowed for each in water supplied through a public system (these are referred to as the primary drinking water standards). Any source of water that does not naturally meet these maximum concentration levels must be treated to meet them before that water can be supplied through a public water system.

The TCEQ does not regulate the quality of water in private water wells. If water produced from a private well does not meet the primary drinking water standards, the TCEQ cannot require the well owner to treat that water to meet those standards. The TCEQ encourages owners of private water wells to have their water tested and, if necessary, treated to meet primary and secondary

[57] See Response No. 147 for more information on this topic.

drinking water standards,[58] but the decision to use water from a private well is the decision of the well owner.

**Comment 46:** Several commenters expressed concern that their private drinking water wells are down-gradient from the proposed drilling/mining area and fear that any activity in that area will have a detrimental effect on the source of potable water for their homes. Some commenters expressed specific concern regarding the well near St. Peter's Lutheran Church. This well is used to provide water for consumption by church members and one commenter stated this well draws water from the specific aquifer zone that is requested for the exemption.

**Response 46:** The UEC application identifies two water wells that are hydrologically down-gradient of the proposed UEC permit site as Church 1 and Church 2.[59] Based on the information on figures 1.3 and 4.1 in the UEC application, these wells are about 2,200 feet from the nearest uranium mineralization identified by UEC (in this case, the ore body in Sand B). To ensure water in these and private drinking water wells in the vicinity are not affected by the proposed mining activities, UEC will be required to meet the regulatory requirements in 30 TAC Chapter 331. Also, the draft permit requires UEC to confine mining solutions to the production zone within the area of designated production zone monitor wells. Monitor wells are established to detect excursions of mining solutions before contamination can migrate off-site. If an excursion is detected and confirmed in a monitor well, the permittee is required to conduct corrective action measures to contain the mining solution to the production zone within the production area. All of these requirements are designed to ensure that wells used by St. Peter's Lutheran Church and other down-gradient wells will not be contaminated by the proposed mining activities.

**Comment 47:** Craig Duderstadt asked if TCEQ is so hard pressed for alternative energy sources as to compromise a whole county's only source of clean drinking water.

**Response 47:** The TCEQ is the environmental agency for the State of Texas. Although the TCEQ encourages the safe development, use, and conservation of natural resources, the TCEQ does not regulate energy development. *In situ* mining of uranium is allowed under state statute and commission rules, and the commission has adopted rules to ensure *in situ* mining is done in a manner that is protective of the state's groundwater.

**Comment 48:** Brenda Jo Hardt asked, where is the research as to what will happen to water wells right outside the boundary lines of the area UEC wants designated as an exempt aquifer? She comments that TCEQ should demand this information.

---

[58] The secondary drinking water standards in 30 TAC § 290.118 are not enforceable, but the TCEQ encourages operators of public drinking water systems to meet these standards.
[59] See Application, Table 4.1.

**Response 48:** The UEC application is not required to include research on the future condition of off-site water wells. Under the TCEQ requirements, the applicant must demonstrate that mining solutions will be contained. Off-site migration of mining solutions is not authorized. In accordance with the requirements of 30 TAC § 331.102, operators of Class III injection wells must confine mining fluids to the production zone within the area of designated monitor wells. Applicable requirements in 30 TAC Chapter 331 are designed to protect groundwater in the vicinity of *in situ* mining operations. The Executive Director is not aware of any documented off-site contamination of groundwater in over 30 years of *in situ* mining in Texas.

**Comment 49:** Marshall Henson stated: UEC is saying they will only recover about 80% of the "stirred up uranium," so it is obvious that our water will contain the other 20% of the "stirred up uranium."

**Response 49:** *In situ* mining typically results in dissolution of 80 to 85% of the uranium in the sandstone material. The remaining 15 to 20% of uranium mineralization remains as a solid in the sandstone material and is not dissolved in the groundwater. If UEC receives a permit and the other authorizations needed to conduct *in situ* mining operations at this site, they will be required to restore the aquifer in accordance with the requirements of 30 TAC § 331.107.

**Comment 50:** Pat Suter commented that use of the oxidizing medium will result in residual uranium and other metals being left in a mobile state.

**Response 50:** The *in situ* uranium mining process results in the recovery of approximately 80-85% of the uranium in the production zone. The residual uranium that remains does so because it has not responded to oxidizing conditions and is not mobile enough to be extracted. In addition, once the mining company ceases introducing the oxidizing conditions, the production zone will naturally return to non-oxidizing conditions.

**Comment 51:** Pat Suter commented that contamination in one part of the aquifer will spread to the whole extent of the aquifer. Robert Meyer expressed the fear that groundwater may be damaged all the way to the gulf coast.

**Response 51:** The Executive Director does not agree that groundwater will be jeopardized all the way to the gulf coast or that contamination in one part of the aquifer will spread to the whole extent of the aquifer. As discussed in previous responses, UEC will be subject to all applicable requirements in 30 TAC Chapter 331, which are designed to protect groundwater in the vicinity of *in situ* mining operations. These rules include requirements for groundwater monitoring for the early detection of migration of any mining fluids from the production zone, in which case the operator is required to take actions to correct the situation. Once mining is complete, the operator is required to perform aquifer restoration in accordance with 30 TAC § 331.107.

Uranium is mobilized by oxidizing conditions introduced into its environment, where it is naturally not mobile. If mining fluids were to begin to migrate away from the site, they would be

leaving the areas where the mining company introduced oxidizing conditions and the process that mobilized the uranium would reverse in the natural chemically-reducing environment. In order for any contaminants to travel in the groundwater from the proposed UEC site to the coast, these contaminants would have to escape undetected from the site, in spite of required monitoring systems, and travel unaffected approximately fifty miles through chemically-reducing conditions.

**Comment 52:** Robin Sherwood asked how many people depend upon the Goliad aquifers for their life-sustaining consumption as well as daily household use.

**Response 52:** Although a specific number of consumers is not available, the Executive Director recognizes that a large number of Texans rely on water from the Goliad Formation. The Goliad sands are part of the larger Gulf Coast aquifer that extends along the Gulf of Mexico from Florida to Mexico. Information from the Texas Water Development Board states that the Gulf Coast aquifer provides water to all or parts of 54 counties in Texas. Because they supply water for human consumption, all USDWs, including the Goliad Formation, are protected under 30 TAC § 331.5, which provides that injection into a USDW is prohibited if that injection would cause or allow movement of fluid that would result in the pollution of a USDW. For Class III injection wells, injection can only occur in a portion of an aquifer that has been exempted in accordance with the requirements of 30 TAC § 331.13. Migration of mining solutions beyond the mining zone and into the non-exempt portions of the Goliad sands is prohibited.

## J. Groundwater Quantity/Availability

**Comment 53:** Many commenters expressed concern about the effect the proposed mining activities will have on the quantity of groundwater available for other purposes. Specifically, some stated that there is not enough clean water to use it for uranium mining rather than other uses. Many stated that they are dependent on groundwater and have no alternative water source if the groundwater is contaminated or depleted, and expressed concern that no one will be able to live on their property if the groundwater source is taken away. Some commenters stated that water loss would cripple livestock production in the area.

**Response 53:** The Executive Director recognizes the importance of groundwater to the citizens of Texas, not only as a source of water for private use, but for agricultural and industry purposes as well. *In situ* uranium mining does consume groundwater resources and will result in a net loss of water in the aquifer. However, injection well requirements that apply to *in situ* mining (30 TAC Chapter 331) do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations.

Although the rules do not require applicants to provide any direct information on the amount of water they will use from the aquifer because that aspect is not regulated, the application does

include some related information. TCEQ's application form for a Class III injection well requests information related to the fluid handling capacity of the processing facility and disposal capacity of the waste disposal well(s). The TCEQ requests this information because it is necessary for the Executive Director to assess whether the applicant can meet the requirements of 30 TAC § 331.102 relating to confinement of mining fluids and whether the applicant can meet the proposed mine schedule in Section 8 of the application. Due to the fact that system is integrated, fluid handling and disposal capacity information also provides cues as to the amount of water the applicant expects to use. The operation of the Class III injection well is dependent on the capacity of the processing facility and the Class I disposal well(s). Production of fluids from Class III wells are processed in the facility, and a portion of those fluids are then re-injected in the Class III wells. Another portion of these produced fluids, the bleed water and the brine from reverse osmosis treatment of the produced fluids, are disposed in the Class I well. Please note that the processing facilities in which these fluids will be managed would be authorized under a radioactive materials license, not the proposed Class III well area permit, and the on-site disposal of fluids would be by injection in a Class I underground injection well, which requires a separate Class I injection well permit.

In Section 10 of its application, UEC provided an analysis of the fluid handling capacity and the fluid disposal requirements for its proposed *in situ* mining operation. Based on the information provided in table 10.1 of the application, UEC will dispose of 787,301,000 gallons (2,417 acre-feet) of water over a period of about 8 years, the projected life of the operation. The maximum projected fluid disposal rate would be 10,671,000 gallons (about 33 acre-feet) a month.

The Executive Director acknowledges that groundwater is the primary source of water in Goliad County, and that even with water resources of the Coleto Creek Reservoir, many residents, especially those who live in rural areas, depend almost exclusively on groundwater as a source of water for domestic and agricultural use. With respect to *in situ* mining, the TCEQ has adopted rules, as part of its EPA-approved underground injection control program and required under the Texas Injection Well Act, to protect groundwater quality in the vicinity of *in situ* uranium operations.

**Comment 54:** Pat Calhoun stated that historical evidence is that no unconfined aquifer can be mined without reducing quantity of water available.

**Response 54:** When the amount of water discharged (in this case, through pumping of the aquifer) exceeds recharge, the elevation of the water table in an unconfined aquifer will be lowered, as will the elevation of the poteniometric surface in a confined aquifer. *In situ* mining results in net loss of water from the aquifer, regardless of whether the aquifer being mined is confined or unconfined. As noted in a previous response, injection well requirements that apply to *in situ* mining (30 TAC Chapter 331) do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations.

**Comment 55:** Several homeowners asked if their wells would run dry due to the proposed mining activities. Mike Abrameit, on behalf of the Ander-Weser Volunteer Fire Department, and Thomas Anklam expressed concern regarding availability of water for firefighting and asked what if the firefighters' well went dry and there was no water to fight a fire.

Some commenters asked who will supply water and who will pay for it if there is not enough groundwater to pull from the well after mining.

**Response 55:** *In situ* recovery of uranium does result in a net loss of groundwater and could result in the lowering of water levels in the aquifer, but the Executive Director cannot predict whether a particular water well will run dry, nor is this a consideration required for issuance of a Class III UIC well permit. Injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations. However, given UEC's proposed water use and Goliad County's Groundwater Management Plan, the Executive Director does not expect any wells to run dry. The TCEQ does not require a permittee to supply water or pay for alternative sources of water should an off-site water well run dry.

The draft permit specifically provides that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations. The permittee may be subject to civil liability for damages caused to residents or landowners. The TCEQ does not have jurisdiction over the award of civil damages from injury to persons or property.

**Comment 56:** GCGCD commented that the potential for overproduction bleedwater over 1%, cleanup of non-orebearing sand due to vertical leakage, and the need for more water exchanges during restoration raise serious questions regarding the depletion of area water supplies.

**Response 56:** The Executive Director reviewed the information in Section 10 of UEC's application and considers the projections of water use to be reasonable. The estimates are provided in the application as part of an assessment of the planned facility's fluid handling capacity. Injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations.

The comments regarding bleedwater and vertical leakage appear to be based on modeling results presented in a report by Daniel B. Stephens and Associates.[60] Daniel B. Stephens used the groundwater modeling programs MODFLOW and MODPATH to track the movement of particles within an area of one injection well surrounded by four production wells. The results of this modeling indicated some injected particles would not be captured by the production wells,

[60] This report was commissioned and funded by the Goliad County Groundwater Conservation District. A copy of this report was provided to the Executive Director's staff at the January 24, 2008 TCEQ Public Meeting in Goliad.

and that injected fluids would migrate out of the production zone. The Executive Director notes that the assumptions used for this modeling were not based on site-specific characteristics, which were not available to Daniel B. Stephens at the time the modeling was performed.[61] Also, the modeling was based only on one injection well and four production wells, and the duration of injection was assumed to be 20 years. Furthermore, this modeling did not consider the effects of aquifer restoration with regard to any mining fluids that were not captured by the production wells. The Executive Director notes that based on information in this report, the amount of bleed water needed to contain injected fluids depended on well spacing, and that containment of injected fluids was achieved with less than 1% bleed with reduced spacing of down-gradient wells (page 7 of report). Lastly, the assumption of six pore volumes for aquifer restoration is standard for projecting fluid handling capacity. Although the Executive Director considers this modeling to provide useful general information regarding the predicted results of injection into this aquifer, the Executive Director does not regard these results as definitive characterization of the site for the reasons stated above.

**Comment 57:** GCGCD requested that a model be prepared to define the water use limits that will not affect existing water wells.

**Response 57:** The Executive Director acknowledges that significant amounts of water are required for an *in situ* mining operation, and that this water use must be taken into consideration by the Goliad County Groundwater Conservation District. In the District's 2008 management plan, projected water use for uranium exploration and mining in 2010 is 800 acre-feet, increasing to 2800 acre-feet by 2030. Although such a model as suggested by GCGCD would be informative, the underground injection control rules do not require such a model. Injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations. The draft permit does specifically provide that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations.

**Comment 58:** Aldon and Brenda Bade commented that with water resources in short supply, they cannot begin to understand how TCEQ could possibly consider approving a uranium mining permit that could make huge areas of water in the Gulf Coast Aquifer unsuitable for consumption.

**Response 58:** UEC has included in their application for a Class III injection well area permit a request for an aquifer exemption for 423.8 acres within their proposed permit area. UEC has identified uranium mineralization in four sand layers of the Goliad Formation (one uranium ore body in each sand layer). Because the groundwater within these mineralized zones meets the

[61] This report is dated June 25, 2007. The UEC application, which contains site-specific information, was submitted to the Executive Director on August 7, 2007.

definition of an underground source of drinking water, or USDW,[62] an aquifer exemption is required to conduct *in situ* mining operation in this area. This exemption, if approved, applies only to the 423.8 acres, not the entire aquifer. The Executive Director recommends that approval of the aquifer exemption designation. The EPA must also approve any request for an aquifer exemption. *In situ* mining will affect the groundwater within the exempted area. However, UEC will be required to contain any injected mining fluids to the zones being mined, and will be required to restore the groundwater quality within the mined zones in accordance with the requirements of 30 TAC § 331.107. Additionally, UEC will be required to meet all applicable requirements of 30 TAC Chapter 331, which are designed to ensure protection of the groundwater in the vicinity of an *in situ* mining operation.

Considering the size of the area requested for aquifer exemption and the requirement that this area be restored after mining operations cease, the proposed activities will not likely result in depletion of the amount of water available for consumption to an extent that would threaten water supplies.

**Comment 59:** GCGCD asked if TCEQ will be responsible for monitoring groundwater levels so that users in the vicinity will not encounter a loss of water level.

**Response 59:** The TCEQ is not responsible for monitoring groundwater levels in the vicinity. The rules do not generally require monitoring of off-site water levels at *in situ* uranium mining sites. Injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations. The draft permit does specifically provide that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations.

**Comment 60:** GCGCD asked what actions TCEQ will take if water levels do decline.

**Response 60:** Because the volume of fresh water used by the permittee is not regulated, TCEQ may only take action if the decline in water levels results in a violation of a rule or permit requirement. For example, the underground injection control program requires the monitoring of groundwater quality to demonstrate that mining fluids are confined to the mining zone. If the lowering of water levels in the aquifer were to affect the ability to monitor groundwater quality effectively, the TCEQ could require corrective action measures, including additional monitoring requirements, to ensure that mining solutions are effectively contained.

**Comment 61:** Several commenters stated that the aquifer will be unsustainable due to loss of water if the proposed mining occurs.

---

[62] A USDW is defined at 30 TAC § 331.2(105) as an aquifer or a portion of an aquifer that supplies drinking water for human consumption, or that contains less 10,0000 mg/l total dissolved solids, and is not an exempted aquifer.

**Response 61:** As discussed previously, estimated water use for UEC's proposed operation is 2,417 acre-feet over about 8 years. In the Goliad County Groundwater Conservation District's 2008 Management Plan,[63] the following estimates were provided regarding groundwater use for *in situ* uranium mining: 800 acre-feet in 2008, 2,400 acre-feet in 2020, and 2,800 acre-feet in 2030. Based on a comparison of these estimates to UEC's projected water use, the Executive Director does not believe that the aquifer will become unsustainable due to the water use at the proposed *in situ* uranium mining site.

**Comment 62:** Some commenters expressed concern that there will be a high loss of groundwater due to use in the waste disposal well during mining and restoration. Commenters asked whether TCEQ or UEC has done the math on disposed water; whether these figures include future use; whether UEC's use will be restricted during times of drought; whether there is enough water without having to take from the aquifer "storage"; and whether only minimum required percentages and figures are being used to calculate the disposed waste water.

**Response 62:** *In situ* mining will result in the disposal of groundwater produced during the mining and restoration processes. UEC has estimated that it will dispose of 2,417 acre-feet of water over the 8 year life of the proposed operation, which includes both production and restoration activities. Although the Executive Director is unsure what the commenter means by "future use", it is possible that the amount of water disposed could increase above the current estimate if additional production areas are identified and developed. Because injection well requirements that apply to *in situ* mining do not regulate the volume of fresh water used by a permittee authorized to conduct *in situ* mining operations, the TCEQ does not have the authority to restrict the applicant's water use in times of drought or restrict pumping water from storage ("groundwater mining"). The Executive Director is unsure what the commenter means by "minimum required percentages and figures." The Executive Director has reviewed the calculations provided by the applicant regarding projected water disposal and considers them to be reasonable.

**Comment 63:** Doug Scott and Darrell Blumich raised concern that the nuclear power industry has a serious problem obtaining enough water for cooling towers and ask where this water will come from.

**Response 63:** The Executive Director acknowledges that there are many demands on water resources in the state, including municipal, industrial, mining, irrigation, and livestock uses. The TCEQ does not license nuclear reactor facilities. Nuclear reactor facilities are regulated by the United States Nuclear Regulatory Commission. The availability of cooling water for nuclear power plants is not addressed in the UEC application or in the rules of the underground injection program for *in situ* uranium mining.

---

[63] Table titled "Current and Projected Groundwater Pumpage and Use", at http://www.goliadcogcd.org/uploads/2008_Management_Plan.pdf

**Comment 64:** Pat Calhoun asked if TCEQ requires a "water management plan".

**Response 64:** There is no requirement for a water management plan in the current rules that apply to Class III injection well area permits. The Executive Director does request information regarding fluid handling capacity. This information, although not specifically required by rule, assists the Executive Director in evaluating if the proposed processing plant will be designed with sufficient fluid handling capacity to meet the proposed mine schedule. Wastewater management is considered in an application for a radioactive materials license authorizing uranium recovery and is addressed by certain requirements for a Class I waste disposal well permit application. UEC has not yet submitted an application for a radioactive materials license. UEC submitted an application for a Class I injection well permit on September 23, 2008. This application is currently under review by the Executive Director and is available to the public at the Goliad County Courthouse.

**Comment 65:** Debby Brumby and Barbara Smith asked if enough water will remain restore the aquifer when mining is completed.

**Response 65:** Although injection well requirements that apply to *in situ* mining (30 TAC Chapter 331) do not regulate the volume of fresh water used by a permittee, Section 10 of UEC's application states that the proposed *in situ* mining operation will result in the disposal of 2,417 acre-feet of water over a period of about 8 years. This figure includes mining and restoration activities. This volume of water is equivalent to one foot of saturation over about 10,000 acres of an aquifer with 25% porosity (2,417 ac.ft/0.25 = 9,668 acres). This area is equivalent to about 16 square miles (10,000 acres/640 acres per square mile), or an area 4 miles by 4 miles. If this amount of groundwater was pumped, assuming no recharge, the groundwater level over this 16 square mile area would be lowered one foot. This amount of water use should not result in depletion of the aquifer in this area; therefore, enough water will remain to restore the aquifer when mining is completed. Based upon the information in the application, the ED anticipates that there will be a sufficient water supply to complete restoration activities in accordance with 30 TAC § 331.107.[64]

**Comment 66:** GCGCD asked if TCEQ will be responsible for implementation of water rights for compliance with the GCGCD one-half acre-foot per year pumping limit.

