

**Texas Commission on Environmental Quality
INTEROFFICE MEMORANDUM**

TO: Office of Chief Clerk DATE: November 22, 2022

FROM: Clark Reeder
Staff Attorney
Environmental Law Division

SUBJECT: Backup Documents for the Consideration of Hearing Requests at
Agenda

Applicant: Uranium Energy Corp.
Proposed Permit No.: WDW423 and WDW424
Program: Office of Waste, Radioactive Materials Division
Docket No.: TCEQ Docket No. 2022-1553-WDW

Enclosed please find the following documents:

- Draft Permit WDW423
- Draft Permit WDW424
- Technical Summary and Executive Director's Preliminary Decision
- Executive Director's Response to Public Comments
- Compliance History



Permit No. WDW423

This permit supersedes
and replaces Permit
No. WDW423 issued
May 25, 2010.

Texas Commission on
Environmental Quality
Austin, Texas

Permit to Conduct
Class I Underground Injection
Under Provisions of Texas Water Code
Chapter 27 and Texas Health and Safety
Code Chapter 401

I. Permittee

Uranium Energy Corp.
500 N Shoreline Blvd. Ste. 800N
Corpus Christi, Texas 78401

II. Type of Permit

Initial _____ Renewal Amended

Commercial _____ Noncommercial

Hazardous _____ Nonhazardous

Onsite Offsite _____

Authorizing Disposal of Waste from Captured Facility _____

Authorizing Disposal of Waste from Off-site Facilities Owned by Owner/Operator _____

III. Nature of Business

In-situ uranium mining.

CONTINUED on Pages 2 through 6

The permittee is authorized to conduct injection in accordance with limitations, requirements, and other conditions set forth herein. This permit is granted subject to the rules and orders of the Commission, and the laws of the State of Texas. The permit will be in effect for ten years from the date of approval or until amended or revoked by the Commission. If this permit is appealed and the permittee does not commence any action authorized by this permit during judicial review, the term will not begin until judicial review is concluded.

DATE ISSUED:

For the Commission

IV. General Description and Location of Injection Activity

The disposal well will be used to dispose of nonhazardous wastes and by-product material as defined in §11.e(2) of the Atomic Energy Act and §401.003(3)(B) of the Texas Health & Safety Code, derived from in-situ uranium mining. The facility will be located at 14869 N US Hwy 183 Yorktown, Texas 78164. The well will be located approximately 1,900 feet from the east line and 1,900 feet from the south line of the Peter Gass Survey, A-129, Latitude 28°51'53" North, Longitude 97°21'26.6" West, Goliad County, Texas. The injection zone is within the Frio and Vicksburg Formations at the approximate depths of 2,800 to 3,590 feet below ground level (BGL). The authorized injection interval is within the Vicksburg Formation at the approximate depths of 3,200 to 3,590 feet BGL.

V. Drilling and Completion Requirements

- A. The drilling and completion of the well shall be done in accordance with 30 Texas Administrative Code (TAC) Section (§) 331.62, the plans and specifications of the permit application, and the following conditions.
- B. The permittee shall set and cement surface casing to a minimum depth of 1,850 feet BGL, and long string casing into or through the injection zone in order to properly protect each underground source of drinking water (USDW) or freshwater aquifer.
- C. Mechanical integrity shall be demonstrated prior to authorization by the Executive Director to conduct injection operations.
- D. Any changes to the plans and specifications in the original application shall be approved in writing by the Executive Director that said changes provide protection standards equivalent to or greater than the original design criteria.

VI. Character of the Waste Streams

- A. Industrial nonhazardous waste authorized to be injected by this permit shall consist solely of the following waste streams:
 1. Waste generated by the permittee:
 - a. Recovered rainwater from bermed areas;
 - b. Process wastewater from reverse osmosis reject;
 - c. Restoration groundwater;
 - d. Wash down from maintenance and housekeeping;
 - e. Accidental upsets; and
 - f. Dissolved salts and low concentrations of uranium and radium.
 2. Other associated wastes such as groundwater and rainfall contaminated by the above authorized wastes, spills of the above authorized wastes, and wash waters and solutions used in cleaning and servicing the waste disposal well system equipment which are compatible with the permitted waste streams, injection zone and well materials.

3. Wastes generated during well construction or closure of the well and associated facilities that are compatible with permitted the waste streams, injection zone and well materials.
- B. The injection of wastes is limited to those wastes authorized in Provision VI.A. above, into the Frio and Vicksburg Formations within the injection zone between the approximate depths of 2,800 to 3,590 feet BGL.
- C. The pH of injected waste streams shall be greater than 5.0 and less than 9.0.
- D. Except when authorized by the Executive Director, the specific gravity of injected fluids shall be greater than 0.997 and less than 1.05 as measured at 68°F.

VII. Waste Streams Prohibited From Injection

Unless authorized by Provision VI.A., the following waste streams are prohibited:

- A. Hazardous wastes as defined under 40 CFR §261.3(a) through (d), issued pursuant to the Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments, which are regulated by the Commission as authorized by the United States Environmental Protection Agency (EPA), including but not limited to any listed hazardous waste or a waste derived from the treatment, storage or disposal of a listed hazardous waste;
- B. Any by-product material as defined by Texas Health and Safety Code §401.003(3)(A);
- C. Any low-level radioactive waste as defined by Texas Health and Safety Code §401.004;
- D. Any naturally occurring radioactive material (NORM) waste as defined by Texas Health and Safety Code §401.003(26); and
- E. Any oil and gas NORM waste as defined by Texas Health & Safety Code §401.003(27).

VIII. Operating Parameters

The well shall be operated in compliance with the requirements of 30 TAC Chapters 305, 331, and 335; the plans and specifications of the permit application; and the following conditions:

- A. Surface injection pressure shall not cause pressure in the injection zone to:
 1. initiate any new fractures or propagate existing fractures in the injection zone;
 2. initiate new fractures or propagate existing fractures in the confining zone; or
 3. cause movement of fluid out of the injection zone that may contaminate USDWs, and fresh water.

