MANAGEMENT PLAN - Amended

For the Designation of a Water Conservation Area (WCA)
McCarty-Rexford WCA; Thomas 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

We, the water right owners, desire to conserve and extend the productive life of the Ogallala Aquifer within Thomas and Sheridan Counties. The purpose of the McCarty-Rexford WCA is to maximize high quality milk production while reducing water use over the term of the WCA based upon long term averages. We will facilitate the execution of the goals through more flexible and efficient use of the water resources, continued adoption of economically viable water conservation and efficiency technologies, and continued analysis of crop/feed selection to reduce water use while increasing or maintaining the nutritional value of the dairy cattle feed.

We recognize the need to conserve the Ogallala Aquifer within Thomas and Sheridan Counties as the water table continues to decline at an unsustainable rate. We are committed to a reduction in water use from a long-term average of 16.22 inches per acre to 15.00 inches per acre on the currently irrigated 1039 acres, while maintaining the stock water right at 250 acre-feet per year. We propose a WCA term of 5-years, commencing on January 1st, 2018 and ending on December 31st. 2022. The proposed reduction in water use equates to a maximum of 7744 acre-feet over the term of the WCA.

We also propose to add additional water rights as shown in Attachment F for the period from January 1st, 2020 and ending on December 31st, 2020. We are committed to a reduction in water use from a long-term average of 14.39 inches per acre to 14.00 inches per acre on the currently irrigated 656 acres. The proposed reduction in water equates to a maximum of 2,296 acre-feet over the term of the WCA.

The maximum amount of water use when the two periods of this amended plan will not exceed the combination of the total water use equaling 10,040 acre-feet

Based on the currently authorized Local Enhanced Management Area (LEMA) Plan, these irrigation water rights are located in townships with 0.5-2% decline and would receive 18 inches per irrigated acre on 1165 acres and 15.4 inches per irrigated acre on 647 acres. The LEMA plan would allocate a total of 12889 acre-feet on the irrigation rights. We recognize that this quantity is not sustainable long term and desire to reduce water below long term averages and below the current LEMA allocation. We also recognize the proposed WCA plan is the first step in reducing water usage and additional reductions may be necessary in future WCA plans to extend the productive life on the Ogallala Aquifer within Thomas and Sheridan Counties.

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 3,660 acre-feet (AF) per year, with an average annual irrigation use during the period 2003-2016 of 2,430 AF. With an approximate 9% reduction from the historical annual average use, the 5-year WCA irrigation allocation is 6,494 AF, 3-year irrigation allocation is 2,296 AF and the 5-year WCA stock allocation is 1,250 AF. The total WCA allocation is 10,040 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

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:

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; and
c) The area has been closed to new appropriations by rule, regulation or order of the Chief Engineer.

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:

- Detailed table with description of WCA geographic boundaries and legal descriptions of water rights - Attachment A
- Maps with WCA geographic boundaries defined- Attachment B
- Estimated useable life maps (if available) - Attachment C
- Changes in water levels (if available) - Attachment D & E
- Summary of water use history - Attachment F
- KGS Observation well(s) data (if applicable) - Attachment G
- KDA-DWR Theis analysis report(s) (if applicable) - Attachment H

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. We, the water right owners, we request the Chief Engineers consideration of the following conservation measures be considered and enumerated under this plan. The measures include the following:

a) Installation of an evaporative condensing milk processing plant in April of 2012. The installation allows us to reclaim 45,000 gallons of water per day or approximately 50 AF per year. We also included waterless urinals in this facility to further reduce our water consumption.
b) Installation of Smart Cow Cooling Systems.
    a. These systems are regulated to increase or decrease sprinkling frequency based on ambient temperature. The system allows us to optimize cow comfort while reducing water use.
    b. The systems also included timer interrupters to shut of sprinkler systems when cows are away from the pen. We estimate water savings to be 50,000 to 100,000 gallons per year depending on climatic conditions.
c) In addition to Smart Cow Cooling systems, we have installed additional cooling measures to decrease water use within the dairy barns including;
    a. Temperature regulated fans that allow for increased start time for water sprinklers by three degrees Fahrenheit;
    b. Installation of tunnel ventilation in the milk parlor allowing for reduced sprinkler usage by reducing ambient temperature by as much as 15 degrees Fahrenheit compared to external temperature.
d) Modification of the water trough cleaning schedule from 3 days per week to 2 days has not impacted cow herd health, productivity, or audit scores while saving an estimated 435,000 gallons per year.
e) Installation of soil moisture probes on all McCarty Family owned property.
f) Increase in load sizes of milk trailers to reduce the frequency of on farm tank washes and washes of trailers used to haul milk.
g) Installation of a tank to reclaim water from our calf milk pasteurizer to be reused as drinking water for our calves.
h) From 2008-2017, we have averaged the reapplication of 222 AF of effluent to irrigated and non-irrigated agricultural fields.

Although our water conservation measures have allowed us to increase our head count at the Dairy to current operating capacity of 4800 head, we believe the measures we have taken have allowed us to conserve considerable amounts of water when considering the dairy and farming operation as a whole. Additionally, we are committed to continually assessing our operation in terms of water use to find water conservation measures that make economic sense for our operation while benefiting the Ogallala Aquifer in Thomas County.

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:
    a. All points of diversion are limited to their annual authorized quantity unless explicitly authorized under this plan.
    b. All points of diversions are limited to their current authorized pumping rates.
    c. The total water use under all water rights combined shall be limited to no more than 10,040 acre-feet for the 5-year duration of this plan.