**Response 66:** The TCEQ has the authority to issue water right permits for the use of "state water" under Chapter 11 of the Texas Water Code. Groundwater is not "state water",[65] therefore, the TCEQ does not have the authority to regulate the amount of groundwater pumped. Texas Water Code § 36.101 endows the groundwater conservation districts with the authority to

[64] For more information on aquifer restoration, see Section T, below.
[65] Tex. Water Code § 11.021(a).

make and enforce rules regarding limitations on groundwater pumping, however water wells used for uranium mining are specifically exempt from the provisions of Texas Water Code Chapter 36.[66] The TCEQ does not enforce the requirements of the Goliad County Groundwater Conservation District.

**Comment 67:** Mina Williams for Coastal Bend Sierra Club asked what mechanisms TCEQ has in place for pre-permitting consultation with state, regional, county, and local water planning groups to ensure that sufficient water will be available long-term to complete the restoration process, and if there are no such mechanisms, will TCEQ take the initiative in drafting regulations to assure that such consultations will take place before uranium mining permits are granted? [67]

**Response 67:** TCEQ does not have mechanisms for consultation between the TCEQ and other state, regional, county, and local water planning groups that are specific to those authorities or groups. Rather, these groups are invited and encouraged to participate in the public participation process that is afforded prior to the issuance of any uranium mining permit. Any of these groups can provide comments during the public comment period and may be able to participate in a contested case hearing, depending on whether the group meets requirements for standing.[68] A separate and distinct consultation process would not afford any better access to the permitting process than these established public participation mechanisms already provide. The ED recognizes that regional and local authorities often have very valuable information to share and encourages these groups to communicate with the ED using the public participation process.

The Executive Director recognizes the importance of regional water planning to ensure sustainability of groundwater resources. However, the TCEQ does not regulate groundwater usage. Also, the TCEQ is not authorized by law to enforce any agreements reached from consultations regarding water use and availability between applicants and other authorities. An applicant for an underground injection control well within a groundwater conservation district is required by Texas Water Code § 27.024 to provide the district with geologic, hydrologic, and water quality data obtained during the development of its application within 90 days after the applicant receives the final information.

## K. Concerns related to mining in a USDW or unconfined aquifer

**Comment 68:** Many commenters stated that the applicant cannot mine in the proposed area because it is an underground source of drinking water (USDW) or drinking water aquifer. Commenters stated that it is illegal or should be illegal to mine uranium in a USDW. GCGCD

[66] Tex. Water Code § 36.117(l).
[67] *See also* Comment and Response No. 8, *infra*.
[68] 30 TAC §§ 55.203(b) and 55.205.

noted that the water within the exploration permit issued by the Railroad Commission is used by those within the area and down-gradient of those areas for human consumption and further comments that the aquifer has been used, is being used, and will be used in the future by people living, working, and hunting in the area. One commenter stated that it cannot be disputed that the 423.8 acres within requested aquifer exemption currently serve as a source of drinking water for human consumption.

**Response 68:** Under 30 TAC § 331.2(97) an "underground source of drinking water" or USDW is an aquifer or its portion which supplies drinking water for human consumption, or in which the groundwater contains fewer than 10,000 milligrams per liter total dissolved solids, and is not an exempt aquifer. Injection of mining solutions into a USDW is prohibited under 30 TAC § 331.5. However, the EPA and state underground injection control programs recognize that there may be some circumstances when injection into a formation that would otherwise be classified as a USDW may be appropriate; such circumstances require an aquifer exemption under the requirements of 30 TAC § 331.13.[69]

Although the aquifer in the larger general area is used as a source of drinking water for human consumption, the portion of the Goliad Formation of the Gulf Coast Aquifer that underlies the 423.8-acre area for which UEC has requested an aquifer exemption does not currently serve as a source of drinking water for human consumption. Within the proposed mining zone, there are no wells that provide drinking water for human consumption. However, the groundwater within this zone contains fewer than 10,000 mg/L of total dissolved solids, which means that without an aquifer exemption, the mining area meets the definition of a USDW. Thus, the proposed UEC project requires an aquifer exemption before UEC can inject mining solutions into the mining zone. If the area is designated as an exempt aquifer, it no longer meets the definition of an underground source of drinking water; thus, the prohibition of 30 TAC § 331.5 would not apply.

**Comment 69:** Many commenters stated that the aquifer is "not confined" or is "unconfined". Wesley Ball asked how TCEQ defines "confined" and "unconfined" aquifers. GCGCD stated that the application mischaracterizes the aquifer as confined, though the Texas Water Development Board's current data shows that the sands proposed to be mined are in a recharge zone and unconfined. GCGCD stated that the characteristics of the Gulf Coast aquifer in northern Goliad County are well-documented and fully defined in TWDB groundwater models. Some commented that *in situ* mining and aquifer exemption requirements cannot be met because the aquifer is unconfined. GCGCD commented that the application states that the four sands are confined. However, it stated, in the cross section figures, the sands are shown as confining, which is the correct nomenclature. GCGCD stated that there is a major difference between confined and confining, especially when it comes to leakage of a highly contaminated fluid between aquifer units and that uranium *in situ* mining cannot be done in an unconfined aquifer.

---

[69] *See* Western Nebraska Resources Council v. U.S. EPA, 943 F.2d 867 (1991), holding that aquifer exemption regulations are a plainly permissible interpretation of the Safe Drinking Water Act.

Thomas and Mary Anklam commented that when UEC pulls up water from the aquifer, that water is replaced with water up dip and stated that with that in mind, the permit should not be issued because the aquifer is not confined. GCGCD commented that it is not possible to isolate a segment of this groundwater in an aquifer that is sloping at the rate of 90 feet per mile where the groundwater is steadily moving southeast making its way to the Gulf of Mexico and where this same groundwater comes to the surface in the form of springs feeding various streams. Jim Blackburn commented that the applicant cannot meet aquifer exemption requirements because pump tests have not yet established that portion of the aquifer which is confined.

Some commenters asked if TCEQ can prove that the mining permit is in an unconfined aquifer or requested independent research to support the assertion that the aquifer is confined. Kirk Klinkerman asked who is legally liable for the decision regarding whether the aquifer is confined or unconfined.

**Response 69:** The terms "confined aquifer" and "unconfined aquifer" are not defined in the TCEQ's rules. A confined aquifer is defined by some experts as "a formation in which the groundwater is isolated from the atmosphere at the point of discharge by impermeable geologic formations; confined groundwater is generally subject to pressure greater than atmospheric."[70] In Groundwater, by R. A. Freeze and J. A. Cherry, a confined aquifer is described as an aquifer that is confined between two aquitards (low permeability sediments or rock).[71] In a confined aquifer, the water level in a completed well completed usually rises above the top of the aquifer. Conversely, an unconfined aquifer is one in which the water is at atmospheric pressure. A confined aquifer is saturated through its total vertical extent, while an unconfined aquifer is not. An unconfined aquifer will have a water table within the aquifer.[72]

TCEQ rules do not contain a prohibition on *in situ* mining in an unconfined aquifer or in the recharge zone of an aquifer, nor do TCEQ rules prohibit the designation of an exempt aquifer for an unconfined aquifer. The requirements for exempting a portion of an aquifer do not address the isolation of groundwater in the exempt portion of the aquifer from the other non-exempt portions of the aquifer. Rather, compliance with the injection well permit and compliance with other TCEQ rules requires the confinement of mining solutions within the permitted mining zone.[73] Although in Texas there is no regulatory prohibition on *in situ* mining in an unconfined aquifer, *in situ* mining is generally done in an aquifer that is under confined conditions. A confined aquifer is preferred by an *in situ* mine operator because it is completely saturated. Mining in an unconfined aquifer, which is not saturated over its entire thickness, could result in a

[70] F. G. Driscoll, Groundwater and Wells (2nd ed., 1986).
[71] At page 48 (1979).
[72] *Ground Water, Volume I: Ground Water and Contamination*, EPA Publication No. EPA/625/6-90/016a, September, 1990, at 81.
[73] 30 TAC § 331.102.

lowering of the water table in the aquifer to the point the pumps in the production wells are no longer completely submerged, decreasing the efficiency of the recovery of mining fluids.

UEC's application identifies four distinct sand layers of the Goliad sands (designated as Sands A, B, C and D) in which UEC proposes to mine. The application describes intervening layers of clay between the sand layers that serve as confining strata. Information provided in the 6.2.1 of application indicates that groundwater in the designated Sand A is under water table conditions (that is, unconfined), and the groundwater in Sands B, C, and D is under confined conditions.

The production area authorizations (PAAs) UEC must obtain prior to mining are required to address how mining solutions will be confined. Because each ore body is in a separate sand (one ore body in each of the four sands), UEC has indicated it intends to seek four PAAs, one for each sand. For each PAA, UEC must provide information on hydrogeologic testing to demonstrate that mining solutions can be confined to the production area.[74] The results of these tests will be considered by the Executive Director in evaluating each PAA application. With respect to Sand A, the Executive Director will take into consideration, among other factors, the unconfined nature of that sand and the effect this condition may have related to proposed mining activities.

The applicant is required by law to present accurate and complete information in an application, such as data and the determination of whether an area of the aquifer is confined or unconfined, and there are legal repercussions for doing otherwise. There are several legal mechanisms in place to ensure the accuracy of information submitted to the commission in an application. The draft permit incorporates TCEQ rule in 30 TAC § 305.125(19) which requires the permittee to promptly submit facts or information to the TCEQ when the permittee becomes aware that it failed to submit any relevant facts in the permit application or submitted incorrect information in the application. Under 30 TAC § 331.21, all geoscientific information submitted to the TCEQ in the application must be prepared and sealed by a professional geoscientist or licensed professional engineer. This helps ensure accurate data because a professional geoscientist or licensed professional engineer is subject to a code of conduct that disallows submission of false data.[75] As provided by state law, a permittee is subject to administrative, civil, and criminal penalties, for knowingly making any false statement, representation, or certification on any report, record, or document submitted or maintained for governmental use.

## L. Aquifer Exemption

**Comment 70:** Several commenters asked that TCEQ not allow the aquifer exemption.

[74] 30 TAC § 305.49(b)(6).
[75] 22 TAC §§ 851.104(a) and 137.57.

**Response 70:** An aquifer exemption identifies and delineates a specific formation that is exempt from the requirements as a USDW. The Executive Director reviewed UEC's request that the 423.8 acre area of the Goliad Formation identified on figure 1.3 of the application, from a depth of 45 feet to 404 feet, be exempted in accordance with the requirements of 30 TAC § 331.13. The Executive Director determined that the aquifer for which the exemption is requested meets the applicable criteria and recommends that the exemption be granted. The commission makes the decision whether to grant an aquifer exemption, and any designation of an aquifer exemption requires final approval by the U.S. Environmental Protection Agency.[76]

The executive director is recommending the 423.8 acre area at the UEC site be designated as exempt because groundwater beneath this area currently is not used as a source of drinking water for human consumption, and because it will not be used as a source of drinking water in the future because it is mineral bearing (in this case, for uranium) with production capability. Additionally, the naturally-occurring concentration of uranium in the groundwater beneath this acreage ranges from 0.006 to 6.680 mg/L and the naturally-occurring radioactivity associated with radium-226 in this groundwater ranges from 10 to 3160 picocuries per liter (pCi/L)[77]. This concentration of uranium and this radium-226 radioactivity exceed primary drinking water standards of 0.03 mg/L and 5 pCi/L, respectively, making it unlikely it will serve as a future source of drinking water for human consumption.

**Comment 71:** Some commenters stated that TCEQ cannot grant an aquifer exemption in part of an unconfined aquifer used for human consumption, that the exemption cannot be granted and meet required conditions; and that the unconfined and continuously moving aquifer has been used, is currently being used, and will be used in the future by many residents living, working, and hunting in the area.

Jim Blackburn commented that the aquifer exemption criteria cannot be met because the proposed exemption area is not isolated from or otherwise separated from the Gulf Coast Aquifer and proposed mining is in the recharge zone of the Gulf Coast Aquifer.

**Response 71:** The Executive Director evaluated the aquifer exemption request in accordance with the criteria in 30 TAC § 331.13.

Aquifer confinement is not a requirement for the designation of an exempt aquifer. The Executive Director is not authorized to impose any requirements not currently in the rules without first changing the rules in accordance with the formal rulemaking process prescribed by the Administrative Procedure Act.[78]

---

[76] 30 § TAC 331.13(d).
[77] Application, Table 5.4.
[78] Tex. Gov't Code Ch. 2001

30 TAC § 331.13(c) does require that in order to be designated exempt, it must be shown that the aquifer or portion of the aquifer for which the designation is requested does not currently serve as a source of drinking water for human consumption, and until exempt status is removed, it will not in the future serve as a source of drinking water for human consumption because:

(A) It is mineral, hydrocarbon or geothermal energy bearing with production capability;

(B) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;

(C) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or,

(D) It is located above a Class III well mining area subject to subsidence or catastrophic collapse.

UEC has requested the designation of 423.8 acres of the Goliad Formation from a depth of 45 to 404 feet. The criteria in the rule do not apply to the entire aquifer, but only the portion for which the exemption is requested. Although the Evangeline Aquifer undoubtedly provides water for human consumption, UEC has demonstrated that the proposed exempted aquifer does not currently serve as a source of drinking water for human consumption. There is one well, the Abrameit Windmill (well No. 44 in Table 4.1 of UEC application), currently providing water for a stock pond within the proposed exempted aquifer. In response to this comment, the Executive Director recommends modifying finding number eight of the proposed Exempted Aquifer Order to clarify that there are no existing wells that withdraw water for human consumption from the Goliad Formation within the designated area. Further, if UEC proposes a production area that includes this particular well, additional information about the well or plugging and abandonment of the well may be required to ensure that mining solutions will be confined. UEC has also demonstrated that the proposed exempt aquifer is uranium bearing with production capacity and contains levels of radium-226 and uranium that make it impractical to be used as a source of water for human consumption in the future.

No designation of an exempt aquifer is final until approved by the EPA.[79] Even with the aquifer exemption designation, UEC will still be required to restore groundwater under the requirements of 30 TAC § 331.107.

The executive director agrees that groundwater within the Gulf Coast Aquifer is moving and that groundwater from an exempted portion of this aquifer will eventually migrate down-gradient and out of the exempted portion of the aquifer. This fact does not preclude the exemption of an aquifer or a portion of one. Under 30 TAC § 331.13(b), the commission may require a permit for injection into an exempted aquifer to protect fresh water outside the exempted aquifer from pollution caused by injection into the exempted aquifer. The permit requirements ensure that while water in the aquifer will eventually migrate down-gradient, nonetheless, mining fluids will not leave the exempted portion of the aquifer. Containment of mining solutions within the

[79] 30 § TAC 331.13(d).

mining zone is required in the injection well permit. If UEC obtains all authorizations required for *in situ* mining at this site, it will be required to restore the aquifer in accordance with the requirements of 30 TAC § 331.107.

**Comment 72:** Some commenters questioned whether the applicant had applied for the aquifer exemption because it cannot guarantee that the environment in the area will not be harmed and asked if the applicant is requesting leniency now, what will happen in the future. Other commenters expressed concern that the applicant will request additional aquifer exemptions in the future and asked that TCEQ demand that information now. Mr. and Mrs. Jason Mikeska commented that surely UEC is not going to want only one aquifer exemption in one specific area and asks which way UEC's mining will move in the future.

**Response 72:** UEC has requested an aquifer exemption for a 423.8 acre area of the Goliad Formation because the uranium ore bodies they wish to mine in this area occur in a water-bearing zone that meets the definition of an underground source of drinking water, or USDW (please see Response 68, above). Unless these sands qualify for an aquifer exemption, UEC will not be allowed to conduct *in situ* mining operations to recover uranium from these sands.

An aquifer exemption does not give a company or individual the option to not restore an aquifer once mining is complete. If UEC obtains authorization to conduct *in situ* mining operations at this site, it will be required to conduct aquifer restoration in accordance with the requirements of 30 TAC § 331.107.

In the event an individual or company is unable to restore the aquifer to pre-mining conditions, the restoration table values of a Production Area Authorization may be amended by the commission only after consideration of the factors in 30 TAC § 331.107(f)(1) and (2). Any amendment application for a change in the restoration table values would be subject to public notice and opportunity for a contested case hearing.

Under 30 TAC § 331.107(f)(1), in determining whether restoration values should be amended, the commission considers the following:

- uses for which the groundwater was suitable at baseline water quality levels;
- actual existing use of groundwater in the area prior to and during mining;
- potential future use of groundwater of baseline quality and of proposed restoration quality;
- the effort made by the permittee to restore the groundwater to baseline;
- technology available to restore groundwater fro particular parameters;
- the ability of existing technology to restore groundwater to baseline quality in the area under consideration;
- the cost of future restoration efforts;
- the consumption of groundwater resources during further restoration; and

- the harmful effects of levels of particular parameters.

Once the commission has evaluated a request to amend restoration values, the commission may, in accordance with 30 TAC § 331.107(f)(2), amend restoration values if it finds that:

- reasonable restoration efforts have been undertaken, giving consideration to the factors in 30 TAC § 331.107(f)(1);
- 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; and
- further restoration efforts would consume energy, water, or other natural resources of the state without providing a corresponding benefit to the state.

On page 14-1 in section 14.0 of their application, UEC states "because project development is ongoing, additional aquifer exemption areas will be needed in the permit area." There is no rule or statute that precludes the designation of additional aquifer exemptions in the future. The TCEQ would evaluate any new requests in accordance with all applicable rules.

**Comment 73:** LaFern Roessler asked how the 45 to 404 foot depth for the aquifer exemption request was determined and states that the aquifer should be defined from the top of the soil to the final depth of the water tables.

**Response 73:** The zone of the requested aquifer exemption was determined based on the occurrence of uranium mineralization. At the site, UEC has identified uranium mineralization in four sands of the Goliad Formation The top of the shallowest sand, designated as Sand A, is at about 45 feet, and the base of the deepest sand, designated as Sand D is at about 404 feet.

**Comment 74:** Some commenters expressed concern about the boundaries of the requested aquifer exemption, noting that the area for which the aquifer exemption was requested is close to drinking water supply wells. Thomas and Mary Anklam commented that any affect to the exempted portion must necessarily affect those nearby water wells. Mike Abrameit, on behalf of the Ander-Weser Volunteer Fire Department, referred to the delineation of the exempted area as a type of "gerrymandering" and speculated that the applicant will similarly request an exemption for other areas in the future. Jim Blackburn stated that the applicant cannot meet the criteria for an aquifer exemption because the boundary was arbitrarily chosen to avoid water wells and is not based on the geology of the area or aquifer characteristics.

**Response 74:** The Executive Director evaluates an aquifer exemption request to determine whether it meets the criteria of 30 TAC § 331.13. The portion for which the exemption was requested meets the rule criteria. No aquifer exemption is final until approved by the EPA. Even if water wells are close to the exempted area, no migration of contaminants outside the

monitor well ring is authorized by the permit; therefore, even the closest wells should not be contaminated.

## M. Geology/Hydrology of Aquifer

**Comment 75:** Several commenters expressed concern that the geologic and hydrologic characteristics of the aquifer, including faults, undulations, and unconfined and sloping features, make it unsuitable for the proposed mining activity. They expressed concern that the applicant will not be able to adequately control and contain contaminants due to these characteristics that may allow fluid movement.

**Response 75:** In accordance with the requirements of 30 TAC § 331.102, mining solutions must be confined to the production zone within the area of designated production zone monitor wells. In order to demonstrate that injected fluids can be contained to the production zone within the production area, hydraulic testing is performed to determine the degree of hydraulic communication throughout the sand that is to be mined, between the sand to be mined and other sand units, and the effect of any features, such as faults, on hydraulic communication within an area. A fault may provide a conduit for mining fluids from the production zone to nonproduction zone sands. Conversely, a fault may serve as a hydrologic barrier to fluid flow. The effect any fault may have on the migration of injected fluids is determined by hydrologic testing. If UEC is issued a Class III injection well area permit for this site, UEC will also need a production area authorization for each area they wish to mine within the permitted area.[80] For any proposed production area, UEC will be required to submit the results of hydraulic testing, and, for any proposed production area that may be influenced by a fault, hydraulic testing must also address the effects the fault may have on injected fluids. Hydraulic testing is used to assure adequate confinement under 30 TAC § 331.102 to demonstrate that there is no hydrologic communication between production zone and overlying or underlying formations and to demonstrate adequacy of production zone monitor wells to assure that the production zone monitor wells will detect excursions of mining solutions as required under 30 TAC § 331.103. These results will be reviewed by the TCEQ. As with the Class III injection well permit application, a copy of the production area authorization application must be made available to the public.[81] An application for a production area authorization is subject to public notice requirements and an opportunity to submit public comment.[82]

UEC identified two faults in the permit area (Section 7.2 of application). The two faults trend northeast-southwest, are about 4,500 feet apart, and offset sediments of the Goliad Formation. The fault in the northwestern part of the proposed permit area is downthrown to the southeast,

[80] 30 TAC § 331.7(b).
[81] 30 TAC § 39.405(g).
[82] 30 TAC §§ 39.653 and 55.150; Tex. Water Code § 27.0513(a).

and the fault in the southeastern part of the area is downthrown to the northwest, creating a graben, or downthrown block between the two faults. On the upthrown (northwestern) side of the northwestern-most fault, Sand A crops out and is unconfined. Southeast of this fault, within the graben, Sand A is overlain by a clay layer. Recharge of Sand A would occur on the upthrown side of the northwestern-most fault, where Sand A is exposed at the surface, but not within the graben, where it does not crop out. None of the other three sands (B,C, and D) crop out in the proposed permit area.