- B. The operating surface injection pressure shall not exceed values as tabulated below:

Specific Gravity at 68°F and Surface Pressure (g/cm)	Maximum Surface Injection Pressure (psig)
0.997 to 1.005	761
1.005 to 1.05	698

- C. For WDW423 and WDW424 the maximum cumulative injection rate shall not exceed 200 gallons per minute (gpm).
- D. The cumulative volume of wastewater injected into WDW423 and WDW424 shall not exceed 8,640,000 gallons per month (30 days), or 105,192,000 gallons per year, based on the cumulative injection rate of 200 gpm.
- E. A positive pressure of at least 100 psig over tubing injection pressures shall be maintained in the tubing-casing annulus for the purpose of leak detection. Temporary deviations from this requirement which are a part of normal well operations are authorized but may not exceed 15 minutes in duration. For 15 minutes after the pressure differential drops below 100 psig, the permittee shall conduct troubleshooting and proceed to restore a minimum 100 psig pressure differential. If a minimum 100 psig pressure differential cannot be achieved within 15 minutes, the permittee shall commence shut-in procedures on the well and notify the Texas Commission on Environmental Quality (TCEQ) in writing within 48 hours. The permittee may continue to operate the well under flow conditions that maintain a minimum 100 psig pressure differential.
- F. The permittee shall notify the Executive Director at least 24 hours prior to commencing any workover which involves taking the injection well out of service. Approval by the Executive Director shall be obtained before the permittee may begin work. Notification shall be in writing and shall include plans for the proposed work. The Executive Director may grant an exception in accordance with 30 TAC §331.63(i) when immediate action is required to comply with 30 TAC §331.63(b). Completion of the well outside the approved injection interval, by perforation of casing, setting of screen, or establishment of open hole section, requires that the permitted injection interval be changed according to 30 TAC §331.62(a)(3)(B) to include the depths of well completion. Pressure control equipment shall be installed and maintained during workovers which involve the removal of tubing.

IX. Monitoring and Testing Requirements

- A. Monitoring and testing shall be in compliance with the requirements of 30 TAC §305.125, §331.64, the plans and specifications of the permit application, and the following conditions.

- B. The integrity of the long string casing, injection tubing, and annular seal shall be tested by means of an approved pressure test with a liquid or gas annually and whenever there has been a well workover. The integrity of the cement within the injection zone shall be tested by means of an approved radioactive tracer survey annually. A radioactive tracer survey may be required after workovers that have the potential to damage the cement within the injection zone.
 - C. The pressure buildup in the injection zone shall be monitored annually, including at a minimum, a shutdown of the well for a sufficient time to conduct a valid observation of the pressure fall-off curve.
 - D. A temperature log, noise log, oxygen activation log or other approved log is required at least once every five years to test for fluid movement along the entire borehole.
 - E. A casing inspection, casing evaluation, or other approved log shall be run whenever the owner or operator conducts a workover in which the injection string is pulled, unless the Executive Director waives this requirement due to well construction or other factors which limit the test's reliability, or based upon the satisfactory results of a casing inspection log run within the previous five years. The Executive Director may require that a casing inspection log be run every five years if there is sufficient reason to believe the integrity of the long string casing of the well may be adversely affected by naturally occurring or man-made events.
 - F. Injection fluids shall be tested in accordance with 30 TAC §331.64(b) and the approved waste analysis plan.
 - G. The pH and specific gravity of the injected waste shall be monitored continuously at a minimum frequency of at least once every 24 hours and whenever the waste stream changes.
 - H. Corrosion monitoring of well materials shall be conducted quarterly and in accordance with 30 TAC §331.64(g). Test materials shall be the same as those used in the wellhead, injection tubing, packer, and long string casing, and shall be continuously exposed to the waste fluids except when the well is taken out of service.
 - I. The permittee shall ensure that all waste analyses used for waste identification or verification and other analyses for environmental monitoring have been performed in accordance with methods specified in the current editions of United States Environmental Protection Agency (EPA) SW-846, ASTM standards or other methods accepted by the TCEQ. The permittee shall have a Quality Assurance/Quality Control (QA/QC) program that is consistent with EPA SW-846 and the TCEQ Quality Assurance Project Plan.
- X. Record Keeping Requirements
- The permittee shall keep complete and accurate records as required by 30 TAC Chapters 305, 331, and 335.

XI. Financial Assurance for Well Closure

In accordance with 30 TAC Chapter 37, §305.154(a)(9), and §§331.142-144, the permittee shall secure and maintain financial assurance, in a form approved by the Executive Director, in the amount of \$198,400 (cost estimate prepared October 2021 in current dollars). Adjustments to the cost estimates for plugging and abandonment in current dollars, and to financial assurance based thereon, shall be made in accordance with 30 TAC §331.143(d) and Chapter 37. Financial assurance shall be obtained at least 60 days prior to the commencement of drilling of the well.

XII. Additional Requirements

- A. The base of the wellhead shall be enclosed by a diked, impermeable pad or sump to protect the ground surface from spills and releases. Any liquid collected shall be disposed of in an appropriate manner.
- B. Acceptance of this permit by the permittee constitutes an acknowledgment and agreement that the permittee will comply with all the terms and conditions embodied in the permit, and the rules and other orders of the Commission.
- C. This permit is subject to further orders and rules of the Commission. In accordance with the procedures for amendments and orders, the Commission may incorporate into permits already granted, any condition, restriction, limitation, or provision reasonably necessary for the administration and enforcement of Texas Water Code, Chapter 27 and Texas Health and Safety Code Chapter 401.
- D. This permit does not convey any property rights of any sort, nor any exclusive privilege, and does not become a vested right in the permittee.
- E. The issuance of this 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.
- F. The following rules are incorporated as terms and conditions of this permit by reference:
 - 1. 30 TAC Chapter 305, Consolidated Permits;
 - 2. 30 TAC Chapter 331, Underground Injection Control; and
 - 3. 30 TAC Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste;
- G. The express incorporation of the above rules as terms and conditions of this permit does not relieve the permittee of an obligation to comply with all other laws or regulations which are applicable to the activities authorized by this permit.
- H. Incorporated Application Materials. This permit is based on, and the permittee shall follow, the plans and specifications contained in the Class I Underground Injection Control Application dated January 15, 2020, March 17, 2020, May 10, 2021, August 9, 2021, October 6, 2021 and December 22, 2021 which are hereby approved subject to the terms of this permit and any other orders of the TCEQ.

