

January 2018 – December 2022

Frontier Farms

Water Conservation Area Management Plan

Water Conservation Area Executive Summary

WCA Acres: 1,684 acres

Number of IRR Water Rights: 3

Number of IRR Wells: 12

Historical Period: 2008-2017

- No wells were pumped between 1987-2007 due to being enrolled in CRP

Prior Conservation:

- All three water rights were enrolled in CRP from 1990-mid 2000's

WCA Allocation:

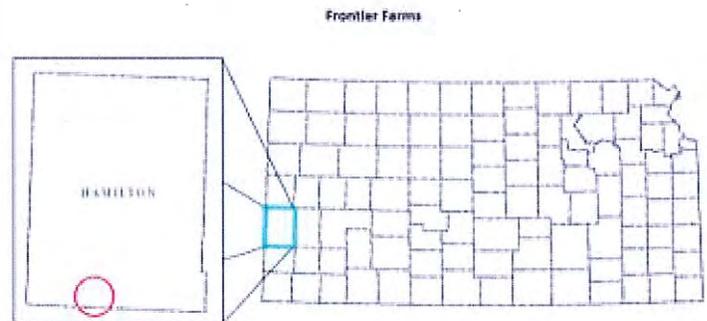
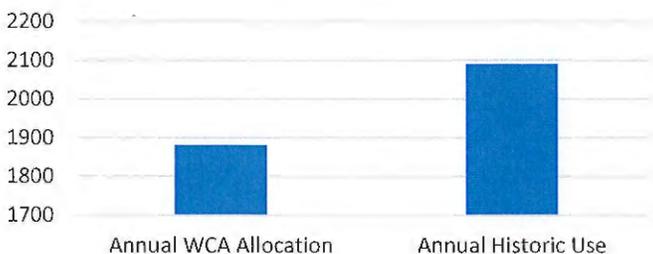
- Total WCA allocation of 9,402.395 AF for period of WCA
- Annual average allocation of 1,880.479 AF
- 10% conservation from the 2008-2017 average use

Corrective Controls- Limiting quantity per year by use made of water:

- All wells currently authorized for less than 300 AF/Yr can pump up to 300 AF/Yr
- No water right may exceed its annual authorized quantity in any calendar year
- No point of diversion may exceed its annual authorized pumping rate in any calendar year
- Potential carryover of 1 year's WCA allocation with a subsequent WCA upon review and approval

Total water conserved over WCA period (based on historical use): 1,044.71 AF

Annual Historic Use VS. Annual WCA Allocation



*NOTE: Provided by KS Dept of Agriculture – Division of Water Resources
Initial consultations with KDA-DWR began in July 2018*

MANAGEMENT PLAN

For the Designation of a Water Conservation Area (WCA) Frontier Farms WCA; Hamilton County, KS January 2018 through December 2022

In order to conserve and extend the productive life of the aquifer in our region and increase the value and viability of our water rights and water resources for future generations we, the undersigned water right owners propose the following management plan, pursuant to K.S.A. 82a-745 (WCA Law), to form the basis of a Consent Agreement and Order Designating a Water Conservation Area (WCA).

Expression of Conservation Goals

The goals of this WCA are to maintain production while enhancing profitability per acre-foot of water pumped, to examine and change current conservation practices as necessary, and to reduce water use over the term of the WCA from long-term averages. We, the water right owners, enrolling in a consent agreement under the terms and conditions of this WCA management plan will work towards these goals by exercising more flexible and efficient use of the water resource.

Water Rights Enrolled and Geographic Boundaries

This WCA shall include the water rights listed in the attached document. This list includes details of all points of diversion associated with those water rights; as well as legal descriptions of the locations of the points of diversion and/or identification numbers.

The current total appropriations authorized for all water rights included in this WCA are 2,493 acre-feet (AF) per year, with an average annual use for years with reported use during the period 2008-2017 of 2,089.421 AF. With a 10% reduction from the historical annual average use, the five (5) year WCA allocation is 9,402.395 AF.

The geographic boundary for this WCA is shown on the attached map(s) and attached table defined by legal locations. This table includes total acres and legal definitions by section, township, and range of the WCA boundary.

Findings Regarding Groundwater Conditions

We understand that the WCA Law requires a finding that one of the following circumstances be present within the area geographic boundaries of this WCA; specified in K.S.A. 82a-1036 (a) through (d):

- a) Groundwater levels in the area in question are declining or have declined excessively;
- b) The rate of withdrawal of groundwater in the area equals or exceeds the rate of recharge within such area;
- c) Preventable waste of water is occurring or may occur within the area in questions; or
- d) Unreasonable deterioration of the quality of water is occurring or may occur within the area in question

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and amendments thereto, exist, or include a finding or findings that the area within the geographic boundaries described in paragraph (1) has been closed to new appropriations by rule, regulation or order of the Chief Engineer.

We have been informed that the following conditions exist:

- Groundwater levels in the area in question are declining or have declined excessively;
- The rate of withdrawal of groundwater in the area equals or exceeds the rate of recharge within such area;

These conditions suggest the advisability of implementing this WCA.

See the attached maps and figures supporting these findings and observations. Such attached documents may include:

- Maps with WCA geographic boundaries defined- Attachment A & B
- Detailed table with description of WCA geographic boundaries- Attachment C
- Summary of water rights with description of legal locations- Attachment D
- KGS Observation well(s) data- Attachment E & F
- KDA-DWR Theis analysis report(s)- Attachment G

Per the Corrective Controls Provisions and Plan for Conservation Section under this WCA management plan it has been determined that the proposed provisions listed will not significantly affect nearby points of diversion. This has been determined by a Theis analysis conducted by the Kansas Department of Agriculture. The Theis report(s) for the water rights in question are included in the attached documents.

Due Consideration for Past Conservation

We acknowledge that as described in the law, a water conservation area (WCA) management plan shall give due consideration to water users who have previously implemented reductions in water use resulting from voluntary conservation measures. Frontier Farms have already taken the following voluntary conservation measures:

- a. WR#'s 27346, 27347, 27348 were all enrolled in Conservation Reserve Program (CRP) in 1990.
- b. WR# 27346 did not pump from 1987-2011.
- c. WR# 27347 did not pump from 1987-2008.
- d. WR# 27348 did not pump from 1987-2007.

Corrective Control Provisions and Plan for Conservation

We acknowledge that the following corrective controls will be in effect within this WCA during the term of the WCA period listed:

1. Water rights, at the discretion of the owners, may be pumped as directed by the owner, provided that:

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- a) The sum of water use under all water rights combined shall be limited to no more than 9,402.395 acre-feet every five (5) years.
 - b) All points of diversion are limited to their current authorized pumping rates.
 - c) All points of diversion under water right #27346 are limited to the combined annual authorized quantity of 761 acre-feet each year of the WCA.
 - i. The point of diversion located in section 19 is held to its authorized quantity of 371 acre-feet each year of the WCA.
 - ii. The points of diversion located in sections 25 and 30 may use up to 300 acre-feet each in any calendar year.
 - d) All points of diversion under water right #27347 are limited to the combined annual authorized quantity of 982 acre-feet each year of the WCA.
 - i. The points of diversion located sections 25, 30, 31, and 36 may use up to 300 acre-feet each in any calendar year.
 - e) All points of diversion under water right #27348 are limited to the combined annual authorized quantity of 750 acre-feet each year of the WCA.
 - i. The points of diversion located in sections 31 and 32 may use up to 300 acre-feet each in any calendar year.
2. The corrective control provisions of this WCA cannot conflict with the rules and regulations of the local GMD that result in greater overall conservation of water resources. If a Local Enhanced Management Area (LEMA) plan or an Intensive Groundwater Use Control Area (IGUCA) is formed after the initiation of this WCA, and the WCA is partially or wholly within the LEMA or IGUCA, the corrective control provisions that result in the greater overall conservation of water resources based on inches per acre and not based on percent reduction of average historical use shall prevail. However, any LEMA or IGUCA must give due consideration to the conservation achieved by WCA participants pursuant to 82a-745(a)(6). The Chief Engineer is authorized to amend the provision of the WCA to conform to any rules, regulations, or requirements that result in greater conservation of the water resource subject to the foregoing due consideration for past and current conservation.

We, the water right owners enrolling in this WCA understand we may gain the following additional incentive(s) in consideration for our WCA participation.

3. Up to the annual WCA allocation 1,880.479 AF may be carried over and added to a subsequent WCA period after (last year of WCA); if unused during the duration of this WCA period. In order for the carryover quantity to be included, all owners must enter into agreement to participate into a subsequent WCA by December 31st of the last year of this WCA period.) Upon review, should a subsequent WCA be entered, the potential carryover will not allow any well to exceed its annual authorized quantity or the agreed upon corrective controls.

Compliance Monitoring and Enforcement

We, the owners, understand that the following compliance monitoring and enforcement provisions are proposed. This section also includes any specific provisions regarding measuring or reporting water usage.

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There are two (2) recognized observation well(s) within one (1) mile of this WCA boundary that have for many years been measured annually by the Kansas Geological Survey (KGS). See attached maps for locations. The well(s) will continue to be measured annually and the data collected will help in evaluating the effectiveness of the WCA. An onsite observation well may be necessary to monitor the local water level more accurately.

We will submit an annual report no later than March 1st and maintain a spreadsheet detailing the following information for each well and all wells combined: beginning and ending meter readings, quantity of water diverted, acres irrigated, the inches per acre, and the quantity of water remaining for the WCA period listed. These records will be available to KDA-DWR upon request.

We will ensure backup measurements will be supported or an alternate measurement device will be available to be put into service in case the water flowmeter record for any given well is questionable or not reliable.

We acknowledge that water flowmeters within the WCA will be sealed to the measurement chamber by KDA-DWR during the duration of this management plan to ensure an accurate water use record.

We, water right owners within this WCA shall be responsible for ensuring the water flowmeters comply with state and local law(s). Any water right owner or authorized designee who finds a flow meter that is inoperable or inaccurate shall within 48 hours contact the KDA-DWR concerning the matter. Whenever an inoperable or inaccurate meter is repaired or replaced, the owner or authorized designee shall notify the KDA-DWR within seven (7) days on a form prescribed by the Chief Engineer of the water flowmeter installation and any water flowmeter repair or replacement event.

We acknowledge that failure to abide by the terms of this agreement may result in the termination of the WCA. Failure to abide by the terms, conditions, and limitations of the individual water rights will be subject to the civil penalties outlined in K.A.R. 5-14-10 and K.A.R. 5-14-12.

Review of Effectiveness

We acknowledge that a review of this WCA shall be completed prior to November 1st of the final year of the WCA period listed to ensure the above terms remain appropriate and are achieving the stated goals of this WCA. Should the Chief Engineer find that the terms are no longer appropriate or that no progress has been made towards the stated goal, the Chief Engineer may refuse to renew a WCA and may suggest new terms and goals. We understand that upon review, and a finding by the Chief Engineer that the WCA has achieved or made progress towards its goals and that the same terms be included in a subsequent WCA for another designated period. The terms of the WCA may be continued as long as this WCA is in good standing with its most recent WCA period and upon formal approval by the Chief Engineer. The Chief Engineer shall issue findings addressing the terms and goals of the existing management plan prior to any renewal of a subsequent WCA.

We acknowledge that unless terminated under the provisions below (e.g. due to the development of a LEMA), the WCA will be in effect for the listed period with an evaluation at the end of every WCA period.

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We understand that KDA-DWR will conduct this evaluation to ensure compliance and conservation. The evaluation will determine total water use during the WCA period.

We acknowledge that should an order of designation for a LEMA be implemented prior to end of this WCA period, an evaluation of this WCA will be conducted the year prior to the start of a LEMA. This evaluation may be used to determine an additional allocation amount of water to be carried over into a LEMA; should this be the case.

Member addition, withdrawal, and removal

We acknowledge that the water right owners and their associated water right(s) and geographic boundaries may be added to the WCA upon written notification to the Chief Engineer by the owners of each enrolling water right with legal descriptions of the areas to be added. A member may withdraw from the WCA through written notification to the Chief Engineer signed by the owners of the participating water right or rights to be withdrawn from the WCA.

If the addition or withdrawal of water rights requires modification to the water allocation quantities, geographic boundaries, places of use, terms, or conditions of the original WCA, the management plan shall be revised to incorporate such changes and the associated consent agreement shall be reaffirmed by all parties, after opportunity for comment on the proposed revisions by the applicable GMD.

Termination

We acknowledge this WCA agreement may be terminated by written notification, signed by all then-existing members of the WCA, to the Chief Engineer of the intent to terminate.

We also acknowledge that the Chief Engineer may terminate this WCA upon findings that it is not being upheld to its terms. Such termination shall give notice and require a full evaluation of the WCA and water rights associated to ensure follow up actions.

State Law

We acknowledge that this WCA is subject to compliance with all other applicable state laws.

Notification to Nearby Owners

We acknowledge that, by statute, the Chief Engineer is required to provide written notification to all water right owners with a point of diversion within ½ of a mile, or farther if deemed necessary, by a rule and regulation of the Chief Engineer, of the geographic boundaries of this WCA.

Assurances

We acknowledge this WCA will not alter the terms, conditions, and limitations of the base water rights.

Review of Other Applicable Requirements

We acknowledge that upon review, this WCA management plan was found to effect equal or greater overall conservation than applicable GMD regulations, LEMA, and IGUCA requirements.

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Participant's Agreement

By signing below, we, the water right owners, agree that this management plan is fair and equitable. This management plan, provided to the Chief Engineer and water right owners, is the expressed written intent of the parties and the whole agreement between the parties. We, the water right owners agree to be bound by all the terms contained in this management plan and understand that the provisions of this agreement shall be construed to give effect to the provisions listed. We, the water right owners also agree that this management plan is the basis for a consent agreement among the Chief Engineer and the undersigned water right owners, and therefore any order and consent agreement issued by the Chief Engineer, designating this WCA, shall be binding upon all parties as the necessary formal implementation of this management plan.

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Division of Water Resources

FOR THE PARTICIPANTS: All participating water right owner(s) signing below, affirm their approval of this WCA management plan and if approved by the Chief Engineer allow consent to the Chief Engineer to formally approve the designation of this Water Conservation Area, described herein, by means of a Consent Agreement and Order.

[Signature] Date: 8-23-2018

ZACHARY GALE POA (Signature)
Water Right No(s). 27346; 27347; 27348

PO BOX 1227, SYRACUSE, KS 67878-1227
Full Mailing Address

Fd farms@gmail.com 620-384-8284
Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)
) SS
County of Hamilton
Acknowledged before me on 8/23/18
by Zachary Gale
Signature: [Signature]
Notary Public

My commission expires: 3-27-19
(Notary Seal)



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FOR THE PARTICIPANTS: All participating water right owner(s) signing below, affirm their approval of this WCA management plan and if approved by the Chief Engineer allow consent to the Chief Engineer to formally approve the designation of this Water Conservation Area, described herein, by means of a Consent Agreement and Order.

[Signature] Date: 8/13/18

A K CORAL CAY FAMILY TRUST Owner (Signature)
Water Right No(s). 27346; 27347; 27348

E J & KATHLEEN DE GROOT PO BOX 1227, SYRACUSE, KS 67878-1227
Full Mailing Address

amosd@rockviewfarms.com 714-222-6000
Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)
) SS
County of _____)
Acknowledged before me on _____
by _____
Signature: _____
Notary Public

*Notary Certificate
Attached*

My commission expires: _____
(Notary Seal)

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ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

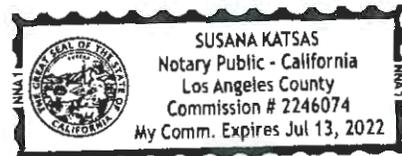
State of California
County of Los Angeles)

On August 13, 2018 before me, Susana Katsas (Notary Public)
(insert name and title of the officer)

personally appeared E. J. DeGroot
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature _____ (Seal)

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CERTIFICATE OF SERVICE

I hereby certify that on this ____ day of _____, ____ copies of the foregoing were sent via first class, U.S. mail, to the following:

ZACHARY GALE
PO BOX 1227
SYRACUSE, KS 67878-1227

A K CORAL CAY FAMILY TRUST
E J & KATHLEEN DE GROOT
PO BOX 1227
SYRACAUSE, KS 67878-1227

Kansas Department of Agriculture
Staff Person

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Attachment A- Maps with WCA geographic boundaries defined



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Attachment C – Detailed table with description of WCA geographic boundaries

WCA Boundary																			
Sec	T (S)	R (W)	NE (1/4)				NW (1/4)				SW (1/4)				SE (1/4)				Total Acres
			NE (1/4)	NW (1/4)	SW (1/4)	SE (1/4)	NE (1/4)	NW (1/4)	SW (1/4)	SE (1/4)	NE (1/4)	NW (1/4)	SW (1/4)	SE (1/4)	NE (1/4)	NW (1/4)	SW (1/4)	SE (1/4)	
19	26	41					33	19	19	33	33	19	19	33					208
30	26	41					34	24	24	34									116
25	26	42	34	34	34	34													136
30	26	41									34	34	34	34					136
30	26	41									L-3	L-4							X
31	26	41					34	34	34	34	34	34	34	34					272
31	26	41						L-1	L-2			L-3	L-4						X
25	26	42													34	34	34	34	136
36	26	42	34	34	34	34													136
31	26	41													34	34	34	34	136
32	26	41					34	34	34	34	34	34	34	34	34	34	34	34	408
Grand Total Acres																		1684	
Additional Boundary Notes:																			
Legal	Note																		
30-26S-41W	L-3 (NWSW), L-4 (SWSW)																		
31-26S-41W	L-1(NWNW), L-2(SWNW), L-3(NWSW), L-4(SWSW)																		

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Attachment D- Summary of water rights with description of legal locations

Frontier Farms 2018 WCA Summary

"Legal Ave Water Use"- A historical average calculated only using water use reports of equal or less than the annual authorized quantity.

WR #	ID#	PDIV#	Location (Sect, Twn, Range)	Historical Period (20XX-20XX)	2018 Annual Auth Qty (AF)	Legal Ave WU (AF)
27346	1	49635	30-26S-41W	12-17	209.000	194.034
27346	3	6527	19-26S-41W	12-17	371.000	210.837
27346	5	84371	25-26S-42W	13-17	181.000	174.789
27347	2	32783	30-26S-41W	12-17	220.000	174.667
27347	2	33451	31-26S-41W	12-17	191.000	151.001
27347	2	1170	36-26S-42W	13-17	189.000	172.535
27347	4	83394	25-26S-42W	12-17	189.000	145.478
27347	4	76692	31-26S-41W	08-17	193.000	166.477
27348	1	54902	32-26S-41W	08-15	191.000	165.875
27348	3	4809	31-26S-41W	08-17	202.000	192.029
27348	4	74546	32-26S-41W	09-17	176.000	171.703
27348	5	74570	32-26S-41W	08-17	181.000	169.995

Historical Use Summary				
2018 Annual Auth Qty (AF)	Legal Ave WU 08-17 (AF)	Ave Irr Acres	Actual AI/Acre	% Use of Authorized
2,493	2,089.421	1,500.00	16.72	84%

Recent Water Use Reports				
2015 Use	2016 Use	2017 Use	2017 Acres	
2,000.000	2,148.146	1,965.921	1,500.00	AF
80%	86%	79%	N/A	% of Auth

Annual WCA Allocation (10% Conservation)				
	Annual WCA Allocation	Reduction from Ave Use	% of Authorized	Est. Acre-Inch (2017 Acres)
Totals	1,880.479	208.942	75%	15.04

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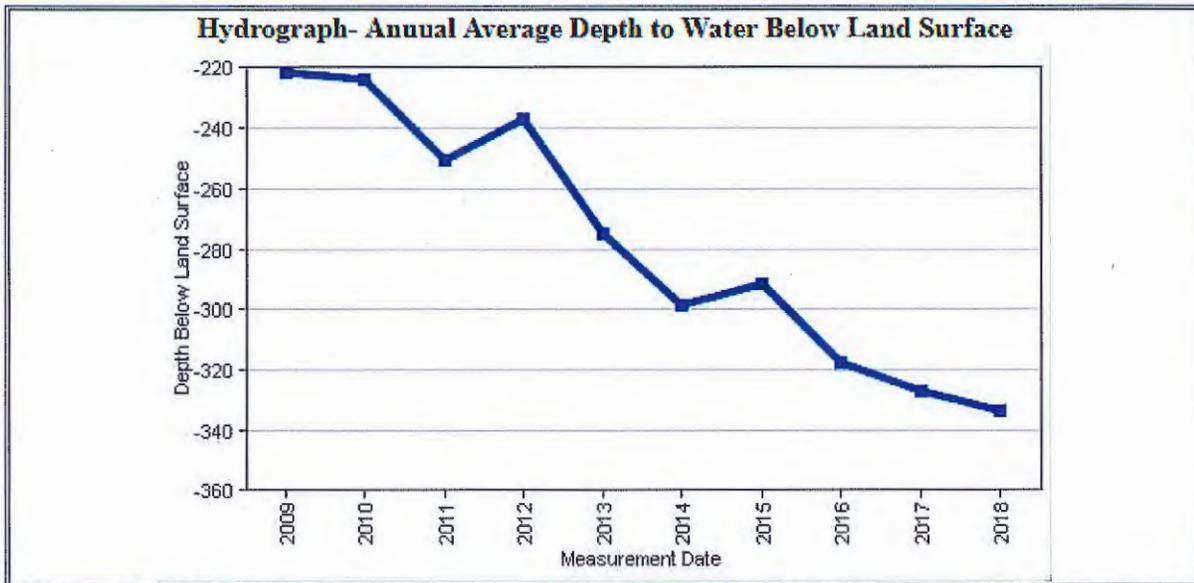
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Attachment E: KGS Observation well(s) data

General Well Site Information ?

USGS ID:	374421101490902	KGS Local Well ID:	26S 41W 32DAC 01
County:	Hamilton	PLSS Description:	26S 41W 32 SWNESE
HUC 8 Code:	11040005	GMD:	Southwest Kansas GMD #3
Longitude:	-101.820699	Lat/Long Source:	GPS (within 50 feet)
Latitude:	37.741465	Lat/Long Accuracy:	5 seconds
Surface Elevation (ft):	3346	Depth of Well (ft):	669
Geological Unit Codes:	KJ	USGS Map Name:	SYRACUSE WEST SE



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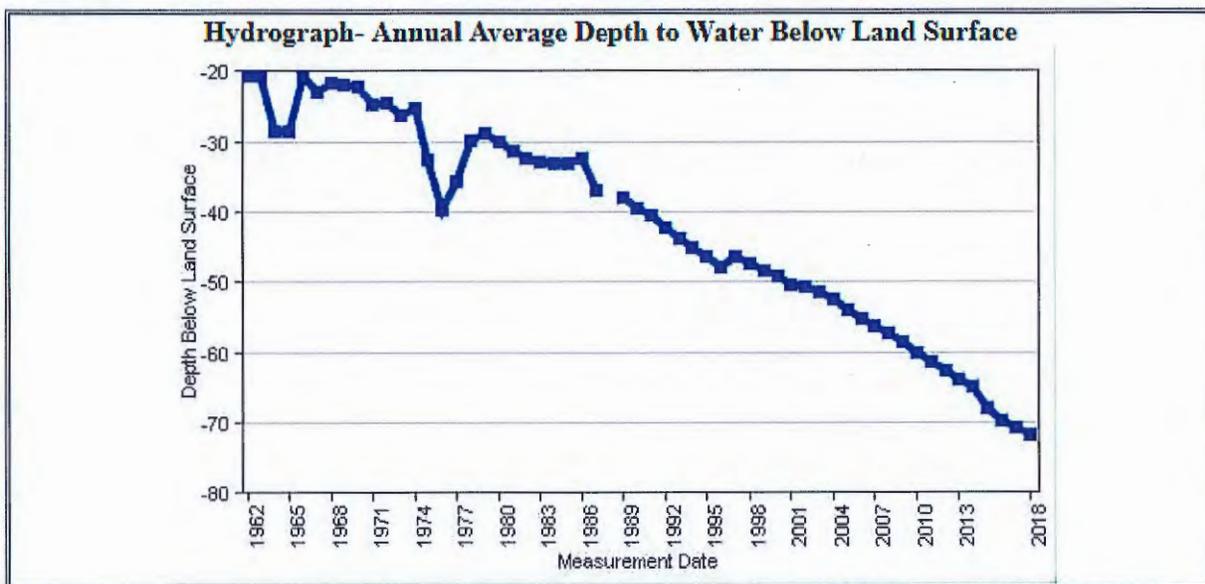
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Attachment F: KGS Observation well(s) data

General Well Site Information ?

USGS ID:	374638101495001	KGS Local Well ID:	26S 41W 20BCD 01
County:	Hamilton	PLSS Description:	26S 41W 20 SESWNW
HUC 8 Code:	11040005	GMD:	Southwest Kansas GMD #3
Longitude:	-101.829753	Lat/Long Source:	GPS (within 50 feet)
Latitude:	37.775383	Lat/Long Accuracy:	5 seconds
Surface Elevation (ft):	3317	Depth of Well (ft):	140
Geological Unit Codes:	QU TO	USGS Map Name:	Syracuse West SE



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Attachment G: KDA-DWR Theis analysis report(s)

Theis analysis of Frontier WCA

A Theis analysis was performed to evaluate the potential impacts of the proposed Frontier WCA on nearby points of diversion. Under the proposed WCA individual wells would be allowed to divert a maximum of 300 acre-feet per year. Each water right would be limited to its total annual authorized quantity.

The Frontier WCA wells are screened in the Dakota Aquifer. A linear trend of the average depth to water at nearby monitoring wells (Figure 1) for the past 20-years was used to estimate the depth to water in 2068 (482 feet). Transmissivity (3,100 ft²/day) was computed using four lithological logs and an assumed hydraulic conductivity (Tables 1-5). The storage coefficient was assumed to be 2×10^{-4} . Figure 2 is a map of the pumping, nearby and monitoring wells and lithological logs used in the analysis.

The difference in drawdown after 50-years of pumping cycles was evaluated at four nearby points of diversion. The worst-case pumping scenario was determined for each nearby well (Tables 6-10). The maximum increase in drawdown was 14.05 feet, or 7.02% of the approximately 200 feet of saturated thickness, at File 24,199.

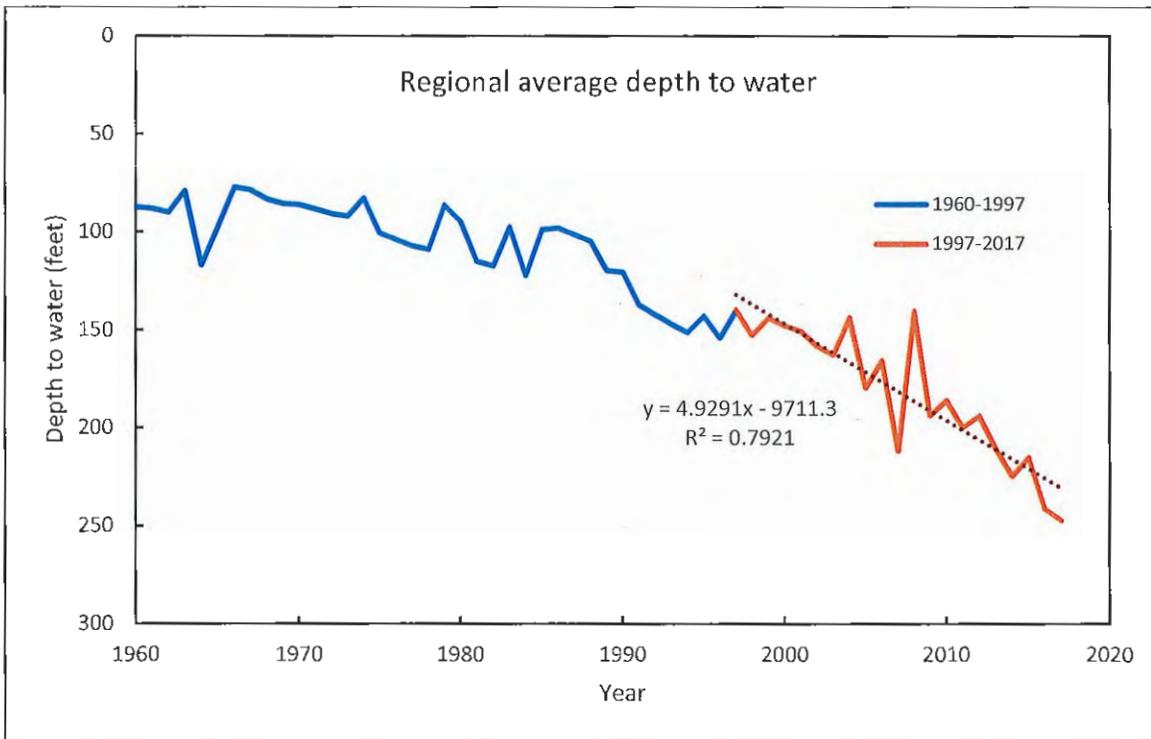


Figure 1: Regional average depth to water 1960-2017

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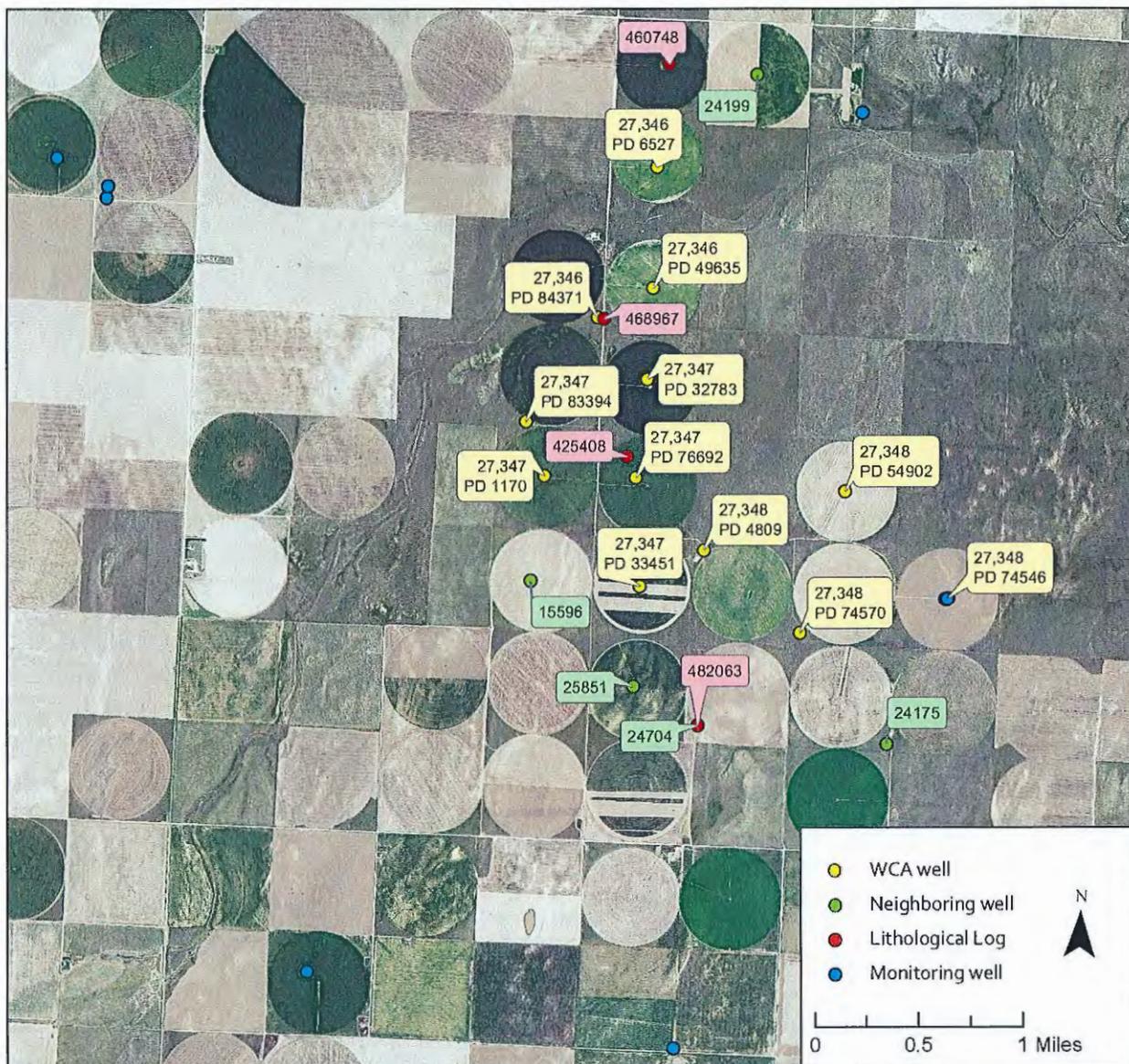


Figure 2: Map showing the pumping wells (yellow), neighboring wells of interest (green), location of lithological logs (red) and water level monitoring wells (blue).

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Table 1: Lithological log 460748 and estimated transmissivity

Description	Depth (feet)	Kx (ft/d)	T (ft ² /d)
Top soil	0-2		
Brown sandy clay	2-6		
Fine sand with few clay strips	6-15		
Brown sandy clay	15-24		
Sand, fine to medium	24-31		
Brown clay	31-50		
Fine sand	50-53		
Brown sandy clay	53-64		
Sand, fine to medium coarse	64-67		
Light blue clay	67-96		
Blue clay	96-120		
Brown clay	120-164		
Brown sandy clay, with few coarse sand streaks	164-185		
Soapstone with some sandstone	185-205		
Sandstone, used lots of water	205-263		
Black shale	263-266		
Sandstone, used water	266-280		
Sandstone with couple soapstone ledges	280-345		
Soapstone, black shale	345-396		
Sandstone, little tight	396-482		
Sandstone, little tight	482-682	10	2,000
Red bed	682-700	0	0
Transmissivity (ft ² /d):			2,000

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Table 2: Lithological log 468967 and estimated transmissivity

Description	Depth (feet)	Kx (ft/d)	T (ft ² /d)
top soil	0-2		
brown sandy clay	2-7		
fine sand	7-13		
brown sandy clay	13-18		
fine sand with couple clay stringers	18-35		
sand, fine to medium coarse, small medium gravel	35-66		
brown clay with couple sand beds	66-94		
brown clay	94-108		
light green clay	108-147		
light blue and green clay	147-156		
blue clay	156-165		
brown clay	165-186		
sand, fine to medium coarse, with some clay stringers	186-195		
brown clay with few sand strips	195-234		
sandstone with few small soapstone ledges	234-302		
sandstone	302-317		
shale with few sand strips	317-336		
shale with many sandstone	336-368		
shale	368-401		
sandstone with few shale ledges	401-420		
sandstone with couple sandstone ledges	420-460		
sandstone	460-480		
red clay and sandstone	480-482		
red clay and sandstone	482-492	11	110
sandstone	492-580	20	1,760
sandstone with couple clay ledges	580-680	17	1,700
red bed	680-700	0	0
Transmissivity (ft ² /d):			3,570

Above projected water level

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Table 3: Lithological log 425408 and estimated transmissivity

Description	Depth (feet)	Kx (ft/d)	T (ft ² /d)
Topsoil	0-2		
Brown sandy clay, some sand beds	2-109		
Fine to medium coarse sand, clay stringers	109-134		
Brown sandy clay, limerock, sand bed	134-142		
Fine to medium coarse sand, trace small gravel	142-168		
Brown sandy clay, sand beds	168-201		
Fine to medium coarse sand, small gravel	201-208		
Gray soapstone	208-224		
Sandstone and soapstone	224-363		
Sandstone	363-382		
Sandstone and soapstone	382-404		
Sandstone	404-482		
Sandstone	482-630	20	2,960
Red bed	630-635	0	0
Transmissivity (ft ² /d):			2,960

Table 4: Lithological log 482063 and estimated transmissivity

Description	Depth (feet)	Kx (ft/d)	T (ft ² /d)
surface	0-2		
brown silty clay	2-15		
brown clay	15-74		
sand, fine to small	74-89		
cemented sand and clay	89-99		
brown clay	99-115		
sand, fine to medium coarse	115-132		
blue and gray clay	132-141		
sand fine to medium, ledges	141-158		
brown clay	158-197		
sand, fine to medium	197-244		
soapstone and sandstone	244-326		
shale, limestone, few sandstone	326-404		
sandstone and soapstone	404-455		
limestone and soapstone	455-466		
false red bed	466-475		
sandstone	475-482		
sandstone	482-683	20	4,020
soapstone	683-712	0	0
red bed	712-730	0	0
Transmissivity (ft ² /d):			4,020

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Table 5: Estimated transmissivity from lithological logs

Lithological Log (KGS ID)	Transmissivity
460748	2,000
468967	3,570
425408	2,960
482063	4,020
Average	3,138

Table 6: This analysis of drawdown at File 15,596 compared to historic use. T = 3,100 ft²/d; S = 0.0002

Pumping Well		Rate (gpm)	Volume Pumped (AF)		Distance (ft)	Drawdown (ft)		Change in Drawdown	
File No.	PDIV		Baseline	Proposed		Baseline	Proposed	Feet	% of ST
27,346	49635	676	194.03	198.00	8,123	14.89	14.94	0.04	0.02%
27,346	6527	685	210.84	371.00	11,073	18.39	24.31	5.93	2.96%
27,346	84371	1,354	174.79	192.00	6,956	14.27	14.98	0.72	0.36%
27,347	32783	769	174.67	235.00	5,973	16.99	19.02	2.04	1.02%
27,347	33451	671	151.00	190.00	2,825	19.76	21.09	1.34	0.67%
27,347	1170	711	172.54	180.00	2,715	21.01	21.10	0.08	0.04%
27,347	83394	745	145.48	185.00	4,079	17.28	18.64	1.36	0.68%
27,347	76692	670	166.48	192.00	3,796	18.99	19.88	0.89	0.44%
27,348	54902	650	165.88	205.00	8,416	13.92	15.35	1.43	0.72%
27,348	4809	700	192.03	200.00	4,526	18.31	18.44	0.12	0.06%
27,348	74546	673	171.70	175.00	10,660	11.86	11.90	0.04	0.02%
27,348	74570	648	170.00	170.00	7,043	14.16	14.16	0.00	0.00%
								13.98	6.99%

Table 7: This analysis of drawdown at File 24,175 compared to historic use. T = 3,100 ft²/d; S = 0.0002

Pumping Well		Rate (gpm)	Volume Pumped (AF)		Distance (ft)	Drawdown (ft)		Change in Drawdown	
File No.	PDIV		Baseline	Proposed		Baseline	Proposed	Feet	% of ST
27,346	49635	676	194.03	198.00	13,097	11.63	11.67	0.04	0.02%
27,346	6527	685	210.84	371.00	15,880	14.18	19.70	5.51	2.76%
27,346	84371	1,354	174.79	192.00	13,188	10.50	10.98	0.48	0.24%
27,347	32783	769	174.67	235.00	11,163	12.54	14.35	1.81	0.91%
27,347	33451	671	151.00	190.00	7,506	13.33	14.65	1.33	0.66%
27,347	1170	711	172.54	180.00	11,150	11.68	11.76	0.08	0.04%
27,347	83394	745	145.48	185.00	12,409	10.03	11.35	1.32	0.66%
27,347	76692	670	166.48	192.00	9,366	12.82	13.70	0.88	0.44%
27,348	54902	650	165.88	205.00	6,543	15.74	17.18	1.44	0.72%
27,348	4809	700	192.03	185.00	6,830	15.55	15.21	-0.34	-0.17%
27,348	74546	673	171.70	190.00	4,045	18.19	18.69	0.50	0.25%
27,348	74570	648	170.00	170.00	3,611	18.42	18.42	0.00	0.00%
								13.05	6.52%

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Table 8: This analysis of drawdown at File 24,199 compared to historic use. T = 3,100 ft²/d; S = 0.0002

Pumping Well		Rate (gpm)	Volume Pumped (AF)		Distance (ft)	Drawdown (ft)		Change in Drawdown	
File No.	PDIV		Baseline	Proposed		Baseline	Proposed	Feet	% of ST
27,346	49635	676	194.03	198.00	6,080	16.90	16.95	0.04	0.02%
27,346	6527	685	210.84	371.00	3,490	33.48	39.58	6.10	3.05%
27,346	84371	1,354	174.79	192.00	7,439	13.84	14.56	0.72	0.36%
27,347	32783	769	174.67	235.00	8,282	14.54	16.57	2.03	1.01%
27,347	33451	671	151.00	175.00	13,420	9.82	10.45	0.63	0.31%
27,347	1170	711	172.54	195.00	11,621	11.41	11.95	0.54	0.27%
27,347	83394	745	145.48	185.00	10,680	10.98	12.32	1.33	0.67%
27,347	76692	670	166.48	192.00	10,759	11.89	12.76	0.87	0.44%
27,348	54902	650	165.88	205.00	10,892	12.08	13.50	1.42	0.71%
27,348	4809	700	192.03	200.00	12,230	11.69	12.02	0.33	0.17%
27,348	74546	673	171.70	175.00	14,249	10.02	10.06	0.04	0.02%
27,348	74570	648	170.00	170.00	14,316	9.73	9.73	0.00	0.00%
								14.05	7.02%

Table 9: This analysis of drawdown at File 24,704 compared to historic use. T = 3,100 ft²/d; S = 0.0002

Pumping Well		Rate (gpm)	Volume Pumped (AF)		Distance (ft)	Drawdown (ft)		Change in Drawdown	
File No.	PDIV		Baseline	Proposed		Baseline	Proposed	Feet	% of ST
27,346	49635	676	194.03	198.00	11,240	12.66	12.71	0.04	0.02%
27,346	6527	685	210.84	371.00	14,321	15.27	21.00	5.74	2.87%
27,346	84371	1,354	174.79	192.00	10,749	11.70	12.25	0.55	0.27%
27,347	32783	769	174.67	235.00	8,951	13.96	15.99	2.02	1.01%
27,347	33451	671	151.00	190.00	3,862	17.69	19.03	1.33	0.67%
27,347	1170	711	172.54	180.00	7,508	14.26	14.34	0.08	0.04%
27,347	83394	745	145.48	185.00	8,948	12.12	13.47	1.34	0.67%
27,347	76692	670	166.48	192.00	6,539	15.26	16.14	0.88	0.44%
27,348	54902	650	165.88	205.00	7,095	15.15	16.59	1.44	0.72%
27,348	4809	700	192.03	200.00	4,497	18.36	18.48	0.12	0.06%
27,348	74546	673	171.70	175.00	7,206	14.40	14.44	0.04	0.02%
27,348	74570	648	170.00	170.00	3,532	18.56	18.56	0.00	0.00%
								13.60	6.80%

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Table 10: This analysis of drawdown at File 25,851 compared to historic use. T = 3,100 ft²/d; S = 0.0002

Pumping Well		Rate (gpm)	Volume Pumped (AF)		Distance (ft)	Drawdown (ft)		Change in Drawdown	
File No.	PDIV		Baseline	Proposed		Baseline	Proposed	Feet	% of ST
27,346	49635	676	194.03	198.00	10,205	13.32	13.37	0.04	0.02%
27,346	6527	685	210.84	371.00	13,307	16.11	21.94	5.83	2.92%
27,346	84371	1,354	174.79	192.00	9,491	12.39	13.02	0.64	0.32%
27,347	32783	769	174.67	235.00	7,876	14.92	16.94	2.03	1.01%
27,347	33451	671	151.00	190.00	2,583	20.35	21.69	1.34	0.67%
27,347	1170	711	172.54	180.00	5,863	15.89	15.98	0.08	0.04%
27,347	83394	745	145.48	185.00	7,329	13.42	14.77	1.35	0.68%
27,347	76692	670	166.48	192.00	5,356	16.63	17.51	0.89	0.44%
27,348	54902	650	165.88	205.00	7,401	14.85	16.28	1.43	0.72%
27,348	4809	700	192.03	200.00	3,944	19.24	19.36	0.12	0.06%
27,348	74546	673	171.70	175.00	8,395	13.41	13.45	0.04	0.02%
27,348	74570	648	170.00	170.00	4,491	17.02	17.02	0.00	0.00%
								13.80	6.90%

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