Based on information submitted in Section 6 of UEC's application, including seven cross-sections using 64 geophysical logs, the four sands of the Goliad Formation in this area occur as sheets, not discrete sand channels. Furthermore, these sands are porous media, not open conduits. As discussed in a previous comment, the transmissivity of fluids across any faults must be evaluated through hydrologic testing, the results of which must be submitted in any subsequent applications for production area authorizations.

Sediments of the Gulf Coast Aquifer dip to the southeast, towards the coast. Although portions of the aquifer are unconfined, such as in places where individual sand units crop out, the aquifer becomes confined with depth. Hydrologic data submitted in Section 6 of the UEC application indicates sands B, C, and D are under confined conditions at the site. As discussed in previous response, information submitted in Section 7 of the application indicates that aquicludes exist above and below all four sands of the Goliad Formation at the site.

In making the decision to recommend issuance of a Class III injection well area permit, the Executive Director took into consideration the geologic information provided in Section 7 of UEC's application. The Executive Director's staff also relied on other geologic information, such as published geologic maps, geologic reports, and geologic publications. The Executive Director has reviewed the application for compliance with all applicable rules, and, based on this review, has recommended issuance of this permit.

**Comment 76:** Some commenters stated that geologic data included in the application, much of which is from 1979 studies, should be updated with more modern techniques and current data.

**Response 76:** Based on information in Section 7 of UEC's application, the geologic evaluation of the site was based on various published geologic studies, and, most importantly, site-specific subsurface data. UEC used 64 geophysical logs to evaluate geologic conditions at the site. Therefore, geologic evaluation of this site is based on current, site-specific data provided in the application.

**Comment 77:** GCGCD expressed concern that TCEQ is evaluating the permit before aquifer pumping tests are performed to determine the degree of hydrologic connection between sand zones and asks how TCEQ can grant a permit without having this hydrologic data.

**Response 77:** An application for a Class III injection well permit must include a proposed plan for hydrologic testing; the results of such tests are submitted in any subsequent applications for production area authorizations. Mining cannot commence unless and until the applicant obtains necessary production area authorizations, therefore, these tests will be conducted and evaluated before any mining activity could begin.

**Comment 78:** TCEQ recommends three observation wells for hydrologic testing. GCGCD asked if TCEQ will require one above the producing sand zone, one in it, and one below.

**Response 78:** In TCEQ UIC Technical Guidance II-Hydrologic Testing, a minimum of three observation wells is recommended for the production zone. Depending on geologic conditions, such as complex stratigraphy, unconformities, or structural features such as faults, additional observation wells may be needed in underlying and overlying zones.

**Comment 79:** GCGCD asked if TCEQ will make hydrologic data collected from observation wells available to public for independent assessment.

**Response 79:** An application for a production area authorization will contain hydrologic test data from pumping wells and observation wells. An applicant must provide a copy of the application for public viewing. UEC's application for Production Area No. 1 is currently available for public review and copying and the Goliad County Courthouse.

**Comment 80:** GCGCD noted that the application states that each sand unit is confined on top and bottom by substantial aquicludes, but the Texas Water Development Board Gulf Coast Groundwater Availability Modeling, Daniel B. Stephens and Associates' model and Groundwater of Goliad County, Dale, et. al. 1957 (p. 12) indicate that there are not confining layers between sands. GCGCD asked, what is the basis for UEC stating that confining layers are present prior to hydrologic testing?

**Response 80:** On page 14-1 of the application, UEC refers to cross sections in figures 6.8a through 6.13 to demonstrate the existence of aquicludes above and below the four sands of the Goliad Formation. Spontaneous potential and resistivity logs, and, in unmineralized zones, natural gamma ray logs, were used to construct these cross sections. The responses from these logs indicate the presence of aquicludes above and below each of the four sands of the Goliad Formation at the site.

An application for a Class III injection well permit must include a proposed plan for hydrologic testing; the results of such tests are submitted in any subsequent applications for production area authorizations. While the presence of confining layers is indicated by the responses on the geophysical logs used to construct the geologic cross sections, hydrologic testing will yield additional data regarding confining layers.

**Comment 81:** Some commenters asked what studies the applicant has conducted regarding area faultlines. Lynn and Ginger Cook commented that there have not been enough, nor thorough, hydro-geological surveys performed to characterize at least two major faults in the area and the communication between the sands where the mining is proposed and the ones on the other side of the fault(s) from where the drinking water comes.

**Response 81:** UEC has presented the results of their geologic investigation of the site in Section 7 of the application. This investigation includes site-specific subsurface geologic data and delineation of two faults. The Executive Director considered this information in accordance with 30 TAC § 331.122(2) in recommending approval of the application and issuance of a Class III injection well area permit.

As stated in a previous response, the results of hydrologic studies must be submitted with any subsequent application for a production area authorization. These studies will include an investigation of the transmissivity of any faults that may affect the movement of injected fluids, and the degree of communication between sands in the area. Additionally, these hydrologic tests will provide information on how groundwater will respond to pumping.

**Comment 82:** Some commenters asked what happens when mining activities hit faultlines in an unconfined drinking water aquifer.

**Response 82:** The effect any faults may have on the movement of injected fluids is best evaluated by hydrologic testing. As stated in previous responses, the results of such testing must be submitted with any subsequent applications for production area authorizations.

**Comment 83:** Robin Sherwood asked how sensitive shallow groundwater supplies are to aquifer disturbances.

**Response 83:** The sensitivity of shallow groundwater to aquifer disturbances is evaluated by hydrologic testing. Hydrologic testing results must be provided in the application for a production area authorization. UEC has submitted an application for PAA No. 1, which is available for review at the Goliad County Courthouse.

**Comment 84:** Judy Scott commented that the engineering model of the water sands in the Goliad area show they all commingle.

**Response 84:** The Executive Director is not sure of the engineering study referenced in this comment, but assumes the commenter is referring to the groundwater modeling study conducted by Daniel B. Stephens and Associates for the Goliad County Groundwater Conservation District. A copy of this report was provided to the Executive Director's staff by the District at the January 24, 2008 TCEQ public meeting held in Goliad, Texas. That study provided no discussion regarding the commingling of groundwater from all sands at the site. The study involved a

numerical simulation of the behavior of injected water into a zone that appears to be equivalent to Sand A, although the results of this study did indicate migration of injected fluids to a lower zone. As discussed in a previous comment, the Executive Director considers this study to be useful in a general sense, but notes the assumptions on which this modeling was based do not include site-specific conditions. Because of the general nature of this modeling, the Executive Director cannot conclude that groundwater in the four sands of the Goliad Formation at this site are in hydraulic communication. An application for a Class III injection well area permit must include a description of the applicant's proposed formation testing program (30 TAC § 331.122(2)(G)), which UEC included in Section 11 of its application. If a Class III well permit is issued to UEC, the company will need to obtain a production area authorization for each area they wish to mine. Each production area authorization application must include the results of hydrologic testing. The Executive Director will rely on the results of this testing in evaluating the existence and degree of hydrologic communication between these four sands.

**Comment 85:** Rob Baiamonte expressed concern about transmissivity around faults. He asked, given that there are variations in the grain size in the sand zones and faults adjacent to the ore bed, whether there will be variations in the hydraulic conductivity within the sand zones.

**Response 85:** Hydrologic testing required for application for a production area authorization will yield information regarding variations in hydraulic conductivity. Hydrologic testing results are not required to be produced as part of the instant Class III UIC well application, but must be provided in an application for a production area authorization. UEC has submitted an application for PAA No. 1, which is available for review at the Goliad County Courthouse.

**Comment 86:** Rob Baiamonte asked why there is no discussion in the application of the transport of uranium from the underlying Catahoula Tuff to the Goliad Sands via the fault zones.

**Response 86:** The executive director does not consider such a discussion to be necessary for evaluation of UEC's application, nor is it required by the rules. The executive director recognizes that the presumed source of uranium in the deposits of South Texas is volcanic ash deposited over larger areas of the gulf coast region during the Oligocene and Miocene epochs,[83] and that uranium mineralization occurs in the Soledad Conglomerate and Fant Tuff members of the Miocene Catahoula Formation.[84] However, there is no evidence that the uranium mineralization at this site, which occurs in sands of the Formation, was the result of uranium-enriched groundwater from the Catahoula Formation sediments flowing up through faults at the site. In Goliad County, the top of the Catahoula Formation is separated from the base of the

[83] Galloway, W. E., Murphy, T. D., Blecher, R. C., Johnson, B. D., and Sutton, S., *Catahoula Formation of the Texas Coastal Plain: Depositional Systems, Composition, Structural development, Ground-water Flow History, and Uranium Distribution*, Report of Investigations No. 87, Bureau of Economic Geology, University of Texas, Austin, Texas, 1977, at 38.

[84] Galloway, W. E., Finlay, R. J., Henry, C. D., *South Texas Uranium Province—Geologic Perspective*, Guidebook 18, Bureau of Economic Geology, University of Texas, Austin, Texas, 1979, Figure 2.

Goliad Formation by 1,200 to 1,900 feet of sediments, including several hundred feet of clay of the Lagarto Clay.[85] Although a fault can serve as a conduit for fluid movement, the presence of this much clay would most likely result in the fault being sealed. Furthermore, any uranium-enriched fluids flowing upwards along a fault at the site would encounter sands in the Lagarto Clay before encountering sands in the Goliad Formation. However, sands in the Lagarto Clay do not contain uranium mineralization, as is evidenced in geophysical logs for several of the deeper exploration wells.[86]

**Comment 87:** Rob Baiamonte asked for the basis of the applicant's depiction of the formation between the sand zones as a clay barrier, given that the Goliad formation is described as predominantly sand with minor clay and gravel.

**Response 87:** The description of the Goliad Formation as being composed predominately of sand with minor clay and gravel applies to the formation on a regional scale. On page 7-19 in Section 7.2.1 of the application, UEC describes the Goliad Formation at the site as having a high sand content, and consisting of four discrete sands, each separated from the sand unit above and below by clay layers. To demonstrate this interpretation, on page 7-19 of the application UEC refers to figures 6.14 through 6.20, which are a set of cross sections constructed with geophysical logs of wells drilled at the site. Based on responses for the spontaneous and resistivity logs, and on the responses for the natural gamma ray log in unmineralized zones, the lithology of the sediments of the Goliad Formation at the site indicate a sequence of discrete, continuous sand units separate by continuous shale or clay units.

**Comment 88:** Rob Baiamonte commented that cross-sections provided in the application show suggested confining zones thinning to as little as twenty feet and asked, given the complexity of the grain size distribution in the sands, how UEC knows that its proposed confining zone is present across the entire mining zone.

**Response 88:** 30 TAC § 331.122(a)(2)(D) requires the commission to consider maps and cross sections detailing the geologic structure of the local area prior to issuing an injection well permit. Information on the cross sections provided in Section 6 of the UEC application indicate the confining zones are continuous across the site, although there is some variation in the thickness of each. Prior to mining, UEC will have to obtain a production area authorization for each proposed production area. The results of hydrologic testing will have to be submitted with each production area authorization application. These tests must be designed to evaluate the existence and degree of hydrologic communication between the sand units at the site.

---

[85] Dale, O. C., Moulder, E. A., and Arnow, T., *Ground-water Resources of Goliad County,* Bulletin 5711, Tex. Bd. of Water Eng'rs, 1957, Table 1.

[86] For an example, see log of well no. UP 2-1 on Figure 6.9a of the Application.

**Comment 89:** GCGCD commented that its initial concern is mechanical damage to the aquifer, citing the fact that twenty wells per acre will be drilled in the mining zone.

**Response 89:** The only mechanical disturbance of the formation material that results from drilling is the removal of drill cuttings. Removal of drill cuttings will not result in dissolution of formation material constituents into the groundwater.

## N. Baseline Determination

**Comment 90:** Several commenters expressed concern that the determination of baseline aquifer conditions was inaccurate due to exploration activities conducted prior to baseline testing. Some added that citizens do not know to what level groundwater should be restored because true baseline data does not exist. Commenters stated that the application's assessment that elevated levels of radium-226 found in five wells was due to naturally high amounts is questionable and not supported by scientific data.

GCGCD commented that it does not accept the methodology used by the applicant to determine baseline because wells from which baseline samples were taken were drilled after exploration activities and in close proximity to exploration boreholes. GCGCD stated that water quality data taken prior to the baseline testing and from other users in the ore zone have lower values for radium and uranium than baseline samples collected by the applicant, and concluded that the baseline samples are not representative of groundwater quality prior to exploration or in other areas of the ore zone.

Brenda Jo Hardt stated that she believes boreholes were drilled before testing any wells and left purposely open and unplugged with cuttings on the ground so that the soil and wells would be contaminated with heavy metals and toxins, making it easier for UEC to get an aquifer exemption. She contends that this contamination prior to baseline testing was planned by UEC.

**Response 90:** In accordance with the requirement of 30 TAC § 331.104(a)(2), production area baseline must be established from at least five designated production zone wells in the production area. Section 5 of UEC's application provides that twenty baseline wells were drilled at the site; five wells are located in each of the uranium-mineralized zones in the four sands of the Goliad Formation. Given the large number of exploration wells drilled by UEC to delineate these uranium ore bodies, each of these twenty baseline wells may be near previously drilled exploration wells. Results of analysis of groundwater samples from these wells indicate radioactivity associated with radium-226 in these groundwater samples ranges from 10 to 3160 picocuries per liter (pCi/L), all of which exceed the primary drinking water standard of 5 pCi/L. The Executive Director notes that these 20 baseline wells were purposefully drilled and completed in mineralized zones, as the purpose of production zone baseline wells is to establish groundwater quality within a mineralized zone prior to mining of that mineralized zone. The

presence of high values of radioactivity associated with radium-226 in the groundwater within a uranium-mineralized zone is not surprising or unusual. Radium-226 is a daughter product of radioactive decay of uranium-238, the most abundant isotope of uranium (99.3 % of all naturally-occurring uranium is uranium-238), and is typically associated with uranium mineralization. Also, gamma ray logs for these 20 wells indicate each is completed in a uranium-bearing zone.

Groundwater samples from the twenty baseline wells were analyzed for 26 constituents and parameters, as were groundwater samples from 47 private wells in the vicinity of the proposed site. Data from the baseline wells appears remarkably similar to data from the private wells for all constituents and parameters with the exception of uranium and radium-226, which are significantly higher in the baseline wells. Based on this data and the high gamma-ray activity recorded in the baseline wells, the Executive Director concludes that the data from analysis of groundwater samples from each of the baseline wells is representative of the quality of groundwater within the uranium-mineralized zones.

GCGCD's concern appears to be that exploration drilling activities resulted in the dissolution of radionuclides from the aquifer material into the groundwater in the vicinity of the exploration boreholes, and that if a baseline well was drilled near an exploration borehole, a groundwater sample from the exploration borehole would be of groundwater affected by the exploration drilling, thereby not being representative of groundwater at the site. The implication of this concern is that because exploration drilling caused an increase in the concentration of uranium and the radioactivity associated with radium-226 in the groundwater, the baseline sample data will not be representative of the concentration and radioactivity, respectively, of uranium and radium-226 in the groundwater, but would be artificially high. GCGCD is concerned that because aquifer restoration is based on data from baseline wells, UEC would not have to restore the groundwater within the mined zone to naturally-occurring pre-mining levels, but would be allowed to restore the groundwater only to the artificially high values determined from analysis of groundwater affected by exploration drilling.

The Executive Director does not agree with the implication that baseline groundwater samples are not representative of groundwater within the proposed production zone. The Executive Director does not agree that exploration or drilling activities prevent the ability to determine baseline quality. Exploration drilling involves no injection of fluids. The borehole is filled with drilling mud, and additional mud is added as the borehole depth is advanced. Additionally, the Executive Director is not aware of any mechanism associated with exploration drilling that would result in the preferential dissolution of uranium and radium-226 from the aquifer material into the groundwater.

**Comment 91:** Some commenters asked if TCEQ will require additional baseline sampling before mining based on the fact that extensive sampling by landowners shows good quality drinking water throughout the county and in the proposed mining area. Others asked if TCEQ

plans to address what they believe is an invalid and statistical evaluation of the baseline quality of the groundwater.

**Response 91:** TCEQ rules require a minimum of five baseline wells (30 TAC § 331.104(a)(2)) for establishment of a production area's baseline quality. Baseline quality reflects the groundwater quality of an aquifer prior to the beginning of injection activities; a baseline well is used to define baseline quality within the permit area (for regional baseline wells) or in the production area (production area baseline well). Production area baseline information will be used to establish aquifer restoration values for the restoration table in subsequently issued production area authorizations. Because the four proposed production areas as described in UEC' s application are in separate sand layers, the restoration goals, as reflected in the restoration table values for each PAA will most likely differ somewhat. The TCEQ will evaluate each PAA application for determination of aquifer restoration requirements, and will evaluate the need for additional baseline sampling based on the data submitted with each potential PAA application. The need for any additional baseline testing would not be dependent on water quality outside of the proposed permit area. The Executive Director does note that analysis of groundwater samples from private wells in the locality of the proposed site indicate overall good quality water outside of the uranium mineralized zones (Tables 5.1 and 5.2 in UEC application).

**Comment 92:** GCGCD commented that, for future applications, regulations need to be reviewed and revised to require that baseline water quality be established prior to a major disturbance of the aquifer by borehole drilling. Robin Sherwood commented that there should be mandatory baseline testing of water performed by third parties before even one borehole is drilled.

**Response 92:** The TCEQ adopts rules for the injection well program subject to a formal rulemaking process under the Administrative Procedures Act. Therefore, revisions to rules related to baseline water quality testing must be made through that process. As a practical note, it is not possible to accurately establish baseline water quality prior to drilling any boreholes or wells from which to draw samples. Baseline water quality is established by testing the water in the formation proposed to be mined. In order to access and draw samples of this groundwater, boreholes or wells must be drilled. Furthermore, it would not seem practical to establish baseline water quality without first knowing where the mineralized areas are, which is accomplished through exploration drilling.

Using existing wells in an area to determine baseline quality is problematic for several reasons. First, completion data on these wells is not always available, and landowners sometimes do not know at what depth a well has been completed, as was the case for UEC when they conducted their sampling program of area wells at this site (of the 47 wells surveyed, the depths of only 12 were known—see Table 4.1 in UEC's application). Second, many of the private water wells in

Goliad County are over 50 years old,[87] and the condition of the well casing is unknown. Most of these wells have submersible pumps (Table 4.1 of UEC's application), making inspection of the casing impossible unless these pumps are removed, which is time consuming and expensive. Old, damaged casing could result in the wellbore providing a pathway for mixing of groundwater between sands. Third, completed wells would be difficult to investigate using geophysical logging techniques. Again, submersible pumps would have to be removed, and the presence of casing would affect the measurement of natural gamma ray radiation from the formation. Additionally, spontaneous potential measurement requires an open borehole; the presence of casing would completely mask this effect, making measurement of spontaneous potential impossible.

The RRC investigated concerns related to exploration drilling, and did not find that it affected local groundwater quality. Further, the act of drilling does not mobilize uranium ore, so it would not result in an increase in uranium levels in an area in which they had previously been lower. The 20 baseline wells drilled by UEC comply with the applicable requirements with respect to the number and location of the wells to provide groundwater samples that are representative of the quality of groundwater at UEC's proposed site.[88]

**Comment 93:** Several commenters expressed concern about the selection of locations for the wells from which baseline samples were taken. Robin Sherwood commented that baseline water quality levels should reflect water quality across the entire aquifer segment, not just a partial sample. Venice Scheurich expressed concern that baseline values were determined by obtaining samples from wells selected by the applicant and that she believes this is an unsound method. GCGCD commented that baseline water quality measures should be taken from the full height of the water column and not just in the ore body layer.