These materials are incorporated into this permit by reference as if fully set out herein. Any and all revisions to these elements shall become conditions of this permit upon the date of approval by the Commission.

- I. All pre-injection units servicing this well must be authorized under TCEQ Radioactive Material License R06064 under 30 TAC Chapter 336, Radioactive Substance Rules.



Permit No. WDW424

This permit supersedes
and replaces Permit
No. WDW424 issued
May 25, 2010.

Texas Commission on
Environmental Quality
Austin, Texas

Permit to Conduct
Class I Underground Injection
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 - D. A temperature log, noise log, oxygen activation log or other approved log is required at least once every five years to test for fluid movement along the entire borehole.
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- X. Record Keeping Requirements
- The permittee shall keep complete and accurate records as required by 30 TAC Chapters 305, 331, and 335.

XI. Financial Assurance for Well Closure

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XII. Additional Requirements

- A. The base of the wellhead shall be enclosed by a diked, impermeable pad or sump to protect the ground surface from spills and releases. Any liquid collected shall be disposed of in an appropriate manner.
- B. Acceptance of this permit by the permittee constitutes an acknowledgment and agreement that the permittee will comply with all the terms and conditions embodied in the permit, and the rules and other orders of the Commission.
- C. This permit is subject to further orders and rules of the Commission. In accordance with the procedures for amendments and orders, the Commission may incorporate into permits already granted, any condition, restriction, limitation, or provision reasonably necessary for the administration and enforcement of Texas Water Code, Chapter 27 and Texas Health and Safety Code Chapter 401.
- D. This permit does not convey any property rights of any sort, nor any exclusive privilege, and does not become a vested right in the permittee.
- E. The issuance of this 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.
- F. The following rules are incorporated as terms and conditions of this permit by reference:
 - 1. 30 TAC Chapter 305, Consolidated Permits;
 - 2. 30 TAC Chapter 331, Underground Injection Control; and
 - 3. 30 TAC Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste;
- G. The express incorporation of the above rules as terms and conditions of this permit does not relieve the permittee of an obligation to comply with all other laws or regulations which are applicable to the activities authorized by this permit.
- H. Incorporated Application Materials. This permit is based on, and the permittee shall follow, the plans and specifications contained in the Class I Underground Injection Control Application dated January 15, 2020, March 17, 2020, May 10, 2021, August 9, 2021, October 6, 2021 and December 22, 2021 which are hereby approved subject to the terms of this permit and any other orders of the TCEQ.

These materials are incorporated into this permit by reference as if fully set out herein. Any and all revisions to these elements shall become conditions of this permit upon the date of approval by the Commission.

- I. All pre-injection units servicing this well must be authorized under TCEQ Radioactive Material License RO6064 under 30 TAC Chapter 336, Radioactive Substance Rules.

March 29, 2022

TECHNICAL SUMMARY AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

Description of Application

Applicant: Uranium Energy Corp. (UEC)

Underground Injection Control (UIC) Permit Nos. WDW423 and WDW424

Location: The proposed UEC facility will be located at 14869 N US Hwy 183 Yorktown, Goliad County, Texas 78164.

WDW423 will be located approximately 1,900 feet from the east line and 1,900 feet from the south line of the Peter Gass Survey, A-129, Latitude 28°51'53" North, Longitude 97°21'26.6" West.

WDW424 will be located approximately 2,100 feet from the east line and 2,700 feet from the south line of the Peter Gass Survey, A-129, Latitude 28°52'1.8" North, Longitude 97°21'28.1" West.

General: The applicant proposes to operate an in-situ uranium mining facility. Wastes will be nonhazardous and generated on-site. WDW423 and WDW424 have not been drilled at this time.

Request: UEC submitted an application to the Texas Commission on Environmental Quality (TCEQ) dated January 15, 2020 for permit renewals for the construction of underground injection wells for disposal of industrial nonhazardous waste and for amendment to the permits to reduce the maximum allowable surface injection pressure. The application was received on January 23, 2020.

Authority: The proposed permits are required by the Injection Well Act, Texas Water Code §27.011. Draft permits have been prepared in accordance with applicable requirements of 30 Texas Administrative Code (TAC) Chapters 281, 305 and 331, which have been adopted under the authority of the Texas Water Code, Chapters 5 and 27.

Technical Information

The permit renewal and amendment application has been evaluated in accordance with 30 TAC Chapters 305, 331 and 335. Evaluation of the structural and stratigraphic geology indicates that the UEC facility is located in a geologically suitable location for injection well operations. UEC has demonstrated that the injection zone is of sufficient permeability, porosity, thickness and areal extent to receive the injected waste streams. The confining zone was shown to be laterally continuous and free of transecting, transmissive faults or fractures to prevent the migration of fluids into underground sources of drinking water (USDW).

Records of all known artificial penetrations of the injection and confining zones, occurring within a 2½ mile radius from the future disposal wells, have been reviewed. Information submitted demonstrates all wells were properly plugged or constructed to prevent endangerment to a USDW. The Railroad Commission of Texas issued its non-endangerment of oil and gas reservoir letter dated September 27, 2021 after its staff

completed a technical review of the permit application. Ambient monitoring and mechanical integrity tests of the well are required on an annual basis.

Under the existing permit, the operating surface injection pressure shall not exceed 976 pounds per square inch gauge (psig) when the specific gravity of the waste stream is 0.997 to 1.005 or 914 psig when the specific gravity is 1.005 to 1.05. The pH of injected waste streams shall be greater than 5.0 and less than 9.0. For WDW423 and WDW424 the maximum injection rate shall not exceed 200 gallons per minute (gpm) cumulative. The cumulative volume of wastewater injected into WDW423 and WDW424 shall not exceed 8,640,000 gallons per month (30 days), or 105,192,000 gallons per year.

