Administrative Package Cover Page

This file contains the following documents:

1. Summary of application (in plain language)
   - English
   - Alternative Language (Spanish)
2. First Notice (NORI-Notice of Receipt of Application and Intent to Obtain a Permit)
   - English
   - Alternative Language (Spanish)
3. Application materials

Portada de Paquete Administrativo

Este archivo contiene los siguientes documentos:

1. Resumen en lenguaje sencillo (PLS, por sus siglas en inglés) de la actividad propuesta
   - Inglés
   - Idioma alternativo (español)
2. Primer aviso (NORI, por sus siglas en inglés)
   - Inglés
   - Idioma alternativo (español)
3. Solicitud original

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS DOMESTIC WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

The City of Hereford (CN600245427) operates the City of Hereford Wastewater Treatment Plant (RN101612570), a pond system consisting of a bar screen, two aerated lagoons, and a storage pond. The facility is located at approximately 2.5 miles south east of the intersection US Highway 60 and Farm-to-Market Road 2943, in Hereford, Deaf Smith County, Texas 79045. This permit is a renewal to discharge 2.5 million gallons per day (MGD) of treated wastewater. Effluent will be used for irrigation of 583 acres. This permit will not authorize a discharge of pollutants into water in the state.

Discharges from the facility are expected to contain BOD_5. Treated domestic wastewater is treated by a bar screen and two aerated lagoons with a storage pond.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

NOTICE OF RECEIPT OF APPLICATION AND INTENT TO OBTAIN WATER QUALITY PERMIT RENEWAL

PERMIT NO. WQ0010186002

APPLICATION. City of Hereford, P.O. Box 2277, Hereford, Texas 79045, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Land Application Permit (TLAP) No. WQ0010186002 to authorize the disposal of treated wastewater at a volume not to exceed a daily average flow of 2,500,000 gallons per day via surface irrigation of 583 acres of non-public access agricultural land. The domestic wastewater treatment facility and disposal area are located approximately 2.5 miles southeast of the intersection of U.S. Highway 60 and Farm-to-Market Road 2943, near the city of Hereford, in Deaf Smith County, Texas 79045. TCEQ received this application on July 7, 2025. The permit application will be available for viewing and copying at Hereford City Hall, Front Entrance, 224 North Lee Avenue, Hereford, in Deaf Smith County, Texas prior to the date this notice is published in the newspaper. The application, including any updates, and associated notices are available electronically at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tlap-applications. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-102.313333,34.822777&level=18

ADDITIONAL NOTICE. TCEQ's Executive Director has determined the application is administratively complete and will conduct a technical review of the application. After technical review of the application is complete, the Executive Director may prepare a draft permit and will issue a preliminary decision on the application. **Notice of the Application and Preliminary Decision will be published and mailed to those who are on the county-wide mailing list and to those who are on the mailing list for this application. That notice will contain the deadline for submitting public comments.**

PUBLIC COMMENT / PUBLIC MEETING. You may submit public comments or request a public meeting on this application. The purpose of a public meeting is to provide the opportunity to submit comments or to ask questions about the application. 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. A public meeting is not a contested case hearing.

OPPORTUNITY FOR A CONTESTED CASE HEARING. After the deadline for submitting public comments, the Executive Director will consider all timely comments and prepare a response to all relevant and material, or significant public comments. **Unless the application**

is directly referred for a contested case hearing, the response to comments, and the Executive Director's decision on the application, will be mailed to everyone who submitted public comments and to those persons who are on the mailing list for this application. If comments are received, the mailing will also provide instructions for requesting reconsideration of the Executive Director's decision and for requesting a contested case hearing. A contested case hearing is a legal proceeding similar to a civil trial in state district court.

TO REQUEST A CONTESTED CASE HEARING, YOU MUST INCLUDE THE FOLLOWING ITEMS IN YOUR REQUEST: your name, address, phone number; applicant's name and proposed permit number; the location and distance of your property/activities relative to the proposed facility; a specific description of how you would be adversely affected by the facility in a way not common to the general public; a list of all disputed issues of fact that you submit during the comment period and, the statement "[I/we] request a contested case hearing." If the request for contested case hearing is filed on behalf of a group or association, the request must designate the group's representative for receiving future correspondence; identify by name and physical address an individual member of the group who would be adversely affected by the proposed facility or activity; provide the information discussed above regarding the affected member's location and distance from the facility or activity; explain how and why the member would be affected; and explain how the interests the group seeks to protect are relevant to the group's purpose.

Following the close of all applicable comment and request periods, the Executive Director will forward the application and any requests for reconsideration or for a contested case hearing to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

The Commission may only grant a request for a contested case hearing on issues the requestor submitted in their timely comments that were not subsequently withdrawn. **If a hearing is granted, the subject of a hearing will be limited to disputed issues of fact or mixed questions of fact and law relating to relevant and material water quality concerns submitted during the comment period.**

TCEQ may act on an application to renew a permit for discharge of wastewater without providing an opportunity for a contested case hearing if certain criteria are met.

MAILING LIST. If you submit public comments, a request for a contested case hearing or a reconsideration of the Executive Director's decision, you will be added to the mailing list for this specific application to receive future public notices mailed by the Office of the Chief Clerk. In addition, you may request to be placed on: (1) the permanent mailing list for a specific applicant name and permit number; and/or (2) the mailing list for a specific county. If you wish to be placed on the permanent and/or the county mailing list, clearly specify which list(s) and send your request to TCEQ Office of the Chief Clerk at the address below.

INFORMATION AVAILABLE ONLINE. For details about the status of the application, visit the Commissioners' Integrated Database at www.tceq.texas.gov/goto/cid. Search the database using the permit number for this application, which is provided at the top of this notice.

AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at **https://www14.tceq.texas.gov/epic/eComment/**, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105,

P.O. Box 13087, Austin, Texas 78711-3087. Please be aware that any contact information you provide, including your name, phone number, email address and physical address will become part of the agency's public record. For more information about this permit application or the permitting process, please call the TCEQ Public Education Program, Toll Free, at 1-800-687-4040 or visit their website at www.tceq.texas.gov/goto/pep. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from City of Hereford at the address stated above or by calling Mr. Ryan Polster, CPM, City Manager, at 806-363-7100.

Issuance Date: July 30, 2025

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the application.

APPLICANT NAME: City of Hereford

PERMIT NUMBER (If new, leave blank): WQ0010186002

Indicate if each of the following items is included in your application.

	Y	N		Y	N
Administrative Report 1.0	☒	☐	Original USGS Map	☒	☐
Administrative Report 1.1	☐	☒	Affected Landowners Map	☐	☒
SPIF	☐	☒	Landowner Disk or Labels	☐	☒
Core Data Form	☒	☐	Buffer Zone Map	☐	☒
Summary of Application (PLS)	☒	☐	Flow Diagram	☒	☐
Public Involvement Plan Form	☐	☒	Site Drawing	☒	☐
Technical Report 1.0	☒	☐	Original Photographs	☐	☒
Technical Report 1.1	☐	☒	Design Calculations	☐	☒
Worksheet 2.0	☐	☒	Solids Management Plan	☐	☒
Worksheet 2.1	☐	☒	Water Balance	☐	☒
Worksheet 3.0	☒	☐			
Worksheet 3.1	☐	☒			
Worksheet 3.2	☐	☒			
Worksheet 3.3	☐	☒			
Worksheet 4.0	☐	☒			
Worksheet 5.0	☐	☒			
Worksheet 6.0	☒	☐			
Worksheet 7.0	☐	☒			

For TCEQ Use Only

Segment Number _____County _____
Expiration Date _____Region_____
Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.0

For any questions about this form, please contact the Applications Review and Processing Team at 512-239-4671.

Section 1. Application Fees (Instructions Page 26)

Indicate the amount submitted for the application fee (check only one).

Flow	New/Major Amendment	Renewal
<0.05 MGD	$350.00 ☐	$315.00 ☐
≥0.05 but <0.10 MGD	$550.00 ☐	$515.00 ☐
≥0.10 but <0.25 MGD	$850.00 ☐	$815.00 ☐
≥0.25 but <0.50 MGD	$1,250.00 ☐	$1,215.00 ☐
≥0.50 but <1.0 MGD	$1,650.00 ☐	$1,615.00 ☐
≥1.0 MGD	$2,050.00 ☐	$2,015.00 ☒

Minor Amendment (for any flow) $150.00 ☐

Payment Information:

Mailed — Check/Money Order Number: Click to enter text.

Check/Money Order Amount: Click to enter text.

Name Printed on Check: Click to enter text.

EPAY — Voucher Number: Click to enter text.

Copy of Payment Voucher enclosed? Yes ☐

Section 2. Type of Application (Instructions Page 26)

a. Check the box next to the appropriate authorization type.

☒ Publicly Owned Domestic Wastewater

☐ Privately-Owned Domestic Wastewater

☐ Conventional Water Treatment

b. Check the box next to the appropriate facility status.

☒ Active ☐ Inactive

c. Check the box next to the appropriate permit type.

- ☐ TPDES Permit
- ☒ TLAP
- ☐ TPDES Permit with TLAP component
- ☐ Subsurface Area Drip Dispersal System (SADDS)

d. Check the box next to the appropriate application type

- ☐ New
- ☐ Major Amendment *with* Renewal
- ☐ Major Amendment *without* Renewal
- ☒ Renewal without changes
- ☐ Minor Amendment *with* Renewal
- ☐ Minor Amendment *without* Renewal
- ☐ Minor Modification of permit

e. For amendments or modifications, describe the proposed changes: Click to enter text.

f. For existing permits:

Permit Number: WQ00 10186002

EPA I.D. (TPDES only): TX N/A

Expiration Date: December 1, 2025

Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 26)

A. The owner of the facility must apply for the permit.

What is the Legal Name of the entity (applicant) applying for this permit?

City of Hereford

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/

CN: 600245427

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

Prefix: Ms. Last Name, First Name: Bunch, Cathy

Title: Mayor Credential: Click to enter text.

B. Co-applicant information. Complete this section only if another person or entity is required to apply as a co-permittee.

What is the Legal Name of the co-applicant applying for this permit?

N/A

(The legal name must be spelled exactly as filed with the TX SOS, with the County, or in the legal documents forming the entity.)

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at: http://www15.tceq.texas.gov/crpub/

CN: Click to enter text.

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

Prefix: Click to enter text. Last Name, First Name: Click to enter text.

Title: Click to enter text. Credential: Click to enter text.

Provide a brief description of the need for a co-permittee: Click to enter text.

C. Core Data Form

Complete the Core Data Form for each customer and include as an attachment. If the customer type selected on the Core Data Form is **Individual**, complete **Attachment 1** of Administrative Report 1.0. Appendix A: Core Data Form

Section 4. Application Contact Information (Instructions Page 27)

This is the person(s) TCEQ will contact if additional information is needed about this application. Provide a contact for administrative questions and technical questions.

A. Prefix: Mr. Last Name, First Name: Polster, Ryan

Title: City Manager Credential: CPM

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, Texas 79045

Phone No.: 806.363.7100 E-mail Address: mgr@hereford-texas.com

Check one or both: ☒ Administrative Contact ☐ Technical Contact

B. Prefix: Mr. Last Name, First Name: Krueger, Paul

Title: Civil Engineer Credential: P.E.

Organization Name: Parkhill

Mailing Address: 4222 85th Street City, State, Zip Code: Lubbock, Texas 79423

Phone No.: 806.473.2200 E-mail Address: pkrueger@parkhill.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

Section 5. Permit Contact Information (Instructions Page 27)

Provide the names and contact information for two individuals that can be contacted throughout the permit term.

A. Prefix: Mr. Last Name, First Name: Polster, Ryan

Title: City Manager Credential: CPM

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, Texas 79045

Phone No.: 806.363.7100 E-mail Address: mgr@hereford-texas.com

B. Prefix: Mr. Last Name, First Name: Krueger, Paul

Title: Civil Engineer Credential: P.E

Organization Name: Parkhill

Mailing Address: 4222 85th Street City, State, Zip Code: Lubbock, Texas, 79423

Phone No.: 806.473.2200 E-mail Address: pkrueger@parkhill.com

Section 6. Billing Contact Information (Instructions Page 27)

The permittee is responsible for paying the annual fee. The annual fee will be assessed to permits ***in effect on September 1 of each year***. The TCEQ will send a bill to the address provided in this section. The permittee is responsible for terminating the permit when it is no longer needed (using form TCEQ-20029).

Prefix: Mr. Last Name, First Name: Polster, Ryan

Title: City Manager Credential: CPM

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, TX 79045

Phone No.: 806.363.7100 E-mail Address: mgr@hereford-texas.com

Section 7. DMR/MER Contact Information (Instructions Page 27)

Provide the name and complete mailing address of the person delegated to receive and submit Discharge Monitoring Reports (DMR) (EPA 3320-1) or maintain Monthly Effluent Reports (MER).

Prefix: Mr. Last Name, First Name: Torres, Johnny

Title: Director of Public Works Credential:

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, TX 79045

Phone No.: 806.363.7100 E-mail Address: Johnnyt@wtrt.net

Section 8. Public Notice Information (Instructions Page 27)

A. Individual Publishing the Notices

Prefix: Mr. Last Name, First Name: Krueger, Paul

Title: Civil Engineer Credential: P.E.

Organization Name: Parkhill

Mailing Address: 4222 85th Street City, State, Zip Code: Lubbock, TX 79423

Phone No.: 806.473.2200 E-mail Address: pkrueger@parkhill.com

B. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package

Indicate by a check mark the preferred method for receiving the first notice and instructions:

☒ E-mail Address

☐ Fax

☐ Regular Mail

C. Contact permit to be listed in the Notices

Prefix: Mr. Last Name, First Name: Polster, Ryan

Title: City Manager Credential: CPM

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, TX 79045

Phone No.: 806.363.7100 E-mail Address: mgr@hereford-texas.com

D. Public Viewing Information

If the facility or outfall is located in more than one county, a public viewing place for each county must be provided.

Public building name: Hereford City Hall

Location within the building: Front Entrance

Physical Address of Building: 224 Lee Ave

City: Hereford County: Deaf Smith

Contact (Last Name, First Name): Polster, Ryan

Phone No.: 806.363.7100 Ext.: Click to enter text.

E. Bilingual Notice Requirements

This information **is required** for **new, major amendment, minor amendment or minor modification, and renewal** applications.

This section of the application is only used to determine if alternative language notices will be needed. Complete instructions on publishing the alternative language notices will be in your public notice package.

Please call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine whether an alternative language notices are required.

1. Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?

   ☐ Yes ☒ No

   If **no**, publication of an alternative language notice is not required; **skip to** Section 9 below.

2. Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?

   ☐ Yes ☐ No

3. Do the students at these schools attend a bilingual education program at another location?

   ☐ Yes ☐ No

4. Would the school be required to provide a bilingual education program but the school has waived out of this requirement under 19 TAC §89.1205(g)?

   ☐ Yes ☐ No

5. If the answer is **yes** to **question 1, 2, 3, or 4**, public notices in an alternative language are required. Which language is required by the bilingual program? Click to enter text.

F. Summary of Application in Plain Language Template

Complete the F. Summary of Application in Plain Language Template (TCEQ Form 20972), also known as the plain language summary or PLS, and include as an attachment.

Attachment: Appendix B – Plain Language Summary

G. Public Involvement Plan Form

Complete the Public Involvement Plan Form (TCEQ Form 20960) for each application for a **new permit or major amendment to a permit** and include as an attachment.

Attachment: N/A

Section 9. Regulated Entity and Permitted Site Information (Instructions Page 29)

A. If the site is currently regulated by TCEQ, provide the Regulated Entity Number (RN) issued to this site. **RN** 101612570

Search the TCEQ's Central Registry at http://www15.tceq.texas.gov/crpub/ to determine if the site is currently regulated by TCEQ.

B. Name of project or site (the name known by the community where located):

City of Hereford Wastewater Treatment Plant

C. Owner of treatment facility: City of Hereford

Ownership of Facility: ☒ Public ☐ Private ☐ Both ☐ Federal

D. Owner of land where treatment facility is or will be:

Prefix: N/A Last Name, First Name: N/A

Title: N/A Credential: N/A

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, TX 79045

Phone No.: 806.363.7100 E-mail Address: mgr@hereford-texas.com

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment: N/A

E. Owner of effluent disposal site:

Prefix: N/A Last Name, First Name: N/A

Title: N/A Credential: N/A

Organization Name: City of Hereford

Mailing Address: PO Box 2277 City, State, Zip Code: Hereford, TX 79045

Phone No.: 806.363.7100 E-mail Address: Click to enter text.

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment: N/A

F. Owner sewage sludge disposal site (if authorization is requested for sludge disposal on property owned or controlled by the applicant)::

Prefix: N/A Last Name, First Name: N/A

Title: N/A Credential: N/A

Organization Name: N/A

Mailing Address: N/A City, State, Zip Code: N/A

Phone No.: N/A E-mail Address: N/A

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment: N/A

Section 10. TPDES Discharge Information (Instructions Page 31)

A. Is the wastewater treatment facility location in the existing permit accurate?

☐ Yes ☐ No

If **no**, **or a new permit application**, please give an accurate description:

N/A

B. Are the point(s) of discharge and the discharge route(s) in the existing permit correct?

☐ Yes ☐ No

If **no**, **or a new or amendment permit application**, provide an accurate description of the point of discharge and the discharge route to the nearest classified segment as defined in 30 TAC Chapter 307:

Click to enter text.

City nearest the outfall(s): Click to enter text.

County in which the outfalls(s) is/are located: Click to enter text.

C. Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?

☐ Yes ☐ No

If **yes**, indicate by a check mark if:

☐ Authorization granted ☐ Authorization pending

For **new and amendment** applications, provide copies of letters that show proof of contact and the approval letter upon receipt.

Attachment: Click to enter text.

D. For all applications involving an average daily discharge of 5 MGD or more, provide the names of all counties located within 100 statute miles downstream of the point(s) of discharge: Click to enter text.

Section 11. TLAP Disposal Information (Instructions Page 32)

A. For TLAPs, is the location of the effluent disposal site in the existing permit accurate?

☒ Yes ☐ No

If **no, or a new or amendment permit application**, provide an accurate description of the disposal site location:

N/A

B. City nearest the disposal site: Hereford

C. County in which the disposal site is located: Deaf Smith

D. For **TLAPs**, describe the routing of effluent from the treatment facility to the disposal site:

Treated effluent is pumped from the storage pond to either the effluent disposal site consisting of 209 acres directly east, or to the effluent disposal site consisting of 374 acres 6,700 feet to the northeast of the storage pond

E. For **TLAPs**, please identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained: Segment No. 0229B of the Red River Basin

Section 12. Miscellaneous Information (Instructions Page 32)

A. Is the facility located on or does the treated effluent cross American Indian Land?

☐ Yes ☒ No

B. If the existing permit contains an onsite sludge disposal authorization, is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ Not Applicable

If No, or if a new onsite sludge disposal authorization is being requested in this permit application, provide an accurate location description of the sewage sludge disposal site.

Click to enter text.

C. Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?

☐ Yes ☒ No

If yes, list each person formerly employed by the TCEQ who represented your company and was paid for service regarding the application: N/A

D. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following information:

Account number: Click to enter text.

Amount past due: Click to enter text.

E. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If **yes**, please provide the following information:

Enforcement order number: Click to enter text.

Amount past due: Click to enter text.

Section 13. Attachments (Instructions Page 33)

Indicate which attachments are included with the Administrative Report. Check all that apply:

☐ Lease agreement or deed recorded easement, if the land where the treatment facility is located or the effluent disposal site are not owned by the applicant or co-applicant.

☒ Original full-size USGS Topographic Map with the following information:

- Applicant's property boundary
- Treatment facility boundary
- Labeled point of discharge for each discharge point (TPDES only)
- Highlighted discharge route for each discharge point (TPDES only)
- Onsite sewage sludge disposal site (if applicable)
- Effluent disposal site boundaries (TLAP only)
- New and future construction (if applicable)
- 1 mile radius information
- 3 miles downstream information (TPDES only)
- All ponds.

☐ Attachment 1 for Individuals as co-applicants

☐ Other Attachments. Please specify: Appendix C – USGS Map

Section 14. Signature Page (Instructions Page 34)

If co-applicants are necessary, each entity must submit an original, separate signature page.

Permit Number: WQ0010186002

Applicant: City of Hereford

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code § 305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Cathy Bunch

Signatory title: Mayor

Signature:_____ Date:_____

(Use blue ink)

Subscribed and Sworn to before me by the said_____

on this_____ day of_____, 20_____.

My commission expires on the_____ day of_____, 20_____.

_____

Notary Public *[SEAL]*

_____

County, Texas

DOMESTIC WASTEWATER PERMIT APPLICATION ADMINISTRATIVE REPORT 1.0

The following information is required for new and amendment applications.

Section 1. Affected Landowner Information (Instructions Page 36)

A. Indicate by a check mark that the landowners map or drawing, with scale, includes the following information, as applicable:

- ☐ The applicant's property boundaries
- ☐ The facility site boundaries within the applicant's property boundaries
- ☐ The distance the buffer zone falls into adjacent properties and the property boundaries of the landowners located within the buffer zone
- ☐ The property boundaries of all landowners surrounding the applicant's property (Note: if the application is a major amendment for a lignite mine, the map must include the property boundaries of all landowners adjacent to the new facility (ponds).)
- ☐ The point(s) of discharge and highlighted discharge route(s) clearly shown for one mile downstream
- ☐ The property boundaries of the landowners located on both sides of the discharge route for one full stream mile downstream of the point of discharge
- ☐ The property boundaries of the landowners along the watercourse for a one-half mile radius from the point of discharge if the point of discharge is into a lake, bay, estuary, or affected by tides
- ☐ The boundaries of the effluent disposal site (for example, irrigation area or subsurface drainfield site) and all evaporation/holding ponds within the applicant's property
- ☐ The property boundaries of all landowners surrounding the effluent disposal site
- ☐ The boundaries of the sludge land application site (for land application of sewage sludge for beneficial use) and the property boundaries of landowners surrounding the applicant's property boundaries where the sewage sludge land application site is located
- ☐ The property boundaries of landowners within one-half mile in all directions from the applicant's property boundaries where the sewage sludge disposal site (for example, sludge surface disposal site or sludge monofill) is located

B. ☐ Indicate by a check mark that a separate list with the landowners' names and mailing addresses cross-referenced to the landowner's map has been provided.

C. ☐ Indicate by a check mark that the landowners list has also been provided as mailing labels in electronic format (Avery 5160).

D. Provide the source of the landowners' names and mailing addresses: Click to enter text.

E. As required by *Texas Water Code § 5.115*, is any permanent school fund land affected by this application?

☐ Yes ☐ No

If **yes**, provide the location and foreseeable impacts and effects this application has on the land(s):

Click to enter text.

Section 2. Original Photographs (Instructions Page 38)

Provide original ground level photographs. Indicate with checkmarks that the following information is provided.

- ☐ At least one original photograph of the new or expanded treatment unit location
- ☐ At least two photographs of the existing/proposed point of discharge and as much area downstream (photo 1) and upstream (photo 2) as can be captured. If the discharge is to an open water body (e.g., lake, bay), the point of discharge should be in the right or left edge of each photograph showing the open water and with as much area on each respective side of the discharge as can be captured.
- ☐ At least one photograph of the existing/proposed effluent disposal site
- ☐ A plot plan or map showing the location and direction of each photograph

Section 3. Buffer Zone Map (Instructions Page 38)

A. Buffer zone map. Provide a buffer zone map on 8.5 x 11-inch paper with all of the following information. The applicant's property line and the buffer zone line may be distinguished by using dashes or symbols and appropriate labels.

- The applicant's property boundary;
- The required buffer zone; and
- Each treatment unit; and
- The distance from each treatment unit to the property boundaries.

B. Buffer zone compliance method. Indicate how the buffer zone requirements will be met. Check all that apply.

- ☐ Ownership
- ☐ Restrictive easement
- ☐ Nuisance odor control
- ☐ Variance

C. Unsuitable site characteristics. Does the facility comply with the requirements regarding unsuitable site characteristic found in 30 TAC § 309.13(a) through (d)?

☐ Yes ☐ No

DOMESTIC WASTEWATER PERMIT APPLICATION

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

This form applies to TPDES permit applications only. Complete and attach the Supplemental Permit information Form (SPIF) (TCEQ Form 20971).

Attachment: N/A

WATER QUALITY PERMIT

PAYMENT SUBMITTAL FORM

Use this form to submit the Application Fee, if the mailing the payment.

- Complete items 1 through 5 below.
- Staple the check or money order in the space provided at the bottom of this document.
- **Do Not mail this form with the application form.**
- Do not mail this form to the same address as the application.
- Do not submit a copy of the application with this form as it could cause duplicate permit entries.

Mail this form and the check or money order to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, Texas 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, Texas 78753

Fee Code: WQP **Waste Permit No:** WQ0010186002

1. Check or Money Order Number: Click to enter text.
2. Check or Money Order Amount: Click to enter text.
3. Date of Check or Money Order: Click to enter text.
4. Name on Check or Money Order: Click to enter text.
5. APPLICATION INFORMATION

   Name of Project or Site: City of Hereford Wastewater Treatment Plant

   Physical Address of Project or Site: Click to enter text.

   If the check is for more than one application, attach a list which includes the name of each Project or Site (RE) and Physical Address, exactly as provided on the application.

Staple Check or Money Order in This Space

ATTACHMENT 1

INDIVIDUAL INFORMATION

Section 1. Individual Information (Instructions Page 41)

Complete this attachment if the facility applicant or co-applicant is an individual. Make additional copies of this attachment if both are individuals.

Prefix (Mr., Ms., Miss): Click to enter text.

Full legal name (Last Name, First Name, Middle Initial): Click to enter text.

Driver's License or State Identification Number: Click to enter text.

Date of Birth: Click to enter text.

Mailing Address: Click to enter text.

City, State, and Zip Code: Click to enter text.

Phone Number: Click to enter text. Fax Number: Click to enter text.

E-mail Address: Click to enter text.

CN: Click to enter text.

For Commission Use Only:
Customer Number:
Regulated Entity Number:
Permit Number:

DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST OF COMMON DEFICIENCIES

Below is a list of common deficiencies found during the administrative review of domestic wastewater permit applications. To ensure the timely processing of this application, please review the items below and indicate by checking Yes that each item is complete and in accordance applicable rules at 30 TAC Chapters 21, 281, and 305. If an item is not required this application, indicate by checking N/A where appropriate. Please do not submit the application until the items below have been addressed.

Core Data Form (TCEQ Form No. 10400) ☒ Yes
(Required for all application types. Must be completed in its entirety and signed. Note: Form may be signed by applicant representative.)

Correct and Current Industrial Wastewater Permit Application Forms ☒ Yes
(TCEQ Form Nos. 10053 and 10054. Version dated 6/25/2018 or later.)

Water Quality Permit Payment Submittal Form (Page 19) ☒ Yes
(Original payment sent to TCEQ Revenue Section. See instructions for mailing address.)

7.5 Minute USGS Quadrangle Topographic Map Attached ☒ Yes
(Full-size map if seeking "New" permit. 8 ½ x 11 acceptable for Renewals and Amendments)

Current/Non-Expired, Executed Lease Agreement or Easement ☒ N/A ☐ Yes

Landowners Map ☒ N/A ☐ Yes
(See instructions for landowner requirements)

Things to Know:

- All the items shown on the map must be labeled.
- The applicant's complete property boundaries must be delineated which includes boundaries of contiguous property owned by the applicant.
- The applicant cannot be its own adjacent landowner. You must identify the landowners immediately adjacent to their property, regardless of how far they are from the actual facility.
- If the applicant's property is adjacent to a road, creek, or stream, the landowners on the opposite side must be identified. Although the properties are not adjacent to applicant's property boundary, they are considered potentially affected landowners. If the adjacent road is a divided highway as identified on the USGS topographic map, the applicant does not have to identify the landowners on the opposite side of the highway.

Landowners Labels and Cross Reference List ☒ N/A ☐ Yes
(See instructions for landowner requirements)

Electronic Application Submittal ☒ Yes
(See application submittal requirements on page 23 of the instructions.)

Original signature per 30 TAC § 305.44 – Blue Ink Preferred ☒ Yes
(If signature page is not signed by an elected official or principle executive officer, a copy of signature authority/delegation letter must be attached)

Summary of Application (in Plain Language) ☒ Yes

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.0

For any questions about this form, please contact the Domestic Wastewater Permitting Team at 512-239-4671.

The following information is required for all renewal, new, and amendment applications.

Section 1. Permitted or Proposed Flows (Instructions Page 42)

A. Existing/Interim I Phase

Design Flow (MGD): 2.5

2-Hr Peak Flow (MGD): Click to enter text.

Estimated construction start date: Click to enter text.

Estimated waste disposal start date: 2002

B. Interim II Phase

Design Flow (MGD): N/A

2-Hr Peak Flow (MGD): N/A

Estimated construction start date: N/A

Estimated waste disposal start date: N/A

C. Final Phase

Design Flow (MGD): N/A

2-Hr Peak Flow (MGD): N/A

Estimated construction start date: N/A

Estimated waste disposal start date: N/A

D. Current Operating Phase

Provide the startup date of the facility: 2002

Section 2. Treatment Process (Instructions Page 42)

A. Current Operating Phase

Provide a detailed description of the treatment process. **Include the type of treatment plant, mode of operation, and all treatment units.** Start with the plant's head works and

finish with the point of discharge. Include all sludge processing and drying units. **If more than one phase exists or is proposed, a description of *each phase* must be provided**.

The City of Hereford WWTP receives flow from the collection system from a lift station located to the west, outside the treatment facility. Flow is then routed through the headworks structure that includes a mechanical bar screen, then the two aerated lagoons operating in series followed by a storage pond. From the storage pond, effluent is pumped to 583 acres of non-public access land owned by the City of Hereford for land application.

B. Treatment Units

In Table 1.0(1), provide the treatment unit type, the number of units, and dimensions (length, width, depth) **of each treatment unit, accounting for *all* phases of operation.**

Table 1.0(1) - Treatment Units

Treatment Unit Type	Number of Units	Dimensions (L x W x D)
Mechanical Bar Screen	1	N/A
Aerated Lagoon	2	875' x 200' x 15'
Storage Pond	1	875' x 1620' x 21'

C. Process Flow Diagram

Provide flow diagrams for the existing facilities and **each** proposed phase of construction.

Attachment: Appendix D – Flow Diagram

Section 3. Site Information and Drawing (Instructions Page 43)

Provide the TPDES discharge outfall latitude and longitude. Enter N/A if not applicable.

- Latitude: N/A
- Longitude: N/A

Provide the TLAP disposal site latitude and longitude. Enter N/A if not applicable.

- Latitude: 34° 49' 30" N
- Longitude: 102° 18' 10" W

Provide a site drawing for the facility that shows the following:

- The boundaries of the treatment facility;
- The boundaries of the area served by the treatment facility;
- If land disposal of effluent, the boundaries of the disposal site and all storage/holding ponds; and
- If sludge disposal is authorized in the permit, the boundaries of the land application or disposal site.

Attachment: Appendix E – Site Map

Provide the name **and** a description of the area served by the treatment facility.

The area served by the treatment facility is the City of Hereford which has a population of 15,608. The City of Hereford is located in Deaf Smith County at the intersection of US Highway 60 and US Highway 385.

Collection System Information **for wastewater TPDES permits only**: Provide information for each **uniquely owned** collection system, existing and new, served by this facility, including satellite collection systems. **Please see the instructions for a detailed explanation and examples.**

Collection System Information

Collection System Name	Owner Name	Owner Type	Population Served
		Choose an item.	
		Choose an item.	
		Choose an item.	
		Choose an item.	

Section 4. Unbuilt Phases (Instructions Page 44)

Is the application for a renewal of a permit that contains an unbuilt phase or phases?

☐ Yes ☒ No

If yes, does the existing permit contain a phase that has not been constructed **within five years** of being authorized by the TCEQ?

☐ Yes ☐ No

If yes, provide a detailed discussion regarding the continued need for the unbuilt phase. **Failure to provide sufficient justification may result in the Executive Director recommending denial of the unbuilt phase or phases**.

Click to enter text.

Section 5. Closure Plans (Instructions Page 44)

Have any treatment units been taken out of service permanently, or will any units be taken out of service in the next five years?

☐ Yes ☒ No

If yes, was a closure plan submitted to the TCEQ?

☐ Yes ☐ No

If yes, provide a brief description of the closure and the date of plan approval.

Click to enter text.

Section 6. Permit Specific Requirements (Instructions Page 44)

For applicants with an existing permit, check the Other Requirements or Special Provisions of the permit.

A. Summary transmittal

Have plans and specifications been approved for the existing facilities and each proposed phase?

☒ Yes ☐ No

If yes, provide the date(s) of approval for each phase: 2002

Provide information, including dates, on any actions taken to meet a *requirement or provision* pertaining to the submission of a summary transmittal letter. **Provide a copy of an approval letter from the TCEQ, if applicable**.

Click to enter text.

B. Buffer zones

Have the buffer zone requirements been met?

☒ Yes ☐ No

Provide information below, including dates, on any actions taken to meet the conditions of the buffer zone. If available, provide any new documentation relevant to maintaining the buffer zones.

Click to enter text.

C. Other actions required by the current permit

Does the *Other Requirements* or *Special Provisions* section in the existing permit require submission of any other information or other required actions? Examples include Notification of Completion, progress reports, soil monitoring data, etc.

☒ Yes ☐ No

If yes, provide information below on the status of any actions taken to meet the conditions of an *Other Requirement* or *Special Provision*.

The City of Hereford conducts soil sampling on lands that have received effluent irrigation in compliance with the special provisions on the existing permit.

D. Grit and grease treatment

1. Acceptance of grit and grease waste

Does the facility have a grit and/or grease processing facility onsite that treats and decants or accepts transported loads of grit and grease waste that are discharged directly to the wastewater treatment plant prior to any treatment?

☐ Yes ☒ No

If No, stop here and continue with Subsection E. Stormwater Management.

2. Grit and grease processing

Describe below how the grit and grease waste is treated at the facility. In your description, include how and where the grit and grease is introduced to the treatment works and how it is separated or processed. Provide a flow diagram showing how grit and grease is processed at the facility.

N/A

3. Grit disposal

Does the facility have a Municipal Solid Waste (MSW) registration or permit for grit disposal?