**Response 93:** In accordance with the requirement of 30 TAC § 331.104(a)(2), production area baseline must be established from at least five designated production zone wells in the production area. Section 5 of UEC's application provides that twenty baseline wells were drilled at the site; five wells are located in each of the uranium-mineralized zones in the four sands of the Goliad Formation. The 20 baseline wells were purposefully drilled and completed in mineralized zones, as the purpose of production zone baseline wells is to establish groundwater quality within a mineralized zone prior to mining of that mineralized zone. Based on review of the data collected, the Executive Director concludes that the data from analysis of groundwater samples from each of the baseline wells is representative of the quality of groundwater within the uranium-mineralized zones, which will naturally be higher in certain constituents than groundwater outside the uranium-mineralized zones.

---

[87] Dale, O. C., Moulder, E. A., and Arnow, T., *Ground-water Resources of Goliad County,* Bulletin 5711, Tex. Bd. of Water Eng'rs, 1957, Table 4.
[88] 30 TAC § 331.104(a)(2).

**Comment 94:** GCGCD asked if the wells used for establishing baseline and restoration compliance are screened to sample the water through the entire thickness of the sand or just the ore body section, and, if the production sand zone is 75 feet thick and the ore thickness within that zone is twenty feet thick, is it statistically valid to collect a baseline water sample from only the ore layer in the water sand?

**Response 94:** The Executive Director determined that the applicant used appropriate screen lengths for the baseline wells. Each of UEC's 20 baseline wells were screened through the zone where uranium mineralization appears to be the most intense (based on gamma ray response), although the gamma ray response generally indicates uranium mineralization to some degree through the entire sand. The constituents for which baseline will be determined occur in the aqueous phase, which is to say they are dissolved in the groundwater. None of these fours sands is overly thick so the distribution of each of the constituents in the groundwater should be relatively uniform simply from mixing. Under these conditions, groundwater samples from each screened interval should be representative of groundwater quality in each respective sand.

**Comment 95:** GCGCD commented that the ore zone in the proposed exemption zone is only a fraction of the total aquifer exemption volume and asked if TCEQ is allowing baseline to be established with water samples collected only from ore zones, and if so, what is the statistical justification for this approach?

**Response 95:** The vertical extent of the proposed aquifer exemption is from the top of Sand A to the base of Sand D as depicted in the UEC application because uranium mineralization has been found in all four of the sands (A through D) of the Goliad Formation at the UEC site. The Executive Director notes that the area extent of the requested exemption includes the combined areas of the four sand layers identified in the UEC application (one in each of the four sands), even though no single ore body extends over the entire area requested for exemption. Because the areas of the ore bodies overlap, the Executive Director believes it would be appropriate to designate the combined vertical and area extent as the exempt aquifer, rather than designating four separate areas for exemption, one for each ore body, each with a corresponding vertical extent.

**Comment 96:** GCGCD asked, in evaluating groundwater quality data, what valid statistical procedures are used to test the sample populations for normal or log normal distributions.

**Response 96:** There are numerous methods for assessing whether or not data are from a normal or lognormal distribution. The Executive Director recommends use of the Shapiro-Wilk Test (for 50 or less sample results) and the Shapiro-Francia Test (for over 50 sample results) for making a decision to accept or reject normality or lognormality of a data set. [89]

[89] Robert D. Gibbons, Statistical Methods for Groundwater Monitoring, Chapter 11 (1994).

**Comment 97:** GCGCD asked if it is the TCEQ's policy to allow sample averaging of data when it does not follow a normal or log normal distribution.

**Response 97:** The Executive Director allows averaging of data if the data are from a continuous, infinite distribution. "Averaging" is equated with the statistical procedure called "x-bar," which adds all the values and divides this sum by the number of values. It also is called the sample mean. This method is an estimation technique and is used to estimate the true mean of distribution. It is the best linear unbiased estimation of the mean for any continuous, infinite distribution and is the minimum value unbiased estimator of the mean for a normal distribution.[90]

**Comment 98:** GCGCD asked, if the monitoring well ring is the point of compliance for restoration, is it statistically valid to collect baseline samples only from within the ore zone?

**Response 98:** The monitor well ring is used as the point of compliance to determine if there are excursions of mining fluids from the production zone; the monitor well ring is not the point of compliance for aquifer restoration. Aquifer restoration is required for the portion of the aquifer that is affected by mining solutions. This generally is the production zone within the production area. It is the groundwater in the production zone within the production area that is affected by mining and must be restored to pre-mining conditions as provided in 30 TAC § 331.107. Therefore, baseline groundwater samples used to determine restoration values are from wells completed in the production zone within the production area. Samples collected from wells completed in the production zone but outside of the production area (such as a monitor well) would not be representative of the groundwater within the production zone of the production area.

**Comment 99:** GCGCD asked whether the baseline samples were collected from a well that was screened only in the ore zone, or across the entire thickness of the sand; are the baseline monitor wells located randomly across the extent of the proposed well fields or biased toward the most concentrated ore zones; is there a sampling plan that prescribes how to locate the baseline monitor wells; and is there a procedure for collecting water samples including purging, stabilization, and filtering?

**Response 99:** Based on a comparison of the geophysical well logs for the 20 baseline wells to the well completion reports for these 20 wells,[91] baseline wells typically were screened across the zone with the highest gamma ray response, which should correspond to the zones with the highest uranium content. The TCEQ has no sampling plan that prescribes how to locate baseline monitor wells. Baseline wells should be located so as to provide representative groundwater samples from the production zone within the production area. Uranium concentrations from

[90] Richard O. Gilbert, Statistical Methods for Environmental Pollution Monitoring, 141 (1987).
[91] Both of these can be found in Appendix B of the application.

groundwater samples from these 20 wells ranged from 0.006 to 6.680 milligrams per liter, and radium-226 values ranged from 10.0 to 3160 picocuries per liter. These large ranges do not indicate these wells were purposefully located in zones where mineralization is most intense. 30 TAC § 331.104(a) requires at least five designated production zone wells in the production area. The UEC application states that sample collection, preservation and reporting was based on the TCEQ's Technical Guideline I-*Groundwater Analysis* and the EPA's *Methods for Chemical Analysis of Water and Wastes*.[92]

**Comment 100:** Barbara Smith asked what quality test numbers for baseline conditions the applicant will be required to meet.

**Response 100:** Baseline water quality data for restoration must be obtained from at least 5 baseline wells for each zone of mineralization that is to be mined.[93] As of June 30, 2008, all analytical data submitted to the TCEQ must be from an accredited laboratory according to 30 TAC Chapter 25. Data from these sample analyses will be used to establish aquifer restoration requirements. Once mining is complete, the production zone of the production area must be restored in accordance with the requirements of 30 TAC § 331.107. As discussed in a previous response, aquifer restoration requirements may be amended to allow for higher concentrations of constituents in the groundwater within the production zone of the production area, but only after consideration of the items in 30 TAC § 331.107(f)(1), and only if the commission arrives at the findings in 30 TAC § 331.107(f)(2).

**Comment 101:** Kenneth W. Buelter commented that when UEC began drilling boreholes, the water was being obtained from a well that was deemed "non-potable", and asked if that well has been tested for the same constituents that are showing up in many area wells after the borings began.

**Response 101:** Many exploration boreholes were drilled under a permit issued to UEC by the RRC; the Executive Director is not aware of the circumstances of the particular well referenced in this comment and does not know if that well has been tested for constituents showing up in many area wells. The TCEQ's underground injection control program has no definition of the term "potable water," but the term is used in the regulations that apply to public drinking water systems. As used in these regulations, the term potable water refers to water that meets the drinking water standards in 30 TAC Chapter 290 for public water systems.[94]

**Comment 102:** Garrett Engelking commented that more long-term monitoring should be done prior to exploration and suggests that groundwater conservation districts could do it.

---

[92] Application, page 4-2.
[93] 30 TAC § 331.104(a)(2).
[94] 30 TAC § 290.38(20).

**Response 102:** UEC has already conducted exploration and used information gathered in the exploration process to locate and develop the proposed project. The TCEQ does not regulate the exploration process; exploration wells are subject to the requirements of the RRC. TCEQ rules do not require long-term monitoring of local groundwater prior to application for the Class III UIC well permit or aquifer exemption.

**Comment 103:** GCGCD, Barbara Smith, and Garrett Engelking all expressed the sentiment that generally, TCEQ and groundwater conservation districts need to work more closely together to monitor changes in groundwater quality.

**Response 103:** The TCEQ's Underground Injection Control Program strives to protect underground sources of drinking water and fresh water from pollution. Also, the TCEQ tries to work closely with districts and other government agencies to further their shared goal of protecting the environment. Upon request, the TCEQ can share with the districts information obtained in applications, investigations, reports and correspondence. All information submitted to the agency for the proposed project is subject to the requirements of the Public Information Act and is available for public review unless it is legally protected from disclosure by an exception in the Public Information Act.[95]

## O. Degradation of Water Quality during Exploration Phase

**Comment 104:** Many commenters complained that groundwater in the area has already been degraded in quality due to the applicant's exploration activities. Commenters cited an increase in levels of sodium, sulfates, and iron that has coincided with exploration activities. Some have seen their water turn red and water filters clog. Some commented that they believe this contamination was caused by the exploration itself or by introduction of contaminants through exploration boreholes left unplugged. Pat Calhoun noted that only those six wells closest to the exploration site became degraded, suggesting that the exploration caused the degradation, but that the Railroad Commission cited "excessive rainfall" as the possible cause; however, the six contaminated wells have not cleared up and one more has tested contaminated since a drought began. GCGCD cites the "sudden deterioration of water quality" as one reason they believe in-situ leach mining can't be done safely in Goliad County. Many commenters expressed concern that issuing the permit will exacerbate the current contamination problems.

**Response 104:** The Executive Director is aware that several wells in the area have become contaminated with iron bacteria. The presence of active iron bacteria results in additional iron being dissolved into the groundwater, the development of mucilaginous sheaths of bacteria ("slimes"), and the precipitation of iron hydroxides. Dissolved iron gives the water a red color and an iron taste, and stains porcelain fixtures such a sinks and tubs; the slimes clog water filters;

[95] Tex. Gov't Code Ch. 552

and the precipitation of iron hydroxide can block water pipes. However, the Executive Director is not aware that iron bacteria represent a health hazard to livestock.

The Anklams mentioned that their well water has been tested three times, and that sodium, sulfates, and iron in the water have increased over time. Based on information provided in Table 5.1 of UEC's application, a water sample from the Anklam's well contained 99 mg/L sodium, 38 mg/L sulfates, and less than 0.01 mg/L iron. The Executive Director cannot verify that the changes in water quality noted by Ms. Anklam were caused by exploration activity.

As noted previously, the drilling of exploration wells at this site is authorized by a permit from the RRC. The Executive Director understands that the RRC has investigated public concerns regarding drilling, and found no evidence that iron bacteria problems in local wells was associated with exploration drilling. The Executive Director is not aware of contamination of water wells that is attributable to unplugged boreholes. The Executive Director understands that the RRC investigated concerns that UEC had left boreholes unplugged, and that the matter was resolved to the satisfaction of the RRC.

If UEC's permit is approved and UEC is authorized to conduct *in situ* mining operations, UEC will be required to meet all applicable regulatory requirements in 30 TAC Chapter 331. These regulations are designed to protect groundwater quality in the vicinity of an *in situ* mining operation. In over 30 years of *in situ* uranium production at over 30 sites in Texas, no occurrences of off-site groundwater contamination have been documented. Although changes in water quality cited by commenters coincided in time with exploration activities, there is not a scientific basis by which the Executive Director can conclude that exploration activities caused the changes. Likewise, there is not a sufficient basis to conclude that the proposed mining activities would exacerbate the problem.

**Comment 105:** Some commenters expressed concern regarding the expense of dealing with iron bacteria in groundwater, which they believe is caused by exploration activity. Some asked who is responsible for paying for bottled water and filters needed when iron content is too high.

**Response 105:** As stated in Response 105, the Executive Director does not conclude that iron bacteria problems are caused by exploration activity. Generally, a well owner is responsible for purchasing bottled water and filters as needed when well water quality is not suitable for human consumption.

**Comment 106:** Garrett Engelking asked TCEQ to adopt procedure and an action plan for addressing ongoing changes to groundwater quality in this area and determining reason for it.

**Response 106:** The TCEQ Underground Injection Control program rules of 30 TAC Chapter 331 require the monitoring of groundwater quality at *in situ* uranium mining operations and the implementation of corrective action to prevent or correct pollution of USDWs, fresh water or

surface water. The TCEQ implements rules regarding the management and disposal of wastes that prohibit discharge to state waters that would result in groundwater contamination. If there is evidence that a particular change to groundwater quality is the result of a spill or prohibited discharge, the TCEQ can require the responsible party to investigate the cause and remediate the contamination. In addition, the TCEQ is a member of the Texas Groundwater Protection Commission, which, under Texas Water Code §§ 26.406-408, must compile an annual report documenting instances of groundwater contamination due to regulated activities. This statute does not require the TCEQ to do any additional monitoring or investigation, but is intended to help track and monitor groundwater contamination issues across the state. Any different or additional requirements for groundwater monitoring, other than what is currently in TCEQ rules, must be adopted through the administrative rulemaking process. TCEQ must consider any petitions to change its rules under the requirements of the Administrative Procedures Act and 30 TAC Chapter 20.

## P. Monitoring

**Comment 107:** Joan S. Folks asked who is responsible for monitoring water quality during mining, with what frequency will the monitoring be done, and whether there will be enough manpower and inspectors to adequately monitor water quality. Shirley D. Smith expressed general concern regarding the proper monitoring of groundwater quality during mining. G.A. Gutmann asked who is responsible for paying to test the aquifer at various locations during mining.

**Response 107:** The permittee is responsible for testing of all baseline, monitor or other wells which require testing under the requirements of a Class III injection well area permit. In accordance with the requirements of 30 TAC § 331.105(1), all monitor wells must be sampled at least twice a month. If mining fluids are detected in a monitor well, the sampling frequency is twice a week.[96] Once aquifer restoration is complete, the operator must obtain at least three sets of samples during the 180-day stability period.[97] The cost of this monitoring is the responsibility of the permittee. The TCEQ has adequate funding and personnel to implement its underground injection control program, including inspections of permitted Class III well facilities. A permittee is not required to sample wells outside the permitted area.

**Comment 108:** Garrett Engelking commented that the site needs additional, more intense groundwater quality monitoring before mining, during mining, during restoration, and long-term monitoring after closure of site.

[96] 30 TAC § 331.105(4).
[97] 30 TAC § 331.107(e).

**Response 108:** Although baseline groundwater must be established before mining as required by 30 TAC § 331.104, TCEQ rules do not require continual groundwater monitoring before mining occurs. During mining, groundwater monitoring and sampling is required by 30 TAC §§ 331.103 and 331.105. Groundwater monitoring is required to demonstrate that the permittee is confining mining solutions within the production zone of the production area. Under 30 TAC § 331.107, monitoring of water quality by analyzing samples from baseline wells is required for at least 180 days after the cessation of restoration activities. The TCEQ has proposed rules that would require an extended period for stability sampling (33 Tex. Reg. 7484). Under the proposed rules, 30 TAC § 331.107 would be revised to extend the stability period from 180 days to one year, and to extend the stability period to two years when initial aquifer restoration values have been amended.

**Comment 109:** Rob Baiamonte commented that there is not enough detail in the mine plan regarding monitoring of spills from ruptured pipes and valves in the mine fields and air monitoring, and there is not enough detail in contingency plans for responding to releases. He asked whether these issues will be covered in surface facility permit application.

**Response 109:** The issue of spills will be addressed in the required radioactive materials license. UEC has not yet applied for the license. Spills of mining solutions, industrial liquids, or recovered source material are subject to requirements under 30 TAC Chapter 336, Radioactive Substance Rules, for reporting, containment, and corrective action to remediate any contamination.

**Comment 110:** GCGCD asked if TCEQ will consider the stratigraphic and structural complexity of the mining area when evaluating the monitor well spacing design in accordance with 30 TAC § 331.103.

**Response 110:** The Executive Director will consider geological data pertinent to the spacing of monitor wells. Monitor well spacing must meet the requirements of 30 TAC § 331.103. Proposed monitor well information must be submitted with each application for a production area authorization. On September 3, 2008, UEC submitted an application for a production area authorization for the ore body in Sand B at the site. This application currently is being reviewed.

**Comment 111:** GCGCD commented that Section 11.1.1 of the application is confusing as it discusses monitoring wells and observation wells, and requested that the entire section be clarified. In addition, GCGCD noted that the application states that monitor wells are to be completed in the sands overlying the production zone and asked whether there should also be a requirement for monitor wells in the sands underlying the production zone.

**Response 111:** Section 11.1.1-Monitoring Wells, on page 11-2 of UEC's application addresses Hydrologic Testing. As used by UEC in Section 11.1.1, the terms "monitoring wells" and "observation wells" are synonymous, and refer to wells used to monitor water levels during a

pump test. In its January 30, 2008 response to the Executive Director's January 7, 2008 notice of deficiency letter, UEC indicated hydrologic testing would include an evaluation of hydrologic connectivity between the D Sand and sands of the underlying Lagarto Formation. Generally, observation wells are not completed in deeper zones unless geologic data indicate the confining zone at the base of a proposed injection zone may not be of sufficient thickness to contain injected fluids. If hydrologic testing indicated a hydraulic connection between the production zone and an underlying aquifer, the executive director would recommend monitor wells in the underlying aquifer.

**Comment 112:** GCGCD commented, given that the Daniel B. Stevens model uses homogenous conditions in the aquifer, the extraction wells do not capture 100% of the pregnant lixiviant in a three-year mining period. Therefore, GCGCD asked how UEC can assure, given the added complexities of aquifer heterogeneities that are obvious on cross-sections provided in section 6 of the application, that escaping contamination will be detected by a monitoring well ring that is based on a spacing of 400 feet and takes no consideration of the variation of sedimentary structure.

**Response 112:** The Executive Director notes that on page one of the groundwater modeling report prepared by Daniel B. Stephens and Associates of Albuquerque, New Mexico for the Goliad County Groundwater Conservation District, the authors state that direct site-specific data on the potential mining area were not available at the time this numerical modeling was done. Use of site-specific data, which are now available, may yield different results. Also, on page seven of this report, the authors state that with a spacing of 100 feet between the down-gradient extraction wells, the target of less than 1% bleed was met, and complete capture of injected fluids was achieved. Site-specific geologic conditions will be considered in any review of monitor well spacing proposed in an application for a production area authorization.

**Comment 113:** GCGCD asked, given that the Daniel B. Stevens model shows vertical communication between the A and B sands, will a monitoring well ring be placed in both A and B sands during production and restoration?

**Response 113:** Until an application for a production area authorization is analyzed, the Executive Director cannot form any conclusions regarding hydrologic connectivity between sands at the site. The Executive Director's staff found no specific mention in the Stevens report of hydraulic connectivity between Sand A and Sand B. In any event, the Executive Director also notes that the modeling performed by Daniel B. Stephens was not based on site-specific information. The existence and degree of hydraulic connection between sands at the site will be evaluated by hydrologic testing, the results of which must be submitted in any applications for production area authorizations, which are needed to mine the ore bodies at the site. UEC submitted an application for a Production Area Authorization No. 1 on September 3, 2008. The application is currently under review by the Executive Director's staff and is available to the public at the Goliad County Courthouse. If hydrologic test results indicate hydraulic

connectivity between the A and B sands, the Executive Director will take that information into consideration when evaluating the monitor well design for each PAA.

**Comment 114:** Larrie and Brenda Brysch expressed concern that there is no requirement for online analyzers of perimeter wells, and commented that they feel this endangers them.

Rob Baiamonte commented that electrical conductivity can be measured remotely in the well on a continuous basis and asked if TCEQ considers this to be a reasonable monitoring approach for the monitor well ring.

**Response 114:** Continuous, online sampling is available for some groundwater parameters, such as pH and conductivity. However, continuous monitoring is not available for other parameters, such as chlorides, which require laboratory analysis and provide the best indication of the presence of mining fluids in a monitor well. Based on the groundwater gradients displayed on the poteniometric maps provided in Section 6 of UEC's application (figure 6.22), and on the calculated groundwater velocity of 6.7 feet per year (page 6-14 of UEC's application), the sampling frequency of twice a month for production zone monitor wells, as required under 30 TAC § 331.105(1), is adequate for the detection of excursions. Additionally, if mining fluids are detected in a monitor well, that well must be sampled at least twice a week until the mining fluids are cleaned up from any affected wells under the requirements of 30 TAC § 331.105.

Down-hole instrumentation is available to continuously monitor electrical conductivity. Use of such instrumentation generally would be acceptable for monitoring this parameter of the groundwater.

**Comment 115:** Rob Baiamonte noted that the sands containing the ore bodies thin and thicken in a curving pattern. He asked, given the complexity of this pattern, how UEC can ensure that randomly spaced monitoring wells will capture an excursion traveling down one of these channels.