The permitted injection zone is the Frio and Vicksburg Formations from 2,800 to 3,590 feet below ground level (BGL). The authorized injection interval is the Vicksburg Formation from 3,200 to 3,590 feet BGL.

The Jasper Aquifer is the lowermost underground source of drinking water in the vicinity of the well locations. Its base occurs at depths of approximately 1,750 feet BGL in this area.

The proposed renewal permits include the following:

- A. standard provisions for construction, operation and closure of the subject injection wells including requirements for testing, monitoring, and reporting;
- B. standard provisions to establish and maintain financial assurance to provide for proper facility closure;
- C. amendment in the following manner:
 - a. reduce the maximum allowable surface injection pressure from 976 to 761 psig when the injected waste stream specific gravity is 0.997 to 1.005; and
 - b. reduce the maximum allowable surface injection pressure from 914 to 698 psig when the injected waste stream specific gravity is 1.005 to 1.05.
- D. updated permit provisions to incorporate current standard language and requirements into the permits; and
- E. removal of pre-injection units because regulations no longer require permitting of PIUs.

Process for Reaching a Final Decision and Opportunities for Public Participation

Once the proposed permits are drafted, they are sent to the TCEQ Office of the Chief Clerk for public notice. Mailed and newspaper notice of the application and executive director's preliminary decision are provided in accordance with 30 TAC §39.651(d) with instructions for submitting public comments and requesting a public meeting. Written public comments and requests for a

TECHNICAL SUMMARY

WDW423 and WDW423

March 28, 2022

public meeting must be submitted to the Office of the Chief Clerk within 30 days from the date of publication of the newspaper notice.

The executive director will consider public comments in making a final decision on the application. The TCEQ will hold a public meeting if the executive director determines that there is a significant degree of public interest in the application or if requested by a local legislator. After the deadline for public comments, the executive director will consider the comments and prepare a response to all relevant and material or significant public comments. The response to comments will include the executive director's decision on the application and will provide instructions for requesting a contested case hearing or reconsideration of the executive director's decision.

A contested case hearing will only be granted based on disputed issues of fact that are relevant and material to the commission's decision on the application on issues that were raised during the public comment period and not withdrawn. The executive director may issue final approval of the application unless a timely contested case hearing request or request for reconsideration is filed. If a timely hearing request or request for reconsideration is filed, the executive director will not issue final approval of the permits and will forward the application and request to the TCEQ Commissioners for their consideration at a scheduled commission meeting. If hearing requests are granted, the hearings will be conducted by the State Office of Administrative Hearings. Decisions regarding the permits may be reconsidered in response to a Motion for Rehearing or a Motion for Reconsideration and by appeal to a District Court in Travis County.

Preliminary Decision

The executive director has made a preliminary decision that the proposed permits, if issued, meet all statutory and regulatory requirements.

The proposed permits do not authorize variances or alternatives to required standards. Parties have requested a hearing on the proposed permit renewals.

Prepared by:

Reviewed by:

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**UNDERGROUND INJECTION CONTROL
PERMIT NOS. WDW423 AND WDW424**

**APPLICATION BY
URANIUM ENERGY CORP.
FOR RENEWAL AND
AMENDMENT OF PERMIT NOS.
WDW423 AND WDW424**

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§**

**BEFORE THE
TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY**

EXECUTIVE DIRECTOR'S RESPONSE TO PUBLIC COMMENTS

The Executive Director of the Texas Commission on Environmental Quality (the Commission or TCEQ) files this Response to Public Comments on the application by Uranium Energy Corp. (Applicant or UEC) for renewal and amendment of two Class I injection well permits WDW423 and WDW424, authorizing the injection of nonhazardous wastewater generated from the processing of ion exchange resin from in-situ uranium mining operations. Before an application is approved, Title 30 Texas Administrative Code (30 TAC) Section (§) 55.156 requires that the Executive Director prepare a response to all timely, relevant and material, or significant comments received.

This response addresses all timely public comments received, whether or not withdrawn. If you need more information about this application or the Underground Injection Control permitting process, please call the TCEQ Public Education Program at 1-800-687-4040. General information about TCEQ can be found at our website at www.tceq.texas.gov.

I. Public Comments Received

The Office of Chief Clerk received timely comments from Heather Sumpter on behalf of the Goliad County Groundwater Conservation District (the District), including five letters dated July 27, 2020; July 26, 2021; April 29, 2022; and May 24, 2022. The District also requested a public meeting and a contested case hearing on the application.

This application is subject to the requirements in Senate Bill (SB) 709, effective September 1, 2015. SB 709 amended the requirements for comments and contested case hearings. One of the changes required by SB 709 is that the Commission may not find that a "hearing requestor is an affected person unless the hearing requestor timely submitted comments on the permit application." Texas Water Code (TWC) §5.115(a-1)(2)(B).

II. Background

A. Facility Description

The facility will be located at 14869 North United States Highway 183, Yorktown, Texas 78164 in Goliad County, Texas and consists of a 17.0-acre tract of land out of the Peter Gass Survey, Abstract Number 129, which will include the two proposed injection wells (WDW423 and WDW424) and associated pre-injection units. WDW423 will be located approximately 1,900 feet from the east line and 1,900 feet from the south line of the Peter Gass Survey, A-129, Latitude 28°51'53" North, Longitude 97°21'26.6" West. WDW424 will be located approximately 2,100 feet from the east line and 2,700 feet from the south line of the Peter Gass Survey, A-129,

Latitude 28°52'1.8" North, Longitude 97°21'28.1" West. The facility will not be located within the boundaries of the Coastal Management Program.

The permitted injection zone for proposed wells WDW423 and WDW424 is within the Frio and Vicksburg Formations from 2,800 to 3,590 feet below ground level (BGL). The authorized injection interval is within the Vicksburg Formation from 3,200 to 3,590 feet BGL. The Jasper Aquifer is the lowermost underground source of drinking water (USDW) in the vicinity of the well locations. Its base occurs at depths of approximately 1,750 feet BGL in this area.