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. Water Right # 19489-IRR (PDIV# 40566) maybe over-pumped by up to an additional 67 AF/YR for a total of 180 AF/YR.
4. Water Right #19489-STK (PDIV# 64553/79958) may be over-pumped by up to an additional 50 AF/YR for a total of 300 AF/YR
5. Additional dry acres as identified in the grey highlighted portion of Attachment A – WCA Authorized Place of Use may be irrigated.
6. Up to the annual WCA allocation (1702 AF) may be carried over 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.

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.

There is one recognized observation well(s) within one (1) mile of this WCA boundary that has 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 may 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 me 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. 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 withdrawal 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 statue, 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.

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.

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.

_____ Date: 4/1/2020

Ken McCarty - McCarty Dairy LLC - Owner (Signature)
Water Right No(s). 6178, 41788, 6572, 14882, 19489, 47297, 19546

_____ Date: 4/1/2020

Mike McCarty - McCarty Dairy LLC - Owner (Signature)
Water Right No(s). 6178, 41788, 6572, 14882, 19489, 47297, 19546

_____ Date: 4/1/2020

David McCarty - McCarty Dairy LLC - Owner (Signature)
Water Right No(s). 6178, 41788, 6572, 14882, 19489, 47297, 19546

_____ Date: 4/1/20

Clay McCarty - McCarty Dairy LLC - Owner (Signature)
Water Right No(s). 6178, 41788, 6572, 14882, 19489, 47297, 19546

455 N. Franklin, Colby, KS 67701
Full Mailing Address

Ownership@mccartyfamilyfarms.com (785) 460-0596
Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)
) SS
County of THOMAS)
Acknowledged before me on APRIL 1, 2020
by WILLIAM V ADAMS.
Signature: William V. Adams
Notary Public

My commission expires: 6-15-22
(Notary Seal)

NOTARY PUBLIC - State of Kansas
WILLIAM V. ADAMS
My Appt. Exp. 6-15-22

RECEIVED
APR 20 2020
Stockton Field Office
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.

_____ Date: 4/1/2020

Ken McCarty - McCarty Bros Partnership- Partner (Signature)
Water Right No(s). 18838, 18839, 14883, 19488, 35977, 38080, 41379

_____ Date: 4/1/2020

Mike McCarty - McCarty Bros Partnership - Partner (Signature)
Water Right No(s). 18838, 18839, 14883, 19488, 35977, 38080, 41379

_____ Date: 4/1/2020

David McCarty - McCarty Bros Partnership - Partner (Signature)
Water Right No(s). 18838, 18839, 14883, 19488, 35977, 38080, 41379

_____ Date: 4/1/20

Clay McCarty - McCarty Bros Partnership - Partner (Signature)
Water Right No(s). 18838, 18839, 14883, 19488, 35977, 38080, 41379

455 N. Franklin, Colby, KS 67701
Full Mailing Address

Ownership@mccartyfamilyfarms.com (785) 460-0596
Email Address Phone Number

ACKNOWLEDGMENT OF NOTARY

State of Kansas)
) SS
County of THOMAS)
Acknowledged before me on APRIL 1, 2020
by WILLIAM V ADAMS.
Signature: William V. Adams
Notary Public

My commission expires: 6-15-22
(Notary Seal)

NOTARY PUBLIC - State of Kansas
WILLIAM V. ADAMS
My Appt. Exp. 6-15-22

RECEIVED
APR 20 2020
Stockton Field Office
Division of Water Resources

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:

McCarty Dairy LLC/McCarty Bros Partnership
455 N. Franklin
Colby, KS 67701

Groundwater Management District No. 4

DWR-KDA Water Commissioner. Stockton Field Office

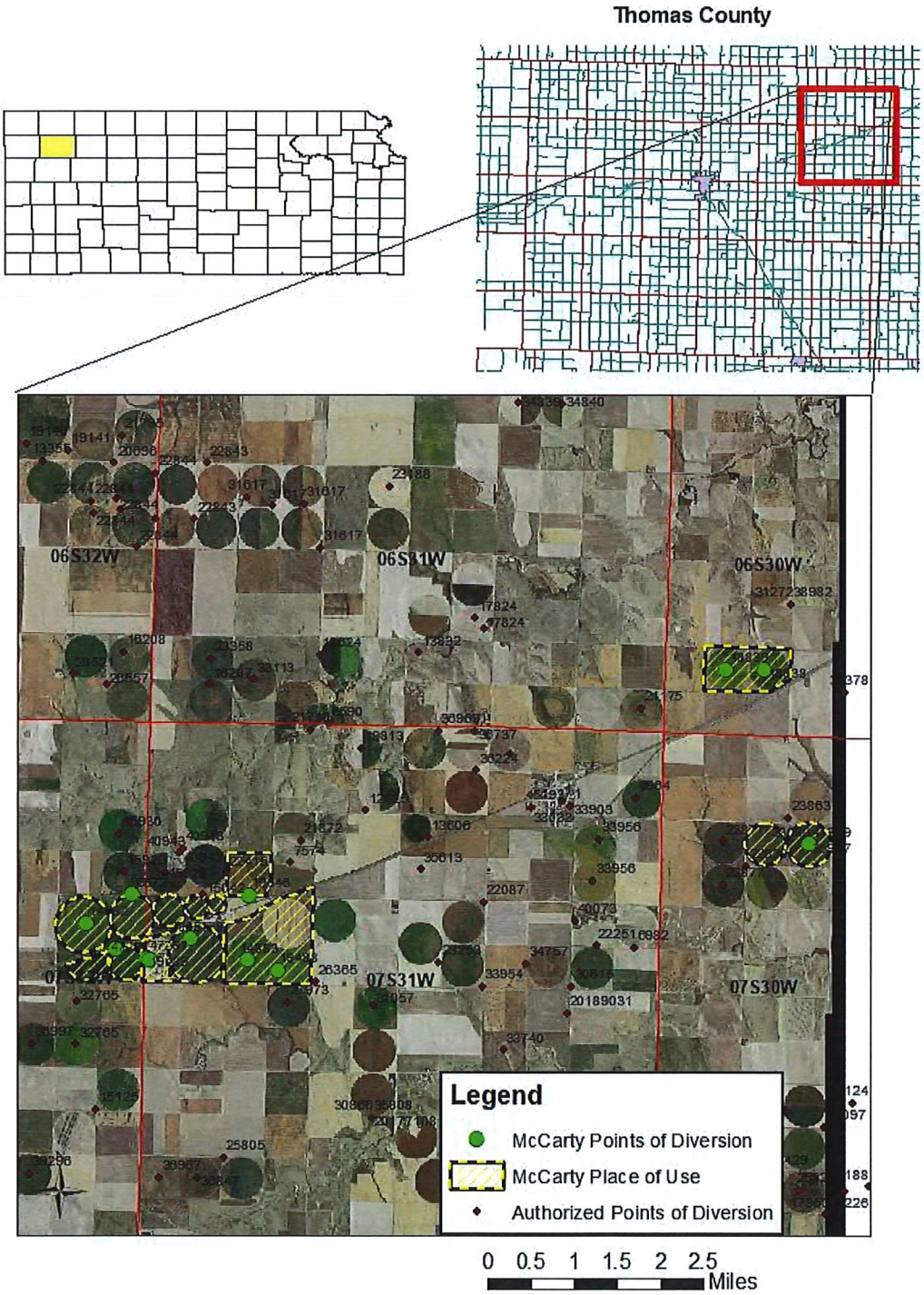
_____
Kansas Department of Agriculture
Staff Person

Attachment A
WCA Place of Use

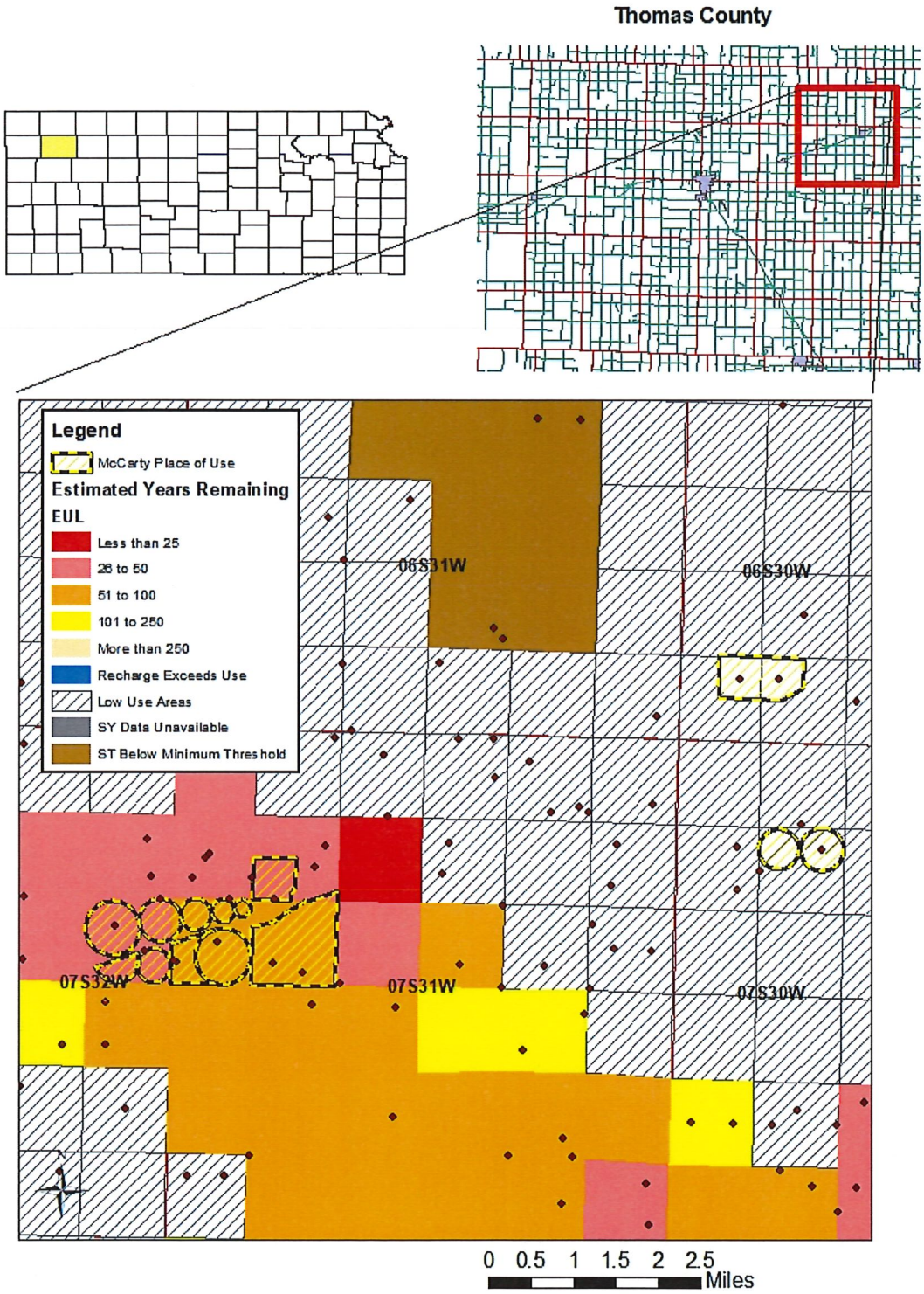
WCA Authorized Place of Use																			
S	T	R	NE¼				NW¼				SW¼				SE¼				TOTAL
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
1	10S	42W	40	40	40	40			20	40	40	40	40	40	40	40	40	40	540
12	10S	42W	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	640
14	09S	42W	40	40	40	40													160
33	09S	41W	40	40	40	40	40	40	40	40									320
34	09S	41W					40	40	40	40	40	40	40	40					320
19	09S	40W									40	37	37	40	40	40	40	40	314
24	09S	41W													40	40	40	40	160
30	09S	40W	40	40	40	40	40	37.11	37.03	40									314.14
25	09S	41W	40			40									40	40	40	40	240
1	10S	41W	40	40	40	40	40	40	40	40	40	40	40	40	30	40	40	40	630
6	10S	40W					40	40	40	40	40	40	40	40					320
7	10S	40W	40	40	40	40	40	38.67	33	40	40	9	2	33					395.67
29	09S	40W	40	40	40	40	40	30	40	40					40	40	40	40	470
8	10S	40W	16	40	40	36	40	40	12	34									258
17	10S	40W	30	30	30	30	30	30	30	30	12			24	2	24	40	8	350
18	10S	40W	26	35	40	38	6			12					9	14			180
20	10S	40W		8			2												10
35	09S	41W													40	40	40	40	160
2	10S	41W	40.4	40.4	40	40	40.4	40.4	40	40									321.6
														Total Authorized Acres					6103

Water Right #	PDIV#	Sect-TWP-Range	Authorized Quantity (AF)
6178 41788	9053	18-07S-31W	342
6572	6829	13-07S-32W	260
14882	53340	13-07S-32W	313
19489-IRR	40566	13-07S-32W	113
19489-STK 47297	64553	18-07S-31W	250
19489-STK 47297	79958	18-07S-31W	na
19546	9453	08-07S-31W	320
~~22087~~	~~17386~~	~~15-07S-31W~~	~~320~~
18838	35278	32-06S-30W	320
18839	54273	31-06S-30W	320
14883	38071	17-07S-31W	592
19488	17481	17-07S-31W	487
35977 38080 41379	42690	08-07S-30W	226 117

Attachment B
Water Right Area Location Map
Water Rights &Authorized Place of Use

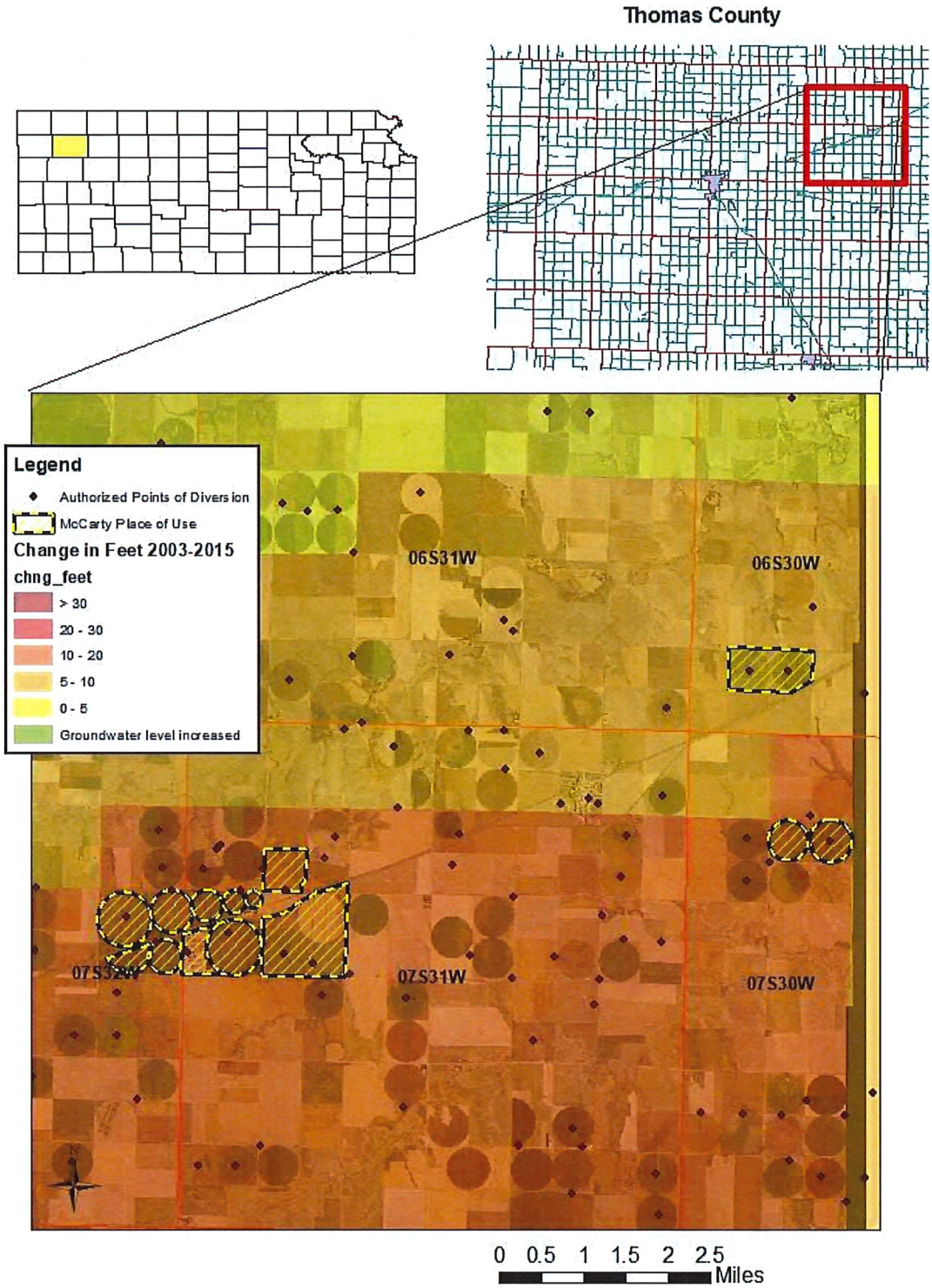


Attachment C
Estimated Usable Life to Support 400 GPM



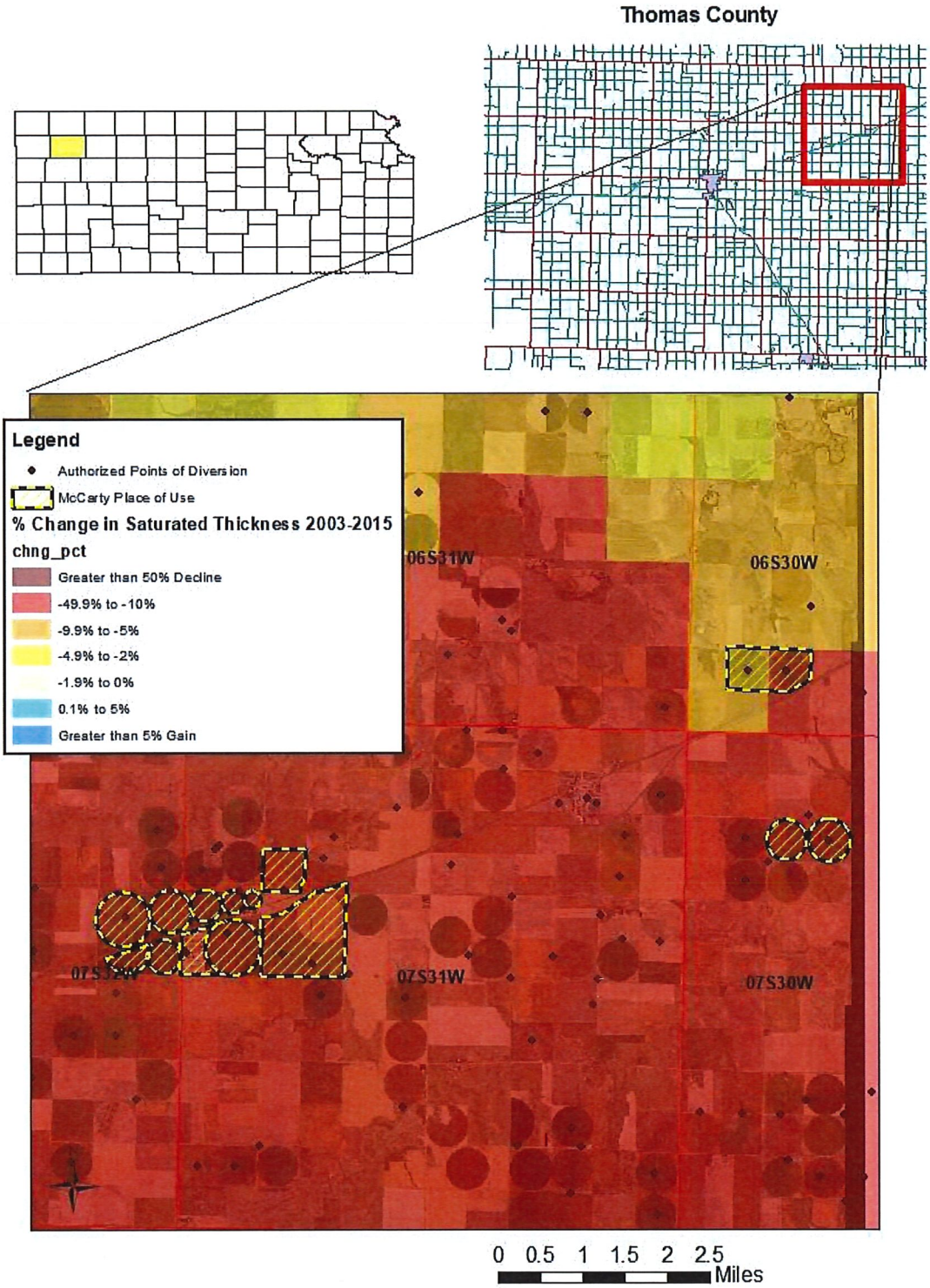
Attachment D

Changes in Water Level (ft) from 2003 to 2015



Attachment E

Percent Change in Saturated Thickness from 2003 to 2015



Attachment F
Summary of Water Use History

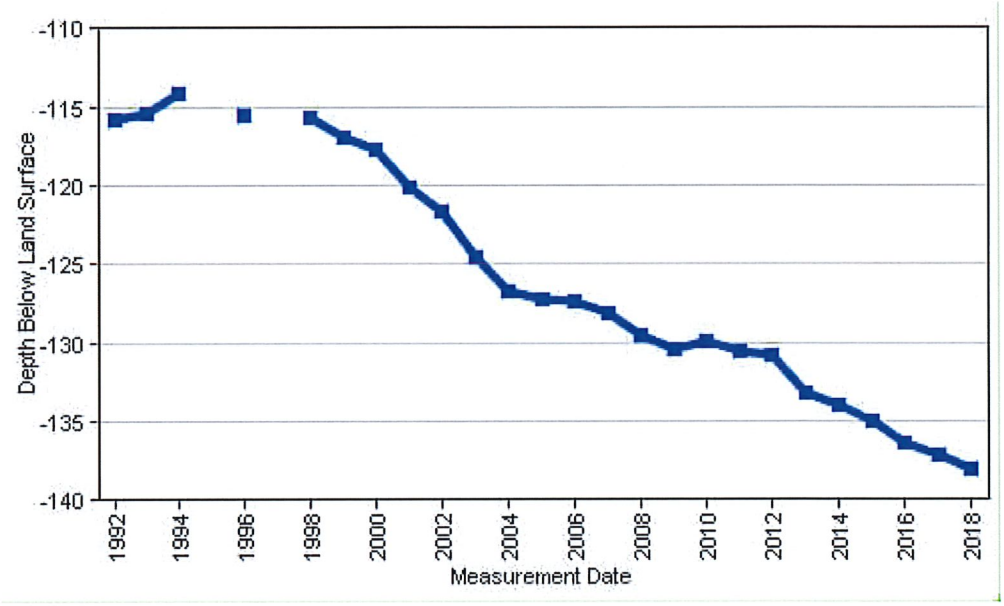
FILE #	6178 & Overlap pd/pu 41788		6572		14882		19489-IRR / 20127370-MF		19489-STK ID3 & Overlap 47297 (Primary Well)		19489-STK ID2 & ID4* Overlap 47297 (Standby Well)		19546		22087		18838		18839		Combined		
YEAR	AF	Acres	AF	Acres	AF	Acres	AF	Acres	AF	Avg. Head	AF	Avg. Head	AF	Acres	AF	Acres	AF	Acres	AF	Acres	AF	Acres	IN/AC
2016	272	215	143	125	219	200	96	142	235.4	4800	0	na	115	120	128	122	103	117	141	120	1089	1039	12.58
2015	274	215	158	125	255	200	111	142	243.14	4800	0	na	78	120	122.59	122	105	117	94.00	120	1075	1039	12.42
2014	265	215	177	125	216	200	119	142	226	4500	0	na	123	120	111.64	122	165	117	174	120	1239	1039	14.31
2013	275	215	249	125	288	200	38	142	206	4750	0	na	150	120	151.77	122	158	117	124	120	1282	1039	14.81
2012	342	215	260	125	357	200	183	142	250	4825	0	na	162	120	215.61	122	154	117	191	120	1649	1039	19.05
2011	296	215	132	125	245	200	110	142	250	4000	0	na	177	120	201.92	122	178	117	179	120	1317	1039	15.21
2010	343	215	155	125	309	200	112	142	250	4000	0	na	118	123	104.78	122	113	117	119	120	1269	1042	14.61
2009	171	215	81	125	160	200	75	142	250	4000	0	na	95	123	132.55	122	78	117	71	120	731	1042	8.42
2008	0	0	160	125	239	200	0	0	235	2075	0	na	114	123	131.08	122	121	117	131	120	765	685	13.40
2007	351	213	255	125	300	200	299	142	0	1875	55	na	195	123	138.82	122	144	117	170	120	1714	1040	19.77
2006	340	213	192	125	264	200	175	142	119	1750	0	na	195	123	134.32	122	160	117	171	120	1497	1040	17.28
2005	313	210	171	125	312	200	145	142	160	1700	0	na	108	123	134.34	122	176	117	181.74	120	1406	1037	16.27
2004	331	210	244	125	300	200	215	142	164	1600	0	na	158	123	174.8	122	247	117	229.36	120	1724	1037	19.95
2003	373	215	217	125	300	200	196	145	137	1550	0	na	167	123	135.91	122	270	117	259.85	120	1783	1045	20.47
AVERAGE:	314.58	213.83	193.31	125.00	277.23	200.00	149.92	142.25	209.66	3412	**	na	143.09	121.62	152.85	122.00	161.07	117.00	166.53	120.00	1406	1040	16.22
Average AF/Acre	1.47		1.55		1.39		1.05		na		na		1.18		1.25		1.38		1.39		1.35		
Average Inches/Acre	17.65		18.56		16.63		12.65		na		na		14.12		15.03		16.52		16.65		16.22		
Average Gallons/Head/ Day ***	na		na		na		na		55		na		na		na		na		na				
Auth. Quantity (total combined, if overlapping PD)	342 AF		260 AF		313 AF		113 AF / 565 AF (MYFA)		81.463 mgy (250 AF)		na		320 AF		320 AF		320 AF		320 AF				
Avg. % Appr. Quanity used	92%		74%		88%		Currently in 5th year of MYFA (5 years)		84%		na		45%		48%		50%		52%		#DIV/0!		

FILE #	14883		19488		35977		38080		41379		Combined		
YEAR	AF	Acres	AF	Acres	AF	Acres	AF	Acres	AF	Acres	AF	Acres	IN/AC
2016	212.75	205	272	205	264	246					749	656	13.70
2015	245.21	205	248	205	260	246					753	656	13.78
2014	215.1	205	338	205	253	246					806	656	14.75
2013	84	205	239	205	249	246					572	656	10.46
2012	358.89	205	357	205	321	246					1037	656	18.97
2011	294.64	205	326	205	292	246					913	656	16.69
2010	294.25	205	210	205	227	246					731	656	13.38
2009	212.06	205	159	205	217	246					588	656	10.76
2008	113	205	179	205	229	246					521	656	9.53
2007	340.56	205	247	270	220	246					808	721	13.44
2006	382.42	205	321	270	329	246					1032	721	17.18
2005	279.77	205	272	270	267	246					819	721	13.63
2004	347.18	205	402	270	328	246					1077	721	17.93
2003	358.26	205	276	270	362	246					996	721	16.58
AVERAGE:	267.01	205.00	274.71	228.21	272.71	246.00	0.00	0.00	0.00	0.00	814	679	14.39
Average AF/Acre	1.30		1.20		1.11		#DIV/0!		#DIV/0!		1.20		
Average Inches/Acre	15.63		14.45		13.30		#DIV/0!		#DIV/0!		14.39		
Average Gallons/Head/ Day ***	na		na		na		na		na				
Auth. Quantity (total combined, if overlapping PD)	342 AF		260 AF		313 AF		320 AF		320 AF				

Attachment G

KGS Observation Well Data

USGS ID:	392631100501201	**KGS Local Well ID:**	07S 32W 13DBD 01
County:	Thomas	**PLSS Description:**	7S 32W 13 SENWSE
HUC 8 Code:	10260011	**GMD:**	Northwest Kansas GMD #4
Longitude:	-100.838228	**Lat/Long Source:**	GPS (within 50 feet)
Latitude:	39.442954	**Lat/Long Accuracy:**	5 seconds
Surface Elevation (ft):	3028	**Depth of Well (ft):**	223
Geological Unit Codes:	TO	**USGS Map Name:**	GEM NE
Use of Site:	Withdrawal of Water	**Use of Water:**	Irrigation
WWC5 Links:	None	**WIMAS Link:**	40566



Attachment H
Theis Analysis

Theis analysis of proposed McCarty WCA

A Theis analysis was performed to evaluate the effects of the proposed McCarty WCA flexibilities. Under the proposal Water Right File 19,489, which authorizes both irrigation and stockwater use, would be allowed to exceed its authorized quantity. The annual quantity would be limited to 180 acre-feet for irrigation and 300 acre-feet for stockwater. The impacts were evaluated at a nearby well authorized by Water Right File 32,765.

The drawdown under the proposed conditions was compared to a baseline condition. Average water use from 2006-2015, excluding 2009, was used for the baseline scenario. Transmissivity is estimated from nearby well logs (Figures 1 and 2, Tables 2 and 3). Saturated thickness is interpolated from 2015-2017 monitoring well measurements. Storage coefficients were assumed to be the saturated thickness multiplied by 10^{-5}. The irrigation well was assumed to pump at its authorized rate. The stockwater well was assumed to pump continuously at a constant rate. The net change in drawdown at nearby File 32,765 is an increase of 2.16 feet or 3.08% of the current saturated thickness (Table 1).

Table 1: Theis analysis of drawdown at File 32,765. T = 50,000 gpd/ft; S = 0.0007

WCA	Rate (gpm)		Volume Pumped (AF)		Distance	Drawdown (ft)		Change in Drawdown	
Well	Baseline	Proposed	Base.	Prop.	(ft)	Base.	Prop.	Feet	% of ST
STK	125.6	185.9	202.83	300.00	5,062	2.81	4.15	1.34	1.91 %
IRR	650.0	650.0	127.44	180.00	4,794	6.35	7.17	0.82	1.17 %
					Net:	9.16	11.32	2.16	3.08 %