**Response 115:** With the exception of Sand C, which thins out in the central part of the graben, sands of the Goliad Formation at this site occur as continuous sheets, not in discrete channels, and each is easily correlated using geophysical logs. The location of all monitor wells must be in accordance with the requirements of 30 TAC § 331.103. Proposed monitor well locations, which are submitted in the application for a production area authorization, will be reviewed for compliance with these requirements. UEC submitted an application for Production Area Authorization No. 1 on September 3, 2008, but the application has not yet been reviewed to determine required monitor well locations.

**Comment 116:** Rob Baiamonte noted that the permit refers to designated monitoring wells being sampled every two weeks for control parameters and asked if a designated monitoring well

is every well in the ring, or just a select few. If these are only a select few, he asked how they are selected.

**Response 116:** In accordance with the requirements of 30 TAC § 331.105(1) and paragraph G. 1. a. of the draft permit, all monitor wells must be sampled at least twice a month. 30 TAC § 331.105(4) requires twice-a-week sampling for any well in which mining fluids are present.

**Comment 117:** Rob Baiamonte noted that proposed control parameters include chloride, sulfate, total dissolved solids (TDS) and electrical conductivity. He commented that although chloride is stated as providing the earliest warning, there is no discussion to support this contention. In fact, he noted that the barren lixiviant can be treated with reverse osmosis to decrease chloride prior to reinjection. Based on these premises and the conclusion that chloride should not be at elevated levels when the lixiviant is reinjected, he asked what the basis is for using chloride as an indicator.

**Response 117:** Chloride is a good indicator parameter of the presence of mining solutions in a monitor well for several reasons. The concentration of chloride is not appreciably affected by chemical reactions with the formation material, which can retard the movement of a constituent in groundwater, so it moves more freely than other constituents. Also, as a component of the *in situ* leaching process, chloride is generally present in a concentration range that allows for precise and accurate measurement. In addition, chloride is easily measurable. Precise and accurate measurement promotes the ability to determine when and where a change in concentration has occurred.

Although chloride concentration can be reduced through treatment of the mining fluid, relatively high chloride concentrations are maintained in the mining fluid such that even if the fluid is treated, chloride concentrations will remain high enough to continue to be an accurate indicator. First, the resin beads used to capture the dissolved uranium have chloride ions attached to them. When the uranium-containing mining fluids contact the resin beads in the ion exchange tanks, uranium ions displace these chloride ions, which go into solution. Once the beads reach their capacity for uranium, the beads are treated to remove the uranium. After uranium is removed from the beads, the beads are treated with a sodium chloride solution to "charge" the beads with chloride ions so the beads can be used again for uranium recovery. Water from this process is then used in the mining process. Mining fluids periodically may be treated to reduce chloride concentration if that concentration is so high it causes interference with the uranium recovery process. Overall, however, chloride concentration in the mining fluid will be significantly higher than background. Thus, elevated chloride detected in a monitor well is a good indicator that there is an excursion of mining fluids.

**Comment 118:** Rob Baiamonte noted that the application states uranium will not be used as a control parameter because it does not move readily through the aquifer. He stated that this is in conflict with the process, which is designed to mobilize uranium. He asks what scientific basis

the NRC and TCEQ use to exclude the use of uranium as a control parameter for detecting excursions.

**Response 118:** Uranium is mobilized through the *in situ* mining process. However, any mining fluids that may migrate outward from the production zone within the production area will quickly encounter naturally-reducing conditions. As recognized by the Nuclear Regulatory Commission in guidance document NUREG-1569,[98] uranium will precipitate from the groundwater under reducing conditions, and therefore may not be present in any fluids that migrate outward to a monitor well. Uranium is said to be a non-conservative parameter as its concentration is affected by chemical changes in the aquifer. Other groundwater parameters, such as chloride concentration, are better indicators of the presence of mining solutions in a monitor well. If an excursion is detected and confirmed, a complete analysis of groundwater constituents, including uranium if appropriate, may be required to assess and remediate the excursion under the requirements of 30 TAC § 331.106.

**Comment 119:** Rob Baiamonte asked what the TCEQ's protocol is for establishing upper control limits for control parameters for excursions and whether TCEQ uses a valid statistical approach.

**Response 119:** The Executive Director generally follows the recommendations in previously cited NUREG-1569 for establishment of upper control parameter limits. In this guidance document, several methods are discussed, and, on page 5-41, a percentage increase is deemed acceptable. Under this method, upper control parameter limits are established by increasing the mine area baseline concentration by a certain percentage for the selected control parameters. The specific upper control parameter limits are established in the Production Area Authorization. UEC submitted its application for Production Area Authorization 1, and the application is under review.

**Comment 120:** Rob Baiamonte noted that under excursion prevention, the application requires monitoring of specified wells within ¼ mile of the injection site at least every three months and asked how these wells will be selected.

**Response 120:** Under 30 TAC § 331.84(d), specified wells within ¼ mile of the injection site shall be monitored at least once every three months to detect any migration from the injection zone into fresh water. Monitoring of these wells would be in addition to any monitor wells required under 30 TAC § 331.103. The decision to specify monitoring of any existing wells within ¼ mile of the injection site depends on the depth of any of these wells, their location in relation to the injection site (such as being down-gradient from the injection site), and the operator's ability to access these wells for monitoring and sampling as the wells could be off of the property controlled by the operator. The executive director will recommend monitoring of

[98] Standard Review Plan for *In situ* Leach Uranium Extraction License Applications, 5-41 (June, 2003).

any existing wells, in accordance with the requirements of 30 TAC § 331.84(d) based on site-specific information in each production area authorization application.

**Comment 121:** GCGCD commented that Section 12 of the application lacks a discussion on the long-term monitoring during and after restoration and asked how frequently UEC will sample the monitoring wells after restoration to demonstrate that contaminant levels have not increased, and for how long.

**Response 121:** The Executive Director reviewed Section 12 of the application and determined that it contained all information requested. Under 30 TAC § 331.107, monitoring of water quality by analyzing samples from baseline wells is required for at least 180 days after the cessation of restoration activities. The TCEQ has proposed rules that would require an extended period for stability sampling.[99] Under the proposed rules, 30 TAC § 331.107 would be revised to extend the stability period from 180 days to one year, and to extend the stability period to two years when initial aquifer restoration values have been amended. It is not likely that the rules will be "grandfathered" to apply to applications filed prior to their effective date.

**Comment 122:** Mr. and Mrs. John H. Dreier asked if TCEQ will do an environmental audit upon the closing of the mine area.

**Response 122:** TCEQ does not conduct an audit, but the Executive Director does conduct a final inspection to certify that closure has been accomplished in accordance with the permit.[100] This is in addition to decommissioning required under any radioactive materials license that may be associated with the site.

**Comment 123:** Mr. and Mrs. John H. Dreier asked if TCEQ will require monitoring wells to be left in place after mining has finished.

**Response 123:** Within 120 days after acknowledgment of completion of final restoration, the permittee is required to accomplish closure of the mining facilities in accordance with approved plugging and abandonment plans submitted as part of a supplementary technical report.[101] After groundwater is restored according to the rules and permits and the wells are closed, no further monitoring is required. The TCEQ will not require monitoring wells to be left in place once required monitoring activities are completed.

**Comment 124:** G.A. Gutmann asked who is responsible for paying for monitoring after mining is completed. Mark Krueger noted that uranium, radium and arsenic continue to become

[99] 33 Tex. Reg. 7482, 7484 (Sept. 5, 2008) (prop. to be codified at 30 TAC §§ 331.103-109) (TCEQ).
[100] 30 TAC § 331.86(b).
[101] 30 TAC § 331.86(a).

oxidized after restoration is complete. He estimated the cost for testing over 15 years to be approximately $24,000 per well and asked who will pay for this testing.

**Response 124:** After restoration and closure, no additional monitoring is required. If a landowner wishes to monitor his or her own private well, it would be at the landowner's expense.

**Comment 125:** Robin Sherwood commented that based on the monitoring logs in UEC's information, they are using outdated, out-moded monitoring methods and equipment. She asked what TCEQ is going to do to get UEC and TCEQ using the best and most accurate equipment and techniques available.

**Response 125:** The Executive Director is not sure of the monitoring logs referenced by this commenter, but assumes she is referring to the geophysical logs included in the application. Some of these logs are from wells drilled in the 1980s, but many are of wells drilled since 2006. These logs were used for geologic correlation and are adequate in all respects for this purpose.

**Comment 126:** Carol Warren asked who will be monitoring whether there is movement of byproducts and how. She asked if TCEQ can require that someone other than the applicant conduct monitoring activities. Kirk Klinkerman asked if a TCEQ representative will record monitoring data.

**Response 126:** If the permit is issued, UEC will be required to monitor both the production zone (monitor well ring) and nonproduction zones (overlying or underlying aquifers) in accordance with 30 TAC § 331.103. This monitoring is the responsibility of the permittee. However, under 30 TAC § 331.85, the permittee is required to submit reports of all monitoring results for TCEQ review. Additionally, the Executive Director will conduct periodic site inspections during which groundwater samples will be collected and sent for analysis to the Texas Department of State Health Services Laboratory in Austin, Texas.

**Comment 127:** Several commenters expressed concern about possible gamma radiation emissions and how such an emission would be detected.

**Response 127:** Emission of radiation is addressed in the radioactive materials license, which is needed for construction, operation, and closure of the proposed processing facility. UEC has not yet submitted an application for a radioactive materials license. A radioactive materials license limits the dose from gamma radiation and other sources of radiation to 5 rem[102] per year for occupational exposure and 100 millirem for individual members of the public. Rule requirements related to radioactive materials licenses are located at 30 TAC Chapter 336. This

[102] The term "rem" is an abbreviation for "roentgen equivalent man", which is a measure of ionizing radiation absorbed by a unit weight of matter. One rem is equal to 1000 millirems (mrems).

topic can be addressed in greater detail if UEC submits an application, and should be raised during the applicable comment period.

## Q. Control of Migration

**Comment 128:** Several commenters expressed concern regarding the possibility that contaminants could migrate within the aquifer and asked how the applicant will control migration. Carol Warren asked what will be done to ensure byproducts are not leaking into other water sands up or down dip from the mining activity. Mark Krueger stated that there exists no scientific research to prove migration will not occur, but only theories. Shirley D. Smith expressed concern about vertical escape of contaminated water into another aquifer sand.

**Response 128:** If the permit is issued, UEC will be required to confine mining solutions within the area of designated production zone monitor wells. Migration of mining fluids is controlled through well spacing and by pumping more groundwater than is injected (known as the "bleed"). This results in the movement of groundwater toward the wells and not away from them. The natural characteristics of the sands in the mining zone also help prevent migration. Based on information submitted in Section 6 of UEC's application, including seven cross sections using 64 geophysical logs, the four sands of the Goliad Formation in this area occur as sheets, not discrete sand channels. Furthermore, these sands are porous media, not open conduits. The groundwater is contained within the pores of the sand formation and does not flow as an underground river or stream.

The oxidizing nature of the injected mining fluids results in uranium and other constituents being dissolved from the aquifer material. After mining is complete, the oxidizing environment created within the mined zone remains. Aquifer restoration will lower the level of oxidation within the mine zone, but oxidizing conditions may persist to some degree. Under these oxidizing conditions, certain constituents can occur in the groundwater in higher concentrations than would occur in reducing conditions. Outward from the mined zone, naturally-occurring reducing conditions will prevail. As groundwater migrates from the mined zone, it will encounter these reducing conditions, and the concentrations of the constituents dissolved in the groundwater will be reduced to background concentrations.

Finally, the production zone, overlying freshwater aquifers, and, in some cases, the underlying freshwater aquifer, are monitored to detect the migration of any mining fluids from the production zone within the production area. If mining fluids are detected in any of these wells, the operator must, in accordance with the requirements of 30 TAC § 331.106, take actions to confine the mining fluids to the production zone within the production area. Possible actions that might be taken include increasing the amount of bleed water, or the installation of additional production wells in the area of the excursion. The purpose of both of these actions, either separately or together, is to induce groundwater to flow towards the production area, rather than

outward from it. Once mining is complete, the aquifer must be restored in accordance with the requirements of 30 TAC § 331.107.

**Comment 129:** Lynn and Ginger Cook commented that excursions occur at all *in situ* leach mining operations when leaching solutions escape from the mining area into adjacent areas of aquifer, and that this could be due to pump failure or loss of power or computer malfunction.

**Response 129:** Excursion may occur for a variety of reasons. The prevention of excursions is addressed in several ways, including: Proper construction, testing, and operation of wells; monitoring of injection pressure; and maintaining a bleed (pumping more fluid out than is injected to direct mining fluids from the injection well to production wells and create a groundwater gradient toward the production area). Production and nonproduction monitor wells are required for detection of excursions (30 TAC § 331.103). If an excursion occurs, monitoring frequency is increased from twice a month to twice a week (30 TAC § 331.105(4) nonproduction zones, and the excursion must be remedied in accordance with the requirements of 30 TAC § 331.106. On page 9-18 of Section 9 of UEC's application, UEC states that in the event of a well failure, operation of that well will cease until the cause of the failure is corrected.

**Comment 130:** Craig Duderstadt commented that the basic theory of containing water without excursions only theoretically holds true in an unconfined aquifer.[103]

**Response 130:** The commenter appears to be referring to one of the conclusions reached by Daniel B. Stephens and Associates, who were commissioned by the Goliad County Groundwater Conservation District to prepare a numerical modeling study to evaluate possible effects of *in situ* mining at the proposed UEC site. These conclusions are based on modeling that assumes steady-state conditions in a saturated, homogeneous, isotropic aquifer.[104] In that report, the authors concluded that based on modeling of groundwater behavior of a zone that appears to be equivalent to Sand A (an unconfined sand), total capture of all injected fluid could not be achieved with a well spacing of 140 feet and less than 1% bleed. The authors further concluded that by reducing the spacing of down-gradient wells to 100 feet, complete capture of all injected fluids was achieved with less than 1% bleed. The failure (as indicated by modeling) of the production wells to capture all of the injected fluid is a function of the spacing of the production well, not aquifer confinement (or lack of confinement).

**Comment 131:** Brenda Jo Hardt commented that failure to plug exploration wells, resulting in contamination of updip wells, proves that there will be excursions from mining.

**Response 131:** The commenter appears to be referring to the iron bacteria contamination that has been occurring in several private water wells up-gradient of UEC's proposed permit site.

---

[103] *See also* Comment and Response 69, *supra*, regarding confined/unconfined conditions.
[104] Section 2 of Daniel B. Stephens Report.

Exploration wells were drilled under a permit issued by the RRC. The Executive Director understands that the RRC concluded there was no evidence that exploration drilling at the UEC site was the cause of the iron bacteria contamination occurring in private water wells up-gradient of the exploration site.

## R. Spill/Excursion Response and Cleanup

**Comment 132:** Carol Warren asked who will monitor spills and how. Cyrus Reed also expressed concerns regarding spills and traffic accidents.

**Response 132:** The application and proposed draft injection well permit do not directly address spills and traffic accidents involving the transportation of uranium. The TCEQ does regulate the handling and processing of radioactive materials through its Radioactive Materials Licensing Program. The draft permit requires that the Applicant have a valid license from the TCEQ covering the handling and processing of radioactive materials from the facility, prior to beginning mining operations.[105] The Applicant has not yet submitted an application to the TCEQ for a radioactive materials license. Before issuing a radioactive materials license, the TCEQ evaluates the licensee's qualifications. The TCEQ must determine that the licensee is qualified by training and experience to conduct the proposed radioactive material activities in accordance with TCEQ rules and in such a manner as to protect and minimize the danger to public health and safety and the environment.[106] The TCEQ must also determine that the licensee's proposed equipment, facilities, and procedures are adequate to protect and minimize danger to the public health and safety and the environment.[107] Additionally, as part of the Applicant's application for a radioactive materials license it will be required to provide a copy of an adequate operating, radiation safety, and emergency procedures manual.[108] If you need more information about the Radioactive Materials Licensing process, please call the TCEQ Radioactive Materials Division at (512) 239-6466. General information about the licensing process can also be found at our website at www.tceq.state.tx.us.

**Comment 133:** Carol Warren asked how contaminants can be cleaned up after a spill. Pat Suter commented that clean-up after a mistake is difficult.

**Response 133:** The Class III UIC well permit for which UEC has applied does not directly address clean-up after surface spills. The Executive Director reviewed the applicant's plans for coping with shutting-in of wells and well failures in order to prevent the migration of contaminating fluids into fresh water. Under 30 TAC Chapter 336, actions required for spill

[105] Draft Permit, Section VI.
[106] 30 TAC § 336.207(1).
[107] 30 TAC § 336.207(2).
[108] 30 TAC § 336.1111(1)(G).

response, reporting, and clean-up must be addressed in the radioactive materials license application. The license application must also address emergency plans and procedures. UEC has not yet submitted an application for a radioactive materials license, which it must possess prior to beginning mining under the rules and Section VI of the draft permit. This question can be addressed with greater specificity if UEC submits an application for a radioactive materials license and should be raised during the applicable public comment period.

**Comment 134:** Several commenters asked questions about contingency plans in the event of contamination by a spill or excursion. Lynn and Ginger Cook asked who would be responsible for paying for well testing in the event of contamination and how frequently tests would have to be done in the event of contamination. Shirley D. Smith asked, who will fix the wells if they become contaminated and how. Joan S. Folks asked what contingency plans will be in effect if there is a contamination of water or soil. Carol Warren asked how contaminants can be cleaned up from the aquifer.

**Response 134:** Soil and surface water contamination will be addressed in the radioactive materials license, which is needed for construction, operation, and closure of the processing plant, not the Class III injection well area permit. UEC has not yet applied for this license. The holder of a Class III injection well area permit is not required to have a contingency plan for excursions. Excursions must be addressed in accordance with the requirements of 30 TAC § 331.106. Under these requirements, if there is an excursion of mining fluids, the operator must notify the TCEQ, re-sample all affected wells for an expanded set of constituents, and initiate measures to clean up all affected monitor wells. While mining fluids are present in a monitor well, that well must be sampled at least twice a week.[109] In the event mining solutions affect an off-site well, the operator would be in violation of 30 TAC §§ 331.5 (Prevention of Pollution) and 331.102 (Confinement of Mining Solutions), and would be subject to enforcement actions by the TCEQ's Office of Compliance and Enforcement. In addition to possible fines and other penalties, the operator would be required to clean up any groundwater contamination that resulted from injection of mining fluids. All costs associated with this clean up would be the responsibility of the operator. There are several methods for cleaning up contaminated groundwater. For removing inorganic contaminants such as those that are present in mining fluids associated with *in situ* uranium mining, the basic method is "pump and treat", which involves pumping the contaminated water to the surface, treating it to remove the contaminants, and then reinjecting the treated water. Contaminants removed by treatment would be disposed at an authorized facility, such as at a facility with a Class I injection well.

Response to contamination due to an excursion from the mining production zone is addressed by this permit. Under 30 TAC § 331.106, when mining solutions are present in groundwater outside of the production zone, the operator must clean up all monitor wells, all zones outside of the production zone, and the production zone outside of the mine area that contain mining fluids.

[109] 30 TAC § 331.105(4).

In the event of off-site contamination, groundwater remediation requirements would be established through a corrective action plan in accordance with the requirements of 30 TAC § 331.44 to assure that groundwater is cleaned-up in an expeditious and practical manner. A corrective action plan details what needs to be done to address the particular contamination. For an excursion in a monitor well, companies may increase pumping rates to cause groundwater (and the excursion) to flow back toward the production area. In a case in which contamination has traveled too far for this to be effective, "pump and treat methods" can be used. Wells can be installed in the contaminated zone, the contaminated groundwater is pumped to the surface, treated to remove the contaminants, then reinjected (much like aquifer restoration). Or, the contaminated groundwater can be pumped to the surface and the disposed in a Class I injection well. In accordance with the requirements of 30 TAC § 331.105(4), when mining solutions are present in a designated monitor well, samples must be taken at least twice a week. In the case of off-site contamination, the Executive Director would designate a sampling frequency to monitor that the clean-up is performed in an expeditious and practical manner.

In the event *in situ* mining resulted in off-site contamination of groundwater, the operator, UEC, would be responsible for all costs associated with groundwater remediation, including well testing.

Soil and surface water contamination will be addressed in the radioactive materials license, which is needed for construction, operation, and closure of the processing plant. UEC has not yet applied for this license

**Comment 135**: G. A. Gutmann asked if the applicant will provide water for affected persons, even those whose property is not leased by the company, in the event of contamination and, if so, how much that water will cost the property owner.

**Response 135:** In the event UEC causes the contamination of off-site groundwater, UEC would be subject to enforcement action by the TCEQ and would be required to remediate the contamination. As part of an enforcement action or remediation plan in this situation, UEC could be required to provide water at UEC's expense to persons affected by the contamination.