Permits WDW423 and WDW424 were previously issued for these Class I injection wells on May 25, 2010 for a term of ten years. Because the application for renewal was initiated before the permit expiration date, the existing permit remains in full force and effect and will not expire until commission action on the application for renewal is final under 30 TAC §305.65(4). The injection wells have not been drilled, constructed, or completed.

B. Application Description

The application, if granted, would authorize the construction and operation of Class I injection wells WDW423 and WDW424 for injection of industrial nonhazardous wastes associated with in-situ uranium mining. Injected wastes would include recovered rainwater from bermed areas, process wastewater from reverse osmosis reject, restoration groundwater, wash down from maintenance and housekeeping, accidental upsets, dissolved salts and low concentrations of uranium and radium, other associated wastes such as groundwater and rainfall contaminated by the above authorized wastes, spills of the above authorized wastes, wash waters and solutions used in cleaning and servicing the waste disposal well system equipment which are compatible with the permitted waste streams, and injection zone and well materials. Wastes generated during well construction or closure of the wells and associated facilities that are compatible with the permitted waste streams, injection zone and well materials would also be included. A permit amendment has been requested to reduce the maximum allowable surface injection pressure from 976 to 761 psig when the injected waste stream specific gravity is 0.997 to 1.005 and reduce the maximum allowable surface injection pressure from 914 to 698 psig when the injected waste stream specific gravity is 1.005 to 1.05.

The Executive Director has prepared draft permits that would authorize injection of nonhazardous wastes and by-product material derived from in-situ uranium mining as defined in §11e. (2) of the federal Atomic Energy Act and §401.003(3)(B) of the Texas Health & Safety Code. The proposed permits are required by the Injection Well Act, Texas Water Code §27.011. The draft permits have been prepared in accordance with applicable requirements of 30 Texas Administrative Code (TAC) Chapters 281, 305 and 331, which have been adopted under the authority of the Texas Water Code, Chapters 5 and 27.

C. Procedural Background

The TCEQ received this application on January 23, 2020, and declared it administratively complete on April 27, 2020. The Notice of Receipt of Application and Intent to Obtain a Nonhazardous Waste Underground Injection Control Permit Renewal was published in English on May 28, 2020 in the *Goliad Advance - Guard* in Goliad County, Texas.

The Executive Director completed the technical review of the application on April 4, 2022 and prepared two draft permits. The Notice of Application and Preliminary Decision for Nonhazardous Waste Underground Injection Control Permit Renewal and Amendment was

published in English on April 28, 2022 in the *Victoria Advocate*, on May 4, 2022 in *The Cuero Record*, and on May 5, 2022 in the *Goliad Advance-Guard*, *Karnes Countywide*, *Bee-Picayune*, and *Refugio County Press*. The public comment period ended on June 6, 2022.

This application was filed on or after September 1, 2015; therefore, this application is subject to the procedural requirements adopted pursuant to House Bill 801, 76th Legislature (1999) and Senate Bill 709, 84th Legislature (2015), both implemented by the Commission in its rules in 30 TAC Chapters 39, 50, and 55.

III. Access to Rules, Laws, and Information

The following webpages provide access to state and federal rules and regulations:

- The Texas Secretary of State webpage is sos.state.tx.us.
- TCEQ rules in Title 30 of the Texas Administrative Code are available at sos.state.tx.us/tac/ by selecting “View the current Texas Administrative Code” on the right, and then selecting “Title 30 Environmental Quality.”
- Texas statutes are available at statutes.capitol.texas.gov.
- Federal rules in Title 40 of the Code of Federal Regulations are available at the EPA’s public webpage at epa.gov/laws-regulations/regulations.
- Federal environmental laws are available at the EPA’s public webpage at epa.gov/laws-regulations/laws-and-executive-orders.
- General information about TCEQ can be found at the Commission’s public webpage at tceq.texas.gov.
- General information about TCEQ and information about the underground injection control permitting process is available at the Commission’s public webpage at tceq.texas.gov.
- Information about the underground injection control permitting process is available from the TCEQ Public Education Program at 1-800-687-4040.
- If you would like to receive a hard copy of this RTC, please contact the Office of the Chief Clerk at 512-239-3300.

The permit application, Executive Director’s preliminary decision, and draft permits are available for viewing and copying at the Goliad County Courthouse, 127 North Courthouse Square, Goliad, Texas 77963.

Commission records for this application and draft permits are available by appointment for viewing and copying in the Office of the Chief Clerk (OCC) at the TCEQ main office in Austin at 12100 Park 35 Circle, Building F, 1st Floor. Please call (512) 239-3300 to request an appointment. Some documents located in OCC may also be viewed in the Commissioner’s Integrated Database at: www14.tceq.texas.gov/epic/eCID/.

IV. Comments and Responses

Comment No. 1:

The District’s May 24, 2022 letter states that the mailing address for the facility and the inclusion of the Yorktown mayor and Yorktown Memorial Hospital on the mailing list for the application could suggest that the proposed facility is located in Dewitt County rather than Goliad County. The District commented that the Yorktown Memorial Hospital is closed and is an abandoned structure.

Response No. 1:

The application, the draft permits, and the public notices for the renewal and amendment of permits WDW423 and WDW424 all indicate that the injection wells are located in Goliad County, not Dewitt County. The application, draft permits, and public notices also provide detailed information about the location of the injection wells in Goliad County using street addresses, land survey information, and latitude and longitude. The Executive Director does not agree that the facility's mailing address and mailing public notice to local governmental entities for Yorktown, which is located in Dewitt County, creates confusion about the injection well's location. The injection wells are located in a rural area of Goliad County, but the street address for the facility does indicate a Yorktown address. Under TCEQ rules at 30 TAC §39.413(12) notice may be mailed to any person the Executive Director or chief clerk may decide to choose. The Executive Director does not agree that mailing notice to the Yorktown mayor was inappropriate. The Executive Director acknowledges the information regarding the status of the Yorktown Memorial Hospital.

Comment No. 2:

The District's July 27, 2020, letter states that the proposed area is within a fault zone. The District's May 24, 2022, letter states the proposed location of the injection wells is near two major faults. The District asks whether the faults provide a vertical conduit which can allow an injected fluid under pressure to contaminate the USDW above. The District comments that there are two indicators of vertical transmission: the presence of hydrogen sulfide odor at the water wells and the deposition of uranium ore in the top aquifer sands.

Response No. 2:

An application for a Class I injection well permit must provide delineation of all faults within the area of review (AOR) together with a demonstration that the fault is not sufficiently transmissive or vertically extensive to allow migration of hazardous constituents out of the injection zone under 30 TAC §§305.49(a)(1) and 331.121(a)(2)(P). The application provided a delineation of the faults in the AOR and demonstrated to the satisfaction of the Executive Director that the faults are not sufficiently transmissive or vertically extensive to allow migration of injected fluids out of the proposed injection zone.

The proposed UEC Goliad facility will be located along the trend of the San Marcos Arch, a structural feature which lies within the upper inland portion of the Gulf Coast Basin. Specifically, the proposed facility will be situated within the Wilcox fault zone, an approximate 20-mile-wide band of growth faults oriented roughly from southwest to northeast.

The permitted Injection Interval for the UEC wells (WDW423 and WDW424) is within the Vicksburg Formation at depths of 3,200 to 3,590 feet BGL and consists of a stratigraphically isolated sand package within a relatively thick sequence of clay and/or shale above and below that comprise the Injection Zone. Because the shales at the UEC site are plastic and unconsolidated at the depths of interest, the application demonstrates that it is unlikely that coherent, transmissive fractures or fault planes exist. When two bodies of unconsolidated shale, or shale and sand, slide past each other along a fault, the application demonstrates that it is likely that the fault plane will become filled and sealed with plastic shale. Due to the very plastic nature of the Gulf Coast Region shales and clays, faults tend to seal themselves, allowing no vertical fluid movement up the fault plane. The large thickness of shale strata above the Injection Interval, which provides extensive shale to shale contact along the fault

plane, combined with possible shale smearing along the fault plane, would likely ensure adequate sealing to prevent any significant vertical migration of formation and/or injected fluids along the fault plane. It is likely that the placement of the injection wells will not result in upward movement of injected fluids via vertical fault conduits and would not contaminate an aquifer containing usable quality water.

The Confining Zone for the UEC injection wells consists of shale/sandy shale sequences within the upper portion of the Frio Formation. The Confining Zone is designated to protect the lowermost USDW from the effects of injection by confining fluid movement within the Injection Zone. Shales provide layers of low permeability. More permeable and porous layers between shale sequences provide pressure “bleed-off” zones which relieve any pressure buildup within the Confining Zone. The application demonstrates that the Confining Zone is laterally continuous over an area sufficient to prevent movement of fluids into the USDW or freshwater aquifers, and averages approximately 350 - 450 feet in thickness with a net shale thickness of approximately 300 feet. Geophysical log responses, provided in the application, indicate that the Confining Zone is present in the interval from 2,118 to 2,953 feet BGL in the vicinity of proposed injection wells WDW423 and WDW424. Mapped faults transect the Confining Zone within the study area, with a maximum vertical displacement of approximately 180 feet, which is less than the total thickness of the Confining Zone. This indicates that more porous and/or permeable formations/units, either above or below the Confining Zone, would not come in contact with one another due to fault offset. The application demonstrates that it is unlikely that the injection reservoir unit will be juxtaposed against sand or other potentially porous or permeable strata that will conduct injected fluid out of the reservoir.

The District’s comment did not specify which water wells in the area had a hydrogen sulfide odor. Since hydrogen sulfide may originate under varying conditions in localized, isolated stratigraphic zones or through “biofouling” in water wells, and since the location of these water wells relative to these specific faults and injection wells is unknown, the Executive Director cannot conclude that the presence of hydrogen sulfide odor in these water wells does by itself indicate the presence of a vertically transmissive fault.

The presence of uranium in upper aquifer sands (specifically the Goliad Formation) is widely considered to be the result of leaching of uranium from volcanic tuff or ash deposits within the Goliad Formation. The leaching process likely occurred near the outcrop area where recharge of oxidizing groundwater may have increased the solubility of uranium minerals in the interstices and coating on sand grains in the sediments. Subsequent downgradient migration of the soluble uranium within the oxygenated groundwater continued until the geochemical conditions became reducing and uranium minerals were deposited in roll front or tabular bodies due to varying stratigraphic or structural conditions.

Comment No. 3:

The District comments that the technical information provided by Carothers in 2007 associated with the original Class III injection well permit application disagrees with the current Class I permit renewals and amendments. The District comments that United States Geological Survey (USGS) and other researcher’s evaluation of migration along growth faults also needs to be considered.

Response No. 3:

The cited report prepared by Carothers in 2007 is not part of this application for renewal and amendment of Class I injection well permits WDW423 and WDW424. For purposes of reviewing and responding to the District's comments, relevant geologic discussion contained in technical information provided by Carothers (2007) was reviewed and compared for consistency with the geologic discussion contained in the current Class I injection well renewal and amendment application for WDW423 and WDW424. Technical information provided by Carothers in 2007 appears to be associated with suitability for a Class III uranium mining area permit and not the Class I injection well renewal and amendment application for WDW423 and WDW424; the focus of the Carothers report is uranium mineralization and production feasibility in shallower formations rather than suitability of deeper formations for Class I injection well operations. The Carothers report appears to express the opinion that faulting has probably served as a conduit for reducing waters-gases to migrate from deeper horizons as well as altering the groundwater flow system in the uranium-bearing sands. However, the Carothers report is not based on detailed analysis of the deeper subsurface within the zone(s) proposed for Class I injection well operations. The Class I injection well application does contain detailed information about the deeper subsurface geologic environment and specifically considers the presence of faults relative to Class I well completion depths.

Site-specific geologic evaluation discussed in Comment No. 2 above and presented in Section V of the current Class I injection well permit renewal and amendment application references a total of 43 professional papers/studies and web resources, including USGS seismicity/earthquake hazard websites and widely cited studies/papers concerning growth fault development, permeability, and sealing properties by S.K. Mathai and S.G. Roberts (1996), C.A. Morrow, L.Q. Shi, and J.D. Byerlee (1984), and R.R. Berg and A.H. Avery (1995).

Comment No. 4:

The District's May 24, 2022 letter states that no technical data has been provided to verify the geology of nearby faults. The District comments that there is no provision to monitor the action of the faults if injection operation occurs. The District comments that there is no assurance or protection provided to protect the drinking water in water wells and livestock wells in the vicinity of the faults.

Response No. 4:

The Executive Director has reviewed the application and determined the application sufficiently considers nearby faults including faults representing impermeable boundaries to injected fluids and as pathways for migration of injected fluids. Consideration of faults is necessary to assure that injected waste will remain in the injection zone and to assess the expected pressure buildup within the injection zone. As indicated in Response No. 3 above, Section V of the current Class I injection well renewal and amendment application contains geologic and technical data regarding faulting within the AOR. The mapped faults in the study area are best represented in cross section A-A', which runs perpendicular to the projected strike of the faults (Figure V-18 in the permit renewal and amendment application). Multiple structure maps were prepared to indicate all the faults mapped in the AOR. The top of the Injection Interval, the top of the Injection Zone, and the top of Confining Zone are shown with the mapped faults (Figures V-20, V-22, and V-24, respectively in the application).

Faulting is present within the 2.5-mile permit application AOR. Four major southeast-northwest trending faults have been identified in the study area and are summarized below.

A northernmost fault extends across approximately 75 percent of the width of the AOR in a southwest-northeast trending direction. Because of the lack of data points, the fault cannot be mapped completely across the injection area. This fault cuts the Injection Interval and Upper Confining Zone. The thickness of the Upper Confining Zone averages approximately 400 feet along the trend of the fault. The maximum vertical displacement of the Confining Zone is approximately 80 feet and juxtaposes shale against shale. The fault appears to dip to the southeast and extends into the deeper section.

Moving toward the south-southeast within the AOR, a second fault is identified, located approximately 3,800 feet northwest of WDW424. The fault displaces approximately 50 to 80 feet of the Upper Confining Zone, juxtaposing shale against shale, and also intersects the top of the Injection Interval. The Upper Confining Zone averages approximately 400 feet in thickness along the trend of this fault.

Again, moving southward in the AOR, a third fault, located approximately 1,200 feet southeast of WDW423, appears to displace the top of the Upper Confining Zone. Approximately 150 feet of displacement exist at this level, juxtaposing shales of the Upper Frio Formation against shales of the Frio Formation (Confining Zone). The Upper Confining Zone averages approximately 400 feet in thickness along the trend of this fault. The fault dips to the southeast and extends into the deeper section. This fault also appears to split along strike to the northeast.

A fourth fault in the southernmost AOR appears to displace strata within the upper portion of the section, including the top of the Upper Confining Zone with approximately 50 feet of displacement. The Upper Confining Zone averages approximately 475 feet in thickness along the trend of this fault. This fault juxtaposes the Upper Confining Zone against clays of the overlying Anahuac Formation. However, it does not appear that the fault extends deeper.

The Class I injection well permitting process is structured through statutory framework under the Texas Water Code. The purpose of the TCEQ's Underground Injection Control (UIC) program is to ensure that the injection of fluids is protective of fresh water. This protection is accomplished through the numerous requirements in the following provisions of the draft permits:

- Provision V-Drilling and Completion Requirements;
- Provision VI-Character of the Waste Streams;
- Provision VII-Waste Streams Prohibited from Injection;
- Provision VIII-Operating Parameters;
- Provision IX-Monitoring and Testing Requirements; and
- Provision XII-Additional Requirements

Under Provision V of the draft permits, the drilling and completion of each well must be in accordance with the requirements in 30 TAC §331.62 (relating to construction standards) and the specifications in the application. Additionally, under Provision V of the draft permits, surface casing must be set and cemented to a depth of 1,850 feet to protect USDWs in the area.

Prior to injection of any fluids, UEC will have to demonstrate to the TCEQ that the well has mechanical integrity, as defined at 30 TAC §331.43.

In accordance with Provision VI and Provision VII of the draft permits, only certain wastes may be disposed in the proposed wells. Authorized wastes must be compatible with the well materials, compatible with the sedimentary rocks in the proposed injection zone and in the confining zone, and compatible with the groundwater in the injection zone.

Under Provision IX of the draft permits, the wells must be tested and monitored in accordance with the requirements of 30 TAC §§305.125 and 331.64. These requirements include annual mechanical integrity testing of the casing, injection tubing, annular seal, and bottom-hole cement for leaks using a pressure test and radioactive tracer survey, annual pressure build-up analysis, evaluation of fluid movement every five years using an approved geophysical log, and evaluation of the casing each time the well is subjected to workover procedures. Injected fluids must be analyzed in accordance with the approved Waste Analysis Plan described in Section IX of the application. Waste analysis must be performed using EPA-approved methods, and must be done at a laboratory certified in accordance with the requirements in 30 TAC Chapter 25 (relating to environmental testing laboratory accreditation and certification). Additionally, continuous corrosion monitoring must be performed on the wellhead, injection tubing, packer and casing materials. An assessment of corrosion monitoring will be completed on a quarterly basis.

In accordance with Provision XII of the draft permits, the base of the wellhead must be enclosed by a diked, impermeable pad or sump to protect the ground surface from spill, and any collected fluids must be disposed in an appropriate manner.

The permitted injection wells WDW423 and WDW424 have not yet been drilled and constructed. Once the wells are drilled, constructed and completed according to the provisions of the permits and TCEQ rules, UEC will be required to conduct various tests on the well construction and perform injectivity tests to determine well capacity and reservoir characteristics under 30 TAC §331.62(a)(8). Pressure-fall-off testing will be conducted to assess the characteristics of the injection zone and provide indication about the transmissivity or sealing properties of nearby faults by measuring the pressure response within the formation. The permittee must provide a completion report providing the information and test results required under 30 TAC §331.65(b)(1) and must obtain approval from the Executive Director prior to beginning any injection operations.