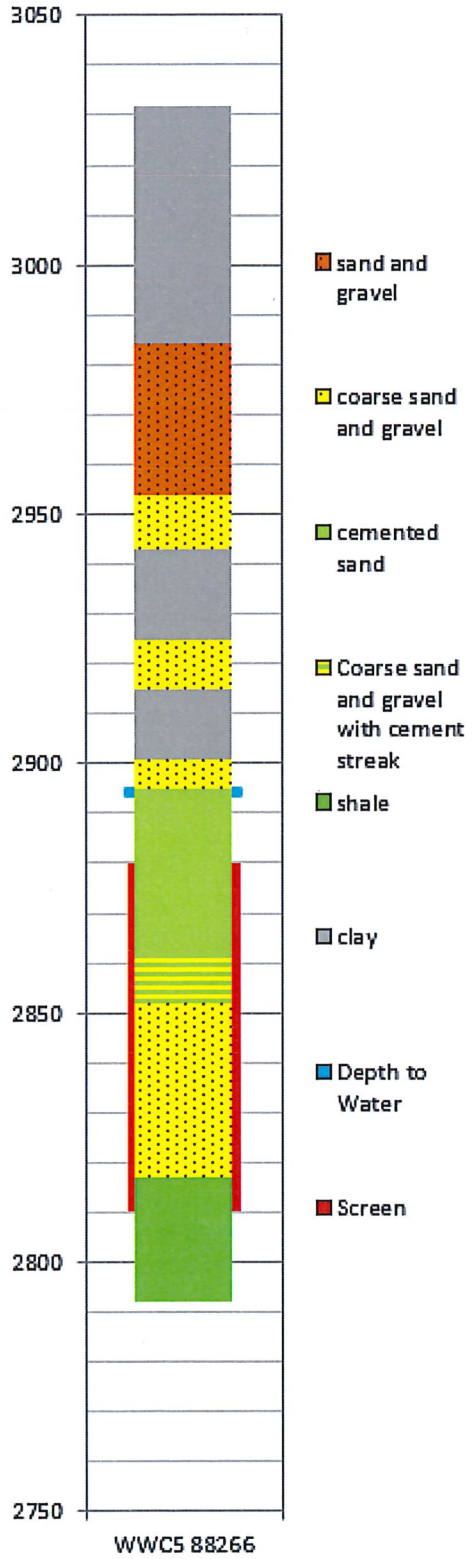


Figure 1: WWC5 log 88266 near File 32,765

Table 2: Lithological log and transmissivity estimate for log 88266

Depth (feet)	Description	Kx (ft/day)	T (ft^2/d)
0 - 48	Clay	Above estimated water level	
48 - 78	Sand and gravel		
78 - 89	Coarse sand and gravel		
89 - 107	Clay		
107 - 117	Coarse sand and gravel		
117 - 131	Clay		
131 - 137	Coarse sand and gravel		
137 - 138	Cemented sand and caliche		
138 - 171	Cemented sand and caliche	15	495
171 - 180	Coarse sand and gravel with cement streak	150	1,350
180 - 215	Coarse sand and gravel	160	5,600
215 - 240	Ochre and shale	0	0
		Transmissivity (ft^2/day)	7,445
		Transmissivity (gpd/ft)	55,689

F

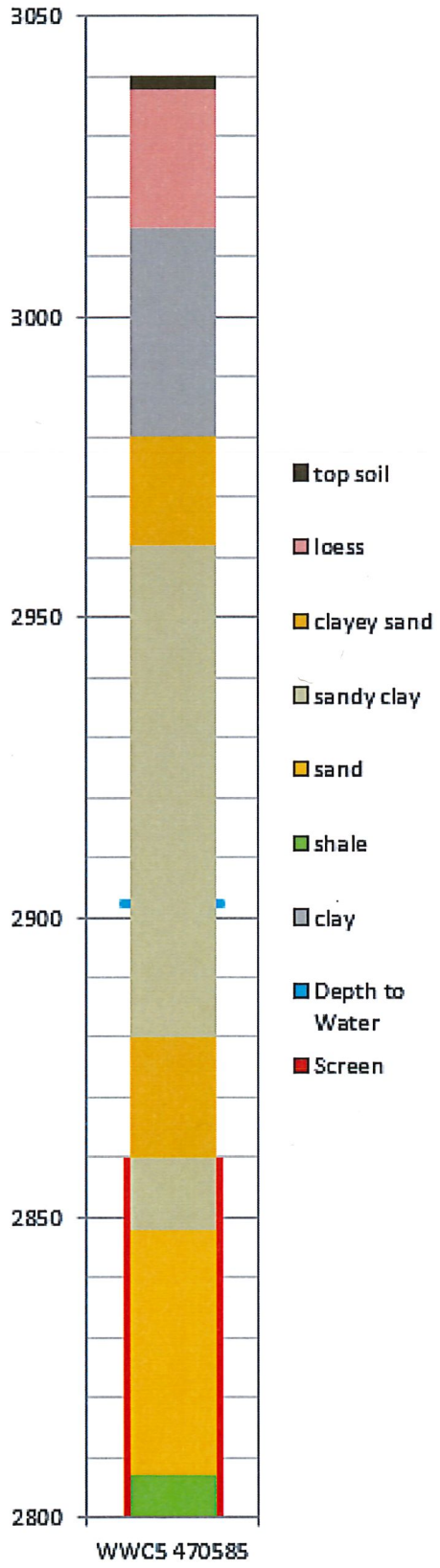


Figure 2: WWC5 log 470585 near stockwater well

Table 3: Lithological log and transmissivity estimate for log 470585

Depth (feet)	Description	Kx (ft/day)	T (ft^2/d)
0 - 2	surface	Above estimated water level	
2 - 25	loess		
25 - 60	clay with caliche streaks		
60 - 78	fine and med sand with clay and caliche streaks		
78 - 138	clay and caliche with sand streaks		
138 - 160	clay and caliche with sand streaks	10	220
160 - 180	fine and med sand with clay and caliche streaks	45	900
180 - 192	clay and caliche with sand streaks	15	180
192 - 233	fine and med sand and small gravel with clay lenses	130	5,330
233 - 240	yellow ochre	0	0
		Transmissivity (ft^2/day)	6,630
		Transmissivity (gpd/ft)	49,592