**Comment 136:** Mr. and Mrs. John H. Dreier asked if TCEQ has trained personnel on staff to respond to pollution problems quickly as they occur.

**Response 136:** TCEQ has trained investigators and emergency personnel stationed at the central office and sixteen regional offices throughout the state to respond quickly to environmental problems.

## S. Contamination of Surface Water, Air, and Soil

**Comment 137:** Several commenters expressed concerns about contamination of surface waters due to exploration and mining activities. Mary Anklam stated that the gently sloping land means water runs from the exploration area into nearby creeks and then into recharge the zone of the aquifer. Lynn and Ginger Cook expressed concerns that surface gamma radiation contamination and other toxins can run off from heavy rains and contaminate creeks, tanks, the river, and the Coleto Reservoir. John B. and Wanda Duke and Margaret Rutherford also expressed concern about the pollution of springs, ponds, and streams, and Coleto Creek Reservoir. Lynn and Ginger Cook, Margaret Rutherford and Sam Rhotenberry expressed concern about contamination of surface water used for recreation by runoff from the site. Margaret Rutherford asked what happens when the soil covering the sites with gamma radiation washes off into surface water bodies.

**Response 137:** The permit, if issued, would not authorize any discharge of waste to surface waters. Issues related to runoff from exploration activities are regulated by the Railroad Commission of Texas, not the TCEQ. However, the executive director recognizes that the proposed mining area is in the watershed of Coleto Creek Reservoir, and surface contamination anywhere within this watershed could be transported by surface runoff to the reservoir. Potential surface contamination associated with mining activities at the site would be from spills of mining fluids or wastewater at the processing facility or possibly at the proposed Class I injection well. Requirements for containment of these fluids are addressed in the radioactive materials license required for the processing. Requirements for any units used to store wastewater prior to injection that are not regulated under the license would be addressed in the Class I well permit. Generally, the occurrence of spills is minimized through design and operating requirements that apply to the processing facility and any units authorized under a Class I well permit. Spills do occur, however, and therefore these design requirements include secondary containment, such as curbing and sumps to capture spilled fluids before they can be introduced to the environment.

The executive director also recognizes that a portion of the precipitation that occurs in the area will percolate into the subsurface, providing recharge to the Gulf Coast Aquifer. Any surface contaminants, natural or otherwise, could be dissolved into the precipitation and transported into the subsurface through recharge. As discussed in a previous response, however, recharge to any of the four sands of the Goliad Formation within the graben bounded by the two faults is unlikely or greatly reduced as these sands do not crop out within the area of the graben.

The executive director is aware that the RRC investigated UEC's exploration drilling activity in regards to surface gamma radiation. It is executive director's understanding that this gamma ray radiation was due to uncovered drill cuttings, and that the matter was addressed to the satisfaction of the RRC. This gamma radiation most likely was from the presence in the drill cuttings of various daughter products from the radioactive decay of uranium.

**Comment 138:** Several commenters expressed concern regarding surface contamination and soil contamination. Annie Hardt and Margaret Rutherford expressed concern about soil contamination from leaks and spills during and after mining. Margaret Rutherford is especially concerned that rain and topography will result in contaminated water flowing across her yard resulting in soil contamination on her property. Margaret Rutherford and Wayne and Margie Smith also cited concerns about spills from trucks hauling fluids in and out of the facility.

**Response 138:** The federal Hazardous Materials Transportation Act (HMTA) gives the United States Department of Transportation (DOT) the authority to regulate the packaging, shipping, and transport of radioactive materials.[110] The Texas Department of State Health Services (DSHS) is the lead state regulatory agency regarding the transport of radioactive materials.[111] Should a spill or traffic accident occur while radioactive materials are in transit, the TCEQ may act in support of DSHS staff as well as other emergency responders.[112]

The application and proposed draft injection well permit do not directly address spills and traffic accidents involving the transportation of uranium. The TCEQ does regulate the handling and processing of radioactive materials through its Radioactive Materials Licensing Program. The draft permit requires that the Applicant have a valid license from the TCEQ covering the handling and processing of radioactive materials from the facility, prior to beginning mining operations.[113] If any soil contamination were to occur, it would be caused by spills of mining fluids or wastewater produced from processing of mining fluids. Processing facilities, which are authorized under a radioactive materials license, are required to have secondary containment to prevent spills from entering the environment.[114] Spills at the facility also could occur from a leak in a pipeline conveying liquids to and from the processing facility. In this case, the spill would enter the environment. Because of this, a condition of a radioactive materials license is a spill response plan, which details how such spills are addressed.[115] The Applicant has not yet submitted an application for a radioactive materials license. Before issuing a radioactive materials license, the TCEQ evaluates the licensee's qualifications. The TCEQ must determine that the licensee is qualified by training and experience to conduct the proposed radioactive material activities in accordance with TCEQ rules and in such a manner as to protect and minimize the danger to public health and safety and the environment.[116] The TCEQ must also determine that the licensee's proposed equipment, facilities, and procedures are adequate to

---

[110] 49 U.S.C. § 5101 et seq.
[111] 25 TAC § 289.101(c), Memorandum of Understanding Between the Tex. Dept. of Health and the Texas Nat. Res. Conservation Comm'n Regarding Radiation Control.
[112] 25 TAC § 209.101(I).
[113] Draft Permit, Section VI.
[114] 30 TAC § 336.1211(4)(J)((iv).
[115] Spill response is addressed in 30 TAC § 336.1113. 30 TAC §§ 336.1111(1)(A)(iii)-(iv) addresses environmental affects of the project and accidents and § 336.1111(G) requires an emergency manual. Additionally, TCEQ has proposed rules to require an emergency plan for responding to a release in § 336.210 (33 Tex. Reg. 7487, 7497).
[116] 30 TAC § 336.207(1).

protect and minimize danger to the public health and safety and the environment.[117] Additionally, as part of the Applicant's application for a radioactive materials license it is required to provide a copy of an adequate operating, radiation safety, and emergency procedures manual.[118] General information about the licensing process can also be found at our website at www.tceq.state.tx.us.

**Comment 139:** Many commenters expressed concerns regarding air contamination as a result of *in situ* mining operations. Several cited specific concern regarding radon emissions into the air from the proposed processing facility and noted that radon causes cancer. Some had requested more information on emissions from the rotary vacuum dryer proposed to dry yellowcake slurry. Some expressed concern regarding the impact on air quality from truck traffic and machinery. Darwin A. Foerster expressed concern about dust forcing him off his property. Mr. and Mrs. John H. Dreier asked whether TCEQ has certified staff members to check for airborne emissions from the processing plant and what the inspection frequency will be. The Dreiers also asked if there are penalties in place for non-compliance and if so, how much and who enforces and collects them. Margaret Rutherford asked when and how she will know when radon gas is in the air, who will tell her when to evacuate, whether anyone will even admit that an emission has occurred, and whether there be mass evacuations of families? Brenda Jo Hardt and Annie Hardt asked where the research from UEC is regarding the levels of radon in the air they expect.

**Response 139:** The Underground Injection Control program rules for the Class III area permit do not address radon emissions. Worker and public exposure to radon or other sources of radioactivity are addressed under a radioactive materials license. A radioactive materials license limits the dose from radon and other sources of radiation to 5 rem per year for occupational exposure and 100 millirem for individual members of the public. UEC has not yet submitted an application for a radioactive materials license.

## T. Restoration of Aquifer: Feasibility and Enforcement

**Comment 140:** Several commenters expressed concern regarding the feasibility of restoring the aquifer after mining activities are completed. Donna Hoffman (Lone Star Sierra) commented that hydrologists and groundwater conservation district officials say the aquifer cannot be restored for human use. Lynn and Ginger Cook stated that restoration does not restore all elements to initial levels and cited specifically uranium, radium-226, arsenic, and molybdenum. Kirk Klinkerman asked if it is true that the water table in the permit area will not be suitable for human consumption.

---

[117] 30 TAC § 336.207(2).
[118] 30 TAC § 336.1111(1)(G).

**Response 140:** 30 TAC § 331.107 requires that the aquifer be restored to pre-mining groundwater quality as provided in the restoration table of a production area authorization. The restoration table values may not represent concentrations of groundwater constituents that are suitable for human consumption. Typically, pre-mining groundwater quality of a production zone will have uranium and radium-226 levels that exceed maximum concentration limits that are suitable for human consumption. There may also be uranium-indicator constituents, such as lead and arsenic, that also exceed the maximum concentration limits. The Executive Director notes that if mining is to be done in a USDW, an aquifer exemption must be approved for that portion of the USDW that is to be mined. An aquifer exemption can only be granted if, in addition to other considerations, the groundwater in that portion of the USDW currently is not being used for human consumption, and, until the exemption is lifted, will not be used for human consumption.[119] When making a decision to amend a restoration table to raise the restoration standard for a particular constituent, one of the factors the commission takes into consideration is if, based on the proposed new standard, groundwater in the aquifer would be suitable for any use to which it was reasonably suited prior to mining (30 TAC § 331.107(f)).

**Comment 141:** GCGCD asked if the stable uranium deposits will be only partially accessed but disturbed sufficiently to make restoration a practical impossibility.

**Response 141:** The goal of *in situ* mining is to recover as much uranium from the ore body as is economically possible. Industry experience indicates about 80 to 85% of the uranium minerals in an ore body are recovered using *in situ* techniques. It is difficult to quantify and determine exactly how the remaining uranium mineralization, which either proved to be unresponsive to the mining fluids or was not in contact with these fluids, will react to the relatively clean water that is injected during aquifer restoration. Because oxidizing mining fluids are no longer being injected into the production zone, the mined zone is deprived of the added oxygen and bicarbonate necessary for uranium mobilization. Remaining uranium minerals in the aquifer material may react to some extent with the groundwater, but chemical equilibrium should be re-established. Based on science and experiences with similar restoration projects, it is expected that after all restoration efforts have concluded and the oxidized conditions caused by mining solutions are reduced, the natural conditions that originally precipitated the uranium into the ore body would continue to affect the groundwater by reducing the uranium levels in solution.

**Comment 142:** GCGCD stated that the discussion of baseline (in Sec. 12) leads one to believe the pregnant lixiviant will not leave the ore zone; however, the Daniel B. Stephens Model shows that the lixiviant will leave the ore zone. GCGCD asked what the vertical and horizontal boundaries of the water that needs to be restored will be.

**Response 142:** Baseline information relates to the production zone (the stratigraphic interval into which mining solutions are authorized to be injected), and aquifer restoration requirements

[119] 30 TAC § 331.13(c).

also apply to the production zone. Any excursion on mining fluids out of the production zone must be addressed in accordance with the requirements of 30 TAC § 331.106. After a detected excursion all monitor wells in which mining fluids have been detected and all zones outside of the production zone must be cleaned up. The vertical and horizontal boundaries of the water that needs to be restored are the same as the production zone.

The Executive Director notes that the modeling performed by Daniel B. Stephens for the Goliad County Groundwater Conservation District was not based on site-specific characteristics. Also, this modeling was done on the assumption of 20 years of production. Although this modeling provides useful insight into the general performance of Sand A during *in situ* operations, the Executive Director does not find the modeling to be a definitive prediction of aquifer behavior at the site.

**Comment 143:** In its application, UEC assumes 6 pore volumes will be sufficient for restoration. GCGCD asked what the basis of this water amount is, considering that other *in situ* leach mining facilities have required many more pore volumes to achieve baseline conditions. GCGCD asked what the plan of action is for bonding, groundwater use, and disposal, if more than 6 pore volumes are needed. GCGCD commented that there is no discussion in Section 12 on the number of pore volumes that will be used to restore the aquifer and asked why TCEQ does not require a detailed discussion of this important parameter. Barbara Smith asked how much water will be needed for restoration of the aquifer.

**Response 143:** UEC states on page 8-4 of the application that an assumption of 6 pore volumes was made in determining projected water use in regards to the initial mine plan. At other *in situ* uranium sites, more than 6 pore volumes were pumped during restoration activities. In evaluating UEC's assumption of 6 pore volumes, the Executive Director took into consideration UEC's statements on page 8-1 of the application that restoration will begin as soon as hydraulic separation can be established between the mined portion of an aquifer and the portion that is currently being mined, and that prior to re-injection, mining fluids will be treated using reverse osmosis to reduce the level of constituents and parameters in the mining fluid. Based on these considerations, the Executive Director accepts the assumption of 6 pore volumes for aquifer restoration as reasonable. The estimate of the number of pore volumes for groundwater restoration is used for planning and determining cost estimates; groundwater must be restored to the restoration table values regardless of the number of pore volumes it may actually take to achieve restoration.

The Executive Director notes that the mine plan submitted in a Class III injection well permit is preliminary, and a subsequent mine plan will be submitted with each application for a production are authorization. Also, UEC committed in Section 12 of the application to provide a restoration demonstration within 18 months of the beginning of *in situ* operations. Should the results of that demonstration indicate the assumed number of pore volumes required for aquifer restoration is

inadequate, the Executive Director would require the amount of financial assurance for aquifer restoration be adjusted accordingly.

The Executive Director further notes that under current rules, an applicant for a Class III injection well permit is not required to provide a cost estimate for aquifer restoration or financial assurance for aquifer restoration. Financial assurance for aquifer restoration is addressed under a radioactive materials license. These cost estimates are reviewed by staff of the TCEQ Underground Injection Control Program.

**Comment 144:** Pat Calhoun commented that Table 10-1 is based on a proposed 1% bleed from the production zones and 6 pore volumes for restoration and asked if TCEQ will require a contingency plan to address a higher bleed during production and a greater number of pore volumes for restoration.

**Response 144:** TCEQ rules do not require the applicant is to have a contingency plan to address higher bleed during production and a greater number of pore volumes for restoration. Table 10-1 is included in the application to provide the TCEQ information on the fluid handling capacity of the proposed facility. This information assists the TCEQ in evaluating if the proposed processing plant will be designed with sufficient fluid handling capacity to meet the proposed mine schedule. The proposed draft permit requires the permittee to maintain a rate of withdrawal of water that exceeds the rate of injection in each production area. The assumption of 1% bleed is reasonable to assure that mining solutions are confined. Additionally, the information in Table 10-1 indicates the facility in any given month will have a minimum of 129,000 gallons of excess disposal capacity. Restoration is required under the requirements of 30 TAC § 331.107 and is not limited to a number of pore volumes pumped through the restoration system.

**Comment 145:** Debby Brumby and Barbara Smith asked how much water will be required to restore the aquifer and whether enough water will remain after mining to complete restoration activities. (See also Response 59 for more information on water quantity).

**Response 145:** Although injection well requirements that apply to *in situ* mining (30 TAC Chapter 331) do not regulate the volume of fresh water used by a permittee, Section 10 of UEC's application states that the proposed *in situ* mining operation will result in the disposal of 2,417 acre-feet of water over a period of about 8 years. This figure includes mining and restoration activities. Based upon the information in the application, the ED anticipates that there will be a sufficient water supply to complete restoration activities in accordance with 30 TAC § 331.107.

**Comment 146:** Carol Warren asked what can be done to clean up the aquifer. Rob Baiamonte asked how the industry reclaims the area in an open aquifer, and how can citizens use it if it has not been reclaimed.

**Response 146:** The Executive Director presumes the term "open aquifer" refers to an unconfined aquifer. The same aquifer restoration techniques would be used in an unconfined aquifer as in a confined aquifer. There are several methods of aquifer restoration. One method is groundwater sweep, which involves pumping the affected water from the mined zone and disposing of it. This allows for unaffected water in the area surrounding the mined portion of the aquifer to flow into the mined area, replacing the affected water. A second method is to pump the affected water from the mined portion of the aquifer, dispose of it, and replace it with water from another mineralized but yet unmined portion of the aquifer. A third method is to pump the affected water from the mined portion of the aquifer, treat it to remove the contaminants, usually using reverse osmosis, and then re-inject the treated water. All three of these methods have been used with varying success. The third method is preferable because it results in the disposal of significantly less water. A fourth method, which is experimental and has not yet been used in Texas, is to treat the affected groundwater by injecting fluids that contain a reducing agent. The assumption is that the introduction of a reducing agent (such as hydrogen sulfide) will cause the contaminants to precipitate from the groundwater and become immobilized.

UEC proposes to use reverse osmosis treatment as the main restoration technique. The reverse osmosis treatment circulates cleaned water through the production zone, removes contaminants through reverse osmosis filtration, disposes the contaminants in a deep waste disposal well, and then re-circulates the filtered water through the production zone. UEC requests designation of an exempt aquifer. In making the request for the designation of the exempt aquifer, UEC must show that the designated portion of the aquifer does not currently serve as source of drinking water for human consumption and will not in the future serve as a source of drinking water for human consumption.

**Comment 147:** John W. and Pearl J. Caldwell commented that contamination is likely irreversible. Wesley Ball, Robin Sherwood, Perry and Denise Hiebner, Debby Brumby, and Mr. and Mrs. John H. Dreier asked if TCEQ will hold UEC accountable to restore the aquifer to pre-mining quality during reclamation or if TCEQ will relax the standard for restoration in this case. Wesley Ball and Robin Sherwood asked how TCEQ plans to enforce upon UEC the requirement to restore the aquifer to pre-mining quality. Mr. and Mrs. John H. Dreier asked if TCEQ has a plan in place if UEC cannot bring exempt aquifer water back to baseline standards. G.A. Gutmann asked who is responsible for harm done and for putting the aquifer back in the condition that it was before mining began.

**Response 147:** If the permit is approved and mining is conducted, the commission will require UEC to perform aquifer restoration in accordance with the requirements of 30 TAC § 331.107. Under these requirements, the operator is required to restore the mined aquifer to the restoration values of the PAA determined under 30 TAC § 331.104.

The rules allow for amendment of restoration table values under 30 TAC § 331.107(f). If the operator cannot achieve the restoration values, the operator may request amendment of the

restoration values for groundwater constituents. In determining whether to grant an amendment of restoration values, the commission considers: uses for which the groundwater was suitable at baseline water quality levels; actual existing use of groundwater in the area prior to and during mining; potential future use of groundwater of baseline quality and proposed restoration quality; the effort made by the permittee to restore groundwater; technology available to restore groundwater for the particular parameters; the ability of existing technology to restore groundwater to baseline quality; the cost of further restoration efforts; the consumption of groundwater resources during further restoration; and the harmful effects of levels of a particular parameter. Under 30 TAC § 331.107(f)(2), the commission may amend the restoration table values of the PAA if it finds that: reasonable restoration efforts have been undertaken; the values for the parameters 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; and further restoration efforts would consume energy, water, or other natural resources of the state without providing a corresponding benefit to the state.

**Comment 148:** GCGCD, Larry and Maggie Christ, Wayne and Margie Smith, Carol Warren and Robin Sherwood commented that TCEQ must consider failures of previous *in situ* leach mining operations to restore the groundwater.

**Response 148:** The Executive Director reviews application materials to determine if the application meets the statutory and rule requirements. Commission rules do not authorize the Executive Director to consider performance of other operations except those included in the applicant's compliance history.

The Executive Director is not aware of an instance in which a permittee violated applicable permits and rule requirements regarding groundwater restoration. However, the requirements themselves have been revised in the past, often to reflect higher values of some constituents than were present prior to mining activities. This will be discussed in more detail in the following responses.

**Comment 149:** Several commenters noted that no uranium mining operation has ever returned the aquifer to pre-mining conditions and, in most cases, requirements were relaxed by the regulating agency in order for the mining company to exit operations. Lara Cushing asked why TCEQ modified permits for 32 *in situ* mines in South Texas, allowing for decreased cleanup standards and how Goliad residents can be assured it won't happen in this case. Larry and Maggie Christ asked how successful restoration has been in other places where *in situ* mining has taken place and requested a detailed list and locations. Kirk Klinkerman asked if it is true that most *in situ* uranium mines are restored to contamination levels above the site pre-permit levels. Peter Hughes asked for safety facts and statistics on cleanup after a mining process such as the one proposed.

**Response 149:** The Executive Director acknowledges that mining companies have not always succeeded in restoring groundwater in mined aquifers to pre-mining conditions, and that the commission has approved amendments to restoration values of production area authorizations for various constituents and parameters in the groundwater. Data from aquifer restoration efforts at other *in situ* mining operations in South Texas confirm that restoration to determined pre-mining groundwater conditions for all constituents and parameters has been achieved at one production area on one of these sites. Restoration efforts all other sites improved groundwater quality by lowering the concentrations of constituents and have reduced the radioactivity associated with radionuclides in the groundwater, but not all were lowered to pre-mining levels, despite continued efforts by site operators. Eventually, at each of these sites, a decision had to be made as to whether continued restoration efforts (and continued energy and water use) justified small improvements in water quality within the portion of the aquifer being restored. If the operator cannot achieve the restoration table values, the operator may seek an amendment of the PAA.

