

Submit completed application to:  
 Kansas Department of Agriculture  
 Division of Water Resources  
 Field Office for your area.  
 Call for address:

Topeka -- (785) 296-5733  
 Stafford -- (620) 234-5311  
 Stockton -- (785) 425-6787  
 Garden City -- (620) 276-2901  
<http://agriculture.ks.gov/dwr>

## DWR FIELD OFFICE APPLICATION FOR APPROVAL TO CHANGE THE PLACE OF USE AND/OR THE POINT OF DIVERSION



**STATE OF KANSAS**

WATER METER REQUIRED

**Filing Fee Must Accompany the Application, K.S.A. 82a-708b(b), as amended.**  
 Fee Schedule is on the third page of this application form.

**Paragraph Nos. 1, 2, 3 & 5 must be completed. Complete all other applicable portions.** If change in point of diversion is greater than 100 feet, or if place of use will be changed, include a topographic map or detailed plat showing the authorized and proposed point(s) of diversion and/or place of use.

File No. 48677

RECEIVED  
 10:14am  
 JAN 29 2019

1. Application is hereby made for approval of the Chief Engineer to change the (check one or both):

Place of Use                       Point of Diversion

Stafford Field Office  
 Division of Water Resources

under the water right which is the subject of this application in accordance with the conditions described below.

The source of supply is:                       Groundwater                       Surface water

2. Name and address of Applicant: Carolyn Williams Inc.

326 Spruce Street, Halstead, KS 67056

Phone Number: (316)830-2844                      Email address: \_\_\_\_\_

Name and address of Water Use Correspondent: Carolyn Williams Inc.

326 Spruce Street, Halstead, KS 67056

Phone Number: (316)830-2844                      Email address: \_\_\_\_\_

3. The presently authorized place of use is:

Owner of Land ---- NAME: Carolyn Williams Inc.

ADDRESS: 326 Spruce Street, Halstead, KS 67056

(If there is more than one landowner, attach supplemental sheets as necessary.)

Sec.	Twp.	Range	NE¼				NW¼				SW¼				SE¼				TOTAL ACRES
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
21	25S	2W	33	33	33	33													175

4. If this application is for a change in place of use, it is proposed that the place of use be changed to:

Owner of Land ---- NAME: Carolyn Williams Inc.

ADDRESS: 326 Spruce Street, Halstead, KS 67056

(If there is more than one landowner, attach supplemental sheets as necessary.)

Sec.	Twp.	Range	NE¼				NW¼				SW¼				SE¼				TOTAL ACRES
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
21	25S	2W	33	33	33	34													185

**For Office Use Only:** Code \_\_\_\_\_ Fee \$ 400- TR # \_\_\_\_\_ Receipt Date \_\_\_\_\_ Check # 1382

5. **Presently authorized point of diversion:**  
 One in the NE Quarter of the SE Quarter of the SW Quarter of Section 21, Township 25 South, Range 2W (E/W), in Sedgwick County, Kansas, 1278 feet North 2898 feet West of Southeast corner of section. Authorized Rate 1000 GPM Authorized Quantity 227.50 AF Depth of well 37 (feet)  
**(DWR use only: Computer ID No. \_\_\_\_\_ GPS 1295 feet North 2708 feet West)**  
 This point will not be changed  This point will be changed as follows:  No change, point better described with GPS as follows:  
**Proposed point of diversion: (Complete only if change is requested or if existing point is better described by GPS)**  
 One in the NE Quarter of the SW Quarter of the NE Quarter of Section 21, Township 25 South, Range 2W (E/W), in Sedgwick County, Kansas, 3455 feet North 1410 feet West of Southeast corner of section. Proposed Rate 1000 GPM Proposed Quantity 227.50 AF Proposed well depth (feet) ~40.  
 This point is:  Additional Well  Geo Center List other water rights that will use this point \_\_\_\_\_.

6. **Presently authorized point of diversion:**  
 One in the \_\_\_\_\_ Quarter of the \_\_\_\_\_ Quarter of the \_\_\_\_\_ Quarter of Section \_\_\_\_\_, Township \_\_\_\_\_ South, Range \_\_\_\_\_ (E/W), in \_\_\_\_\_ County, Kansas, \_\_\_\_\_ feet North \_\_\_\_\_ feet West of Southeast corner of section. Authorized Rate \_\_\_\_\_ Authorized Quantity \_\_\_\_\_ Depth of well \_\_\_\_\_ (feet)  
**(DWR use only: Computer ID No. \_\_\_\_\_ GPS \_\_\_\_\_ feet North \_\_\_\_\_ feet West)**  
 This point will not be changed  This point will be changed as follows:  No change, point better described with GPS as follows:  
**Proposed point of diversion: (Complete only if change is requested or if existing point is better described by GPS)**  
 One in the \_\_\_\_\_ Quarter of the \_\_\_\_\_ Quarter of the \_\_\_\_\_ Quarter of Section \_\_\_\_\_, Township \_\_\_\_\_ South, Range \_\_\_\_\_ (E/W), in \_\_\_\_\_ County, Kansas, \_\_\_\_\_ feet North \_\_\_\_\_ feet West of Southeast corner of section. Proposed Rate \_\_\_\_\_ Proposed Quantity \_\_\_\_\_ Proposed well depth (feet) \_\_\_\_\_.  
 This point is:  Additional Well  Geo Center List other water rights that will use this point \_\_\_\_\_.

7. The changes herein are desired for the following reasons?  
 (please be specific) Modifying place of use and moving well to location with less salinity and better water quality.

8. If a well, is the test hole log attached?  Yes  No

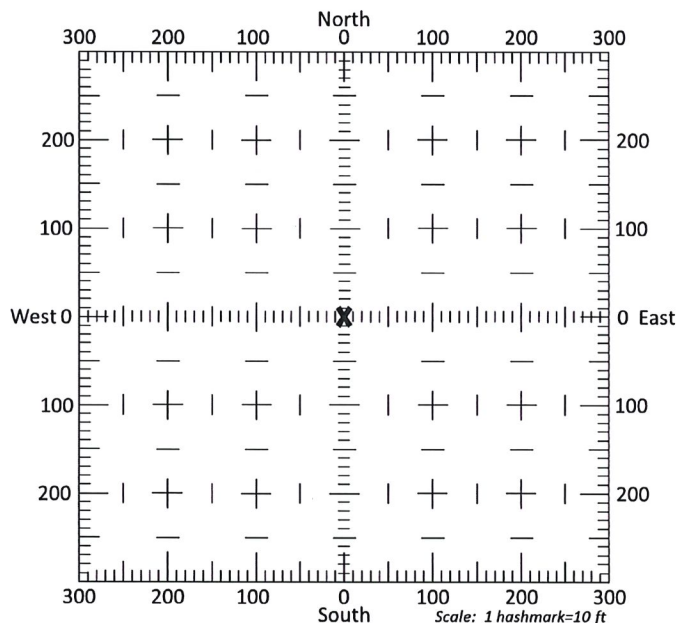
9. The change(s) (was)(will be) completed by?  
ASAP

10. If the point of diversion is a well:  
 (a) What are you going to do with the old well?  
Plug it  
 (b) When will this be done? When new well drilled

11. Groundwater Management District recommendation attached?  Yes  No

12. Assisted by T. Boese, GMD2

13a. If the proposed point of diversion will be relocated more than 300 feet but within 2,640 feet of the existing point of diversion, attach a topographic map or aerial photograph. For groundwater sources, show all wells (including domestic) within one-half mile of the proposed point of diversion and the names and mailing addresses of the owners. For surface water sources, show the names and addresses of the landowner(s) one-half mile downstream and one-half mile upstream from your property lines



13b. If the proposed point of diversion will be relocated within 300 feet of the existing point of diversion, indicate its location on the diagram shown above in relation to the existing point of diversion. (PLEASE NOTE: The "X" in center of diagram above represents the presently authorized point of diversion.)

14. If the proposed groundwater point of diversion is 300 or fewer feet from the existing point of diversion, complete the following:

- (a) Does the undersigned represent all owners of the currently authorized place(s) of use identified in this application?  
 Yes     No    (If no, all owners must sign this application.)
- (b) Will the ownership interest of any owner of the currently authorized place(s) of use identified in this application be adversely affected if this application is approved as requested?  
 Yes     No    (If yes, all owners must sign this application.)
- (c) If this application is not approved expeditiously, will there be substantial damage to property, public health or safety?  
 Yes     No    (If no, all owners must sign this application.)

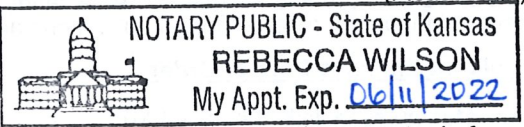
If the application proposes a surface water change in point of diversion, a groundwater change in point of diversion greater than 300 feet, or a change in place of use, the application must be signed by all owners of the currently authorized place of use, or their duly authorized agent (attach notarized statement authorizing representation).

I hereby verify, being first duly sworn upon my oath or affirmation and under penalty of perjury, that I am of lawful age and the owner, the spouse of the owner, or a duly authorized agent of the owner(s) to make this application on their behalf, in regards to the water right(s) to which this application pertains. I further verify that the statements contained in this application are true, correct and complete.

Dated at Halstead \_\_\_\_\_, Kansas, this 23rd \_\_\_\_\_ day of January \_\_\_\_\_, 2019.

<p><u>Carolyn Williams</u> (Owner)</p> <p>Carolyn Williams, President, Carolyn Williams Inc (Please Print)</p> <p>_____ (Owner)</p> <p>_____ (Please Print)</p> <p>_____ (Owner)</p> <p>_____ (Please Print)</p>	<p>_____ (Spouse)</p> <p>_____ (Please Print)</p> <p>_____ (Spouse)</p> <p>_____ (Please Print)</p> <p>_____ (Spouse)</p> <p>_____ (Please Print)</p>
--	---

State of Kansas }  
County of HARVEY } SS



I hereby certify that the foregoing application was signed in my presence and sworn to before me this 23rd day of JANUARY, 2019.

Rebecca Wilson  
Notary Public

My Commission Expires 06/11/2022.

ONLY COMPLETE APPLICATIONS WILL BE PROCESSED. To be complete, all of the applicable portions of the application form must be completed with accurate information; maps, if necessary, must be included; signatures of all the appropriate owners' must be affixed to the application and notarized; and the appropriate fee must be paid.

**FEE SCHEDULE**

Each application to change the place of use or the point of diversion under this section shall be accompanied by the application fee set forth in the schedule below: Make checks payable to: **Kansas Department of Agriculture**

(1) Application to change a point of diversion 300 feet or less	\$100
(2) Application to change a point of diversion more than 300 feet	\$200
(3) Application to change the place of use	\$200

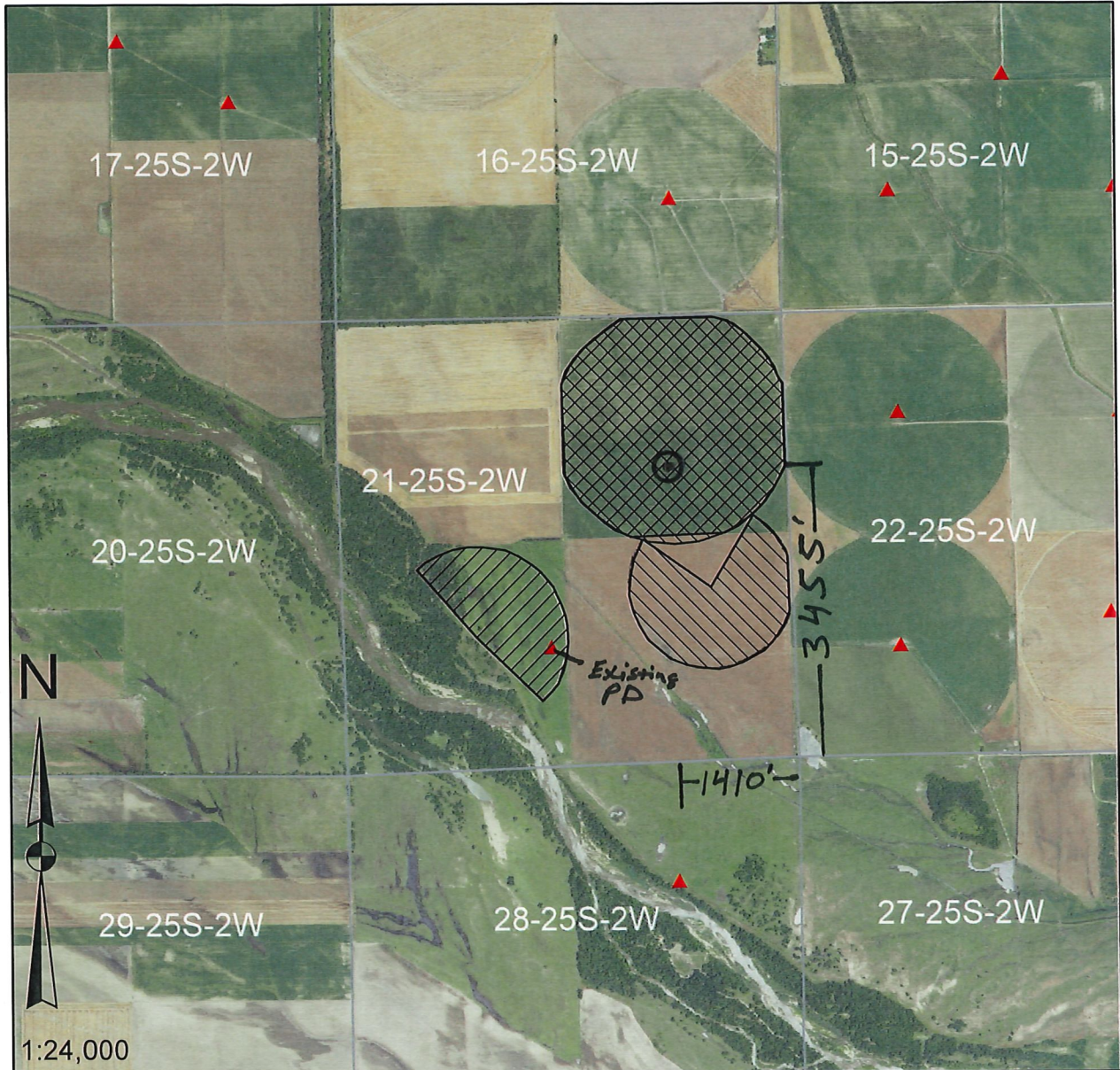
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Stafford Field Office  
Division of Water Resources



# Application Map - File No. 48677



I declare that all water wells or diversion sites using the same source of supply and within 1/2 mile of the proposed point of diversion have been plotted on the application map.

Carolee Williams  
Signature *President*

January 23, 2019  
Date

- New Application
- Application No. 48677 To Change:

- Point of Diversion
- Place of Use
- Use Made of Water
- Proposed Point of Diversion
- Existing Points of Diversion
- Proposed Place of Use
- Authorized Place of Use

Water wells within 1/2 mile of proposed point of diversion include: (type use, owner, address)

- 1) There are no known wells within 1/2 mile of the proposed point of diversion
- 2)

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Agriculture, Residential & Commercial

Customer's Name Jacobs Farms Date 10/31/2018  
 Address 9733 N 151st St W Sedgwick, KS 67135 Test #   
 County Sedgwick Quarter NE Section 21 Township 25S Range 2W

Drilled Footage		Description of Strata	SWL	YIELD	PLAIN	PERF
From	To					
		TEST HOLE #1 CASED				
		37.86443 -97.54183	5'		0-20'	20-40'
0	1	Topsoil				
1	10	Fine Sand				
10	30	Medium Sand	GROUT			
30	40	Medium Sand w/Medium Gravel	0-20'			
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INPUTS	
Target Section Definition	
Section	21
Township	25
Range	2
Range Direction	W
Target Point Coordinates (NAD27 or NAD83)	
Target Longitude	-97.546000
Target Latitude	37.858080

NAD27

Load Data and Compute

**Instructions**

1. Enter values for section, township, range and range direction.
2. Enter **NAD27** or **NAD83** longitude and latitude of target point.
3. Click "Load Data and Compute" button.
4. Use feet distances corresponding to datum of target point.

Longitude changed

Latitude changed

File No. 48677 well location

*Existing PD*

UTM - NAD27

4190860

627910

12/4/2018

Loaded Section Data From LEOBASE using NAD83		
Corner	Corner Latitudes	Corner Longitudes
SW	37.85413771	-97.55548378
NW	37.86875558	-97.55575753
NE	37.86890780	-97.53738608
SE	37.85453468	-97.53694351
Degrees Longitude per Foot		3.46365713E-06
Degrees Latitude per Foot		2.74615901E-06
Target Point Distances from Corners using NAD83		
Corner	Feet North(+)/South(-)	Feet East(-)/West(+)
SW	1436	-2738
NW	-3887	-2817
NE	-3943	2487
SE	1291	2615

Loaded Section Data From LEOBASE using NAD27		
Corner	Corner Latitudes	Corner Longitudes
SW	37.85412600	-97.55516100
NW	37.86874400	-97.55543500
NE	37.86889600	-97.53706400
SE	37.85452300	-97.53662100
Degrees Longitude per Foot		3.46365658E-06
Degrees Latitude per Foot		2.74598553E-06
Target Point Distances from Corners using NAD27		
Corner	Feet North(+)/South(-)	Feet East(-)/West(+)
SW	1440	-2645
NW	-3883	-2724
NE	-3939	2580
SE	1295	2708

Difference (NAD83 Minus NAD27)		
Corner	Corner Latitudes	Corner Longitudes
SW	0.00001171	-0.00032278
NW	0.00001158	-0.00032253
NE	0.00001180	-0.00032208
SE	0.00001168	-0.00032251
Difference (NAD83 Minus NAD27)		
Corner	Feet North(+)/South(-)	Feet East(-)/West(+)
SW	-4.35510092	-93.19009963
NW	-3.97146940	-93.11790908
NE	-4.04808448	-92.98882636
SE	-4.33504344	-93.11299280

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Division of Water Resources

**Equus Beds Groundwater Management District No. 2  
Abandoned Well Plugging Agreement**

I, Carolyn Williams Inc, the undersigned and owner of an abandoned water well understand that an abandoned water well is a groundwater contamination threat and a public health and safety hazard.

The abandoned water well is located NE, SE, SW, Section 21, Township 25 South, Range 2W West, Sedgwick County which is approximately 1295 feet north and 2708 feet west of the apparent SE section corner. Total well depth is 37 feet and the diameter of the well is 16 inches. Current depth to static water level in the well is ~10 feet below land surface. The well was previously authorized by water permit no. 48677.

I agree to properly plug the abandoned well pursuant to the Equus Beds Groundwater Management District rules and regulations K.A.R. 28-30-200 through K.A.R. 28-30-207 and the following agreement provisions:

1. Well plugging operations will be supervised by either (a) a water well contractor licensed with the Kansas Department of Health and Environment, (b) a profession engineer or geologist licensed to practice in the State of Kansas, or (c) the abandoned water well owner or land owner of the property on which the water well or borehole is located.
2. The above described well will be plugged: a) by December 31, 19, or b) within 30 days after the replacement well, approved by a change in point of diversion, becomes operational.
3. A completed WWC-5P form will be submitted to the Kansas Department of Health and Environment within 30 days after the abandoned well is plugged and a copy of the WWC-5P form will be furnished to the District within the same period of time.
4. The well owner or authorized agent will notify the District 48 hours before plugging operations occur.
5. Failure to comply with the provisions of this agreement shall constitute noncompliance of the groundwater management district rules and regulations K.A.R. 28-30-200 through K.A.R. 28-30-207.

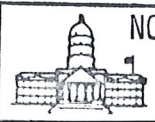
Dated this 23rd day of January, 2019 at Halstead, KS

Signature Carolyn Williams

Address 326 Spruce Street

City, State, Zip Code Halstead, KS 67056

Telephone 316-830-2844

State of Kansas	County of <u>HARVEY</u>	
Subscribed and affirmed to before me this <u>23RD</u> day of <u>JANUARY</u> , 20 <u>19</u> ,		
by <u>Rebecca Wilson</u> (Notary Public)		
My Commission Expires <u>06/11/2022</u>		
		NOTARY PUBLIC - State of Kansas <b>REBECCA WILSON</b> My Appt. Exp. <u>06/11/2022</u>

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WATER WELL RECORD Form WWC-5

Division of Water Resources App. No.

48677

Well ID

Original Record Correction Change in Well Use

1 LOCATION OF WATER WELL: County: Sedgwick Fraction SE 1/4 SE 1/4 NE 1/4 SW 1/4 Section Number 21 Township Number T 25 S Range Number R 2 E W

2 WELL OWNER: Last Name: First: Street or Rural Address where well is located (if unknown, distance and direction from nearest town or intersection): If at owner's address, check here: N. 151st St W. and W. 93rd St. N. NORTH WELL

3 LOCATE WELL WITH "X" IN SECTION BOX: N W E S 1 mile

4 DEPTH OF COMPLETED WELL: 37 ft. Depth(s) Groundwater Encountered: 1) 9 ft. 2) ft. 3) ft. or 4) Dry Well WELL'S STATIC WATER LEVEL: 9 ft. below land surface, measured on (mo-day-yr) 12/4/2017

5 Latitude: 37.858427 (decimal degrees) Longitude: 97.546316 (decimal degrees) Datum: WGS 84 NAD 83 NAD 27 Source for Latitude/Longitude: GPS (unit make/model: ) (WAAS enabled? Yes No) Land Survey Topographic Map Online Mapper:

6 Elevation: 1395 ft. Ground Level TOC Source: Land Survey GPS Topographic Map Other KOLAR

7 WELL WATER TO BE USED AS: 1. Domestic: Household Lawn & Garden Livestock Irrigation Feedlot Industrial 5. Public Water Supply: well ID 6. Dewatering: how many wells? 7. Aquifer Recharge: well ID 8. Monitoring: well ID 9. Environmental Remediation: well ID Air Sparge Soil Vapor Extraction Recovery Injection 10. Oil Field Water Supply: lease 11. Test Hole: well ID Cased Uncased Geotechnical 12. Geothermal: how many bores? a) Closed Loop Horizontal Vertical b) Open Loop Surface Discharge Inj. of Water 13. Other (specify):

Was a chemical/bacteriological sample submitted to KDHE? Yes No If yes, date sample was submitted: Water well disinfected? Yes No

8 TYPE OF CASING USED: Steel PVC Other CASING JOINTS: Glued Clamped Welded Threaded Casing diameter 16 in. to 37 ft., Diameter in. to ft., Diameter in. to ft. Casing height above land surface 18 in. Weight lbs./ft. Wall thickness or gauge No. 0.50

TYPE OF SCREEN OR PERFORATION MATERIAL: Steel Stainless Steel Fiberglass PVC Other (Specify) Brass Galvanized Steel Concrete tile None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: Continuous Slot Mill Slot Gauze Wrapped Torch Cut Drilled Holes Other (Specify) Louvered Shutter Key Punched Wire Wrapped Saw Cut None (Open Hole)

SCREEN-PERFORATED INTERVALS: From 20 ft. to 37 ft., From ft. to ft., From ft. to ft. GRAVEL PACK INTERVALS: From 23 ft. to 37 ft., From ft. to ft., From ft. to ft.

9 GROUT MATERIAL: Neat cement Cement grout Bentonite Other Grout Intervals: From 3 ft. to 23 ft., From ft. to ft., From ft. to ft.

Nearest source of possible contamination: Septic Tank Lateral Lines Pit Privy Livestock Pens Insecticide Storage Sewer Lines Cess Pool Sewage Lagoon Fuel Storage Abandoned Water Well Watertight Sewer Lines Seepage Pit Feedyard Fertilizer Storage Oil Well/Gas Well Other (Specify) Monitoring well Direction from well? North Distance from well? 50 ft.


Table with 6 columns: 10 FROM, TO, LITHOLOGIC LOG, FROM, TO, LITHO. LOG (cont.) or PLUGGING INTERVALS. Rows: 0-9 Clay, 9-27 Sand + Gravel, 27-29 Clay, 29-37 Sand + Gravel. Includes a Notes section.

11 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was constructed, reconstructed, or plugged under my jurisdiction and was completed on (mo-day-year) 12/4/2017 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 238 This Water Well Record was completed on (mo-day-year) 12/7/2017 under the business name of Premier Pump and Well Service, Inc.

# Servi-Tech Laboratories

1816 E. Wyatt Earp • PO Box 1397 • Dodge City, KS 67801  
 www.servitechlabs.com

Phone: 620.227.7123 • 800.557.7509 • Fax: 620.227.2047

<b>LABORATORY REPORT</b>		Report Date: 11/26/2018 04:14 pm				
 <p><b>Send To:</b> EQUUS BEDS GROUNDWATER          15075 MGT. DISTRICT #2          313 SPRUCE  <b>Bill To:</b> HALSTEAD, KS 67056          43304</p>	<p style="text-align: center;"><i>Sean H. Jenkins</i>          Sean H. Jenkins          QA Manager</p>	<p><b>Location:</b> NW-SE-NE 21-25S-2W</p> <p><b>Invoice No:</b> 373122  <b>P.O. #:</b>  <b>Depth:</b> 33  <b>Flow Rate:</b></p>				
<p><b>Project ID:</b>  <b>Project Title:</b> CAROLYN WILLIAMS INC  <b>Sample ID:</b> 48677 TEST WELL (3 PVC)  <b>Client Name:</b> CAROLYN WILLIAMS INC.  <b>Subject:</b> Monitoring Well Lab Analysis</p>	<p><b>Date/Time Received:</b> 11/19/2018 09:30 am  <b>Name of Submitter:</b> usps  <b>Date/Time Sampled:</b> 11/15/2018 03:16 pm  <b>Name of Sampler:</b> David Randolph</p>					
<b>Analysis</b>	<b>Result</b>	<b>Unit</b>	<b>RL</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Tech</b>
<b>NELAP Accredited Tests</b>						
Chloride, Cl	204	mg/L AR	10.0	EPA 300.0	11/20/2018 11:26AM	ABC
Dissolved Sodium, Na	178	mg/L AR	1.0	EPA 200.7	11/26/2018 1:59PM	ABC
Electrical Conductivity, EC @ 25C	1300	µmho/cm AR	0.1	SM 2510 B-1997	11/20/2018	ABC
<b>Non-Accredited Tests</b>						
Total Dissolved Solids (Calc), TDS	832	mg/L	5	Calculation		
<b>NELAP Statement</b>						
<p><b>Laboratory Accreditation:</b> The analytical results included in this report meet all the requirements of the National Environmental Laboratory Accreditation Program (NELAP), unless otherwise noted. The reported results apply only to the sample as it was supplied. This report may not be reproduced, except in full, without permission of Servi-Tech.</p> <p style="text-align: center;"><b>Sample Acceptability Criteria</b></p> <p style="text-align: center;">Sample not received 'on ice'.</p>						
<p>RECEIVED</p> <p>NOV 26 2018</p> <p>Equus Beds GMD #2</p>						
<p>Test Basis: AR=As Received</p>						
<p>RL = Reporting Limit</p>						

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 Division of Water Resources

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www.servitechlabs.com

Phone: 620.227.7123 • 800.557.7509 • Fax: 620.227.2047

Lab #: D-2019NL000875

## LABORATORY REPORT

Report Date: 11/26/2018 04:14 pm

Accreditation Agency

Accreditation Number

KDHE  
TCEQ  
OK DEQ

E-10150  
T104704505-18-9  
Lab ID 9707 Cert. # 2018-178

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NOV 26 2018

Equus Beds GMD #2

Test Basis: AR=As Received

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Phone: 620.227.7123  
800.557.7509  
Fax: 620.227.2047

Lab #: 000649      **LABORATORY ANALYSIS REPORT**      Report Date: 11/08/2018 04:58 p  
Sample ID: WILLIAMS 4      Client Name:      Location: IRRIGATION

**AGGRESSIVE INDEX (over 12.0):** The Aggressive Index (AI) is a measure of the tendency of water to deteriorate the structure of asbestos-cement pipes. The result indicates that this water is considered "non-aggressive". A water supply can be very corrosive even though the pH is neutral. This occurs in water where there is no hardness or dissolved minerals to coat piping and protect it from the natural corrosiveness of the water.

**LANGLIER SATURATION INDEX:** A calculation that indicates the calcium carbonate (CaCO<sub>3</sub>) saturation of a given water supply. An index value between -0.5 to +0.5, suggests the water is not expected to either form a calcium carbonate scale layer or dissolve an existing scale layer. The water supply may be considered "non-corrosive", but there are other factors that may affect corrosion. These factors include the type of metals used for piping and fixtures, water temperature, flow rate, and others.

## Interpretations For Irrigation Use

### GENERAL RATING - POOR QUALITY IRRIGATION WATER

**SALINITY HAZARD - MEDIUM:** Extended use of this irrigation water is considered satisfactory for growth of many plants. Soluble salts have potential to accumulate to levels that may affect growth of moderately salt-sensitive species (e.g., alfalfa, corn, soybeans), may affect young seedlings, or may affect newly planted cuttings. Routine leaching by a degree of over irrigating may be needed to mobilize salts into the lower root zone, but good internal soil drainage is necessary. Test irrigation water and soil regularly to monitor salinity levels.

**PERMEABILITY HAZARD: HIGH.** The adjusted SAR value suggests this water should not be used for extended irrigation of fine-textured or clayey soils. It should be used with caution on medium-textured and some sandy-textured soils. Surface crusting, reduced water infiltration rates, and excess runoff are typical symptoms of sodium accumulations. Frequent application of a soluble calcium amendment (e.g., gypsum) may be needed, but requires internal soil drainage that permits downward water movement to be effective. Recommend using other soil management strategies to help maintain soil permeability. Test the soil annually for exchangeable sodium (%Na) and the irrigation water frequently for adjusted SAR to monitor sodium accumulations.

**BORON HAZARD - VERY LOW:** Boron is one of the essential plant nutrients required by plants for healthy growth but it is only needed in very small amounts and can therefore become toxic to plants even at very low concentrations. The boron concentration in this water source is considered safe for most field crops and landscape plants.

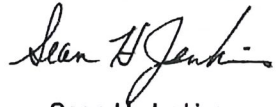
**CHLORIDE HAZARD FROM SPRINKLER IRRIGATION - HIGH (150 - 350 mg/L):** Chloride contained in water droplets that dry on leaf surfaces is likely to cause foliar injury (burning, spotting, etc.) when applied to moderately sensitive crops (e.g. soybeans). Foliar damage may be expected with chloride sensitive plant types (e.g. certain tree species, some ornamentals, etc.). Chloride injury problems may be more common during high temperature and low humidity conditions. Irrigate at night or during cool weather conditions, if possible. Increasing droplet size or applying water below the crop canopy can help minimize problems.

# Servi-Tech Laboratories

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Phone: 620.227.7123  
800.557.7509  
Fax: 620.227.2047

Lab #: 000649 **LABORATORY ANALYSIS REPORT** Report Date: 11/08/2018 04:58 p

<b>Send To:</b> 485	JACOB FARMS RYAN SPEER / STEVE JACOB 9757 N 151ST W SEDGWICK, KS 67135	 Sean H. Jenkins QA Manager	
<b>Client Name:</b>		<b>Received:</b>	11/02/2018 08:30 am
<b>Sample ID:</b>	WILLIAMS 4	<b>Submitted By:</b>	usps
<b>Location:</b>	IRRIGATION	<b>Invoice No:</b>	373005
<b>Sampled:</b>	10/31/2018 04:00 pm	<b>P.O. #:</b>	
<b>Sampled By:</b>	RON		

Analysis	Result	Unit	lbs /	
			Acre Inch	meq / L
Nitrate Nitrogen, NO3-N	2.26	mg/L	0.5	0.2
Chloride, Cl	200	mg/L	45.3	5.6
Sulfate, SO4	110	mg/L	24.9	2.3
Sulfate-Sulfur, SO4-S	38	mg/L	8.6	2.4
Bicarbonate, HCO3	380	mg/L	86.1	6.2
Carbonate, CO3	<10	mg/L	<2.3	<0.3
Total Alkalinity, CaCO3	310	mg/L	70.3	6.2
Hardness (CaCO3)	330	mg/L		
Hardness (CaCO3)	19	grains/gal		
Total Calcium, Ca	98	mg/L	22.2	4.9
Total Magnesium, Mg	21	mg/L	4.8	1.7
Total Potassium, K	4	mg/L	0.9	0.1
Total Sodium, Na	151	mg/L	34.2	6.6
Sodium Adsorption Ratio, SAR	3.6	ratio		
Adjusted SAR, SARa	8.5	ratio		
Total Boron, B	0.26	mg/L	0.1	
Total Iron, Fe	0.33	mg/L	0.1	
Total Manganese, Mn	0.707	mg/L	0.2	
Electrical Conductivity, EC @ 25C	1400	µmho/cm		
Total Dissolved Solids (Calc), TDS	896	mg/L		
pH, at 19.7°C	7.3	unit		
Corrosion Indices				
Langelier Index, LI	0.5			
Aggressive Index, AI	12.3			

**Interpretations for Corrosive Indices**

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JAN 29 2019

Report formatted for regulatory compliance available upon request.