Comment No. 5:

The District submitted a memorandum prepared by John Oneacre of Ground Water Solutions, LTD (the Ground Water Solutions memo) with additional technical comments on the application. The Ground Water Solutions memo states that the application does not discuss the source of lignite in the Queen City Formation and Jackson Group and that UEC does not discuss source rocks for oil and gas deposits.

Response No. 5:

The District's May 24, 2022 letter indicated that a memorandum prepared by John Oneacre was attached to the comment letter. Because the Executive Director was not able to locate the attached memorandum in the correspondence file in the Chief Clerk's Office, Executive Director

staff contacted the District on June 7, 2022 to request a copy of the memorandum. The Ground Water Solutions memo was submitted by the District on July 19, 2022.

Geologic evaluation and discussion presented in Section V of the application is specifically focused on suitability of a particular formation/zone for injection of waste fluids, not extraction/production of hydrocarbons. An applicant is required under 30 TAC §305.49(a)(7) to obtain a letter from the Railroad Commission of Texas (RRC) stating that “the drilling of a disposal well and the injection of the waste into the subsurface stratum selected for disposal will not endanger or injure any oil or gas formation.” The Applicant provided a “no harm” letter from the RRC dated September 27, 2021 and is included in Attachment E of the application.

Comment No. 6:

The Ground Water Solutions memo states that the application provides two different numbers for faulting in the area of review: on page V-15, UEC states two faults are present and on page V-17, UEC states four faults can be mapped.

Response No. 6:

The Ground Water Solutions commentor was likely referring to Section V.B.3 of the original (January 1, 2020) submittal of the application. The revised (May 14, 2021) version of the Section V text does not reference the “two” faults in Section V.B.3. The revised page V-17 text references a total of eleven mapped faults within the study area, not four. Additionally, the context of the discussion in page V-15 of the January 1, 2020 version of the application appears to reference the two faults as the closest faults to the injection well locations, not simply implying that there are “only” two faults in the study area.

Comment No. 7:

The Ground Water Solutions memo states that the application describes the faults as sealing faults but also suggests upward migration and charging of shallower reservoirs from deeper source rocks through the fault.

Response No. 7:

The Groundwater Solutions memo is likely referring to a discussion on the sealing properties of Gulf Coast faults presented in pages V-21 thru V-23 in the original (January 1, 2020) submittal of the application. The Applicant was referencing other types of faults and fault sealing properties based on specific lithologies unique to certain geologic formations, such as indurated (hard) sandstones and shales that display brittle properties and may potentially be hydraulically conductive (i.e., via macroscopic features) when faulted. The Applicant suggests that in the absence of macroscopic fractures (not expected in the “soft” sediments of the shallow Gulf Coast basin), deformed sands and shales in the fault plane would be expected to have a lower permeability than surrounding undeformed shale or sand. Additionally, in a sand-shale sequence, the smearing of ductile shale horizons along fault planes generally results in the significant reduction of cross-fault permeability.

Comment No. 8:

The Ground Water Solutions memo states that the application shows fault offsets parallel to the northwest fault that UEC did not identify or infer as a fault.

Response No. 8:

The commenter may have been reviewing an earlier version of the dip-oriented structural cross section (Figure V-18) provided with the original application submittal in January 2020. This offset is clearly identified as a fault in the revised version of Figure V-18 (revised May 15, 2021) and is indicated as extending upward into Catahoula Formation, Oakville Sand, Lagarto, and into the base of the Goliad Formation.

Comment No. 9:

The Ground Water Solutions memo states that the application does not cite the Carothers report that suggests that uranium mineralization at the site is due to the effect of reducing conditions of methane or hydrogen sulfide migration through growth faults.

Response No. 9:

The cited Carothers report was not part of the Class I injection well permit renewal and amendment application reviewed by the Executive Director. The application being considered is for injection wells that will inject fluids into the Vicksburg Formation at depths of 3,200 to 3,590 feet BGL, not for Class III injection into the much shallower Goliad Sands that are known to contain uranium bearing deposits. Factors reviewed by the Executive Director do not focus on uranium deposit formation, but suitability of deeper formations for waste injection.

Comment No. 10:

The District's July 27, 2020; July 26, 2021; April 29, 2022; and May 24, 2022 letters request a public meeting on the application.

Response No. 10:

Under 30 TAC §55.154(c), the Executive Director must hold a public meeting on an application if the Executive Director determines that there is a substantial or significant degree of public interest in an application or if requested by a member of the legislature who represents the general area in which the proposed facility is located. The Executive Director determined that there is not a substantial or significant degree of public interest in the application to warrant the holding of a public meeting on the application. Only one entity has submitted comments and requested a public meeting. The Executive Director sent a letter to the District informing it of this determination.

V. Conclusion

The Executive Director has reviewed the application and preliminarily determined that it meets all relevant regulatory and statutory requirements.

VI. Changes Made to the Draft Permits in Response to Comments

No changes were made to the draft permits in response to public comments received.

Respectfully submitted,

Texas Commission on Environmental Quality

Toby Baker
Executive Director

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REPRESENTING THE EXECUTIVE DIRECTOR OF
THE TEXAS COMMISSION ON
ENVIRONMENTAL QUALITY

CERTIFICATE OF SERVICE

I certify that on September 6, 2022, that the Executive Director's Response to Public Comments for the renewal and amendment of two Class I injection well permits WDW423 and WDW424 was filed with the TCEQ's Office of the Chief Clerk.



Clark Reeder, Staff Attorney

N/A

G. Type of environmental management systems (EMSs):

N/A

H. Voluntary on-site compliance assessment dates:

N/A

I. Participation in a voluntary pollution reduction program:

N/A

J. Early compliance:

N/A

Sites Outside of Texas:

N/A