Restoration table values have been amended pursuant to an application to amend the production area authorization through the process established in 30 TAC § 331.107(f)(1) and (2). An application to amend the restoration table values of a PAA is subject to public notice, opportunity to provide public comment, and an opportunity to request a contested case hearing.

The Executive Director's staff has developed some preliminary data on restoration table values at other sites and provides this as Attachment A. This is not intended to be a comprehensive study of all amendments and has not been checked against historic records.

**Comment 150:** Robin Sherwood commented that standards for restoration should never be lowered and the practice should be eliminated. Venice Scheurich asked if regulations have been changed so it is no longer legally possible to change restoration table values and if not, how TCEQ plans to avoid relaxing standards for groundwater restoration when a mining company makes such a request in the future.

**Response 150:** 30 TAC § 331.07(f)(1) establishes a process for amending restoration table values. Values may be amended after considering several factors, listed in Response 140, above.

**Comment 151:** Jim Kreneck and Robin Sherwood asked, if there is a price drop in uranium and it is no longer profitable to continue mining, or, if the mining company goes bankrupt and the bond money is spent, who will be responsible for the restoration of the aquifer?

**Response 151:** The permittee is required to comply with the permit and rule requirements to restore the aquifer regardless of economic conditions. Financial assurance funds are available if the permittee fails to perform restoration activities. The permittee cannot spend this money until it is released to the permittee by the TCEQ. Financial assurance funds will not be released until restoration activities are completed and the site is closed. If the permittee goes bankrupt, the

TCEQ can use this money to perform cleanup activities. The amount of financial assurance is based on cost estimates for the State to hire a third-party to conduct restoration activities.

## U. Financial Assurance, Bankruptcy, and other Liability Concerns

**Comment 152:** Several commenters had questions and concerns about the form, amount, and use of financial assurance mechanisms required for a Type III UIC well. Donna Hoffman commented that bonding must be done to ensure that money to clean up is available and then in the past, the money has been used to bail companies out when they go bankrupt. Ashley Duderstadt commented that the financial assurance regulations are generally inadequate. Raymond G. Decker and Cathy Brunicardi commented that the bonds required are not in line with what is at stake. Raymond and Karon Arnold commented that if UEC put up a multibillion dollar bond, its credibility would increase. Kathleen Jackson asked what the amount of UEC's bond is. William V. Hill, Jr. asked whether financial assurance is in the form of an actual bond or just a formal paper from the corporation.

**Response 152:** Financial assurance is a funding source to provide money or assurance to the TCEQ to close the wells should the permittee fail to plug and abandon the wells when required to do so. The financial assurance requirements for the injection well program are found in 30 TAC §§ 331.142-144 and 30 TAC Chapter 37. These rules are consistent with United States Environmental Protection Agency (EPA) requirements as the state of Texas implements an approved Underground Injection Control program under the federal Safe Drinking Water Act. Financial assurance is required for plugging and abandonment of the wells used for *in situ* recovery of uranium. Evidence of the financial assurance must be submitted at least 60 days prior to commencement of drilling operations for new wells or 30 days prior to permit issuance for previously constructed wells. Acceptable financial assurance mechanisms include a trust fund, payment bond, performance bond, irrevocable standby letter of credit, insurance, financial test; or corporate guarantee. The cost estimate used by UEC in Section 13 of their application of $1.10/foot for a total estimate of $878,460 is a cost estimate that has proven to be acceptable for establishing financial assurance for plugging and abandonment of Class III wells. The amount of financial assurance required will be determined for each production area authorization. Once the initial amount is determined, the draft permit requires that the amount of financial assurance be updated annually to reflect changes in costs of material and labor. In addition, the radioactive materials license required for recovery of uranium will also require financial assurance for decommissioning and groundwater restoration. The applicant has not yet applied for this license. Liability coverage is not required under the injection well permit or under the radioactive materials license.

**Comment 153:** Several commenters asked about the Applicant's responsibility to compensate members of the community or pay for private well remediation should contamination or other damage, including damage to health of humans or animals, occur as a result of the mining

operations. William V. Hill, Jr. asked what legal remedy is available for parties injured once the corporation ceases to exist.

**Response 153:** The TCEQ does not require liability coverage or require a permittee to set aside funding to reimburse residents or landowners in the event of contamination, property damage, or personal injury. Financial assurance is required by a permittee to provide funding to plug and abandon wells, and the radioactive materials license requires financial assurance for decommissioning and groundwater restoration. This financial assurance is available to the TCEQ should the permittee/licensee fail to perform the required activity. The TCEQ would not release a financial assurance mechanism until the permittee/licensee has performed the required activity such that the financial assurance is no longer needed.

The permittee may be subject to civil liability for damages caused to residents or landowners. The draft permit specifically provides that the permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations. The TCEQ does not have jurisdiction over the award of civil damages from injury to persons or property and cannot establish the remedies that may be available to an injured person should a corporation dissolve or otherwise cease to exist.

**Comment 154:** Kathleen Jackson asked what happens if UEC sells all its holdings in Goliad County before all rules are followed. Several commenters asked what will happen if UEC goes bankrupt and who will pay for cleanup in that event.

**Response 154:** The draft permit references TCEQ rules that require the permittee to notify the Executive Director in the event of the permittee's filing in bankruptcy.[120] Financial assurance is a funding source available to the TCEQ in the event of the permittee's bankruptcy or other condition that indicates that the permittee is unable or unwilling to perform required activities. The financial assurance mechanisms must comply with the requirements of 30 TAC Chapter 37 and are structured so that the TCEQ should not have to participate in a bankruptcy proceeding to call upon the financial assurance in the event that the permittee fails to perform the required activity.

In the event that UEC sells its assets to another company, the permit must be transferred to that company. A transfer of a permit requires formal approval by the TCEQ, and the TCEQ would not approve a transfer until arrangements for transferring financial assurance have been provided. Should UEC sell their operation to another company, UEC would not be released from this financial assurance until the new company provided financial assurance for these activities.

[120] 30 TAC § 305.125(22), incorporated by reference at Section VIII. A. 2. of the Draft Permit.

**Comment 155:** Carol Warren commented that historically, companies abandon sites and let taxpayers clean up. Robin Sherwood stated that the history of the uranium mining companies in Texas, and elsewhere, is to set aside a diminishing bond, use it up upon completion of mining out the area, run out of money, declare bankruptcy and abandon the site.

**Response 155:** The Executive Director is not aware of an *in situ* uranium recovery facility in Texas that has been abandoned by the permittee and left to taxpayers to clean up. Financial assurance is required as a source of funding to plug and abandon wells, decommission, and restore groundwater should the permittee/licensee fail to do so.

**Comment 156:** Laura Cushing asked why the financial assurance provision for funding restoration that is in place now was not adequate to ensure that the aquifer in Kleberg County was restored and asked how TCEQ can assure the Goliad community that a similar situation will not occur in Goliad County.

**Response 156:** The financial assurance for groundwater restoration of the permitted and licensed *in situ* uranium recovery facility in Kleberg County is adequate to provide funds to the TCEQ to restore the groundwater at the site should the permittee/licensee (URI, Inc.) fail to do so. In October 2000, the TCEQ, the Department of State Health Services (DSHS), URI, and URI's surety, USF&G, entered into an agreement to ensure that URI continued groundwater restoration during a period when URI was unable to fund restoration with the proceeds of uranium sales. Under the agreement, URI continued groundwater restoration at the Kingsville Dome (Kleberg County) and Rosita Mines (Duval County) using funds from collateral that URI posted with USF&G. The DSHS, in turn, reduced the performance bonds issued by USF&G based on the restoration performed by URI. Three subsequent extension agreements were entered into to ensure continued groundwater restoration of the mines. All of the agreements have expired, and URI has subsequently re-posted additional financial assurance to cover all groundwater restoration obligations. In 2007, legislation transferred the licensing program for *in situ* recovery of uranium from DSHS to the TCEQ. The agreements made with URI were based on the specific circumstances and details of the financial assurance and groundwater restoration requirements for the URI mines. The Executive Director does not expect to enter similar arrangements with permittees/licensees in the future.

**Comment 157:** Some commenters asked why TCEQ would give a mining permit to a company that is already millions of dollars in the red and asked how the company can possibly clean up contaminated groundwater when they are broke.

**Response 157:** The Executive Director does not review an applicant's business model or financial qualifications as part of the review of an injection well permit application, although the ability to provide acceptable financial assurance does demonstrate some financial capability. The draft permit incorporates TCEQ rule in 30 TAC § 305.125(5) which requires the permittee to operate and maintain all facilities and systems of treatment and control to achieve compliance

with the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operating staffing and training, and adequate laboratory and process controls. When mining is completed, the permittee is required to restore the groundwater in accordance with the requirements of 30 TAC § 331.107(b) regardless of the permittee's financial status. Financial assurance for groundwater restoration is required under the radioactive materials license for *in situ* recovery of uranium and would be a source of funding available to the TCEQ should the licensee fail to perform the required restoration.

**Comment 158:** Gregory C. Chapman asked, by approving an activity that may damage the environment, if TCEQ agrees that the agency can be sued in a court of law for damages for approving the permit.

**Response 158:** Persons harmed by a decision of the TCEQ to issue a permit can appeal that decision to the a district court in Travis County.[121] The TCEQ does not agree to waive any of its rights, immunities, or privileges in granting a permit.

## V. Compliance History

**Comment 159:** Several commenters expressed concerns about UEC's compliance with Texas Railroad Commission rules during exploration activities at the site. Lynn and Ginger Cook asked whether the TCEQ requests a compliance history from the Texas Railroad Commission, and if not, why not? The Cooks commented that this should be included as part of the permit application and would provide a performance history of the company. Debby Brumby noted that UEC was cited by the RRC for uncased exploration boreholes drilled into the drinking water aquifers that were not restored, which she states is a breach of trust. The Cooks and Mark Kruger commented that UEC's violations of RRC rules show that it does not respect the rules and the environment and should be viewed as an indicator of non-compliance. Pat Calhoun and Brenda Jo Hardt stated that leaving boreholes open and cuttings on the surface, improper backfilling of mudpits, and too-deep surface plugs were not accidents and Carl Duderstadt commented that unplugged boreholes resulted in contamination of groundwater and therefore his family's well. David P. and Carol C. Warren, Ds.V.M., commented that exploration activities have already caused surface damage. GCGCD cites RRC reports on permit No. 123 site violations and elevated gamma radiation contamination on the surface covered with a minimum of one foot of new top soil as evidence that *in situ* leach mining cannot be done safely in Goliad County. Margaret Rutherford asked if all exploration sites were inspected by the RRC and Kathleen Jackson asked what fines were levied for violations found by the RRC.

**Response 159:** Texas Water Code § 27.051 requires the commission to find that the use or installation of the proposed injection well is in the public interest prior to granting an

[121] Tex. Water Code § 5.351.

application.[122] In determining whether the well is the public interest, the commission must consider the compliance history of the applicant and related entities.[123] As required by statute, the commission has established a procedure for the preparation of comprehensive summaries of an applicant's compliance history, including the compliance history of any corporation or business entity managed, owned, or otherwise closely related to an applicant.[124] The commission's compliance history rules are contained in 30 Texas Administrative Code Chapter 60. The compliance period that is reviewed consists of the five years prior to the date the permit application is received.[125] The components of the compliance history are specified in statute and rules and include any final enforcement orders, court judgments, consent decrees, and criminal convictions of this state and the federal government relating to compliance with applicable legal requirements under the jurisdiction of the commission or the EPA.[126] Under the current rules, the compliance history does not include information related to compliance with legal requirements under the jurisdiction of another state agency, such as the Texas Railroad Commission. Therefore, the Executive Director is not authorized to consider the applicant's compliance history with the RRC as part of his review of the permit application.

**Comment 160:** Robin Sherwood cited www.coalsectorstocks.com information about Harry Anthony's uranium mining operation in the Czech Republic and asked, based on that history, why TCEQ is considering issuing this permit.

**Response 160:** The compliance history TCEQ may consider when determining whether or not to issue a permit is described in Texas Water Code § 5.753 and 30 TAC § 60.1. The components do not include compliance of projects in foreign jurisdictions such as the Czech Republic, only compliance with environmental laws of the State of Texas, other states' environmental rules, and the EPA. Therefore, the Executive Director is not authorized under the rules to consider an applicant's history there. It is the Executive Director understanding that the regulations for *in situ* mining in the Czech Republic differ significantly from those in the United States and Texas in that they allow injection of acids to free uranium deposits, whereas the U.S. and Texas do not.

**Comment 161:** G.A. Gutmann asked if UEC has a good track record of doing what they say they will do when it comes to cleaning up a mined area and bringing the aquifer back to its original state. Jim Blackburn commented that the applicant should be required to provide its compliance history dating back to the 1980's when certain employees were involved in other *in situ* uranium mining activities.

**Response 161:** Because UEC is a relatively new company, it has no history of operations in Texas. As stated above, the commission has established a procedure for the preparation of

[122] Tex. Water Code § 27.051(a)(1).
[123] Tex. Water Code § 27.051(d)(1).
[124] Tex. Water Code § 27.051(e).
[125] 30 TAC § 60.1(b).
[126] Tex. Water Code § 5.753(b)(1), 30 TAC § 60.1(c).

comprehensive summaries of an applicant's compliance history, which includes the compliance history of any corporation or business entity managed, owned, or otherwise closely related to an applicant and consists of the five years prior to the date the permit application is received.

**Comment 162:** Jim Blackburn suggested that the rules found at 30 TAC § 331.220 regarding compliance history should be applied to this permit application.

**Response 162:** The rules to which Mr. Blackburn refers only apply to applications submitted or pending on or after May 26, 2001, and before September 1, 2002.[127] UEC's application was filed August 7, 2007, therefore, these rules are not legally applicable to this application.

## W. Enforcement: Inspections and Penalties

**Comment 163:** Lynn and Ginger Cook asked who is responsible for production site and processing facility inspections, and what components are checked and with what frequency. Mr. and Mrs. John H. Dreier asked what the inspection frequency will be once mining starts. Kathleen Jackson asked what is included in the on-site TCEQ inspection, and if it is a public record.

**Response 163:** The processing facility and site of a uranium recovery operation are authorized under a radioactive materials license issued by the TCEQ. The regulatory responsibility for processing facilities transferred from the Texas Department of State Health Services to TCEQ in 2007 under Senate Bill 1604. UEC has not yet applied for a radioactive materials license. If the license is issued, TCEQ will be responsible for inspecting the production site and processing facility. Other agencies, such as the Occupational Safety and Health Administration (OSHA) and the RRC (for exploration boreholes) may also be responsible for inspections.

During an on-site inspection, TCEQ investigators will verify the permittee's compliance with all applicable rules and permit conditions. This includes reviewing monitoring requirements, operational requirements, reporting requirements, and recordkeeping requirements. The TCEQ also conducts a facility area inspection to witness the permittee's operations, including interviews with workers. For verification purposes, groundwater or wastewater sampling will be conducted by the TCEQ investigators when needed. The TCEQ will also inspect the permittee's on-site laboratory and witness the permittee's sampling analyses. In addition, the TCEQ investigators will verify the permittee's compliance with the solid waste management program, used oil management program, and aboveground and underground storage tank rules. At the conclusion of an investigation, the TCEQ investigator will prepare an inspection report. A final TCEQ inspection report is a public record and may be requested under the Public Information Act.

[127] 30 TAC § 331.120(a).

The TCEQ will make every effort to adhere to at least a yearly inspection. Inspections may be conducted more frequently if there is a citizen complaint or special circumstances which warrant increased inspections.

**Comment 164:** John B. and Wanda Duke asked who will conduct tests of water, air, and soil in the mining area and how it will be done.

**Response 164:** All required testing is the responsibility of the permit holder. Samples taken by TCEQ inspectors during routine or complaint-based investigations will be tested by the TCEQ or an accredited environmental testing laboratory under contract with the Executive Director. How such tests will be conducted is difficult to answer because there are a variety of types of tests that can fulfill many different sampling, monitoring and testing requirements. As a general rule, environmental sampling is conducted pursuant to TCEQ and EPA approved guidance with respect to techniques, equipment, and timing and depends on the media and parameter that is being measured. The TCEQ reviews the results of all tests that are required to be submitted to the agency.

**Comment 165:** Margaret Rutherford asked if TCEQ will be able to afford to test the soil as needed during and after mining.

**Response 165:** The TCEQ can conduct any sampling and analysis necessary to fulfill its responsibilities regarding oversight of this proposed operation.

**Comment 166:** Rob Baiamonte expressed concern regarding monitoring of the mining process, in part due to the RRC's inability to find all the boreholes during its inspection, and asked how monitoring of boreholes will be done during mining.

**Response 166:** All monitor and baseline wells must be identified in the production area authorization, which is needed for each production area to be mined. Injection and production wells are not individually identified in the permit or the production area authorization. However, the permittee must maintain onsite information regarding each of these wells, and must make this information available to the Executive Director on request. The permittee must confine mining solutions to the production zone. Corrective action to prevent or correct pollution of an underground source of drinking water, fresh water or surface water would be required under 30 TAC 331.44 if a well or unplugged borehole that might pose a hazard to a USDW or a freshwater aquifer is discovered by the permittee or by the TCEQ during an on-site inspection.

**Comment 167:** Several commenters expressed concerns regarding testing their private drinking water wells for contamination. Mr. and Mrs. Carl E. Jenkins, Shirley D. Smith and Dora Altman asked who will pay for testing of private wells and if TCEQ will pay to have their wells tested regularly to ensure safety from uranium, radium-226, arsenic and other carcinogens. Mr.

and Mrs. Jenkins also asked if residents will be forced to re-test their wells to be sure they are not contaminated and if so, how often.

**Response 167:** The TCEQ does not regulate private drinking water wells and does not have the authority to require private well owners to test their wells. Monitoring water quality in a private well is the responsibility of the well owner. The rules do not require the permittee to test or monitor any wells off-site. The cost of groundwater monitoring that is required under 30 TAC §§ 331.103 and 331.105 is the responsibility of the permittee. Monitoring of water quality in a private well is the decision of the well owner. The cost of sampling a private well would be paid by the well owner. The executive director notes that as discussed in previous responses, protection of groundwater in the vicinity of a mining site is the purpose of the requirements in 30 TAC Chapter 331 that apply to *in situ* mining. That is to say, the purpose of these rules is to prevent injected fluids from migrating from the production zone in the production area, and, if any such migration of mining fluids does occur, to ensure that it is promptly detected and addressed so that no off-site contamination occurs.

**Comment 168:** Some commenters asked if TCEQ will monitor the air for radon emissions.

**Response 168:** TCEQ will not monitor the air for radon emissions. The TCEQ's underground injection control program requirements, the pending permit injection well permit application, and the proposed draft permit do not address radon emissions or radon monitoring. Radon emissions and radon monitoring are considered under a radioactive material license required for uranium recovery. An applicant for a radioactive materials license may be required to monitor for radon as a condition of its license. UEC has not yet applied for this required license.

**Comment 169:** Raymond G. Decker and Cathy Brunicardi stated that based on current damage by UEC to Goliad groundwater and Harry Anthony's track record in Kleburg County, they question the State's ability (resources) and commitment to adequately monitor in-situ uranium mining. Gene and Reta Brown asked if TCEQ has the manpower to monitor the operation on a daily basis and if the monitoring and inspections by TCEQ are of the caliber to guarantee the people in the area will not be affected by the operation. Larry Christ asked who will be monitoring the mining operations itself and how often, and stated that once or twice a year is "totally unacceptable." Elizabeth Haun Beard commented that monitoring must be constant.

**Response 169:** The TCEQ has adequate resources and ability to review permit and license applications, inspect facilities, and enforce the requirements for *in situ* uranium recovery. The TCEQ inspects these types of facilities at least once a year. All citizen complaints are investigated promptly. The TCEQ does not maintain a permanent resident inspector for *in situ* uranium recovery operations and does not make daily inspections.

**Comment 170:** Raymond and Karon Arnold asked if TCEQ has trained monitoring personnel on the ground ready to move and the resources to fund their work. William V. Hill asked what the educational, scientific, and technical qualifications of the TCEQ inspectors are.

**Response 170:** The TCEQ has trained professional staff members in the central office and in sixteen regional offices who provide routine investigations, respond to citizen complaints, and perform emergency environmental response. Minimum qualification for the TCEQ environmental investigators is a bachelor's degree from an accredited college or university with a major in a natural or physical science, engineering, environmental studies, or related fields. In addition, each TCEQ investigator maintains a Professional Development Plans (PDP) in accordance with agency policy. TCEQ training courses and on-the-job training are also provided to the TCEQ investigator. The TCEQ has the resources to fund investigators' work.

