

**Before the Chief Engineer of the Kansas Department of Agriculture,
Division of Water Resources,
the Director of the Kansas Water Office, and
the Secretary of Health and Environment**

**In the matter of the application of the
Cities of Hays and Russell, Kansas for
approval to transfer water from
Edwards County pursuant to the
Kansas Water Transfer Act.**

Pursuant to K.S.A. 82a-1501, *et seq.*

**FIRST AMENDED
APPLICATION TO TRANSFER WATER
FROM EDWARDS COUNTY, KANSAS
TO THE CITIES OF HAYS AND RUSSELL, KANSAS**

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Introduction

In an *Application to Transfer Water from Edwards County, Kansas to the Cities of Hays and Russell, Kansas*, filed on January 6, 2016, Hays and Russell (the “Cities”) sought approval to transfer water from thirty-two water appropriation rights on property they own in Edwards County, Kansas (the “R9 Ranch”), to Schoenchen, Kansas and then on to Hays and Russell for municipal use.

Hays purchased the R9 Ranch, including its appurtenant groundwater rights, in January of 1995. Hays later sold an undivided interest in the Ranch to Russell. The Cities purchased the Ranch because their existing sources of municipal water do not meet their current or long-term needs.

Nearly 7,000 acres in size, the R9 Ranch sits along the south side of the Arkansas River in southwestern Edwards County, approximately 5 miles southwest of Kinsley. The R9 Ranch is in the Middle Arkansas River subbasin except for a few acres that cross over into the far western edge of the Rattlesnake Creek subbasin. The R9 Water Rights currently authorize irrigation from 57 wells, with a total annual appropriation of over 8,000 acre-feet.¹

To “transfer” an annual quantity of more than 2,000 acre-feet of water more than 35 miles, the Kansas Water Transfer Act² requires an applicant to obtain orders from the Chief Engineer, contingently changing the relevant characteristics of the subject water rights. In this case, the Chief Engineer has signed a Master Order³ and thirty-two Change Approvals⁴ contingently changing each of the R9 Water Rights from irrigation to municipal use. The contingently approved changes will become effective upon the entry of an Order approving the requested water transfer and the execution of a contract to begin construction of municipal wells on the R9 Ranch.

To meet the requirements of the Water Transfer Act and DWR regulations, the Cities submit this *First Amended Application to Transfer Water from Edwards County, Kansas to the Cities of Hays and Russell, Kansas* and respectfully request authorization to

¹ Ex. 1.

² K.S.A. 82a-1501, *et seq.*

³ Ex. 2, Master Order.

⁴ *Id.*, The 32 Change Approvals are attached to and part of the Master Order. On May 15, 2019, the Chief Engineer gave notice to the Cities that the well locations on the maps attached to the Amended Change Applications control over minor discrepancies in the distances North and West of the Southeast Corners of the relevant Sections in the Change Approvals. The Chief Engineer’s May 15, 2019 letter is attached to Ex. 2.

transfer up to 6,756.8 acre-feet of water per year for municipal use in Hays and Russell. In support of this Transfer Application, the Cities provide the following information as required by K.A.R. 5-50-2(a) - (z) which requires that to be complete, a transfer application must provide information in response to each of the 26 subsections. See the Table of Contents above and responses to each subsection below.

(a) The names and mailing addresses of the applicants:

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(b) The maximum quantity of water proposed to be transferred in a calendar year and the proposed maximum diversion rate:

As stated above, the Cities request authorization to transfer up to 6,756.8 acre-feet of water per year for municipal use in Hays and Russell. The maximum annual quantities to be transferred from each of the R9 Water Rights are set out in Table 1.⁵ The quantities and rates of diversion for each of the 14 municipal wells are provided in Table 2.⁶

Table 1				
DWR File No.	Circle No.	Acre Feet Converted from Irrigation to Municipal Use by Well	Acre Feet Converted from Irrigation to Municipal Use by Water Right	Proposed Municipal Wells
21,729-D1	8	86.0		A
		102.0		A
	9	188.0		A
21,729-D1 Totals			376.0	
21,729-D2	7	74.0		A
		114.0		A
	10	188.0		A
21,729-D2 Totals			376.0	
21,730	1	176.0	176.0	G

⁵ See also, Ex. 2, Table 1.

⁶ See also, Ex. 2, Table 2.

21,731	2	80.0 ⁷		G
		192.0		
	3	177.0		H
		126.0		
	4	87.0		H
56.0				
5	162.0		H	
21,731 Totals			800.0	
21,732-D1	6	188.0		B
	11	165.0		B
21,732-D1 Totals			353.0	
21,732-D2	12	240.0	240.0	B
21,733	13	189.0	189.0	C
21,734	14	290.9		D
	15	170.2		D
	16	121.0		E
	17	130.2		D
	18	176.8		C
21,734 Totals			889.1	
21,841	8A	195.0	195.0	F
21,842	11A	195.0	195.0	E
22,325	19	186.0	186.0	I
22,326	20	188	188	I
22,327	21	145.8	145.8	I
22,329	24	75.0	75.0	J
22,330	25	75.0	75.0	J
22,331	22	180.0	180.0	J
22,332	23	135.0	135.0	J
22,333	39	50.0	50.0	K
22,334	27	136.1	136.1	K
22,335	26	142.6	142.6	K

⁷ One of the irrigation wells on Circle No. 2 allows diversion of 80.0 acre-feet and the other allows the diversion of 192.0 acre-feet annually. However, when combined, no more than 192 acre-feet can be diverted in a single calendar year.

22,338	28	116.6	116.6	L
22,339	29	118.8	118.8	L
22,340	31	116.6	116.6	M
22,341	30	188.0	188.0	M
22,342	36	75.0	75.0	M
22,343	35	122.0	122.0	N
22,345	38	159.0	159.0	N
22,346	37	140.4	140.4	N
27,760	32	142.5		L
	33	142.6		K
27,760 Totals			285.1	
29,816	9A	90.0		F
	10A	98.0		E
29,816 Totals			188.0	
30,083	36	69.7	69.7	M
30,084	24 & 25	75.0	75.0	J
Total			6,756.8	

Table 2		
Proposed Municipal Well	Annual Quantity in Acre-Feet	Rate of Diversion in Gallons per Minute
A	752	945
B	593	885
C	365.8	1,360
D	591.3	1,500
E	414	1,270
F	285	1,040
G	368	1,040
H	608	765
I	519.8	805
J	540	700
K	471.3	700
L	377.9	950
M	449.3	950
N	421.4	1,040
Total	6,756.8	

The quantities to be transferred will be subject to the following Limitations set out in the Master Order.

The Ten-Year Rolling Aggregate Limitation

The Chief Engineer has made a finding of fact that it is appropriate to permit the Cities to divert up to 6,756.8 acre-feet of water per calendar year from the R9 Water Rights based on historic consumptive use⁸ but has imposed a further Limitation on the quantity of water that can be diverted during any rolling 10-year period based on an estimated quantity of water that can be reasonably diverted from the R9 Water Rights.⁹

To establish this Limitation, the Chief Engineer required the Cities to prepare a computer model of the aquifer that assesses the impact of the transfer on the

⁸ Ex. 2, §§ III., XII., and XIV.

⁹ *Id.* at §§ IV.A. and XIII.A.

surrounding area.¹⁰ Based on the model results, the Chief Engineer entered an additional finding that a ten-year rolling average of 4,800 acre-feet of water per year is a reasonable maximum quantity for the long-term yield from the R9 Water Rights.¹¹

The Ten-Year Rolling Aggregate Limitation permits the Cities to divert up to 6,756.8 acre-feet of water each year from the combined R9 Water Rights so long as the quantity diverted during any calendar year, plus the total of the quantities diverted from the combined R9 Water Rights during each of the 9 previous calendar years, does not exceed 48,000 acre-feet of water.

The Ten-Year Rolling Aggregate Limitation is imposed for the exclusive benefit of the public as a whole and not for the benefit of any other water right, person, or entity and does not confer any benefits or create any rights in any third party.¹²

Because the Limitation is imposed by the Master Order and incorporated into each of the Change Approvals, there is no need to include similar Limitations in any order approving the water transfer. The Cities respectfully request that the Hearing Panel approve the transfer of the individual quantities requested for each of the R9 Water Rights without further Limitations.

The Reasonable-Need Limitations

The Kansas Water Appropriation Act limits appropriation rights to the reasonable needs of appropriators.¹³ DWR regulations reflect that requirement when changing irrigation water rights to municipal use.¹⁴

Pursuant to these requirements, the Chief Engineer has imposed the Reasonable-Need Limitations on each of the Cities. These Limitations cap the total quantity of water that can be diverted from the R9 Water Rights for municipal use by each of the Cities, when combined with all other water rights owned by each City.

The Project will provide a long-term supply of water to the Cities and to other communities in the region and is expected to have a design life of at least 50 years and to be productive even longer.

¹⁰ *Id.* at § IV.B. and Ex. 3, Burns and McDonnell, *R9 Ranch Modeling Results*, September 24, 2018.

¹¹ Ex. 2, § XIII.A.

¹² *Id.* at ¶¶ 165 and 227.

¹³ K.S.A. 82a-707(e).

¹⁴ See K.A.R. 5-5-9(a)(6) (1994 version).

DWR's traditional method to establish the reasonable needs of municipal users uses 20- to 40-year timeframes, which is appropriate for most growing municipalities, principally because most are close to alternative sources that can meet their short-, medium-, and long-term needs.

Unlike most other Kansas cities, the Hays and Russell must look far afield to find reliable water sources.

Because obtaining long-term financing for the Project is unlikely if the full 6,756.8 acre-feet of water for municipal use that is available from the R9 Ranch could not be accessed without the Chief Engineer's approval, he included an objective method to increase the quantity of water that could be used as needs increase based on actual and projected population changes, the reasonable needs of additional users, and other measurable indices.¹⁵

The Reasonable-Need Limitations are set out in the Master Order and discussed in more detail in Paragraphs (s) and (z), *infra*.

(c) The location of the proposed point or points of diversion:

The Cities intend to consolidate the 57 existing irrigation wells on the R9 Ranch into 14 new municipal wells designated as municipal wells A–N.¹⁶ The consolidation is depicted in Ex. 1 and the initial well locations are provided in Table 3, *infra*.

The Cities have reviewed the existing data to formulate a plan for the diversion and transportation of water from the R9 Water Rights to the Cities but have not yet conducted hydrologic testing to select precise well locations.

Instead, the Cities requested,¹⁷ and the Chief Engineer approved,¹⁸ placement of the new municipal wells within 1,000 feet of the preliminary well locations in Table 3 so long as all of DWR's and GMD5's applicable well-location requirements and restrictions are met,¹⁹ including:

¹⁵ Ex. 2, §§ IV.B and XIII.B.

¹⁶ See Table 2, *supra*.

¹⁷ Exs. 4-36.

¹⁸ See Ex. 2, § XVIII.

¹⁹ See Ex. 2, ¶ 42.

- ◆ The new municipal wells will divert water from the same source of supply as the original irrigation well locations.²⁰
- ◆ The new municipal wells will be no more than one-half mile from the original irrigation well locations.²¹
- ◆ All municipal wells will be more than 1,320 feet from wells with an earlier priority, except those wells owned by the Cities.²² In fact, the distance between existing irrigation wells outside of the R9 Ranch will be maintained or increased.²³
- ◆ All municipal wells will be more than 660 feet from all existing domestic wells, except domestic wells owned by the Cities.²⁴
- ◆ The distance between (i) municipal wells with a source of supply in the Arkansas River alluvium and the centerline of the River and (ii) the centroid of the irrigation wells being consolidated into that municipal well and the centerline of the River will not decrease by more than 10 percent.²⁵

During the design process, well locations will be refined by locating the highest yielding portions of the aquifer with compatible water quality. Existing data, such as well logs, pump tests, monitoring wells, water quality analyses, and test borings, will be utilized to focus development on areas with optimum saturated thickness, hydraulic conductivity, and groundwater quality. In addition, changes in pumping patterns associated with the conversion from irrigation to municipal use will be considered. Well spacing between proposed municipal wells will be maximized to limit interference and minimize aquifer stress.²⁶

²⁰ K.S.A. 82a-708b(a)(3); K.A.R. 5-25-2a(a) and (d).

²¹ K.A.R. 5-25-2a(a).

²² K.A.R. 5-4-4(c)(1)(C) and (d); K.A.R. 5-25-2a and K.A.R. 5-25-2(a).

²³ Ex. 2, ¶ 208.

²⁴ K.A.R. 5-4-4(c)(2)(C) and (d); K.A.R. 5-25-2a and K.A.R. 5-25-2(a).

²⁵ K.A.R. 5-5-13.

²⁶ Ex. 37, June 16, 2015, Burns and McDonnell Memo re: *R9 Ranch Conversion to Municipal Water Supply, Methodologies for Well Site Selection*.

Maps attached to each of the Amended Change Applications²⁷ show the proposed well location and the areas within 1,000 feet of each of the points shown in Table 3 where new municipal wells can be placed without violating regulatory restrictions.

Table 3	
A	A well in the NE/4 of the NE/4 of the SW/4 of Section 29 T25S-19W, 2,264 Feet North and 2,568 Feet West of the SE Corner of the Section.
B	A well in the SE/4 of the SW/4 of the NE/4 of Section 32 T25S-19W, 2,748 Feet North and 1,714 Feet West of the SE Corner of the Section.
C	A well in the NE/4 of the SE/4 of the SW/4 of Section 33 T25S-19W, 830 Feet North and 3,019 Feet West of the SE Corner of the Section.
D	A well in Lot 3 of Section 5 T26S-19W, 4,806 Feet North and 3,036 Feet West of the SE Corner of the Section.
E	A well in the NW/4 of the SE/4 of the SE/4 of Section 5 T26S-19W, 1,549 Feet North and 880 Feet West of the SE Corner of the Section.
F	A well in the NW/4 of the SE/4 of the NE/4 of Section 4 T26S-19W, 4,553 Feet North and 1,260 Feet West of the SE Corner of the Section.
G	A well in the NW/4 of the NE/4 of the SW/4 of Section 30 T25S-19W, 2,278 Feet North and 3,779 Feet West of the SE Corner of the Section.
H	A well in the SW/4 of the SW/4 of the NE/4 of Section 31 T25S-19W, 3,144 Feet North and 1,882 Feet West of the SE Corner of the Section.
I	A well in the SE/4 of the NE/4 of the NW/4 of Section 1 T26S-20W, 5,132 Feet North and 2,908 Feet West of the SE Corner of the Section.
J	A well in the NE/4 of the SW/4 of the SW/4 of Section 1 T26S-20W, 1,634 Feet North and 4,078 Feet West of the SE Corner of the Section.
K	A well in the NW/4 of the SW/4 of the NE/4 of Section 11 T26S-20W, 3,630 Feet North and 2,141 Feet West of the SE Corner of the Section.
L	A well in the SW/4 of the NE/4 of the SE/4 of Section 10 T26S-20W, 1,862 Feet North and 882 Feet West of the SE Corner of the Section.
M	A well in the SW/4 of the NE/4 of the NE/4 of Section 15 T26S-20W, 4,370 Feet North and 1,167 Feet West of the SE Corner of the Section.
N	A well in the SW/4 of the NW/4 of the SE/4 of Section 15 T26S-20W, 1,725 Feet North and 2,421 Feet West of the SE Corner of the Section.

²⁷ Exs. 5-36.

(d) The location of the proposed point or points of use:

The places of use will be the:

- ◆ The R9 Ranch.
- ◆ City of Hays and its immediate vicinity as well as related areas in the NE/4 of Section 19 and the NW/4 of Section 36, T13S-R18W.²⁸
- ◆ City of Russell and its immediate vicinity.²⁹

Agreements to sell water to other municipal users in the future will require applications to change the place of use.

(e) The proposed use made of the water:

Municipal use.

(f) Any economically and technologically feasible alternative source or sources of supply available to the applicants and to any other present or future users of the water proposed to be transferred. The water transfer application shall specify why this source of supply was selected over the alternative sources available:

There are no alternative economically and technologically feasible sources of supply available to the applicants

The R9 Ranch was not selected over or in lieu of any other source because there are no alternative sources that will meet the Cities' long-term needs.

The Cities' existing water rights are not adequate to meet present municipal needs during periods of normal precipitation. During droughts, the Cities' municipal needs are more acute and even drastic. New water rights are not available in the region for several reasons and the diversion of groundwater in the basin west of the Cedar Bluff Reservoir, and the Reservoir itself, have impaired the Cities' water rights in the Smoky Hill River alluvium.

After years of searching for alternative sources of water, it is clear that the R9 Ranch is the only source that will realistically meet the Cities' long-term water needs. There are no other sustainable, environmentally, economically, or technologically feasible water-supply alternatives available.

²⁸ Ex. 2, § XVI.

²⁹ Ex. 2, § XVI.

See Appendix A for a partial list of alternatives explored by the Cities during their decades-long search.

There are no other present or future users of the water proposed to be transferred

The Cities own the R9 Ranch and are the only “present or future users of the water proposed to be transferred.” There are no other reasonably foreseeable future users of the R9 Water Rights.

- (g) The proposed plan of design, construction, and operation of any works or facilities used in conjunction with carrying the water from the point or points of diversion to the proposed point or points of use. The proposed plan shall be in sufficient detail to enable all parties to understand the impacts of the proposed water transfer:**

The R9 Ranch was originally acquired for development as a supplemental water supply resource for the Cities, and possibly other municipalities in the future. The Cities have not prepared detailed plans and specifications at this time.³⁰ The proposed plan is set out in the Amended Change Applications;³¹ and documents prepared by Burns & McDonnell.³²

Development of the R9 Ranch as a municipal water supply is anticipated to occur in phases yielding up to a projected normal capacity of approximately 4.0 million gallons of water per day. Full development of the Ranch as a municipal water supply will involve installation of 14 public water supply wells and supporting infrastructure including well houses, power distribution, raw water collection piping, a water storage tank, and a high service pump station.³³

The largest piece of required infrastructure will be a new pipeline approximately 65 miles in length from the R9 Ranch to Schoenchen, KS.³⁴ The new pipeline will tie into the existing pipeline from Schoenchen to Hays. A separate pipeline from Schoenchen to

³⁰ The statute and the regulations require that a transfer applicant provide a “proposed plan of design, construction, and operation” of the collection and transmission system that is in “sufficient detail to enable all parties to understand the impacts of the proposed water transfer.” However, full set of detailed plans and specifications is not required at this stage of the proceeding. K.S.A. 82a-1502(c)(6) and K.A.R. 5-50-2(g).

³¹ Exs. 5–36.

³² Exs. 1 and 37-40.

³³ *Id.*

³⁴ Ex. 39.

Russell’s raw water collection system will be constructed when Russell decides to begin taking water from the R9 Ranch.

The design, construction, and operation of the proposed infrastructure is summarized in Table 4 and discussed in more detail in the Burns and McDonnell Exhibits.

Table 4								
Phase	Yield (mgd)	Wells Required	Transmission Pipeline	Pump Stations	Storage Tanks	Collection Piping	Power Distribution	Civil Improvements
I	2.0	6 - 8	65 Miles	1	1	Yes	Yes	Yes
II	1.0	2 - 4	None	None	None	Yes	Yes	Yes
III	1.0	2	None	None	None	Yes	Yes	Yes

(h) The estimated date for completion of the infrastructure and initial operation thereof:

The Cities are not presently able to predict how long it will take to complete the Project. There are a number of prerequisites that must be completed before the Cities can begin initial operation. While it is impossible to provide a precise schedule for completion, the Chief Engineer has asked the Cities to provide their “hoped-for schedule of implementation.”

The Cities must first obtain an Order from the Panel approving the transfer. The Transfer Act includes a required schedule.³⁵ Table 5, provides the minimum and maximum days for each step in the proceeding beginning after the Chief Engineer determines that the Transfer Application is complete and the Panel selects a Hearing Officer.

Obtaining an Order is expected to take between 8 and 20 months after the Panel appoints the Hearing Officer.

³⁵ K.S.A. 82a-1503(b).

Table 5		
	Min.	Max.
Notice of Prehearing Conference (Must be issued within 14 days after the Hearing Officer is appointed.)	0	14
Prehearing Conference starts (Cannot start for 90 days but must start within 120 days after the required notice.)	90	120
Prehearing Conference concludes (the Conference must conclude within 45 days.)	0	45
Public Hearing starts (Cannot start for 90 days but must start within 120 days after the Prehearing Conference.)	90	120
Public hearing concludes (Must conclude within 120 days after commencement.)	5	120
Hearing Officer's Initial Order	30	90
Transfer Panel's Final Order	30	90
	Total Days	245
	Total Months	8.2
		599
		20.0

Additional prerequisites that must occur after obtaining an Order approving the proposed transfer and time estimates are provided in Table 6.

Table 6		
	Min.	Max.
Design of an affordable collection and transmission system including the Phase 1 municipal wells, the collection system and pump station on the R9 Ranch, the pipeline, and related infrastructure.	12	24
Obtaining permits and approvals for road, railroad, pipeline, and stream crossings; and easements and rights-of-way as needed. <i>(concurrent with Design)</i>	3	9
Obtain project financing <i>(concurrent with Design)</i>	2	12
Obtain KDHE approval of the wells, collection system, pumping station, and pipeline.	1	3
Bidding and construction of the project.	24	36
Total Months	37	63

The City of Hays has been collecting a one-half cent sales tax to fund the Project for many years. However, additional financing will be required, which cannot be obtained until after the Transfer is approved. The Cities expect to obtain the required financing concurrently with the activities described in Table 6.

Based on these estimates, and assuming that a Hearing Officer is selected by June 1, 2019, the Cities expect the project to be complete and ready for service between March of 2023, and March of 2026.

(i) That the benefits to the State if the transfer is approved outweigh the benefits to the State if the transfer is not approved:

The Transfer Act defines “water transfer” as the movement of more than 2,000 acre-feet of water per year farther than 35 miles.³⁶ The Act requires some applicants to establish that the benefits to the state of approval outweigh the benefits to the state of denial. Because this transfer will not “reduce the amount of water required to meet the present or any reasonably foreseeable future beneficial use of water by present or future users” in Edwards County, the Cities will not be required to demonstrate that the benefits to the State of approving the transfer outweigh the benefits to the State of disapproval.³⁷

Nevertheless, Transfer Application must be approved by the Hearing Panel before the Cities are permitted to build the Project and transfer water from the R9 Ranch to Hays and Russell. The Act provides that: “No person shall make a water transfer in this state unless and until the transfer is approved pursuant to the provisions of this act.”³⁸

The comparison of the proposed transfer’s benefits to the State is only triggered when the State can choose to allocate a particular source of unallocated water to one user instead of another.³⁹ Because the Cities own the R9 Water Rights, there are no present or future users in the area of origin with a realistic expectation that any of that

³⁶ K.S.A. 82a-1501(a)

³⁷ K.S.A. 82a-1502(a).

³⁸ K.S.A. 82a-1502(a).

³⁹ *Id.* The Water Transfer Act was first enacted in 1983 and amended in 1993 to stop Wichita and other communities in central Kansas from obtaining water rights for unallocated water stored in Milford Reservoir. The State was in a position to determine, as a matter of public policy, whether that unallocated water should be made available to municipal users in central Kansas or reserved for future use in the Kansas River Basin. Because Hays and Russell own existing water rights, the State is not in the same position with respect to the water rights on the R9 Ranch as it was with respect to unallocated storage in Milford Reservoir – thus, no benefits-comparison is required in the present situation.

water will ever be available to them. Thus, the threshold requirement is not met, and the benefits comparison is not triggered in this case.

Moreover, because approval of this Transfer Application does not require a demonstration that the benefits to the State of approving the transfer outweigh the benefits to the State of disapproval, evidence establishing each of the factors set out in K.S.A. 82a-1502(c)(1)-(9) and K.A.R. 5-50-2(f), (g), (k), (l), (m), (n), (o), (p), and (q) is not required.⁴⁰

The Cities acknowledge that information requested in the cited provisions of the statute and the DWR regulation may be of interest to the Hearing Panel and relevant to other issues that the Panel may consider in its deliberations. For that reason, and for that reason only, and without conceding that such proof is required or waiving that argument, the Cities are providing the information requested in the cited provisions of the regulation and intend to introduce evidence on these issues at the transfer hearing.

Thus, the Cities are not aware of any benefits to the State of failing to approve the transfer and incorporate paragraphs (f)–(g), (k), and (l)–(q), *infra*. As discussed in detail in paragraph (m), *infra*, approval of the Transfer Application will create direct economic benefits for families in Hays, Russell, and the region as well as for the numerous public and private institutions that call Hays and Russell home. Without adequate water, the Cities will wither, resulting in significant direct and indirect economic, social, and political detriments to the State.

Moreover, approval of the transfer application is likely to reduce the stress on the Smoky Hill River caused by the Hays and Russell water rights that draw water from the alluvium and the surface. Reduced stress will enhance the health of the River and increase the likelihood that minimum desirable streamflow requirements at Ellsworth will be met.

⁴⁰ Factors listed in K.S.A. 82a-1502(c)(5), (7), (8), and possibly (9) appear to overlap with factors in K.S.A. 82a-1502(b), which must be established in order to approve the Transfer.

(j) That the proposed transfer will not impair water reservation rights, vested rights, appropriation rights, or prior applications for permits to appropriate water:

Approval of the Transfer Application will not cause impairment.

Regional groundwater flow is to the northeast.⁴¹ There are very few groundwater wells down-gradient of the R9 Ranch, with the nearest approximately 1.5 miles away.⁴² The wells closest to the R9 Ranch are side-gradient, to the southeast.⁴³

The R9 Water Rights have priority dates from 1974–1977,⁴⁴ making them among the most senior water rights in the area. In fact, since the R9 Water Rights were approved in the mid-1970s, irrigation use on the R9 Ranch has never caused impairment, impairment complaints, or impairment concerns.

The Change Approvals for each of the R9 Water Rights comply with existing consumptive use and spacing rules, which are designed to protect senior rights from impairment.⁴⁵ Moreover, no proposed point of diversion will be placed within one-half mile of any existing lawfully permitted well.⁴⁶

Finally, the Chief Engineer has contingently imposed, and the Cities have agreed to contingently accept, a further reduction in the quantity of water that can be diverted from the R9 Water Rights. Consumptive-use Limitations reduce the quantity of water that can be changed from irrigation to municipal use to 6,756.8 acre-feet per year. The Master Order and the Change Approvals further reduce the available water by imposing the Ten-Year Rolling Aggregate Limitation, discussed *supra*.⁴⁷

There are no water reservation rights⁴⁸ or prior applications for permits in the region.

⁴¹ Ex. 3, 2018-09-24 *Revised BMcD Modeling Report*, Figures 5 and 8.

⁴² *Id.* p. 6.

⁴³ *Id.*

⁴⁴ The most senior R9 Water Right, File, 21,729 D-1, has a January 2, 1974, priority date; the most junior R9 Water Right, File, 30,084, has a July 1, 1977, priority date.

⁴⁵ See ¶ (c), *supra*.

⁴⁶ Ex. 2, ¶ 208.

⁴⁷ See ¶ (b), *supra*.

⁴⁸ The term “water reservation rights” could refer to federally reserved water rights held by the United States pursuant to *Winters v. U.S.*, 207 U.S. 564 (1908), but probably refers

There is no reason to believe that water rights of any kind will be impaired by the transfer.

- (k) Any current beneficial use of the water that is proposed to be transferred, including minimum desirable streamflow requirements:**

Current Use.

The R9 Water Rights are currently authorized for irrigation and will be changed to municipal use as provided in the Master Order.⁴⁹

Minimum desirable streamflow requirements.

None of the R9 Water Rights are subject to Minimum Desirable Streamflow Requirements, which are imposed on all water appropriation rights with priority dates after April 12, 1984.⁵⁰ The most junior water right on the R9 Ranch, File 30,084, has a July 1, 1977 priority date.⁵¹

- (l) Any reasonably foreseeable future beneficial use of the water:**

The only reasonably foreseeable beneficial use of the R9 Water Rights is municipal unless this Transfer Application is denied, in which case the Cities may continue using the R9 Water Rights for irrigation.

- (m) The economic, environmental, public health and welfare, and other impacts of approving or denying the transfer of water:**

Economic Impacts

For the reasons discussed in this section, the gross revenue product generated in Hays and Russell approaches \$2.0 billion making it vital to the overall Kansas economy. Approval of the Transfer Application will create direct economic benefits for families in Hays, Russell, and the region as well as for the numerous public and private institutions

to water rights created pursuant to the Kansas Water Plan Storage Act, K.S.A. 82a-1301, *et seq.*, which are special water rights held by the Kansas Water Office permitting the diversion and storage of surface water in conservation storage water supply capacity or conservation storage water quality capacity in federal reservoirs in which the state controls storage space. K.S.A. 82a-1303(a). There are no water reservation rights of either kind in the region.

⁴⁹ Ex. 2, § XI.

⁵⁰ K.S.A. 82a-703b(a).

⁵¹ See Ex. 36.

that call Hays and Russell home. Those benefits will translate into direct and indirect benefits to the State of Kansas.

The Cities' existing water sources do not meet their present needs, and the Cities, their many inhabitants, and the numerous people and entities reliant upon them, have all sacrificed in some way during the decades-long struggle to find a sufficient water supply. Without adequate water, the Cities will wither, along with the significant benefits they provide to the entire State.

The City of Hays, Kansas

The City of Hays makes significant direct and indirect contributions to the State's economy and livelihood. Approving the Transfer Application will foster and improve the significance and quality of that contribution.

Incorporated in 1885 with an estimated population of 20,845 as of July 1, 2017,⁵² the City of Hays is the largest municipality in northwest Kansas and the county seat of Ellis County.⁵³ The City serves as a regional center for education, healthcare, professional services, shopping, culture, and recreation.⁵⁴ In 2012, the Kansas Department of Revenue stated that Ellis County had the highest "trade pull factor" of all Kansas counties. Trade pull factor is measured by dividing the county sales tax collections per capita by the average statewide sales tax per capita.⁵⁵

The Hays Unified School District had an estimated enrollment of 3,177 students during the 2016/17 school year.⁵⁶ The District is served by five elementary schools, two middle schools, and one high school.⁵⁷ There are also three parochial schools in the City.

A branch of the North Central Kansas Technical College is located in Hays. It offers nursing, business and computer technology, business management, automotive mechanics, and residential electricity programs.⁵⁸

⁵² <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>, accessed on October 9, 2018.

⁵³ Ex. 41, excerpt from 2017 Official Statement for Hays bond issue.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *Id.*

Fort Hays State University has a combined campus and online enrollment of Approximately 14,658 students. It has four colleges and a graduate school. The University plays an important role in the education and economy of the State.⁵⁹

Hays has extensive medical resources serving its residents and the region, including the Hays Medical Center, one of the top rural medical centers in the United States, which recently became a part of the University of Kansas Health system. The Hays Medical Center provides health services to a population of more than 130,000, employs more than 1,200, and is home to DeBakey Heart Institute of Kansas.⁶⁰

Hays is also home to the Hays Pathology Lab, the Hearing Center, Fort Hays State University's Nurse Education Program, the Home Healthcare Services of Western Kansas, two nursing homes, Developmental Services of Northwest Kansas, and the High Plains Mental Health Center.⁶¹

Hays is located on Interstate 70, a major east-west transportation route. It has daily freight service provided by several motor freight lines and the Union Pacific Railroad.⁶²

The Hays Regional Airport is located three miles southeast of town and has two concrete runways. The longest is 6,501 feet by 100 feet; the other runway is 4,501 feet by 75 feet. ⁶³ The Airport provides commercial service by United Express to Denver and Chicago.⁶⁴

Hays sponsors numerous indoor and outdoor activities, with 22 city parks, 300 acres of land with an 18-hole municipal golf course, picnic areas, ballfields, a sports complex, a jogging and fitness trail, a municipal swimming pool, and an aquatic park.⁶⁵

⁵⁹ *Id.*

⁶⁰ *Id.* at PDF p. 1.

⁶¹ *Id.*

⁶² *Id.*

⁶³ <http://www.airnav.com/airport/KHYS>, accessed on October 18, 2018.

⁶⁴ <http://flyhays.com/new-flight-schedule/>, accessed on October 18, 2018.

⁶⁵ Ex. 41, excerpt from 2017 Official Statement for Hays Bond issue.

Hays also hosts numerous cultural activities, including several historical and scientific museums; an arts council, which provides music, dance, theater, fine arts, and literature activities; and performances and exhibits sponsored by Fort Hays State University.⁶⁶

Hays is home to the Sternberg Museum of Natural History, which utilizes research, publications, collections, interpretive exhibits, and educational programs to advance an appreciation and understanding of Earth's natural history.⁶⁷

Hays is home to no less than 24 churches, more than 50 restaurants, 15 hotels, 10 car dealerships, 10 apartment complexes, and the Big Creek Crossing retail mall, which includes more than 25 retailers.

The *Hays Daily News*, the *Hays Post*, the *Ellis Review*, and Fort Hays State University Tiger Media Network provide local and national newspaper and news media coverage.

Hays is also home to the Kansas State University, Agricultural Research Center – Hays, with 8 faculty researchers and 24 full-time support staff.⁶⁸ The research facility at Hays includes the Center's headquarters consisting of 33 buildings.⁶⁹ The Hays Agricultural Research Center owns and manages land that is used for research and production including 268 acres of buildings, roads, and waterways, including a greenhouse complex; 2,133 acres of cropland; 4,944 acres of rangeland; and a 900-head research feedlot with a modern feedmill.⁷⁰ The Center has two satellite units including the, "H.B. Ranch" in Trego County and "Saline Experimental Range" in the Saline River watershed approximately 25 miles northeast of Hays in Ellis County.⁷¹

Properties owned or leased by public entities in Ellis County are appraised at over **\$237 million**.⁷²

⁶⁶ *Id.*

⁶⁷ <http://sternberg.fhsu.edu/>, accessed on October 18, 2017.

⁶⁸ <https://www.hays.k-state.edu/index.html>, accessed on October 17, 2018.

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² Ex. 42, list of publicly owned and leased property in Ellis County, Kansas.

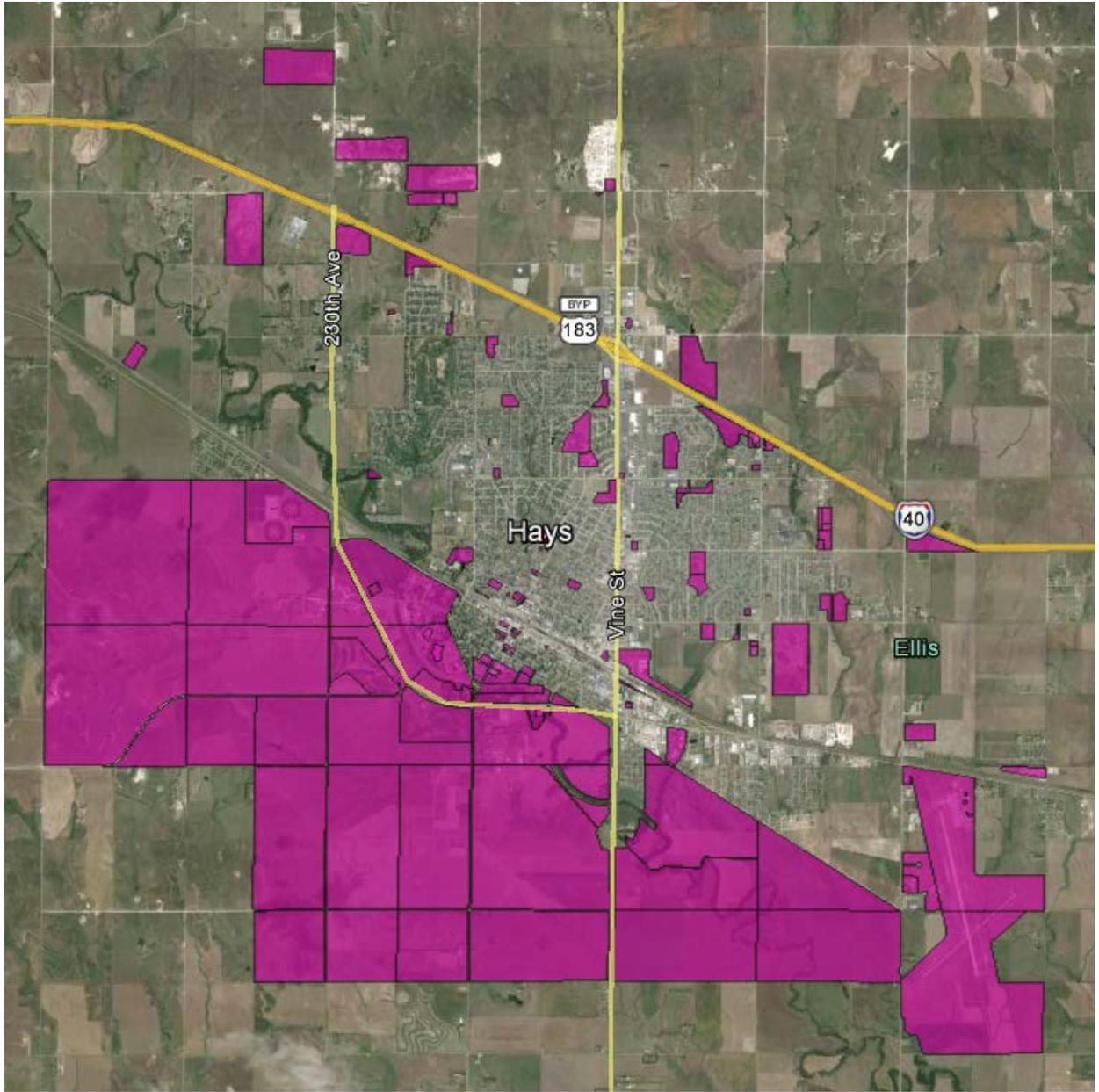


Figure 1. Publicly owned or leased real property in and around Hays.

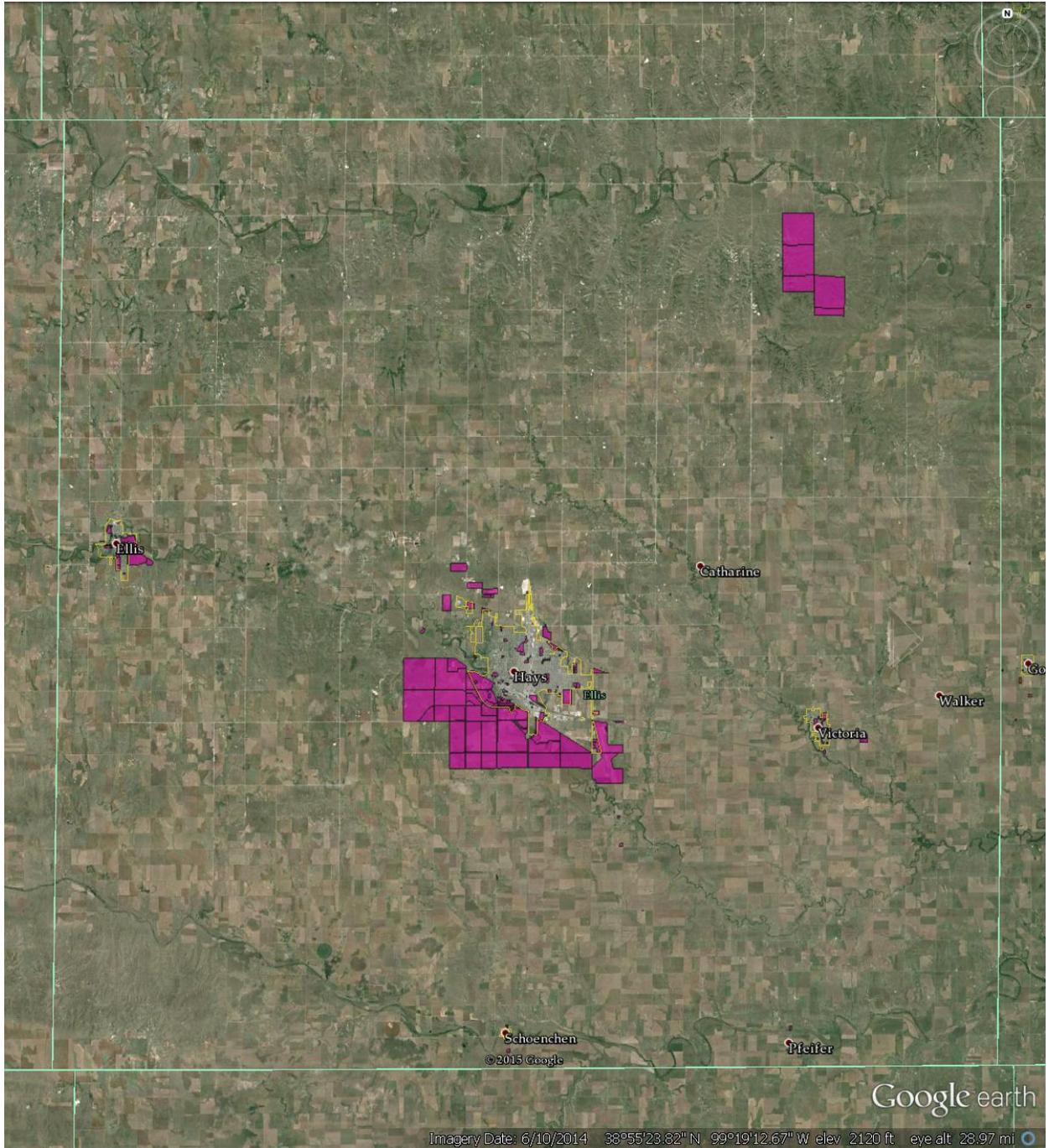


Figure 2. Publicly owned or leased real property in Ellis County.

City of Russell, Kansas

Incorporated in 1872, with an estimated population of 4,463 as of July 1, 2017,⁷³ the City of Russell serves as the Russell County seat.⁷⁴

Russell owns and operates its own electric, water, and sewer systems and provides solid waste collection and disposal services.⁷⁵ Russell is served by two major highways: I-70 and US-281 and offers rail service from Union Pacific Railroad.⁷⁶ The Russell Municipal Airport is a general aviation airport located two miles southeast of the City and has a 5,000-foot by 75-foot concrete runway.⁷⁷

Russell Unified School District No. 407 employs 173 people and provides public education to approximately 865 students through two elementary schools, one middle school, and one senior high school.⁷⁸ Russell has several vocational and technical junior colleges and universities within 100 miles, including North Central Kansas Technical College at Beloit; Barton Community College at Great Bend; Fort Hays State University and North Central Kansas Vo-Tech, both in Hays.⁷⁹

The Russell Regional Hospital is a full-service facility employing approximately 180 people and serves both Russell and the surrounding rural areas.⁸⁰

Russell's public recreation facilities include: 160 acres of city parks; a 9-hole municipal golf course; a public swimming pool; numerous ball parks and playing fields; and a municipal library.⁸¹ Russell has more than 10 restaurants, 9 churches, 25 retail stores, and 4 hotels.

⁷³ https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml, accessed on October 16, 2018.

⁷⁴ Ex. 43, excerpt from 2015 Official Statement for City of Russell bond issue.

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ <http://www.airnav.com/airport/KRSL>, accessed on October 19, 2018.

⁷⁸ Ex. 43.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

Russell is also home to wheat gluten and ethanol manufacturing facilities located in the City's industrial park. Russell County is one of the leading petroleum-producing counties in the State.⁸²

As noted above, adequate water will create direct benefits to federal, state, and local governments. Properties owned or leased by public entities in Russell County are appraised at nearly **\$50 million**.⁸³

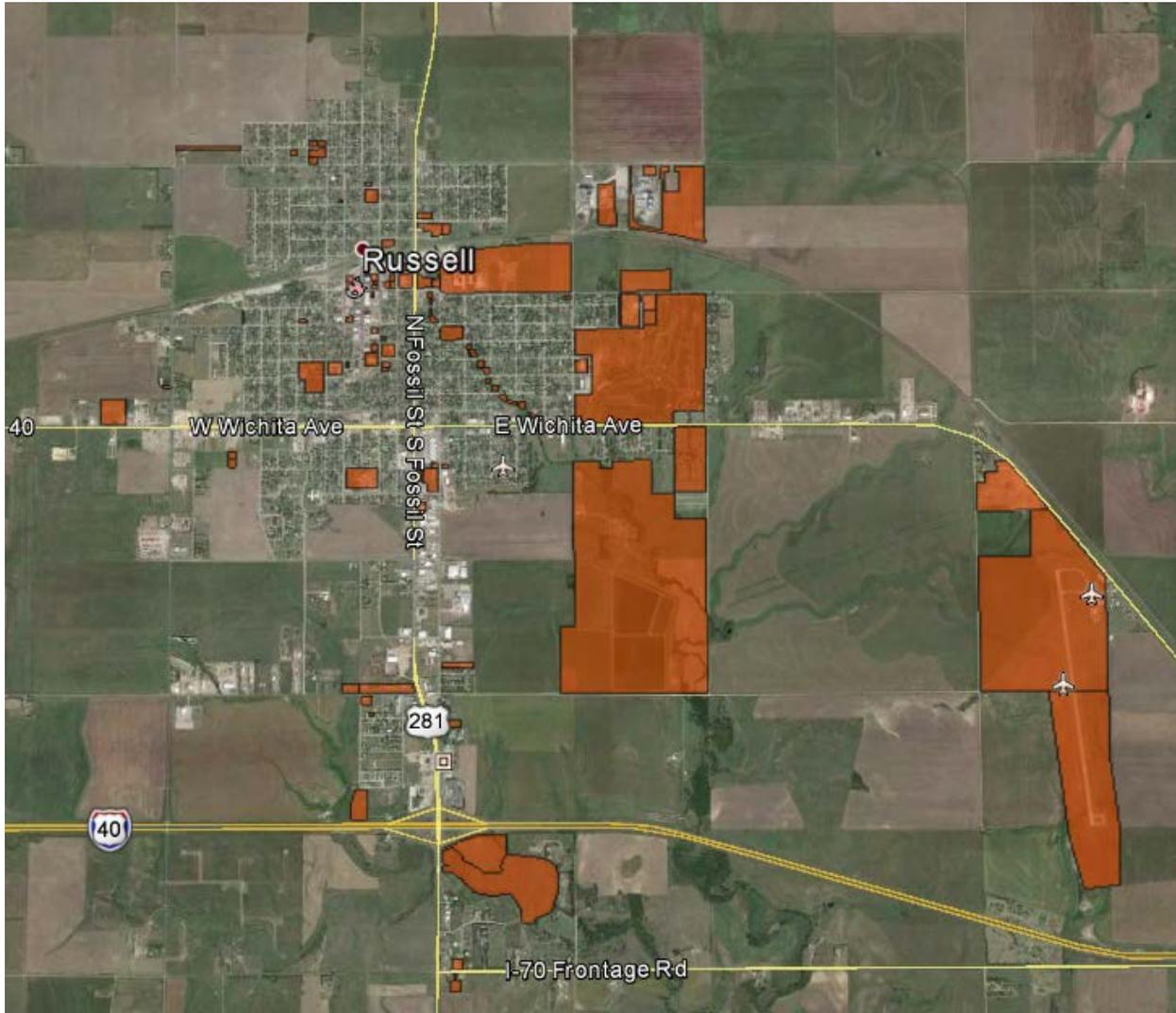


Figure 3. Publicly owned or leased real property in and around Russell.

⁸² *Id.*

⁸³ Ex. 44, list of publicly owned and leased property in Russell County.

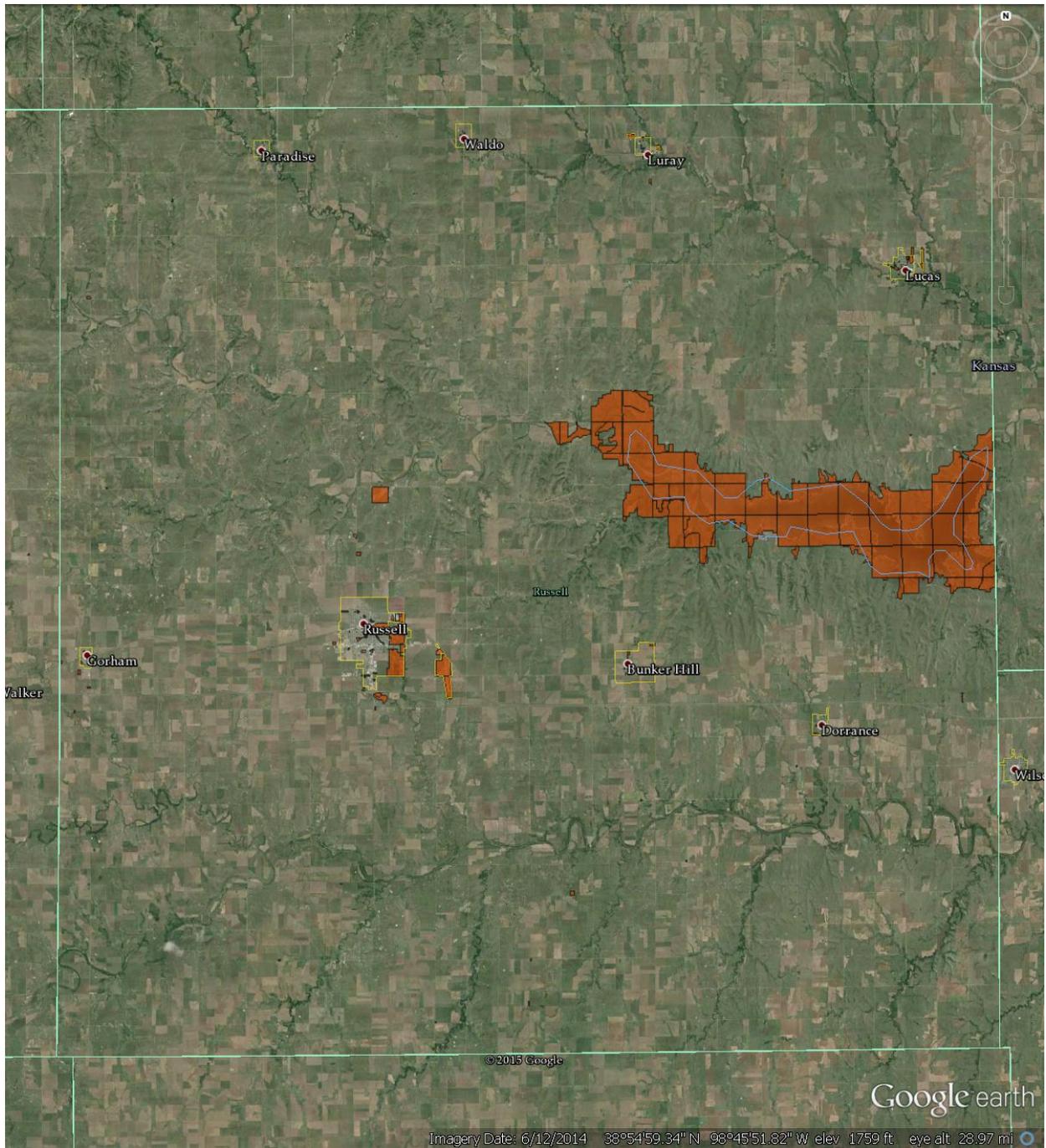


Figure 4. Publicly owned or leased property in Russell County.

State-Wide Economic Impacts

In 2014, Hays asked the Docking Institute of Public Affairs⁸⁴ at Fort Hays State University to evaluate the economic impact that Hays and Russell have on the surrounding regions and the Kansas economy as a whole. The 2014 Docking Economic Report used well-established input-output models and economic-location theory to measure the economic productivity and the impact that Hays and Russell have on the economy by evaluating the Cities' land, labor, capital, and entrepreneurial resources compared with the larger region and statewide.⁸⁵ The report was intended to "aid government officials in determining whether the economic benefits of the region warrant administrative approval and the public resources needed to tap [the R9 Ranch as an] alternate water source."⁸⁶

The 2014 Docking Report concludes that the "City of Hays is the economic center of a regional economy in northwestern Kansas that is important to the State of Kansas" and that Hays and Russell are "particularly important for stimulating and maintaining the health of the overall Kansas economy."⁸⁷

This is not surprising for many reasons, including the enormous amount of state-owned infrastructure in Hays, including Fort Hays State University; the Kansas State Experiment Station; the State Highway Patrol Headquarters; branch offices of the Kansas Department of Transportation; the Kansas Department of Health and Environment; the Kansas Department of Wildlife, Parks and Tourism; the Division of Motor Vehicles; and the Department for Children and Families.⁸⁸ Kansas and the Federal government have placed their offices at the intersection of two busy highways—U.S. 183 and I-70, the transportation center for northwest Kansas. Thousands of individuals live in Hays as a direct result of employment by the State and the federal government.

⁸⁴ The primary mission of the Docking Institute "is to facilitate effective public policy decision making among governmental and non-profit entities."

<https://www.fhsu.edu/docking>.

⁸⁵ Ex. 45, Docking Institute, *Economic Impact of the Hays and Russell Region On the Kansas Economy*, at 5–9 (Dec. 2014) (discussing methodology and data).

⁸⁶ *Id.* at 5.

⁸⁷ *Id.* at 4.

⁸⁸ See Exs. 42, 44, and Figures 1-4, *supra*.

Hays' and Russell's gross revenue product is about \$1.8 billion and growing.⁸⁹ Using "trade pull factors," the 2014 Docking Economic Report measured the "retail trade dominance" of Ellis County and Hays compared to the surrounding counties.

A value of 1 indicates that non-resident purchases [in the City] are equal to resident purchases outside of the area of residence. A value that is less than 1 indicates that non-resident purchases are less than resident purchases made outside the area of residence. And, a value that is greater than 1 indicates the non-resident purchases are greater than resident purchases made outside the area of residence.⁹⁰

"For Hays the 2013 [trade pull factor] is 1.68 which shows that non-resident retail purchases in Hays are much larger than the retail purchases made outside of Hays by Hays residents."⁹¹ In fact, Hays' trade pull factor is now the second highest, sometimes falling to number three, of all Kansas cities with more than 10,000 residents. And Ellis County's 1.41 trade pull factor is the second highest of all counties in Kansas with populations greater than 25,000.⁹²

The Report concludes that "loss of any vital resource [by the Hays and Russell area], the most vulnerable to which the area is susceptible being water, would cause a serious loss of population and industry and would have a significant negative effect on the entire Kansas economy."⁹³

As the economic and social hub of the region, the population of Hays expands on a daily basis and increases further in response to special events held within the City. According to a 2010 Population Report⁹⁴ by the Docking Institute:

- ◆ There are 27,284 people in Hays on an average day, including Hays residents, non-Hays residents who travel to Hays for any reason from the nine-county region and those non-Hays residents who stay in local hotels/motels on an average day.

⁸⁹ Ex. 45, Docking Institute, *Economic Impact of the Hays and Russell Region On the Kansas Economy*, at PDF p. 4 (Dec. 2014).

⁹⁰ *Id.* at PDF p. 9.

⁹¹ *Id.*

⁹² *Id.* at PDF pp. 15–16.

⁹³ *Id.* at PDF p. 14.

⁹⁴ Ex. 46, Docking Institute, *Estimation of Average Daily Population and Peak Population Levels During Special Events in Hays, Kansas*, at PDF pp. 7–8 (May 2010).

- ◆ There were 32,916 people in Hays on the day when the State 2-1A Football Championship was hosted in 2009. In all 6,742 people attended this event, including 1,110 Hays residents, 30 people who stayed in motels/hotels, 130 people who stayed with friends/family in Hays, and 5,472 people who came to Hays for the day.
- ◆ There were 29,983 people in Hays on the peak attendance day of the Hays City Shootout in 2009. In all, 4,838 people attended this event, including 2,139 Hays residents, 241 people who stayed in motels/hotels, 174 people who stayed with friends/family in Hays, and 2,284 people who came to Hays for the day.
- ◆ There were 37,192 people in Hays on the peak attendance day of the 3-2-1A State Wrestling Tournament in 2010. In all, 12,097 people attended this event, including 830 Hays residents, 5,456 people who stayed in motels/hotels, 237 people who stayed with friends/family in Hays, and 5,574 people who came to Hays for the day.
- ◆ There were 35,614 people in Hays on the peak attendance day of the 1A State Basketball Tournament in 2010. In all, 9,476 people attended this event, including 1,146 Hays residents, 1,172 people who stayed in motels/hotels, 150 people who stayed with friends/family in Hays, and 7,008 people who came to Hays for the day.
- ◆ There were 32,319 people in Hays on the peak attendance day of the Special Olympics Basketball & Cheerleading Tournament in 2010. In all, 7,855 people attended this event, including 1,461 Hays residents, 4,285 people who stayed in motels/hotels, 332 people who stayed with friends/family in Hays, and 1,777 people who came to Hays for the day.
- ◆ On an average day, 5,512 people travel to Hays from the nine-county region for any reason.
- ◆ On an average day, 3,580 people travel to Hays from the nine-county region for shopping or retail trade.
- ◆ On an average day, 699 people travel to Hays from the nine-county region to see a doctor, dentist, hospital, or other health service provider.
- ◆ On an average day, 1,605 people travel to Hays from the nine-county region to work.

- ◆ On an average day, 619 people travel from the nine-county region to attend school in Hays.
- ◆ On an average day, 1,359 visitors stay in hotels and motels in Hays.⁹⁵

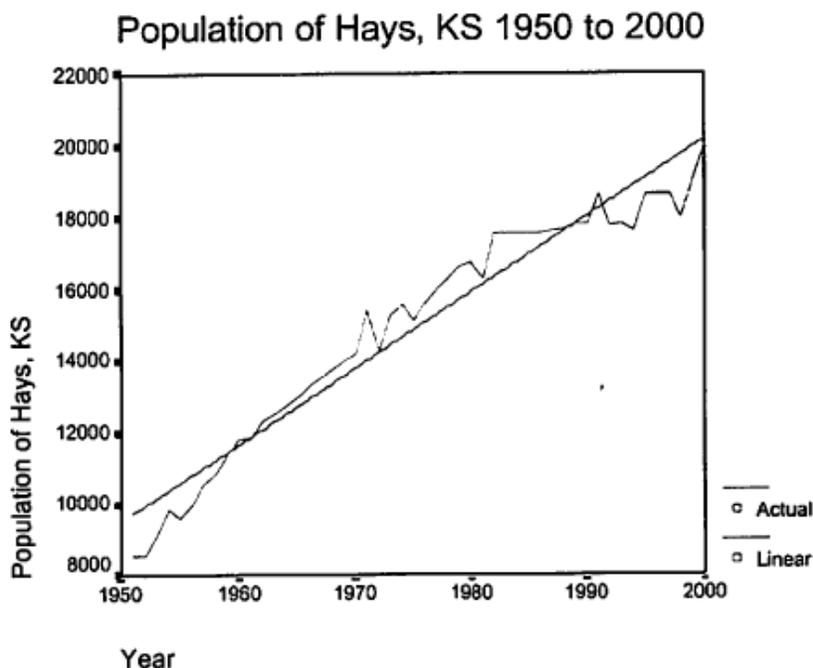
Hays' water supply problems have already adversely affected its growth, and the wellbeing of both Cities is closely tied to the availability of sufficient water. As Joe Aistrup, Ph.D., formerly with the Docking Institute, explained in a 2002 report to the Division of Water Resources:

The availability of water has been and will be a key component of population growth for the cities of Hays and Russell. Chart Number 1 [below] shows that the drought in the early 1990's and the resulting restriction of water supplies are directly associated with the population of Hays dropping below its linear projection. For Russell, being able to purchase water from the [Public wholesale water supply District No. 15] is a key element of its effort to rebound economically through luring value-added agricultural industries.⁹⁶

⁹⁵ *Id.*

⁹⁶ Ex. 47, Docking Institute, *Memo Regarding Planning Horizon, Projections of Population and Industrial Growth in Hays, Industrial Demand in Russell, and the Potential for Partnership with other Water Districts and Incorporated Cities*, at pp. 1–2 (Jan. 9, 2002).

Chart Number 1



Economic growth in Hays and Russell benefits the entire State. Dr. Aistrup's 2002 Report further elaborated on the benefits of obtaining a long-term water source for the Cities through the Public Wholesale Water Supply District No. 15:

Economic growth in these cities benefits the state as a whole. When cities like Hays and Russell are thriving, tax revenues collected by the state increase and the large investments the state has made for infrastructure to support these communities pay dividends. Indeed, this is the reason that the policies of other state agencies like the Kansas Department of Commerce and Housing and federal agencies like Economic Development Administration have specifically focused on economic development in small to medium sized Kansas communities. The District seeks relatively small quantities of water when compared to irrigation water rights and yet this appropriation will have a large and direct impact on economic development in Hays, Russell, and the surrounding communities. This growth will, in turn, benefit the state as a whole.⁹⁷

⁹⁷ *Id.* at 2 (emphasis added).

Moreover, the potential “third-party effects,” i.e., the economic impacts of the water transfer on the area directly surrounding the R9 Ranch, primarily Edwards County, will be minimal, and statewide detrimental impacts of the transfer, if any, will be non-existent or negligible. Studies have long shown “that direct and indirect economic impacts of water transfers on the area of origin are generally small from the perspective of a state’s economy,”⁹⁸ which was confirmed for the Cities’ proposed water transfer in this case. In 1996, Eric D. Madden⁹⁹ performed an in-depth evaluation of the potential hydrologic and economic third-party effects in Edwards County that would result from a transfer to Hays and Russell.¹⁰⁰

Mr. Madden found that “Edwards County would probably not experience any significant economic impacts from the proposed water transfer immediately.”¹⁰¹ Retiring the R9 Ranch from agricultural production would result in a 0.17% decrease in Edwards County’s total personal income, and a 1.6% reduction in its total agricultural acreage.¹⁰² Further, because the R9 Ranch does not utilize any farm management, crop, or commercial soil services from within Edwards County; and purchases all of its seeds, fertilizers, natural gas, pesticides, chemicals, and irrigation parts and services from outside Edwards County, loss of such commercial activity would have no effect on the local economy.¹⁰³

⁹⁸ Bonnie G. Colby, *Economic Resources J.* 721, 737 (Fall 1988).

⁹⁹ Mr. Madden submitted the report in partial fulfillment of the requirements for his Bachelors in Environmental Studies degree from the University of Kansas. The report was approved on June 5, 1996, by Stanford L. Loeb, who is now Acting Director of KU’s Environmental Studies Program. Mr. Madden went on to graduate with honors from the University of Kansas (B.A. in English and Environmental Policy, with honors) and from the KU School of Law, where he was Order of the Coif and Editor-in-Chief, of the Kansas Law Review. He is currently a partner at Reid Collins & Tsai LLP, in Dallas, Texas. <http://www.rctlegal.com/person/eric-d-madden/>, accessed on October 17, 2018.

¹⁰⁰ Ex. 48, Eric D. Madden, *An Evaluation of Potential Hydrologic and Economic Third Party Effects in Edwards County, Kansas, Resulting from the Hays-Russell Water Transfer Proposal* (June 5, 1996).

¹⁰¹ *Id.* at PDF p. 42.

¹⁰² *Id.* at PDF pp. 37–38.

¹⁰³ *Id.* at PDF p. 37.

Mr. Madden provided the following summary of the potential economic impacts of the water transfer, which assumes that no further economic development will occur on the R9 Ranch after it is taken out of agricultural production:¹⁰⁴

Impact Type	Loss	Loss as % of county total
Direct Impacts		
Employment	6 jobs	0.4%
Income	\$110,000-\$140,000	0.13-0.17%
Agricultural acreage	6,742 acres (total)	1.6%
	4,719 acres (corn)	8.2%
	674 acres (alfalfa)	3.3%
	674 acres (wheat)	0.6%
	674 acres (soy beans)	4.1%
Indirect Impacts		
Diesel and oil purchases	\$57,846	1.7%
Induced Impacts		
Income spent in county economy	\$50,000-\$80,000	0.13-0.17%
Revenue Impacts		
Property tax revenue	\$7,730.58	0.05% -
Sales tax revenue	\$1,294.76	1.2%

In fact, the Cities began taking portions of the R9 Ranch out of production in 2007 or 2008 by enrolling in the EQIP program. When the abandonment statute was amended so that R9 Water Rights were no longer at risk for non-use, the Cities took more of the R9 Ranch out of production.¹⁰⁵ From 2013–2017 the remaining irrigation wells were decommissioned. There have been no claims of harm to the economy.

An adequate water supply for Hays and Russell has far greater economic value than continuing to use the water on the R9 Ranch for irrigation. As of December 2017, over 83% of all water use in Kansas was for irrigation.¹⁰⁶ In Groundwater Management District No. 5, where Edwards County is located, irrigation use makes up an even larger

¹⁰⁴ *Id.* at PDF p. 43.

¹⁰⁵ K.S.A. 82a-718.

¹⁰⁶ Ex. 49, Kansas Dep't of Ag., *Fact Sheet, Water Use Data Collection and Use* (Dec. 2018).

percentage of total water use, accounting for 98% of all metered water.¹⁰⁷ In 2001, the Docking Institute issued a report measuring “the economic impact of an acre-foot of water on the economy of Southwest Kansas.”¹⁰⁸ The report concluded that, in 1998 dollars, “the direct impact” of “Ogallala Aquifer water used for irrigation” was “about \$18 per acre foot.”¹⁰⁹

In contrast, the direct economic impact of an acre-foot of water for municipal use was about \$460 in 2001 dollars.¹¹⁰

Hays and Russell have already experienced serious population and industry impacts because of their longstanding struggle with inadequate water supplies. These impacts include severe water-use restrictions incorporated into the Cities’ rate ordinances and water conservation plans.¹¹¹ For example, in the mid-1980s, Hays’ water supply concerns and resulting conservation measures led it to ask the Division of Water Resources to initiate proceedings to designate an Intensive Groundwater Use Control Area (“IGUCA”) in the City to address the use of private water wells for discretionary outside activities.¹¹² In July 1985, the Chief Engineer granted Hays’ request, requiring registration of all domestic wells and reserving the right to ban the use of such wells for watering outdoor vegetation from 12:00 p.m.–7:00 p.m. daily from June 1 through September 30 of each year.¹¹³

¹⁰⁷ Ex. 50, Kansas Dep’t of Ag., Excerpt from *Kansas Irrigation Water Use 2012 Report*, at PDF p. 5 (2012).

¹⁰⁸ Ex. 51, Docking Institute, *The Value of Ogallala Aquifer Water in Southwest Kansas*, at PDF p. 4 (2001).

¹⁰⁹ *Id.* at PDF p. 44.

¹¹⁰ *Id.*

¹¹¹ Ex. 52, Including, for example, prohibitions on new connections to the potable water system, benefit car washes, washing houses, new lawns, and outdoor water use during daylight hours. See Letter from Toby Dougherty to David Barfield (Mar. 28, 2014).

¹¹² Ex. 53, *In re the Designation of an Intensive Groundwater Use Control Area in Hays, Kansas, and the Immediate Area* (July 25, 1985).

¹¹³ *Id.* at PDF p. 8.

Hays has rebate programs for washing machines, urinals, and turf grass conversions.¹¹⁴ And both Cities have rebate programs for high-efficiency toilets and offer low-flow shower heads.¹¹⁵

The Cities' exemplary conservation efforts, which have been partially documented in the media,¹¹⁶ have come at great cost to the Cities and the region.

[T]he availability of water has been a key component of population growth in Western Kansas. Western Kansas counties that used a significant amount of water from the Ogallala had a rate of population change between 1980 and 1990 that was 10% greater than in counties where water was scarce. Likewise, water rich counties had a rate of population change that was 4% greater than others between 1990 and 2000.¹¹⁷

The City of Russell and its citizens have responded to warnings about their water supply and have significantly reduced water consumption. The industrial sector was able to reduce water consumption by 63% over 10 years.¹¹⁸ The residential/commercial sector was able to reduce their water consumption by 30% over the same time period.¹¹⁹

¹¹⁴ http://www.haysusa.com/html/rebates_programs.html, accessed on October 18, 2018.

¹¹⁵ <http://www.russellcity.org/149/Water-Conservation-Program>, accessed on October 18, 2018; http://www.haysusa.com/html/rebates_programs.html, accessed on October 18, 2018.

¹¹⁶ Rick Montgomery, *Capturing Every Drop: Russell, Kan., Learns to Live with Drought*, The Kansas City Star (June 1, 2014), <http://www.kansascity.com/news/state/kansas/article446882/Capturing-every-drop-Russell-Kan.-learns-to-live-with-drought.html>. See also *Kansas Community Launches Educational Campaign to Help Promote Water Conservation*, AM Conservation Group (Jan. 20, 2014), <http://www.amconservationgroup.com/blog/kansas-community-launches-educational-campaign-to-help-promote-water-conservation>; Associated Press, *Russell seeks to conserve water* (July 11, 2012), <http://cjonline.com/news/2012-07-11/russell-seeks-conserve-water>.

¹¹⁷ Ex. 47, Docking Institute, *Memo Regarding Planning Horizon, Projections of Population and Industrial Growth in Hays, Industrial Demand in Russell, and the Potential for Partnership with other Water Districts and Incorporated Cities*, at pp. 1–2 (Jan. 9, 2002).

¹¹⁸ Ex. 54, Bartlett & West, Inc., *Water Supply Study for the City of Russell, Kansas*, at PDF p. 9 (Dec. 2014).

¹¹⁹ *Id.*

In fact, in 2013, Russell's total water consumption dropped by 22% over the previous five years, with more than one-third of its residents using rain barrels to collect and reuse rainwater.¹²⁰

Russell's governing body recognizes the importance and scarcity of water in this region. In addition to investing in infrastructure, Russell looked to its neighbors to the west and their conservation efforts. In 2013, the City of Russell began offering free low-flow showerheads to its customers and implemented a new water-conservation program in middle school science classes.¹²¹ In 2014, Russell implemented a water-conservation rebate program, which promoted the purchase and proper installation of high-efficiency toilets.¹²²

Hays has also taken significant steps to reduce water consumption over the years. As noted by a former Hays City Manager, Hannes Zacharias, in 1994, Hays is one of the "stingiest water users in the state, per capita."¹²³ In March 1991, the Ellis County Coalition for Economic Development published the "Hays Water Survey," to implement conservation measures that would help address Hays' long-term "problem of an adequate supply of potable water."¹²⁴ By 1994, Hays routinely rationed water during spring and summer, distributed limited-flow showerheads to water customers, offered incentives for high-efficiency toilets, implemented an effluent reuse plan that ensured that low quality water was used where possible, and prohibited washing cars and watering lawns between noon and 7:00 p.m., among other water-use restrictions on City residents. As a result, Hays decreased water use by 47% between 1988 and 1994.

Beginning in the early 1990's, Hays began using treated effluent from its municipal sewage treatment plant for irrigation. The initial investment included a holding basin, pump station, and 10-inch, 1.5-mile pipeline to the Fort Hays Municipal Golf Course. Over the years, several baseball, softball, and soccer fields were added to the system. In the mid 1990's, the City began irrigating Larks Park (home of Fort Hays State University baseball and Hays' collegiate summer baseball team, the Hays Larks) with effluent. In 2011 this system was expanded when the Bickle/Schmidt Sports

¹²⁰ Montgomery, *supra*, note 112.

¹²¹ <http://www.amconservationgroup.com/blog/kansas-community-launches-educational-campaign-to-help-promote-water-conservation>.

¹²² Montgomery, *supra* note 112.

¹²³ Ex. 55, Mike Berry, *Hays Covets Supply of Water to the South*, Wichita Eagle (Sept. 10, 1994).

¹²⁴ Ex. 56, Ellis County Coalition for Economic Development, *Hays Water Survey*, at PDF p. 3 (Mar. 1991).

Complex was constructed. The pipeline was extended one mile to the west to serve that complex. A pond at the Fort Hays Municipal Golf Course was enlarged to create a reservoir effluent and a second pumping station was installed. The golf course and sports complex are now irrigated from this reservoir. Hays currently irrigates 145 acres with treated effluent, which averages 18.2% of the total effluent produced on an annual basis and in 2017, a relatively dry year, the average was 29%.

Hays' aggressive water-conservation program has expanded since 1994. Hays is the only city in Kansas to adopt the green plumbing code and implement landscaping requirements that significantly limit the amount of irrigated area and type of vegetation compared to landscaping routinely grown and irrigated in other Kansas communities. To keep consumption rates low, Hays has enacted stringent water-conservation measures, mandated the use of water-saving devices, and implemented a program that pays part of homeowners' cost to purchase and install these devices. Hays budgets over \$200,000 annually to fund water-conservation programs including: toilet, urinal, and washing machine rebates; a low-flow showerhead giveaway program; commercial/industrial retrofits; and the only cash-for-grass program east of the Rocky Mountains and north of Texas. Hays pays homeowners to remove irrigated cool-season turf and replace it with more water efficient landscaping. As a result, Hays' average daily gallons per capita water usage is significantly less than comparable Kansas cities.

In addition, both Hays and Russell have water-rate ordinances with increasing block structures.¹²⁵ While the first gallon of water is relatively inexpensive, as consumption increases, so does the incremental rate. This approach has dramatically decreased the per capita water use by residents.

Hays and Russell residents have embraced these conservation efforts and take pride in their accomplishments, but carrying the banner as the statewide leaders in conservation has created a widely held perception that the Cities lack water. They are at the effective limits of conservation for this part of the country. Hays has had to adopt many practices and policies found in the desert southwest. If the Cities are required to push even harder, it would thrust them even further from their peer communities in Kansas, which would further repel private and commercial investment.

Hays is the economic engine of Northwest Kansas; its continued growth and economic viability are crucial to the entire State. This is only possible if Hays has access to a water supply consistent with the reasonable expectations of citizens in other Kansas communities.

¹²⁵ See responses to ¶ (p), *infra*.

Environmental Impacts

With the exception of above-ground structural facilities, such as a pump station and well houses on the R9 Ranch, all areas disturbed during construction will be returned to their original condition. The planning and design of the pipeline and related structures will avoid environmentally sensitive areas and minimize intrusion into the natural setting.¹²⁶

Public Health and Welfare Impacts

Approving the proposed transfer will have obvious and significant positive impacts on the public health and welfare of the Cities, their surrounding areas, and on the State as a whole—and no negative impacts.

Kansas law does not directly define the phrase “public health and welfare.” Use of the phrase throughout state and federal law indicate that the term has broad applicability and general meaning,¹²⁷ but, at a minimum, the term refers to conditions that impact human, animal, and plant health.¹²⁸

Kansas public policy favors ensuring that individuals and communities have an adequate water supply in order to maintain and improve the public health and welfare.

The Legislature has stated that proper utilization and control of the water resources of the state requires comprehensive planning.¹²⁹ The State’s long-range objectives for management, conservation, and development of the waters of the state include development of sufficient supplies of water to meet the anticipated future needs of the people of the state, including specifically the public health and general welfare.¹³⁰

¹²⁶ Ex. 4.

¹²⁷ See Bradley M. Taub, *Why Bother Calling Patents Property?*, 6 J. Marshall Rev. Intell. Prop. L. 151, 172 (Fall 2006) (discussing, in the context of patent law, the broad meaning given to the term “public health and welfare”) (citations omitted).

¹²⁸ See, e.g., *Massachusetts v. EPA*, 549 U.S. 497, 559 (2007) (distinguishing the “public health and welfare problems” related to “air pollution,” in the “lower stratosphere,” from “other greenhouse gases in the upper reaches of the atmosphere,” and concluding that the EPA’s regulation of gases in the “upper reaches of the atmosphere . . . is not akin to regulating the concentration of some substance that is *polluting the air*”) (emphasis added).

¹²⁹ K.S.A. 82a-901a.

¹³⁰ K.S.A. 82a-907(a) and (e). See also, K.S.A. 82a-602 and 82a-614.

The Legislature requires that water resource planning include designing municipal water systems to provide an adequate water supply to meet the needs during a drought having a 2% chance of occurrence.¹³¹

The Legislature has recognized the importance of an adequate supply of potable water in numerous provisions, including those dealing with Rural Water Supply Districts,¹³² Rural Water Districts,¹³³ Water Supply and Distribution Districts,¹³⁴ Public Wholesale Water Supply Districts,¹³⁵ the State Water Plan Storage Act,¹³⁶ and the extensive authorities and powers conferred on Cities to develop and operate public water supply systems.¹³⁷

Moreover, in 2013, Governor Brownback “issued a call to action to his Administration to develop a 50-year Vision for the Future of Water in Kansas.”¹³⁸ In a joint effort, the Kansas Department of Agriculture, Division of Water Resources and the Kansas Water Office formed a “Water Vision Team” that developed and published a document titled *A Long-Term Vision for the Future of Water Supply in Kansas*, which was “based upon input from the citizens of Kansas.”¹³⁹

“The Vision attempts to make clear that water is necessary for human health and welfare as well as environmental stewardship and our economic well-being.”¹⁴⁰ And the Vision specifically sought to “allow for the transfer of water supplies between basins where feasible and cost effective.”¹⁴¹

¹³¹ K.S.A. 82a-928(q).

¹³² K.S.A. 82a-601 -- 82a-611.

¹³³ K.S.A. 82a-612 – 82a-650.

¹³⁴ K.S.A. 19-3501 – 19-3544.

¹³⁵ K.S.A. 19-3545 –19-3557.

¹³⁶ K.S.A. 82a-1301 – 82a-1370.

¹³⁷ See K.S.A. Chapters 12, 13, 14, and 15.

¹³⁸ Ex. 57. *A Long-Term Vision for the Future of Water Supply in Kansas*, at 4 (Jan. 2015).

¹³⁹ *Id.* at 1.

¹⁴⁰ *Id.* at 9.

¹⁴¹ *Id.* at 43.

(n) Any and all measures the applicant has taken to preserve the quality and remediate any contamination of water currently available for use by the applicant:

There have been no known opportunities to utilize contaminated water in the City of Russell.

Hays Public Water Supply Well C-20.

In the late 1940s and the 1950s, the City of Hays followed then-applicable procedures to establish a vested water right based on the wellfield it had previously developed in the Big Creek alluvium in and around the City of Hays. This vested water right recognized the City's use of water prior to the 1945 enactment of the Kansas Water Appropriation Act, K.S.A. 82a-701, *et seq.*

On December 2, 1949, the City submitted the appropriate DWR form documenting water use from wells drilled in various locations around the City. The original application was amended several times and on September 5, 1951, the final application was submitted.¹⁴² The City stated that it began using groundwater in 1903 and that it had used a maximum of 660 million gallons of water (2,025.5 acre feet) during at least one calendar year prior to 1945 at a combined rate of 1.8 million gallons/day. At the time of the application, the City had drilled 16 wells, constructed two water towers, a concrete reservoir, and a distribution system.¹⁴³

On January 12, 1955, the Chief Engineer issued an Order Determining and Establishing the vested water right designated as File EL-02.¹⁴⁴ The Order established the right to continue to use groundwater from the Big Creek basin for municipal use from 16 wells at a maximum quantity of 660 million gallons/year (2,025.5 acre feet/year) at a rate of 1.8 million gallons/day for municipal use in the City of Hays and the immediate vicinity.¹⁴⁵

¹⁴² Ex. 58.

¹⁴³ *Id.*

¹⁴⁴ Ex. 59.

¹⁴⁵ *Id.*

On May 23, 1991, the City filed a Change Application and separate correspondence explaining that Wells C-20 and C-23 have been contaminated with volatile organic compounds and requested that these wells be moved a “significant distance to ensure that water from the [new] well is not contaminated.”¹⁴⁶

On December 6, 1991, the Chief Engineer issued an Order making significant changes to this vested right because the City wanted to move Well C-20 to the current locations of Wells C-29 (approximately 0.6 of a mile) and C-30 (approximately 1.4 miles).¹⁴⁷ DWR would not approve the change because the wells were being moved too far and would not be considered to be in the same “source of supply” as the old wells. The new wells, C-32 and C-33, were authorized under new water right applications designated as Files No. 40,367 and 40,368. These new water rights did not add any new quantity. The Order states that it documents an agreement by the City to suspend operation of Well C-20 and to reduce the quantity of the vested right from 660 million gallons/year (2,025.46 acre-feet/year) to 400 million gallons/year (1,227.55 acre-feet/year).¹⁴⁸ There is no discussion in the file explaining the reasons for or justifying this reduction.

The Order suspends the right to divert water from Well C-20 “until such time as the Chief Engineer vacates the suspension” and provides that “the ultimate disposition of groundwater diversions by means of well C-20 shall be dependent upon the extent water shall be appropriated by means of wells (‘C-33 and C-32’, respectively) authorized under File Nos. 40,367 and 40,368.”

In April of 1995, Hays entered into an Interim Agreement with KDHE to perform “site characterization” activities to address tetrachloroethylene contamination found in Well C-20.¹⁴⁹

In August of 1995, the City of Hays entered into a participation agreement with Western Plains Development Corp., H. Schwaller and Sons, Inc., and Verlin Pfannenstiel in which the parties agreed to share costs to address groundwater contamination in and around the Vine Street Site in Hays.¹⁵⁰ In May of 1996, KDHE notified the City that it was eligible for access to the KDHE Drycleaning Facility Release Trust Fund because of groundwater contamination at two drycleaning facilities located

¹⁴⁶ Ex. 60.

¹⁴⁷ Ex. 61.

¹⁴⁸ *Id.*

¹⁴⁹ Ex. 62.

¹⁵⁰ Ex. 63.

at 1015 Centennial Boulevard and 108 Centennial Center, both near the intersection of 26th and Vine Street.¹⁵¹

The City of Hays entered into a Consent Agreement with KDHE, Case No. 99-E0001, on January 27, 1999, to address drycleaning solvent contamination at the “City of Hays Public Water Supply Site.”¹⁵² KDHE treated contaminated groundwater and the City used the clean water to augment its public water supply.

The parties entered into a subsequent MOU on July 22, 2008.¹⁵³ According to the MOU, KDHE operated well C-20TA until 2008. Contamination levels had dropped below the maximum contaminant level, but the City decided to continue to operate the well because the water was still contaminated. In addition to utilities, the City has spent considerable sums since 2008 to continue to operate this well.

The remediation and the use of contaminated groundwater to supplement water supplies has been ongoing in Hays for many years. The City expects to continue to utilize this important water source because it serves two important objectives. First, it supplements the City’s water supply. Second, it removes potentially harmful chemicals from groundwater

(o) The provisions of a revised management program adopted by a groundwater management district that are applicable to the proposed transfer whenever any of the proposed points of diversion are located within a groundwater management district:

The R9 Ranch is within the boundaries of the Big Bend Groundwater Management District No. 5. The GMD’s Revised Management Plan, dated October 11, 2018 is attached.¹⁵⁴ In addition, the GMD5 regulations are found at K.A.R. 5-25-1, *et seq.*

All of the substantive provisions in the GMD’s Management Program that affect the use of water, changes in the place and type of use, and changes in the points of diversion were addressed in the Master Order and the Change Approvals.

GMD5’s well-spacing requirements are met, all of the R9 Water Rights are certified, the proposed use is beneficial, the quantity is reasonable, existing rights will not be impaired, consumptive use will not be increased, and the public interest of the district will not be prejudiced.

¹⁵¹ Ex. 64.

¹⁵² Ex. 65.

¹⁵³ Ex. 66.

¹⁵⁴ Ex. 67.

Water rights are real property rights defined by the rate of diversion, the annual quantity, the type, and the place of use. The Master Order and the Change Approvals made substantial reductions in both the rates of diversion and the annual quantities. The quantities are reasonable and sustainable and otherwise comply with the limitations imposed on the R9 Water Rights.

(p) Whether or not the applicant, and any entity to be supplied water by the applicant, have adopted and implemented conservation plans and practices that fulfill the following requirements:

(1) Are consistent with guidelines developed and maintained by the Kansas water office, pursuant to K.S.A. 74-2608 and its amendments:

Both Hays and Russell have adopted and implemented water conservation plans that have been reviewed and approved by the Kansas Water Office.¹⁵⁵

While it is likely that the Cities will provide municipal water to other communities, they do not have commitments to or from the owners of other public water supply systems at this time.

(2) Have been in effect for not less than 12 consecutive months immediately before the filing of this water Transfer Application:

The adopted conservation plans have been in effect for many years in both communities.

(3) Provide for a rate structure that encourages efficient use of water and results in conservation and wise, responsible use of water, if the transfer is for use by a public water supply system:

Both Hays and Russell have rate structures and related ordinances that encourage conservation.¹⁵⁶

(q) The effectiveness of conservation plans and practices that have been adopted and implemented by the applicant and any other entities to be supplied water by the applicant:

See the extensive discussion in Paragraph (m), supra.

¹⁵⁵ Ex. 68 (Russell's Water Conservation Plan) and Ex. 52 (consolidated document including: (1) a March 28, 2014 letter to the Chief Engineer relating to Hays' updated Water Conservation Plan, and (2) the updated Water Conservation Plan).

¹⁵⁶ Exs. 69-72.

- (r) **If applicable, population projections for any public water supply system that will be supplied by the water transfer, and the basis for those projections:**

Table 6				
	2010 Population ¹⁵⁷	July 1, 2017 Estimated Population ¹⁵⁸	2026 Projected Population ¹⁵⁹	2036 Projected Population ¹⁶⁰
City of Hays	20,510	20,845	25,410	30,975
City of Russell	4,506	4,463	5,440	6,632

The 2010 population and the 2017 population estimates are from the U.S. Census. Population projections for 2026 and 2036 are based on 2% annual population growth as approved by the Chief Engineer.¹⁶¹

- (s) **The projected water needs of the applicant and of any other entities to be supplied water by the applicant, and the basis for those projections:**

The Chief Engineer has found that the Project will provide a long-term supply of water to the Cities, is expected to have a design life of at least 50 years, and to be productive even longer.¹⁶² While it is likely that the Cities will provide municipal water to other communities, the Cities do not have commitments to or from the owners of other public water supply systems at this time.

The Kansas Water Appropriation Act limits appropriation rights to the reasonable needs of appropriators.¹⁶³ DWR regulations reflect that requirement when changing irrigation water rights to municipal use.¹⁶⁴

¹⁵⁷ https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml, accessed on October 16, 2018.

¹⁵⁸ *Id.*

¹⁵⁹ July 1, 2017 estimated population multiplied by 1.0210.

¹⁶⁰ 2026 Projected Population multiplied by 1.0210.

¹⁶¹ Ex. 2, ¶¶ 237, 238.a.iii., and Appendices D and E.

¹⁶² Ex. 2, ¶ 171.

¹⁶³ K.S.A 82a-707(e).

¹⁶⁴ *See* K.A.R. 5-5-9(a)(6) (1994 version).

The Master Order and the Change Approvals establish Reasonable-Need Limitations for Hays and for Russell that limit each City's municipal use from the R9 Water Rights when combined with that City's use of water from all other sources.¹⁶⁵

DWR's traditional method to determine the reasonable needs of municipal users, based on a 20- to 40-year timeframe, is appropriate for most growing municipal users, principally because most users are close to sufficient alternative sources to address their short-, medium-, and long-term needs.¹⁶⁶ Unlike most other Kansas cities, however, Hays and Russell must look far afield to find reliable water sources.¹⁶⁷

Financing for the Project will require amortization over the entire design life of the Project. The Cities do not believe that long-term financing for the Project will be available if the full quantity of water from the R9 Ranch that is available for municipal use is not approved with an objective method for reasonable increases as municipal water needs increase.

For these reasons, the Chief Engineer has agreed that DWR's traditional method to determine the reasonable needs of municipal users is not appropriate in this case and that a longer planning horizon is necessary.¹⁶⁸

The Chief Engineer has approved a method to establish the Reasonable-Need Limitations.¹⁶⁹ This method sets objective standards to determine the reasonable quantities needed for municipal use for each of the Cities into the future, based on actual and projected population changes, the reasonable needs of additional users, and other measurable indices.¹⁷⁰ This approach allows the approved quantities to increase as needs and demands change.¹⁷¹

¹⁶⁵ See ¶ (c), *supra*.

¹⁶⁶ Ex.2, ¶ 174.

¹⁶⁷ *Id.*, ¶ 175.

¹⁶⁸ *Id.*, ¶ 178.

¹⁶⁹ *Id.*, § XIII.B.b. and Appendices D and E.

¹⁷⁰ *Id.*

¹⁷¹ *Id.*

The Chief Engineer has determined that this approach is consistent with the overall purposes of Kansas water law and its underlying policies, so long as the longer planning horizon does not permit the Cities to use water in excess of their reasonable municipal needs.¹⁷²

The calculation of the Reasonable-Need Limitations for Hays and Russell are shown in Appendices D and E of the Master Order and summarized in Table 7. The Master Order sets Russell’s Reasonable-Need Limitation at 1,841.3 acre-feet per year to conform to Russell’s existing water rights in the Smoky Hill Basin.¹⁷³

Table 7			
	2012-2021 Reasonable Need	2022-2031 Reasonable Need	2032-2041 Reasonable Need
Hays	3,815.90	4,651.56	5,670.23
Russell (calculated)	1,450.37	1,614.70	1,815.01
Russell (Per the Master Order)	1,841.30	1,841.30	1,841.30

(t) Plans for any environmental mitigation made necessary by the proposed water transfer:

The only environmental mitigation required will be the subject of federal and State permits for river and stream crossings, National Pollutant Discharge Elimination System permits during construction, and public water supply permits from the Kansas Department of Health and Environment. *See* response to Paragraph (u), *infra*.

(u) A list of other federal, state and local permits necessary to complete the proposed water transfer and the projected dates they will be obtained:

This project will consist of several phases extending across multiple years. The proposed plan describes several alternative pipeline routes.¹⁷⁴ Thus, the precise number and locations of the numerous crossing permits that will be required cannot be realistically predicted until the detailed planning of the pipeline route is complete.

The Cities are not able to provide projected dates to obtain permits that will not be needed for some time, however, the Cities’ best estimate of the schedule is provided in Paragraph (h), *supra*.

¹⁷² *Id.*, ¶ 178; K.A.R. 5-5-9(a)(6) (1994 version).

¹⁷³ Ex. 2, ¶ 183.

¹⁷⁴ *See* response to ¶ (h), *supra*.

The following list of permits are those the Cities may need to complete the project. The Cities will supplement this list as more information becomes available.

- ◆ Railroad line crossing permits or easements from Union Pacific, the Missouri Pacific, and the ATSF railroads.
 - ◆ County road crossing permits, right-of-way use permits, and county floodplain permits from relevant counties, potentially including, but not limited to, Edwards, Pawnee, Rush, Ellis, and Russell Counties.
 - ◆ State highway crossing and right-of-way use permits from the Kansas Department of Transportation.
 - ◆ River and stream crossing permits from the United States Army Corps of Engineers and DWR.
 - ◆ Notice of intent permits for stormwater control pursuant to National Pollutant Discharge Elimination System requirements from the State of Kansas, including a stormwater pollution prevention plan.
 - ◆ Oil and gas pipeline crossing permits.
 - ◆ Public water supply permits for the wellfield as well as for raw water collection from the Kansas Department of Health and Environment.
 - ◆ Building and Electrical permits for planned structures in the wellfield.
- (v) **The current per capita per day usage of any public water supply user to be supplied water by the applicant, and the current average per capita per day usage of other similar users in a region of the State that is climatically similar. If the applicant's per capita per day usage exceeds the regional average, the applicant shall show why its per capita per day usage is reasonable:**

See response to Paragraph (s), *supra*. Per capita use by existing water suppliers is available in a series of annual reports prepared by the DWR and the USGS.¹⁷⁵ Published data is for 2015 and is available on DWR's web site. These reports show that per capita per day usage in both Hays and Russell are below their respective regional averages.

¹⁷⁵ Exs. 73-91.

Table 8						
	GPCD 2011	GPCD 2012	GPCD 2013	GPCD 2014	GPCD 2015	GPCD Average 2011-2015
Hays	99	102	88	81	88	92
Region 5	149	149	126	116	114	131
Russell	146	149	101	135	137	134
Region 6ML	151	152	126	132	129	138

- (w) **The projected per capita per day usage of any public water supply user to be supplied water by the applicant:**

See response to Paragraphs (s) and (z).

- (x) **A copy of the contingently approved application for change in the place of use, the type of use and the point of diversion:**

The Amended Change Applications, Master Order, and Change Approvals are attached.¹⁷⁶

- (y) **Pursuant to K.A.R. 28-16-28b and K.A.R. 28-16-28d, the impacts of the proposed transfer on the water quality and designated uses of any stream that may be affected by the proposed transfer:**

This Transfer Application seeks approval for a transfer of groundwater. No long-term impacts on surface water are anticipated. There will be stream crossings as described in paragraph (u) above but impacts on water quality, if any, are expected to be minimal and temporary.

- (z) **Any additional factors that may be required by the chief engineer:**

Hays and Russell remain committed to water conservation but must have an additional supply of water to foster more diverse future growth.

Conclusion

For the reasons set out above, the Cities of Hays and Russell respectfully request approval of this Transfer Application on the terms requested.

¹⁷⁶ Exs. 2 and 5-36.

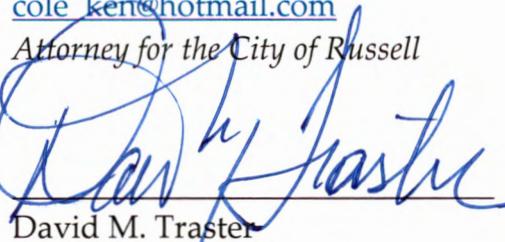
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Certificate of Service

I hereby certify that this FIRST AMENDED APPLICATION TO TRANSFER WATER FROM EDWARDS COUNTY, KANSAS TO THE CITIES OF HAYS AND RUSSELL, KANSAS was served by placing the same in the United States mail, postage prepaid and properly addressed on the 16th day of May, 2019, to the following:

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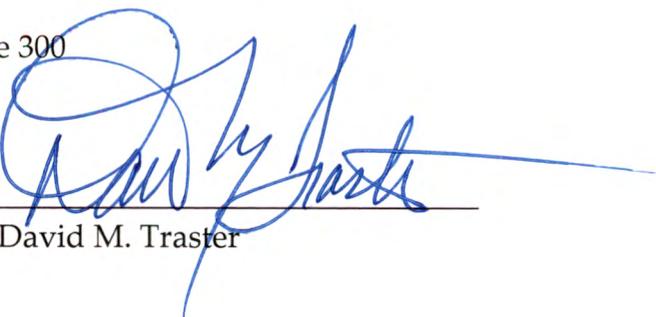
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Exhibit List

- Ex. 1 Maps showing R9 Ranch and well locations.pdf
- Ex. 2 2019-03-27 Hays Russell Master Order.pdf
- Ex. 3 2018-09-24 Revised BMcD Modeling Report
- Ex. 4 2019-03-24 Change Application Cover Letter
- Exs. 5-36 The Cities' Change Applications and Amendments.
- Ex. 37 2015-06-16 Burns and McDonnell Memo re: R9 Ranch Conversion.pdf
- Ex. 38 2015-09-24 R9 Ranch Conceptual Development Memo.pdf
- Ex. 39 2015-12-23 Conceptual Pipeline Corridor.pdf
- Ex. 40 2015-06-23 R9 Conceptual Development PowerPoint.pdf
- Ex. 41 2017 Hays Bond Issue Statement
- Ex. 42 2015-12-13 Ellis County Govt Prop Value.pdf
- Ex. 43 2015 Excerpt from Russell's Official Statement for Recent Bond Issue.pdf
- Ex. 44 2015-12-13 Russell County Govt Prop Value .pdf
- Ex. 45 2014-12 Hays-Russell Economic Impact Preliminary Report.pdf
- Ex. 46 2010-05 Hays Population Report.pdf
- Ex. 47 2002-01-09 Memo to David Pope re: Growth Projections for Hays & Russell.pdf
- Ex. 48 1996-06-05 Madden - Potential Hydrologic and Economic.pdf
- Ex. 49 2018-12 DWR Water Use Fact Sheet.pdf
- Ex. 50 2012 DWR Kansas Irrigation Water Use Report.pdf
- Ex. 51 2001 - Gilson - The Value of Ogallala Aquifer Water in SW Kansas.pdf
- Ex. 52 2014-03-28 Hays Letter to David Barfield - Water Conservation Plan.pdf
(consolidated document including: (1) a March 28, 2014 letter to the Chief Engineer relating to Hays' updated Water Conservation Plan, and (2) the updated Water Conservation Plan)
- Ex. 53 1985-07-25 - Hays IGUCA Order.pdf
- Ex. 54 2014-12 City of Russell Water Supply Study - Final Report.pdf
- Ex. 55 1994-09-10 Hays Covets Supply of Water to the South, Wichita Eagle.pdf

- Ex. 56 1991-03 March Ellis County Coalition - Hays Water Survey - Water Study Panel.pdf
- Ex. 57 2015-01 Vision of the Future of Water Supply in Kansas.pdf
- Ex. 58 1951-09-05 Application to establish Vested Right EL02.pdf
- Ex. 59 EL-002 1955-01-12 Order establishing vested right.pdf
- Ex. 60 1991-05-23 Application to change the point of diversion for Well C-20.pdf
- Ex. 61 EL-002 1991-12-06 Change Order.pdf
- Ex. 62 PWS Well #20 Interim Agreement, 1995.pdf
- Ex. 63 1995 Participation Agreement - Vine St.pdf
- Ex. 64 1996-05-02 Notice of Eligibility for (former) Drycleaning Facilities.pdf
- Ex. 65 1999-01-27 PWS Well #20 Consent Agrmt.pdf
- Ex. 66 2008-07 Remediation Well C-20TA Memo of Understanding - 1015 Centennial Blvd.pdf
- Ex. 67 1988-03 Management Program.pdf
- Ex. 68 2019 & 2018 Russell Water Conservation Plan.pdf
- Ex. 69 Hays Water Service and Rate Ordinances.pdf
- Ex. 70 Hays Wellhead Protection Ordinances.pdf
- Ex. 71 Russell Water Rate Ordinances.pdf
- Ex. 72 Russell Water Conservation Ordinances.pdf
- Ex. 73 1997 KS Municipal Water Use Report.pdf
- Ex. 74 1998 KS Municipal Water Use Report.pdf
- Ex. 75 1999 KS Municipal Water Use Report.pdf
- Ex. 76 2000 KS Municipal Water Use Report.pdf
- Ex. 77 2001 KS Municipal Water Use Report.pdf
- Ex. 78 2002 KS Municipal Water Use Report.pdf
- Ex. 79 2003 KS Municipal Water Use Report.pdf
- Ex. 80 2004 KS Municipal Water Use Report.pdf
- Ex. 81 2005 KS Municipal Water Use Report.pdf
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- Ex. 89 2013 KS Municipal Water Use Report.pdf
- Ex. 90 2014 KS Municipal Water Use Report.pdf
- Ex. 91 2015 KS Municipal Water Use Report.pdf
- Ex. 92 1977-07-05 Black & Veatch, Hays Water Supply Memorandum.pdf
- Ex. 93 1981-01-30 Approval of Application for File 33,296.pdf
- Ex. 94 1984-05-31 Lower Smoky Hill IGUCA Order.pdf
- Ex. 95 1990-05-22 Department of the Army Permit No. 2SB OXR 1 3138.pdf
- Ex. 96 2004-06-15 Burns & McDonnell - Phase II Smoky Hill Well Field Study.pdf
- Ex. 97 2002-11-15 Brikowski Final Report re: Yield fr Smoky Hill Wellfield.pdf
- Ex. 98 2003-02-14 Burns & McDonnell - Status Report on Kanopolis-Wilson Eval.pdf
- Ex. 99 2003-06-03 Burns & McDonnell - Summary Report, Smoky Well Field Study.pdf
- Ex. 100 2006-10-03 Initial Order Approving Well Relocation in Hays' Smoky Wellfield.pdf
- Ex. 101 2005-09-30 Burns & McDonnell - Supp. GW Modeling on Smoky Wellfield.pdf
- Ex. 102 2010-08 Wilson Lake Environmental Report.pdf
- Ex. 103 1987-09-16 Dakota Water Quality Data - Chart & Map.pdf
- Ex. 104 1987-09-16 Dakota Test Hole Drilling Report.pdf
- Ex. 105 1988-03-04 Dakota Test Hole Drilling Report.pdf
- Ex. 106 1992-05-15 File 40,702 Application.pdf
- Ex. 107 1992-05-15 File 40,703 Application.pdf
- Ex. 108 1992-05-15 File 40,704 Application.pdf
- Ex. 109 1992-05-15 File 40,705 Application.pdf
- Ex. 110 1992-05-15 File 40,706 Application.pdf
- Ex. 111 1992-05-15 File 40,707 Application.pdf

- Ex. 112 1992-07-01 Permit for File 40,702.pdf
- Ex. 113 1992-07-01 Permit for File 40,703.pdf
- Ex. 114 1992-07-01 Permit for File 40,704.pdf
- Ex. 115 1992-07-01 Permit for File 40,705.pdf
- Ex. 116 1992-07-01 Permit for File 40,706.pdf
- Ex. 117 1992-07-01 Permit for File 40,707.pdf
- Ex. 118 1997-01-01 Eval of Long-Term Effect of Water Resource Development on Dakota Aquifer.pdf
- Ex. 119 1992-07-21 Bucher-Willis-Ratliff Ltr - Squier re: Hays, Dakota Well Dvlpmt.pdf
- Ex. 120 KGS Dakota Aquifer Study, Vol. 1, Hydrogeologic Setting.pdf
- Ex. 121 KGS Dakota Aquifer Study, Vol. 2, Numerical Modeling.pdf
- Ex. 122 2001-09-24 Ground Water Associates Inc - S Russell Water Project Rpt.pdf
- Ex. 123 2000-11-01 Water Supply Contract Between PWWSD #15 & Hays.pdf
- Ex. 124 2001-08-03 Letter from KGS re: Review of Loan Fund Project No. 2304.pdf
- Ex. 125 2001-08-06 Letter from KWO re: Review of Loan Fund Project No. 2304.pdf
- Ex. 126 2002-04-30 Ground Water Associates - S Russell Project - Water Quality Rpt.pdf
- Ex. 127 2003-05 Bartlett & West Engineers - Water Supply Alternative Review.pdf
- Ex. 128 1967-03 Wilson and Company, Water Supply Study Report for Russell.pdf
- Ex. 129 1991-08-22 Wilson Lake Application for Permit to Appropriate Water.pdf
- Ex. 130 2012-02-21 Letourneau letter Granting Wilson Extension to 12-31-16.pdf
- Ex. 131 1993-08-26 Black & Veatch, Memorandum re: Wilson Lake.pdf
- Ex. 132 1997-09 Wilson Lake Recon Study for Water Supply Storage Reallocation.pdf
- Ex. 133 2003-02-20 Burns & McDonnell - Evaluation of Wilson and Kanopolis.pdf
- Ex. 134 2003-09 Army Corps of Engineers E Smoky Hill-Saline Basin Public Wtr Study.pdf
- Ex. 135 2005-07-07 Burns & McDonnell - Wilson Water Treatment Facilities - Design Report.pdf
- Ex. 136 2015-01 KGS Information Circular re: The High Plains Aquifer.pdf

- Ex. 137 1985-04-18 Letter from Layne-Western Co re: Additional Groundwater Supplies.pdf
- Ex. 138 1987-01 Clarke Well and Equipment, Inc. - Additional Water Supply-Trego Co.pdf
- Ex. 139 1989-09-21 Summary of Potential Long-Term Sources of Water Supply.pdf
- Ex. 140 1989-08-24 Ground Water Associates Letter re: Water Rights for Sale-Graham Co.pdf
- Ex. 141 1997-05-13 Black & Veatch - Hays Water Resources Eval-Summary Report.pdf
- Ex. 142 2002-01-10 PWWSD 15 Meeting Agenda.pdf
- Ex. 143 1998-04-06 Black & Veatch - Memorandum - Post Rock Costs.pdf
- Ex. 144 2006-06-14 Burns & McDonnell - Post Rock Water Supply Alt Exec Summary.pdf
- Ex. 145 1990-09-09 Michael Perrault, Precious Water-How Hays Plans to Keep Flow.pdf
- Ex. 146 1993-04 Black & Veatch - Big Creek Water Banking Operation Plan.pdf
- Ex. 147 2006-08 Bartlett & West Engineers - Hays Wastewater Reuse Update.pdf
- Ex. 148 1991-05 Black & Veatch - Operation Plan Big Creek Water Banking Plan.pdf
- Ex. 149 1993-04 Black & Veatch - Operation Plan Big Creek Water Banking Plan.pdf
- Ex. 150 1974-04 Layne-Western Company - Groundwater Hydro Study Saline Valley.pdf
- Ex. 151 1986-05-13 Black & Veatch Letter to Carter, Hays City Manager.pdf
- Ex. 152 2001-08-22 Water Rights on Saline River.pdf
- Ex. 153 1993-07-01 DWR Policy Safe Yield in Alluvium.pdf
- Ex. 154 1994-10-13 Portion of KS Register Adopting K.A.R. 5-3-11.pdf
- Ex. 155 2009 KWO - 2009 Kansas Water Plan.pdf
- Ex. 156 2012 Cedar Bluff Lake Reservoir Information Sheet.pdf
- Ex. 157 1984-05 Cedar Bluff Water Supply and Operation Studies.pdf
- Ex. 158 2003-01-30 Letter from KWO re: Cedar Bluff.pdf
- Ex. 159 1984-05-31 DWR Interim Order re: Lower Smoky Hill IGUCA.pdf
- Ex. 160 1984-07-27 DWR Correctional Order re: Lower Smoky Hill IGUCA.pdf
- Ex. 161 1988-07-28 DWR Upper Smoky Hill IGUCA Order.pdf

- Ex. 162 2003-04-28 Letter from Bird to Sebelius.pdf
- Ex. 163 2004-09-22 Cedar Bluff Artificial Recharge Pool Operations Agreement.pdf
- Ex. 164 2008-06-30 Burns & McDonnell - Cedar Bluff Cattle Feeders Water Right Eval.pdf
- Ex. 165 2011-07-15 City Commission Work Session Agenda Packet.pdf
- Ex. 166 1990-01-03 Black & Veatch - Development of Big Bend Study.pdf
- Ex. 167 1993-11-01 Water Group Subcommittee Meeting.pdf
- Ex. 168 1989-09-15 DWR Policy closing Walnut Creek and Tribs.pdf
- Ex. 169 1992-01-29 Walnut Creek IGUCA Order.pdf
- Ex. 170 1996-12-06 Amendment to Walnut Creek IGUCA.pdf
- Ex. 171 1998-06-24 Amendment to Walnut Creek IGUCA.pdf
- Ex. 172 2001-06-29 Amendment to Walnut Creek IGUCA.pdf
- Ex. 173 1981-07-08 Pawnee Valley IGUCA Order.pdf
- Ex. 174 1985-09-13 Pawnee Valley IGUCA Order.pdf
- Ex. 175 2007-06-18 Pawnee Valley Phase 1 IGUCA Order.pdf
- Ex. 176 2015-12-12 Info. from WIMAS Database for File 40,406.pdf
- Ex. 177 1997-11-19 Hays Daily News, Glen Elder is Focus of Water Meeting.pdf
- Ex. 178 1997-10-17 Letter from DWR to Hays County Coalition.pdf
- Ex. 179 2002-01-31 Letter from PWWSD 15 to the Cities of Hays and Russell.pdf
- Ex. 180 Pikitanoi Correspondence.pdf
- Ex. 181 1999-02-25 KWO, The Pikitanoi Report.pdf
- Ex. 182 2003-02-13 Duffy Memo to Greenlee re: Water Issues for Hays and Russell.pdf
- Ex. 183 1997-03-24 Doug Wildin Letter.pdf
- Ex. 184 2002-07 Ground-Water Recharge in Upper Arkansas River Corridor in SW KS.pdf

Appendix A Definitions

As used in this First Amended Transfer Application, the following terms are defined as follows:

“Cities” means, collectively, the City of Hays, Kansas, the City of Russell, Kansas.

“City” means either the City of Hays, Kansas, or the City of Russell, Kansas.

“Change Applications” means the applications submitted to the Chief Engineer on June 26, 2015, as amended, and attached as Exhibits 5-36, which applications request contingent approval to change the use made of the water, the places of use, and the points of diversion under the R9 Water Rights.

“Change Approvals” means the individual contingent approvals of the Change Applications signed and issued by the Chief Engineer and attached to the Master Order as Exhibits 1-32.

“DWR” means the Division of Water Resources of the Kansas Department of Agriculture.

“GMD5” means the Big Bend Groundwater Management District No. 5.

“Hays” means the City of Hays, Kansas.

“KAPA” means the Kansas Administrative Procedure Act, K.S.A. 77-501, *et seq.*

“KJRA” means the Kansas Judicial Review Act, K.S.A. 77-601, *et seq.*

“Limitation” means a term or condition imposed by the Chief Engineer on a water right pursuant to K.S.A. 82a-707(e), K.S.A. 82a-708b, K.A.R. 5-5-8, and/or K.A.R. 5-5-9 (1994 version), that, depending on the particular circumstances, limits the authorized rate(s) of diversion and/or the authorized annual quantity(ies) of water when a junior water right(s) is combined with a senior water right(s), to a rate of diversion or annual quantity of water that is less than the sum of the combined water rights’ individual authorized rates of diversion or annual quantities of water. Depending on the particular circumstances, Limitations might be added, removed, or modified in an approval of an application to change the characteristics of a water right. Limitations are binding conditions unless and until they are removed or modified in a subsequent final order issued by the Chief Engineer.

“Master Order” means the Master Order Contingently Approving Change Applications Regarding R9 Water Rights, the associated Change Approvals attached to the Master Order as Exhibits 1-32, and its Appendices A through I signed by the Chief Engineer on the 27 day of March, 2019.

“Project” means the diversion and transportation infrastructure planned by the Cities, including any future infrastructure expansions, to divert water from the R9 Water Rights and to transport it for municipal use in the City of Hays, Kansas, and its immediate vicinity as well as related areas in the Northeast Quarter (NE/4) of Section 19 and the Northwest Quarter (NW/4) of Section 36, in Township 13 South, Range 18 West, Ellis County, Kansas; and in the City of Russell, Kansas, and its immediate vicinity. The Project’s transportation infrastructure, to the extent that it delivers water for municipal use in the aforementioned areas, and to other users upon approval of future change applications, amounts to a “common distribution system” as that term is used in K.A.R. 5-1-1(vv).

“R9 Ranch” means that ranch historically known as such and comprised of various parcels of land located in Edwards County, Kansas, as visually depicted on the map attached to the Master Order as Exhibit 33¹⁷⁷ and as more specifically described in the legal description in the Master Order Appendix A.

“R9 Water Rights” means the existing, certified water appropriation rights with points of diversion on the R9 Ranch and assigned file numbers 21,729-D1; 21,729-D2; 21,730; 21,731; 21,732-D1; 21,732-D2; 21,733; 21,734; 21,841; 21,842; 22,325; 22,326; 22,327; 22,329; 22,330; 22,331; 22,332; 22,333; 22,334; 22,335; 22,338; 22,339; 22,340; 22,341; 22,342; 22,343; 22,345; 22,346; 27,760; 29,816; 30,083; and 30,084.

“Russell” means the City of Russell, Kansas.

¹⁷⁷ See also, Ex. 1.

Appendix B

Summary of efforts to find additional sources of water

This Appendix summarizes the Cities' efforts to find alternative sources of water and places the Cities' extensive efforts to resolve their longstanding water-supply deficits in context. It is not a complete statement of their joint or separate efforts, nor does it detail all of the Cities' efforts to evaluate each alternative. Only a few key documents for each alternative are provided at this time.

Evaluations of prospective sources run the gamut from the extensive efforts by multiple engineering firms to evaluate the "East Russell County Option" to a cursory review of a proposal to purchase Arkansas River surface water from Kearney County in Southwest Kansas.

A complete evaluation of a water supply alternative is a time-consuming, expensive, and complex process that requires, at a minimum, development of a conceptual design, analysis of standard criteria, and comparison to other alternatives. But the initial decision to conduct a complete evaluation of a particular source is generally intuitive, and many prospective sources do not justify the time and resources required for a complete analysis.

Thus, while all of the options discussed below were given the consideration warranted, not all of them have the same level of documentation. While numerous considerations are evaluated, the most important factors include the following:

- (1) Reliability. A prospective source must be able to supply the projected net quantity. This includes evaluating:
 - a. sustainable yield, *i.e.*, the net projected quantity must be available during a long-term and severe drought without causing significant ecological or environmental impacts;
 - b. need, *i.e.*, the source must be able to supply average-day and maximum-day demands, either individually or in combination with other sources; and
 - c. quality issues, *i.e.*, pollution and water quality variability.
- (2) Water rights. Water must be physically available and diversion must be legally permissible. This includes evaluating:
 - a. the extent to which the source has been developed by other users and the relative priority of other uses compared to the priority of prospective water rights; and
 - b. other legal considerations, principally the Kansas Water Transfer Act.

- (3) Project characteristics. Factors that affect both the total cost and cost per unit of water, include:
- a. proximity to the Cities;
 - b. the extent that existing infrastructure can be used;
 - c. the ability to develop the project in stages so that costs can be closely matched to demand;
 - d. the type and extent of required treatment, for example;
 - i. surface water and groundwater have different treatment requirements,
 - ii. finished water must comply with Safe Drinking Water Act requirements,¹⁷⁸
 - iii. aesthetics (taste and odor) must be acceptable to consumers,
 - iv. common contaminants like chlorides, nitrates, and pesticides may require special treatment, and
 - e. the presence of endangered species, wetlands, or historically important property.
- (4) Project Costs. Estimation, evaluation, and comparison of total project costs, including:
- a. raw water, water right, or storage acquisition;
 - b. land and right-of-way purchase;
 - c. permitting and environmental mitigation;
 - d. planning, design, and construction;
 - e. operation, maintenance, and replacement;
 - f. energy and utilities;
 - g. financing; and
 - h. technical, legal, and other professional services.

The Cities have evaluated the following potential sources of water.

¹⁷⁸ 42 U.S.C. 300f, *et seq.* and K.S.A. 65-161, *et seq.*

Smoky Hill River

The City of Hays' Smoky Hill River wellfield authorizes withdrawal of up to 2,800 acre-feet of water from the alluvium pursuant to three certified water appropriation rights, Files 1,248, 5,757, and 33,296. The quantity has been reduced by a 1984 IGUCA.

Russell's water rights at Pfeiffer, Files 1,267, 1,861, 17,586 and 17,587, permit the diversion of up to 1,086 acre-feet of surface water and 961 acre-feet of groundwater and are also limited by the 1984 IGUCA. Russell also has 2,700 acre-feet of storage in the Cedar Bluff Reservoir, File 7,628, which has a potential maximum yield of 2,000 acre-feet of water that Russell can have released each year.

For decades, Hays has explored the idea of expanding and optimizing its Smoky Hill River wellfield near Schoenchen to improve the reliability and quantity of water available from that limited water source.

In July of 1977, Black and Veatch submitted a *Water Supply Memorandum* to Hays that examined existing and anticipated water requirements and recommended a plan to expand the City's total water supply to meet current and immediate future water requirements including adding additional wells in the Smoky Hill River alluvium both east and west of then-existing wells.¹⁷⁹

On July 19, 1979, the City filed five applications for new water rights in the Smoky Hill wellfield: Files 33,292, 33,293, 33,294, 33,295, and 33,296. The applications requested permits to drill 18 new wells to divert an additional 1,400 acre-feet at an additional 6,300 gpm. This would have increased the total diversion from the Smoky Hill wellfield to 3,900 acre-feet per year at a rate of 9,900 gpm.

After discussion with DWR, the City withdrew all but one of the applications because of impairment and other concerns. On January 30, 1981, the Chief Engineer issued a single permit, File 33,296, for two new wells with a combined capacity of up to 300 acre-feet per year.¹⁸⁰

¹⁷⁹ Ex. 92, Black & Veatch, *Water Supply Memorandum*, at PDF p. 11 (July 5, 1977).

¹⁸⁰ Ex. 93, Approval of Application for File No. 33,296.

On May 21, 1984, the Chief Engineer issued an order establishing an IGUCA in the Smoky Hill River alluvium stating that for 1985, and until modified by the Chief Engineer, all non-irrigation water rights within the boundaries of the IGUCA are restricted to 90% of their maximum usage in 1981, 1982, or 1983.¹⁸¹

Irrigation use was restricted to the lower of the authorized quantity or 15 acre-inches per acre on the maximum number of authorized acres irrigated during any calendar year from 1977 through 1982.¹⁸²

In 1989, Hays obtained authorization from the U.S. Army Corps of Engineers for the “one-time construction of three temporary instream dams to hold water in an attempt to recharge the aquifer.”¹⁸³ The one-time construction was limited to “emergency water storage,” and the City was required to remove the dams “immediately following the recharge of the . . . wellfield or the elimination of [the] emergency water situation.”¹⁸⁴ The dams were not constructed, presumably because they were not intended to provide a long-term, sustainable water supply and could have impaired downstream water rights.

In 1995, Ground Water Associates investigated the Smoky Hill River wellfield and recommended that Hays rehabilitate, relocate, and replace certain wells. The investigation included drilling 32 test holes, installing five test wells, and conducting aquifer tests. The report proposed locations for two wells southwest of the wellfield as it existed at the time, which would expand the field one-half mile upstream.¹⁸⁵

A 2002 report by Tom Brikowski, Ph.D., Geology, of the University of Texas, evaluated the sustainable yield from the Hays Smoky Hill River wellfield. Dr. Brikowski concluded that, based on Hays’ average water use in 2002, the wellfield will routinely require groundwater overdrafting during the summers and that dry periods

¹⁸¹ Ex. 94, *In re Designation of an Intensive Groundwater Use Control Area in Trego, Ellis, Rush and Russell Cnties, Kan.* (Kan. Dep’t of Ag., Div. of Water Res. May 31, 1984).

¹⁸² *Id.*

¹⁸³ Ex. 95, Dep’t of the Army Permit (Mar. 26, 1990), and accompanying documents, at PDF pp. 4–12 (permit); PDF p. 1–3 (letters regarding permit).

¹⁸⁴ *Id.* at PDF p. 6.

¹⁸⁵ Ex. 96, Burns & McDonnell, *Phase II Report*, at PDF p. 2 (June 15, 2004).

“may deplete the aquifer sufficiently that limited extraction (e.g., 1,000 acre-ft/yr) is possible until the drought ends.”¹⁸⁶

Dr. Brikowski concluded that the wellfield has “minimum storage capability to rely on in times of limited stream flow.”¹⁸⁷ He recommended expanding the wellfield to help “drought proof” it. Later, Burns & McDonnell concluded that even if the City adopted Dr. Brikowski’s recommendations it would only extend the wellfield’s sustainable yield to meet Hays’ water needs “until about 2011.”¹⁸⁸

In 2003, Burns & McDonnell submitted an evaluation of the options to improve the Smoky Hill River wellfield to allow Hays to pump its full water right without significant interference with third-party wells and to expand the wellfield’s ability to produce during droughts.¹⁸⁹

Burns and McDonnell concluded that Hays should be able to pump its full water right as long as there is flow in the River.¹⁹⁰ However, during extended dry periods, additional water storage is required.¹⁹¹

Burns & McDonnell agreed that expansion of the wellfield would help the City withstand droughts, as noted in Dr. Brikowski’s report. “However this expansion, a move of a relatively long distance, presents potential regulatory hurdles. Additionally multiple wells may need to be relocated to capture the water available in storage.”¹⁹² Moreover, “[e]ven if new [water] rights were available, they would be subject to minimum desirable streamflow restrictions,” which “would potentially result in a new well/water right being unavailable during critical drought periods.”¹⁹³

¹⁸⁶ Ex. 97, Tom Brikowski, *Final Report: Sustainable Yield from the Smoky Hill River Wellfield, Schoenchen, KS*, at PDF p. 4 (Nov. 15, 2002).

¹⁸⁷ *Id.*

¹⁸⁸ Ex. 98, Burns & McDonnell, *Status Report on Wilson Lake and Kanopolis Water Supply Evaluation*, at PDF p. 1 (Feb. 14, 2003).

¹⁸⁹ Ex. 99, Burns & McDonnell, *Summary Report*, (June 3, 2003) and the attached *Interim Report* (Apr. 1, 2003).

¹⁹⁰ *Id.* at PDF p. 1.

¹⁹¹ *Id.*

¹⁹² *Id.* at PDF p. 2.

¹⁹³ *Id.* at PDF p. 15.

Burns & McDonnell further cautioned against overpumping the wellfield, noting that doing so may result in “accelerated deterioration of the wells, well screens, surrounding gravel pack and aquifer materials, and potential water quality deterioration because of aeration of the aquifer materials.”¹⁹⁴ The report recommended that Hays move forward with further investigation and testing of expanding the wellfield.¹⁹⁵ The City chose to upgrade the wellfield,¹⁹⁶

In June 2004, Burns & McDonnell issued its follow-up “Phase II Report” for the Smoky Hill River wellfield expansion project.¹⁹⁷ Phase II included field investigations to identify new well sites and “form an opinion of the probable cost of the wellfield improvements.”¹⁹⁸ The report presented several options including installation of new wells in different locations without requesting additional water rights.¹⁹⁹

The Report recommended relocating five existing wells and redrilling one well that was in poor condition.²⁰⁰ In addition, the City requested additional work for a “capital improvement package,” replacing the “east chlorination facility and equipment, evaluation and replacement or modification of raw water transmission lines within the existing wellfield and upgrades to the [monitoring and reporting] system.”²⁰¹ The wellfield modifications would increase the average well spacing, which would reduce potential drawdown interference.²⁰²

On October 7, 2004, Hays proceeded with the recommended plan that began with a series of applications to change the points of diversion for the wells in the Smoky Hill Wellfield.²⁰³ In response to concerns expressed by other water users, DWR required that Hays perform further “hydrologic analyses in order to determine the potential impacts to other water users, evaluate impacts to water levels, and estimate the amount

¹⁹⁴ *Id.* at PDF p. 19.

¹⁹⁵ *Id.* at PDF p. 3.

¹⁹⁶ Ex. 96, Burns & McDonnell, *Phase II Report*, at PDF p. 3 (June 15, 2004).

¹⁹⁷ *Id.*

¹⁹⁸ *Id.* at PDF p. 1.

¹⁹⁹ *Id.* at PDF p. 2.

²⁰⁰ *Id.* at PDF p. 3.

²⁰¹ *Id.* at PDF p. 7.

²⁰² *Id.* at PDF p. 8.

²⁰³ Ex. 100, *Initial Order*, at ¶ 1 (Kan. Dep’t of Ag., Div. of Water Res. Oct. 3, 2006).

of stream depletions in the vicinity of the wellfield.”²⁰⁴ In response, Burns & McDonnell submitted a report concluding that the City’s proposed wellfield enhancement would not impact the Smoky Hill River.²⁰⁵

A public hearing was held in May of 2006.²⁰⁶ Then-Chief Engineer, David Pope, who presided at the hearing, issued an Order on October 3, 2006, approving the change applications in part and imposing terms and conditions.²⁰⁷ The project was completed in 2009. Even with the improvements to the Smoky Hill wellfield, Hays is unable to withdraw its full allocation of water during periods of low streamflow.

There are other challenges as well. Russell’s wellfield is downstream from the Hays wellfield and recharge at Pfeifer is largely dependent on stream flow in the River. Flow in the Smoky Hill River, including releases from Russell’s storage right in Cedar Bluff, must make it past the Hays wellfield to replenish the Russell wellfield.

A recent Bartlett & West, Inc. study concluded that the Smoky Hill River alluvium is not a viable source for Russell noting the existence of the IGUCA, minimum desirable streamflow requirements, and the need for treatment.²⁰⁸

Groundwater from the Smoky Hill River alluvium is not an economically or technologically feasible alternative source of supply that is available to the Cities. The R9 Ranch was selected over this alternative for a number of reasons but mainly because the Smoky Hill River is being utilized at its full capacity and often beyond. It is not a reliable source of additional water for either Hays or Russell. In fact, approval of the transfer is likely to increase the health of the Smoky Hill River between Cedar Bluff and the Kanopolis Reservoir in Ellsworth County.

²⁰⁴ Ex. 101, Burns & McDonnell, *Supplemental Modeling Report*, at PDF p. 1 (Sept. 30, 2005).

²⁰⁵ *Id.* at PDF p. 14.

²⁰⁶ Ex. 100, *Initial Order*, at ¶ 19 (Kan. Dep’t of Ag., Div. of Water Res. Oct. 3, 2006).

²⁰⁷ *Id.* at 34-35.

²⁰⁸ Ex. 54, Bartlett & West, Inc., *Water Supply Study for the City of Russell, Kansas*, at pp. 23–24 (December 2014).

Dakota Aquifer

The Dakota aquifer underlies most of the Smoky Hill-Saline River Basin, but “there is great variability in aquifer yield and quality.”²⁰⁹ In 1987, the need for additional water supplies led the City of Hays to begin looking for locations to drill wells in the Dakota formation even though it was known that the water is high in chlorides and other minerals. Samples were taken at four locations just north of Hays and eight locations to the south.²¹⁰

As a result of initial testing, on May 15, 1992, Hays filed six Applications for new water appropriation rights for six new wells that would divert up to 860 acre-feet from the Dakota formation southwest of town: Files 40,702; 40,703; 40,704; 40,705; 40,706 and 40,707.²¹¹

On July 1, 1992, the Chief Engineer approved all six Applications and issued Permits that contained a number of specific limitations.²¹² The Permits require Hays to install and maintain an observation well network to monitor water levels in the aquifer, to collect water level data from an observation well network, and to submit a written summary of the data with each annual water use report.

The City commissioned the Kansas Geological Society to perform a sustainable yield study.²¹³ The study found that the City’s wells were located in a confined system with little freshwater recharge. The study suggested that excessive pumping would deplete the aquifer and/or degrade the water quality. Ultimately, the study did not

²⁰⁹ Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 22 (Aug. 2010).

²¹⁰ Ex. 103, *Dakota Water Supply Analysis*; Ex. 104, *Test Hole Drilling Report*, (Sept. 16, 1987); Ex. 105, *Test Hole Drilling Report*, (Mar. 4, 1988).

²¹¹ Exs. 106-111, Applications for Files 40,702; 40,703; 40,704; 40,705; 40,706 and 40,707.

²¹² Exs. 112-117.

²¹³ Ex. 118, Kansas Geological Survey, *An Evaluation of the Long-term Effect of Water Resources Development on the Dakota Aquifer in the Vicinity of the Hays Well Field*. See also Ex. 119, Letter from Bucher, Willis & Ratliff to Laverne Squier regarding recharge concerns for wells in the Dakota wellfield and corresponding Black & Veatch memorandum (July 21, 1992).

establish a sustainable yield, but indicated it would be significantly less than original projections.²¹⁴

As a result of the study and the need to blend the mineralized Dakota water with existing water sources, Hays embarked on a pumping program to perfect its Dakota Aquifer water right.

DWR proposed Certificates of Appropriation at the City’s request. Upon review, the City requested that DWR refrain from issuing the draft certificates because not all of the water rights have been fully perfected.

Water use from this source has not been significant. The following table summarizes the water withdrawn from the six Dakota wells. Some instances of “0.00” are the result of rounding small quantities.

File No.	40,702	40,703	40,704	40,705	40,706	40,707	Total Annual Use
Year	AF Used						
1992	0.00	0.00	0.00	0.00	2.91	3.04	5.95
1993	19.64	17.37	16.10	19.39	17.75	17.44	107.69
1994	13.90	0.00	18.86	17.70	16.16	0.69	67.31
1995	12.66	11.31	11.14	14.63	14.62	15.38	79.74
1996	12.12	15.35	13.37	16.99	13.54	16.20	87.57
1997	10.33	7.24	5.86	7.44	10.53	7.78	49.18
1998	12.43	13.19	13.69	12.13	12.13	10.92	74.49
1999	13.87	5.48	13.90	17.77	11.34	15.46	77.82
2000	11.08	13.21	13.34	15.31	14.05	12.56	79.55
2001	75.00	7.57	8.84	8.77	6.59	8.80	115.57
2002	119.59	0.00	0.00	0.61	0.00	0.00	120.20
2003	0.00	0.00	0.00	0.01	117.57	0.03	117.61
2004	0.18	0.02	0.01	95.87	0.01	0.01	96.10

²¹⁴ Ex. 120, Kansas Geological Survey, *An Evaluation of the Long-term Effect of Water Resources Development on the Dakota Aquifer in the Vicinity of the Hays Well Field, Vol. 1: Hydrogeologic Setting*; Ex. 121, Vol. 2: Numerical Modeling.

File No.	40,702	40,703	40,704	40,705	40,706	40,707	Total Annual Use
Year	AF Used	AF Used	AF Used	AF Used	AF Used	AF Used	
2005	15.11	32.74	12.24	13.94	20.30	11.04	105.37
2006	0.95	0.00	128.68	1.14	2.07	0.01	132.85
2007	0.00	0.00	0.00	0.00	0.00	14.58	14.58
2008	21.97	0.00	0.00	0.00	54.83	0.00	76.80
2009	11.98	0.00	0.00	0.12	102.54	1.41	116.05
2010	0.00	0.00	0.00	0.00	0.00	78.23	78.23
2011	37.20	65.35	0.00	0.01	0.04	6.24	108.84
2012	0.00	31.15	0.00	0.01	0.00	0.00	31.16
2013	0.00	0.74	0.00	0.01	0.00	150.80	151.55
2014	0.01	0.00	0.00	125.01	0.59	0.89	126.50
2015	0.01	0.00	0.00	122.06	0.00	0.00	122.07
2016	11.46	0.00	0.00	41.99	0.00	54.41	107.86
2017	0.00	0.00	0.00	53.34	0.00	62.26	115.6
Average Annual Use	15.37	8.49	9.85	22.47	16.06	18.78	91.01

Additional water from the Dakota formation is not an economically or technologically feasible alternative source of supply available to the Cities for a number of reasons, including:

- ◆ It is a non-renewable source;
- ◆ It has significant water quality issues that would require extensive treatment; and
- ◆ Well spacing requirements for a new long-term supply would require numerous small-quantity wells spread across a vast area.

South Russell Project

The South Russell Project was developed by the Cities working through the PWWSD #15 staff in the late 1990s. It was initially thought that there was significant potential for a wellfield in Eastern Russell County, along the Smoky Hill River

alluvium. Several contractors and engineering firms have investigated this option. The initial thought was that the area could produce in excess of 7,000 acre-feet of water annually.²¹⁵ Early studies estimated that the plan would cost around \$20.8 million in year-2000 dollars.²¹⁶

This option was also viewed as a stepping stone to Kanopolis. When it became clear that Kanopolis was not a viable option, the South Russell project became less attractive as well.

In 2001, PWWSD #15 hired Ground Water Associates to review the initial plans. That review concluded that the yield was not as high as originally thought and questioned the ability of the area to provide water during a drought because the alluvium would be subject to the same drought factors as Hays' and Russell's current wellfields.²¹⁷

Ground Water Associates concluded that the project could add another 1,000 acre-feet of supply, but noted that water from the project would have to be treated or blended to produce a potable supply and that the project would not provide "a drought proof supply since both the vertical and horizontal wells would be subject to the minimum desirable streamflow requirements."²¹⁸ Put simply, during droughts, when the Cities' water needs were greatest, the South Russell Project could not be relied on to provide a significant quantity.

A 2001 report from the Kansas Geological survey supported this conclusion, noting that the bulk of the water would come from the Smoky Hill River, that the discharge from that source "varies substantially" in the area of the planned wellfield, and that the flow of the river would be insufficient to meet previously projected production values during dry periods.²¹⁹ This was a critical finding because the Smoky

²¹⁵ Ex. 122, Ground Water Associates, Inc., *Report on South Russell Water Project*, at PDF p. 1 (Sept. 24, 2001) (noting that the South Russell would have an initial production capacity of about 2 million gallons per day that would eventually expand to 7 million gallons per day, *i.e.*, about 7,800 acre-feet per year).

²¹⁶ Ex. 123, Water Supply Contract between Hays and PWWSD #15, at PDF p. 3 (Nov. 1, 2000).

²¹⁷ Ex. 122, Ground Water Associates, Inc., *Report on South Russell Water Project*, at PDF pp. 1–3 (Sept. 24, 2001).

²¹⁸ *Id.* at PDF p. 1.

²¹⁹ Ex. 124, Letter from Donald Whittemore of the Kansas Geological Survey to David Traster (Aug. 3, 2001).

Hill River is subject to minimum desirable streamflow requirements,²²⁰ and the water rights from the proposed project would be junior to other earlier rights on the River.²²¹

The Kansas Water Office stated: “It is difficult to justify a project of this scope and cost that does not address the drought vulnerability of Hays and Russell.”²²² This option was not desirable as water would only be readily available when Hays and Russell’s existing sources were also viable. The high cost of treatment was also a factor as the water would need to be desalinized.²²³ As the plan progressed, it became clear that the South Russell Project was not a viable long-term option.

In April 2002, Ground Water Associates provided a second report detailing groundwater quality issues.²²⁴ The report concluded that reverse osmosis treatment would be required for the majority of water available from the proposed project, with a smaller quantity that could be treated with standard methods to reduce hardness, iron, and manganese.²²⁵

After extensive efforts and considerable expense to explore and develop the South Russell Project, the Cities concluded that, unlike the Ranch, the project did not offer a feasible long-term solution to their water problems. Poor water quality, limited quantity, high expense, and the important fact that the project would not provide a drought-proof source of water eliminated this alternative.

Wilson Lake

Wilson Lake was constructed in 1964 and is managed by the U.S. Army Corps of Engineers (“USACE”) for flood control, irrigation, navigation, recreation, fish and wildlife, and water quality purposes. “Wilson Lake has long been considered a potential water supply source [for the Cities], especially for Russell[,] because of its

²²⁰ K.S.A. 82a-703c.

²²¹ Ex. 124, Letter from Donald Whittemore of the Kansas Geological Survey to David Traster, at PDF p. 2 (Aug. 3, 2001).

²²² Ex. 125, Letter from Al LeDoux, Director of the Kansas Water Office, to Dave Traster (Aug. 6, 2001).

²²³ Ex. 124, Letter from Donald Whittemore of the Kansas Geological Survey to David Traster (Aug. 3, 2001).

²²⁴ Ex. 126, Ground Water Associates, *Ground Water Investigation* (Apr. 30, 2002).

²²⁵ *Id.* at PDF p. 2.

relatively close proximity compared to other reservoir sources.”²²⁶ However, there are at least three major problems with Wilson Lake: (1) water quality and (2) the cost to acquire storage from the USACE and (3) the fact that Wilson is not authorized for municipal and industrial storage.

In order to utilize water from Wilson Lake, the USACE will need to complete a reallocation study. That effort was started several years ago but was never completed and there are no indications that it will be completed. To go forward, the study will have to be completed, and it will have to conclude that 30,000 acre-feet of storage can and should be reallocated to municipal and industrial use. That storage will then have to be reallocated by Congress, which is likely to face opposition on several fronts. If finally reallocated, the Cities will have to purchase that storage from the Corps, which could be problematic because of cost and competition from other prospective purchasers.

Federal law requires municipalities to pay for water supplies. Congress has established a national policy, making states and local interests responsible for developing municipal water supplies.²²⁷

The USACE has the authority to reallocate storage in existing storage space to M&I use. Between 1958 and 1979, the price for reallocated storage was based on the original cost of construction of the federal reservoir.²²⁸ In 1979, the Corps began charging municipalities the highest of (1) the benefits or revenues foregone, (2) replacement cost, or (3) the “updated cost of storage.”²²⁹ The “updated cost of storage” is an attempt to “duplicate the cost of the project, as originally constructed, at today’s prices.”²³⁰ Purchasers must also pay construction and operational costs associated with reallocation, including costs to revise the “water control plan” and environmental mitigation costs.²³¹

²²⁶ Ex. 127, Bartlett and West, *Water Supply Alternative Review*, at PDF p. 13 (May 2003).

²²⁶ *Id.*

²²⁷ 43 U.S.C. 390b(a).

²²⁸ U.S. Army Corps of Engineers *Water Supply Handbook*, Dec. 1988, at p. 4-4.
<http://www.iwr.usace.army.mil/Portals/70/docs/iwrreports/96ps4.pdf>.

²²⁹ *Id.* at p. 4-8.

²³⁰ *Id.* at PDF p. 76.

²³¹ *Id.*

Water quality in Wilson Reservoir is also problematic. In 1967, Wilson and Company prepared a Report for the City of Russell analyzing a number of alternative sources, including water from the Saline River Valley.²³² Water quality is a major issue. Because the Saline River has cut down into the Dakota formation, there are significant water quality issues in both surface and groundwater.²³³ The Report is critical of the water quality in Wilson Reservoir:

The water being stored in Wilson Reservoir is of rather poor quality at the present time because it contains excessive amounts of chlorides. The concentrations vary over the reservoir area but all appear to be too high to merit consideration of the source for a municipal water supply.²³⁴

In spite of known quality issues, on August 22, 1991, Hays and Russell filed an application for a water appropriation right to divert up to 8,000 acre-feet of water annually from Wilson Lake for municipal purposes.²³⁵ The application remains viable until at least December 31, 2016.²³⁶

In 1993, Black & Veatch prepared a brief report regarding the development of a water supply from Wilson Lake that would serve both communities.²³⁷ The report states that treatment to remove high levels of minerals would be required, discusses options for disposal of brine from the treatment process, and summarizes the needed infrastructure. It does not address the cost to purchase storage from the USACE.²³⁸

In 1997, USACE studied the feasibility of reallocating 30,000 acre-feet of storage space in Wilson Lake to municipal and industrial use.²³⁹

Based on a Wilson Lake 2 percent net yield of 80 c.f.s. as confirmed in the yield study and a Wilson reservoir simulation model developed for this report, we determined that approximately 30,000 acre-feet of storage would

²³² Ex. 128, Wilson and Company, *Water Supply Study for the City of Russell* (Mar. 1967).

²³³ *Id.* at PDF p. 13.

²³⁴ *Id.* at PDF p. 61.

²³⁵ Ex. 129.

²³⁶ *See* Ex. 130, Letter from Lane Letourneau to David Traster (Feb. 21, 2012).

²³⁷ Ex. 131, Black and Veatch, *Memorandum regarding Wilson Lake* (Aug. 26, 1993).

²³⁸ *See id.*

²³⁹ Ex. 132, U.S. Corps of Engineers, *Wilson Lake Reconnaissance Study for Water Supply Storage Reallocation* (Sept. 1997).

be required to provide the cities of Hays and Russell 8,000 acre-feet per year at the pipeline.²⁴⁰

The study compared the costs to acquire storage in Wilson Lake plus infrastructure and treatment of 8,000 acre-feet of Wilson Lake water with the cost of piping 5,500 acre-feet of water from the Ranch *plus* 2,500 acre-feet from Kanopolis Lake.²⁴¹ The 1997 comparison indicated that Wilson Lake was less costly. At that time, the “updated cost of storage” was estimated to be \$4.75 million but the actual updated cost of storage would be determined during the fiscal year that a contract is actually approved.²⁴² Based on an ENR Construction Cost Index of 5,825 in 1997 and 10,092 in 2015, the cost to acquire storage in Wilson Lake would be almost \$8.25 million.

In 2002, the Cities, acting through PWWSD #15, requested proposals for an evaluation of Lake Wilson and Kanopolis Reservoir as public water supply sources, ultimately selecting Burns & McDonnell to perform the study.²⁴³ That firm’s 40-page report evaluated three potential water sources for the Cities: Kanopolis Reservoir, Wilson Lake, and a new wellfield south of Russell running east for approximately 20 miles.²⁴⁴

The study concluded that the new wellfield should not be pursued because the Cities do not own the water rights and may be unable to obtain them, and no sustainable yield information regarding this “potential water source” was available to evaluate it.²⁴⁵

The study estimated costs to develop Wilson Lake (\$84 million) and Kanopolis (\$75 million) in 2002 dollars; however, the report did not include a price for acquiring the water rights from Kanopolis because the Cities would be required to purchase water from the Kansas Water Office under its water marketing program. The study concluded that both Wilson and Kanopolis would make acceptable water supply alternatives.²⁴⁶

²⁴⁰ *Id.* at PDF p. 12.

²⁴¹ *Id.* at PDF pp. 20–21.

²⁴² *Id.* at PDF p. 16.

²⁴³ Ex. 133, *See Burns & McDonnell, Evaluation of Lake Wilson and Kanopolis Reservoir* (Feb. 20, 2003).

²⁴⁴ *Id.* at PDF pp. 12–13. Both the Kanopolis Reservoir and the South Russell option are discussed in more depth in those respective sections herein.

²⁴⁵ *Id.* at PDF p. 18.

²⁴⁶ *Id.* at PDF p. 30.

However, it eventually became clear that Wilson Lake was not a feasible long-term water supply for the Cities for several reasons. As stated in a 2003 “Water Supply Alternative Review” by Bartlett and West:

The biggest technical limiting factor for tapping [Wilson Lake] has been the raw water quality. Relative to other reservoirs, the water within Wilson Lake is much more mineralized, particularly regarding natural occurring salts that enter the impoundment. Dissolved monovalent salts are not typically removed in conventional treatment processes. Therefore, in order to use the water for municipal use, the water must in effect be treated twice, once as a surface water supply and secondly through a desalinization process, now most commonly Reverse Osmosis (RO). A byproduct of the RO process is a concentrated brine that under [2003] KDHE policies requires disposal into a Class I injection well.²⁴⁷

A 2003 report by the Kansas Water Office and USACE outlined potential water supplies for the Eastern Smoky Hill-Saline Basin, which included the Cities of Hays and Russell. Wilson Lake was eliminated as a potential water source “due to water quality issues (*i.e.*, high salinity requires desalinization of water and disposal of brine, both increase cost).”²⁴⁸

Wilson Lake was also much more expensive than the Ranch because of its poor water quality and the cost to acquire storage. In a 2005 design report, Burns & McDonnell estimated that the costs to treat and deliver Wilson Lake water would be about \$94 million in 2005 dollars.²⁴⁹

All things being equal, infrastructure costs for the Wilson Lake option are roughly equal to the Ranch costs. But all things are not equal. The Cities already own the water rights on the Ranch but would have to purchase storage in Wilson Lake at an estimated \$8.2 million in 2015 dollars in additional cost. That can only happen if Congress reallocates the storage in the Lake. And the operation and maintenance costs for a reverse osmosis plant and a deep brine disposal well make the cost disparity even larger. In the end, the uncertainty, high cost, and extremely poor water quality have eliminated Wilson as a viable long-term water supply alternative for the Cities.

²⁴⁷ Ex. 127, Bartlett and West, *Water Supply Alternative Review*, at PDF p. 13 (May 2003).

²⁴⁸ Ex. 134, Kansas Water Office for U.S. Army Corps of Engineers, *Planning Assistance to States Program Eastern Smoky Hill-Saline Basin Public Water Supply System*, PDF p. 10 (Sept. 2003).

²⁴⁹ Ex. 135, Burns & McDonnell, *Wilson Lake Water Treatment Facilities, Concept Design Report*, at PDF p. 81 (July 7, 2005).

Ogallala Aquifer

According to a 2010 study by the U.S. Army Corps of Engineers, the Ogallala aquifer accounts for approximately 134,000 square miles of the High Plains aquifer and is the dominant source of water in western Kansas. Groundwater Management Districts are involved in the management of most of this aquifer.

The Smoky Hill-Saline River Basin overlaps portions of the aquifer managed by GMD1 (western Kansas) and GMD4 (northwestern Kansas). The aquifer is severely depleted within GMD1, which has been closed to all new water appropriations.²⁵⁰ Small groundwater appropriations may be obtained in some locations in GMD4, but such appropriations, which are under 15 acre-feet per year, do not provide viable long-term water solutions for the Cities.²⁵¹

The Cities' independent investigation of the Ogallala supports the USACE's conclusion that it is not a viable water supply for the Cities. Saturated thicknesses and recharge are minimal and its useable lifetime is already "below minimum threshold" in most of Gove, Trego, and Graham Counties—the closest three counties to Hays and Russell that overlay the aquifer.²⁵²

Trego County

An April 18, 1985, letter from Bob Vincent, then with Layne-Western, to Ken Carter, then Hays City Manager, suggested that Hays look at the Ogallala formation in northeast Trego County. This suggestion was based on a review of published material rather than actual field work.²⁵³

Following up on this suggestion, in January 1987, Black & Veatch and Clarke Well & Equip drilled six test wells in the northern portion of Township 12 South Range 21 West, northwest of Ellis near the Trego-Ellis County line. The wells were approximately 22 miles from Hays. Two of the wells had saturated thicknesses of 34

²⁵⁰ K.A.R. 5-21-4(a).

²⁵¹ See, Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 22 (Aug. 2010).

²⁵² Ex. 136, Kansas Geological Survey, *The High Plains Aquifer*, at PDF p. 4 (Sept. 2001, Rev. Dec. 2009, Jan. 2015).

²⁵³ Ex. 137.

feet and an estimated potential yield of 250 gpm. The report concluded a dependable source of water might be available in this area.²⁵⁴

Consistent with the 1987 testing, a September 1989 report included a potential option for two 250 gpm wells, 25 miles of 16-inch pipeline, and a 1,000 gpm pump station at an initial cost of \$11,000,000 or about \$14,000 per acre-foot.²⁵⁵ If additional sources could be located in the area, the cost per acre-foot would come down as the wellfield expanded.²⁵⁶ This option was not pursued for a number of reasons, including the high cost per acre-foot, other sources that would reduce the per-acre-foot cost were never located, new water rights would be needed, the Transfer Act²⁵⁷ would be triggered, the total quantity was limited, and the aquifer is not recharged.²⁵⁸

Graham County

In August of 1989, Bob Vincent, by then with Ground Water Associates, Inc., wrote to Les Lampe, the Director of Water Resources Engineering for Black and Veatch, informing him of the availability of about 2,000 acre-feet of irrigation water from the Ogallala formation in Graham County.²⁵⁹

A September 1989 Report ranked this near the bottom of several options studied.²⁶⁰ While there were water rights available for sale in north-central Graham County, total hardness levels were considered borderline and would likely require treatment.²⁶¹

²⁵⁴ Ex. 138, Clarke Well and Equipment, Inc., *Pursuit of Add'l Water Supply E. Trego Cnty.* (Jan. 1987).

²⁵⁵ Ex. 139 at PDF p. 6.

²⁵⁶ *Id.*

²⁵⁷ In 1989, the Water Transfer Act, K.S.A. 82a-1501, *et seq.*, defined a “water transfer” as the diversion and transportation of 1,000 acre-feet or more per year for beneficial use outside of a ten-mile radius from the point of diversion. L. 1983, Ch. 341, §1(a). The definition was expanded to 2,000 acre-feet and 35 miles in 1993. L. 1993, Ch. 219, §1(a)(1).

²⁵⁸ Ex. 139, at PDF p. 6.

²⁵⁹ Ex. 140, Letter from Ground Water Associates to Black & Veatch (Aug. 24, 1989).

²⁶⁰ Ex. 139, at PDF p. 1.

²⁶¹ *Id.* at 3.

The 1989 report estimated costs at \$21,000,000 for 70 miles of 20-inch pipe, \$600,000 for 11 new municipal wells, \$400,000 for three new booster stations, and approximately \$4,000,000 for treatment plant expansions for a total cost of \$26,000,000.²⁶² The costs to acquire water rights and rights-of-way, legal fees, and engineering costs were not included for any of the options considered in that study.²⁶³

This option was considered and rejected for the same reasons the Trego County option was not pursued.²⁶⁴

In a May 13, 1997 letter report, Black and Veatch concluded that the option did not appear to be cost-effective because of the cost to purchase 5,500 acre-feet of existing water rights, coupled with the cost of the infrastructure to bring the water to Hays.²⁶⁵

Ogallala water is not an economically or technologically feasible alternative source of supply that is available to the Cities. The R9 Ranch was selected over this alternative for a number of reasons, including the following:

- ◆ Quantities in the Ogallala are limited and not being replenished.
- ◆ Saturated thickness is minimal in areas closest to Hays and Russell.
- ◆ The aquifer's useable lifetime is already below minimum thresholds.
- ◆ Obtaining water from the Ogallala to the west would require the Cities to acquire existing water appropriation rights from irrigators already using this source even though the Cities already own water rights in Edwards County.
- ◆ There is no contiguous concentration of senior appropriation rights comparable to the R9 Ranch so water rights from multiple owners would have to be acquired.
- ◆ To obtain a source comparable to the Ranch, the Cities would likely be forced to use their condemnation powers making the cost to acquire the necessary water rights unpredictable.

²⁶² *Id.* at 5.

²⁶³ *Id.* at 2.

²⁶⁴ *Id.* at 5.

²⁶⁵ Ex. 141, Black & Veatch, *Summary Report regarding development of Kanopolis as a water supply*, at PDF p. 6 (May 13, 1997).

- ◆ The distances to significant quantities of Ogallala water approach and in most cases exceed the distance to the Ranch. The distances are even greater for Russell than for Hays.
- ◆ While there are no recent estimates of infrastructure costs, total costs are not likely to be substantially lower than going to the Ranch.

Kanopolis Reservoir

Operated by the U.S. Army Corps of Engineers (“USACE”), Kanopolis Lake was completed in 1948 on the Smoky Hill River downstream of Ellsworth and about 75 miles east of Hays and 45 miles east of Russell. Kanopolis Reservoir was initially authorized for flood control, irrigation, and recreation purposes. Some storage was later allocated to include water supply.²⁶⁶

In 1997, the Cities asked Black & Veatch to study the feasibility of developing Kanopolis Reservoir as a water supply.²⁶⁷ The Black & Veatch report compared the R9 Ranch, Wilson Reservoir, Kanopolis Reservoir, and groundwater rights in Graham County as potential water sources for the Cities.²⁶⁸ Kanopolis Reservoir was the most distant alternative considered and would have required the greatest capital investment.²⁶⁹

A 2003 report by the Kansas Water Office and the USACE proposed piping raw water from Kanopolis Reservoir to a treatment plant operated by Hays, Russell, or a public wholesale water supply district, as well as other potential alternatives for providing water to the Eastern Smoky Hill and Saline basins.²⁷⁰ This proposed solution was a regional system, dependent upon numerous potential participants intended to

²⁶⁶ Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 26 (Aug. 2010).

²⁶⁷ Ex. 141, Black & Veatch, *Summary Report regarding development of Kanopolis as a water supply* (May 13, 1997).

²⁶⁸ *Id.* at PDF p. 6.

²⁶⁹ Ex. 127, Bartlett & West, *Water Supply Alternative Review*, at 11 (May 2003).

²⁷⁰ Ex. 134, Kansas Water Office for U.S. Army Corps of Engineers, *Planning Assistance to States Program Eastern Smoky Hill-Saline Basin Public Water Supply System*, PDF p. 5 (Sept. 2003).

achieve the “operational economies of scale over multiple small systems.”²⁷¹ The report listed 34 cities and 22 rural watershed districts as potential participants.²⁷² It recommended that potential participants form a regional public wholesale water supply district and limit the water-supply contracts to “20-year increments.”²⁷³ The report acknowledged the significant capital investment that would be required of Hays and Russell to pipe water up from Kanopolis. Under the plan, the Cities would need new transmission lines for both raw and treated water and additional treatment plants.

At the outset of the study, the Kansas Water Office made it clear that it would “NOT be responsible for pipeline and treatment construction or costs.”²⁷⁴ Moreover, it noted that Kanopolis Lake is not drought proof and that its reliability has worsened because of storage loss from sedimentation and reduced inflow from the Smoky Hill River since 1950.²⁷⁵

More recent droughts brought added attention to the lake’s water supply issues, as noted by the Kansas Water office and the USACE:

Specifically of concern are the water releases and lake levels during times of little or no inflow, such as in 2006, and the needs of downstream water users. This concern is reinforced by data on water appropriations and water uses. In the 101 miles of river below Kanopolis Dam to the New Cambria gage, which is located east of the confluence of the Smoky Hill and Saline rivers, there are nearly 300 water rights for an authorized quantity totaling 41,123 acre-feet per year (38.5 MGD) from surface and alluvial groundwater sources. The larger portions of this quantity are appropriations for irrigation, and municipal and industrial use, including the city of Salina.²⁷⁶

²⁷¹ Ex. 134, Kansas Water Office for U.S. Army Corps of Engineers, *Planning Assistance to States Program Eastern Smoky Hill-Saline Basin Public Water Supply System*, PDF p. 13 (Sept. 2003).

²⁷² *Id.* at PDF p. 8.

²⁷³ *Id.* at PDF p. 14.

²⁷⁴ Ex. 142, Public Wholesale Water Supply District No. 15, Meeting Agenda (Jan. 10, 2002).

²⁷⁵ *Id.*

²⁷⁶ Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 27 (Aug. 2010).

In 2005, Hays asked Ranson Financial and Burns & McDonnell to evaluate the possible acquisition of Post Rock Rural Water District.²⁷⁷ Post Rock has experienced financial difficulties and was not making payments on its USDA loans. The report noted that Post Rock has easements and infrastructure in Ellis and Russell Counties, including around Wilson and Kanopolis Lakes. However, its treatment facility was under an abatement order from KDHE, and Post Rock was experiencing a 35% water loss in its distribution system. “[S]ignificant distribution system improvements would be required.”²⁷⁸

While Post Rock’s existing “pipeline easements could be used for a Kanopolis to Hays pipeline[,] . . . the easements may not be in the most favorable alignment and thus may increase pipeline cost, so they offer little value.”²⁷⁹ Moreover, “a significant capital investment will be required in order to achieve compliance with KDHE regulations.”²⁸⁰

The report concludes that it would not be in Hays’ best interest to acquire Post Rock, even if the USDA loans were forgiven.²⁸¹

Big Creek Water Banking

In the late 1980s–early 1990s, Black & Veatch developed a plan to use treated effluent from the Hays wastewater treatment plant as part of a recharge and withdrawal program in the Big Creek alluvial aquifer.²⁸² A portion of the wastewater would be used to irrigate golf courses, parks, and ballfields with the remaining effluent used to recharge the Big Creek alluvium.²⁸³ The plan involved several miles of 10 to 16

²⁷⁷ Ex. 143, Hays had also hired Black & Veatch to perform a cost for acquiring Post Rock and piping water up from Kanopolis in 1998. The Memorandum only allowed for 645 acre-feet of water at a high cost. Black & Veatch, *Memorandum* (Apr. 6, 1998).

²⁷⁸ Ex. 144, Burns & McDonnell, *Post Rock Water Supply Alternative Executive Summary*, PDF p. 4 (June 14, 2006).

²⁷⁹ *Id.*

²⁸⁰ *Id.* at PDF p. 5.

²⁸¹ *Id.* at PDF p. 6.

²⁸² Ex. 145, Michael Perrault, *Precious Water: How Hays Plans to Keep it Flowing*, Midwest Contractor, at PDF p. 2 (Sept. 9, 1990).

²⁸³ Ex. 146, Black & Veatch, *Operation Plan for the Big Creek Water Banking Plan*, at PDF p. 28 (Apr. 1993).

inch pipe through which effluent would travel before discharging into Big Creek.²⁸⁴ Effluent would also be discharged to a new “recharge basin.”²⁸⁵ Water would be stored in the alluvium for later withdrawal by new wells that would also induce recharge.²⁸⁶ “The City’s initiatives . . . yielded the State’s first formal consideration of the concept of Water Banking.”²⁸⁷

In May 1991, the City presented its operation plan for the water-banking project to DWR,²⁸⁸ and in 2006, the City retained Bartlett & West to revisit the plan.²⁸⁹

The 2006 report expressed several concerns. DWR and KDHE were at odds about how to monitor and measure the quantity and quality of water that would be diverted for reuse. DWR preferred recharge basins that would provide more “calculable accounting”; KDHE preferred discharging the effluent into Big Creek because of “water quality concerns.”²⁹⁰ “This difference in institutional preference was not resolved.”²⁹¹

Due to a relatively small net quantity of water²⁹² (approximately 500 acre-feet²⁹³); poor aquifer recharge;²⁹⁴ water quality concerns including for example the existence of “Emerging Pollutants of Concern” like pharmaceuticals, personal care products, and

²⁸⁴ Ex. 145, Michael Perrault, *Precious Water: How Hays Plans to Keep it Flowing*, Midwest Contractor, at PDF p. 2 (Sept. 9, 1990).

²⁸⁵ Ex. 146, Black & Veatch, *Operation Plan for the Big Creek Water Banking Plan*, at PDF p. 13 (Apr. 1993).

²⁸⁶ *Id.* at PDF p. 45.

²⁸⁷ Ex. 147, Bartlett & West Engineers, Inc., *Wastewater Reuse Update*, at PDF p. 5 (Aug. 2006).

²⁸⁸ Ex. 148, Black & Veatch, *Operation Plan for the Big Creek Water Banking Plan* (May 1991).

²⁸⁹ Ex. 147, Bartlett & West Engineers, Inc., *Wastewater Reuse Update*, at PDF p. 8 (Aug. 2006).

²⁹⁰ *Id.*

²⁹¹ *Id.*

²⁹² *Id.* at PDF p. 5.

²⁹³ Ex. 145, Michael Perrault, *Precious Water: How Hays Plans to Keep it Flowing*, Midwest Contractor, at PDF p. 4 (Sept. 9, 1990).

²⁹⁴ Ex. 149, Black & Veatch, *Operation Plan for the Big Creek Water Banking Plan*, at PDF pp. 16–22 (Apr. 1993).

endocrine disruptors;²⁹⁵ and more economical alternatives,²⁹⁶ the City abandoned the water-banking plan. As noted by Midwest Contractor, “[t]he plan will only bring Hays enough water to match levels the city was deriving [in 1981]. And as with any progressive City, Hays is looking to grow.”²⁹⁷

It should be noted that as part of its conservation efforts beginning in the early 1990’s, Hays began using treated effluent from its municipal sewage treatment plant for irrigation of recreational areas. Hays currently irrigates 145 acres with treated effluent, which averages 18.2% of the total effluent produced on an annual basis and in 2017, a relatively dry year, the average was 29%.

Saline River

In 1967, Wilson and Company prepared a Report for the City of Russell analyzing a number of alternative sources, including water from the Saline River Valley.²⁹⁸ As discussed under the Wilson Reservoir headings, water quality is a major issue. The Saline River cuts down into the Dakota formation causing water quality issues in both surface and groundwater.²⁹⁹ The report’s opening paragraph of the section discussing the Saline River Valley states:

Very little precise data are available regarding groundwater in the alluvial deposits of the Saline River, but enough is known in a general form to guide a judgment as to the potential supply value of the valley’s aquifers. The wells in the river alluvium that have been tested indicate a satisfactory quality of water available at some locations. However, the existing wells are low production, shallow wells used only for domestic or stock use on farms, and their operation does not appreciably affect the normal groundwater migration toward the river channel. The sustained large draft that would be necessary for a municipal supply would almost certainly draw the brackish river water into the aquifer, even if an aquifer could be located that would supply the required demand. Considerations of the quantity and

²⁹⁵ Ex. 147, Bartlett & West Engineers, Inc., *Wastewater Reuse Update*, at PDF pp. 13–15 (Aug. 2006).

²⁹⁶ *Id.* at PDF pp. 5, 17–18.

²⁹⁷ Ex. 145, Michael Perrault, *Precious Water: How Hays Plans to Keep it Flowing*, Midwest Contractor, at PDF p. 5 (Sept. 9, 1990).

²⁹⁸ Ex. 128, Wilson and Company, *Water Supply Study for the City of Russell*, (Mar. 1967).

²⁹⁹ *Id.* at PDF p. 13.

quality of groundwater supplies likely to be found in the Saline River Valley do not indicate that a feasible municipal supply could be developed.³⁰⁰

In 1974, Hays asked Layne-Western Co., Inc. to provide a hydrology report on the Saline River Valley area north of Hays for potential additional water supplies.³⁰¹ Layne-Western did not find sufficient water quantities of acceptable quality to meet the Cities' needs and concluded that "even the best quality test location will deteriorate from the infiltration of water from the Saline River" as the aquifer recharges from that source.³⁰² The report concluded that "[d]ue to the excessive distance to this valley area from the City of Hays, it does not appear to warrant additional groundwater investigation at this point in time."³⁰³

Additional water quality testing was conducted in the mid-1980s.³⁰⁴ It appears that some consideration may have been given to obtaining water from the Saline River or its alluvium as late as 2001 because Scott Ross, the DWR Water Commissioner at Stockton Field Office, faxed a list of water rights to Lavern Squire, Manager of PWWSD #15.³⁰⁵

A recent Bartlett & West, Inc. report recommended further study of this source as an alternative for Russell. The report indicates that Russell could obtain an additional 1,075 acre-feet of water from new water rights in the Saline River alluvium and the Salt Creek alluvium at a projected cost of \$7.6 million, or just over \$7,000 per acre-foot.³⁰⁶ The report states that "water quality shouldn't be a significant issue for the City of Russell because the newly constructed EDR WTP has the technology to treat the water from this aquifer."³⁰⁷

³⁰⁰ *Id.* at PDF p. 60.

³⁰¹ Ex. 150, Layne-Western Company, Inc., *Groundwater Hydrology Study* (Apr. 1974).

³⁰² *Id.* at PDF pp. 5–6.

³⁰³ *Id.* at PDF p. 6.

³⁰⁴ Ex. 151, Letter from Black & Veatch to Kenneth Carter, City Manager of Hays (May 13, 1986).

³⁰⁵ Ex. 152.

³⁰⁶ Ex. 54, Bartlett & West, Inc., *Water Supply Study for the City of Russell, Kansas* (December 2014), PDF pp. 21–23, 36.

³⁰⁷ *Id.* at PDF p. 21.

In addition to the quality issues, all evidence indicates that there is insufficient quantity from this source to meet the Cities' long-term water needs. DWR's July 1, 1993 administrative policy limits new appropriation rights from the Saline River and its alluvium to 50% of the "percent of calculated recharge available" for appropriation.³⁰⁸ DWR increased the limitation to 75% when it adopted this policy as a regulation in 1994.³⁰⁹

Groundwater from the Saline River alluvium is not an economically or technologically feasible alternative source of supply for the Cities. The R9 Ranch was selected over this alternative for a number of reasons but mainly because of significant concerns with water quality, insufficient water quantity, and the need for immediate treatment.

- ◆ This source may provide Russell with an alternative but does not address critical needs in Hays. Moreover, the Bartlett & West study is preliminary and does not address limitations on new water rights that could affect the viability of this project.
- ◆ There is no contiguous concentration of senior appropriation rights comparable to the R9 Ranch in the Saline River alluvium; water rights from multiple owners would have to be acquired.
- ◆ Obtaining water from this source would require the Cities to acquire existing water appropriation rights from irrigators already using this source even though the Cities already own water rights in Edwards County.
- ◆ To obtain a source comparable to the Ranch, the Cities would likely be forced to use their condemnation powers, making the cost to acquire the necessary water rights unpredictable.
- ◆ New water rights would be subject to minimum desirable streamflow requirements and could affect baseflow into Wilson Lake.
- ◆ The operation of K.A.R. 5-3-11 would require the acquisition of additional quantities of water beyond "sustainable yield."
- ◆ Acquiring all of the existing irrigation water rights in the Saline River alluvium in Ellis and Russell counties would, at most, yield only approximately 1,400 acre-feet of water after conversion to Municipal use.

³⁰⁸ Ex. 153.

³⁰⁹ Ex. 154 at PDF p. 5.

The cost of a gathering system, treatment, and conveyance to Hays and Russell would be cost prohibitive.

- ◆ Acquiring all of the existing irrigation rights would require in excess of 50 miles of collection piping and 15 to 20 miles of raw water transmission in an area with mostly bedrock and as many as 20 well houses because of the one-half mile limitation on moving points of diversion.
- ◆ Much like the Cities' water rights in the Smoky Hill River and its alluvium, water rights in the Saline River alluvium are vulnerable to drought.

Cedar Bluff Reservoir

The headwaters of the Smoky Hill River are located in eastern Colorado.³¹⁰ The drainage basin above the Cedar Bluff Reservoir covers 5,530 square miles.³¹¹

Construction of the Cedar Bluff Reservoir in Trego County was completed in 1951.³¹² It is operated by the U.S. Bureau of Reclamation.³¹³ It was originally authorized for irrigation, flood control, and water supply, with incidental benefits for recreation, fish and wildlife, and water quality.³¹⁴ In 1992, Congress reformulated the project as an operating pool for fish, wildlife, and recreation, eliminating irrigation.³¹⁵ The elevation of the top of the conservation pool is 2,144.0 above mean sea level but the surface is often below that elevation because of reduced inflow.³¹⁶

The construction of the Reservoir cut off the flow of water from the west into Ellis and Russell Counties impairing water rights held by both Cities in the Smoky Hill River alluvium. Numerous proposals and studies about Cedar Bluff serving as a potential water supply for the Cities were undertaken over the years, but none of them have resulted in viable projects.

³¹⁰ Ex. 155, Kansas Water Office, *2009 Kansas Water Plan*, at PDF p. 1 (2009).

³¹¹ Ex. 156, KWO Cedar Bluff Lake, *Reservoir Information Sheet* (2012).

³¹² *Id.*

³¹³ *2009 Kansas Water Plan, supra*, at PDF p. 4.

³¹⁴ Ex. 156, KWO Cedar Bluff Lake, *Reservoir Information Sheet* (2012).

³¹⁵ Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 25 (2010).

³¹⁶ *Id.*

Both Hays and Russell have wellfields in the Smoky Hill River alluvium that depend almost entirely on river flow for recharge. The alluvium is very narrow and has limited saturated thickness creating a storage vessel that can hold a limited quantity of water. Without significant recharge from the River, the water supply is insufficient to meet the Cities' current needs.

Under normal conditions, sustainable yield has been estimated to be roughly 2,000 acre-feet per year from the Hays wellfield. The recent and unprecedented drought that ran from 2010-2015 illustrates the vulnerability that extended periods without river flow can have on the aquifer. The aquifer was nearly full going into the drought. Withdrawals of approximately 1,000 acre-feet per year quickly caused declines that triggered water watch conditions in Hays in as few as 12 months.

A 1984 report prepared by the U.S. Department of Interior titled, *Cedar Bluff Reservoir Water Supply & Operations Study*, assessed inflow to the reservoir to determine what water was available for irrigation and other uses.³¹⁷ The study found that inflow was significantly less than when the reservoir was constructed and concluded that Cedar Bluff should no longer be used for irrigation.

A 2003 report by the Kansas Water Office and the U.S. Army Corps of Engineers outlined potential water supplies for the Eastern Smoky Hill-Saline Basin, which includes Hays and Russell.³¹⁸ Cedar Bluff was eliminated as a potential water source because of its dismal "historical record." "A 1999 yield analysis indicated a very low yield."³¹⁹

In a January 2003 letter to "concerned citizens," the Kansas Water Office confirmed that it had

completed an analysis that indicates that **Cedar Bluff Lake is not a viable option for a sustainable, significant, long-term public water supply.** This analysis and public discussion in 1999 led the Kansas legislature to pass a proviso that prohibits the use of Cedar Bluff Lake for public water supply.

³¹⁷ Ex. 157, Cedar Bluff Reservoir Water Supply and Operation Studies, at PDF p. 26–27 (May 1984).

³¹⁸ Ex. 134, Kansas Water Office for U.S. Army Corps of Engineers, *Planning Assistance to States Program Eastern Smoky Hill-Saline Basin Public Water Supply System*, PDF p. 10 (Sept. 2003).

³¹⁹ Ex. 134, Kansas Water Office for U.S. Army Corps of Engineers, *Planning Assistance to States Program Eastern Smoky Hill-Saline Basin Public Water Supply System*, PDF p. 10 (Sept. 2003).

The Kansas Water Office has no intention of violating this legislative direction by selling public water supply from Cedar Bluff Lake.³²⁰

That Cedar Bluff is not a reliable long-term water supply for the Cities is further supported by the fact that DWR has established two IGUCAs along the Smoky Hill River, one downstream from the Cedar Bluff Reservoir³²¹ and a second upstream from the Reservoir.³²²

And as noted in a 2010 Draft Environmental Report by the U.S. Army Corps of Engineers and the Kansas Water Office:

Results of an analysis by [the Kansas Water Office] to determine the water supply yield that can be expected during a two percent chance drought . . . indicated Cedar Bluff is not suitable for storage of water under the Water Marketing Program In addition, all of the streams and alluvial corridors in the Basin are closed or restricted for new water appropriations.³²³

The nonviability of Cedar Bluff as a long-term municipal water source is further demonstrated by problems with the use of Russell's storage right in Cedar Bluff Reservoir, DWR File 7,628. Russell relies on the Smoky Hill River to deliver this water to Pfeiffer via the streambed. Significant losses have generally occurred during requested releases because of infiltration, evaporation, and direct pumping by others along the river upstream of the Russell wellfield.³²⁴ Moreover, releases must make it past the Hays wellfield to reach Pfeiffer. This has not been possible during prolonged droughts.

In an April 28, 2003, letter from the Hays City Attorney, John Bird, to Gov. Sebelius, Hays threatened to file an impairment lawsuit against the State if something was not done about the impact Cedar Bluff has on the downstream alluvium.³²⁵ That

³²⁰ Ex. 158, Letter from Kansas Water Office to Gomer Stukesbary (Jan. 30, 2003) (emphasis added).

³²¹ Exs. 159-160, Lower Smoky Hill IGUCA.

³²² Ex. 161, Upper Smoky Hill IGUCA.

³²³ Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 25 (Aug. 2010).

³²⁴ *Id.*

³²⁵ Ex. 162, Letter from John T. Bird to Gov. Kathleen Sebelius (Apr. 28, 2003).

letter resulted in an *Artificial Recharge Pool Operations Agreement*,³²⁶ which acknowledges the hydraulic connection between streamflow in the Smoky Hill River and the adjoining alluvium. The purpose of the agreement is to increase artificial recharge for the benefit of all water users in the valley.

While the *Artificial Recharge Pool Operations Agreement* has improved management of flows in the River during normal conditions, the 2010-2011 drought demonstrated that it is insufficient to address the Cities' water needs.

A recent Bartlett & West, Inc. report reviewed numerous previous studies and concluded that Cedar Bluff is not a viable option for additional water for Russell.³²⁷

Cedar Bluff Lake is not an economically or technologically feasible alternative source of supply that is available to the Cities. The R9 Ranch was selected over this alternative for all of the reasons discussed above.

Cedar Bluff Cattle Feeders Water Rights³²⁸

In 2008, Burns & McDonnell evaluated water rights owned by Cedar Bluff Cattle Feeders (CBCF), which had expressed an interest in selling land and facilities, including 904 acre-feet of water rights.³²⁹ In 2005, the Kansas Department of Agriculture, DWR, KWO, and the City of Hays jointly agreed, in a memorandum of understanding, to evaluate potential purchase and retirement of water rights with the goal of reducing water use impacts in the Smoky Hill IGUCA.³³⁰ By purchasing the CBCF water rights, the Cities hoped to lessen the impact that evapotranspiration and upstream water use had on their wellfields.³³¹

³²⁶ Ex. 163, Cedar Bluff Reservoir Artificial Recharge Pool Operations Agreement (Sept. 22, 2004).

³²⁷ Ex. 54, Bartlett & West, Inc., *Water Supply Study for the City of Russell, Kansas* (December 2014), pp. 19–21.

³²⁸ Ex. 164, Burns & McDonnell, *Cedar Bluff Cattle Feeders Water Right Evaluation* (June 30, 2008).

³²⁹ *Id.* at PDF p. 1.

³³⁰ *Id.*

³³¹ *Id.* at PDF pp. 2–3.

Burns & McDonnell's report concluded that retiring the CBCF water rights would have a "positive yet limited benefit to the City of Hays."³³² Moreover, CBCF's asking price for the property was excessive. A state appraisal valued the property at approximately \$1 million and the Burns & McDonnell Report valued the water rights alone between \$400,000–\$468,000, with the caveat that these prices were "somewhat inflated . . . considering that a portion of the water right is for stock watering and because a high percentage of the property is uncultivated and thus not irrigated."³³³ The owners were asking \$6,000,000.³³⁴

Acquisition of water rights from Cedar Bluff Cattle Feeders is not an economically or technologically feasible alternative source of supply that is available to the Cities. The R9 Ranch was selected over this alternative because of the high price, small quantity, and limited benefit of acquiring these water rights.

Walnut Creek, Pawnee River, and the Middle Arkansas River

In a 1967 Report prepared for Russell,³³⁵ Wilson and Company discussed the potential development of a wellfield in the Arkansas River Valley approximately five miles northwest of Great Bend, Kansas, along Walnut Creek. The report concluded that this source should not be pursued unless other options were not feasible.³³⁶

In the late 1980s and early 1990s, Black and Veatch studied the "Big Bend" area of the Arkansas River looking for potential wellfield sites for Hays.³³⁷ At the time, Hays was looking for about 3,000 acre-feet.³³⁸ Black and Veatch proposed development of wellfields at three alternate locations: the Walnut Creek basin, the Pawnee River basin, and an area southwest of Great Bend, Kansas. That project was slated to cost \$27 million.³³⁹

³³² *Id.* at 6–7.

³³³ *Id.* at PDF p. 5–6.

³³⁴ Ex. 165, City of Hays City Commission Work Session Agenda, at PDF p. 18 (July 21, 2011).

³³⁵ Ex. 128, Wilson & Co., *Water Supply Study*, (Mar. 1967).

³³⁶ *Id.* at PDF p. 76.

³³⁷ Ex. 166, Black & Veatch, *Development of Big Bend Supply*, at PDF p. 2 (Jan. 3, 1990).

³³⁸ *Id.* at PDF p. 2.

³³⁹ *Id.* at PDF p. 8.

In 1993 and early 1994, the City was contacted by Central Kansas Utilities from Great Bend with an offer to sell water to Hays at \$2.65 per 1,000 gallons or approximately \$864 per acre-foot.³⁴⁰ This option was not pursued because the water would be subject to price increases.³⁴¹

Walnut Creek

The Walnut Creek alluvium, the productive area closest to Hays, is closed to further development. And the Creek discharges into the Cheyenne Bottoms Wildlife Refuge, an environmentally sensitive area³⁴² and important migratory bird stopover.³⁴³

In 1948 and 1954, the Kansas Fish and Game Commission (now the Kansas Department of Wildlife, Parks and Tourism) obtained surface-water appropriation rights from Walnut Creek and the Arkansas River.³⁴⁴ Water Right File No. 439, priority date October 18, 1948, was certified on September 13, 1990, and permits the diversion of 19,175 acre-feet per year of Walnut Creek Surface water at 500 cfs.³⁴⁵

Water Right File No. 2,427, priority date April 9, 1954, was certified on August 15, 2000, permitting the diversion of up to 18,185 acre-feet per year of surface water from the Arkansas River at 80 cfs.³⁴⁶

In September 1989, the Chief Engineer adopted Administrative Policy No. 89-10, entitled, *Availability of surface water and groundwater from Walnut Creek, its tributaries and their valley alluviums and other hydraulically connected aquifers*.³⁴⁷ The Policy stated that applications for new permits to appropriate surface water from Walnut Creek or its tributaries or groundwater from aquifers that are hydraulically connected to Walnut Creek or its tributaries received on or after that date would be accepted for filing and

³⁴⁰ Ex. 167, Water Group Subcommittee Meeting, *Minutes*, at PDF p. 7 (Nov. 1, 1993).

³⁴¹ *Id.*

³⁴² Ex. 166, Black & Veatch, Memorandum, *Development of Big Bend Supply*, at PDF p. 1 (Jan. 3, 1990).

³⁴³ John C. Peck, *Property Rights in Groundwater—Some Lessons from the Kansas Experience*, 12 KAN. J. L. & PUB. POL'Y 493, 499 (2003).

³⁴⁴ *Id.*

³⁴⁵ *Id.* at endnote 51.

³⁴⁶ *Id.*

³⁴⁷ Ex. 168.

given a file number but would be denied because approval would prejudicially and unreasonably affect the public interest or impair use under existing water rights.³⁴⁸

As of May 6, 1991, 504 water rights, including 82 vested rights, permitted the diversion of up to 71,724.64 acre-feet of surface and groundwater each year from the Walnut Creek basin.³⁴⁹

DWR's 1989 Report and Policy were precursors to public hearings held in December of 1990 that resulted in an IGUCA Order issued on January 29, 1992.³⁵⁰ The Walnut Creek IGUCA has been amended but remains in place.³⁵¹

Pawnee River

Black and Veatch reported that the next closest area, the Pawnee River alluvium, is also closed to new appropriations,³⁵² but that does not appear to have been the case. New permits were possible in GMD5 until March 16, 2001, if the ever-changing regulatory criteria could be met.³⁵³ However, the GMD indicated that new water rights would be difficult to obtain in the Pawnee River Basin.³⁵⁴

Even though the area was not technically closed to new appropriations at the time of the Black and Veatch Report, the area was likely over appropriated. And if it was not over appropriated then, it is now. On July 8, 1981, the Chief Engineer issued an IGUCA order for the Pawnee River Basin from Larned, Kansas, west to the Pawnee County line making the requirements for obtaining a new water right more onerous.³⁵⁵ On September 13, 1985, the Chief Engineer issued another IGUCA Order further tightening the restrictions.³⁵⁶

³⁴⁸ *Id.*

³⁴⁹ Ex. 169, Walnut Creek IGUCA.

³⁵⁰ *Id.*

³⁵¹ Ex. 170, Supplemental Order to Walnut Creek IGUCA; Ex. 171, Amended Order; Ex. 172, Summary Supplemental Amended Order (III).

³⁵² Ex. 166, Black & Veatch, *Development of Big Bend Supply*, at PDF p. 1 (Jan. 3, 1990). *See also* Exs. 173-175, the three IGUCA orders issued by DWR.

³⁵³ Vol. 20, No. 09 Kan. Reg. 294-95 (Mar. 1, 2001).

³⁵⁴ Ex. 166, Black & Veatch, *Development of Big Bend Supply*, at PDF p. 2 (Jan. 3, 1990).

³⁵⁵ Ex. 173, Pawnee River Basin IGUCA.

³⁵⁶ Ex. 174, Order reducing sustainable yield for Pawnee River Basin IGUCA.

On March 16, 2001, the Chief Engineer closed all of GMD5 to new appropriations.³⁵⁷ This regulation closed the Pawnee basin in Pawnee County. On October 25, 2002, the Pawnee and Buckner drainage basins outside of the GMD were closed to new appropriations of water by regulation.³⁵⁸

On June 18, 2007, the Chief Engineer issued a third Order expanding the IGUCA into Hodgeman and Ness Counties to include the Pawnee River, Buckner Creek, and Sawlog Creek basins.³⁵⁹ That IGUCA proceeding had been bifurcated with Phase I to focus on whether an IGUCA was needed and, if so, Phase II would determine the appropriate controls. The 2007 Order concluded that controls were needed and ordered that a prehearing conference be held to establish the Phase II process. While Phase II has not begun, and the Chief Engineer who issued that Order has retired, the possibility of an IGUCA similar to the Walnut Creek Order remains.

Middle Arkansas River Basin near Great Bend

As noted above there have been several proposals to purchase water near Great Bend, Kansas. While there are no IGUCAs in place, most of the other reasons apply in this basin with equal force.

The Walnut Creek, Pawnee River, and Middle Arkansas River basins are not economically or technologically feasible alternative sources of supply available to the Cities. The R9 Ranch was selected over these alternatives for a number of reasons, including:

- ◆ The Walnut Creek IGUCA Order, and its progeny, reduces the quantity of water available from valid water rights in a manner that is inconsistent with the prior appropriation doctrine and therefore in violation of Kansas law.³⁶⁰ However, the time limit for challenging the Order has long since

³⁵⁷ Vol. 20, No. 09 Kan. Reg. 294-95 (Mar. 1, 2001) (amending K.A.R. 5-24-4).

³⁵⁸ K.A.R. 5-3-26.

³⁵⁹ Ex. 175, Order expanding Pawnee River Basin IGUCA.

³⁶⁰ K.S.A. 82a-1039 specifically states that nothing in the IGUCA provisions—K.S.A. 82a-1036 – 82a-1038—“shall be construed as *limiting or affecting any duty or power of the chief engineer* granted pursuant to the Kansas water appropriation act.” (Emphasis added.) No “duty or power” is more clearly spelled out in the Kansas water appropriation act than the duty to enforce priority of water rights. *See, e.g.*, K.S.A. 82a-706, K.S.A. 82a-706b, K.S.A. 82a-706e, K.S.A. 82a-707(b), K.S.A. 82a-707(c), K.S.A. 82a-708b, and K.S.A. 82a-716.

expired. Acquisition of such water rights carries an unacceptable level of risk.

- ◆ The open-ended IGUCA Order in the Pawnee Buckner basin places a cloud over the water rights in this basin. The Cities do not know whether, how, or when these proceedings will resume and the outcome of those proceedings is unpredictable.
- ◆ Even if priority was respected, the Kansas Department of Wildlife, Parks and Tourism holds large and very senior water appropriation rights that are supplied from all three basins. The Cities would have to acquire vested rights and very senior appropriation rights to be assured that sufficient water would be available to meet their long-term needs—an unrealistic prospect.
- ◆ The areas are now closed to new appropriations so the Cities would have to acquire existing water rights in the basin from irrigators already using these sources when the Cities already own water rights in Edwards County.
- ◆ Even if it was reasonable to acquire water rights in these basins, there is no contiguous concentration of senior appropriation rights comparable to the R9 Ranch; water rights from multiple owners would need to be acquired.
- ◆ To obtain a source comparable to the Ranch, the Cities would likely be forced to use their condemnation powers making the cost to acquire existing water rights unpredictable.
- ◆ Taking water from any of these basins could harm Cheyenne Bottoms, which would be politically untenable in Hays, Russell, and the surrounding areas.³⁶¹
- ◆ While there are no recent estimates of infrastructure costs, they are not likely to be substantially lower than going to the Ranch. Even if they were lower, there is no reason to believe that they would offset the costs to acquire the water rights.

³⁶¹ Obtaining water from any source is generally unpopular with residents in the source area. The Cities understand that they would likely encounter opposition from area residents at any new source. However, taking water that is needed at Cheyenne Bottoms would likely result in opposition from Hays and Russell residents.

Waconda Lake

Waconda Lake, also known as the Glen Elder Reservoir, is a Bureau of Reclamation facility located in the Solomon River Basin in Mitchell and Osborne Counties approximately 63 miles northeast of Hays and 45 miles northeast of Russell. Waconda Lake is a key flood control structure in the Kansas River Basin and “provides a high degree of protection to the lower Solomon River Valley.”³⁶²

In 1991, Hays filed an application to appropriate 15,000 acre-feet of water from Waconda Lake, File 40,406.³⁶³ DWR dismissed the application on August 12, 2004.³⁶⁴

In 2001, the U.S. Army Corps of Engineers performed a high-level feasibility analysis of several potential water supply alternatives for the Cities including Waconda Lake.³⁶⁵ It noted a significant decrease in inflow to Waconda Lake since the mid-1950s and the significant decrease in water supply that Waconda has provided to the Solomon River in the subsequent decades.³⁶⁶ The Corps concluded that “Waconda Lake water from the Solomon River Basin is considered to have limited potential to address the municipal water supply needs of the Smoky Hill River Basin.”

This problem is exacerbated by the highly sought-after status of Waconda Lake water. For example, already in 1997, the Kansas Department of Wildlife and Parks pressed to “be at the front of the line if water storage becomes available at Waconda Lake. Their purpose: to protect recreation interests at the north-central Kansas Lake from other users and a possible lowering of water levels.”³⁶⁷

The Kansas Water Office and the USACE concluded as follows:

Since the mid-1950s, the surface water supply in the Solomon River has decreased significantly. For example, the 10-year moving average inflow to Webster Reservoir has decreased from 81,800 acre-feet in 1955 to 11,700 acre-feet in 1992 (KWO 2009). Reduced stream flow and runoff into

³⁶² Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 27–28 (Aug. 2010).

³⁶³ Ex. 176, Information from DWR’s WIMAS database (Dec. 12, 2015).

³⁶⁴ *Id.*

³⁶⁵ Ex. 102, U.S. Army Corps of Engineers, *Wilson Lake Water Supply Study*, at PDF pp. 29–30 (Aug. 2010).

³⁶⁶ *Id.* at PDF p. 28–29.

³⁶⁷ Ex. 177, Hays Daily News, *Glen Elder is Focus of Water Meeting* (Nov. 19, 1997).

streams in the Solomon River Basin have been reflected in lower water levels in Webster Reservoir and Kirwin Reservoir. Both of these reservoirs discharge water into Waconda. Waconda Reservoir is currently used for municipal water supply (2,000 acre-feet), and 15,170 acre-feet is currently allocated to the Glen Elder Irrigation District (KWO 2009). If access to the water could be obtained through a reallocation from irrigation uses, it would then have to be transported long distances to a treatment plant in Russell or Hays. In addition, river inflow to the reservoir is declining over time. As a result, Waconda Lake water from the Solomon River Basin is considered to have limited potential to address the municipal water supply needs of the Smoky Hill River Basin.³⁶⁸

As a practical matter, diverting water to the Cities from Waconda Lake is not economically feasible. Because Waconda Lake is a federal body of water, DWR requires a contract with the federal government before acting on any application proposing storage or use of water from the reservoir.³⁶⁹ Acquisition of storage in Waconda from the Bureau of Reclamation would face some of the same obstacles and challenges discussed under the Wilson Lake heading above.

In 1993, the Hays Water Group Subcommittee concluded that Waconda “is a very high cost option due to the fact that no intermediate options are available. Thus, to access any of this water the entire pipeline must be laid with very little opportunity to add to the City’s water supplies in the interim. Phasing this option would be rather difficult.”³⁷⁰

Even though Waconda was not considered to be a viable source, the application remained on file with DWR. In 2002, the PWWSD #15 recommended that the Cities release their application for a water appropriation right from Waconda and the Cities concurred.³⁷¹

³⁶⁸ Ex. 102, U.S. Army Corps of Engineers and the Kansas Water Office, *Wilson Lake Water Supply Study Draft Environmental Report*, at PDF p. 28–29 (Aug. 2010).

³⁶⁹ Ex. 178, Letter from DWR to the Ellis County Coalition (Oct. 17, 1997).

³⁷⁰ Ex. 167, Hays Water Group Subcommittee Meeting, *Minutes*, at PDF p. 8 (Nov. 1, 1993).

³⁷¹ Ex. 179, Letter from PWWSD #15 to the Cities of Hays and Russell (Jan. 31, 2002).

Waconda is not an economically or technologically feasible alternative source of supply that is available to the Cities. The R9 Ranch was selected over this alternative for all of the reasons discussed above.

Pikitanoi Water Project

In the late 1990s, the Kickapoo Tribe of Kansas sought to develop a relationship between the Kickapoo Indian Reservation in northeast Kansas and PWWSD #15, among other public agencies.³⁷² The Kickapoo tribe proposed an ambitious water-supply plan called the Pikitanoi Water Project and proposed extending the Pikitanoi “core pipeline from the western boundary of the Kickapoo Reservation to western Kansas.”³⁷³ It was anticipated that a majority of the project would be financed by federal sources.³⁷⁴ This “core pipeline,” was never constructed.

The plan called for the construction of 304 miles of transmission pipeline to divert water from the Missouri River under Tribal reserved water rights³⁷⁵ to serve the Reservation and other interested parties.³⁷⁶

Exploratory discussions were held between PWWSD # 15 and the Kickapoo Tribe relating to potentially supplying Ellis and Russell Counties with water. Numerous studies were proposed.³⁷⁷ The Kansas Water Office issued a report discussing the project in February 1999, which noted that the project would produce 5,086 acre-feet per

³⁷² Ex. 180, Memorandum from John Thomas, Chairman of the Kickapoo Tribe in Kansas, to Penny Postoak regarding the draft Pikitanoi Rural Water Bill, at PDF p. 1 (Jan. 22, 1999).

³⁷³ Ex. 180, Memorandum from Mario Gonzalez to Steve Cadue, *et al.*, *Alternative Drafts of Proposed Pikitanoi Bill for Meeting with State Water Officials* at PDF p. 2 (Dec. 4, 1998).

³⁷⁴ See Brochure regarding the Pikitanoi Water Project, at PDF p. 47 (noting that “up to 80% of the costs for the non-Indian portion could be paid by federal funds”), Ex. 178.

³⁷⁵ When the United States reserves land for an Indian Reservation, and other uses, it reserves enough water to carry out the reservations purpose by implication. *Winters v. United States*, 207 U.S. 564 (1908); *Arizona v. California*, 373 U.S. 546 (1963). Federal reserved water rights are distinguished from water reservation rights held by the Kansas Water Office pursuant to K.S.A. 82a-1303.

³⁷⁶ Ex. 180, Memorandum from Mario Gonzalez to members of the Pikitanoi Executive Committee, at PDF pp. 2, 56 (Dec. 4, 1998).

³⁷⁷ See, *e.g.*, Ex. 180, Memorandum from Mario Gonzalez to Mike Watson regarding Pikitanoi Feasibility Study, PDF p. 46 (Jan. 14, 1999).

year, but the KWO's study did not include Hays or Russell, extending only as far east as Riley County.³⁷⁸

The Kickapoo Tribe asked their congressional delegation to include \$500,000 in the U.S. Army Corps of Engineers' FY 2000 budget for a "Pikitanoi Special Study."³⁷⁹ It appears that Congress declined to allocate the requested funds.³⁸⁰

The project was apparently abandoned. In early 2000, PWWSD #15 advised the Pikitanoi Executive Committee that the Cities were withdrawing from the project in favor of "regionalized opportunities."³⁸¹ In a 2003 letter to the Office of the Governor, the Director of the Kansas Water Office noted that the Pikitanoi project was "too expensive."³⁸²

Southside Ditch Association (1997)

In 1997, Hays and Russell were contacted by a real estate broker representing a group of land owners called the Southside Ditch Association. They owned vested surface-water rights in the Arkansas River west of Lakin, Kansas and were willing to sell 20,000 acre-feet for \$2,000.00 per acre-foot.³⁸³ The Cities did not pursue this option because of the high price and the distance. It is approximately 120 miles from Lakin to Hays and 166 miles by road. The distance from Lakin to Russell is greater.

Further investigation would have indicated that surface water in the Arkansas River is an unreliable source and would be high in chlorides.³⁸⁴ A cursory investigation revealed that water from the Arkansas River in Southwest Kansas is neither economically nor technologically feasible as an alternative long-term source of supply for the Cities.

³⁷⁸ Ex. 181, Kansas Water Office, *The Pikitanoi Report*, at PDF pp. 4–5 (Feb. 25, 1999).

³⁷⁹ Ex. 180, Letter from Fred Thomas, Chairman of the Kickapoo Tribe in Kansas, to numerous congresspersons, PDF pp. 131–42 (Aug. 13, 1999).

³⁸⁰ *Id.* at PDF p. 143–44.

³⁸¹ Ex. 180, Letter from Lavern D. Squier to Jim Cobler, PDF p. 158–59 (Feb. 14, 2000).

³⁸² Ex. 182, Letter from Clark Duffy to Kathy Greenlee, PDF p. 2 (Feb. 13, 2003).

³⁸³ Ex. 183, Letter from Doug Wildin & Associates to Paul Montoia (Mar. 24, 1997).

³⁸⁴ Ex. 184, Kan. Geological Survey, *Ground-Water Recharge in the Upper Arkansas River Corridor in Sw. Kan.*, at 23 (July 2002). ("The salinity of ground waters in the High Plains aquifer has increased substantially during the last half of the 20th Century in the Arkansas River corridor as a result of saline recharge derived from the river.")