☐ Yes ☐ No

If No, contact the TCEQ Municipal Solid Waste team at 512-239-2335. Note: A registration or permit is required for grit disposal. Grit shall not be combined with treatment plant sludge. See the instruction booklet for additional information on grit disposal requirements and restrictions.

Describe the method of grit disposal.

Click to enter text.

4. *Grease and decanted liquid disposal*

Note: A registration or permit is required for grease disposal. Grease shall not be combined with treatment plant sludge. For more information, contact the TCEQ Municipal Solid Waste team at 512-239-2335.

Describe how the decant and grease are treated and disposed of after grit separation.

Click to enter text.

E. Stormwater management

1. *Applicability*

Does the facility have a design flow of 1.0 MGD or greater in any phase?

☒ Yes ☐ No

Does the facility have an approved pretreatment program, under 40 CFR Part 403?

☐ Yes ☒ No

If no to both of the above, then skip to Subsection F, Other Wastes Received.

2. *MSGP coverage*

Is the stormwater runoff from the WWTP and dedicated lands for sewage disposal currently permitted under the TPDES Multi-Sector General Permit (MSGP), TXR050000?

☐ Yes ☒ No

If yes, please provide MSGP Authorization Number and skip to Subsection F, Other Wastes Received:

TXR05 Click to enter text. or TXRNE Click to enter text.

If no, do you intend to seek coverage under TXR050000?

☐ Yes ☐ No

3. *Conditional exclusion*

Alternatively, do you intend to apply for a conditional exclusion from permitting based TXR050000 (Multi Sector General Permit) Part II B.2 or TXR050000 (Multi Sector General Permit) Part V, Sector T 3(b)?

☐ Yes ☐ No

If yes, please explain below then proceed to Subsection F, Other Wastes Received:

Click to enter text.

4. ***Existing coverage in individual permit***

Is your stormwater discharge currently permitted through this individual TPDES or TLAP permit?

☐ Yes ☒ No

If yes, provide a description of stormwater runoff management practices at the site that are authorized in the wastewater permit then skip to Subsection F, Other Wastes Received.

Click to enter text.

5. ***Zero stormwater discharge***

Do you intend to have no discharge of stormwater via use of evaporation or other means?

☐ Yes ☒ No

If yes, explain below then skip to Subsection F. Other Wastes Received.

Click to enter text.

Note: If there is a potential to discharge any stormwater to surface water in the state as the result of any storm event, then permit coverage is required under the MSGP or an individual discharge permit. This requirement applies to all areas of facilities with treatment plants or systems that treat, store, recycle, or reclaim domestic sewage, wastewater or sewage sludge (including dedicated lands for sewage sludge disposal located within the onsite property boundaries) that meet the applicability criteria of above. You have the option of obtaining coverage under the MSGP for direct discharges, (recommended), or obtaining coverage under this individual permit.

6. ***Request for coverage in individual permit***

Are you requesting coverage of stormwater discharges associated with your treatment plant under this individual permit?

☐ Yes ☒ No

If yes, provide a description of stormwater runoff management practices at the site for which you are requesting authorization in this individual wastewater permit and describe whether you intend to comingle this discharge with your treated effluent or discharge it via a separate dedicated stormwater outfall. Please also indicate if you

intend to divert stormwater to the treatment plant headworks and indirectly discharge it to water in the state.

Click to enter text.

Note: Direct stormwater discharges to waters in the state authorized through this individual permit will require the development and implementation of a stormwater pollution prevention plan (SWPPP) and will be subject to additional monitoring and reporting requirements. Indirect discharges of stormwater via headworks recycling will require compliance with all individual permit requirements including 2-hour peak flow limitations. All stormwater discharge authorization requests will require additional information during the technical review of your application.

F. Discharges to the Lake Houston Watershed

Does the facility discharge in the Lake Houston watershed?

☐ Yes ☒ No

If yes, attach a Sewage Sludge Solids Management Plan. See Example 5 in the instructions.
Click to enter text.

G. Other wastes received including sludge from other WWTPs and septic waste

1. *Acceptance of sludge from other WWTPs*

Does or will the facility accept sludge from other treatment plants at the facility site?

☐ Yes ☒ No

If yes, attach sewage sludge solids management plan. See Example 5 of instructions.

In addition, provide the date the plant started or is anticipated to start accepting sludge, an estimate of monthly sludge acceptance (gallons or millions of gallons), an estimate of the BOD_5 concentration of the sludge, and the design BOD_5 concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

2. *Acceptance of septic waste*

Is the facility accepting or will it accept septic waste?

☐ Yes ☒ No

If yes, does the facility have a Type V processing unit?

☐ Yes ☐ No

If yes, does the unit have a Municipal Solid Waste permit?

☐ Yes ☐ No

If yes to any of the above, provide the date the plant started or is anticipated to start accepting septic waste, an estimate of monthly septic waste acceptance (gallons or millions of gallons), an estimate of the BOD_5 concentration of the septic waste, and the design BOD_5 concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

N/A

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

3. ***Acceptance of other wastes (not including septic, grease, grit, or RCRA, CERCLA or as discharged by IUs listed in Worksheet 6)***

Is or will the facility accept wastes that are not domestic in nature excluding the categories listed above?

☐ Yes ☒ No

If yes, provide the date that the plant started accepting the waste, an estimate how much waste is accepted on a monthly basis (gallons or millions of gallons), a description of the entities generating the waste, and any distinguishing chemical or other physical characteristic of the waste. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Section 7. Pollutant Analysis of Treated Effluent (Instructions Page 49)

Is the facility in operation?

☒ Yes ☐ No

If no, this section is not applicable. Proceed to Section 8.

If yes, provide effluent analysis data for the listed pollutants. ***Wastewater treatment facilities*** complete Table 1.0(2). **W*ater treatment facilities*** discharging filter backwash water, complete Table 1.0(3). Provide copies of the laboratory results sheets. **These tables are not applicable for a minor amendment without renewal.** See the instructions for guidance.

Note: The sample date must be within 1 year of application submission.

Table1.0(2) – Pollutant Analysis for Wastewater Treatment Facilities

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
$CBOD_5$, mg/l	26.2	26.2	1	Grab	5/15/2025 @8:40 AM
Total Suspended Solids, mg/l	27.7	27.7	1	Grab	5/15/2025 @8:40 AM
Ammonia Nitrogen, mg/l	10.5	10.5	1	Grab	5/15/2025 @8:40 AM
Nitrate Nitrogen, mg/l	0.505	0.505	1	Grab	5/15/2025 @8:40 AM
Total Kjeldahl Nitrogen, mg/l	24.3	24.3	1	Grab	5/15/2025 @8:40 AM
Sulfate, mg/l	69.6	69.6	1	Grab	5/15/2025 @8:40 AM
Chloride, mg/l	109	109	1	Grab	5/15/2025 @8:40 AM
Total Phosphorus, mg/l	7.16	7.16	1	Grab	5/15/2025 @8:40 AM
pH, standard units	8.1@21c	8.1@21c	1	Grab	5/15/2025 @8:40 AM
Dissolved Oxygen*, mg/l	X	X	X	X	X
Chlorine Residual, mg/l	<0.100	<0.100	1	Grab	5/15/2025 @8:40 AM
E.coli (CFU/100ml) freshwater	727	727	1	Grab	5/15/2025 @8:40 AM
Entercocci (CFU/100ml) saltwater	X	X	X	X	X
Total Dissolved Solids, mg/l	1120	1120	1	Grab	5/15/2025 @8:40 AM
Electrical Conductivity, µmohs/cm, †	1790	1790	1	Grab	5/15/2025 @8:40 AM
Oil & Grease, mg/l	<4.60	<4.60	1	Grab	5/15/2025 @8:40 AM
Alkalinity ($CaCO_3$)*, mg/l	X	X	X	X	X

*TPDES permits only
†TLAP permits only

Table1.0(3) – Pollutant Analysis for Water Treatment Facilities

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
Total Suspended Solids, mg/l	N/A	N/A	N/A	N/A	N/A
Total Dissolved Solids, mg/l	N/A	N/A	N/A	N/A	N/A
pH, standard units	N/A	N/A	N/A	N/A	N/A

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
Fluoride, mg/l					
Aluminum, mg/l					
Alkalinity ($CaCO_3$), mg/l					

Section 8. Facility Operator (Instructions Page 49)

Facility Operator Name: Joe Olvera

Facility Operator's License Classification and Level: Class D

Facility Operator's License Number: WW0036940

Section 9. Sludge and Biosolids Management and Disposal (Instructions Page 50)

A. WWTP's Sewage Sludge or Biosolids Management Facility Type

Check all that apply. See instructions for guidance

- ☒ Design flow>= 1 MGD
- ☒ Serves >= 10,000 people
- ☐ Class I Sludge Management Facility (per 40 CFR § 503.9)
- ☐ Biosolids generator
- ☐ Biosolids end user – land application (onsite)
- ☐ Biosolids end user – surface disposal (onsite)
- ☐ Biosolids end user – incinerator (onsite)

B. WWTP's Sewage Sludge or Biosolids Treatment Process

Check all that apply. See instructions for guidance.

- ☐ Aerobic Digestion
- ☐ Air Drying (or sludge drying beds)
- ☐ Lower Temperature Composting
- ☐ Lime Stabilization
- ☐ Higher Temperature Composting
- ☐ Heat Drying
- ☐ Thermophilic Aerobic Digestion
- ☐ Beta Ray Irradiation
- ☐ Gamma Ray Irradiation
- ☐ Pasteurization
- ☐ Preliminary Operation (e.g. grinding, de-gritting, blending)

☐ Thickening (e.g. gravity thickening, centrifugation, filter press, vacuum filter)

☐ Sludge Lagoon

☐ Temporary Storage (< 2 years)

☒ Long Term Storage (>= 2 years)

☐ Methane or Biogas Recovery

☐ Other Treatment Process: Click to enter text.

C. Sewage Sludge or Biosolids Management

Provide information on the *intended* sewage sludge or biosolids management practice. Do not enter every management practice that you want authorized in the permit, as the permit will authorize all sewage sludge or biosolids management practices listed in the instructions. Rather indicate the management practice the facility plans to use.

Biosolids Management

Management Practice	Handler or Preparer Type	Bulk or Bag Container	Amount (dry metric tons)	Pathogen Reduction Options	Vector Attraction Reduction Option
Storage	On-Site Owner or Operator	Not Applicable		Class B: PSRP Equivalency	Option 5: Aerobic process for 14 days at >40C

If "Other" is selected for Management Practice, please explain (e.g. monofill or transport to another WWTP): Click to enter text.

D. Disposal site

Disposal site name: N/A

TCEQ permit or registration number: N/A

County where disposal site is located: N/A

E. Transportation method

Method of transportation (truck, train, pipe, other): N/A

Name of the hauler: N/A

Hauler registration number: N/A

Sludge is transported as a:

Liquid ☐ semi-liquid ☐ semi-solid ☐ solid ☐

Section 10. Permit Authorization for Sewage Sludge Disposal (Instructions Page 52)

A. Beneficial use authorization

Does the existing permit include authorization for land application of biosolids for beneficial use?

☐ Yes ☒ No

If yes, are you requesting to continue this authorization to land apply biosolids for beneficial use?

☐ Yes ☐ No

If yes, is the completed **Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)** attached to this permit application (see the instructions for details)?

☐ Yes ☐ No

B. Sludge processing authorization

Does the existing permit include authorization for any of the following sludge processing, storage or disposal options?

Sludge Composting	☐ Yes	☒ No
Marketing and Distribution of Biosolids	☐ Yes	☒ No
Sludge Surface Disposal or Sludge Monofill	☐ Yes	☒ No
Temporary storage in sludge lagoons	☐ Yes	☒ No

If yes to any of the above sludge options and the applicant is requesting to continue this authorization, is the completed **Domestic Wastewater Permit Application: Sewage Sludge Technical Report (TCEQ Form No. 10056)** attached to this permit application?

☐ Yes ☐ No

Section 11. Sewage Sludge Lagoons (Instructions Page 53)

Does this facility include sewage sludge lagoons?

☐ Yes ☒ No

If yes, complete the remainder of this section. If no, proceed to Section 12.

A. Location information

The following maps are required to be submitted as part of the application. For each map, provide the Attachment Number.

- Original General Highway (County) Map:

  Attachment: Click to enter text.
- USDA Natural Resources Conservation Service Soil Map:

  Attachment: Click to enter text.
- Federal Emergency Management Map:

  Attachment: Click to enter text.
- Site map:

  Attachment: Click to enter text.

Discuss in a description if any of the following exist within the lagoon area. Check all that apply.

☐ Overlap a designated 100-year frequency flood plain

☐ Soils with flooding classification

☐ Overlap an unstable area

☐ Wetlands

☐ Located less than 60 meters from a fault

☐ None of the above

Attachment: Click to enter text.

If a portion of the lagoon(s) is located within the 100-year frequency flood plain, provide the protective measures to be utilized including type and size of protective structures:

Click to enter text.

B. Temporary storage information

Provide the results for the pollutant screening of sludge lagoons. These results are in addition to pollutant results in *Section 7 of Technical Report 1.0.*

Nitrate Nitrogen, mg/kg: Click to enter text.

Total Kjeldahl Nitrogen, mg/kg: Click to enter text.

Total Nitrogen (=nitrate nitrogen + TKN), mg/kg: Click to enter text.

Phosphorus, mg/kg: Click to enter text.

Potassium, mg/kg: Click to enter text.

pH, standard units: Click to enter text.

Ammonia Nitrogen mg/kg: Click to enter text.

Arsenic: Click to enter text.

Cadmium: Click to enter text.

Chromium: Click to enter text.

Copper: Click to enter text.

Lead: Click to enter text.

Mercury: Click to enter text.

Molybdenum: Click to enter text.

Nickel: Click to enter text.

Selenium: Click to enter text.

Zinc: Click to enter text.

Total PCBs: Click to enter text.

Provide the following information:

Volume and frequency of sludge to the lagoon(s): Click to enter text.

Total dry tons stored in the lagoons(s) per 365-day period: Click to enter text.

Total dry tons stored in the lagoons(s) over the life of the unit: Click to enter text.

C. Liner information

Does the active/proposed sludge lagoon(s) have a liner with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec?

☐ Yes ☐ No

If yes, describe the liner below. Please note that a liner is required.

Click to enter text.

D. Site development plan

Provide a detailed description of the methods used to deposit sludge in the lagoon(s):

Click to enter text.

Attach the following documents to the application.

- Plan view and cross-section of the sludge lagoon(s)

  Attachment: Click to enter text.
- Copy of the closure plan

  Attachment: Click to enter text.
- Copy of deed recordation for the site

  Attachment: Click to enter text.
- Size of the sludge lagoon(s) in surface acres and capacity in cubic feet and gallons

  Attachment: Click to enter text.
- Description of the method of controlling infiltration of groundwater and surface water from entering the site

  Attachment: Click to enter text.
- Procedures to prevent the occurrence of nuisance conditions

  Attachment: Click to enter text.

E. Groundwater monitoring

Is groundwater monitoring currently conducted at this site, or are any wells available for groundwater monitoring, or are groundwater monitoring data otherwise available for the sludge lagoon(s)?

☐ Yes ☐ No

If groundwater monitoring data are available, provide a copy. Provide a profile of soil types encountered down to the groundwater table and the depth to the shallowest groundwater as a separate attachment.

Attachment: Click to enter text.

Section 12. Authorizations/Compliance/Enforcement (Instructions Page 54)

A. Additional authorizations

Does the permittee have additional authorizations for this facility, such as reuse authorization, sludge permit, etc?

☐ Yes ☒ No

If yes, provide the TCEQ authorization number and description of the authorization:

N/A

B. Permittee enforcement status

Is the permittee currently under enforcement for this facility?

☐ Yes ☒ No

Is the permittee required to meet an implementation schedule for compliance or enforcement?

☐ Yes ☒ No

If yes to either question, provide a brief summary of the enforcement, the implementation schedule, and the current status:

Click to enter text.

Section 13. RCRA/CERCLA Wastes (Instructions Page 55)

A. RCRA hazardous wastes

Has the facility received in the past three years, does it currently receive, or will it receive RCRA hazardous waste?

☐ Yes ☒ No

B. Remediation activity wastewater

Has the facility received in the past three years, does it currently receive, or will it receive CERCLA wastewater, RCRA remediation/corrective action wastewater or other remediation activity wastewater?

☐ Yes ☒ No

C. Details about wastes received

If yes to either Subsection A or B above, provide detailed information concerning these wastes with the application.

Attachment: N/A

Section 14. Laboratory Accreditation (Instructions Page 55)

All laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*, which includes the following general exemptions from National Environmental Laboratory Accreditation Program (NELAP) certification requirements:

- The laboratory is an in-house laboratory and is:
  - periodically inspected by the TCEQ; or
  - located in another state and is accredited or inspected by that state; or
  - performing work for another company with a unit located in the same site; or
  - performing pro bono work for a governmental agency or charitable organization.
- The laboratory is accredited under federal law.
- The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
- The laboratory supplies data for which the TCEQ does not offer accreditation.

The applicant should review 30 TAC Chapter 25 for specific requirements.

The following certification statement shall be signed and submitted with every application. See the Signature Page section in the Instructions, for a list of designated representatives who may sign the certification.

CERTIFICATION:

I certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.*

Printed Name: Cathy Bunch

Title: Mayor

Signature: _____

Date: _____

DOMESTIC WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.1

The following information is required for new and amendment major applications.

Section 1. Justification for Permit (Instructions Page 56)

A. Justification of permit need

Provide a detailed discussion regarding the need for any phase(s) not currently permitted. Failure to provide sufficient justification may result in the Executive Director recommending denial of the proposed phase(s) or permit.

Click to enter text.

B. Regionalization of facilities

For additional guidance, please review TCEQ's Regionalization Policy for Wastewater Treatment[1].

Provide the following information concerning the potential for regionalization of domestic wastewater treatment facilities:

1. Municipally incorporated areas

If the applicant is a city, then Item 1 is not applicable. Proceed to Item 2 Utility CCN areas.

Is any portion of the proposed service area located in an incorporated city?

☐ Yes ☐ No ☐ Not Applicable

If yes, within the city limits of: Click to enter text.

If yes, attach correspondence from the city.

Attachment: Click to enter text.

If consent to provide service is available from the city, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the city versus the cost of the proposed facility or expansion attached.

Attachment: Click to enter text.

2. Utility CCN areas

Is any portion of the proposed service area located inside another utility's CCN area?

☐ Yes ☐ No

[1] https://www.tceq.texas.gov/permitting/wastewater/tceq-regionalization-for-wastewater

If yes, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the CCN facilities versus the cost of the proposed facility or expansion.

Attachment: Click to enter text.

3. Nearby WWTPs or collection systems

Are there any domestic permitted wastewater treatment facilities or collection systems located within a three-mile radius of the proposed facility?

☐ Yes ☐ No

If yes, attach a list of these facilities and collection systems that includes each permittee's name and permit number, and an area map showing the location of these facilities and collection systems.

Attachment: Click to enter text.

If yes, attach proof of mailing a request for service to each facility and collection system, the letters requesting service, and correspondence from each facility and collection system.

Attachment: Click to enter text.

If the facility or collection system agrees to provide service, attach a justification for the proposed facility and a cost analysis of expenditures that includes the cost of connecting to the facility or collection system versus the cost of the proposed facility or expansion.

Attachment: Click to enter text.

Section 2. Proposed Organic Loading (Instructions Page 58)

Is this facility in operation?

☐ Yes ☐ No

If no, proceed to Item B, Proposed Organic Loading.

If yes, provide organic loading information in Item A, Current Organic Loading

A. Current organic loading

Facility Design Flow (flow being requested in application): Click to enter text.

Average Influent Organic Strength or BOD_5 Concentration in mg/l: Click to enter text.

Average Influent Loading (lbs/day = total average flow X average BOD_5 conc. X 8.34): Click to enter text.

Provide the source of the average organic strength or BOD_5 concentration.

Click to enter text.

B. Proposed organic loading

This table must be completed if this application is for a facility that is not in operation or if this application is to request an increased flow that will impact organic loading.

Table 1.1(1) – Design Organic Loading

Source	Total Average Flow (MGD)	Influent BOD5 Concentration (mg/l)
Municipality		
Subdivision		
Trailer park – transient		
Mobile home park		
School with cafeteria and showers		
School with cafeteria, no showers		
Recreational park, overnight use		
Recreational park, day use		
Office building or factory		
Motel		
Restaurant		
Hospital		
Nursing home		
Other		
TOTAL FLOW from all sources		
AVERAGE BOD_5 from all sources		

Section 3. Proposed Effluent Quality and Disinfection (Instructions Page 58)

A. Existing/Interim I Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: Click to enter text.

Total Suspended Solids, mg/l: Click to enter text.

Ammonia Nitrogen, mg/l: Click to enter text.

Total Phosphorus, mg/l: Click to enter text.

Dissolved Oxygen, mg/l: Click to enter text.

Other: Click to enter text.

B. Interim II Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: Click to enter text.

Total Suspended Solids, mg/l: Click to enter text.

Ammonia Nitrogen, mg/l: Click to enter text.

Total Phosphorus, mg/l: Click to enter text.

Dissolved Oxygen, mg/l: Click to enter text.

Other: Click to enter text.

C. Final Phase Design Effluent Quality

Biochemical Oxygen Demand (5-day), mg/l: Click to enter text.

Total Suspended Solids, mg/l: Click to enter text.

Ammonia Nitrogen, mg/l: Click to enter text.

Total Phosphorus, mg/l: Click to enter text.

Dissolved Oxygen, mg/l: Click to enter text.

Other: Click to enter text.

D. Disinfection Method

Identify the proposed method of disinfection.

☐ Chlorine: Click to enter text. mg/l after Click to enter text. minutes detention time at peak flow

Dechlorination process: Click to enter text.

☐ Ultraviolet Light: Click to enter text. seconds contact time at peak flow

☐ Other: Click to enter text.

Section 4. Design Calculations (Instructions Page 58)

Attach design calculations and plant features for each proposed phase. Example 4 of the instructions includes sample design calculations and plant features.

Attachment: Click to enter text.

Section 5. Facility Site (Instructions Page 59)

A. 100-year floodplain

Will the proposed facilities be located above the 100-year frequency flood level?

☐ Yes ☐ No

If no, describe measures used to protect the facility during a flood event. Include a site map showing the location of the treatment plant within the 100-year frequency flood level. If applicable, provide the size and types of protective structures.

Click to enter text.

Provide the source(s) used to determine 100-year frequency flood plain.

Click to enter text.

For a new or expansion of a facility, will a wetland or part of a wetland be filled?

☐ Yes ☐ No

If yes, has the applicant applied for a US Corps of Engineers 404 Dredge and Fill Permit?

☐ Yes ☐ No

If yes, provide the permit number: Click to enter text.

If no, provide the approximate date you anticipate submitting your application to the Corps: Click to enter text.

B. Wind rose

Attach a wind rose: Click to enter text.

Section 6. Permit Authorization for Sewage Sludge Disposal (Instructions Page 59)

A. Beneficial use authorization

Are you requesting to include authorization to land apply sewage sludge for beneficial use on property located adjacent to the wastewater treatment facility under the wastewater permit?

☐ Yes ☐ No

If yes, attach the completed **Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)**: Click to enter text.

B. Sludge processing authorization

Identify the sludge processing, storage or disposal options that will be conducted at the wastewater treatment facility:

☐ Sludge Composting

☐ Marketing and Distribution of sludge

☐ Sludge Surface Disposal or Sludge Monofill

If any of the above, sludge options are selected, attach the completed **Domestic Wastewater Permit Application: Sewage Sludge Technical Report (TCEQ Form No. 10056)**: Click to enter text.

Section 7. Sewage Sludge Solids Management Plan (Instructions Page 60)

Attach a solids management plan to the application.

Attachment: Click to enter text.

The sewage sludge solids management plan must contain the following information:

- Treatment units and processes dimensions and capacities

- Solids generated at 100, 75, 50, and 25 percent of design flow
- Mixed liquor suspended solids operating range at design and projected actual flow
- Quantity of solids to be removed and a schedule for solids removal
- Identification and ownership of the ultimate sludge disposal site
- For facultative lagoons, design life calculations, monitoring well locations and depths, and the ultimate disposal method for the sludge from the facultative lagoon

An example of a sewage sludge solids management plan has been included as Example 5 of the instructions.

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 2.0: RECEIVING WATERS

The following information is required for all TPDES permit applications.

Section 1. Domestic Drinking Water Supply (Instructions Page 63)

Is there a surface water intake for domestic drinking water supply located within 5 miles downstream from the point or proposed point of discharge?

☐ Yes ☐ No

If **no**, proceed it Section 2. **If yes**, provide the following:

Owner of the drinking water supply: Click to enter text.

Distance and direction to the intake: Click to enter text.

Attach a USGS map that identifies the location of the intake.

Attachment: Click to enter text.

Section 2. Discharge into Tidally Affected Waters (Instructions Page 63)

Does the facility discharge into tidally affected waters?

☐ Yes ☐ No

If **no**, proceed to Section 3. **If yes**, complete the remainder of this section. If no, proceed to Section 3.

A. Receiving water outfall

Width of the receiving water at the outfall, in feet: Click to enter text.

B. Oyster waters

Are there oyster waters in the vicinity of the discharge?

☐ Yes ☐ No

If yes, provide the distance and direction from outfall(s).

Click to enter text.

C. Sea grasses

Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☐ No

If yes, provide the distance and direction from the outfall(s).

Click to enter text.

Section 3. Classified Segments (Instructions Page 63)

Is the discharge directly into (or within 300 feet of) a classified segment?

☐ Yes ☐ No

If yes, this Worksheet is complete.

If no, complete Sections 4 and 5 of this Worksheet.

Section 4. Description of Immediate Receiving Waters (Instructions Page 63)

Name of the immediate receiving waters: Click to enter text.

A. Receiving water type

Identify the appropriate description of the receiving waters.

☐ Stream

☐ Freshwater Swamp or Marsh

☐ Lake or Pond

Surface area, in acres: Click to enter text.

Average depth of the entire water body, in feet: Click to enter text.

Average depth of water body within a 500-foot radius of discharge point, in feet: Click to enter text.

☐ Man-made Channel or Ditch

☐ Open Bay

☐ Tidal Stream, Bayou, or Marsh

☐ Other, specify: Click to enter text.

B. Flow characteristics

If a stream, man-made channel or ditch was checked above, provide the following. For existing discharges, check one of the following that best characterizes the area *upstream* of the discharge. For new discharges, characterize the area *downstream* of the discharge (check one).

☐ Intermittent - dry for at least one week during most years

☐ Intermittent with Perennial Pools - enduring pools with sufficient habitat to maintain significant aquatic life uses

☐ Perennial - normally flowing

Check the method used to characterize the area upstream (or downstream for new dischargers).

☐ USGS flow records

☐ Historical observation by adjacent landowners

☐ Personal observation

☐ Other, specify: Click to enter text.

C. Downstream perennial confluences

List the names of all perennial streams that join the receiving water within three miles downstream of the discharge point.

Click to enter text.

D. Downstream characteristics

Do the receiving water characteristics change within three miles downstream of the discharge (e.g., natural or man-made dams, ponds, reservoirs, etc.)?

☐ Yes ☐ No

If yes, discuss how.

Click to enter text.

E. Normal dry weather characteristics

Provide general observations of the water body during normal dry weather conditions.

Click to enter text.

Date and time of observation: Click to enter text.

Was the water body influenced by stormwater runoff during observations?

☐ Yes ☐ No

Section 5. General Characteristics of the Waterbody (Instructions Page 65)

A. Upstream influences

Is the immediate receiving water upstream of the discharge or proposed discharge site influenced by any of the following? Check all that apply.

☐ Oil field activities
☐ Upstream discharges
☐ Septic tanks
☐ Urban runoff
☐ Agricultural runoff
☐ Other(s), specify: Click to enter text.

B. Waterbody uses

Observed or evidences of the following uses. Check all that apply.

- ☐ Livestock watering
- ☐ Irrigation withdrawal
- ☐ Fishing
- ☐ Domestic water supply
- ☐ Park activities
- ☐ Contact recreation
- ☐ Non-contact recreation
- ☐ Navigation
- ☐ Industrial water supply
- ☐ Other(s), specify: Click to enter text.

C. Waterbody aesthetics

Check one of the following that best describes the aesthetics of the receiving water and the surrounding area.

- ☐ Wilderness: outstanding natural beauty; usually wooded or unpastured area; water clarity exceptional
- ☐ Natural Area: trees and/or native vegetation; some development evident (from fields, pastures, dwellings); water clarity discolored
- ☐ Common Setting: not offensive; developed but uncluttered; water may be colored or turbid
- ☐ Offensive: stream does not enhance aesthetics; cluttered; highly developed; dumping areas; water discolored

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 2.1: STREAM PHYSICAL CHARACTERISTICS

Required for new applications, major facilities, and applications adding an outfall.

Worksheet 2.1 is not required for discharges to intermittent streams or discharges directly to (or within 300 feet of) a classified segment.

Section 1. General Information (Instructions Page 65)

Date of study: Click to enter text. Time of study: Click to enter text.

Stream name: Click to enter text.

Location: Click to enter text.

Type of stream upstream of existing discharge or downstream of proposed discharge (check one).

☐ Perennial ☐ Intermittent with perennial pools

Section 2. Data Collection (Instructions Page 65)

Number of stream bends that are well defined: Click to enter text.

Number of stream bends that are moderately defined: Click to enter text.

Number of stream bends that are poorly defined: Click to enter text.

Number of riffles: Click to enter text.

Evidence of flow fluctuations (check one):

☐ Minor ☐ moderate ☐ severe

Indicate the observed stream uses and if there is evidence of flow fluctuations or channel obstruction/modification.

Click to enter text.

Stream transects

In the table below, provide the following information for each transect downstream of the existing or proposed discharges. Use a separate row for each transect.

Table 2.1(1) - Stream Transect Records

Stream type at transect Select riffle, run, glide, or pool. See Instructions, Definitions section.	**Transect location**	**Water surface width (ft)**	**Stream depths (ft)** at 4 to 10 points along each transect from the channel bed to the water surface. Separate the measurements with commas.
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			
Choose an item.			

Section 3. Summarize Measurements (Instructions Page 65)

Streambed slope of entire reach, from USGS map in feet/feet: Click to enter text.

Approximate drainage area above the most downstream transect (from USGS map or county highway map, in square miles): Click to enter text.

Length of stream evaluated, in feet: Click to enter text.

Number of lateral transects made: Click to enter text.

Average stream width, in feet: Click to enter text.

Average stream depth, in feet: Click to enter text.

Average stream velocity, in feet/second: Click to enter text.

Instantaneous stream flow, in cubic feet/second: Click to enter text.

Indicate flow measurement method (type of meter, floating chip timed over a fixed distance, etc.): Click to enter text.

Size of pools (large, small, moderate, none): Click to enter text.

Maximum pool depth, in feet: Click to enter text.

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 3.0: LAND DISPOSAL OF EFFLUENT

The following is required for renewal, new, and amendment permit applications.

Section 1. Type of Disposal System (Instructions Page 67)

Identify the method of land disposal:

- ☐ Surface application
- ☒ Irrigation
- ☐ Drip irrigation system
- ☐ Evaporation
- ☐ Other (describe in detail): Click to enter text.
- ☐ Subsurface application
- ☐ Subsurface soils absorption
- ☐ Subsurface area drip dispersal system
- ☐ Evapotranspiration beds

NOTE: All applicants without authorization or proposing new/amended subsurface disposal MUST complete and submit Worksheet 7.0.

For existing authorizations, provide Registration Number: Click to enter text.

Section 2. Land Application Site(s) (Instructions Page 67)

In table 3.0(1), provide the requested information for the land application sites. Include the agricultural or cover crop type (wheat, cotton, alfalfa, bermuda grass, native grasses, etc.), land use (golf course, hayland, pastureland, park, row crop, etc.), irrigation area, amount of effluent applied, and whether or not the public has access to the area. Specify the amount of land area and the amount of effluent that will be allotted to each agricultural or cover crop, if more than one crop will be used.

Table 3.0(1) – Land Application Site Crops

Crop Type & Land Use	Irrigation Area (acres)	Effluent Application (GPD)	Public Access? Y/N
Alfalfa, Haygrazer and Winter Wheat	583	2,500,000	N

Section 3. Storage and Evaporation Lagoons/Ponds (Instructions Page 67)

Table 3.0(2) – Storage and Evaporation Ponds

Pond Number	Surface Area (acres)	Storage Volume (acre-feet)	Dimensions	Liner Type
1	30.7	534.2	875’ x 1620’ x 21’	Clay

Attach a copy of a liner certification that was prepared, signed, and sealed by a Texas licensed professional engineer for each pond.

Attachment: Click to enter text.

Section 4. Flood and Runoff Protection (Instructions Page 67)

Is the land application site within the 100-year frequency flood level?

☐ Yes ☒ No

If yes, describe how the site will be protected from inundation.

N/A

Provide the source used to determine the 100-year frequency flood level:

FEMA

Provide a description of tailwater controls and rainfall run-on controls used for the land application site.

Effluent will not be irrigated during rainfall events, when the ground is saturated or frozen and effluent will be applied at rate to not cause ponding or runoff.

Section 5. Annual Cropping Plan (Instructions Page 67)

Attach an Annual Cropping Plan which includes a discussion of each of the following items. If not applicable, provide a detailed explanation indicating why. **Attachment**: Appendix F: Annual Crop Plan

- Soils map with crops
- Cool and warm season plant species
- Crop yield goals
- Crop growing season
- Crop nutrient requirements
- Additional fertilizer requirements
- Minimum/maximum harvest height (for grass crops)
- Supplemental watering requirements
- Crop salt tolerances
- Harvesting method/number of harvests
- Justification for not removing existing vegetation to be irrigated

Section 6. Well and Map Information (Instructions Page 68)

Attach a USGS map with the following information shown and labeled. If not applicable, provide a detailed explanation indicating why. **Attachment**: Appendix G: Well Map

- The boundaries of the land application site(s)
- Waste disposal or treatment facility site(s)
- On-site buildings
- Buffer zones
- Effluent storage and tailwater control facilities
- All water wells within 1-mile radius of the disposal site or property boundaries
- All springs and seeps onsite and within 500 feet of the property boundaries
- All surface waters in the state onsite and within 500 feet of the property boundaries
- All faults and sinkholes onsite and within 500 feet of the property

List and cross reference all water wells located within a half-mile radius of the disposal site or property boundaries shown on the USGS map in the following table. Attach additional pages as necessary to include all of the wells.

Table 3.0(3) – Water Well Data

Well ID	Well Use	Producing?Y/N	Open, cased, capped, or plugged?	Proposed Best Management Practice
1014509	Domestic	Y	Open	Buffer
1014237	Unused	N	Cased	Buffer
1014207	Irrigation	Y	Open	Buffer
1014304	Irrigation	Y	Open	Buffer

Well ID	Well Use	Producing?Y/N	Open, cased, capped, or plugged?	Proposed Best Management Practice
1014308	Irrigation	Y	Open	Buffer
1014303	Unused	N	Open	Buffer
1014238	Irrigation	Y	Open	Buffer
647764	Domestic	Y	Cased	Buffer
661163	Domestic	Y	Cased	Buffer
663326	Domestic	Y	Cased	Buffer
214794	Irrigation	Y	Open	Buffer
173332	Test	N	Plugged	Buffer
370286	Test	N	Plugged	Buffer
641127	Domestic	Y	Cased	Buffer
619331	Domestic	Y	Cased	Buffer
588728	Domestic	Y	Cased	Buffer
140854	Domestic	Y	Cased	Buffer
260967	Domestic	Y	Cased	Buffer
77691	Domestic	Y	Cased	Buffer
128538	Public Supply	Y	Cased	Buffer
104131	Test	N	Plugged	Buffer
96078	Environmental Soil Boring	N	Plugged	Buffer
96077	Environmental Soil Boring	N	Plugged	Buffer
96076	Environmental Soil Boring	N	Plugged	Buffer
97289	Environmental Soil Boring	N	Plugged	Buffer
603814	Industrial	Y	Open	Buffer
586784	Test	N	Plugged	Buffer
96080	Environmental Soil Boring	N	Plugged	Buffer

Well ID	Well Use	Producing?Y/N	Open, cased, capped, or plugged?	Proposed Best Management Practice
96081	Environmental Soil Boring	N	Plugged	Buffer
96082	Environmental Soil Boring	N	Plugged	Buffer
96083	Environmental Soil Boring	N	Plugged	Buffer
100445	Test	N	Plugged	Buffer

If water quality data or well log information is available please include the information in an attachment listed by Well ID.

Attachment: Click to enter text.

Section 7. Groundwater Quality (Instructions Page 68)

Attach a Groundwater Quality Technical Report which assesses the impact of the wastewater disposal system on groundwater. This report shall include an evaluation of the water wells (including the information in the well table provided in Item 6. above), the wastewater application rate, and pond liners. Indicate by a check mark that this report is provided.

Attachment: Appendix H – Groundwater Quality

Are groundwater monitoring wells available onsite? ☐ Yes ☐ No

Do you plan to install ground water monitoring wells or lysimeters around the land application site? ☐ Yes ☐ No

If yes, provide the proposed location of the monitoring wells or lysimeters on a site map.

Attachment: Click to enter text.

Section 8. Soil Map and Soil Analyses (Instructions Page 69)

A. Soil map

Attach a USDA Soil Survey map that shows the area to be used for effluent disposal.

Attachment: Appendix I – Soil Map

B. Soil analyses

Attach the laboratory results sheets from the soil analyses. **Note**: for renewal applications, the current annual soil analyses required by the permit are acceptable as long as the test date is less than one year prior to the submission of the application.

Attachment: Appendix I – Soil Map

List all USDA designated soil series on the proposed land application site. Attach additional pages as necessary.

Table 3.0(4) – Soil Data

Soil Series	Depth from Surface	Permeability	Available Water Capacity	Curve Number
See Appendix I				

Section 9. Effluent Monitoring Data (Instructions Page 70)

Is the facility in operation?

☒ Yes ☐ No

If no, this section is not applicable and the worksheet is complete.

If yes, provide the effluent monitoring data for the parameters regulated in the existing permit. If a parameter is not regulated in the existing permit, enter N/A.

Table 3.0(5) – Effluent Monitoring Data

Date	30 Day Avg Flow MGD	BOD5 mg/l	TSS mg/l	pH	Chlorine Residual mg/l	Acres irrigated
01/2023	*	26.98		7.8		
02/2023	*	27.75		8.0		
03/2023	*	22.85		8.2		
04/2023	*	27.15		7.8		
05/2023	*	42.68		7.9		
06/2023	1.10	93.47		8.2		
07/2023	1.20	57.58		7.7		
08/2023	1.00	42.92		8.1		
09/2023	0.98	39.35		8.2		
10/2023	0.93	63.64		8.0		
11/2023	0.89	52.83		7.9		
12/2023	0.87	27.83		8.0		
01/2024	0.99	28.73				

Date	30 Day Avg Flow MGD	BOD5 mg/l	TSS mg/l	pH	Chlorine Residual mg/l	Acres irrigated
02/2024	0.88	34.63		8.1		
03/2024	0.89	36.60		8.2		
04/2024	1.00	85.28		7.9		
05/2024	0.92	125.3		8.0		
06/2024	1.02	105.5		8.4		
07/2024	0.94	104.0		8.0		
08/2024	0.98	99.98		8.4		
09/2024	0.97	101.1		8.1		
10/2024	0.93	99.60		8.3		
11/2024	1.03	101.0		7.9		
12/2024	0.88	93.40		8.4		

Provide a discussion of all persistent excursions above the permitted limits and any corrective actions taken.

*Operators log book lost during flood event. The plant remained operational.

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 3.1: SURFACE LAND DISPOSAL OF EFFLUENT

The following is required for new and major amendment permit applications. Renewal and minor amendment permit applications may be asked for this worksheet on a case by case basis.

Section 1. Surface Disposal (Instructions Page 71)

Complete the item that applies for the method of disposal being used.

A. Irrigation

Area under irrigation, in acres: Click to enter text.

Design application frequency:

hours/day Click to enter text. **And** days/week Click to enter text.

Land grade (slope):

average percent (%): Click to enter text.

maximum percent (%): Click to enter text.

Design application rate in acre-feet/acre/year: Click to enter text.

Design total nitrogen loading rate, in lbs N/acre/year: Click to enter text.

Soil conductivity (mmhos/cm): Click to enter text.

Method of application: Click to enter text.

Attach a separate engineering report with the water balance and storage volume calculations, method of application, irrigation efficiency, and nitrogen balance.

Attachment: Click to enter text.

B. Evaporation ponds

Daily average effluent flow into ponds, in gallons per day: Click to enter text.

Attach a separate engineering report with the water balance and storage volume calculations.

Attachment: Click to enter text.

C. Evapotranspiration beds

Number of beds: Click to enter text.

Area of bed(s), in acres: Click to enter text.

Depth of bed(s), in feet: Click to enter text.

Void ratio of soil in the beds: Click to enter text.

Storage volume within the beds, in acre-feet: Click to enter text.

Attach a separate engineering report with the water balance and storage volume calculations, and a description of the lining.

Attachment: Click to enter text.

D. Overland flow

Area used for application, in acres: Click to enter text.

Slopes for application area, percent (%): Click to enter text.

Design application rate, in gpm/foot of slope width: Click to enter text.

Slope length, in feet: Click to enter text.

Design BOD_5 loading rate, in lbs BOD_5/acre/day: Click to enter text.

Design application frequency:

hours/day: Click to enter text. **And** days/week: Click to enter text.

Attach a separate engineering report with the method of application and design requirements according to *30 TAC Chapter 217*.

Attachment: Click to enter text.

Section 2. Edwards Aquifer (Instructions Page 72)

Is the facility subject to *30 TAC Chapter 213*, Edwards Aquifer Rules?

☐ Yes ☐ No

If **yes**, is the facility located on the Edwards Aquifer Recharge Zone?

☐ Yes ☐ No

If yes, attach a geological report addressing potential recharge features.

Attachment: Click to enter text.

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 3.2: SURFACE LAND DISPOSAL OF EFFLUENT

The following **is required** for **new and major amendment** permit applications. Renewal and minor amendments applicants may be asked for the worksheet on a case by case basis.

NOTE: All applicants proposing new/amended subsurface disposal MUST complete and submit Worksheet 7.0. This worksheet applies to any subsurface disposal system that **does not meet** the definition of a subsurface area drip dispersal system as defined in *30 TAC Chapter 222, Subsurface Area Drip Dispersal System.*

Section 1. Subsurface Application (Instructions Page 73)

Identify the type of system:

- ☐ Conventional Gravity Drainfield, Beds, or Trenches (new systems must be less than 5,000 GPD)
- ☐ Low Pressure Dosing
- ☐ Other, specify: Click to enter text.

Application area, in acres: Click to enter text.

Area of drainfield, in square feet: Click to enter text.

Application rate, in gal/square foot/day: Click to enter text.

Depth to groundwater, in feet: Click to enter text.

Area of trench, in square feet: Click to enter text.

Dosing duration per area, in hours: Click to enter text.

Number of beds: Click to enter text.

Dosing amount per area, in inches/day: Click to enter text.

Infiltration rate, in inches/hour: Click to enter text.

Storage volume, in gallons: Click to enter text.

Area of bed(s), in square feet: Click to enter text.

Soil Classification: Click to enter text.

Attach a separate engineering report with the information required in *30 TAC § 309.20,* excluding the requirements of *§* 309.20 b(3)(A) and (B) design analysis which may be asked for on a case by case basis. Include a description of the schedule of dosing basin rotation.

Attachment: Click to enter text.

Section 2. Edwards Aquifer (Instructions Page 73)

Is the subsurface system over the Edwards Aquifer Recharge Zone as mapped by TCEQ?

☐ Yes ☐ No

Is the subsurface system over the Edwards Aquifer Transition Zone as mapped by TCEQ?

☐ Yes ☐ No

If yes to either question, the subsurface system may be prohibited by *30 TAC §213.8*. Please call the Municipal Permits Team, at 512-239-4671, to schedule a pre-application meeting.

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 3.3: SUBSURFACE AREA DRIP DISPERSAL (SADDS) LAND DISPOSAL OF EFFLUENT

The following **is required** for **new and major amendment** subsurface area drip dispersal system permit applications. Renewal and minor amendments applicants may be asked for the worksheet on a case by case basis.

NOTE: All applicants proposing new/amended subsurface disposal MUST complete and submit Worksheet 7.0. This worksheet applies to any subsurface disposal system that **meets** the definition of a subsurface area drip dispersal system as defined in *30 TAC Chapter 222, Subsurface Area Drip Dispersal System.*

Section 1. Administrative Information (Instructions Page 74)

A. Provide the legal name of all corporations or other business entities managed, owned, or otherwise closely related to the owner of the treatment facility:

B. Click to enter text. Is the owner of the land where the treatment facility is located the same as the owner of the treatment facility?

☐ Yes ☐ No

If **no**, provide the legal name of all corporations or other business entities managed, owned, or otherwise closely related to the owner of the land where the treatment facility is located.

Click to enter text.

C. Owner of the subsurface area drip dispersal system: Click to enter text.

D. Is the owner of the subsurface area drip dispersal system the same as the owner of the wastewater treatment facility or the site where the wastewater treatment facility is located?

☐ Yes ☐ No

If **no**, identify the names of all corporations or other business entities managed, owned, or otherwise closely related to the entity identified in Item 1.C.

Click to enter text.

E. Owner of the land where the subsurface area drip dispersal system is located: Click to enter text.

F. Is the owner of the land where the subsurface area drip dispersal system is located the same as owner of the wastewater treatment facility, the site where the wastewater treatment facility is located, or the owner of the subsurface area drip dispersal system?

☐ Yes ☐ No

If **no**, identify the name of all corporations or other business entities managed, owned, or otherwise closely related to the entity identified in item 1.E.

Click to enter text.

Section 2. Subsurface Area Drip Dispersal System (Instructions Page 74)

A. Type of system

☐ Subsurface Drip Irrigation

☐ Surface Drip Irrigation

☐ Other, specify: Click to enter text.

B. Irrigation operations

Application area, in acres: Click to enter text.

Infiltration Rate, in inches/hour: Click to enter text.

Average slope of the application area, percent (%): Click to enter text.

Maximum slope of the application area, percent (%): Click to enter text.

Storage volume, in gallons: Click to enter text.

Major soil series: Click to enter text.

Depth to groundwater, in feet: Click to enter text.

C. Application rate

Is the facility located **west** of the boundary shown in *30 TAC § 222.83* **and** also using a vegetative cover of non-native grasses over seeded with cool season grasses during the winter months (October-March)?

☐ Yes ☐ No

If yes, then the facility may propose a hydraulic application rate not to exceed 0.1 gal/square foot/day.

Is the facility located **east** of the boundary shown in *30 TAC § 222.83* **or** in any part of the state when the vegetative cover is any crop other than non-native grasses?

☐ Yes ☐ No

If **yes**, the facility must use the formula in *30 TAC §222.83* to calculate the maximum hydraulic application rate.

Do you plan to submit an alternative method to calculate the hydraulic application rate for approval by the executive director?

☐ Yes ☐ No

Hydraulic application rate, in gal/square foot/day: Click to enter text.

Nitrogen application rate, in lbs/gal/day: Click to enter text.

D. Dosing information

Number of doses per day: Click to enter text.

Dosing duration per area, in hours: Click to enter text.

Rest period between doses, in hours: Click to enter text.

Dosing amount per area, in inches/day: Click to enter text.

Number of zones: Click to enter text.

Does the proposed subsurface drip irrigation system use tree vegetative cover as a crop?

☐ Yes ☐ No

If **yes**, provide a vegetation survey by a certified arborist. Please call the Water Quality Assessment Team at (512) 239-4671 to schedule a pre-application meeting.

Attachment: Click to enter text.

Section 3. Required Plans (Instructions Page 74)

A. Recharge feature plan

Attach a Recharge Feature Plan with all information required in *30 TAC §222.79*.

Attachment: Click to enter text.

B. Soil evaluation

Attach a Soil Evaluation with all information required in *30 TAC §222.73*.

Attachment: Click to enter text.

C. Site preparation plan

Attach a Site Preparation Plan with all information required in *30 TAC §222.75*.

Attachment: Click to enter text.

D. Soil sampling/testing

Attach soil sampling and testing that includes all information required in *30 TAC §222.157*.

Attachment: Click to enter text.

Section 4. Floodway Designation (Instructions Page 75)

A. Site location

Is the existing/proposed land application site within a designated floodway?

☐ Yes ☐ No

B. Flood map

Attach either the FEMA flood map or alternate information used to determine the floodway.

Attachment: Click to enter text.

Section 5. Surface Waters in the State (Instructions Page 75)

A. Buffer Map

Attach a map showing appropriate buffers on surface waters in the state, water wells, and springs/seeps.

Attachment: Click to enter text.

B. Buffer variance request

Do you plan to request a buffer variance from water wells or waters in the state?

☐ Yes ☐ No

If yes, then attach the additional information required in *30 TAC § 222.81(c).*

Attachment: Click to enter text.

Section 6. Edwards Aquifer (Instructions Page 75)

A. Is the SADDS located over the Edwards Aquifer Recharge Zone as mapped by TCEQ?

☐ Yes ☐ No

B. Is the SADDS located over the Edwards Aquifer Transition Zone as mapped by TCEQ?

☐ Yes ☐ No

If yes to either question, then the SADDS may be prohibited by *30 TAC §213.8*. Please call the Municipal Permits Team at 512-239-4671 to schedule a pre-application meeting.

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 4.0: POLLUTANT ANALYSIS REQUIREMENTS

The following **is required** for facilities with a permitted or proposed flow of **1.0 MGD or greater**, facilities with an approved **pretreatment** program, or facilities classified as a **major** facility. See instructions for further details.

This worksheet is not required minor amendments without renewal.

Section 1. Toxic Pollutants (Instructions Page 76)

For pollutants identified in Table 4.0(1), indicate the type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected: Click to enter text.

Table 4.0(1) – Toxics Analysis

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acrylonitrile				50
Aldrin				0.01
Aluminum				2.5
Anthracene				10
Antimony				5
Arsenic				0.5
Barium				3
Benzene				10
Benzidine				50
Benzo(a)anthracene				5
Benzo(a)pyrene				5
Bis(2-chloroethyl)ether				10
Bis(2-ethylhexyl)phthalate				10
Bromodichloromethane				10
Bromoform				10
Cadmium				1
Carbon Tetrachloride				2
Carbaryl				5
Chlordane*				0.2
Chlorobenzene				10
Chlorodibromomethane				10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Chloroform				10
Chlorpyrifos				0.05
Chromium (Total)				3
Chromium (Tri) **(*1)**				N/A
Chromium (Hex)				3
Copper				2
Chrysene				5
p-Chloro-m-Cresol				10
4,6-Dinitro-o-Cresol				50
p-Cresol				10
Cyanide **(*2)**				10
4,4'- DDD				0.1
4,4'- DDE				0.1
4,4'- DDT				0.02
2,4-D				0.7
Demeton (O and S)				0.20
Diazinon				0.5/0.1
1,2-Dibromoethane				10
m-Dichlorobenzene				10
o-Dichlorobenzene				10
p-Dichlorobenzene				10
3,3'-Dichlorobenzidine				5
1,2-Dichloroethane				10
1,1-Dichloroethylene				10
Dichloromethane				20
1,2-Dichloropropane				10
1,3-Dichloropropene				10
Dicofol				1
Dieldrin				0.02
2,4-Dimethylphenol				10
Di-n-Butyl Phthalate				10
Diuron				0.09
Endosulfan I (alpha)				0.01

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Endosulfan II (beta)				0.02
Endosulfan Sulfate				0.1
Endrin				0.02
Epichlorohydrin				---
Ethylbenzene				10
Ethylene Glycol				---
Fluoride				500
Guthion				0.1
Heptachlor				0.01
Heptachlor Epoxide				0.01
Hexachlorobenzene				5
Hexachlorobutadiene				10
Hexachlorocyclohexane (alpha)				0.05
Hexachlorocyclohexane (beta)				0.05
gamma-Hexachlorocyclohexane (Lindane)				0.05
Hexachlorocyclopentadiene				10
Hexachloroethane				20
Hexachlorophene				10
4,4'-Isopropylidenediphenol				1
Lead				0.5
Malathion				0.1
Mercury				0.005
Methoxychlor				2
Methyl Ethyl Ketone				50
Methyl tert-butyl ether				---
Mirex				0.02
Nickel				2
Nitrate-Nitrogen				100
Nitrobenzene				10
N-Nitrosodiethylamine				20
N-Nitroso-di-n-Butylamine				20
Nonylphenol				333

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Parathion (ethyl)				0.1
Pentachlorobenzene				20
Pentachlorophenol				5
Phenanthrene				10
Polychlorinated Biphenyls (PCB's) **(*3)**				0.2
Pyridine				20
Selenium				5
Silver				0.5
1,2,4,5-Tetrachlorobenzene				20
1,1,2,2-Tetrachloroethane				10
Tetrachloroethylene				10
Thallium				0.5
Toluene				10
Toxaphene				0.3
2,4,5-TP (Silvex)				0.3
Tributyltin (see instructions for explanation)				0.01
1,1,1-Trichloroethane				10
1,1,2-Trichloroethane				10
Trichloroethylene				10
2,4,5-Trichlorophenol				50
TTHM (Total Trihalomethanes)				10
Vinyl Chloride				10
Zinc				5

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable.

(*3) The sum of seven PCB congeners 1242, 1254, 1221, 1232, 1248, 1260, and 1016.

Section 2. Priority Pollutants

For pollutants identified in Tables 4.0(2)A-E, indicate type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected: Click to enter text.

Table 4.0(2)A – Metals, Cyanide, and Phenols

Pollutant	**AVG Effluent Conc. (µg/l)**	**MAX Effluent Conc. (µg/l)**	**Number of Samples**	**MAL (µg/l)**
Antimony				5
Arsenic				0.5
Beryllium				0.5
Cadmium				1
Chromium (Total)				3
Chromium (Hex)				3
Chromium (Tri) **(*1)**				N/A
Copper				2
Lead				0.5
Mercury				0.005
Nickel				2
Selenium				5
Silver				0.5
Thallium				0.5
Zinc				5
Cyanide **(*2)**				10
Phenols, Total				10

(*1) Determined by subtracting hexavalent Cr from total Cr.

(*2) Cyanide, amenable to chlorination or weak-acid dissociable

Table 4.0(2)B – Volatile Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acrolein				50
Acrylonitrile				50
Benzene				10
Bromoform				10
Carbon Tetrachloride				2
Chlorobenzene				10
Chlorodibromomethane				10
Chloroethane				50
2-Chloroethylvinyl Ether				10
Chloroform				10
Dichlorobromomethane [Bromodichloromethane]				10
1,1-Dichloroethane				10
1,2-Dichloroethane				10
1,1-Dichloroethylene				10
1,2-Dichloropropane				10
1,3-Dichloropropylene [1,3-Dichloropropene]				10
1,2-Trans-Dichloroethylene				10
Ethylbenzene				10
Methyl Bromide				50
Methyl Chloride				50
Methylene Chloride				20
1,1,2,2-Tetrachloroethane				10
Tetrachloroethylene				10
Toluene				10
1,1,1-Trichloroethane				10
1,1,2-Trichloroethane				10
Trichloroethylene				10
Vinyl Chloride				10

Table 4.0(2)C – Acid Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
2-Chlorophenol				10
2,4-Dichlorophenol				10
2,4-Dimethylphenol				10
4,6-Dinitro-o-Cresol				50
2,4-Dinitrophenol				50
2-Nitrophenol				20
4-Nitrophenol				50
P-Chloro-m-Cresol				10
Pentalchlorophenol				5
Phenol				10
2,4,6-Trichlorophenol				10

Table 4.0(2)D – Base/Neutral Compounds

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Acenaphthene				10
Acenaphthylene				10
Anthracene				10
Benzidine				50
Benzo(a)Anthracene				5
Benzo(a)Pyrene				5
3,4-Benzofluoranthene				10
Benzo(ghi)Perylene				20
Benzo(k)Fluoranthene				5
Bis(2-Chloroethoxy)Methane				10
Bis(2-Chloroethyl)Ether				10
Bis(2-Chloroisopropyl)Ether				10
Bis(2-Ethylhexyl)Phthalate				10
4-Bromophenyl Phenyl Ether				10
Butyl benzyl Phthalate				10
2-Chloronaphthalene				10
4-Chlorophenyl phenyl ether				10
Chrysene				5
Dibenzo(a,h)Anthracene				5
1,2-(o)Dichlorobenzene				10
1,3-(m)Dichlorobenzene				10
1,4-(p)Dichlorobenzene				10
3,3-Dichlorobenzidine				5
Diethyl Phthalate				10
Dimethyl Phthalate				10
Di-n-Butyl Phthalate				10
2,4-Dinitrotoluene				10
2,6-Dinitrotoluene				10
Di-n-Octyl Phthalate				10
1,2-Diphenylhydrazine (as Azo-benzene)				20
Fluoranthene				10

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Fluorene				10
Hexachlorobenzene				5
Hexachlorobutadiene				10
Hexachlorocyclo-pentadiene				10
Hexachloroethane				20
Indeno(1,2,3-cd)pyrene				5
Isophorone				10
Naphthalene				10
Nitrobenzene				10
N-Nitrosodimethylamine				50
N-Nitrosodi-n-Propylamine				20
N-Nitrosodiphenylamine				20
Phenanthrene				10
Pyrene				10
1,2,4-Trichlorobenzene				10

Table 4.0(2)E - Pesticides

Pollutant	AVG Effluent Conc. (µg/l)	MAX Effluent Conc. (µg/l)	Number of Samples	MAL (µg/l)
Aldrin				0.01
alpha-BHC (Hexachlorocyclohexane)				0.05
beta-BHC (Hexachlorocyclohexane)				0.05
gamma-BHC (Hexachlorocyclohexane)				0.05
delta-BHC (Hexachlorocyclohexane)				0.05
Chlordane				0.2
4,4-DDT				0.02
4,4-DDE				0.1
4,4,-DDD				0.1
Dieldrin				0.02
Endosulfan I (alpha)				0.01
Endosulfan II (beta)				0.02
Endosulfan Sulfate				0.1
Endrin				0.02
Endrin Aldehyde				0.1
Heptachlor				0.01
Heptachlor Epoxide				0.01
PCB-1242				0.2
PCB-1254				0.2
PCB-1221				0.2
PCB-1232				0.2
PCB-1248				0.2
PCB-1260				0.2
PCB-1016				0.2
Toxaphene				0.3

* For PCBS, if all are non-detects, enter the highest non-detect preceded by a “<”.

Section 3. Dioxin/Furan Compounds

A. Indicate which of the following compounds from may be present in the influent from a contributing industrial user or significant industrial user. Check all that apply.

☐ 2,4,5-trichlorophenoxy acetic acid

Common Name 2,4,5-T, CASRN 93-76-5

☐ 2-(2,4,5-trichlorophenoxy) propanoic acid

Common Name Silvex or 2,4,5-TP, CASRN 93-72-1

☐ 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate

Common Name Erbon, CASRN 136-25-4

☐ 0,0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate

Common Name Ronnel, CASRN 299-84-3

☐ 2,4,5-trichlorophenol

Common Name TCP, CASRN 95-95-4

☐ hexachlorophene

Common Name HCP, CASRN 70-30-4

For each compound identified, provide a brief description of the conditions of its/their presence at the facility.

Click to enter text.

B. Do you know or have any reason to believe that 2,3,7,8 Tetrachlorodibenzo-P-Dioxin (TCDD) or any congeners of TCDD may be present in your effluent?

☐ Yes ☐ No

If **yes**, provide a brief description of the conditions for its presence.

Click to enter text.

C. If any of the compounds in Subsection A **or** B are present, complete Table 4.0(2)F.

For pollutants identified in Table 4.0(2)F, indicate the type of sample.

Grab ☐ Composite ☐

Date and time sample(s) collected: Click to enter text.

Table 4.0(2)F – Dioxin/Furan Compounds

Compound	Toxic Equivalency Factors	Wastewater Concentration (ppq)	Wastewater Equivalents (ppq)	Sludge Concentration (ppt)	Sludge Equivalents (ppt)	MAL (ppq)
2,3,7,8 TCDD	1					10
1,2,3,7,8 PeCDD	0.5					50
2,3,7,8 HxCDDs	0.1					50
1,2,3,4,6,7,8 HpCDD	0.01					50
2,3,7,8 TCDF	0.1					10
1,2,3,7,8 PeCDF	0.05					50
2,3,4,7,8 PeCDF	0.5					50
2,3,7,8 HxCDFs	0.1					50
2,3,4,7,8 HpCDFs	0.01					50
OCDD	0.0003					100
OCDF	0.0003					100
PCB 77	0.0001					0.5
PCB 81	0.0003					0.5
PCB 126	0.1					0.5
PCB 169	0.03					0.5
Total						

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 5.0: TOXICITY TESTING REQUIREMENTS

The following **is required** for facilities with a current operating design flow of**1.0 MGD or greater**, with an EPA-approved **pretreatment** program (or those required to have one under 40 CFR Part 403), or are required to perform Whole Effluent Toxicity testing. See Page 86 of the instructions for further details.

This worksheet is not required minor amendments without renewal.

Section 1. Required Tests

Indicate the number of 7-day chronic or 48-hour acute Whole Effluent Toxicity (WET) tests performed in the four and one-half years prior to submission of the application.

7-day Chronic: Click to enter text.

48-hour Acute: Click to enter text.

Section 2. Toxicity Reduction Evaluations (TREs)

Has this facility completed a TRE in the past four and a half years? Or is the facility currently performing a TRE?

☐ Yes ☐ No

If yes, describe the progress to date, if applicable, in identifying and confirming the toxicant.

Click to enter text.

Section 3. Summary of WET Tests

If the required biomonitoring test information has not been previously submitted via both the Discharge Monitoring Reports (DMRs) and the Table 1 (as found in the permit), provide a summary of the testing results for all valid and invalid tests performed over the past four and one-half years. Make additional copies of this table as needed.

Table 5.0(1) Summary of WET Tests

Test Date	Test Species	NOEC Survival	NOEC Sub-lethal

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 6.0: INDUSTRIAL WASTE CONTRIBUTION

The following **is required** for **all publicly owned treatment works**.

Section 1. All POTWs (Instructions Page 87)

A. Industrial users (IUs)

Provide the number of each of the following types of industrial users (IUs) that discharge to your POTW and the daily flows from each user. See the Instructions for definitions of Categorical IUs, Significant IUs – non-categorical, and Other IUs.

If there are no users, enter 0 (zero).

Categorical IUs:

Number of IUs: 0

Average Daily Flows, in MGD: 0

Significant IUs – non-categorical:

Number of IUs: 0

Average Daily Flows, in MGD: 0

Other IUs:

Number of IUs: 0

Average Daily Flows, in MGD: 0

B. Treatment plant interference

In the past three years, has your POTW experienced treatment plant interference (see instructions)?

☐ Yes ☒ No

If yes, identify the dates, duration, description of interference, and probable cause(s) and possible source(s) of each interference event. Include the names of the IUs that may have caused the interference.

Click to enter text.

C. Treatment plant pass through

In the past three years, has your POTW experienced pass through (see instructions)?

☐ Yes ☒ No

If yes, identify the dates, duration, a description of the pollutants passing through the treatment plant, and probable cause(s) and possible source(s) of each pass through event. Include the names of the IUs that may have caused pass through.

Click to enter text.

D. Pretreatment program

Does your POTW have an approved pretreatment program?

☐ Yes ☒ No

If yes, complete Section 2 only of this Worksheet.

Is your POTW required to develop an approved pretreatment program?

☐ Yes ☒ No

If yes, complete Section 2.c. and 2.d. only, and skip Section 3.

If no to either question above, skip Section 2 and complete Section 3 for each significant industrial user and categorical industrial user.

Section 2. POTWs with Approved Programs or Those Required to Develop a Program (Instructions Page 87)

A. Substantial modifications

Have there been any **substantial modifications** to the approved pretreatment program that have not been submitted to the TCEQ for approval according to *40 CFR §403.18*?

☐ Yes ☐ No

If yes, identify the modifications that have not been submitted to TCEQ, including the purpose of the modification.

Click to enter text.

B. Non-substantial modifications

Have there been any **non-substantial modifications** to the approved pretreatment program that have not been submitted to TCEQ for review and acceptance?

☐ Yes ☐ No

If yes, identify all non-substantial modifications that have not been submitted to TCEQ, including the purpose of the modification.

Click to enter text.

C. Effluent parameters above the MAL

In Table 6.0(1), list all parameters measured above the MAL in the POTW's effluent monitoring during the last three years. Submit an attachment if necessary.

Table 6.0(1) – Parameters Above the MAL

Pollutant	Concentration	MAL	Units	Date

D. Industrial user interruptions

Has any SIU, CIU, or other IU caused or contributed to any problems (excluding interferences or pass throughs) at your POTW in the past three years?

☐ Yes ☐ No

If yes, identify the industry, describe each episode, including dates, duration, description of the problems, and probable pollutants.

Click to enter text.

Section 3. Significant Industrial User (SIU) Information and Categorical Industrial User (CIU) (Instructions Page 88)

A. General information

Company Name: N/A – No industrial users

SIC Code: Click to enter text.

Contact name: Click to enter text.

Address: Click to enter text.

City, State, and Zip Code: Click to enter text.

Telephone number: Click to enter text.

Email address: Click to enter text.

B. Process information

Describe the industrial processes or other activities that affect or contribute to the SIU(s) or CIU(s) discharge (i.e., process and non-process wastewater).

Click to enter text.

C. Product and service information

Provide a description of the principal product(s) or services performed.

Click to enter text.

D. Flow rate information

See the Instructions for definitions of "process" and "non-process wastewater."

Process Wastewater:

Discharge, in gallons/day: Click to enter text.

Discharge Type: ☐ Continuous ☐ Batch ☐ Intermittent

Non-Process Wastewater:

Discharge, in gallons/day: Click to enter text.

Discharge Type: ☐ Continuous ☐ Batch ☐ Intermittent

E. Pretreatment standards

Is the SIU or CIU subject to technically based local limits as defined in the *i*nstructions?

☐ Yes ☐ No

Is the SIU or CIU subject to categorical pretreatment standards found in *40 CFR Parts 405-471*?

☐ Yes ☐ No

If subject to categorical pretreatment standards, indicate the applicable category and subcategory for each categorical process.

Category: Subcategories: Click to enter text.

Click or tap here to enter text. Click to enter text.

Category: Click to enter text.

Subcategories: Click to enter text.

Category: Click to enter text.

Subcategories: Click to enter text.

Category: Click to enter text.

Subcategories: Click to enter text.

Category: Click to enter text.

Subcategories: Click to enter text.

F. Industrial user interruptions

Has the SIU or CIU caused or contributed to any problems (e.g., interferences, pass through, odors, corrosion, blockages) at your POTW in the past three years?

☐ Yes ☐ No

If yes, identify the SIU, describe each episode, including dates, duration, description of problems, and probable pollutants.

Click to enter text.

WORKSHEET 7.0

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CLASS V INJECTION WELL INVENTORY/AUTHORIZATION FORM

Submit the completed form to:

TCEQ
IUC Permits Team
Radioactive Materials Division
MC-233
PO Box 13087
Austin, Texas 78711-3087
512-239-6466

For TCEQ Use Only
Reg. No._____
Date Received_____
Date Authorized_____

Section 1. General Information (Instructions Page 90)

1. TCEQ Program Area

Program Area (PST, VCP, IHW, etc.): Click to enter text.

Program ID: Click to enter text.

Contact Name: Click to enter text.

Phone Number: Click to enter text.

2. Agent/Consultant Contact Information

Contact Name: Click to enter text.

Address: Click to enter text.

City, State, and Zip Code: Click to enter text.

Phone Number: Click to enter text.

3. Owner/Operator Contact Information

☐ Owner ☐ Operator

Owner/Operator Name: Click to enter text.

Contact Name: Click to enter text.

Address: Click to enter text.

City, State, and Zip Code: Click to enter text.

Phone Number: Click to enter text.

4. Facility Contact Information

Facility Name: Click to enter text.

Address: Click to enter text.

City, State, and Zip Code: Click to enter text.

Location description (if no address is available): Click to enter text.

Facility Contact Person: Click to enter text.

Phone Number: Click to enter text.

5. **Latitude and Longitude, in degrees-minutes-seconds**

Latitude: Click to enter text.

Longitude: Click to enter text.

Method of determination (GPS, TOPO, etc.): Click to enter text.

Attach topographic quadrangle map as attachment A.

6. **Well Information**

Type of Well Construction, select one:

- ☐ Vertical Injection
- ☐ Subsurface Fluid Distribution System
- ☐ Infiltration Gallery
- ☐ Temporary Injection Points
- ☐ Other, Specify: Click to enter text.

Number of Injection Wells: Click to enter text.

7. **Purpose**

Detailed Description regarding purpose of Injection System:

Click to enter text.

Attach a Site Map as Attachment B (Attach the Approved Remediation Plan, if appropriate.)

8. **Water Well Driller/Installer**

Water Well Driller/Installer Name: Click to enter text.

City, State, and Zip Code: Click to enter text.

Phone Number: Click to enter text.

License Number: Click to enter text.

Section 2. Proposed Down Hole Design

Attach a diagram signed and sealed by a licensed engineer as Attachment C.

Table 7.0(1) – Down Hole Design Table

Name of String	Size	Setting Depth	Sacks Cement/Grout – Slurry Volume – Top of Cement	Hole Size	Weight (lbs/ft) PVC/Steel
Casing					
Tubing					
Screen					

Section 3. Proposed Trench System, Subsurface Fluid Distribution System, or Infiltration Gallery

Attach a diagram signed and sealed by a licensed engineer as Attachment D.

System(s) Dimensions: Click to enter text.

System(s) Construction: Click to enter text.

Section 4. Site Hydrogeological and Injection Zone Data

1. Name of Contaminated Aquifer: Click to enter text.

2. Receiving Formation Name of Injection Zone: Click to enter text.

3. Well/Trench Total Depth: Click to enter text.

4. Surface Elevation: Click to enter text.

5. Depth to Ground Water: Click to enter text.

6. Injection Zone Depth: Click to enter text.

7. Injection Zone vertically isolated geologically? ☐ Yes ☐ No

Impervious Strata between Injection Zone and nearest Underground Source of Drinking Water:

Name: Click to enter text.

Thickness: Click to enter text.

8. Provide a list of contaminants and the levels (ppm) in contaminated aquifer

Attach as Attachment E.

9. Horizontal and Vertical extent of contamination and injection plume

Attach as Attachment F.

10. Formation (Injection Zone) Water Chemistry (Background levels) TDS, etc.

Attach as Attachment G.

11. Injection Fluid Chemistry in PPM at point of injection

Attach as Attachment H.

12. Lowest Known Depth of Ground Water with < 10,000 PPM TDS: Click to enter text.

13. Maximum injection Rate/Volume/Pressure: Click to enter text.

14. Water wells within 1/4 mile radius (attach map as Attachment I): Click to enter text.

15. Injection wells within 1/4 mile radius (attach map as Attachment J): Click to enter text.

16. Monitor wells within 1/4 mile radius (attach drillers logs and map as Attachment K): Click to enter text.

17. Sampling frequency: Click to enter text.

18. Known hazardous components in injection fluid: Click to enter text.

Section 5. Site History

1. Type of Facility: Click to enter text.
2. Contamination Dates: Click to enter text.
3. Original Contamination (VOCs, TPH, BTEX, etc.) and Concentrations (attach as Attachment L): Click to enter text.
4. Previous Remediation (attach results of any previous remediation as attachment M): Click to enter text.

NOTE: Authorization Form should be completed in detail and authorization given by the TCEQ before construction, operation, and/or conversion can begin. Attach additional pages as necessary.

Class V Injection Well Designations

5A07 Heat Pump/AC return (IW used for groundwater to heat and/or cool buildings)
5A19 Industrial Cooling Water Return Flow (IW used to cool industrial process equipment)
5B22 Salt Water Intrusion Barrier (IW used to inject fluids to prevent the intrusion of salt water into an aquifer)
5D02 Storm Water Drainage (IW designed for the disposal of rain water)
5D04 Industrial Stormwater Drainage Wells (IW designed for the disposal of rain water associated with industrial facilities)
5F01 Agricultural Drainage (IW that receive agricultural runoff)
5R21 Aquifer Recharge (IW used to inject fluids to recharge an aquifer)
5S23 Subsidence Control Wells (IW used to control land subsidence caused by ground water withdrawal)
5W09 Untreated Sewage
5W10 Large Capacity Cesspools (Cesspools that are designed for 5,000 gpd or greater)
5W11 Large Capacity Septic systems (Septic systems designed for 5,000 gpd or greater)
5W12 WTTP disposal
5W20 Industrial Process Waste Disposal Wells
5W31 Septic System (Well Disposal method)
5W32 Septic System Drainfield Disposal
5X13 Mine Backfill (IW used to control subsidence, dispose of mining byproducts, and/or fill sections of a mine)
5X25 Experimental Wells (Pilot Test) (IW used to test new technologies or tracer dye studies)
5X26 Aquifer Remediation (IW used to clean up, treat, or prevent contamination of a USDW)
5X27 Other Wells
5X28 Motor Vehicle Waste Disposal Wells (IW used to dispose of waste from a motor vehicle site - These are currently banned)
5X29 Abandoned Drinking Water Wells (waste disposal)

APPENDIX A

CORE DATA FORM

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☐ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☒ Renewal *(Core Data Form should be submitted with the renewal form)*

☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
CN 600245427		**RN 101612570**

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)* — *If new Customer, enter previous Customer below:*

City of Hereford

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*

11. Type of Customer:

☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☒ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees

☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?

☐ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address:

P.O. Box 2277

City	Hereford	**State**	TX	**ZIP**	79045	**ZIP + 4**	2277

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*
	steve@go-herd.com

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(806) 363-7102		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

City of Hereford Wastewater Treatment Plant

23. Street Address of the Regulated Entity: ***(No PO Boxes)***							
	City		**State**		**ZIP**		**ZIP + 4**
24. County	Deaf Smith						

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	Approximately 2 miles northeast of the intersection of U.S. higheay 60 and Farm-to-Market Road 2943 and 0.5 mile east of the intersection of U.S. Highway 60 and County Road 8.				
26. Nearest City			**State**	**Nearest ZIP Code**	
Hereford			TX	79045	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
34	50	41.95	102	17	48.27

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
4952		221320	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Wastewater treatment for Hereford.

34. Mailing Address:	**P.O. Box 2277**						
	City	**Hereford**	**State**	**TX**	**ZIP**	**79045**	**ZIP + 4**	**2277**
35. E-Mail Address:	**mgr@hereford-texas.com**						

36. Telephone Number	37. Extension or Code	38. Fax Number *(if applicable)*
( ) -		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☒ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:
	WQ0010186002			

SECTION IV: Preparer Information

40. Name:	Paul Krueger, P.E.	**41. Title:**	Civil Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(806 **)** 473-3715		**( )** -	PKrueger@parkhill.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	City of Hereford	**Job Title:**	City Manager	
Name *(In Print):*	Ryan Polster		**Phone:**	**(** 806 **)** 363- **7102**
Signature:			**Date:**	

APPENDIX B

PLAIN LANGUAGE SUMMARY

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS DOMESTIC WASTEWATER/STORMWATER

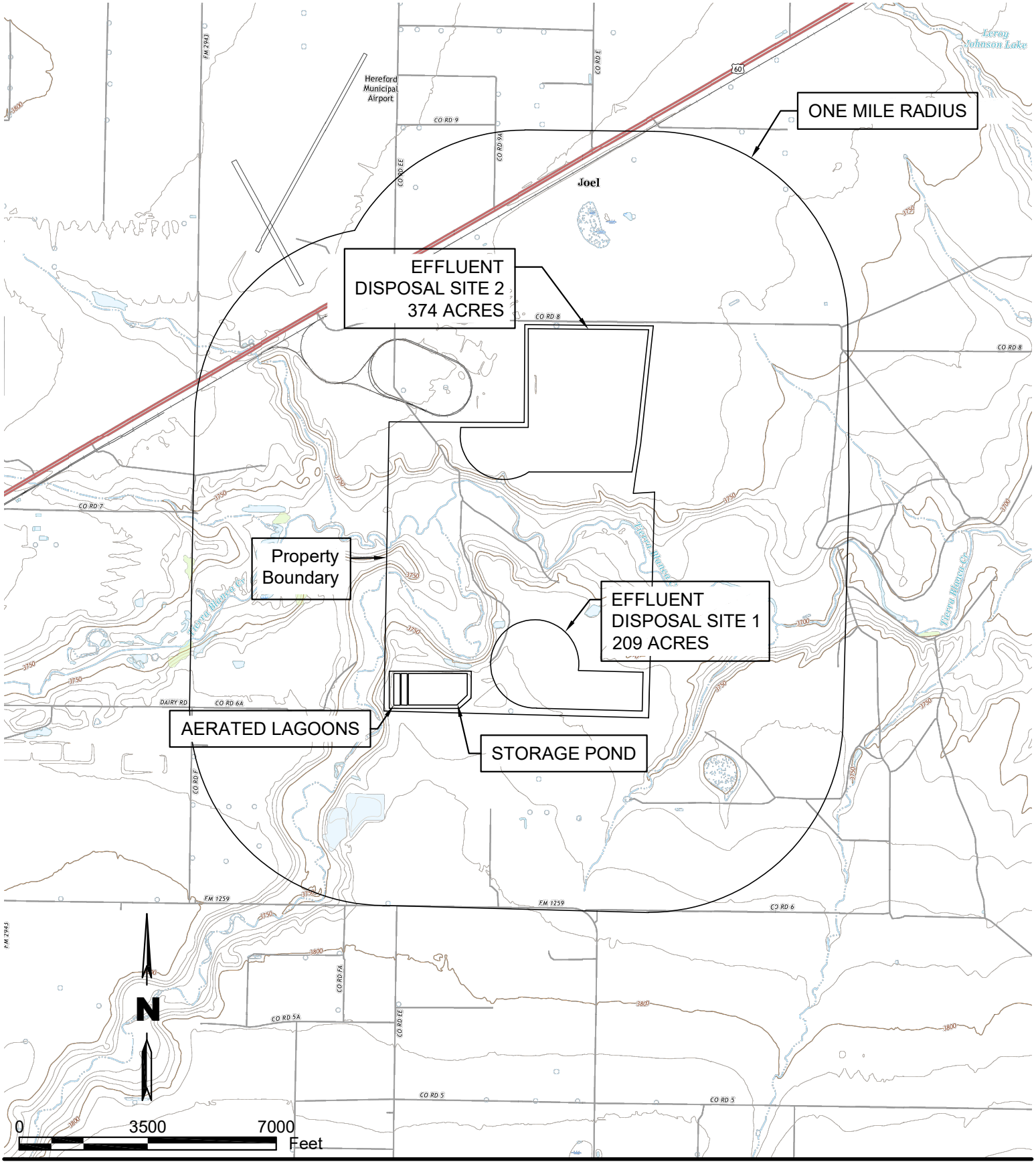
The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

The City of Hereford (CN600245427) operates the City of Hereford Wastewater Treatment Plant (RN101612570), a pond system consisting of a bar screen, two aerated lagoons, and a storage pond. The facility is located at approximately 2 miles northeast of the intersection of U.S. Highway 60 and Farm-to-Market Road 2943 and 0.5 mile east of the intersection of U.S. Highway 30 and County Road 8, in Hereford, Deaf Smith County, Texas 79045. This permit is a renewal to discharge 2.5 million gallons per day (MGD) of treated wastewater. Effluent will be used for irrigation of 583 acres. This permit will not authorize a discharge of pollutants into water in the state.

Discharges from the facility are expected to contain BOD_5. Treated domestic wastewater is treated by a bar screen and two aerated lagoons with a storage pond.

APPENDIX C

USGS MAP



City of Hereford Wastewater Treatment Plant Renewal

City of Hereford
P.O. Box 2277
Hereford, TX 79045

Parkhill

Parkhill.com

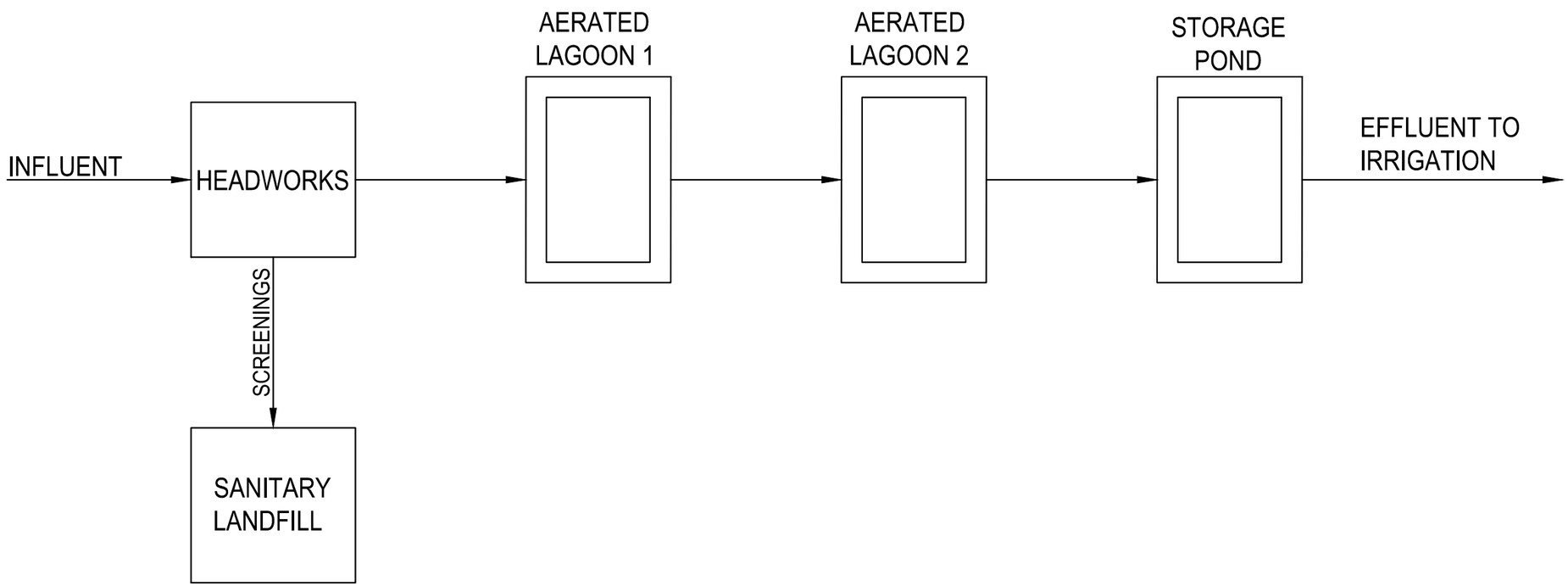
USGS Map

Issue:	Renewal
Date:	06/19/2025
Project No:	45585.25
Sheet:	1 OF 1

APPENDIX D

FLOW DIAGRAM

CITY OF
HEREFORD



City of Hereford Wastewater Treatment Plant Flow Diagram

City of Hereford
PO Box 2277 Hereford, TX 79045-2277

Parkhill
Parkhill.com

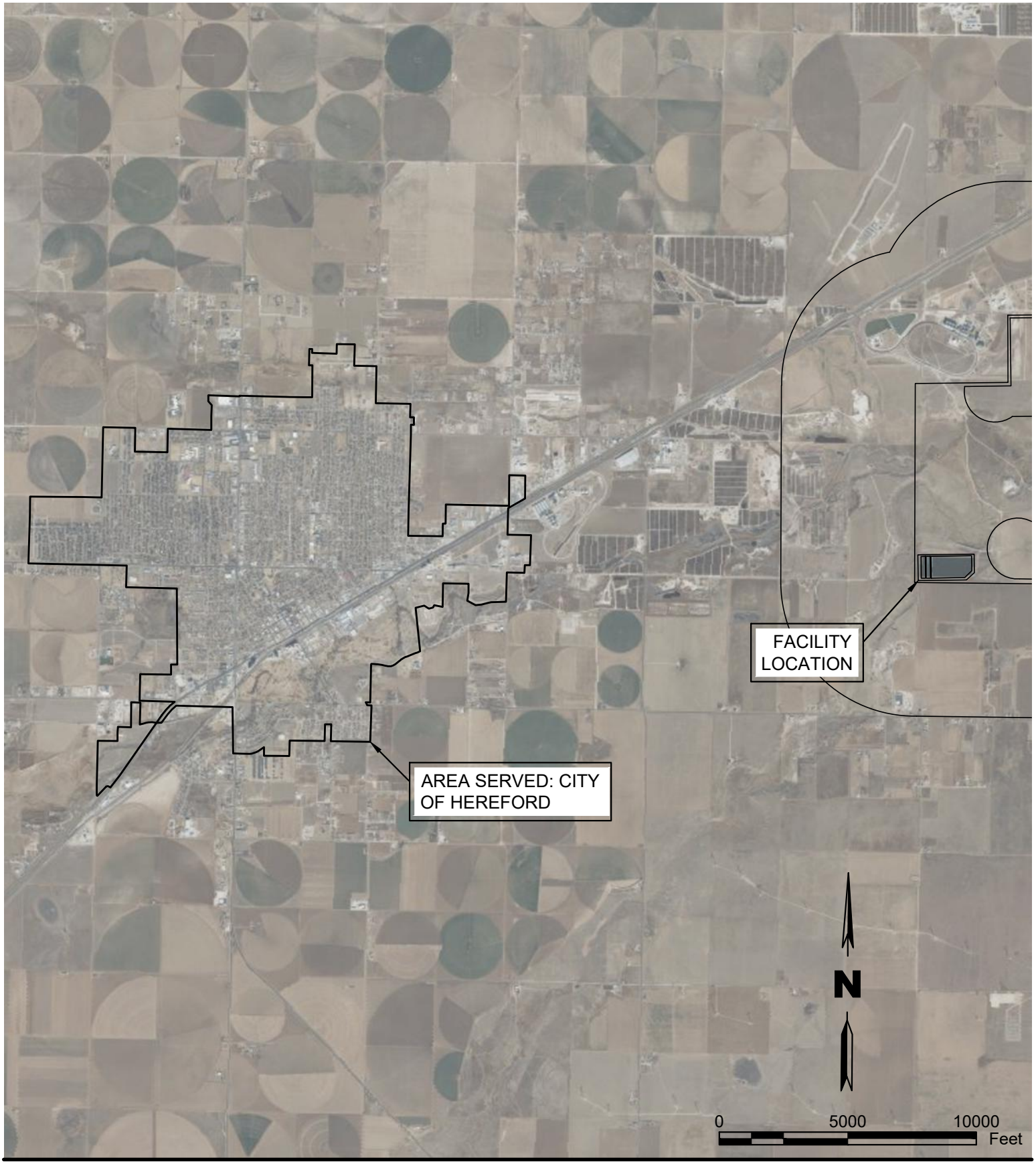
Flow Diagram

Hereford WWTP

Issue:	Renewal
Date:	06/19/2025
Project No:	45585.25
Sheet:	1 of 1

APPENDIX E

SITE PLAN



City of Hereford Wastewater Treatment Plant Renewal

City of Hereford
P.O. Box 2277
Hereford, TX 79045

Parkhill

Parkhill.com

Site Map

Issue:	Renewal
Date:	07/07/2025
Project No:	45585.25
Sheet:	1 OF 1

APPENDIX F

CROPPING PLAN

ANNUAL CROPPING PLAN

The City of Hereford

A. See Attached Soil Map in Appendix I.

B. Alfalfa will be the warm season plant species. Winter wheat will be the cool season species to provide cover during the winter.

C. Typical Annual Growing Season is as follows:

Month	Alfalfa	Wheat
January	X	X
February	X	X
March	X	X
April	X	
May	X	
June	X	
July	X	
August	X	
September	X	
October	X	X
November	X	X
December	X	X

D. Nitrogen-722 lbs/acre/year Phosphorus-70 lb/acre/yr

E. There is no minimum or maximum harvest height. The crop will be harvested as-needed.

F. No additional water is required.

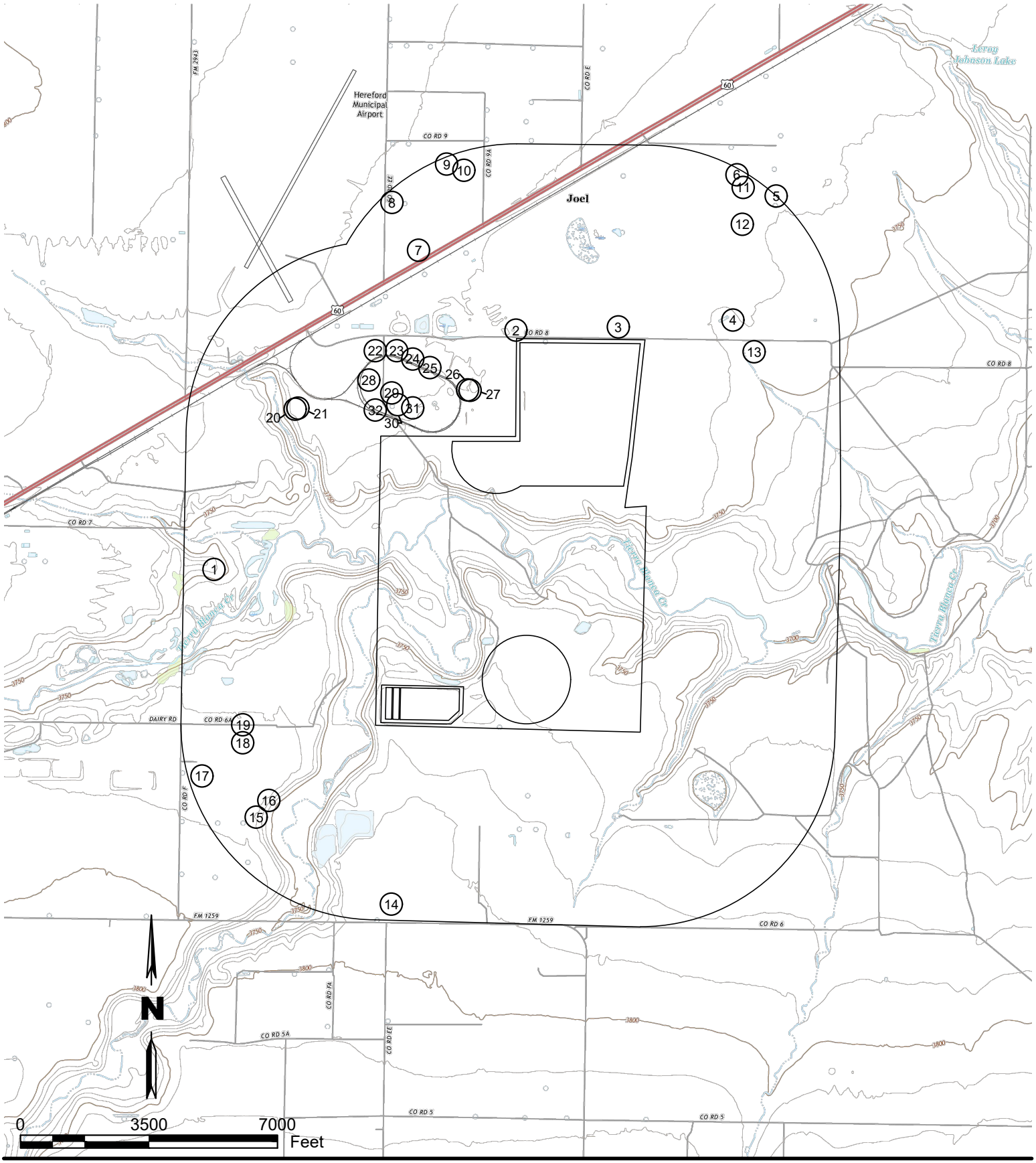
G. Salt Tolerance: 8.0 mmhos/cm @ 25ºC

H. No additional fertilizer requirements are needed.

I. The harvesting method will consist of 7 times (harvests) per year for hay bales or on an as-needed basis.

APPENDIX G

WELL MAP AND INFORMATION



City of Hereford Wastewater Treatment Plant Renewal

City of Hereford
P.O. Box 2277
Hereford, TX 79045

Parkhill

Parkhill.com

Well Map

Issue:	Renewal
Date:	06/19/2025
Project No:	45585.25
Sheet:	1 OF 1

Well Reference Number	
Number	Well ID
1	1014509
2	1014237
3	1014207
4	1014304
5	1014308
6	1014303
7	1014238
8	647764
9	661163
10	663326
11	214794
12	173332
13	370286
14	641127
15	619331
16	588728
17	140854
18	260967
19	77691
20	128538
21	104131
22	96078
23	96077
24	96076
25	97289
26	603814
27	586784
28	96080
29	96081
30	96082
31	96083
32	100445

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-509

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014509
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.832778
Latitude (degrees minutes seconds)	34° 49' 58" N
Longitude (decimal degrees)	-102.332222
Longitude (degrees minutes seconds)	102° 19' 56" W
Coordinate Source	+/- 5 Seconds
Aquifer Code	121OGLL - Ogallala Formation
Aquifer	Ogallala
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3748
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	
Well Depth Source	
Drilling Start Date	
Drilling End Date	
Drilling Method	
Borehole Completion	

Well Type	Withdrawal of Water
Well Use	Domestic
Water Level Observation	None
Water Quality Available	Yes
Pump	
Pump Depth (feet below land surface)	
Power Type	
Annular Seal Method	
Surface Completion	
Owner	Herford Feedyards
Driller	
Other Data Available	
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Groundwater Conservation District
Created Date	3/5/1996
Last Update Date	3/5/1996

Remarks	

Casing - No Data

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements

No Data Available

Water Quality Analysis

Sample Date: 8/15/1978 **Sample Time:** 0000 **Sample Number:** 1 **Collection Entity:** Groundwater Conservation District (general)

Sampled Aquifer: Ogallala Formation

Analyzed Lab: Texas Department of Health **Reliability:** Collected from pumped well, but not filtered or preserved

Collection Remarks: No Data

Parameter Code	Parameter Description	Flag	Value*	Units	Plus/Minus
00415	ALKALINITY, PHENOLPHTHALEIN (MG/L)		0	mg/L	
00410	ALKALINITY, TOTAL (MG/L AS CACO3)		329	mg/L as CACO3	
00440	BICARBONATE ION, CALCULATED (MG/L AS HCO3)		401.49	mg/L	
00910	CALCIUM (MG/L)		54	mg/L	
00445	CARBONATE ION, CALCULATED (MG/L AS CO3)		0	mg/L	
00940	CHLORIDE, TOTAL (MG/L AS CL)		92	mg/L	
00950	FLUORIDE, DISSOLVED (MG/L AS F)		2.9	mg/L	
00900	HARDNESS, TOTAL, CALCULATED (MG/L AS CACO3)		439	mg/L as CACO3	
00920	MAGNESIUM (MG/L)		74	mg/L	
71851	NITRATE NITROGEN, DISSOLVED, CALCULATED (MG/L AS NO3)		12	mg/L as NO3	
00400	PH (STANDARD UNITS), FIELD		8.3	SU	
71860	RESIDUAL SODIUM CARBONATE, CALCULATED		0		
00955	SILICA, DISSOLVED (MG/L AS SI02)		72	mg/L as SIO2	
00931	SODIUM ADSORPTION RATIO, CALCULATED (SAR)		1.27		
00932	SODIUM, CALCULATED, PERCENT		23	PCT	
00929	SODIUM, TOTAL (MG/L AS NA)		61	mg/L	
00094	SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM AT 25C)		1192	MICR	
00945	SULFATE, TOTAL (MG/L AS SO4)		100	mg/L as SO4	
70301	TOTAL DISSOLVED SOLIDS , SUM OF CONSTITUENTS (MG/L)		665	mg/L	

** Value may not display all significant digits for parameter in results, check Scanned Documents for laboratory paperwork..*

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-237

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014237
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.850001
Latitude (degrees minutes seconds)	34° 51' 00" N
Longitude (decimal degrees)	-102.305278
Longitude (degrees minutes seconds)	102° 18' 19" W
Coordinate Source	+/- 1 Second
Aquifer Code	231DCKM - Dockum Formation
Aquifer	Dockum
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3760
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	803
Well Depth Source	Driller's Log
Drilling Start Date	
Drilling End Date	0/0/1962
Drilling Method	
Borehole Completion	

Well Type	Withdrawal of Water
Well Use	Unused
Water Level Observation	Miscellaneous Measurements
Water Quality Available	Yes
Pump	None
Pump Depth (feet below land surface)	
Power Type	
Annular Seal Method	
Surface Completion	
Owner	W.G. Russell
Driller	West Texas Drilling Co.
Other Data Available	Drillers Log
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Texas Water Development Board
Created Date	4/2/1984
Last Update Date	10/17/1994

Remarks	Unused irrigation well. Reported yield 900 GPM. Cemented from 0 to 671 feet.

Casing

Diameter (in.)	Casing Type	Casing Material	Schedule	Gauge	Top Depth (ft.)	Bottom Depth (ft.)
16	Blank	Steel				

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

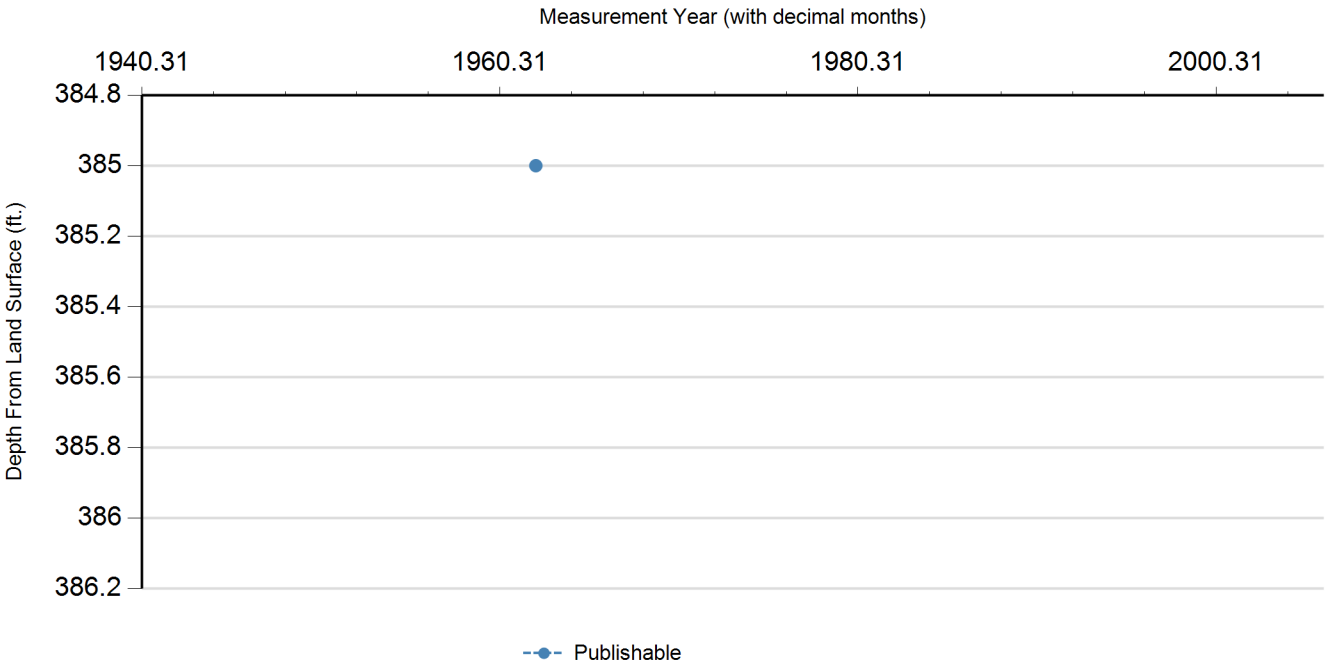
Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	4/25/1962		385		3375	1	Registered Water Well Driller	Unknown		
X	4/27/1984					1	Texas Water Development Board	Steel Tape	21	

Code Descriptions

Status Code	Status Description
P	Publishable
X	No Measurement

Remark ID	Remark Description
21	Unable to reach water level with available measuring equipment

Water Quality Analysis

Sample Date: 10/11/1962 **Sample Time:** 0000 **Sample Number:** 1 **Collection Entity:**

Sampled Aquifer: Dockum Formation

Analyzed Lab: Misc. Industrial Lab **Reliability:**

Collection Remarks: No Data

Parameter Code	Parameter Description	Flag	Value*	Units	Plus/Minus
00910	CALCIUM (MG/L)		8	mg/L	
00940	CHLORIDE, TOTAL (MG/L AS CL)		89	mg/L	
00950	FLUORIDE, DISSOLVED (MG/L AS F)		1.3	mg/L	
00900	HARDNESS, TOTAL, CALCULATED (MG/L AS CACO3)		28	mg/L as CACO3	
00920	MAGNESIUM (MG/L)		2	mg/L	
00400	PH (STANDARD UNITS), FIELD		8.2	SU	
00931	SODIUM ADSORPTION RATIO, CALCULATED (SAR)		93		
00932	SODIUM, CALCULATED, PERCENT		90	PCT	
00929	SODIUM, TOTAL (MG/L AS NA)		120	mg/L	
00945	SULFATE, TOTAL (MG/L AS SO4)		150	mg/L as SO4	

** Value may not display all significant digits for parameter in results, check Scanned Documents for laboratory paperwork..*

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-207

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014207
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.851112
Latitude (degrees minutes seconds)	34° 51' 04" N
Longitude (decimal degrees)	-102.295278
Longitude (degrees minutes seconds)	102° 17' 43" W
Coordinate Source	Global Positioning System - GPS
Aquifer Code	121OGLL - Ogallala Formation
Aquifer	Ogallala
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3762
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	175
Well Depth Source	Driller's Log
Drilling Start Date	
Drilling End Date	2/25/1972
Drilling Method	Mud (Hydraulic) Rotary
Borehole Completion	Perforated or Slotted

Well Type	Withdrawal of Water
Well Use	Irrigation
Water Level Observation	GCD Current Site Visit
Water Quality Available	No
Pump	Turbine
Pump Depth (feet below land surface)	
Power Type	Electric Motor
Annular Seal Method	
Surface Completion	
Owner	Buryl Fish
Driller	Water Industries
Other Data Available	Drillers Log
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	345104102174307
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Groundwater Conservation District
Created Date	2/28/1994
Last Update Date	8/23/2021

Remarks	

Casing

Diameter (in.)	Casing Type	Casing Material	Schedule	Gauge	Top Depth (ft.)	Bottom Depth (ft.)
16	Blank	Steel			0	100
16	Screen	Steel			100	160

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

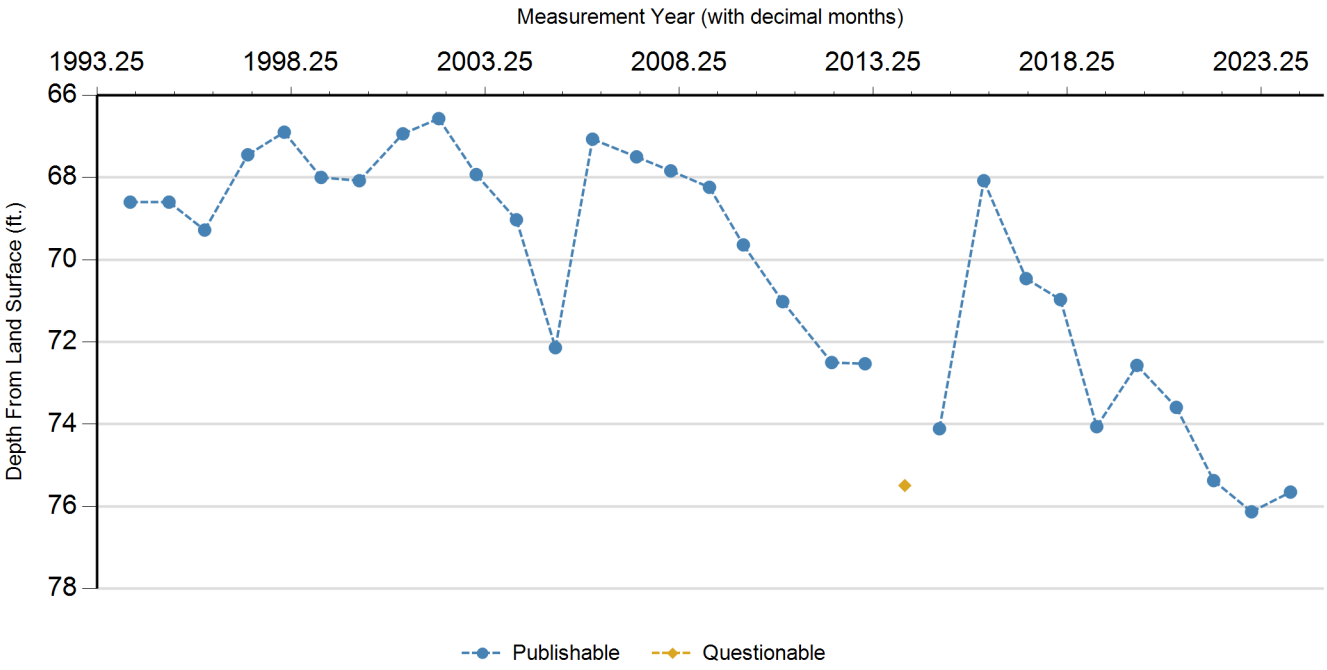
Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	2/10/1994		68.6		3693.4	1	Groundwater Conservation District	Steel Tape		
P	2/10/1995		68.6	0.00	3693.4	1	Groundwater Conservation District	Steel Tape		
P	1/10/1996		69.28	0.68	3692.72	1	Groundwater Conservation District	Steel Tape		
P	2/21/1997		67.45	(1.83)	3694.55	1	Groundwater Conservation District	Steel Tape		
P	1/29/1998		66.9	(0.55)	3695.1	1	Groundwater Conservation District	Steel Tape		
P	1/11/1999		68	1.10	3694	1	Groundwater Conservation District	Steel Tape		
P	1/5/2000		68.08	0.08	3693.92	1	Groundwater Conservation District	Steel Tape		
P	2/20/2001		66.94	(1.14)	3695.06	1	Groundwater Conservation District	Steel Tape		
P	1/22/2002		66.57	(0.37)	3695.43	1	Groundwater Conservation District	Steel Tape		
P	1/10/2003		67.93	1.36	3694.07	1	Groundwater Conservation District	Steel Tape		
P	1/23/2004		69.03	1.10	3692.97	1	Groundwater Conservation District	Steel Tape		
P	1/25/2005		72.14	3.11	3689.86	1	Groundwater Conservation District	Steel Tape		
P	1/9/2006		67.07	(5.07)	3694.93	1	Groundwater Conservation District	Steel Tape		
P	2/28/2007		67.5	0.43	3694.5	1	Groundwater Conservation District	Steel Tape		

Texas Water Development Board

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-207

groundwater division

Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	1/15/2008		67.84	0.34	3694.16	1	Groundwater Conservation District	Steel Tape		
P	1/14/2009		68.24	0.40	3693.76	1	Groundwater Conservation District	Steel Tape		
P	12/3/2009		69.64	1.40	3692.36	1	Groundwater Conservation District	Steel Tape		
P	12/8/2010		71.02	1.38	3690.98	1	Groundwater Conservation District	Steel Tape		
P	3/9/2012		72.5	1.48	3689.5	1	Groundwater Conservation District	Steel Tape		
P	1/18/2013		72.53	0.03	3689.47	1	Groundwater Conservation District	Steel Tape		
Q	1/27/2014		75.49	2.96	3686.51	1	Groundwater Conservation District	Steel Tape	4	
P	12/23/2014		74.11	(1.38)	3687.89	1	Groundwater Conservation District	Electric Line		
P	2/10/2016		68.08	(6.03)	3693.92	1	Groundwater Conservation District	Electric Line		
P	3/13/2017		70.46	2.38	3691.54	1	Groundwater Conservation District	Electric Line		
P	2/1/2018		70.97	0.51	3691.03	1	Groundwater Conservation District	Electric Line		
P	1/7/2019		74.06	3.09	3687.94	1	Groundwater Conservation District	Electric Line		
P	1/20/2020		72.57	(1.49)	3689.43	1	Groundwater Conservation District	Electric Line		Good measurement
P	1/26/2021		73.59	1.02	3688.41	1	Groundwater Conservation District	Electric Line		
P	1/12/2022		75.37	1.78	3686.63	1	Groundwater Conservation District	Electric Line		
P	1/4/2023		76.13	0.76	3685.87	1	Groundwater Conservation District	Electric Line		
P	1/5/2024		75.65	(0.48)	3686.35	1	Groundwater Conservation District	Electric Line		

Code Descriptions

Status Code	Status Description
P	Publishable
Q	Questionable

Remark ID	Remark Description
4	Well pumped recently

Water Quality Analysis - No Data Available

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-304

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014304
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.851667
Latitude (degrees minutes seconds)	34° 51' 06" N
Longitude (decimal degrees)	-102.286111
Longitude (degrees minutes seconds)	102° 17' 10" W
Coordinate Source	+/- 5 Seconds
Aquifer Code	121OGLL - Ogallala Formation
Aquifer	Ogallala
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3762
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	180
Well Depth Source	Driller's Log
Drilling Start Date	
Drilling End Date	8/18/1962
Drilling Method	
Borehole Completion	

Well Type	Withdrawal of Water
Well Use	Irrigation
Water Level Observation	Miscellaneous Measurements
Water Quality Available	No
Pump	Turbine
Pump Depth (feet below land surface)	
Power Type	Natural-Gas Engine
Annular Seal Method	
Surface Completion	
Owner	E.O. Watson
Driller	L.S. Dirks
Other Data Available	Drillers Log
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Groundwater Conservation District
Created Date	
Last Update Date	

Remarks	Reported yield 600 gpm.

Casing - No Data

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

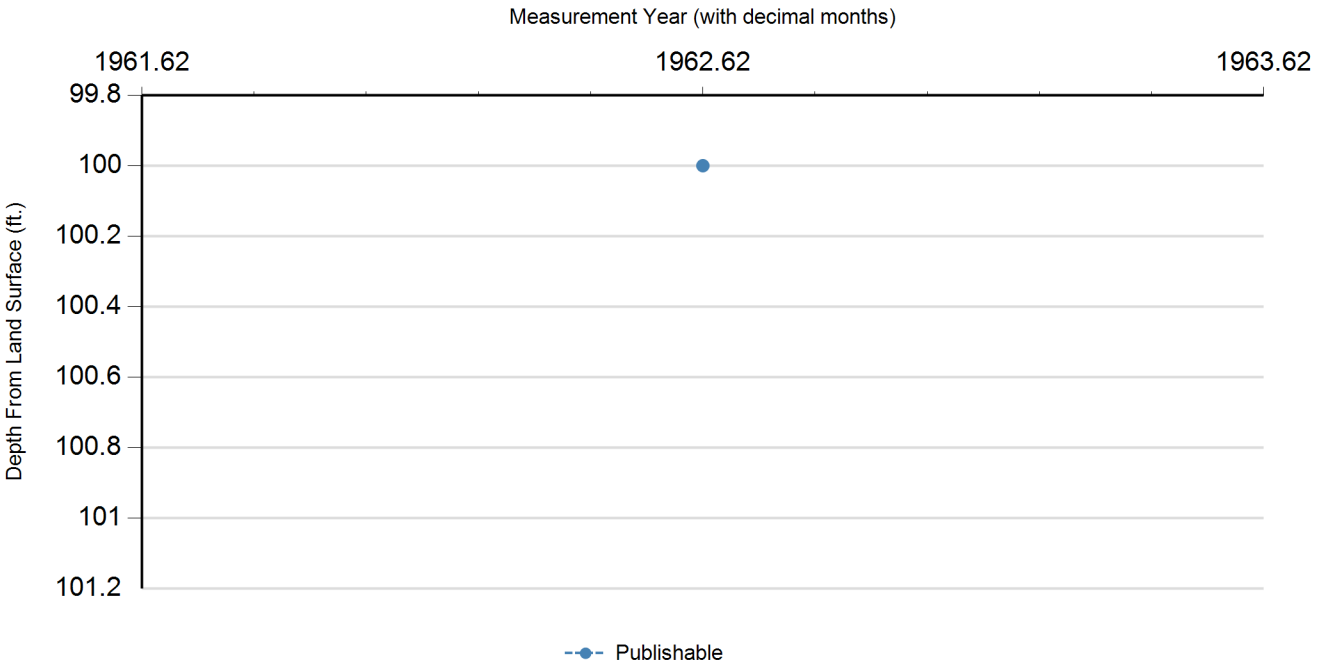
Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	8/18/1962		100		3662	1	Registered Water Well Driller	Unknown		

Code Descriptions

Status Code	Status Description
P	Publishable

Water Quality Analysis - No Data Available

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-308

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014308
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.860001
Latitude (degrees minutes seconds)	34° 51' 36" N
Longitude (decimal degrees)	-102.281667
Longitude (degrees minutes seconds)	102° 16' 54" W
Coordinate Source	+/- 1 Second
Aquifer Code	121OGDK - Ogallala Formation and Dockum Formation
Aquifer	Ogallala/Dockum
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3760
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	744
Well Depth Source	Driller's Log
Drilling Start Date	
Drilling End Date	11/30/1966
Drilling Method	Mud (Hydraulic) Rotary
Borehole Completion	Perforated or Slotted

Well Type	Withdrawal of Water
Well Use	Irrigation
Water Level Observation	Miscellaneous Measurements
Water Quality Available	No
Pump	Turbine
Pump Depth (feet below land surface)	
Power Type	Natural-Gas Engine
Annular Seal Method	
Surface Completion	
Owner	Ernest Sluder
Driller	Walco Drilling Co.
Other Data Available	Drillers Log
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Texas Water Development Board
Created Date	7/27/1983
Last Update Date	

Remarks	Unused irrigation well. Measured yield 750 GPM in 1966. Cemented from 0 to 250 feet.

Casing

Diameter (in.)	Casing Type	Casing Material	Schedule	Gauge	Top Depth (ft.)	Bottom Depth (ft.)
14	Blank	Steel			0	592
14	Screen	Steel			592	744

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

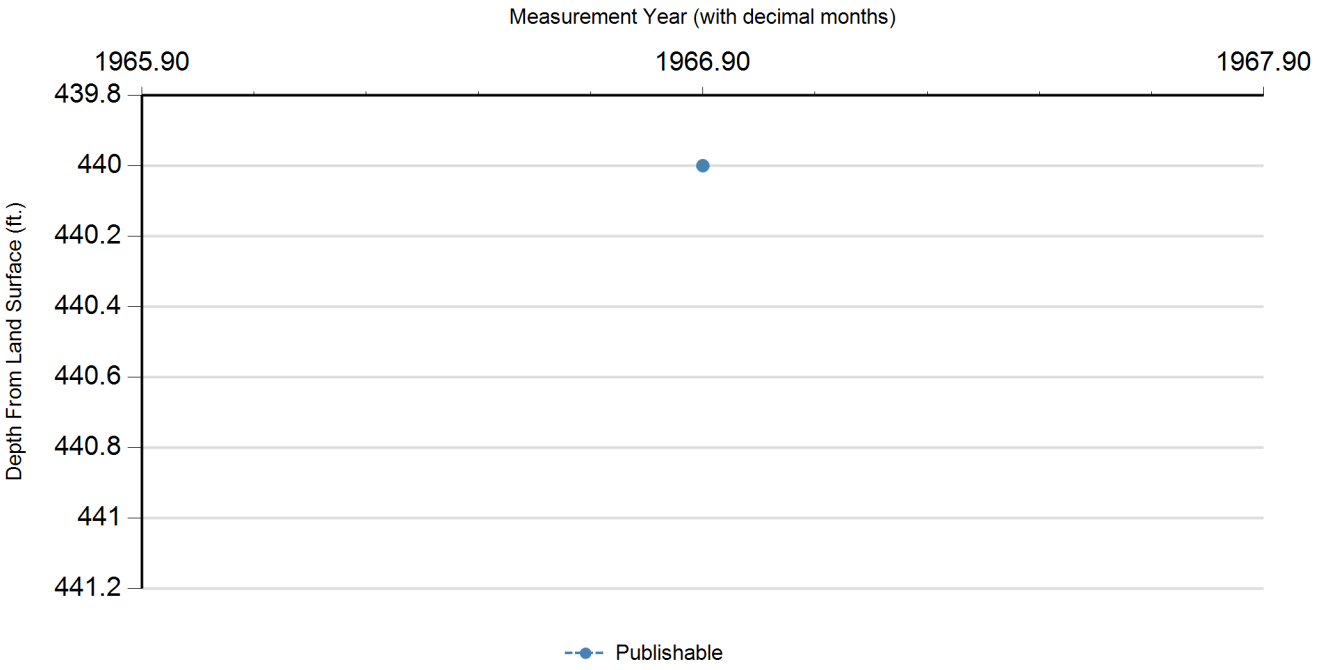
Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	11/30/1966		440		3320	1	Registered Water Well Driller	Unknown		

Code Descriptions

Status Code	Status Description
P	Publishable

Water Quality Analysis - No Data Available

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-303

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014303
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.861667
Latitude (degrees minutes seconds)	34° 51' 42" N
Longitude (decimal degrees)	-102.286111
Longitude (degrees minutes seconds)	102° 17' 10" W
Coordinate Source	+/- 1 Second
Aquifer Code	121OGLL - Ogallala Formation
Aquifer	Ogallala
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3764
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	145
Well Depth Source	Driller's Log
Drilling Start Date	
Drilling End Date	8/10/1957
Drilling Method	Mud (Hydraulic) Rotary
Borehole Completion	Perforated or Slotted

Well Type	Withdrawal of Water
Well Use	Unused
Water Level Observation	Historical
Water Quality Available	No
Pump	Turbine
Pump Depth (feet below land surface)	
Power Type	Natural-Gas Engine
Annular Seal Method	
Surface Completion	
Owner	Earnest Sluder
Driller	L. J. Dirks
Other Data Available	Drillers Log
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Groundwater Conservation District
Created Date	9/6/1994
Last Update Date	10/17/1994

Remarks	

Casing - No Data

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

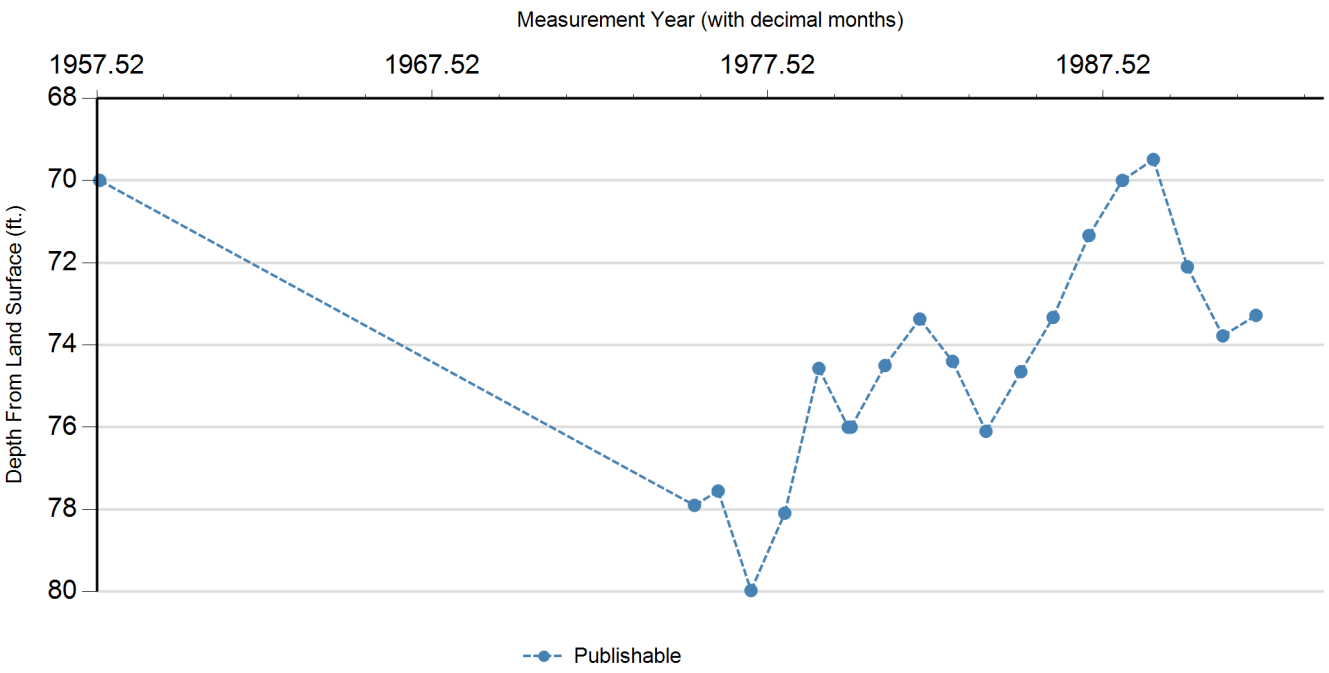
Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	8/10/1957		70		3694	1	Registered Water Well Driller	Unknown		
P	5/2/1975		77.9	7.90	3686.1	1	Groundwater Conservation District	Steel Tape		
P	1/14/1976		77.55	(0.35)	3686.45	1	Groundwater Conservation District	Steel Tape		
P	1/7/1977		79.97	2.42	3684.03	1	Groundwater Conservation District	Steel Tape		
P	1/9/1978		78.09	(1.88)	3685.91	1	Groundwater Conservation District	Steel Tape		
P	1/15/1979		74.57	(3.52)	3689.43	1	Groundwater Conservation District	Steel Tape		
P	12/5/1979		76	1.43	3688	1	Groundwater Conservation District	Steel Tape		
P	1/1/1980		76	0.00	3688	1	Groundwater Conservation District	Steel Tape		
P	1/5/1981		74.5	(1.50)	3689.5	1	Groundwater Conservation District	Steel Tape		
P	1/18/1982		73.37	(1.13)	3690.63	1	Groundwater Conservation District	Steel Tape		
P	1/10/1983		74.4	1.03	3689.6	1	Groundwater Conservation District	Steel Tape		
P	1/9/1984		76.1	1.70	3687.9	1	Groundwater Conservation District	Steel Tape		
P	1/23/1985		74.65	(1.45)	3689.35	1	Groundwater Conservation District	Steel Tape		
P	1/9/1986		73.33	(1.32)	3690.67	1	Groundwater Conservation District	Steel Tape		

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-303

Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	2/4/1987		71.34	(1.99)	3692.66	1	Groundwater Conservation District	Steel Tape		
P	2/3/1988		70	(1.34)	3694	1	Groundwater Conservation District	Steel Tape		
P	1/5/1989		69.49	(0.51)	3694.51	1	Groundwater Conservation District	Steel Tape		
P	1/10/1990		72.1	2.61	3691.9	1	Groundwater Conservation District	Steel Tape		
P	2/1/1991		73.78	1.68	3690.22	1	Groundwater Conservation District	Steel Tape		
P	1/27/1992		73.28	(0.50)	3690.72	1	Groundwater Conservation District	Steel Tape		
X	1/5/1993					1	Groundwater Conservation District	Unknown	23	
X	1/4/1994					1	Groundwater Conservation District	Unknown	23	

Code Descriptions

Status Code	Status Description
P	Publishable
X	No Measurement

Remark ID	Remark Description
23	Well apparently blocked or caved

Water Quality Analysis - No Data Available

Texas Water Development Board (TWDB)
Groundwater Database (GWDB)
Well Information Report for State Well Number 10-14-238

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	1014238
County	Deaf Smith
River Basin	Red
Groundwater Management Area	2
Regional Water Planning Area	O - Llano Estacado
Groundwater Conservation District	High Plains UWCD #1
Latitude (decimal degrees)	34.8566667
Latitude (degrees minutes seconds)	34° 51' 24" N
Longitude (decimal degrees)	-102.3133333
Longitude (degrees minutes seconds)	102° 18' 48" W
Coordinate Source	Global Positioning System - GPS
Aquifer Code	
Aquifer	Ogallala
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	3776
Land Surface Elevation Method	Digital Elevation Model -DEM
Well Depth (feet below land surface)	193
Well Depth Source	Driller's Log
Drilling Start Date	
Drilling End Date	8/14/1972
Drilling Method	Mud (Hydraulic) Rotary
Borehole Completion	Perforated or Slotted

Well Type	Withdrawal of Water
Well Use	Irrigation
Water Level Observation	Historical
Water Quality Available	No
Pump	Submersible
Pump Depth (feet below land surface)	
Power Type	Electric Motor
Annular Seal Method	
Surface Completion	
Owner	Richard Lupton
Driller	Water Industries Inc
Other Data Available	Drillers Log
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	Groundwater Conservation District
Created Date	6/10/2015
Last Update Date	5/30/2019

Remarks	Observation well no longer needed.

Casing

Diameter (in.)	Casing Type	Casing Material	Schedule	Gauge	Top Depth (ft.)	Bottom Depth (ft.)
16	Blank	Steel			0	100
16	Screen				100	193

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

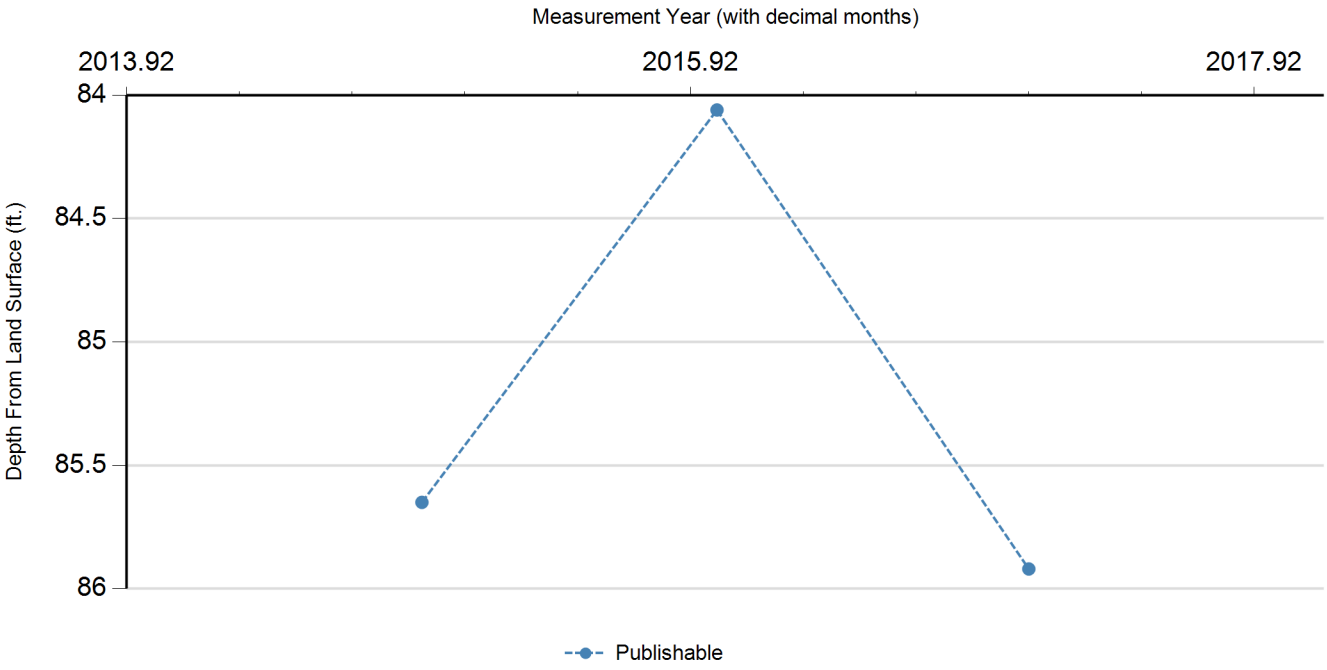
Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

Packers - No Data

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	12/23/2014		85.65		3690.35	1	Groundwater Conservation District	Electric Line		
P	1/5/2016		84.06	(1.59)	3691.94	1	Groundwater Conservation District	Electric Line		
P	2/14/2017		85.92	1.86	3690.08	1	Groundwater Conservation District	Electric Line		

Code Descriptions

Status Code	Status Description
P	Publishable

Water Quality Analysis - No Data Available

STATE OF TEXAS WELL REPORT for Tracking #647764

Owner:	**AMARILLO HOME CENTER / CHAVARRA**	Owner Well #:	**No Data**
Address:	**SAME AS COORDINATES HEREFORD, TX 79045**	Grid #:	**10-14-2**
		Latitude:	**34° 51' 35.44" N**
Well Location:	**SAME AS COORDINATES HEREFORD, TX**	Longitude:	**102° 18' 58.82" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Domestic**

Drilling Start Date: **7/27/2023** Drilling End Date: **7/28/2023**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
9	**0**	**210**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
22	**210**	**Gravel**	**8/16**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
2	**22**	**Cement 6 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **> 50**

Distance to Septic Field or other concentrated contamination (ft.): **> 100**

Distance to Septic Tank (ft.): **> 50**

Method of Verification: **Measured**

Surface Completion: **Pitless Adapter Used** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Currie Drilling Co., Inc.**

3001 N. 23rd St.
Canyon, TX 79015

Driller Name: **SHANE CURRIE** License Number: **54499**

Apprentice Name: **ISAAC DELUNA** Apprentice Number: **61028**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**TOPSOIL**
5	**80**	**CALICHE, CALICHE ROCK AND SANDY CALICHE**
80	**190**	**SAND**
190	**200**	**BROWN SANDY CLAY AND CLAY**
200	**210**	**RED CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
5	**Blank**	**New Steel**		**-2**	**3**
5	**Blank**	**New Plastic (PVC)**		**3**	**160**
5	**Perforated or Slotted**	**New Plastic (PVC)**	**0.035**	**160**	**200**
5	**Blank**	**New Plastic (PVC)**		**200**	**210**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #661163

Owner:	**SOLITAIRE HOMES**	Owner Well #:	**No Data**
Address:	**5303 E. AMARILLO BLVD AMARILLO, TX 79107**	Grid #:	**10-14-2**
Well Location:	**3926 CR 9B HEREFORD, TX 79045**	Latitude:	**34° 51' 43.96" N**
		Longitude:	**102° 18' 42.13" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **3/7/2024** Drilling End Date: **3/7/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
9	**0**	**210**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
22	**210**	**Gravel**	**8/16**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
2	**22**	**Cement 7 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **> 50**

Distance to Septic Field or other concentrated contamination (ft.): **> 100**

Distance to Septic Tank (ft.): **> 50**

Method of Verification: **MEASURED**

Surface Completion: **Pitless Adapter Used**

Surface Completion by Driller

Water Level: **130 ft.** below land surface on **2024-03-07**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Currie Drilling Co., Inc.**

3001 N. 23rd St.
Canyon, TX 79015

Driller Name: **SHANE CURRIE** License Number: **54499**

Apprentice Name: **ISAAC DELUNA** Apprentice Number: **61028**

Comments: **No Data**

Report Amended on 4/16/2024 by Request #42120

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**TOP SOIL**
5	**75**	**CALICHE**
75	**90**	**SAND**
90	**120**	**SANDY CLAY**
120	**190**	**SAND**
190	**200**	**SANDY CLAY AND GRAVEL**
200	**210**	**RED CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
5	**Blank**	**New Steel**		**-2**	**3**
5	**Blank**	**New Plastic (PVC)**		**3**	**160**
5	**Perforated or Slotted**	**New Plastic (PVC)**	**0.035**	**160**	**200**
5	**Blank**	**New Plastic (PVC)**		**200**	**210**

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STATE OF TEXAS WELL REPORT for Tracking #663326

Owner:	**SOLITAIRE HOMES**	Owner Well #:	**No Data**
Address:	**5303 E. AMARILLO BLVD AMARILLO, TX 79107**	Grid #:	**10-14-2**
Well Location:	**3936 CR 9B HEREFORD, TX 79043**	Latitude:	**34° 51' 43.56" N**
		Longitude:	**102° 18' 34.2" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **3/12/2024** Drilling End Date: **3/13/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
9	**0**	**210**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
22	**210**	**Gravel**	**8/16**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
2	**22**	**Cement 7 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **> 50**

Distance to Septic Field or other concentrated contamination (ft.): **> 100**

Distance to Septic Tank (ft.): **> 50**

Method of Verification: **MEASURED**

Surface Completion: **Pitless Adapter Used**

Surface Completion by Driller

Water Level: **150 ft.** below land surface on **2024-03-13**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Currie Drilling Co., Inc.**

3001 N. 23rd St.
Canyon, TX 79015

Driller Name: **SHANE CURRIE** License Number: **54499**

Apprentice Name: **ISAAC DELUNA** Apprentice Number: **61028**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**TOP SOIL**
5	**75**	**CALICHE**
75	**120**	**SAND WITH STREAKS OF CLAY**
120	**190**	**SAND**
190	**200**	**SAND WITH STREAKS OF CLAY**
200	**210**	**RED CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
5	**Blank**	**New Steel**		**-2**	**3**
5	**Blank**	**New Plastic (PVC)**		**3**	**160**
5	**Perforated or Slotted**	**New Plastic (PVC)**	**0.035**	**160**	**200**
5	**Blank**	**New Plastic (PVC)**		**200**	**210**

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STATE OF TEXAS WELL REPORT for Tracking #214794

Owner:	**JOHNSON CATTLE**	Owner Well #:	**No Data**
Address:	**4332 US HWY 60 HEREFORD, TX 79045**	Grid #:	**10-14-3**
Well Location:	**No Data**	Latitude:	**34° 51' 38" N**
		Longitude:	**102° 17' 07" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Irrigation**

Drilling Start Date: **3/17/2010** Drilling End Date: **3/19/2010**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**15**	**0**	**180**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Straight Wall**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **JOHNSON**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **CURRIE DRILLING CO.,INC.**

19200 S. US. HWY. 87
CANYON, TX 79015

Driller Name: **BRUCE CURRIE** License Number: **1712**

Apprentice Name: **BRIAN DAVIS** Apprentice Number: **3203**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

From (ft)	To (ft)	Description
0	4	TOPSOIL
4	38	CALICHE & CALICHE ROCK & SANDY CALICHE
38	63	SANDY CLAY & SAND
63	70	SANDSTONE
70	85	SAND & SANDY CLAY & SANDSTONE
85	87	ROCK
87	112	FINE LOOSE SAND & SANDSTONE-MUDDY
112	122	ROCK-SANDY CLAY
122	140	SAND & SANDY CLAY
140	150	GREEN CLAY & SANDY CLAY
150	165	SAND & SANDY CLAY
165	180	GREEN SANDY CLAY & RED CLAY

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
12	N	STEEL BLANK	180 170
		STEEL SLOTTED	170 50 .150
		STEEL BLANK	50 +1

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STATE OF TEXAS WELL REPORT for Tracking #173332

Owner: **Johnson Land & Cattle**

Address: **4332 Hwy 60**
Hereford, TX 79045

Well Location: **Sec 4, Blk K-14**
Hereford, TX 79045

Well County: **Deaf Smith**

Owner Well #: **Test #3-09**

Grid #: **10-14-3**

Latitude: **34° 51' 26" N**

Longitude: **102° 17' 08" W**

Elevation: **No Data**

****Plugged Within 48 Hours****

****This well has been plugged****

Plugging Report Tracking #123724

Type of Work: **New Well**

Proposed Use: **Test Well**

Drilling Start Date: **3/21/2009** Drilling End Date: **3/21/2009**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**180**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Unknown**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**5**	**20**	**2 cement**

Seal Method: **Hand Mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **none observd**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
180-020 natural fill		
020-005 cement 2 sack cement		
005-000 natural fill		

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **LT Drilling Company**

PO Box 784
Sunray, TX 79086

Driller Name: **Randal James Taylor** License Number: **2366**

Apprentice Name: **Diego Solano** Apprentice Number: **56500**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**8**	**surface top soil brown clay**
8	**40**	**caliche w/rock strips**
40	**60**	**sand w/clay mix & sandy clay strips**
60	**80**	**fine fairly loose sand w/sandstone & sandy clay strips**
80	**100**	**fine fairly loose sand w/sandstone & sandy clay strips**
100	**120**	**broken rock sandstone & sand**
120	**140**	**broken rock to gray sandy clay**
140	**160**	**gray sandy clay & clay**
160	**180**	**gray to red clay & shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS PLUGGING REPORT for Tracking #123724

Owner:	**Johnson Land & Cattle**	Owner Well #:	**Test #3-09**
Address:	**4332 Hwy 60 Hereford, TX 79045**	Grid #:	**10-14-3**
Well Location:	**Sec 4, Blk K-14 Hereford, TX 79045**	Latitude:	**34° 51' 26" N**
		Longitude:	**102° 17' 08" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Test Well**

Drilling Information

Company: **LT Drilling Company** Date Drilled: **3/21/2009**

Driller: **Randal James Taylor** License Number: **2366**

Well Report Tracking #173332

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**180**

Plugging Information

Date Plugged: **3/21/2009** Plugger: **Randal James Taylor**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
005-000 natural fill
020-005 cement 2 sack cement
180-020 natural fill

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information:	**LT Drilling Company** **PO Box 784** **Sunray, TX 79086**		
Driller Name:	**Randal James Taylor**	License Number:	**2366**
Apprentice Name:	**Diego Solano**	Apprentice Number:	**56500**
Comments:	**No Data**		

STATE OF TEXAS WELL REPORT for Tracking #370286

Owner:	**City of Hereford - Ted Coleman**	Owner Well #:	**TH-8-14**
Address:	**PO Box 2277 Hereford, TX 79045**	Grid #:	**10-14-3**
Well Location:	**Sec 59, BLK 7 TX**	Latitude:	**34° 50' 57" N**
		Longitude:	**102° 17' 05" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
		****Plugged Within 48 Hours****	

****This well has been plugged**** **Plugging Report Tracking #147159**

Type of Work: **New Well** Proposed Use: **Test Well**

Drilling Start Date: **6/25/2014** Drilling End Date: **7/25/2014**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**750**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Open Hole**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
		2 sacks
5	**20**	**Cement**

Seal Method: **Handmixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **Natural Fill 000-005**
Cement 005-020
Natural Fill 020-750

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	Top Depth (ft.)	Bottom Depth (ft.)
Pressure Plugged 750'-40' with 71 sks bentonite plug chips		

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Hydro Resources Mid Continent Inc.**

PO Box 784
Sunray, TX 79086

Driller Name: **Randy Taylor** License Number: **2366**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**160**	**top soil clay & caliche w/sand strips**
160	**180**	**gray to red clay**
180	**200**	**red clay**
200	**220**	**red clay**
220	**240**	**red clay**
240	**260**	**red clay**
260	**280**	**red clay**
280	**300**	**red clay**
300	**320**	**red clay**
320	**340**	**red clay**
340	**360**	**red clay**
360	**380**	**red clay**
380	**400**	**red clay**
400	**420**	**red clay**
420	**440**	**red clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

440	460	red clay
460	480	gray to red clay
480	500	gray to red clay
500	520	gray to red clay & shale
520	540	gray to red clay & shale
540	560	gray to red clay & shale
560	580	red clay & little hard shale w/fine sand strips
580	600	red clay & shale w/sand strips
600	620	red clay & shale w/sand strips
620	640	fine fairly tight sand
640	660	fine little tight sand w/hard stone strips & clay
660	680	med fine fairly loose sand w/coarse sand strips & gravel
680	700	med to coarse fairly tight sand w/small gravel
700	720	med to coarse little tight sand w/small gravel
720	740	med to coarse little tight sand w/small gravel & clay
740	750	red clay w/hard stone strips

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(512) 334-5540

STATE OF TEXAS PLUGGING REPORT for Tracking #147159

Owner:	**City of Hereford - Ted Coleman**	Owner Well #:	**TH-8-14**
Address:	**PO Box 2277 Hereford, TX 79045**	Grid #:	**10-14-3**
Well Location:	**Sec 59, BLK 7 TX**	Latitude:	**34° 50' 57" N**
		Longitude:	**102° 17' 05" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Test Well**

Drilling Information

Company: **Hydro Resources Mid Continent Inc.** Date Drilled: **7/25/2014**

Driller: **Randal James Taylor** License Number: **2366**

Well Report Tracking #370286

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**750**

Plugging Information

Date Plugged: **7/25/2014** Plugger: **Randy Taylor**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Pressure Plugged 750'-40' with 71 sks bentonite plug chips

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Hydro Resources Mid Continent Inc.**

PO Box 784
Sunray, TX 79086

Driller Name: **Randy Taylor** License Number: **2366**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #641127

Owner:	**John Koenger**	Owner Well #:	**No Data**
Address:	**3881 FM 1259 Hereford, TX 79045**	Grid #:	**10-14-5**
Well Location:	**3881 FM 1259 Hereford, TX 79045**	Latitude:	**34° 48' 27.37" N**
		Longitude:	**102° 18' 50.11" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **5/12/2023** Drilling End Date: **5/16/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8.88**	**0**	**338**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**13**	**338**	**Gravel**	

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**topsoil**
	3	**13**	**Cement**
	13	**338**	**gravel**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **131 Feet**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **Wheel**

Surface Completion: **Pitless Adapter Used** **Surface Completion by Driller**

Water Level: **211 ft.** below land surface on **2023-05-22**

Packers: **No Data**

Type of Pump: **Submersible** Pump Depth (ft.): **315**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **DB&E Co LTD**

1315 S HWY 87
Dalhart, TX 79022

Driller Name: **Justin Waggoner** License Number: **58655**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**Topsoil**
4	**80**	**Caliche and Sand**
80	**280**	**Tan sand and Sandstone**
280	**310**	**Red orange sand**
310	**330**	**Sandy red clay**
330	**338**	**Red bed**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
5	**Riser**	**New Steel**		**-2**	**3**
5	**Blank**	**New Plastic (PVC)**		**3**	**268**
5	**Perforated or Slotted**	**New Plastic (PVC)**		**268**	**328**
5	**Blank**	**New Plastic (PVC)**		**328**	**338**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #619331

Owner:	**ROBERT GALLEGOS**	Owner Well #:	**No Data**
Address:	**3650 FM 2943 HEREFORD, TX 79045**	Grid #:	**10-14-5**
Well Location:	**SAME AS COORDINATES HEREFORD, TX 79045**	Latitude:	**34° 48' 51.6" N**
		Longitude:	**102° 19' 42.02" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **9/6/2022** Drilling End Date: **9/6/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**9**	**0**	**170**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**22**	**170**	**Gravel**	**8/16**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**2**	**22**	**Cement 8 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **>50**

Distance to Septic Field or other concentrated contamination (ft.): **>100**

Distance to Septic Tank (ft.): **>50**

Method of Verification: **MEASURE**

Surface Completion: **Pitless Adapter Used** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Currie Drilling Co. Inc.**

3001 N. 23rd St.
Canyon, TX 79015

Driller Name: **SHANE CURRIE** License Number: **54499**

Apprentice Name: **ISAAC DELUNA** Apprentice Number: **61028**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**TOP SOIL**
5	**15**	**ROCK**
15	**80**	**SAND & SANDSTONE**
80	**120**	**BROWN SAND & STREAKS OF SANDSTONE**
120	**160**	**BROWN SAND, SANDSTONE, STREAKS OF CLAY**
160	**170**	**RED CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
5	**Blank**	**New Steel**		**-2**	**3**
5	**Blank**	**New Plastic (PVC)**		**3**	**120**
5	**Perforated or Slotted**	**New Plastic (PVC)**	**0.035**	**120**	**160**
5	**Blank**	**New Plastic (PVC)**		**160**	**170**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #588728

Owner:	**ROBERT GALLEGOS**	Owner Well #:	**No Data**
Address:	**3650 CR F HEREFORD, TX 79045**	Grid #:	**10-14-5**
Well Location:	**3650 CR F HEREFORD, TX 79045**	Latitude:	**34° 48' 57.12" N**
		Longitude:	**102° 19' 38.78" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **11/3/2021** Drilling End Date: **11/3/2021**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**9**	**0**	**170**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**20**	**170**	**Gravel**	**8/16**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**2**	**20**	**Cement 6 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Pitless Adapter Used** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Currie Drilling Co. Inc.**

3001 N. 23rd St.
Canyon, TX 79015

Driller Name: **SHANE CURRIE** License Number: **54499**

Apprentice Name: **GABRIEL GONZALEZ** Apprentice Number: **60511**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**TOPSOIL**
5	**30**	**CALICHE & CALICHE ROCK**
30	**55**	**CALICHE & SAND**
55	**110**	**SAND & STREAKS OF CLAY**
110	**160**	**SAND, SANDSTONE, STREAKS OF CLAY**
160	**170**	**RED CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
5	**Blank**	**New Steel**		**-2**	**3**
5	**Blank**	**New Plastic (PVC)**		**3**	**120**
5	**Perforated or Slotted**	**New Plastic (PVC)**	**0.035**	**120**	**160**
5	**Blank**	**New Plastic (PVC)**		**160**	**170**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #140854

Owner:	**FILICINO VILLANUEVA**	Owner Well #:	**No Data**
Address:	**COUNTY RD 6A HEREFORD, TX 79045**	Grid #:	**10-14-5**
Well Location:	**No Data**	Latitude:	**34° 49' 03" N**
		Longitude:	**102° 19' 58" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Domestic**

Drilling Start Date: **4/7/2008** Drilling End Date: **4/8/2008**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**9**	**0**	**175**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**100**	**175**	**Gravel**	**8-16**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**2**	**100**	**40 CEMENT**

Seal Method: **HYDRAULIC FLOW**

Sealed By: **CURRIE**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Pitless Adapter Used**

Water Level: **100 ft.** below land surface on **No Data** Measurement Method: **Unknown**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **Unknown** **Yield: 15 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **CURRIE DRILLING CO.,INC**

19200 S. US. HWY.87
CANYON, TX 79015

Driller Name: **BRUCE CURRIE** License Number: **1712**

Apprentice Name: **BRIAN DAVIS** Apprentice Number: **3203**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**3**	**TOPSOIL**
3	**40**	**CALICHE & CALICHE ROCK**
40	**125**	**SAND**
125	**165**	**SANDY CLAY**
165	**175**	**BROWN CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.) New/Used Type Setting From/To (ft.)
5 N PVC BLANK 175 165
PVC SLOTTED 165 125 .035
PVC BLANK 125 3
STEEL 3 +2

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #260967

Owner:	**POLO CEDILLO**	Owner Well #:	**No Data**
Address:	**CR 6 A** **HEREFORD, TX 79045**	Grid #:	**10-14-5**
Well Location:	**No Data**	Latitude:	**34° 49' 12" N**
		Longitude:	**102° 19' 51" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **6/17/2011** Drilling End Date: **6/21/2011**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**9**	**0**	**180**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**20**	**180**	**Gravel**	**8-16**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**2**	**20**	**7 CEMENT**

Seal Method: **HYDRAULIC FLOW**

Sealed By: **CURRIE**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Pitless Adapter Used**

Water Level: **100 ft.** below land surface on **No Data** Measurement Method: **Unknown**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **Bailer** **Yield: 2 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **CURRIE DRILLING CO.,INC.**

3001 N. 23RD. ST.
CANYON, TX 79015

Driller Name: **BRUCE CURRIE** License Number: **1712**

Apprentice Name: **BRIAN DAVIS** Apprentice Number: **3203**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**TOPSOIL**
4	**65**	**CALICHE & CALICHE ROCK**
65	**115**	**SAND & SANDY CLAY**
115	**120**	**RED SANDY CLAY**
120	**170**	**RED CLAY (SOME SAND)**
170	**180**	**RED CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.) New/Used Type Setting From/To (ft.)
5 N PVC BLANK 180 170
PVC SLOTTED 170 110 .035
PVC BLANK 110 3
STEEL 3 +2

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #77691

Owner:	**POLO CEDILLO**	Owner Well #:	**No Data**
Address:	**COUNTY RD. 6 A HEREFORD, TX 79045**	Grid #:	**10-14-5**
Well Location:	**No Data**	Latitude:	**34° 49' 16" N**
		Longitude:	**102° 19' 51" W**
Well County:	**Randall**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Domestic**

Drilling Start Date: **2/1/2006** Drilling End Date: **2/2/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**9**	**0**	**200**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**22**	**200**	**Gravel**	**8-16**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**2**	**22**	**8 CEMENT**

Seal Method: **HYDRAULIC FLOW**

Sealed By: **CURRIE**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Pitless Adapter Used**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **Unknown** **Yield: 6+ GPM**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **CURRIE DRILLING CO.,INC.**

19200 S. US. HWY. 87
CANYON, TX 79015

Driller Name: **BRUCE CURRIE** License Number: **1712**

Apprentice Name: **BRIAN DAVIS** Apprentice Number: **3203**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**5**	**TOPSOIL**
5	**60**	**CALICHE & CALICHE ROCK & SANDY CALICHE**
60	**70**	**SANDY CLAY**
70	**100**	**SAND & WHITE SANDY CLAY**
100	**120**	**RED CLAY**
120	**130**	**GRAY SANDY CLAY**
130	**168**	**BROWN, GREEN & BLUE CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.) New/Used Type Setting From/To (ft.)
5 N PVC BLANK 200 180
PVC SLOTTED 180 100 .035
PVC BLANK 100 4
STEEL BLANK 4 +1

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #128538

Owner:	**Panda Ethanol**	Owner Well #:	**WW #2**
Address:	**PO Box 486 Hereford, TX 79045**	Grid #:	**10-14-2**
Well Location:	**Sec 23, Blk K3, Hereford, TX 79045**	Latitude:	**34° 50' 42" N**
		Longitude:	**102° 19' 28" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Public Supply**

Drilling Start Date: **10/3/2007** Drilling End Date: **11/19/2007** **Plans Approved by TCEQ - YES**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**22**	**0**	**865**

Drilling Method: **Reverse Circulation**

Borehole Completion: **Unknown**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**590**	**585 cement**

Seal Method: **Truck mixed**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **1320**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **Estimated**

Surface Completion: **Unknown**

Water Level: **608 ft.** below land surface on **2007-11-19** Measurement Method: **Unknown**

Packers: **No Data**

Type of Pump: **Turbine** Pump Depth (ft.): **822**

Well Tests: **Pump** **Yield: 800 GPM**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Yes**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **LT Drilling Company**

PO Box 784
Sunray, TX 79086

Driller Name: **Randal James Taylor** License Number: **2366**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**Surface**
4	**14**	**Caliche**
14	**120**	**White sandy clay w/fine sand strips**
120	**180**	**Fine sand w/sandy clay**
180	**400**	**Red & gray clay**
400	**560**	**Red clay & shale**
560	**620**	**Fine tight sand w/shale strips**
620	**740**	**Fine tight sand w/few shale strips**
740	**785**	**Fine tight sand w/coarse sand + gravel strips**
785	**808**	**Med to coarse sand + gravel**
808	**865**	**Red & gray clay + shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
16	**N**	**Blank**	**.375 steel +2 - 605**
16	**N**	**Slotted**	**steel torch cut 605 - 865 3/8 x 8**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #104131

Owner: **Panda Ethanol**

Address: **PO Box 486**
Hereford, TX 79045

Well Location: **Sec 23, Blk K3**
Hereford, TX 79045

Well County: **Deaf Smith**

Owner Well #: **Test #3**

Grid #: **10-14-2**

Latitude: **34° 50' 42" N**

Longitude: **102° 19' 27" W**

Elevation: **No Data**

****Plugged Within 48 Hours****

****This well has been plugged****

Plugging Report Tracking #116281

Type of Work: **New Well**

Proposed Use: **Test Well**

Drilling Start Date: **1/7/2007** Drilling End Date: **1/7/2007**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**860**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Unknown**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Unknown**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **None obsrvd**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **Estimated**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
860 - 20 30 Bags Volclay Grout		
20 - 5 2 Bags Cement		

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **L T Drilling Company**

PO Box 784
Sunray, TX 79086

Driller Name: **Lester James Taylor**

License Number: **1849**

Apprentice Name: **Diego Solano**

Apprentice Number: **WWDAPP00000621**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**Surface top soil brown clay**
4	**14**	**Caliche w/hard rock strip**
14	**120**	**White sandy clay + fine sand strips**
120	**160**	**Sand w/clay mix**
160	**180**	**Fine fairly loose sand w/clay mix + sandy clay strips**
180	**200**	**Brown to red sandy clay + clay**
200	**220**	**Red and gray clay**
220	**240**	**Red clay**
240	**260**	**Red and brown clay and sandy clay**
260	**300**	**Brown and green sandy clay + clay**
300	**320**	**Brown, green and red sandy clay + clay**
320	**340**	**Brown sandy clay + clay**
340	**360**	**Red and gray sandy clay + clay**
360	**380**	**Red, gray and brown sandy clay w/hard shale strips**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

380	400	Red and brown sandy clay + clay
400	520	Red clay and shale
520	540	Red clay
540	560	Red clay and shale
560	580	Red shale w/fine tight dirty sand strips
580	600	Red and gray shale w/fine tight dirty sand strips
600	620	Red shale w/fine tight dirty sand strips
620	660	Fine little tight brown/red sand w/little clay mix
660	680	Fine little tight brown/red sand w/clay mix + shale strips
680	700	Fine little tight gray sand w/little clay mix
700	720	Fine little tight sand w/coarse sand strips
720	740	Fine little tight sand
740	780	Fine little tight sand w/coarse sand and gravel strips
780	800	Fine to med to coarse little tight sand w/gravel strips
800	820	Coarse tight sand w/gravel to red and blue clay + shale
820	860	Red and gray clay + shale

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STATE OF TEXAS PLUGGING REPORT for Tracking #116281

Owner:	**Panda Ethanol**	Owner Well #:	**Test #3**
Address:	**PO Box 486 Hereford, TX 79045**	Grid #:	**10-14-2**
Well Location:	**Sec 23, Blk K3 Hereford, TX 79045**	Latitude:	**34° 50' 42" N**
		Longitude:	**102° 19' 27" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Test Well**

Drilling Information

Company: **L T Drilling Company** Date Drilled: **1/7/2007**

Driller: **Lester James Taylor** License Number: **1849**

Well Report Tracking #104131

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**860**

Plugging Information

Date Plugged: **1/7/2007** Plugger: **Lester James Taylor**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
20 - 5 2 Bags Cement
860 - 20 30 Bags Volclay Grout

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **L T Drilling Company**

PO Box 784
Sunray, TX 79086

Driller Name: **Lester James Taylor** License Number: **1849**

Apprentice Name: **Diego Solano** Apprentice Number: **WWDAPP00000621**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #96078

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-4**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 54" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 19' 04" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
			****Plugged Within 48 Hours****

****This well has been plugged**** **Plugging Report Tracking #115347**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**15**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**15**	**3 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**2**	**Brown, Lean Clay w/Sand**
2	**3.5**	**Pink, Clayey Sand**
3.5	**4.5**	**Pink, Clayey Sand w/Calcareous Material & Nodules**
4.5	**5**	**Pink, Sandy, Lean Clay**
5	**10**	**No Recovery**
10	**15**	**Pink, Hard Calcareous Material, Silty Sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS PLUGGING REPORT for Tracking #115347

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-4**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 54" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 19' 04" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96078

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**15**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #96077

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-3**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 54" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 18' 55" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
			****Plugged Within 48 Hours****

****This well has been plugged**** **Plugging Report Tracking #115346**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**12**	**2 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**Brown, Lean Clay w/Sand**
1.5	**3**	**Reddish Brown, Lean Clay w/Sand**
3	**5**	**Pink & White, Sandy Lean Clay**
5	**5.5**	**White, Sandy Lean Clay**
5.5	**7**	**Pink, Sandy Lean Clay**
7	**8.5**	**Tan, Pink, & White, Caliche, Hard**
8.5	**12**	**Brown, Sandy Lean Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS PLUGGING REPORT for Tracking #115346

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-3**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 54" N**
		Longitude:	**102° 18' 55" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96077

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #96076

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-2**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 51" N**
		Longitude:	**102° 18' 48" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
		****Plugged Within 48 Hours****	

****This well has been plugged**** **Plugging Report Tracking #115345**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**5.25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**5.25**	**1 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**2.5**	**Brown, Lean Clay w/Sand**
2.5	**5**	**Tan, Pink, & White, Caliche w/Calcareous Material Layers, Hard**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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(512) 334-5540

STATE OF TEXAS PLUGGING REPORT for Tracking #115345

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-2**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 51" N**
		Longitude:	**102° 18' 48" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96076

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**5.25**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #97289

Owner:	**Panda - Hereford Ethanol Plant**	Owner Well #:	**S-1**
Address:	**4100 Spring Valley, Suite 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 47" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 18' 41" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
		****Plugged Within 48 Hours****	

****This well has been plugged**** **Plugging Report Tracking #115486**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/30/2006** Drilling End Date: **10/30/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**0.5 Cement**
2	**20**	**5 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Shane Currie** License Number: **54499**

Apprentice Name: **Troy Lucas** Apprentice Number: **256**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**2.5**	**Brown, Lean Clay w/Sand**
2.5	**3**	**Light Brown, Lean Clay w/Sand**
3	**10**	**Pink & White, Lean Clay w/Sand, w/Calcareous Material**
10	**16**	**Red & Yellow, Lean Clay w/Sand & Calcareous Material, Some Small Calcareous Nodules, Calcareous Material Seam @16**
16	**20**	**Very Pale Brown w/Reddish-Yellow Pockets, Clayey Sand w/Calcareous Material & Friable Claystone Material**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS PLUGGING REPORT for Tracking #115486

Owner:	**Panda - Hereford Ethanol Plant**	Owner Well #:	**S-1**
Address:	**4100 Spring Valley, Suite 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 47" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 18' 41" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/30/2006**

Driller: **Shane Currie** License Number: **54499**

Well Report Tracking #97289

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**20**

Plugging Information

Date Plugged: **10/30/2006** Plugger: **Shane Currie**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Shane Currie** License Number: **54499**

Apprentice Name: **Troy Lucas** Apprentice Number: **256**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #603814

Owner:	**Mark Davis**	Owner Well #:	**IRR 1-22**
Address:	**4340 CR 8** **Midwest PMS LLC** **Hereford, TX 79045**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 36.92" N**
Well Location:	**SEC 18, BLK K-3** **Hereford, TX**	Longitude:	**102° 18' 19.76" W**
		Elevation:	**No Data**
Well County:	**Deaf Smith**		

Type of Work: **New Well** Proposed Use: **Industrial**

Drilling Start Date: **4/10/2022** Drilling End Date: **4/11/2022**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
22	**0**	**816**

Drilling Method: **Reverse Circulation**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
320	**816**	**Gravel**	**Huber**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
-1	**320**	**Cement**

Seal Method: **Positive Displacement**

Sealed By: **Driller**

Distance to Property Line (ft.): **234 S 468 E**

Distance to Septic Field or other concentrated contamination (ft.): **.5 miles**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **permit 97615**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **630 ft.** below land surface on **2022-04-11** Measurement Method: **bailer**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
630 - 816	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Hydro Resources Mid Continent Inc.**

PO Box 784
Sunray, TX 79086

Driller Name: **Randy Taylor** License Number: **2366**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**surface top soil brown clay**
4	**40**	**caliche w/rock strips**
40	**180**	**white, pink, grey & brownish red sandy clay**
180	**340**	**brown & red clay w/sandy clay strips to red clay w/grey clay strips**
340	**500**	**red clay to red clay w/hard shale strips**
500	**540**	**red clay to tight grey sandy clay strips w/little red clay mix**
540	**640**	**tight red & grey sandy clay w/dirty grey sand & grey shale**
640	**720**	**very fine tight brown sand w/clay mix & grey shale w/coarse sand strips**
720	**760**	**med fine tight grey sand w/coarse sand /gravel strips & red clay strips**
760	**800**	**coarse tight sand w/gravel & red clay strips & hard grey shale strips**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
16	**Blank**	**New Steel**	**0.312**	**-2**	**641**
16	**Perforated or Slotted**	**New Steel**	**0.188**	**641**	**801**
16	**Blank**	**New Steel**	**0.312**	**801**	**816**

800	**816**	**coarse tight sand w/gravel to red & grey clay & shale to red clay**

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STATE OF TEXAS WELL REPORT for Tracking #586784

Owner:	**Midwest PMS**	Owner Well #:	**TH 1-21**
Address:	**11347 Business Park Circle Longmont, CO 80504**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 36.74" N**
Well Location:	**SEC 18, K3 Hereford, TX**	Longitude:	**102° 18' 19.76" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
			****Plugged Within 48 Hours****

****This well has been plugged**** **Plugging Report Tracking #212939**

Type of Work: **New Well** Proposed Use: **Test Well**

Drilling Start Date: **10/12/2021** Drilling End Date: **10/12/2021**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**840**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Plugged**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**5**	**20**	**Cement 2**

Seal Method: **Pressure**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Hydro Resources Mid Continent Inc.**

PO Box 784
Sunray, TX 79086

Driller Name: **Randy Taylor** License Number: **2366**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**4**	**surface top soil brown clay**
4	**40**	**caliche w/rock strips**
40	**180**	**white, pink, grey, brown & red sandy clay & clay**
180	**300**	**brown and red clay w/sandy clay strips**
300	**320**	**red clay w/grey clay strips**
320	**340**	**red clay w/grey clay strips**
340	**360**	**red clay**
360	**380**	**red clay**
380	**400**	**red clay**
400	**420**	**red clay**
420	**440**	**red clay**
440	**460**	**red clay**
460	**480**	**red clay**
480	**500**	**red clay w/hard grey shale strips**
500	**520**	**red clay to tight sandy clay strips**
520	**540**	**tight to firm grey sandy clay & little red clay mix**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

540	560	tight red and grey sandy clay to fine tight grey dirty sand
560	580	fine tight grey dirty sand to hard red & grey shale
580	600	hard red and grey clay & shale
600	620	tight to firm red & grey clay & shale
620	640	tight to firm red and grey clay & shale to fine tight dirty sand
640	660	very fine tight brownish sand w/red and grey clay mix
660	680	very fine tight brownish sand w/clay mix to red and grey shale
680	700	tight red and grey sandy clay to fine tight brownish sand
700	720	fine tight brown to grey sand & coarse sand strips
720	740	med fine tight grey sand w/coarse sand & gravel strips
740	760	med size tight grey sand w/gravel & red clay strip
760	780	coarse tight sand w/gravel & red clay strip
780	800	coarse tight sand w/gravel & hard grey shale strip
800	820	coarse tight sand w/gravel to red & grey clay & shale
820	840	red clay

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STATE OF TEXAS PLUGGING REPORT for Tracking #212939

Owner:	**Midwest PMS**	Owner Well #:	**TH 1-21**
Address:	**11347 Business Park Circle Longmont, CO 80504**	Grid #:	**10-14-2**
Well Location:	**SEC 18, K3 Hereford, TX**	Latitude:	**34° 50' 36.74" N**
		Longitude:	**102° 18' 19.76" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Test Well**

Drilling Information

Company: **Hydro Resources Mid Continent Inc.** Date Drilled: **10/12/2021**

Driller: **Randal James Taylor** License Number: **2366**

Well Report Tracking #586784

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**840**

Plugging Information

Date Plugged: **10/12/2021** Plugger: **Randy Taylor**

Plug Method: **pressure plugged**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
0	**5**	**natural fill**
5	**20**	**Cement 2 Bags/Sacks**
20	**440**	**drill cuttings**
440	**840**	**Bentonite 40 Bags/Sacks**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Hydro Resources Mid Continent Inc.**

PO Box 784
Sunray, TX 79086

Driller Name: **Randy Taylor** License Number: **2366**

Comments: **Pressure plugged**

STATE OF TEXAS WELL REPORT for Tracking #96080

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-5**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 44" N**
		Longitude:	**102° 19' 06" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
		****Plugged Within 48 Hours****	

****This well has been plugged**** **Plugging Report Tracking #115349**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**12**	**2 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**Brown, Sandy, Lean Clay**
1.5	**5**	**Pink & White, Clayey Sand**
5	**7.5**	**Pink & White, Calcareous Material w/Nodules up to 2" and Thin Caliche Layers ~3" Thick**
7.5	**12**	**Pink & White, Sandy, Lean Clay, Large Nodules, Calcareous Material**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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(512) 334-5540

STATE OF TEXAS PLUGGING REPORT for Tracking #115349

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-5**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 44" N**
		Longitude:	**102° 19' 06" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96080

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #96081

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-6**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 40" N**
		Longitude:	**102° 18' 57" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
			****Plugged Within 48 Hours****

****This well has been plugged**** **Plugging Report Tracking #115350**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**12**	**2 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**Brown, Lean Clay w/Sand**
1.5	**3.5**	**Tan, Pink, & White, Caliche, Hard**
3.5	**6.5**	**Pink & White, Clayey Sand w/Large amounts of Calcareous Nodules**
6.5	**7.5**	**Pink & White, Clayey Sand**
7.5	**12**	**Pink & White, Silty Sand w/Trace amounts of Calcareous Material**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS PLUGGING REPORT for Tracking #115350

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-6**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 40" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 18' 57" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96081

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #96082

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-7**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 38" N**
		Longitude:	**102° 18' 53" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
			****Plugged Within 48 Hours****

****This well has been plugged**** **Plugging Report Tracking #115351**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**12**	**2 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**0.5**	**Brown, Lean Clay w/Sand**
0.5	**3**	**Tan, Pink, & White, Caliche, Hard**
3	**10**	**Pink & White, Clayey Sand w/Calcareous Material & Nodules**
10	**12**	**Pink & White, Sand, Lean Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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STATE OF TEXAS PLUGGING REPORT for Tracking #115351

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-7**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 38" N**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Longitude:	**102° 18' 53" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96082

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #96083

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-8**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 36" N**
		Longitude:	**102° 18' 46" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**
		****Plugged Within 48 Hours****	

****This well has been plugged**** **Plugging Report Tracking #115352**

Type of Work: **New Well** Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **10/4/2006** Drilling End Date: **10/4/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Plugged**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**1 Cement**
2	**12**	**2 Bentonite**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **Unknown**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Unknown**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**0.5**	**Brown, Lean Clay w/Sand, Calcareous Nodules**
0.5	**3**	**Tan, Pink, & White, Caliche, Hard**
3	**5**	**Pink & White, Clayey Sand w/Calcareous Material & Nodules**
5	**12**	**Pink & White, Sandy, Lean Clay w/Calcareous Nodules & Material**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

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(512) 334-5540

STATE OF TEXAS PLUGGING REPORT for Tracking #115352

Owner:	**Panda-Hereford Ethonol Plant**	Owner Well #:	**SB-8**
Address:	**4100 Spring Valley, Ste. 1001 Dallas, TX 75244**	Grid #:	**10-14-2**
Well Location:	**US HWY 60 & CR 8 Hereford, TX 79045**	Latitude:	**34° 50' 36" N**
		Longitude:	**102° 18' 46" W**
Well County:	**Deaf Smith**	Elevation:	**No Data**

Well Type: **Environmental Soil Boring**

Drilling Information

Company: **Talon Drilling, LP** Date Drilled: **10/4/2006**

Driller: **Kyle L Burt** License Number: **54969**

Well Report Tracking #96083

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**12**

Plugging Information

Date Plugged: **10/4/2006** Plugger: **Kyle Burt**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
Not Provided

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Talon Drilling, LP**

921 N. Bivins
Amarillo, TX 79107

Driller Name: **Kyle Burt** License Number: **54969**

Apprentice Name: **Ronnie Rodriguez** Apprentice Number: **3165**

Comments: **No Data**

STATE OF TEXAS WELL REPORT for Tracking #100445

Owner:	**Panda Ethanol**	Owner Well #:	**TH #2-06**
Address:	**PO Box 486** **Hereford, TX 79045**	Grid #:	**10-14-2**
		Latitude:	**34° 50' 36" N**
Well Location:	**Hereford, TX 79045**	Longitude:	**102° 19' 00" W**
Well County:	**Deaf Smith**	Elevation:	**3765 ft. above sea level**
			****Plugged Within 48 Hours****

****This well has been plugged**** **Plugging Report Tracking #115937**

Type of Work: **New Well** Proposed Use: **Test Well**

Drilling Start Date: **11/15/2006** Drilling End Date: **11/15/2006**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**820**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Unknown**

Annular Seal Data: **No Data**

Seal Method: **Not Applicable**

Sealed By: **Unknown**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **None obsrvd**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **Estimated**

Surface Completion: **Unknown**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
820 - 20 28 bags volclay grout		
20 - 5 2 bags cement		

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **L T Drilling Company**

PO Box 784
Sunray, TX 79086

Driller Name: **Lester James Taylor**

License Number: **1849**

Apprentice Name: **Diego Solano**

Apprentice Number: **WWDAPP00000621**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**Surface top soil brown clay**
1	**100**	**Caliche w/rock strips**
100	**170**	**Brown sandy clay w/minor sand strips**
170	**200**	**Brown and red sandy clay + clay**
200	**220**	**Brown to red sandy clay + clay**
220	**240**	**Red clay**
240	**260**	**Red and green clay + sandy clay**
260	**280**	**Green sandy clay to red clay**
280	**340**	**Red clay**
340	**360**	**Red clay w/brown clay strips**
360	**380**	**Red, brown and gray clay**
380	**400**	**Brown and gray clay w/shale strips**
400	**420**	**Red clay + shale**
420	**560**	**Red clay and shale**
560	**600**	**Gray and red shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	New/Used	Type	Setting From/To (ft.)
No Data			

600	**620**	**Gray and red shale w/fine dirty sand strip**
620	**640**	**Fine tight sand w/clay mix**
640	**660**	**Fine tight sand to hard gray shale**
660	**680**	**Fine tight sand w/hard shale strips**
680	**700**	**Red shale w/fine tight dirty sand strips**
700	**720**	**Fine tight dirty sand w/clay mix + shale strips**
720	**740**	**Fine to med tight sand w/clay mix + shale strips**
740	**760**	**Fine to med tight dirty sand w/clay mix + coarse sand + gravel strips**
760	**780**	**Med to coarse tight dirty sand w/clay mix**
780	**800**	**Med to fine tight dirty sand to red clay**
800	**820**	**Red clay + shale**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS PLUGGING REPORT for Tracking #115937

Owner:	**Panda Ethanol**	Owner Well #:	**TH #2-06**
Address:	**PO Box 486** **Hereford, TX 79045**	Grid #:	**10-14-2**
Well Location:	**Hereford, TX 79045**	Latitude:	**34° 50' 36" N**
		Longitude:	**102° 19' 00" W**
Well County:	**Deaf Smith**	Elevation:	**3765**

Well Type: **Test Well**

Drilling Information

Company: **L T Drilling Company** Date Drilled: **11/15/2006**

Driller: **Lester James Taylor** License Number: **1849**

Well Report Tracking #100445

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**4.5**	**0**	**820**

Plugging Information

Date Plugged: **11/15/2006** Plugger: **Lester James Taylor**

Plug Method: **Unknown**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Description (number of sacks & material)
20 - 5 2 bags cement
820 - 20 28 bags volclay grout

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **L T Drilling Company**

PO Box 784
Sunray, TX 79086

Driller Name: **Lester James Taylor** License Number: **1849**

Apprentice Name: **Diego Solano** Apprentice Number: **WWDAPP00000621**

Comments: **No Data**

APPENDIX H

GROUNDWATER QUALITY

Groundwater Quality Report

The impact on groundwater is estimated to be very minimal, if at all. As noted, the waste disposal system consists of irrigating 583 acres of land with the treated effluent. At the maximum permitted flow this would result in only 4.8 ac/ft/year of applied effluent. The irrigated crops and associated land can be considered as an additional treatment unit, which will provide a pathway for nutrients to be extracted from the irrigated area. Through an application rate of 4.8 ac/ft/year there will be no anticipated impact on the groundwater. Given all information available, there is no foreseen impact to groundwater wells in the area.

APPENDIX I

SOIL MAP AND ANALYSIS

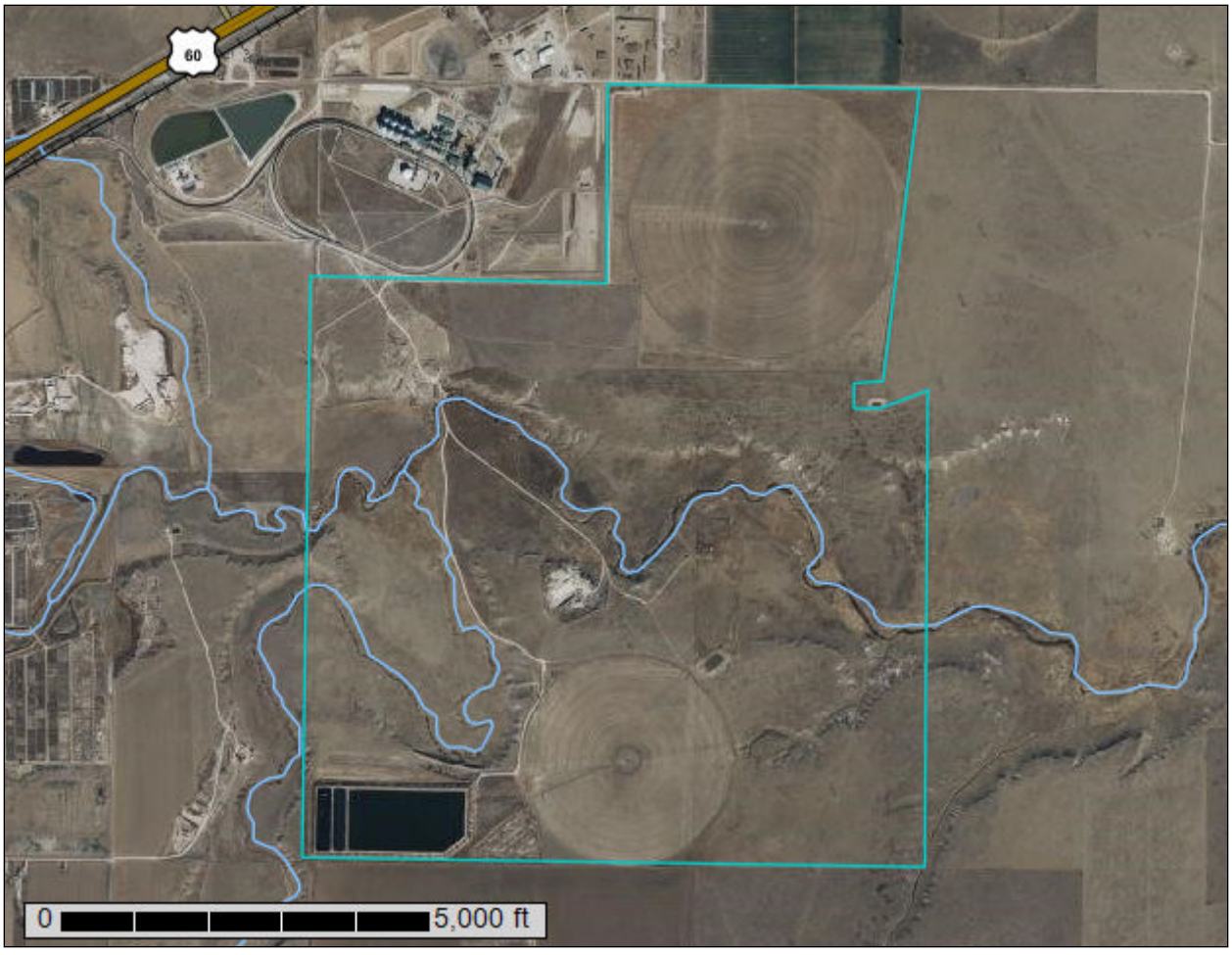
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Deaf Smith County, Texas



July 1, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

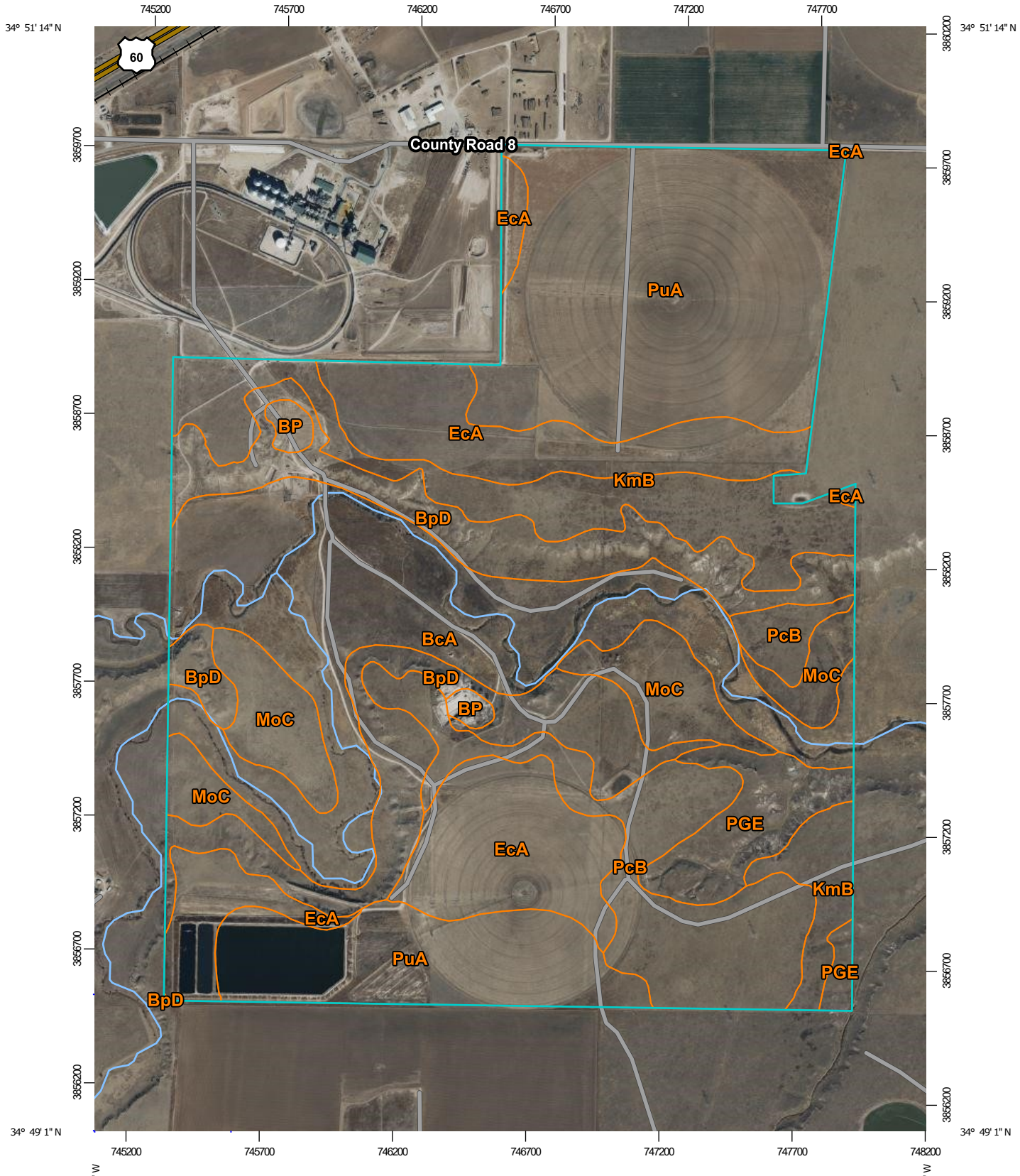
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:20,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Deaf Smith County, Texas
Survey Area Data: Version 21, Aug 30, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 16, 2022—Jan 29, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BcA	Bippus clay loam, 0 to 2 percent slopes, occasionally flooded	317.3	18.0%
BP	Pits, caliche and gravel	11.3	0.6%
BpD	Berda-Potter complex, 3 to 12 percent slopes	236.1	13.4%
EcA	Estacado clay loam, 0 to 1 percent slopes	250.4	14.2%
KmB	Kimberson gravelly loam, 0 to 3 percent slopes	158.6	9.0%
MoC	Mobeetie fine sandy loam, 3 to 5 percent slopes, cool	122.4	7.0%
PcB	Pep clay loam, 1 to 3 percent slopes	158.9	9.0%
PGE	Potter soils, 3 to 20 percent slopes	62.6	3.6%
PuA	Pullman clay loam, 0 to 1 percent slopes	441.4	25.1%
Totals for Area of Interest		**1,758.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the

scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Deaf Smith County, Texas

BcA—Bippus clay loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: db3v
Elevation: 2,200 to 5,100 feet
Mean annual precipitation: 17 to 22 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 185 to 220 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Bippus, occasionally flooded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bippus, Occasionally Flooded

Setting

Landform: Draws
Landform position (two-dimensional): Toeslope
Microfeatures of landform position: Ephemeral streams
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile

A - 0 to 14 inches: clay loam
Bw - 14 to 65 inches: sandy clay loam
Bk - 65 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: R077EY052TX - Draw 16-24" PZ
Hydric soil rating: No

Minor Components

Sprone, occasionally flooded
Percent of map unit: 8 percent
Landform: Draws
Microfeatures of landform position: Ephemeral streams
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R077EY052TX - Draw 16-24" PZ
Hydric soil rating: No

Baileyboro, rarely flooded
Percent of map unit: 7 percent
Landform: Draws
Microfeatures of landform position: Ephemeral streams
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Ecological site: R077EY052TX - Draw 16-24" PZ
Hydric soil rating: No

Levelland, occasionally flooded
Percent of map unit: 5 percent
Landform: Draws
Microfeatures of landform position: Ephemeral streams
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R077CY023TX - Draw 16-21" PZ
Hydric soil rating: No

BP—Pits, caliche and gravel

Map Unit Setting
National map unit symbol: f5tn
Elevation: 2,400 to 5,000 feet
Mean annual precipitation: 15 to 22 inches
Mean annual air temperature: 52 to 63 degrees F
Frost-free period: 165 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition
Pits, caliche and gravel: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Caliche And Gravel

Setting
Landform: Plains
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Calcareous gravelly eolian deposits

Typical profile

^C - 0 to 80 inches: extremely gravelly loam

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: B
Hydric soil rating: No

BpD—Berda-Potter complex, 3 to 12 percent slopes

Map Unit Setting

National map unit symbol: db49
Elevation: 2,200 to 5,300 feet
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 185 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Berda and similar soils: 55 percent
Potter and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berda

Setting

Landform: Draws, escarpments, valley sides
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, convex
Across-slope shape: Linear
Parent material: Calcareous, loamy colluvium and slope alluvium derived from the ogallala formation of miocene-pliocene age.

Typical profile

A - 0 to 7 inches: loam
Bw - 7 to 22 inches: loam
Bk1 - 22 to 52 inches: clay loam
Bk2 - 52 to 80 inches: sandy clay loam

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to slightly saline (1.0 to 5.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R077EY055TX - Hardland Slopes 16-24" PZ
Hydric soil rating: No

Description of Potter

Setting

Landform: Draws, escarpments, valley sides
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous, loamy alluvium derived from the ogallala formation of miocene-pliocene age.

Typical profile

A - 0 to 6 inches: gravelly loam
Bkk - 6 to 15 inches: very gravelly sandy loam
BCkk1 - 15 to 29 inches: very gravelly sandy loam
BCkk2 - 29 to 80 inches: extremely gravelly fine sandy loam

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R077EY068TX - Very Shallow 16-24" PZ
Hydric soil rating: No

Minor Components

Mobeetie

Percent of map unit: 8 percent
Landform: Valley sides, escarpments
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope

Down-slope shape: Convex
Across-slope shape: Linear, concave
Ecological site: R077EY061TX - Mixedland Slopes 16-24" PZ
Hydric soil rating: No

Veal

Percent of map unit: 7 percent
Landform: Valley sides, escarpments
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, concave
Ecological site: R077EY057TX - Limy Upland 16-24" PZ
Hydric soil rating: No

EcA—Estacado clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: db39
Elevation: 2,800 to 5,000 feet
Mean annual precipitation: 17 to 21 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 185 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Estacado and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Estacado

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy eolian deposits

Typical profile

Ap - 0 to 6 inches: clay loam
Bt1 - 6 to 19 inches: clay loam
Bt2 - 19 to 38 inches: clay loam
Btk - 38 to 50 inches: clay loam
Btkk - 50 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Hydric soil rating: No

Minor Components

Bovina

Percent of map unit: 7 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077CY028TX - Limy Upland 16-21" PZ
Hydric soil rating: No

Olton

Percent of map unit: 5 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Hydric soil rating: No

Pep

Percent of map unit: 3 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077CY028TX - Limy Upland 16-21" PZ
Hydric soil rating: No

KmB—Kimberson gravelly loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: f5sg
Elevation: 2,300 to 5,300 feet

Mean annual precipitation: 16 to 21 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 185 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Kimberson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimberson

Setting

Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous loamy eolian deposits

Typical profile

A1 - 0 to 5 inches: gravelly loam
A2 - 5 to 11 inches: gravelly loam
Bkkm - 11 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 4 to 18 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 90 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R077CY037TX - Very Shallow 16-21" PZ
Hydric soil rating: No

Minor Components

Stohman

Percent of map unit: 6 percent
Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R077CY037TX - Very Shallow 16-21" PZ
Hydric soil rating: No

Friona

Percent of map unit: 5 percent

Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R077CY036TX - Sandy Loam 16-21" PZ
Hydric soil rating: No

Potter

Percent of map unit: 4 percent
Landform: Draws
Landform position (two-dimensional): Shoulder
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R077EY068TX - Very Shallow 16-24" PZ
Hydric soil rating: No

MoC—Mobeetie fine sandy loam, 3 to 5 percent slopes, cool

Map Unit Setting

National map unit symbol: 2tqtp
Elevation: 2,200 to 4,700 feet
Mean annual precipitation: 15 to 26 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Mobeetie and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mobeetie

Setting

Landform: Valley sides, hillslopes, valley flats
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Calcareous, sandy colluvium and/or slope alluvium

Typical profile

A - 0 to 10 inches: fine sandy loam
Bk - 10 to 42 inches: fine sandy loam
BCk - 42 to 80 inches: fine sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R077EY061TX - Mixedland Slopes 16-24" PZ
Hydric soil rating: No

Minor Components

Berda

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R077EY055TX - Hardland Slopes 16-24" PZ
Hydric soil rating: No

Likes

Percent of map unit: 4 percent
Landform: Alluvial fans, hillslopes
Landform position (two-dimensional): Backslope, summit, shoulder, footslope, toeslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R077EY064TX - Sandy 16-24" PZ
Hydric soil rating: No

Veal

Percent of map unit: 4 percent
Landform: Knolls, scarps, valley sides
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex, concave
Ecological site: R077EY057TX - Limy Upland 16-24" PZ
Hydric soil rating: No

Guadalupe

Percent of map unit: 2 percent
Landform: Draws, flood plains, terraces
Landform position (two-dimensional): Backslope, toeslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Linear
Ecological site: R077EY065TX - Sandy Bottomland 16-24" PZ

Hydric soil rating: No

PcB—Pep clay loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: db3c
Elevation: 2,700 to 5,300 feet
Mean annual precipitation: 16 to 21 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 185 to 220 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pep and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pep

Setting

Landform: Playa slopes, plains
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Calcareous, loamy eolian deposits from the blackwater draw formation of pleistocene age

Typical profile

Ap - 0 to 9 inches: clay loam
Bw - 9 to 15 inches: clay loam
Bk - 15 to 30 inches: clay loam
Bkk - 30 to 80 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R077CY028TX - Limy Upland 16-21" PZ

Hydric soil rating: No

Minor Components

Portales

Percent of map unit: 6 percent
Landform: Playa slopes, interdunes, plains
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R077CY028TX - Limy Upland 16-21" PZ
Hydric soil rating: No

Estacado

Percent of map unit: 5 percent
Landform: Playa slopes, plains
Down-slope shape: Concave, convex
Across-slope shape: Linear
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Other vegetative classification: Unnamed (G077CH000TX)
Hydric soil rating: No

Zita

Percent of map unit: 4 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Hydric soil rating: No

PGE—Potter soils, 3 to 20 percent slopes

Map Unit Setting

National map unit symbol: f7g2
Elevation: 2,300 to 5,300 feet
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 185 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Potter and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Potter

Setting

Landform: Draws, valley sides
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous, loamy alluvium from the ogallala formation of miocene-pliocene age

Typical profile

A - 0 to 6 inches: gravelly loam
Bkk - 6 to 15 inches: very gravelly sandy loam
BCkk1 - 15 to 29 inches: very gravelly sandy loam
BCkk2 - 29 to 80 inches: extremely gravelly fine sandy loam

Properties and qualities

Slope: 3 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: R077EY068TX - Very Shallow 16-24" PZ
Hydric soil rating: No

Minor Components

Veal

Percent of map unit: 8 percent
Landform: Valley sides, escarpments
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, concave
Ecological site: R077EY057TX - Limy Upland 16-24" PZ
Hydric soil rating: No

Kimberson

Percent of map unit: 7 percent
Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R077CY037TX - Very Shallow 16-21" PZ
Hydric soil rating: No

PuA—Pullman clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: f5ry
Elevation: 2,800 to 5,000 feet
Mean annual precipitation: 17 to 21 inches
Mean annual air temperature: 55 to 63 degrees F
Frost-free period: 180 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pullman and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pullman

Setting

Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey eolian deposits

Typical profile

Ap - 0 to 5 inches: clay loam
Bt - 5 to 33 inches: silty clay loam
Btk1 - 33 to 52 inches: clay loam
Btk2 - 52 to 80 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ

Hydric soil rating: No

Minor Components

Pantex

Percent of map unit: 4 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Hydric soil rating: No

Olton

Percent of map unit: 4 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Hydric soil rating: No

Estacado

Percent of map unit: 2 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077CY022TX - Deep Hardland 16-21" PZ
Hydric soil rating: No

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: “National Soil Survey Handbook.”

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology)

from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left

behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can

occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and

promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5
Extremely acid: 3.5 to 4.4
Very strongly acid: 4.5 to 5.0
Strongly acid: 5.1 to 5.5
Moderately acid: 5.6 to 6.0
Slightly acid: 6.1 to 6.5
Neutral: 6.6 to 7.3
Slightly alkaline: 7.4 to 7.8
Moderately alkaline: 7.9 to 8.4
Strongly alkaline: 8.5 to 9.0
Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1
Moderate: 13-30:1
Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0
Coarse sand: 1.0 to 0.5
Medium sand: 0.5 to 0.25
Fine sand: 0.25 to 0.10
Very fine sand: 0.10 to 0.05
Silt: 0.05 to 0.002
Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated

Prismatic: Vertically elongated and having flat tops

Columnar: Vertically elongated and having rounded tops

Angular blocky: Having faces that intersect at sharp angles (planes)

Subangular blocky: Having subrounded and planar faces (no sharp angles)

Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand

Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field

generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

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15:11

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SAMPLE CROSS REFERENCE

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Sample	Sample ID	Taken	Time	Received
2339520	*0-6*	10/01/2024	15:00:00	10/02/2024

Bottle 01 Glass Qt w/Teflon lined lid
Bottle 02 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1140961) Volume: 20.00000 mL <== Derived from 01 (1.1 grams)
Bottle 03 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1140961) Volume: 20.00000 mL <== Derived from 01 (1.0 grams)
Bottle 04 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1140961) Volume: 20.00000 mL <== Derived from 01 (1.0 grams)
Bottle 05 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1141208) Volume: 20.00000 mL <== Derived from 01 (1.0 grams)
Bottle 06 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1141208) Volume: 20.00000 mL <== Derived from 01 (1.0 grams)
Bottle 07 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1141208) Volume: 20.00000 mL <== Derived from 01 (1.0 grams)
Bottle 08 Prepared Bottle: ICP Preparation for Metals (Batch 1142129) Volume: 50.00000 mL <== Derived from 01 (1.2 grams)
Bottle 09 Prepared Bottle: ANE extraction (Batch 1142465) Volume: 32.00000 mL <== Derived from 01 (2.2 grams)
Bottle 10 Prepared Bottle: ANE extraction (Batch 1142465) Volume: 32.00000 mL <== Derived from 01 (2.2 grams)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 6010B	09	1142465	10/11/2024	1142639	10/14/2024
EPA 6010C	08	1142129	10/10/2024	1142191	10/10/2024
EPA 9050	01	1141635	10/07/2024	1141635	10/07/2024
EPA 351.2 2	05	1141208	10/04/2024	1141330	10/04/2024
SM2540 G-2020 /MOD	01	1140963	10/02/2024	1140963	10/02/2024
EPA 9045D	01	1141705	10/07/2024	1141705	10/07/2024

Sample	Sample ID	Taken	Time	Received
2339521	*6-18*	10/01/2024	15:00:00	10/02/2024

Bottle 01 Glass Qt w/Teflon lined lid
Bottle 02 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1140961) Volume: 20.00000 mL <== Derived from 01 (1.1 grams)
Bottle 03 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1141208) Volume: 20.00000 mL <== Derived from 01 (1.0 grams)
Bottle 04 Prepared Bottle: ICP Preparation for Metals (Batch 1142129) Volume: 50.00000 mL <== Derived from 01 (1.4 grams)
Bottle 05 Prepared Bottle: ANE extraction (Batch 1142465) Volume: 32.00000 mL <== Derived from 01 (2.1 grams)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 6010B	05	1142465	10/11/2024	1142639	10/14/2024
EPA 6010C	04	1142129	10/10/2024	1142191	10/10/2024
EPA 9050	01	1141635	10/07/2024	1141635	10/07/2024
EPA 351.2 2	03	1141208	10/04/2024	1142051	10/10/2024
SM2540 G-2020 /MOD	01	1140963	10/02/2024	1140963	10/02/2024
EPA 9045D	01	1141705	10/07/2024	1141705	10/07/2024

Sample	Sample ID	Taken	Time	Received

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Sample	Sample ID	Taken	Time	Received
2339522	*18-30*	10/01/2024	15:00:00	10/02/2024

Bottle 01 Glass Qt w/Teflon lined lid
Bottle 02 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1140961) Volume: 20.00000 mL <== Derived from 01 (1.1 grams)
Bottle 03 Prepared Bottle: TKN TRAACS Autosampler Vial (Batch 1141208) Volume: 20.00000 mL <== Derived from 01 (1.1 grams)
Bottle 04 Prepared Bottle: ICP Preparation for Metals (Batch 1142129) Volume: 50.00000 mL <== Derived from 01 (1.1 grams)
Bottle 05 Prepared Bottle: ANE extraction (Batch 1142465) Volume: 32.00000 mL <== Derived from 01 (2.1 grams)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
EPA 6010B	05	1142465	10/11/2024	1142639	10/14/2024
EPA 6010C	04	1142129	10/10/2024	1142191	10/10/2024
EPA 9050	01	1141635	10/07/2024	1141635	10/07/2024
EPA 351.2 2	03	1141208	10/04/2024	1142051	10/10/2024
SM2540 G-2020 /MOD	01	1140963	10/02/2024	1140963	10/02/2024
EPA 9045D	01	1141705	10/07/2024	1141705	10/07/2024

Sample	Sample ID	Taken	Time	Received
2339523	*#1 BOD*	10/01/2024	15:15:00	10/02/2024

Bottle 01 Bottle, QEC, 16oz Plastic U016 (100 ea)
Bottle 02 BOD Titration Beaker A (Batch 1140966) Volume: 100.00000 mL <== Derived from 01 (100 ml)
Bottle 03 BOD Analytical Beaker B (Batch 1140966) Volume: 100.00000 mL <== Derived from 01 (100 ml)

Method	Bottle	PrepSet	Preparation	QcGroup	Analytical
SM 5210 B-2016	01	1140966	10/08/2024	1140966	10/08/2024

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RESULTS

Sample Results

2339520 **0-6** Received: 10/02/2024

Solid & Chemical Materials | Collected by: Client | City of Hereford | PO:
Taken: 10/01/2024 15:00:00

EPA 351.2 2 Prepared: 1141208 10/04/2024 05:45:00 Analyzed 1141330 10/04/2024 09:59:00 AMB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Total Kjeldahl Nitrogen**	**1130 ***	**mg/kg**	21.8	P	**7727-37-9**	05

* Dry Weight Basis

EPA 6010B Prepared: 1142465 10/11/2024 15:30:00 Analyzed 1142639 10/14/2024 10:33:00 CAS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Potassium Available EDTA extract**	**1020 ***	**mg/kg**	41.6		**7440-09-7**	09

* Dry Weight Basis

EPA 6010C Prepared: 1142129 10/10/2024 10:00:00 Analyzed 1142191 10/10/2024 13:56:00 CAS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Phosphorus**	**385 ***	**mg/kg**	24.1		**7723-14-0**	08

* Dry Weight Basis

EPA 9045D Prepared: 1141705 10/07/2024 11:00:00 Analyzed 1141705 10/07/2024 11:00:00 DRI

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Soil pH Measured in Water**	**8.2@24**	**SU**	2.00			01

EPA 9050 Prepared: 1141635 10/07/2024 13:15:00 Analyzed 1141635 10/07/2024 13:15:00 AMS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Lab Electrical Conductance at 25**	**1320**	**umhos/cm**				01

SM2540 G-2020 /MOD Prepared: 1140963 10/02/2024 16:12:00 Analyzed 1140963 10/02/2024 16:12:00 BEK

Parameter	Results	Units	RL	Flags	CAS	Bottle

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2339520 0-6

Received: 10/02/2024

Solid & Chemical Materials | Collected by: Client | City of Hereford | PO:
Taken: 10/01/2024 15:00:00

SM2540 G-2020 /MOD — Prepared: 1140963 10/02/2024 16:12:00 — Analyzed 1140963 10/02/2024 16:12:00 BEK

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Total Solids for Dry Wt Conversi**	**87.6**	**%**	0.010			01

2339521 6-18

Received: 10/02/2024

Solid & Chemical Materials | Collected by: Client | City of Hereford | PO:
Taken: 10/01/2024 15:00:00

EPA 351.2 2 — Prepared: 1141208 10/04/2024 05:45:00 — Analyzed 1142051 10/10/2024 05:56:00 AMB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Total Kjeldahl Nitrogen**	**670 ***	**mg/kg**	22.1		**7727-37-9**	03

* Dry Weight Basis

EPA 6010B — Prepared: 1142465 10/11/2024 15:30:00 — Analyzed 1142639 10/14/2024 10:49:00 CAS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Potassium Available EDTA extract**	**1010 ***	**mg/kg**	43.6		**7440-09-7**	05

* Dry Weight Basis

EPA 6010C — Prepared: 1142129 10/10/2024 10:00:00 — Analyzed 1142191 10/10/2024 14:00:00 CAS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Phosphorus**	**359 ***	**mg/kg**	20.2		**7723-14-0**	04

* Dry Weight Basis

EPA 9045D — Prepared: 1141705 10/07/2024 11:00:00 — Analyzed 1141705 10/07/2024 11:00:00 DRI

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	**Soil pH Measured in Water**	**8.1@24**	**SU**	2.00			01

EPA 9050 — Prepared: 1141635 10/07/2024 13:15:00 — Analyzed 1141635 10/07/2024 13:15:00 AMS

Parameter	Results	Units	RL	Flags	CAS	Bottle

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Solid & Chemical Materials — Collected by: Client — City of Hereford — PO:
Taken: 10/01/2024 15:00:00

EPA 9050 — Prepared: 1141635 10/07/2024 13:15:00 — Analyzed 1141635 10/07/2024 13:15:00 AMS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Lab Electrical Conductance at 25	2100	umhos/cm				01

SM2540 G-2020 /MOD — Prepared: 1140963 10/02/2024 16:12:00 — Analyzed 1140963 10/02/2024 16:12:00 BEK

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Total Solids for Dry Wt Conversi	88.3	%	0.010			01

2339522 18-30 — Received: 10/02/2024

Solid & Chemical Materials — Collected by: Client — City of Hereford — PO:
Taken: 10/01/2024 15:00:00

EPA 351.2 2 — Prepared: 1141208 10/04/2024 05:45:00 — Analyzed 1142051 10/10/2024 05:56:00 AMB

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Total Kjeldahl Nitrogen	651 *	mg/kg	20.8		7727-37-9	03
	* Dry Weight Basis						

EPA 6010B — Prepared: 1142465 10/11/2024 15:30:00 — Analyzed 1142639 10/14/2024 10:53:00 CAS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Potassium Available EDTA extract	1160 *	mg/kg	42.0		7440-09-7	05
	* Dry Weight Basis						

EPA 6010C — Prepared: 1142129 10/10/2024 10:00:00 — Analyzed 1142191 10/10/2024 14:03:00 CAS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Phosphorus	375 *	mg/kg	25.9		7723-14-0	04
	* Dry Weight Basis						

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2339522 18-30 — Received: 10/02/2024

Solid & Chemical Materials — Collected by: Client — City of Hereford — PO:
Taken: 10/01/2024 15:00:00

EPA 9045D — Prepared: 1141705 10/07/2024 11:00:00 — Analyzed 1141705 10/07/2024 11:00:00 DRI

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Soil pH Measured in Water	8.2@24	SU	2.00			01

EPA 9050 — Prepared: 1141635 10/07/2024 13:15:00 — Analyzed 1141635 10/07/2024 13:15:00 AMS

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Lab Electrical Conductance at 25	1870	umhos/cm				01

SM2540 G-2020 /MOD — Prepared: 1140963 10/02/2024 16:12:00 — Analyzed 1140963 10/02/2024 16:12:00 BEK

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Total Solids for Dry Wt Conversi	89.7	%	0.010			01

2339523 #1 BOD — Received: 10/02/2024

Non-Potable Water — Collected by: Client — City of Hereford — PO:
Taken: 10/01/2024 15:15:00

Prepared: 10/08/2024 17:50:08 — Calculated 10/08/2024 17:50:08 CAL

Parameter	Results	Units	RL	Flags	CAS	Bottle
Sampling/Transport	Verified					

SM 5210 B-2016 — Prepared: 1140966 10/03/2024 — Analyzed 1140966 10/08/2024 13:43:32 ESN

	Parameter	Results	Units	RL	Flags	CAS	Bottle
NELAC	Biochemical Oxygen Demand (BOD5)	104	mg/L	15.0		1026-3	01

Sample Preparation

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Printed: 06/03/2025

2339520 0-6 Received: 10/02/2024

10/01/2024

		Prepared:		10/08/2024	17:50:08	Calculated	10/08/2024	17:50:08	CAL
z	Enviro Fee (per Sampling Group)	Verified							
z	Paper Reporting Fee	Verified							
Calculation		Prepared:		10/14/2024	14:55:39	Calculated	10/14/2024	14:55:39	CAL
	As Received to Dry Weight Basis	Calculated							
EPA 200.2 2.8		Prepared:	1142129	10/10/2024	10:00:00	Analyzed	1142129	10/10/2024	10:00:00 HLT
NELAC	Solid Metals Digestion	50/1.1829	grams						01
EPA 351.2 2		Prepared:	1141208	10/04/2024	05:45:00	Analyzed	1141208	10/04/2024	05:45:00 AMB
NELAC	TKN Block Digestion	20/1.0498	grams						01
SM 2540 G-1997		Prepared:	1140909	10/02/2024	16:12:00	Analyzed	1140909	10/02/2024	16:12:00 BEK
NELAC	Total Solids Start Code	Started							
TX A&M, Soil Test,IV		Prepared:	1142465	10/11/2024	15:30:00	Analyzed	1142465	10/11/2024	15:30:00 TES
z	Available Nutrient, EDTA Extract	32/2.20	grams						01

2339521 6-18 Received: 10/02/2024

10/01/2024

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2339521 6-18 Received: 10/02/2024

10/01/2024

Calculation		*Prepared:*		*10/14/2024*	*14:55:39*	*Calculated*		*10/14/2024*	*14:55:39*	*CAL*
	As Received to Dry Weight Basis	**Calculated**								
EPA 200.2 2.8		*Prepared:*	*1142129*	*10/10/2024*	*10:00:00*	*Analyzed*	*1142129*	*10/10/2024*	*10:00:00*	*HLT*
NELAC	**Solid Metals Digestion**	**50/1.4027**	**grams**							01
EPA 351.2 2		*Prepared:*	*1141208*	*10/04/2024*	*05:45:00*	*Analyzed*	*1141208*	*10/04/2024*	*05:45:00*	*AMB*
NELAC	**TKN Block Digestion**	**20/1.0231**	**grams**							01
SM 2540 G-1997		*Prepared:*	*1140909*	*10/02/2024*	*16:12:00*	*Analyzed*	*1140909*	*10/02/2024*	*16:12:00*	*BEK*
NELAC	**Total Solids Start Code**	**Started**								
TX A&M, Soil Test,IV		*Prepared:*	*1142465*	*10/11/2024*	*15:30:00*	*Analyzed*	*1142465*	*10/11/2024*	*15:30:00*	*TES*
z	**Available Nutrient, EDTA Extract**	**32/2.08**	**grams**							01

2339522 18-30 Received: 10/02/2024

10/01/2024

Calculation		*Prepared:*		*10/14/2024*	*14:55:39*	*Calculated*		*10/14/2024*	*14:55:39*	*CAL*
	As Received to Dry Weight Basis	**Calculated**								

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Printed: 06/03/2025

2339522 18-30 Received: 10/02/2024

10/01/2024

EPA 200.2 2.8	*Prepared:*	*1142129*	*10/10/2024*	*10:00:00*	*Analyzed*	*1142129*	*10/10/2024*	*10:00:00*	*HLT*	
NELAC	**Solid Metals Digestion**	**50/1.0767**	**grams**							01
EPA 351.2 2	*Prepared:*	*1141208*	*10/04/2024*	*05:45:00*	*Analyzed*	*1141208*	*10/04/2024*	*05:45:00*	*AMB*	
NELAC	**TKN Block Digestion**	**20/1.0690**	**grams**							01
SM 2540 G-1997	*Prepared:*	*1140909*	*10/02/2024*	*16:12:00*	*Analyzed*	*1140909*	*10/02/2024*	*16:12:00*	*BEK*	
NELAC	**Total Solids Start Code**	**Started**								
TX A&M, Soil Test,IV	*Prepared:*	*1142465*	*10/11/2024*	*15:30:00*	*Analyzed*	*1142465*	*10/11/2024*	*15:30:00*	*TES*	
z	**Available Nutrient, EDTA Extract**	**32/2.12**	**grams**							01

2339523 #1 BOD Received: 10/02/2024

10/01/2024

SM 5210 B-2016	*Prepared:*	*1140966*	*10/03/2024*		*Analyzed*	*1140966*	*10/03/2024*	*06:50:55*	*ESN*	
NELAC	**BOD Set Started**	**Started**								

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Qualifiers:

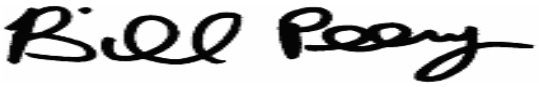
P - Spike recovery outside control limits due to matrix effects.

We report results on an As Received (or Wet) basis unless marked Dry Weight.

Unless otherwise noted, testing was performed at SPL, Inc.- Kilgore laboratory which holds International, Federal, and state accreditations. Please see our Websites for details.

(N)ELAC - Covered in our NELAC scope of accreditation
z -- Not covered by our NELAC scope of accreditation

These analytical results relate to the sample tested. This report may NOT be reproduced EXCEPT in FULL without written approval of SPL Kilgore. Unless otherwise specified, these test results meet the requirements of NELAC.
RL is the Reporting Limit (sample specific quantitation limit) and is at or above the Method Detection Limit (MDL). CAS is Chemical Abstract Service number. RL is our Reporting Limit, or Minimum Quantitation Level. The RL takes into account the Instrument Detection Limit (IDL), Method Detection Limit (MDL), and Practical Quantitation Limit (PQL), and any dilutions and/or concentrations performed during sample preparation (EQL). Our analytical result must be above this RL before we report a value in the 'Results' column of our report (without a 'J' flag). Otherwise, we report ND (Not Detected above RL), because the result is "<" (less than) the number in the RL column. MAL is Minimum Analytical Level and is typically from regulatory agencies. Unless we report a result in the result column, or interferences prevent it, we work to have our RL at or below the MAL.



Bill Peery, MS, VP Technical Services

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Analytical Set 1140966 — SM 5210 B-2016

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Biochemical Oxygen Demand (BOD5)	1140966	0.2	0.200	0.500	mg/L	126842349
Biochemical Oxygen Demand (BOD5)	1140966	0.2	0.200	0.500	mg/L	126842409
Biochemical Oxygen Demand (BOD5)	1140966	0.2	0.200	0.500	mg/L	126842471
Biochemical Oxygen Demand (BOD5)	1140966	0.2	0.200	0.500	mg/L	126844528

Duplicate

Parameter	Sample	Result	Unknown	Unit	RPD	Limit%
Biochemical Oxygen Demand (BOD5)	2339398	2400	2360	mg/L	1.68	30.0
Biochemical Oxygen Demand (BOD5)	2339403	12.7	13.3	mg/L	4.62	30.0
Biochemical Oxygen Demand (BOD5)	2339471	47.7	39.9	mg/L	17.8	30.0
Biochemical Oxygen Demand (BOD5)	2339580	15.5	14.8	mg/L	4.62	30.0
Biochemical Oxygen Demand (BOD5)	2339620	6.01	5.53	mg/L	8.32	30.0
Biochemical Oxygen Demand (BOD5)	2339668	4.21	4.89	mg/L	14.9	30.0
Biochemical Oxygen Demand (BOD5)	2339809	147	130	mg/L	12.3	30.0

Seed Drop

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Biochemical Oxygen Demand (BOD5)	1140966	0.900	0.200	0.500	mg/L	126842351
Biochemical Oxygen Demand (BOD5)	1140966	0.850	0.200	0.500	mg/L	126842411
Biochemical Oxygen Demand (BOD5)	1140966	0.907	0.200	0.500	mg/L	126842473
Biochemical Oxygen Demand (BOD5)	1140966	0.913	0.200	0.500	mg/L	126844756

Standard

Parameter	Sample	Reading	Known	Units	Recover%	Limits%	File
Biochemical Oxygen Demand (BOD5)		226	198	mg/L	114	83.7 - 116	126842352
Biochemical Oxygen Demand (BOD5)		229	198	mg/L	116	83.7 - 116	126842412
Biochemical Oxygen Demand (BOD5)		216	198	mg/L	109	83.7 - 116	126842474
Biochemical Oxygen Demand (BOD5)		222	198	mg/L	112	83.7 - 116	126844757

Analytical Set 1141330 — EPA 351.2 2

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Total Kjeldahl Nitrogen	1141208	ND	0.378	1.00	mg/kg	126852251

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Total Kjeldahl Nitrogen	5.32	5.00	mg/kg	106	90.0 - 110	126852237
Total Kjeldahl Nitrogen	5.34	5.00	mg/kg	107	90.0 - 110	126852245
Total Kjeldahl Nitrogen	5.36	5.00	mg/kg	107	90.0 - 110	126852246
Total Kjeldahl Nitrogen	5.40	5.00	mg/kg	108	90.0 - 110	126852247
Total Kjeldahl Nitrogen	5.36	5.00	mg/kg	107	90.0 - 110	126852248
Total Kjeldahl Nitrogen	5.38	5.00	mg/kg	108	90.0 - 110	126852249
Total Kjeldahl Nitrogen	5.36	5.00	mg/kg	107	90.0 - 110	126852250
Total Kjeldahl Nitrogen	5.40	5.00	mg/kg	108	90.0 - 110	126852254

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CCV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Total Kjeldahl Nitrogen	5.44	5.00	mg/kg	109	90.0 - 110	126852255

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Total Kjeldahl Nitrogen	2339520	995	990	mg/kg	0.504	20.0

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Total Kjeldahl Nitrogen	5.23	5.00	mg/kg	105	90.0 - 110	126852236

LCS Dup

Parameter	*PrepSet*	*LCS*	*LCSD*	*Known*	*Limits%*	*LCS%*	*LCSD%*	*Units*	*RPD*	*Limit%*
Total Kjeldahl Nitrogen	1141208	107	109	100	90.0 - 110	107	109	mg/kg	1.85	20.0

Mat. Spike

Parameter	*Sample*	*Spike*	*Unknown*	*Known*	*Units*	*Recovery %*	*Limits %*	*File*	
Total Kjeldahl Nitrogen	2339520	1150	990	2000	mg/kg	8.00	80.0 - 120	126852258	*

Analytical Set 1142051 — EPA 351.2 2

Blank

Parameter	*PrepSet*	*Reading*	*MDL*	*MQL*	*Units*	*File*
Total Kjeldahl Nitrogen	1141208	ND	0.378	1.00	mg/kg	126866702

CCV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Total Kjeldahl Nitrogen	5.40	5.00	mg/kg	108	90.0 - 110	126866701
Total Kjeldahl Nitrogen	5.44	5.00	mg/kg	109	90.0 - 110	126866703
Total Kjeldahl Nitrogen	5.41	5.00	mg/kg	108	90.0 - 110	126866711
Total Kjeldahl Nitrogen	5.49	5.00	mg/kg	110	90.0 - 110	126866712
Total Kjeldahl Nitrogen	5.48	5.00	mg/kg	110	90.0 - 110	126866713

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Total Kjeldahl Nitrogen	2339520	1220	1050	mg/kg	15.0	20.0

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Total Kjeldahl Nitrogen	5.24	5.00	mg/kg	105	90.0 - 110	126866700

LCS Dup

Parameter	*PrepSet*	*LCS*	*LCSD*	*Known*	*Limits%*	*LCS%*	*LCSD%*	*Units*	*RPD*	*Limit%*
Total Kjeldahl Nitrogen	1141208	109	108	100	90.0 - 110	109	108	mg/kg	0.922	20.0

Mat. Spike

Parameter	*Sample*	*Spike*	*Unknown*	*Known*	*Units*	*Recovery %*	*Limits %*	*File*	
Total Kjeldahl Nitrogen	2339520	3620	1050	2000	mg/kg	128	80.0 - 120	126866708	*

Analytical Set 1140963 — SM2540 G-2020 /MOD

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ControlBlk

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Total Solids for Dry Wt Conversi	1140963	0.0001			grams	126842326

Duplicate

Parameter	Sample	Result	Unknown	Unit	RPD	Limit%
Total Solids for Dry Wt Conversi	2339106	6.96	7.19	%	3.25	20.0
Total Solids for Dry Wt Conversi	2339522	89.4	89.7	%	0.335	20.0

Analytical Set 1142191 — EPA 6010C

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Phosphorus	1142129	ND	0.00734	0.100	mg/kg	126869082

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phosphorus	0.940	1.00	mg/kg	94.0	90.0 - 110	126869081
Phosphorus	0.911	1.00	mg/kg	91.1	90.0 - 110	126869090
Phosphorus	0.931	1.00	mg/kg	93.1	90.0 - 110	126869092

ICL

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phosphorus	25.0	25.0	mg/kg	100	95.0 - 105	126869079

ICV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Phosphorus	1.02	1.00	mg/kg	102	90.0 - 110	126869080

LCS Dup

Parameter	PrepSet	LCS	LCSD	Known	Limits%	LCS%	LCSD%	Units	RPD	Limit%
Phosphorus	1142129	20.0	19.6	20.0	80.0 - 120	100	98.0	mg/kg	2.02	25.0

MSD

Parameter	Sample	MS	MSD	UNK	Known	Limits	MS%	MSD%	Units	RPD	Limit%
Phosphorus	2340724	901	861	16.3	926	23.3 - 179	90.6	86.5	mg/kg	4.63	25.0

Analytical Set 1142639 — EPA 6010C

Blank

Parameter	PrepSet	Reading	MDL	MQL	Units	File
Potassium Available EDTA extract	1142465	ND	0.111	0.500	mg/kg	126878931

CCV

Parameter	Reading	Known	Units	Recover%	Limits%	File
Potassium Available EDTA extract	24.6	25.0	mg/kg	98.4	90.0 - 110	126878919
Potassium Available EDTA extract	24.5	25.0	mg/kg	98.0	90.0 - 110	126878927
Potassium Available EDTA extract	24.3	25.0	mg/kg	97.2	90.0 - 110	126878934
Potassium Available EDTA extract	25.0	25.0	mg/kg	100	90.0 - 110	126878943

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Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Potassium Available EDTA extract	2339520	861	891	mg/kg	3.42	20.0

ICL

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Potassium Available EDTA extract	49.4	50.0	mg/kg	98.8	95.0 - 105	126878913

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Potassium Available EDTA extract	24.4	25.0	mg/kg	97.6	90.0 - 110	126878917

Analytical Set 1141635 — EPA 9050

Blank

Parameter	*PrepSet*	*Reading*	*MDL*	*MQL*	*Units*	*File*
Lab Electrical Conductance at 25	1141635	0.415			umhos/cm	126858795

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Lab Electrical Conductance at 25	2339520	1320	1320	umhos/cm	0	20.0

ICV

Parameter	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Lab Electrical Conductance at 25	13000	12900	umhos/cm	101	90.0 - 110	126858798

Standard

Parameter	*Sample*	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Lab Electrical Conductance at 25	1141635	1420	1410	umhos/cm	101	90.0 - 110	126858796
Lab Electrical Conductance at 25	1141635	102	100	umhos/cm	102	90.0 - 110	126858797
Lab Electrical Conductance at 25	1141635	1420	1410	umhos/cm	101	90.0 - 110	126858803

Analytical Set 1141705 — EPA 9045D

Duplicate

Parameter	*Sample*	*Result*	*Unknown*	*Unit*	*RPD*	*Limit%*
Soil pH Measured in Water	2339520	8.30	8.20	SU	1.21	20.0

Standard

Parameter	*Sample*	*Reading*	*Known*	*Units*	*Recover%*	*Limits%*	*File*
Soil pH Measured in Water	1141705	6.00	6.00	SU	100	90.0 - 110	126860166
Soil pH Measured in Water	1141705	8.00	8.00	SU	100	90.0 - 110	126860167

* Out RPD is Relative Percent Difference: abs(r1-r2) / mean(r1,r2) * 100% Recover% is Recovery Percent: result / known * 100%

Blank - Method Blank (reagent water or other blank matrices that contains all reagents except standard(s) and is processed simultaneously with and under the same conditions as samples; carried through preparation and analytical procedures exactly like a sample; monitors); CCV - Continuing Calibration Verification (same standard used to prepare the curve; typically a mid-range concentration; verifies the continued validity of the calibration curve); ICV - Initial Calibration Verification; LCS Dup - Laboratory Control Sample Duplicate (replicate LCS; analyzed when there is insufficient sample for duplicate or MSD; quantifies accuracy and precision.); MSD - Matrix Spike Duplicate (replicate of the matrix spike; same solution and amount of target analyte added to the MS is added to a third aliquot of sample; quantifies matrix bias and precision.)

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10/01/2024 Page 1 of 2

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SS2

SOIL

Phone 806/363-7101

PO Number _____

☐ *Hand Delivered by Client to Region or LAB*

Matrix: Solid & Chemical Materials

Sampler Printed Name Client

Sampler Affiliation HER3

Sampler Signature _____

☐ Samples Radioactive? ☐ Samples Contains Dioxin? ☐ Samples Biological Hazard?

SPL # (Lab Only)	Sample ID	Bottles	Date	Time	Notes
2339520	0-6	1	10-1-24	3:00	
2339521	6-18	1	10-1-24	3:00	
2339522	18-30	1	10-1-24	3:00	

1 Glass 4 oz w/Teflon lined lid

NELAC	301S	Solid Metals Digestion	EPA 200.2 2.8 (180 days)
NELAC	TKN	Total Kjeldahl Nitrogen	EPA 351.2 2 CAS:7727-37-9 (28.0 days)
NELAC	*Ke	Potassium Available EDTA extract	EPA 6010B CAS:7440-09-7 (28.0 days)
NELAC	*PI	Phosphorus	EPA 6010C CAS:7723-14-0 (180 days)
NELAC	pHLS	Soil pH Measured in Water	EPA 9045D (180 days)
NELAC	TS%	Total Solids for Dry Wt Conversi	SM2540 G-1997 /MOD
	*ANE	Available Nutrient, EDTA Extract	TX A&M, Soil Test,IV (28.0 days)

0 Z -- No bottle required

	ARDW	As Received to Dry Weight Basis	Calculation

1 4 oz Plastic or Glass

NELAC	CONS	Lab Electrical Conductance at 25	EPA 9050 (28.0 days)

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SOIL

Date Time	Relinquished		Received	
10-1-24 4:07	Printed Name [illegible]	Affiliation [illegible]	Printed Name Dink Craig	Affiliation SPL
16:07	Signature Client		Signature [signature]	
10-1-24	Printed Name Dink Craig	Affiliation SPL	Printed Name FedEx	Affiliation
1800	Signature [signature]		Signature	
10/2/24	Printed Name FedEx	Affiliation	Printed Name Ashley Vasquez - SPL, Inc.	Affiliation
1030	Signature		Signature [signature]	
	Printed Name	Affiliation	Printed Name	Affiliation
	Signature		Signature	

Sample Recieved on Ice? ☑ Yes ☐ No
Cooler/Sample Secure? ☑ Yes ☐ No If Shipped: Tracking Number & Temp - See Attached

The accredited column designates accreditation by A - A2LA, N - NELAC, or z - not listed under scope of accreditation. Unless otherwise specified, ANA-LAB shall provide these ordered services pursuant to our Standard Terms & Conditions Agreement (available for download from the welcome page at <http://www.ana-lab.com>). Ana-Lab personnel collect samples as specified by Ana-Lab SOP #000323.

Comments

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HER3-P
SE1

Lab Number
PO Number
Phone 806/363-7101

#1 BOD

☐ Hand Delivered by Client to Region or LAB

Matrix: Non-Potable Water

Sample Collection Start
Date: 10-1-2024 Time: 3:15 pm
Sampler Printed Name: Roy Garcia
Sampler Affiliation: City of Hereford
Sampler Signature: Roy Garcia

Samples Radioactive? ☐ Samples Contains Dioxin? ☐ Samples Biological Hazard? ☐

0 Z -- No bottle required

PuCh Sampling/Transport

1 Polyethylene 1/2 gal (White)

NELAC **Short Hold** **BOD** Biochemical Oxygen Demand (BOD5) SM 5210 B-2016 CAS:1026-3 (2.04 days)

Ambient Conditions/Comments

Date	Time	Relinquished		Received	
10-1-24	16:07	Printed Name: Roy Garcia	Affiliation: City of Hereford	Printed Name: Derek Cross	Affiliation: SPL
		Signature: Roy Garcia		Signature:	
10-1-24	1800	Printed Name: Derek Cross	Affiliation: SPL	Printed Name: FedEx	Affiliation:
		Signature:		Signature:	
10/2/24	1030	Printed Name:	Affiliation:	Printed Name: Ashley Vasquez - SPL, Inc.	Affiliation:
		Signature:		Signature:	
		Printed Name:	Affiliation:	Printed Name:	Affiliation:
		Signature:		Signature:	

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SE1

Sample Received on Ice? [X] Yes [ ] No
Cooler/Sample Secure? [X] Yes [ ] No If Shipped: Tracking Number & Temp - See Attached

The accredited column designates accreditation by A - A2LA, N - NELAC, or 2 - not listed under scope of accreditation. Unless otherwise specified, ANA-LAB shall provide these ordered services pursuant to our Standard Terms & Conditions Agreement (available for download from the welcome page at <http://www.ana-lab.com>). Ana-Lab personnel collect samples as specified by Ana-Lab SOP # 000323.

Comments

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DEREK CRAIG
SPL-INC/PAN
6501 STORAGE DR

AMARILLO, TX 79110
UNITED STATES US

SHIP DATE: 01OCT24
ACTWGT: 57.00 LB MAN
CAD: 0752751/CAFE3808

BILL SENDER

TO KILGORE SPL LOG-IN

2600 DUDLEY RD

KILGORE TX 75662
(903) 984-0551

INV:
PO: DEPT:

REF:

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FedEx Express

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2. Place label in shipping pouch and affix it to your shipment.

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Date Time Tech
Temp: 1.9 1.8 C
Therm#: 6443 Corr Fact: 0.1 C

Rainee Trevino

From: Paul Krueger <PKrueger@Parkhill.com>
Sent: Wednesday, July 23, 2025 10:10 AM
To: Rainee Trevino; mgr@hereford-texas.com
Cc: Jordan Duarte
Subject: RE: Application to Renew Permit No. WQ0010186002- Notice of Deficiency Letter
Attachments: 45585.25 - NOD Response Letter - City of Hereford.pdf

Categories: NOD Response Review

Good Morning,

Please find attached response to the NOD for Hereford's WWTP permit renewal. Feel free to reach out if you would like to discuss further.

Thank you,

Paul Krueger, PE
Civil Engineer

Parkhill
806.473.3715 | Parkhill.com

From: Rainee Trevino <Rainee.Trevino@tceq.texas.gov>
Sent: Wednesday, July 9, 2025 3:00 PM
To: mgr@hereford-texas.com
Cc: Paul Krueger <PKrueger@Parkhill.com>
Subject: Application to Renew Permit No. WQ0010186002- Notice of Deficiency Letter

Dear Mr. Polster,

The attached Notice of Deficiency letter sent on July 9, 2025, requests additional information needed to declare the application administratively complete. Please send the complete response to my attention by July 23, 2025.

Regards,

Rainee Trevino
Water Quality Division | ARP Team
Texas Commission on Environmental Quality
512-239-4324

Parkhill

July 23, 2025

Ms. Rainee Trevino
Applications Review and Processing Team (MC148)
Water Quality Division
Texas Commission of Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Re: City of Hereford
Application to Renew Permit No. WQ0010186002
CN600245427, RN101612570

Dear Ms. Trevino:

We have received the Notice of Deficiency letter on the referenced application in your e-mail dated July 9, 2025, and provide the following responses.

1. *Comment: Our records indicate an original paper copy of the application has not been received. The original paper copy and e-copy of the application are both required. Please submit the original paper copy of the application by:*

   Regular mailing address is:
   Texas Commission on Environmental Quality
   Water Quality Division
   Applications Review and Processing Team (MC148)
   P.O. Box 13087
   Austin, Texas 78711-3087

   Hand delivery address is:
   Texas Commission on Environmental Quality
   Applications Review and Processing Team
   Building F, Room 2101
   12100 Park 35 Circle
   Austin, Texas 78753

   Express mail address is:
   Executive Director
   Applications Review and Processing Team (MC148)
   Texas Commission on Environmental Quality
   12100 Park 35 Circle
   Austin, Texas 78753

   Response: The original paper copy of the application was signed on July 10, 2024, and mailed soon after.

4222 85th Street | Lubbock, Texas 79423 | 806.473.2200 Parkhill.com

2. *Comment:* ***Administrative Report 1.0, Section 1, Application Fees:*** *The fee of $2,015.00 cannot be verified. If payment has not been submitted, please submit a complete payment to: TCEQ, Financial Administration Division (MC214), P.O. Box 13088, Austin, Texas 78711-3088. The application cannot be declared administratively complete until the processing fee has been received and verified.*

   Response: The fee of $2,015.00 was sent with the original paper copy of the application. Please see attachment A for a copy of the complete payment.

3. *Comment:* ***Core Data Form, Section III, Item 25:*** *The distance from the intersection of U.S. Highway 60 and County Road 8 is not accurate. Only one description from a road intersection in feet or miles is required. Please submit the Core Data Form updated with the correct location description.*

   Response: Please see Attachment B for the updated Core Data Form with the correct location description.

4. *Comment:* ***Core Data Form, Section V****: An authorized signature is required. Please provide the signature of the individual listed*

   Response: Please see Attachment B for the updated Core Data Form with the authorized signature.

5. *Comment:* ***Administrative Report 1.0, Section 14, Signature Page:*** *A notarized signature page is required. Please submit the Signature Page completed and notarized.*

   Response: Please see Attachment C for the updated notarized signature page.

6. *Comment: The following is a portion of the NORI which contains information relevant to your application. Please read it carefully and indicate if it contains any errors or omissions. The complete notice will be sent to you once the application is declared administratively complete.*

   APPLICATION*. City of Hereford, P.O. Box 2277, Hereford, Texas 79045, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Land Application Permit (TLAP) No. WQ0010186002 to authorize the disposal of treated wastewater at a volume not to exceed a daily average flow of 2,500,000 gallons per day via surface irrigation of 583 acres of non-public access agricultural land. The domestic wastewater treatment facility and disposal area are located at "**pending applicant response**", near the city of Hereford, in Deaf Smith County, Texas 79045. TCEQ received this application on July 7, 2025. The permit application will be available for viewing and copying at Hereford City Hall, Front Entrance, 224 North Lee Avenue, Hereford, in Deaf Smith County, Texas prior to the date this notice is published in the newspaper. The application, including any updates, and associated notices are available electronically at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tlap-applications. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application.*
   https://gisweb.tceq.texas.gov/LocationMapper/?marker=-102.313333,34.822777&level=18

   Further information may also be obtained from City of Hereford at the address stated above or by calling Mr. Ryan Polster, CPM, City Manager, at 806-363-7100.

   Response: The updated location for the domestic wastewater treatment facility and disposal area is located approximately 2.5 miles southeast of the intersection US Highway 60 and Farm-to-Market Road 2943 in Deaf Smith County, TX, 79045. We believe the rest of the information above is correct and contains no errors or omissions.

Thank you for reviewing the submitted application. If you have any questions or would like to discuss further, please feel free to call me at 806.473.3715.

Sincerely,

PARKHILL

By _____
Paul Krueger, P.E.
Civil Engineer

PSK/jd/*pp*
Enclosures: Attachment A: Verification of Payment
Attachment B: Core Data Form
Attachment C: Updated Signature Page

cc: Mr. Ryan Polster, City Manager, City of Hereford

Attachment B

Updated Core Data Form

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided.)*

☐ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.)*

☒ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
CN 600245427		RN 101612570

SECTION II: Customer Information

4. General Customer Information	**5. Effective Date for Customer Information Updates** (mm/dd/yyyy)	

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)*	*If new Customer, enter previous Customer below:*
City of Hereford	

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited

Government: ☒ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees

☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?

☐ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address:	P.O. Box 2277						
	City	Hereford	**State**	TX	**ZIP**	79045	**ZIP + 4** 2277

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*
	~~[illegible]com~~ Mgr@herefordtexas.gov

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(806) 363-7102		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

City of Hereford Wastewater Treatment Plant

23. Street Address of the Regulated Entity:								
(No PO Boxes)								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County	Deaf Smith							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	Approximately 2.5 miles south east of the intersection US Highway 60 and Farm-to-Market Road 2943 in Deaf Smith County, TX, 79045.

26. Nearest City	State	Nearest ZIP Code
Hereford	TX	79045

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:			28. Longitude (W) In Decimal:		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
34	50	41.95	102	17	48.27

29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)	31. Primary NAICS Code (5 or 6 digits)	32. Secondary NAICS Code (5 or 6 digits)
4952		221320	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Wastewater treatment for Hereford.

34. Mailing Address:	**P.O. Box 2277**							
	City	**Hereford**	**State**	**TX**	**ZIP**	**79045**	**ZIP + 4**	**2277**

35. E-Mail Address:	mgr@hereford-texas.com

36. Telephone Number	37. Extension or Code	38. Fax Number *(if applicable)*
( ) -		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☒ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:
	WQ0010186002			

SECTION IV: Preparer Information

40. Name:	Paul Krueger, P.E.	**41. Title:**	Civil Engineer

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(806) 473-3715		( ) -	PKrueger@parkhill.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	City of Hereford	**Job Title:**	City Manager
Name *(In Print):*	Ryan Polster	**Phone:**	(806) 363- **7102**
Signature:	Ryan W Polster	**Date:**	7/23/2025

Attachment C

Notarized Signature Page

Section 14. Signature Page (Instructions Page 34)

If co-applicants are necessary, each entity must submit an original, separate signature page.

Permit Number: WQ0010186002

Applicant: City of Hereford

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code § 305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Cathy Bunch

Signatory title: Mayor

Signature: Cathy Bunch Date: 7/10/25

(Use blue ink)

Subscribed and Sworn to before me by the said Cathy Bunch

on this 10th day of July, 20 25.

My commission expires on the 29th day of August, 20 27.

Notary Public

PRISCILLA RAMIREZ
MY COMMISSION EXPIRES
08/29/2027
NOTARY ID: 132127848

[SEAL]

Deaf Smith County, Texas

Section 14. Laboratory Accreditation (Instructions Page 55)

All laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*, which includes the following general exemptions from National Environmental Laboratory Accreditation Program (NELAP) certification requirements:

- The laboratory is an in-house laboratory and is:
  - periodically inspected by the TCEQ; or
  - located in another state and is accredited or inspected by that state; or
  - performing work for another company with a unit located in the same site; or
  - performing pro bono work for a governmental agency or charitable organization.
- The laboratory is accredited under federal law.
- The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
- The laboratory supplies data for which the TCEQ does not offer accreditation.

The applicant should review 30 TAC Chapter 25 for specific requirements.

The following certification statement shall be signed and submitted with every application. See the Signature Page section in the Instructions, for a list of designated representatives who may sign the certification.

CERTIFICATION:

I certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.*

Printed Name: Cathy Bunch

Title: Mayor

Signature: Cathy Bunch

Date: 7/10/25

Rainee Trevino

From: Paul Krueger <PKrueger@Parkhill.com>
Sent: Monday, July 28, 2025 11:50 AM
To: Rainee Trevino; mgr@hereford-texas.com
Cc: Jordan Duarte
Subject: RE: Application to Renew Permit No. WQ0010186002- Notice of Deficiency Letter
Attachments: 20972_PLS_2024-11-08.pdf

Hi Rainee,

Is this what you are needing?

Paul Krueger, PE
Civil Engineer

Parkhill
806.473.3715 | Parkhill.com

From: Rainee Trevino <Rainee.Trevino@tceq.texas.gov>
Sent: Friday, July 25, 2025 9:48 AM
To: Paul Krueger <PKrueger@Parkhill.com>; mgr@hereford-texas.com
Cc: Jordan Duarte <jduarte@parkhill.com>
Subject: RE: Application to Renew Permit No. WQ0010186002- Notice of Deficiency Letter

Good morning,

Thank you for the response. I failed to include a comment regarding the Plain Language Summary and the physical location description in the original NOD letter. The location description also needs to be updated with the updated description in the Core Data Form. I apologize for the oversight.

Regards,
Rainee Trevino

From: Paul Krueger <PKrueger@Parkhill.com>
Sent: Wednesday, July 23, 2025 10:10 AM
To: Rainee Trevino <Rainee.Trevino@tceq.texas.gov>; mgr@hereford-texas.com
Cc: Jordan Duarte <jduarte@parkhill.com>
Subject: RE: Application to Renew Permit No. WQ0010186002- Notice of Deficiency Letter

Good Morning,

Please find attached response to the NOD for Hereford's WWTP permit renewal. Feel free to reach out if you would like to discuss further.

Thank you,

Paul Krueger, PE
Civil Engineer

Parkhill
806.473.3715 | Parkhill.com

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUMMARY OF APPLICATION IN PLAIN LANGUAGE FOR TPDES OR TLAP PERMIT APPLICATIONS

Summary of Application (in plain language) Template and Instructions for Texas Pollutant Discharge Elimination System (TPDES) and Texas Land Application (TLAP) Permit Applications

Applicants should use this template to develop a plain language summary of your facility and application as required by Title 30, Texas Administrative Code (30 TAC), Chapter 39, Subchapter H. You may modify the template as necessary to accurately describe your facility as long as the summary includes the following information: (1) the function of the proposed plant or facility; (2) the expected output of the proposed plant or facility; (3) the expected pollutants that may be emitted or discharged by the proposed plant or facility; and (4) how you will control those pollutants, so that the proposed plant will not have an adverse impact on human health or the environment.

Fill in the highlighted areas below to describe your facility and application in plain language. Instructions and examples are provided below. Make any other edits necessary to improve readability or grammar and to comply with the rule requirements. After filling in the information for your facility delete these instructions.

If you are subject to the alternative language notice requirements in 30 TAC Section 39.426, **you must provide a translated copy of the completed plain language summary in the appropriate alternative language as part of your application package**. For your convenience, a Spanish template has been provided below.

ENGLISH TEMPLATE FOR TPDES or TLAP NEW/RENEWAL/AMENDMENT APPLICATIONS DOMESTIC WASTEWATER/STORMWATER

The following summary is provided for this pending water quality permit application being reviewed by the Texas Commission on Environmental Quality as required by 30 TAC Chapter 39. The information provided in this summary may change during the technical review of the application and is not a federal enforceable representation of the permit application.

The City of Hereford (CN600245427) operates the City of Hereford Wastewater Treatment Plant (RN101612570), a pond system consisting of a bar screen, two aerated lagoons, and a storage pond. The facility is located at approximately 2.5 miles south east of the intersection US Highway 60 and Farm-to-Market Road 2943, in Hereford, Deaf Smith County, Texas 79045. This permit is a renewal to discharge 2.5 million gallons per day (MGD) of treated wastewater. Effluent will be used for irrigation of 583 acres. This permit will not authorize a discharge of pollutants into water in the state.

Discharges from the facility are expected to contain BOD_5. Treated domestic wastewater is treated by a bar screen and two aerated lagoons with a storage pond.

PLANTILLA EN ESPAÑOL PARA SOLICITUDES NUEVAS/RENOVACIONES/ENMIENDAS DE TPDES o TLAP

AGUAS RESIDUALES DOMESTICAS /AGUAS PLUVIALES

El siguiente resumen se proporciona para esta solicitud de permiso de calidad del agua pendiente que está siendo revisada por la Comisión de Calidad Ambiental de Texas según lo requerido por el Capítulo 39 del Código Administrativo de Texas 30. La información proporcionada en este resumen puede cambiar durante la revisión técnica de la solicitud y no es una representación ejecutiva fedérale de la solicitud de permiso.

La ciudad de Hereford ((CN600245427) opera la Planta de Tratamiento de Aguas Residuales de la Ciudad de Hereford (RN101612570), un Sistema de estanques que consta de una pantalla de barra, dos lagunas aireadas y un estanque de almacenamiento. La instalación está ubicada en aproximadamente 2.5 millas al sureste de la intersección US Highway 60 y Farm-to-Market Road 2943, en Hereford, Condado de Deaf Smith, Texas 79045. Este permiso es una renovación para descargar 2.5 millones de galones por día (MGD) de aguas residuales tratadas. El efluente se utilizará para el riego de 583 acres.Este permiso no autorizará una descarga de contaminantes en el agua en el estado.

Se espera que las descargas de la instalación contengan BOD_5. Aguas residuales domésticas tratadas. está tratado por una pantalla de bar y dos lagunas aireadas con un estanque de almacenamiento.