**Comment 171:** Carol Warren asked if there is an alternative way for the citizens to protect *themselves*, rather than relying on the state to protect them through enforcement.

**Response 171:** While private citizens are not authorized to enforce the regulations under TCEQ's jurisdiction, individuals are encouraged to report any concerns or suspected noncompliance with the terms of any permit or environmental regulation to the TCEQ by contacting the Corpus Christi Regional Office at 361-825-3100, or by calling the 24-hour toll-free Environmental Complaints Hotline at 1-888-777-3186. The TCEQ investigates all complaints received in a timely manner. If the facility is found to be out of compliance with the terms and conditions of its permit, it will be subject to enforcement action.

In addition, the fact that a person has an injection well permit does not relieve the person of any civil liability. The issuance of the permit does not authorize any injury to persons or property or an invasion of property rights, or any infringement of state or local law or regulations. Individuals may protect their rights by contacting local law enforcement or seeking redress in a civil legal proceeding.

**Comment 172:** Sister Riebschlaeger, Lynn and Ginger Cook, and Robin Sherwood all expressed concern with TCEQ's reliance on self-monitoring and self-reporting by the permittee. Sister Riebschlaeger commented that self- reporting is inadequate for monitoring and enforcement and that TCEQ should be doing the monitoring because it is TCEQ's charge to protect the health and safety of people and the environment. She noted that if we don't make our own policy regarding self-monitoring and self-reporting, the people need to petition their legislative bodies to make the change. Robin Sherwood asked if the TCEQ notes a conflict with allowing the companies to "police and report" themselves, and if not, to explain.

**Response 172:** Self-reporting is an aspect of all TCEQ programs. The Executive Director recognizes the perception of a conflict of interest in self-reporting. However, it is not practically or financially possible for the TCEQ to physically collect samples and analyze them for every

regulated facility with the frequency required by the many programs under its jurisdiction. Fortunately, there are several safeguards in place to help ensure the validity of information submitted under self-reporting. First, all analytical data submitted to the TCEQ by a regulated person must be certified as being true and correct; falsification of any data constitutes fraud and could subject the permittee to enforcement and criminal prosecution. Second, analytical data submitted to the TCEQ must be from laboratories that meet the accreditation requirements of 30 TAC Chapter 25. Third, all data is reviewed by the TCEQ; any apparent inconsistencies would be investigated. Fourth, TCEQ periodically collects samples at facilities and has them analyzed at the Texas Department of State Health Services laboratory in Austin, Texas. Lastly, all information associated with sampling is in the public record and available to anyone who wishes to inspect it.

**Comment 173:** Carol Warren asked if there are severe penalties for noncompliance and how TCEQ can force the permittee to comply. Lynn and Ginger Cook asked whether a fine is imposed if a company is found to be in violation and how the amount of the fine is determined. Mr. and Mrs. John H. Dreier asked if there are penalties in place and who will enforce and collect them. Robin Sherwood commented that TCEQ should implement fines commensurate with violations and called the current fines "horribly inadequate." Raymond G. Decker and Cathy Brunicardi ask why the fines are not high enough to serve as an incentive to comply with environmental guidelines. Kathleen Jackson asked if TCEQ has the power to levy fines for violations committed by UEC. John W. Caldwell stated that punitive penalties should be established.

**Response 173:** The TCEQ enforces the permit and rule requirements and can initiate an enforcement action which may result in the issuance of an enforcement order. An enforcement order requires payment of a fine and if appropriate, sets out corrective actions the permittee must take to come into compliance. The TCEQ may seek administrative penalties of up to $10,000 a day for each violation and civil penalties of up to $25,000 a day for each violation.[128] If the permittee fails to remit the fine imposed, the case is referred to the Texas Office of the Attorney General for collection. Failure to comply with an ordering provision for corrective action is an independent violation and can result in additional enforcement actions at the TCEQ. Also, the TCEQ can refer a case to the Office of the Attorney General, who may pursue an injunction to require the permittee to perform the corrective actions in its TCEQ enforcement order.

The amount of the fine imposed in an enforcement case is determined by using the TCEQ Penalty Policy in force at the time the violation is screened by the enforcement division. The current Penalty Policy is available to the public on TCEQ's website at http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/rg/rg-253/.

[128] Tex. Water Code §§ 7.052, 7.102.

In addition to administrative penalties, a person may also be subject to criminal liability for knowingly or intentionally violating a requirement of the Injection Well Act, a requirement of TCEQ rule, or a TCEQ permit.[129]

## X. Miscellaneous

**Comment 174:** Joan S. Folks commented that she cannot understand why the TCEQ would consider issuing a permit to a private corporation that is only interested in profit rather than the harm it may cause the community.

**Response 174:** The mission of the TCEQ is to protect our state's human and natural resources consistent with sustainable economic development. This mission recognizes that for-profit industries are vital to the state, as they are part of its economic development. Therefore, laws and rules are carefully drafted to protect human health and the environment without prohibiting activities that can be conducted safely under strict regulation. The legislature, in Texas Water Code Chapter 27, specifically authorizes issuance of permits for uranium mining activities without regard to whether or not the applicant is a private, for-profit corporation, but also provides for substantial regulation. Because administrative fines up to $10,000 per day may be imposed for each violation, the permittee has a financial disincentive to violate rules that may harm the community.

**Comment 175:** Venice Scheurich commented that the Gulf Coast Aquifer belongs to all Texans, not just those who lease their land to mining companies. Robin Sherwood asked why UEC was allowed to lease land for potential uranium mining in this area. Shirley D. Smith expressed concern that she cannot keep others from leasing land to the uranium company. Judy Scott commented that many of the people who leased their land to UEC do not live on it and are making money at the expense of the farmers and ranchers who live on and depend on the land.

**Response 175:** The TCEQ does not regulate or enforce leases for mineral interests below private property. A property owner generally has a right to explore and develop mineral deposits underneath his or her own property.

**Comment 176:** GCGCD commented that if the permit is issued, it demands that UEC be subject to the rules of the GCGCD.

**Response 176:** The TCEQ does not have the authority to enforce the GCGCD's rules or to make the permittee subject to those rules, should the permit be issued. Groundwater

[129] Tex. Water Code § 7.157.

conservation districts do not have the statutory authority to regulate groundwater use for uranium mining activities.[130]

**Comment 177:** Pat Calhoun noted that Section 9.5 of the application ("Rain and Emergency Operations") addresses rainfall captured in a 25-year rain event of 8.5 inches in a 24-hour period and asked what would happen if this is exceeded.

**Response 177:** In Section 9.5 of the application, UEC provided information to address design storage capacity, and assumed rainfall from a 25-year rain event. In TCEQ's UIC Technical Guidance III, use of a 10-year, 24-hour rain event is suggested for estimating storage capacity for rainfall. The expected working life of an *in situ* uranium mine is less than 25 years. Certainly more rainfall could occur, but this amount is a reasonable assumption for estimating storage capacity for rainfall. An application for a radioactive materials license and an application for a waste disposal injection well permit must provide specific details on wastewater management, including rainfall events and disposal capacity.[131]

**Comment 178:** Pat Calhoun noted that the application states that a conservative assumption of rainfall is 2.5 inches per month and asked how TCEQ can consider this conservative when the average rainfall for several months of the year exceeds 5 inches per month.

**Response 178:** According to Texas Parks and Wildlife (map titled Precipitation in Texas), the average annual rainfall in Goliad County is about 34 inches. This amount is similar to the average monthly rainfall based on data provided on the Goliad County Groundwater Conservation District website.[132] This data (1913-2007) indicates an average annual rainfall of 34.77 inches for Goliad County, or an average monthly rainfall of 2.9 inches. This information indicates UEC's assumption of 2.5 inches a month is not conservative. However, the Executive Director notes the 2.5 inches a month is an assumption for estimating fluid handling capacity versus fluid disposal requirements; it is not for determining storage capacity for a single large rain event (this was discussed in the previous response in regard to an assumed 8.5-inch rain over a 24-hour period).[133] The Executive Director also notes that based on information provided in Table 10.1 of UEC's application, the minimum amount of excess disposal capacity available for any single month during operations is 129,000 gallons. An application for a radioactive materials license and an application for a waste disposal injection well permit must provide specific details on wastewater management, including rainfall events, storm water management and disposal

[130] Tex. Water Code § 36.117(l).
[131] Rules regarding radioactive materials licenses are in 30 TAC Chapter 336; rules regarding Class I injection wells are in 30 TAC Chapter 331. General application requirements are in 30 TAC Chapter 305.
[132] http://www.goliadcogcd.org/
[133] The analysis regarding the fluid handling capacity at a proposed facility is necessary for the executive director to determine if the applicant for a Class III injection well area permit can meet the schedule in the proposed mine plan, which is required under 30 TAC § 305.49(b)(1).

capacity. UEC submitted an application for a Class I waste disposal well on September 23, 2008, but has not yet submitted an application for a radioactive materials license.

**Comment 179:** Lynn and Ginger Cook commented that the site plan calls for storage for 25-year rain event, however, they believe there will be greater flood and major storm events, in which case, this will not be protective of human health and safety. They ask: Do regulations call for 25-year rain event? What happens in 100-year rain event? A 500-year rain event?

**Response 179:** There is no rule requirement under the underground injection control rules in 30 TAC Chapter 331 regarding design storage for handling of rainfall in the process area. In TCEQ's UIC Technical Guidance III, use of a 10-year, 24-hour rain event is suggested for estimating storage capacity for rainfall. Operating procedures for the processing plant area, including those for the handling of rainfall, are addressed in the Radioactive Material License, which is required for the design, construction, and closure of the processing plant. UEC has not yet applied for this required license.

**Comment 180:** Pat Calhoun and Lynn and Ginger Cook asked what procedures are in place if an excursion takes place during a rain event.

**Response 180:** The requirements for addressing an excursion are in 30 TAC § 331.106. The same requirements apply during a rain event.

**Comment 181:** Pat Calhoun noted that UEC plans to permit two Class I nonhazardous disposal wells and asked what the justification is for the nonhazardous classification when during dry months the injected fluid can be only the reverse osmosis brine which can contain toxic elements above the EPA drinking water standards.

**Response 181:** Fluid disposed in the proposed Class I wells will include production bleed water, reverse osmosis brine, and other fluids generated at the processing facility. These fluids are wastes produced by or resulting from the extraction or concentration of uranium from ore and are classified as by-product material.[134] Under 40 CFR § 261.4(a)(4), byproduct material is excluded from classification as a solid waste. And, under EPA's definition of hazardous waste in 40 CFR § 261.3, only solid wastes are classified as hazardous wastes. Therefore, byproduct waste cannot fall under the category of hazardous waste under RCRA.

Under 30 TAC § 331.11, radioactive waste, such as the byproduct wastewater described above, is specifically authorized for injection into a Class I disposal well. Injection in a Class I disposal well must be below the lowermost underground source of drinking water. UEC submitted an application for a Class I injection well permit on September 23, 2008. This application is

[134] 30 TAC § 336.2(16).

processed separately from the pending Class III injection well permit application and is subject to opportunities to submit public comments and request a contested case hearing.

**Comment 182:** Rob Baiamonte asked if the application for the Class I nonhazardous well is based on Table 9.1, which reports estimated byproduct wastewater composition. He also asked, if Table 9.1 is a poor estimate of the wastewater composition and this cannot be achieved resulting in hazardous composition, who monitors for that event and is the permit still valid.

**Response 182:** Table 9.1 of the application is not part of the Class I injection well permit application. The information in Table 9.1 of UEC's application is for a typical wastewater generated at a Class III injection well operation in Texas. Class I wells must meet all applicable design and operating requirements in 30 TAC Chapter 331, regardless of the composition of the fluid to be injected. An application for a Class I injection well must include information on the type of wastes to be injected, and the well materials must be compatible with that waste. UEC submitted an application for a Class I injection well permit on September 23, 2008. A Class I injection well permit establishes the types of waste and waste characteristics that are authorized for injection.

**Comment 183:** Kenneth W. Buelter noted that UEC's application states that wastewater and non-hazardous solid waste mining tails will be disposed in a Class 1 injection well. He stated that according to textual references from the Code of Federal Regulations (CFR), the Naturally Occurring or Accelerated Produced Radioactive Material (NARM) waste tails that UEC produces in their mining process are not eligible for exemption and must be handled as hazardous waste. Therefore, he concluded that UEC is probably in violation of the Resource Conservation and Recovery Act (RCRA). He asked the TCEQ to provide documentation as to how UEC meets the requirements of this section of RCRA and whether or not UEC has either a State or Nuclear Regulatory Commission (NRC) license that states how they will handle these wastes properly to prevent harm to the environment.

**Response 183:** The Executive Director does not agree that wastewaters produced at an *in situ* uranium recovery operation are regulated as hazardous wastes. The two wastes that will be generated at the site are a wastewater and a solid material. This wastewater is the bleed water and the brine from the reverse osmosis unit. UEC proposes to dispose of wastewaters in one of two planned onsite Class I injection wells. In Table 9.1 on page 9-12 of the application, UEC provides typical concentrations of various constituents in a byproduct wastewater generated at an *in situ* uranium mining facility. The second waste generated during this process is a solid material ("tails") that results from the processing of the mining fluids and the production of the uranium yellow cake. Storage of this waste at the site must be addressed in a radioactive materials license. This waste will be shipped to an authorized off-site disposal facility. These waste materials are not classified and regulated as Naturally Occurring or Accelerated Produced Radioactive Material (NARM). Both the wastewater and the solid material are classified as "by-product material." Under the federal Atomic Energy Act and the Texas Radiation Control Act,

by-product material is defined as the tailings or wastes produced by or resulting from the extraction or concentration of uranium or thorium from ore processed primarily for its source material content. [135]

Under 40 CFR § 261.4(a)(4), byproduct material is excluded from classification as a solid waste. And, under EPA's definition of hazardous waste in 40 CFR § 261.3, only solid wastes are classified as hazardous wastes. Therefore, a hazardous waste permit under RCRA is not required for the treatment, storage and disposal of by-product material. Possession, processing and disposal of by-product material require a TCEQ radioactive materials license. UEC has not yet submitted an application for this license.

**Comment 184:** Mr. and Mrs. John H. Dreier asked whether TCEQ has certified pipeline inspectors on board to inspect and certify pipelines going from the processing plant to the disposal site and if it does, how often pipelines will be inspected. Mr. and Mrs. Dreier asked if TCEQ has specifications and requirements in place for all pipelines that will be laid, including rules concerning the crossing of streams with pipelines to avoid spills and contamination. Finally, they ask if TCEQ or a permit applicant has the power of eminent domain concerning the laying of pipelines across non-leased property or public roads.

**Response 184:** Requirements for any pipes or pipelines used to convey fluids to and from Class III wells are considered in an application for a radioactive materials license, which is required for a processing facility for recovery of uranium.[136] The TCEQ does not have eminent domain powers related to the placement of pipelines for *in situ* recovery of uranium. The applicant would be responsible for obtaining any property rights needed for placement of any pipelines. Furthermore, the proposed draft permit does not authorize any injury to persons or property or an invasion of other property rights, or any infringement of state or local law or regulations.

**Comment 185:** Mr. and Mrs. John H. Dreier asked if TCEQ has plans in place if a disposal well fails and the processing plant cannot dispose of bleed water.

**Response 185:** Wastewater management is also addressed by a radioactive materials license. UEC has not yet submitted an application for this required license. In addition, UEC will need a separate injection well permit to authorize the deep waste disposal well. As part of the application for a waste disposal well permit, an applicant must address contingency plans to deal with shut-ins or well failures to prevent migration of fluid into any wastewater disposal wells. Such contingency plans could include the use of a back-up waste disposal well or the maintaining of reserve wastewater storage capacity.

---

[135] 42 USCA § 2014(e)(2); Tex. Health and Safety Code § 401.003(3)(B).
[136] UEC has not submitted an application for a radioactive materials license.

**Comment 186:** Kenneth W. Buelter commented that UEC's application says they will use reverse osmosis (RO) to recycle and reuse water used in drilling process and that the process will recover ¾ of water used. However, he noted that this is a slow method that requires high pressure and works best with "clean" water streams, which is not what UEC will be trying to push through them. He stated that some websites say RO only recovers 5-15% of water and that this is in opposition to UEC's claim of recovering ¾. He asked the TCEQ to investigate the efficiency of the filtration systems UEC is going to use to ensure that this amount of good clean drinking water will not be wasted by the drilling process.

**Response 186:** The Executive Director is not aware of the use of reverse osmosis filtration in the drilling process. Reverse osmosis treatment will be used to treat mining fluids and in the restoration process. The use of a reverse osmosis unit to treat mining fluids is addressed in the application for a radioactive materials license, which is needed for operation of the processing facility. UEC has not yet submitted an application for a radioactive material license. Information regarding water use provided in Section 10 of the application is to address fluid handling capacity needed to meet the proposed schedule in the mine plan. In Section 12 of the application UEC proposes to conduct a restoration demonstration and submit a report on the demonstration. The Executive Director can review the efficiency of reverse osmosis filtration based on the results of the restoration demonstration.

**Comment 187: Expressed Support for Permit**
Sherilyn Arnecke, Bob Underdown, Kyle Lester, Raymond V. Carter, Jr., Robert W. Gaston and Sidney J. Braquet expressed support for the issuance of the requested permit. They cited various reasons including economic benefits to the region, use of the ore in diversifying energy sources, the abilities of the applicant's technical staff and management, the safety, efficiency, and non-invasive nature of *in situ* mining, the protections of the permitting process and regulatory oversight, the right to development of mineral interests, and personal observation that water quality on their own property has not been disturbed by exploration activities.

**Response 187:** The Executive Director acknowledges the support for issuance of the Class III injection well area permit.

**Comment 188: Requested Denial of Permit**
The following commenters specifically requested that TCEQ deny the permit application and/or the request for an aquifer exemption or stated that granting the permit and/or exemption would be contrary to the mission statement of TCEQ and a dereliction of its duty:
James Blackburn, on behalf of Goliad County, Donna Hoffman, Loretta Van Copenolle, Pat Calhoun, Lynn and Ginger Cook, GCGCD, Raymond and Karon Arnold, Dorothy and Emmett Albrecht, Robbie Boldt, Mrs. Harold Brandt, John W. and Pearl J. Caldwell, Larry and Maggie Christ, Ashley Duderstadt, Craig and LuAnn Duderstadt, Mr. and Mrs. Darwyn Duderstadt, Wilburn R. and Doris Duderstadt, Garland and Sherry Gloor, Brenda Jo Hardt, Annie Hardt, Laurie Hardt, Ernest Hausman, Mark Krueger, Janet Kreneck, Judy and Aubrey and J. Aubrey

Lenamon, Wayne and Margie Smith, Robin Sherwood, Kenneth Schustereit, Roland and Patty Thieme, Catherine West, Roy A. and Martha G. Ward, Raymond G. Decker and Cathy Brunicardi, Dora Altman, Mrs. S.G. Vaughn, Shirley D. Smith, Megan Duderstadt, Sam Rhotenberry, Belitha and Melvin H. McKinney, Thomas and Mary Anklam and Larry Lange.

**Response 188:** The Texas Injection Well Act and the TCEQ's Underground Injection Control Program rules specifically authorize the use of injection wells for the recovery of uranium. The TCEQ's rules allow the designation of an exempt aquifer (an aquifer or portion of an aquifer which meets the criteria for fresh water but which has been designated an exempted aquifer after notice and opportunity for public hearing) to authorize the use of injection wells. The executive director's staff reviewed UEC's Class III injection well permit application and request to designate an exempt aquifer and determined that the application meets all regulatory requirements. Based on this review, the executive director has recommended issuance of this permit and designation of the exempt aquifer. If the application is contested, the TCEQ commissioners will make the decision to approve or deny the permit and aquifer exemption designation. The aquifer exemption is not final until approved by the United States Environmental Protection Agency.

## V. Changes Made in Response to Comment

In response to comment, the Executive Director recommends modifying finding number eight of the proposed Exempted Aquifer Order to clarify that there are no existing wells that withdraw water for human consumption from the Goliad Formation within the designated area.

Respectfully submitted,

Texas Commission on Environmental Quality

Mark Vickery
Executive Director

Stephanie Bergeron Perdue, Deputy Director
Office of Legal Services

Shana L. Horton

Shana L. Horton, Staff Attorney
Environmental Law Division
State Bar No. 24041131
P.O. Box 13087, MC 173
Austin, Texas 78711-3087
(512) 239- 0600

Don Redmond

Don Redmond, Staff Attorney
Environmental Law Division
State Bar No. 24010336
P.O. Box 13087, MC 173
Austin, Texas 78711-3087
(512) 239- 0600

REPRESENTING THE
EXECUTIVE DIRECTOR OF THE
TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY