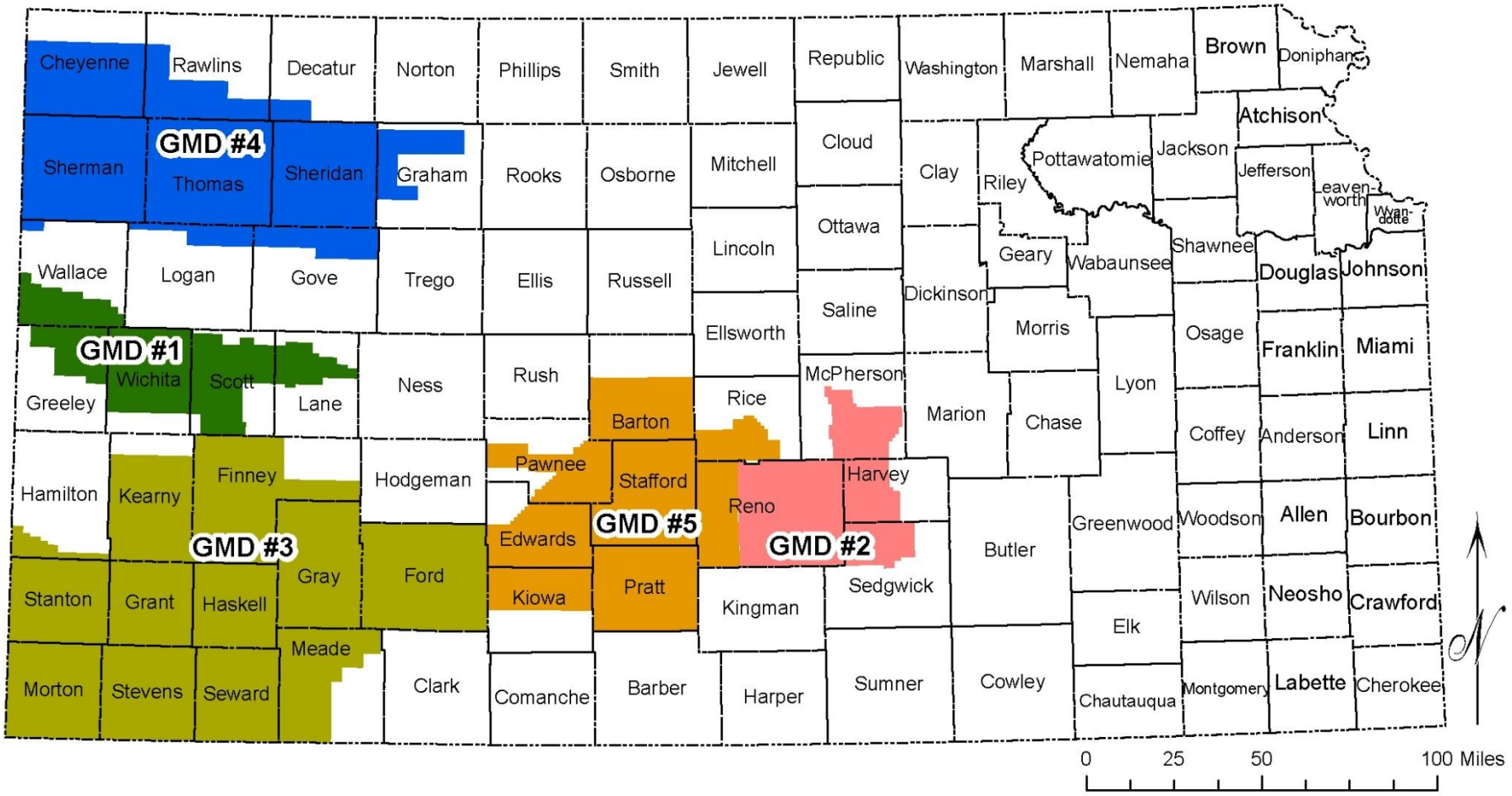
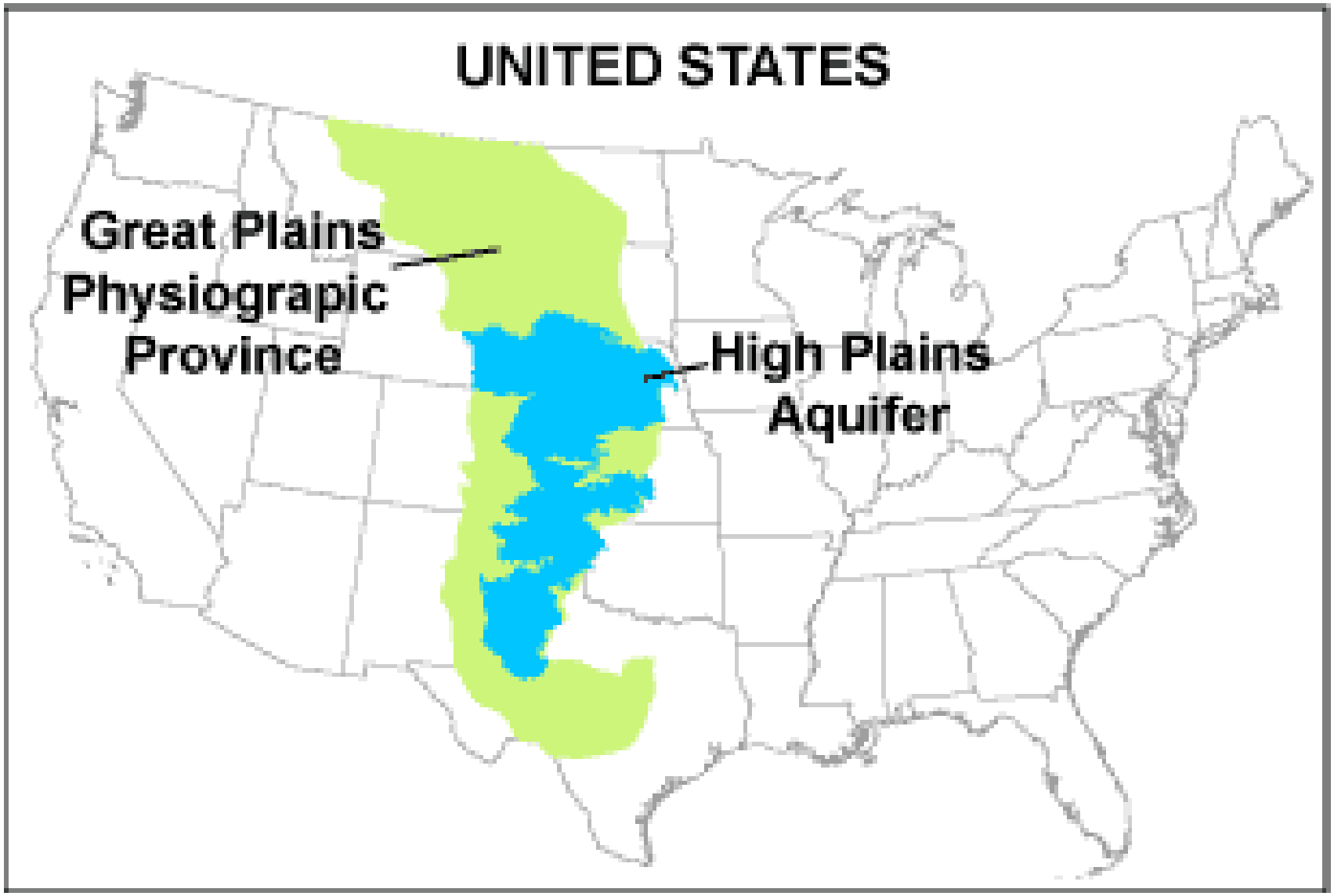
# Equus Beds Groundwater Management District No. 2

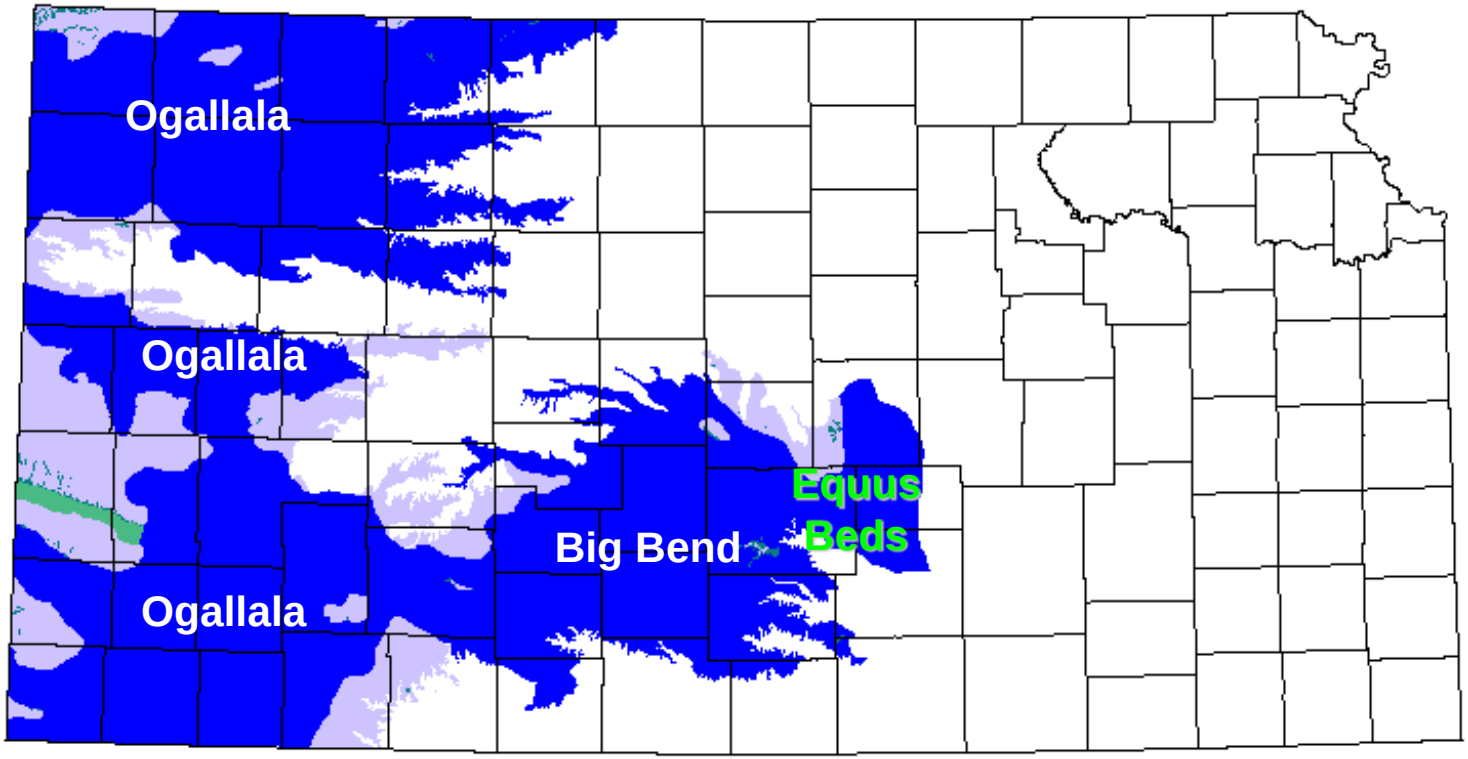
## Kansas Groundwater Management Districts



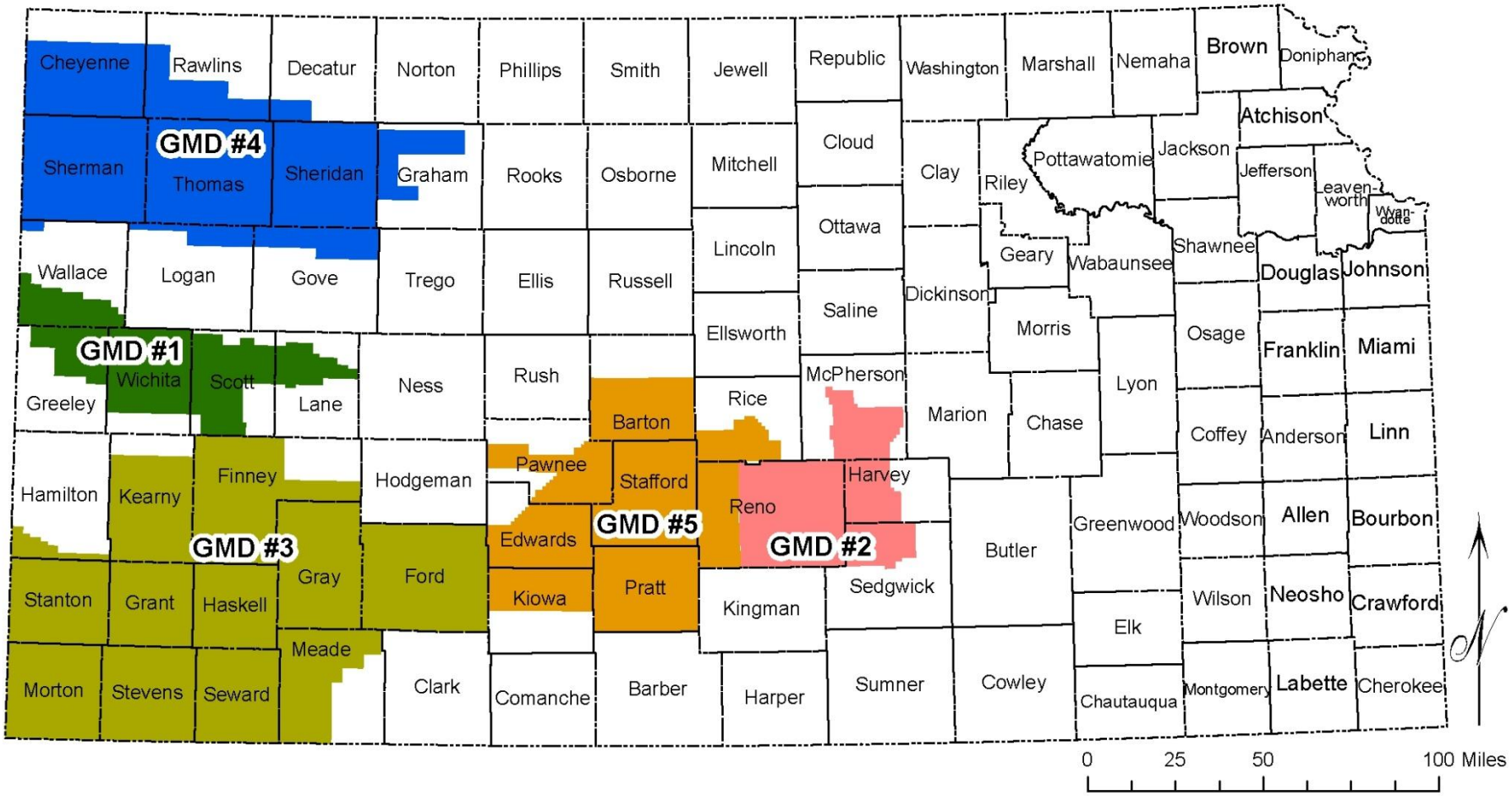

UNITED STATES
Great Plains Physiograpic Province
High Plains Aquifer

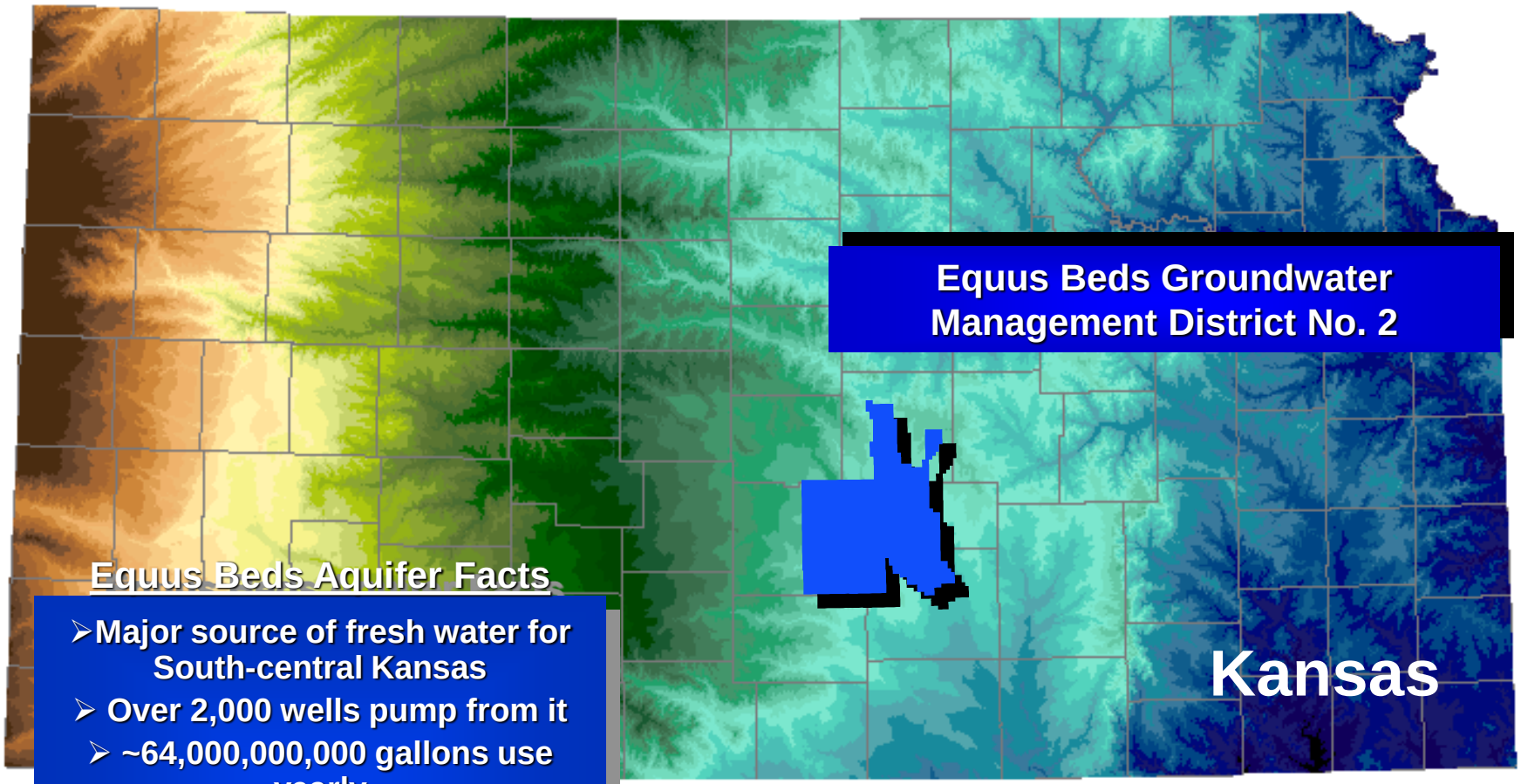

The High Plains aquifer underlies an area of about 174,000 square miles that extends through parts of eight States. The aquifer is the principal source of water in one of the major agricultural areas of the United States.

# Extent of High Plains Aquifer in Kansas



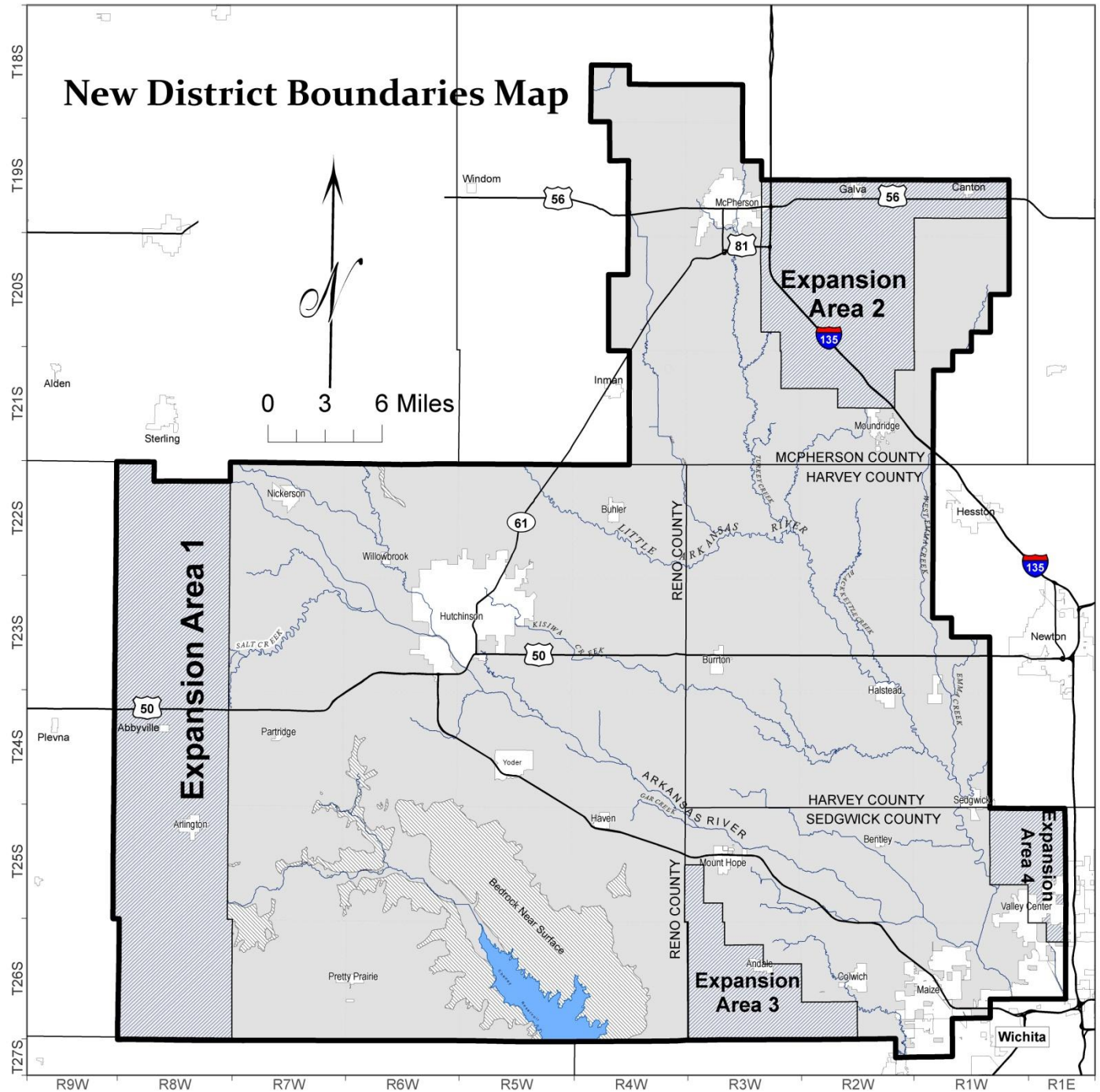
# Kansas Groundwater Management Districts





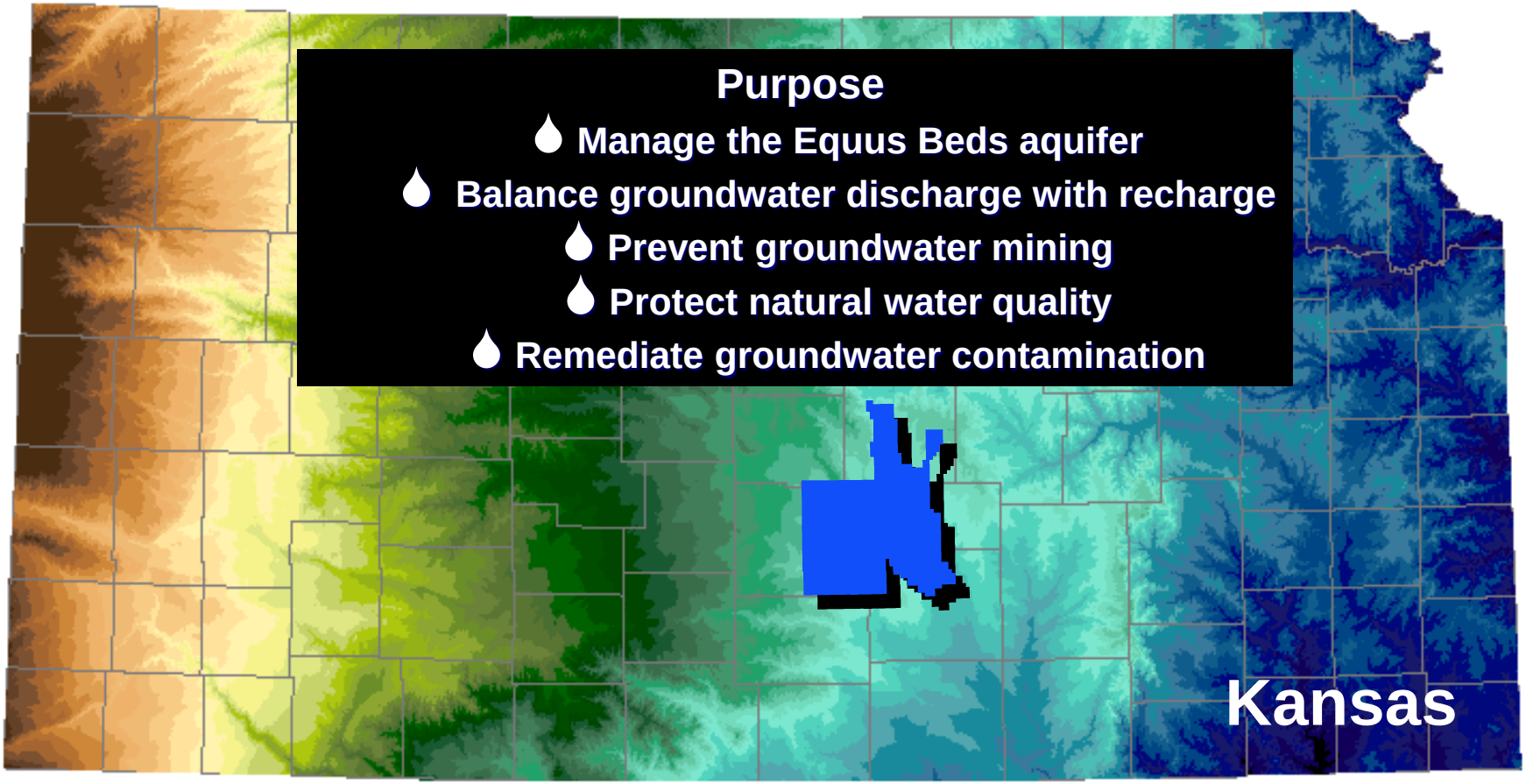

## Equus Beds Aquifer Facts

- Major source of fresh water for South-central Kansas
- Over 2,000 wells pump from it
- ~64,000,000,000 gallons use yearly
- Drinking water for over 550,000 people
- Managed locally by elected officials representing municipal, industrial, irrigation and domestic users


New District Boundaries Map
0 3 6 Miles
Expansion Area 1
Expansion Area 2
Expansion Area 3
Expansion Area 4
MCPHERSON COUNTY
HARVEY COUNTY
RENO COUNTY
SEDGWICK COUNTY
Bedrock Near Surface
Windom
McPherson
Galva
Canton
Inman
Moundridge
Hesston
Alden
Sterling
Nickerson
Buhler
Willowbrook
Hutchinson
Newton
Burrton
Halstead
Plevna
Abbyville
Partridge
Yoder
Arlington
Haven
Sedgwick
Bentley
Mount Hope
Valley Center
Pretty Prairie
Andale
Colwich
Maize
Wichita
LITTLE ARKANSAS RIVER
ARKANSAS RIVER
SALT CREEK
KISIWA CREEK
BLACKTHORN CREEK
EMMA CREEK
OAK CREEK
T18S
T19S
T20S
T21S
T22S
T23S
T24S
T25S
T26S
T27S
R9W
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E

# Equus Beds Groundwater Management District

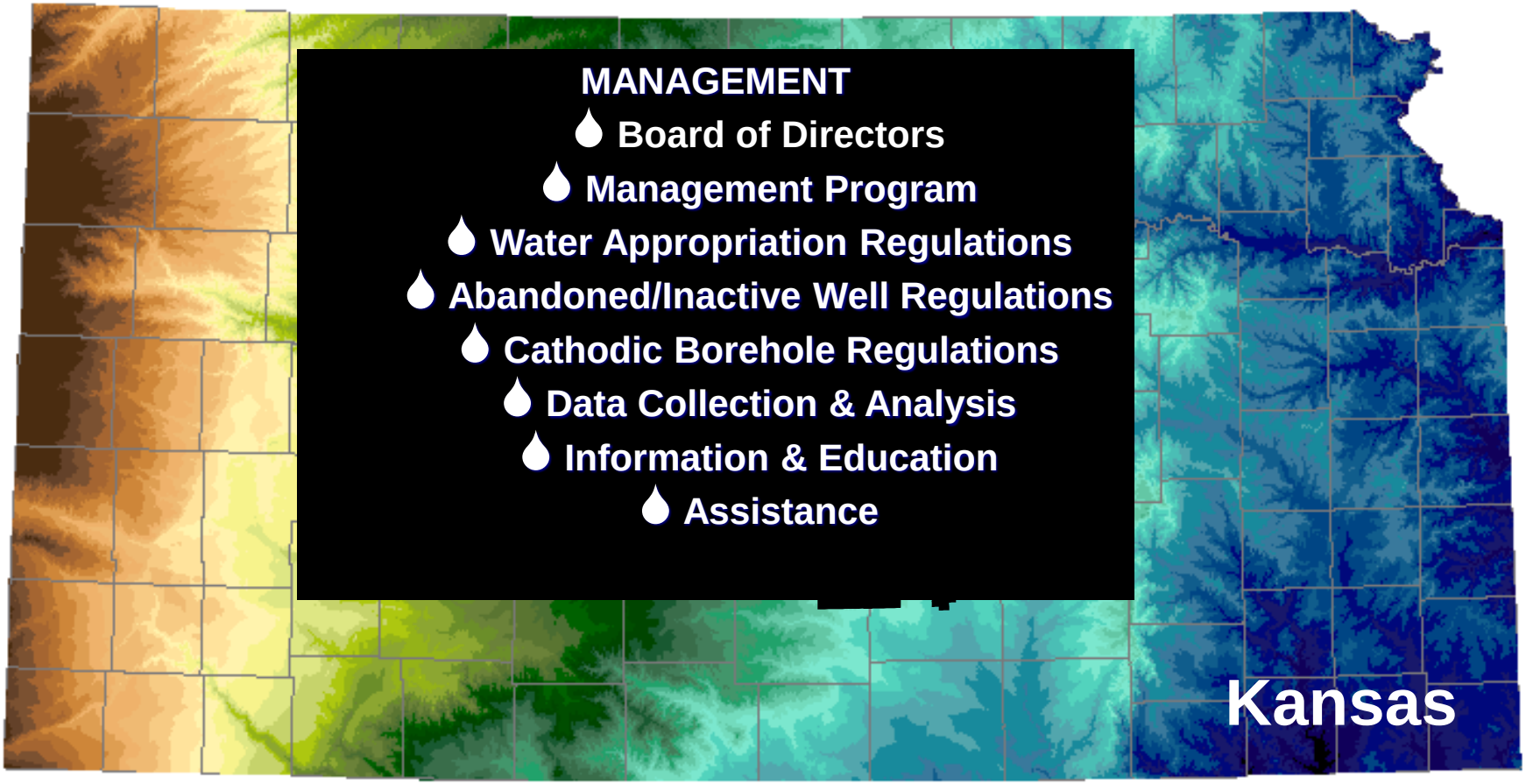
**Established 1975**




**Location - South-central Kansas (Reno, Harvey, McPherson & Sedgwick Counties)**

# Equus Beds Groundwater Management District

**Established 1975**




**Location - South-central Kansas (Reno, Harvey, McPherson & Sedgwick Counties)**

**1993-2023 average water use: 179,311 AF**

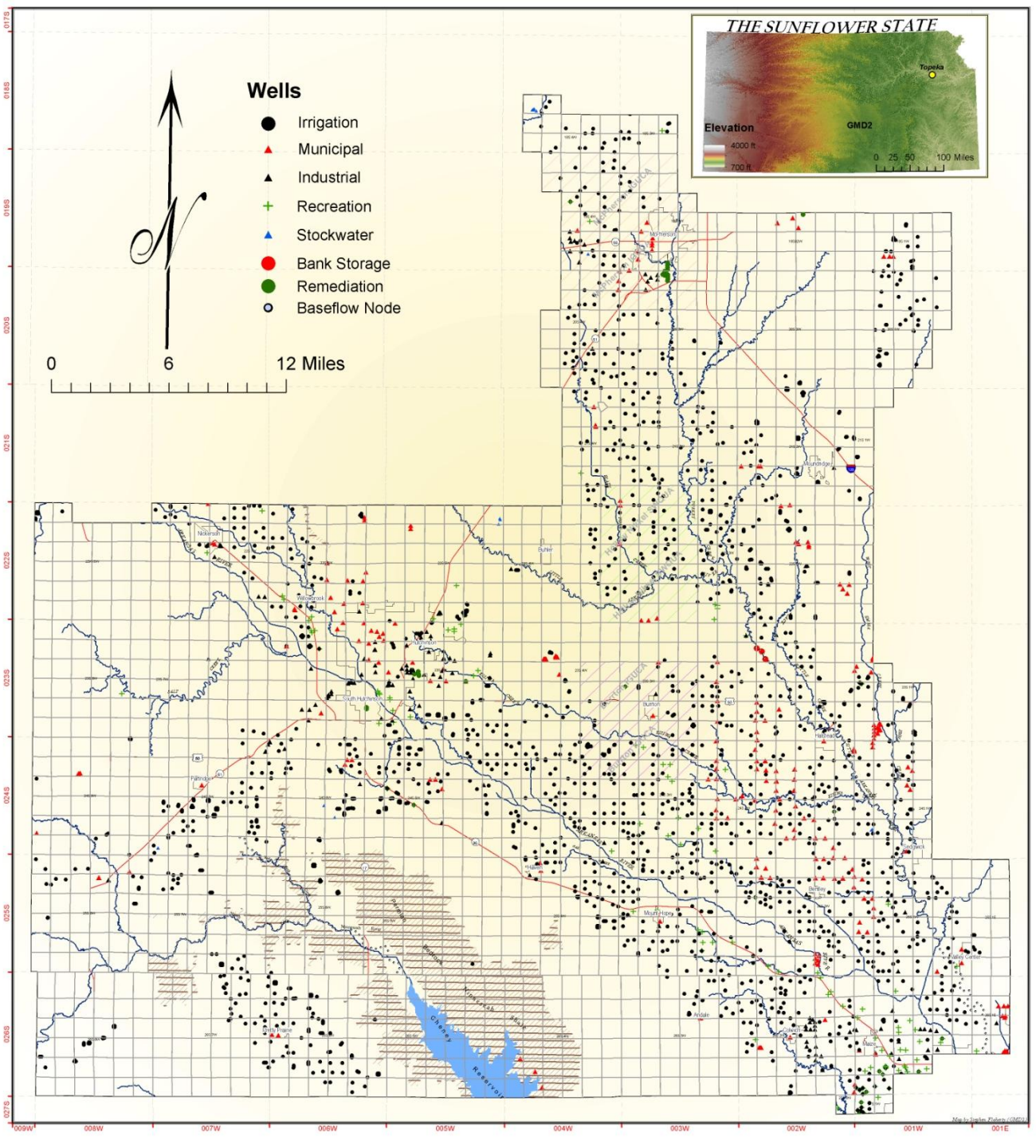
**Irrigation: 112,019 AF**

**Municipal: 41,401 AF**

**Industrial: 19,874 AF**

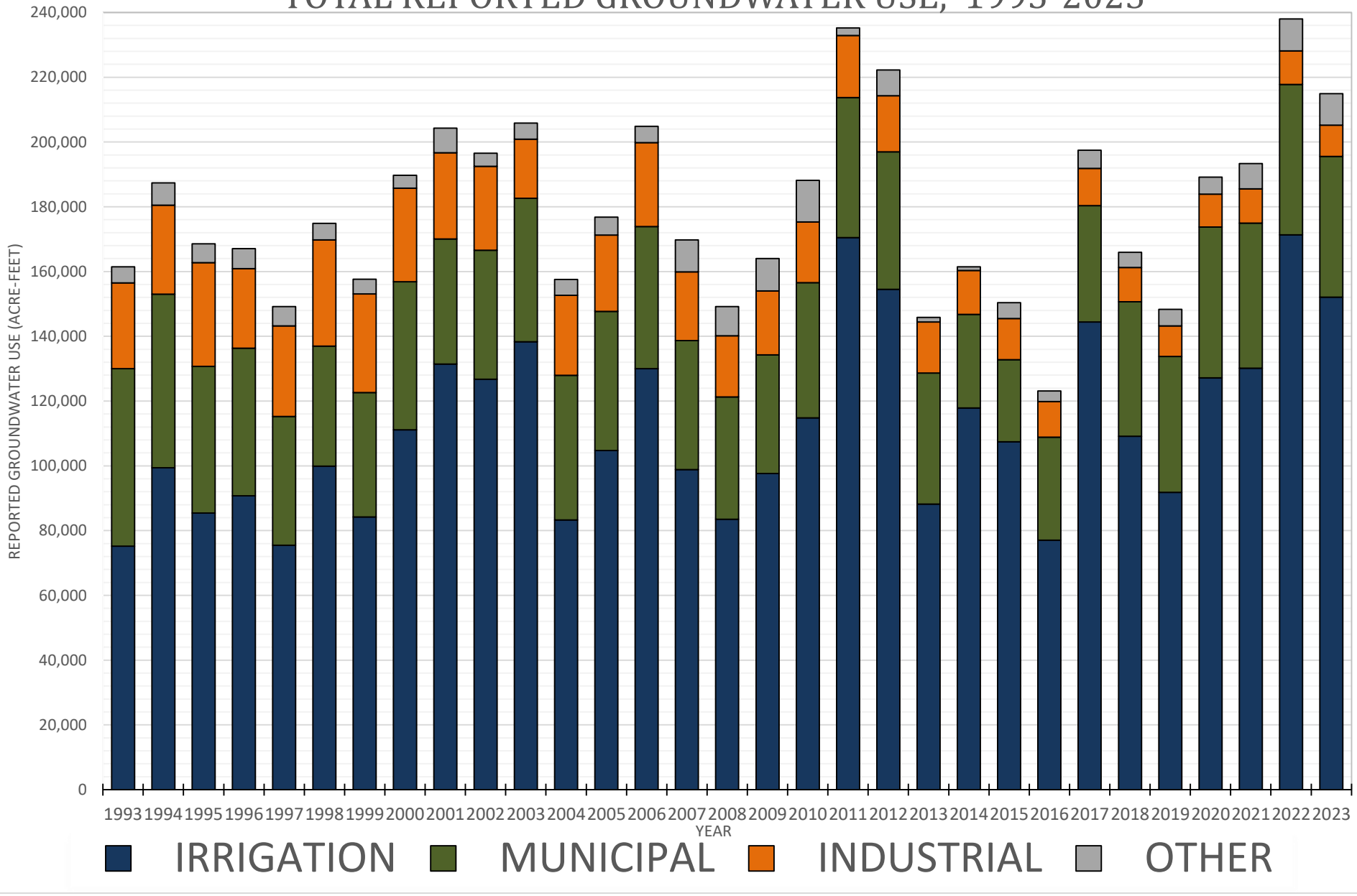
**Other: 6,017 AF**

**Water Use from 1000's of domestic wells not included**




Kansas Geological Survey, Water Information Management and Analysis System (WIMAS) for the Web, http://hercules.kgs.ku.edu/geohydro/wimas

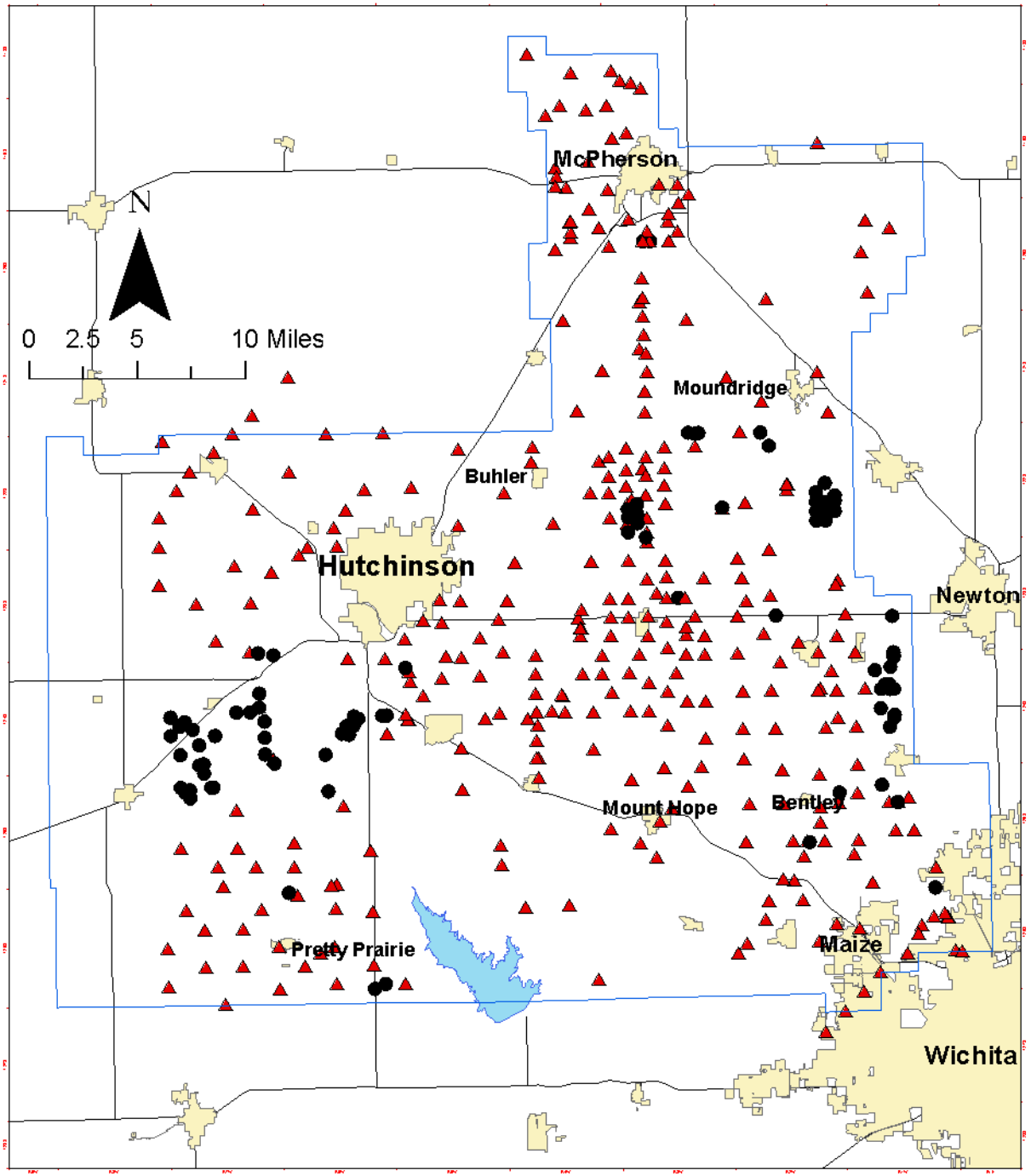
# Equus Beds Groundwater Management District No. 2
# TOTAL REPORTED GROUNDWATER USE, 1993-2023



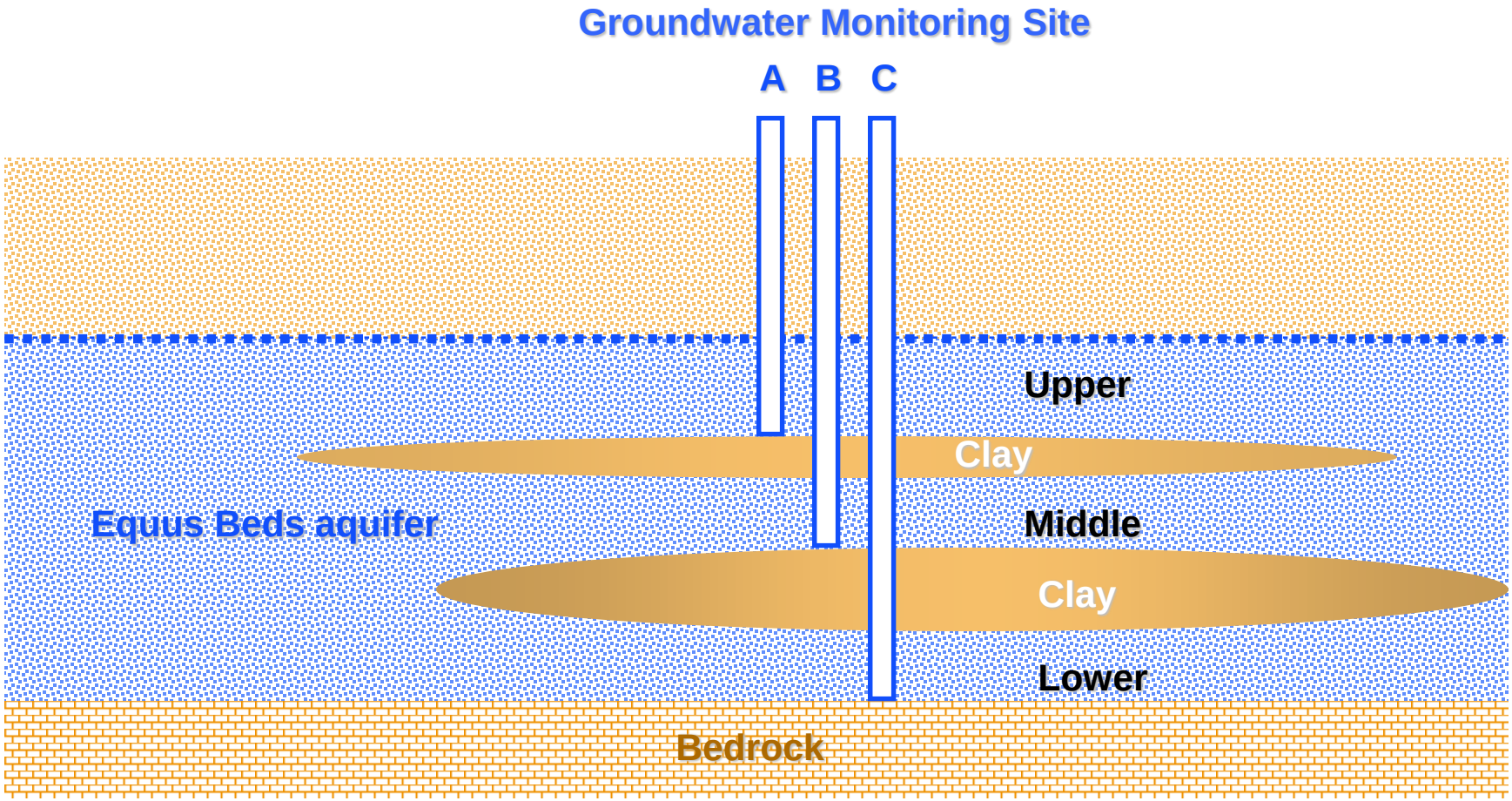
# Equus Beds Groundwater Management District No. 2 Groundwater Monitoring Site Map

## Monitoring Site

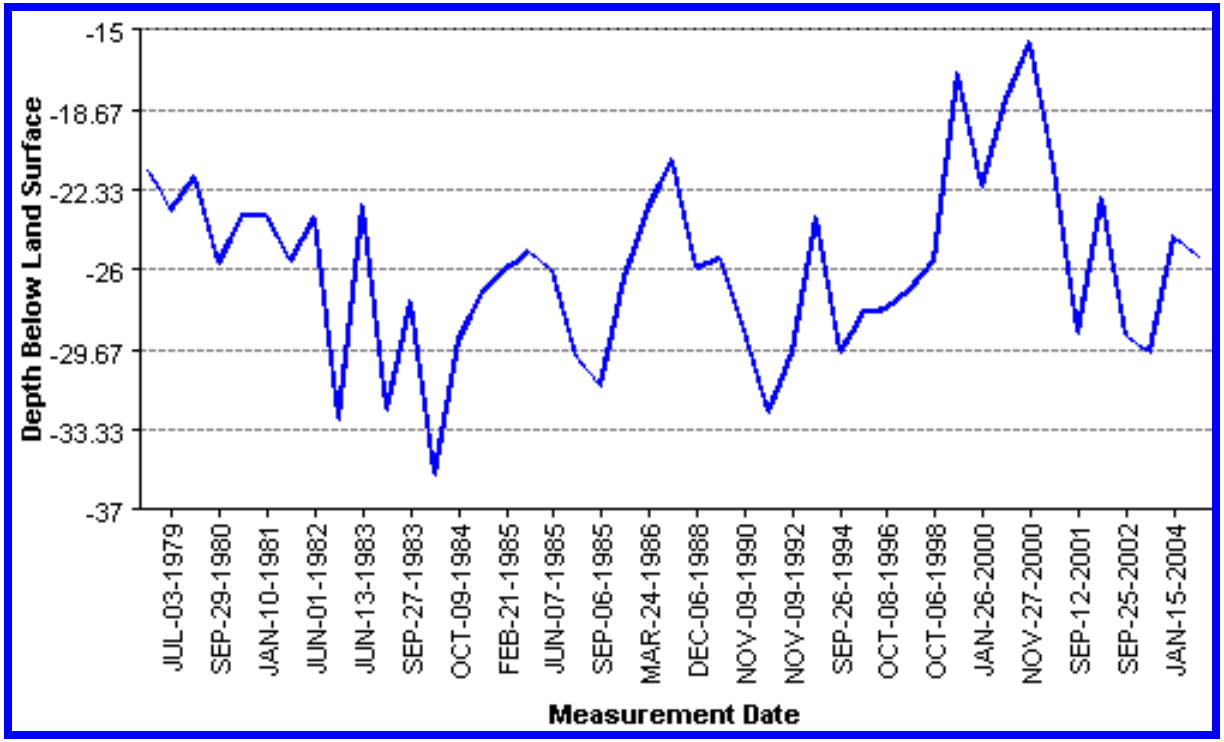
- GMD2 Owned
- Other Measured



# Equus Beds Groundwater Management District
# Groundwater Quality Monitoring Network



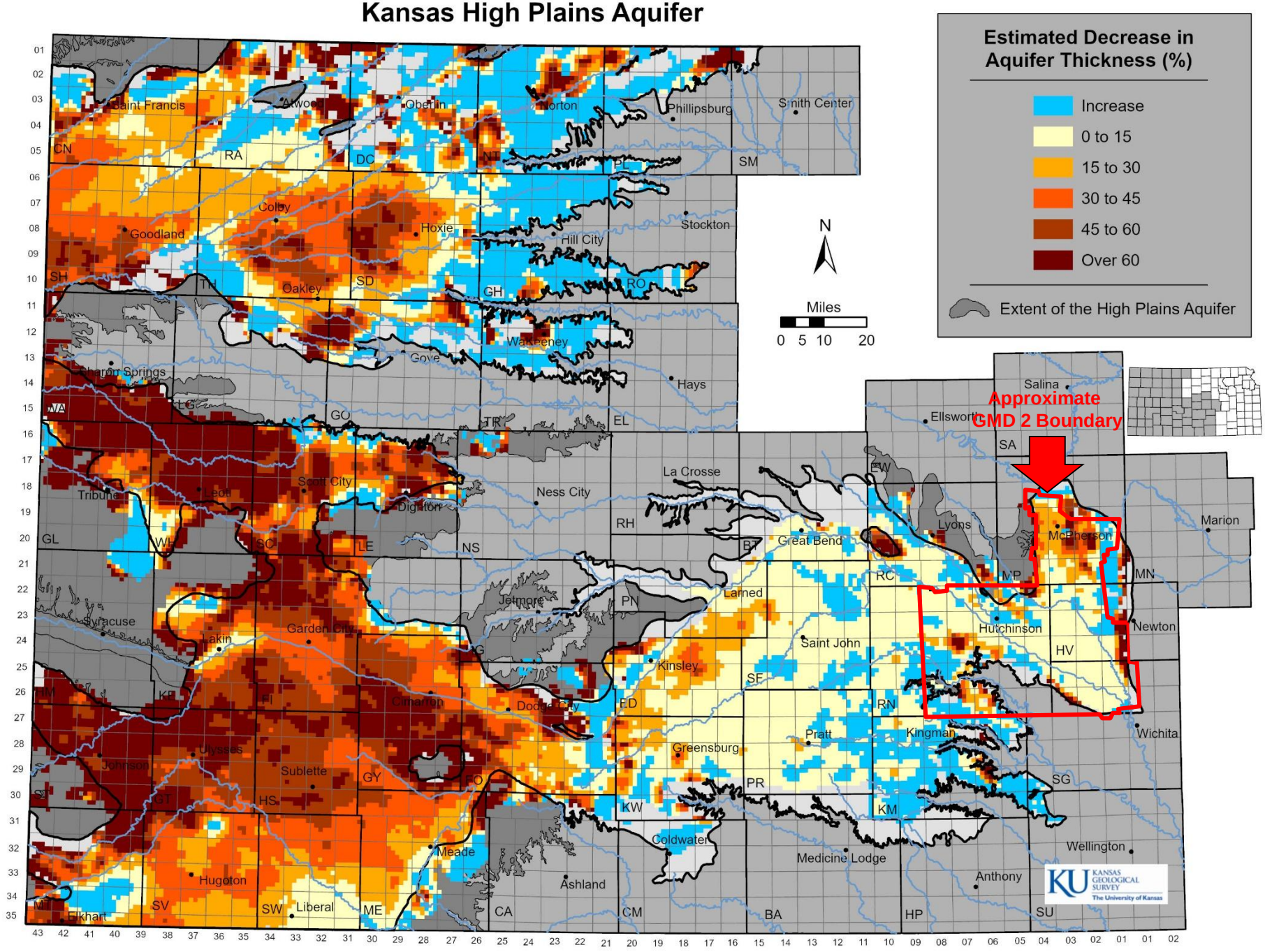
# 2,532 WATER LEVEL MEASUREMENTS IN 2025

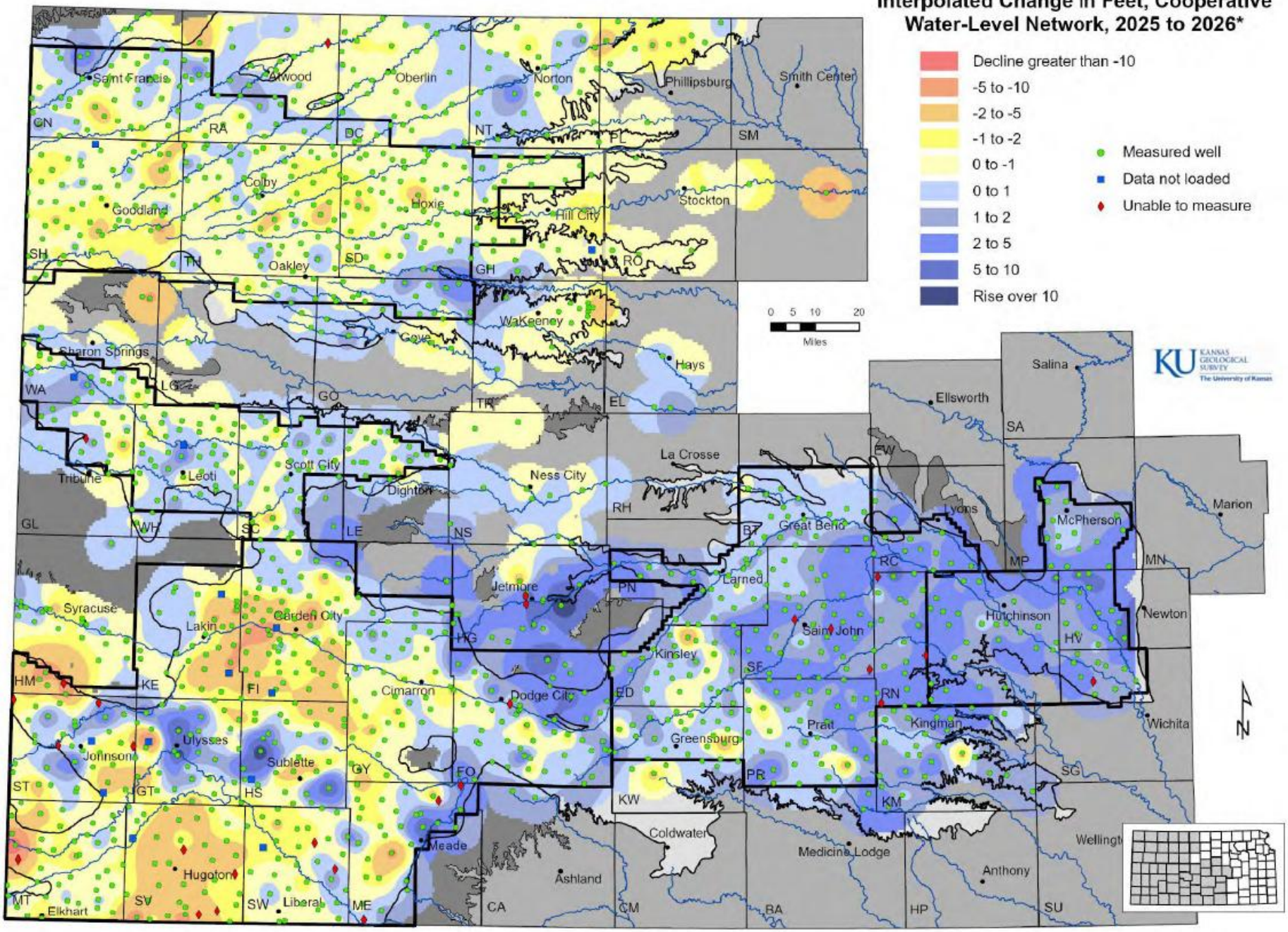



## Water level data on-line at

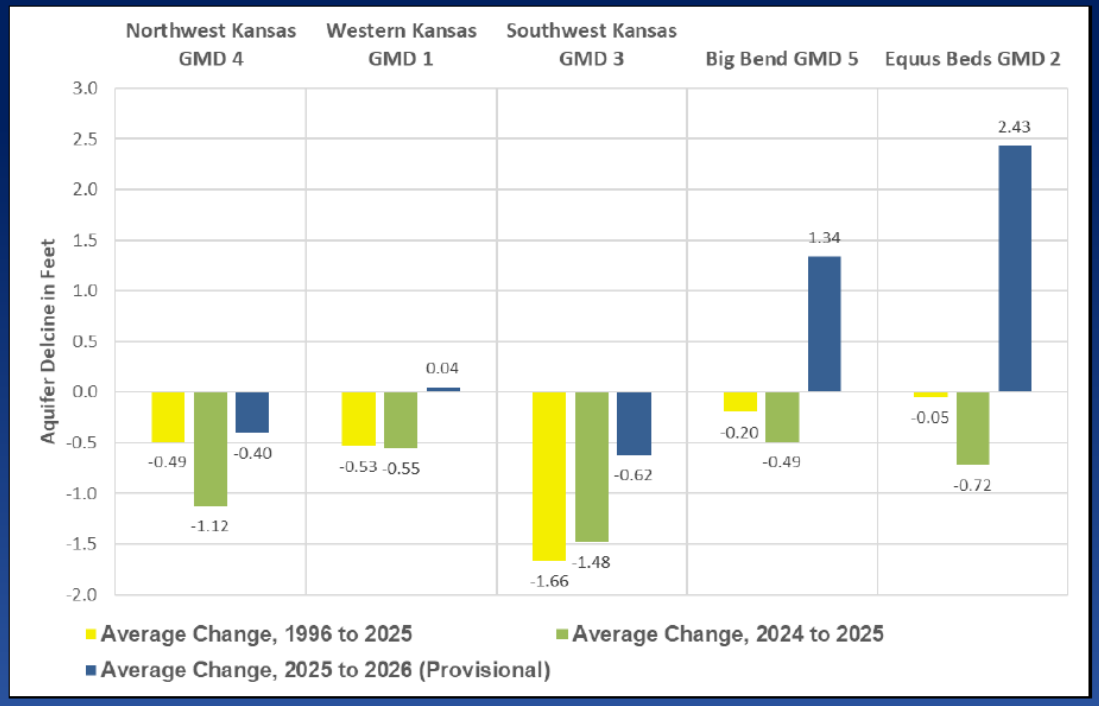
## http://magellan.kgs.ukans.edu/WaterLevels/index.html

# Percent Change in Aquifer Thickness, Predevelopment to Average 2022-2024, Kansas High Plains Aquifer



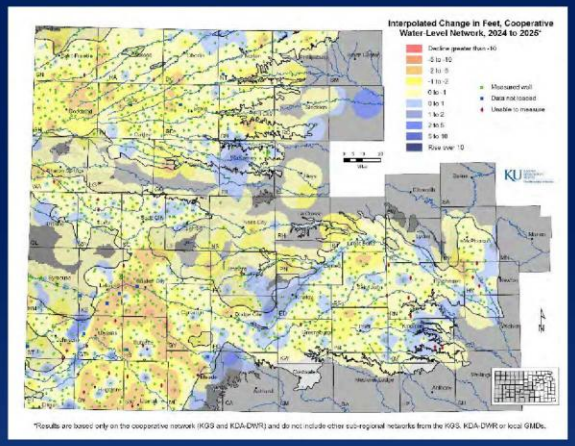



*Provisional results based only on the cooperative network (KGS and KDA-DWR) and do not include other sub-regional networks from the KGS, KDA-DWR or local GMDs.




Results are provisional based only on the cooperative network (KGS and KDA-DWR) and do not include other sub-regional networks from the KGS, KDA-DWR or local GMDs.

## 2024

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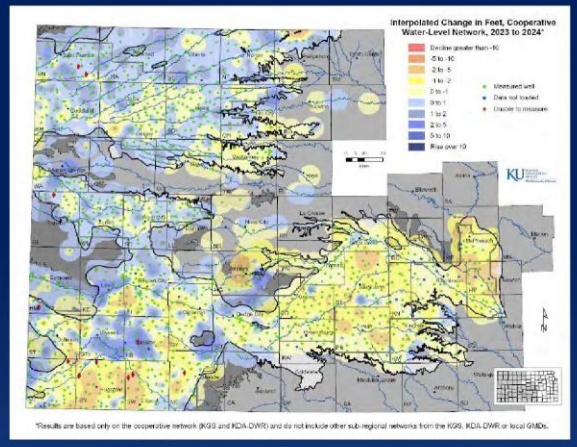
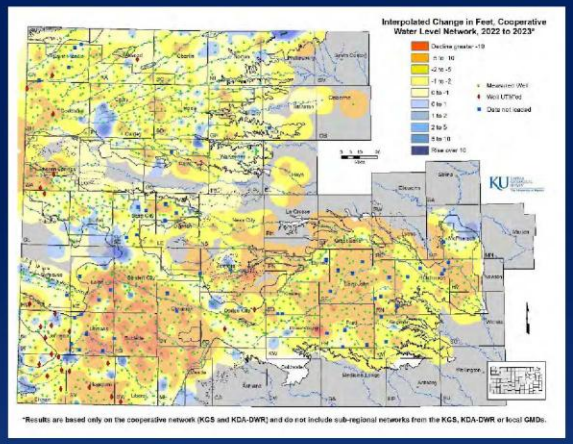
## 2023




*Results are based only on the cooperative network (KGS and KDA-DWR) and do not include other sub-regional networks from the KGS, KDA-DWR or local GMDs.

## 2022

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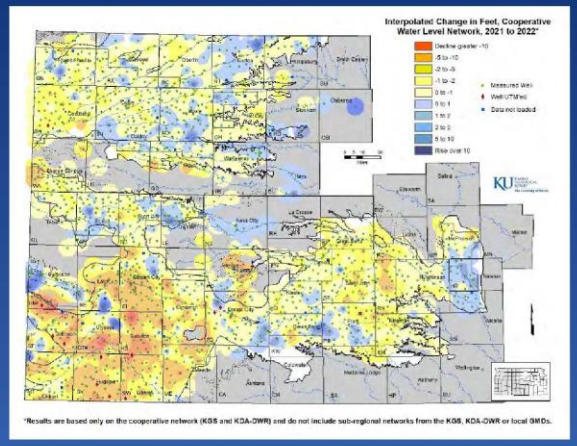
## 2021

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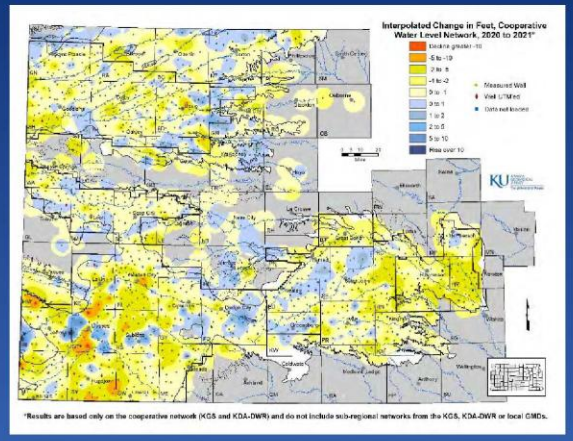
## 2020

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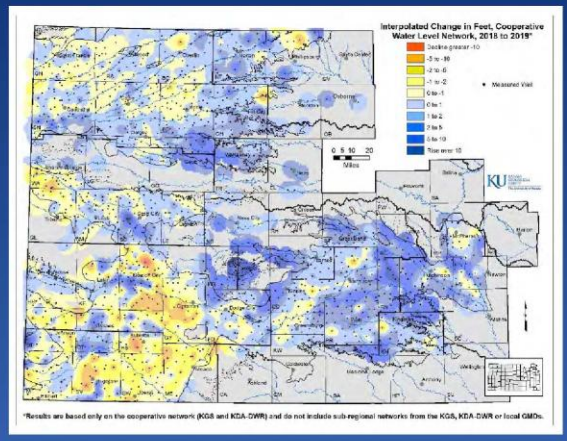
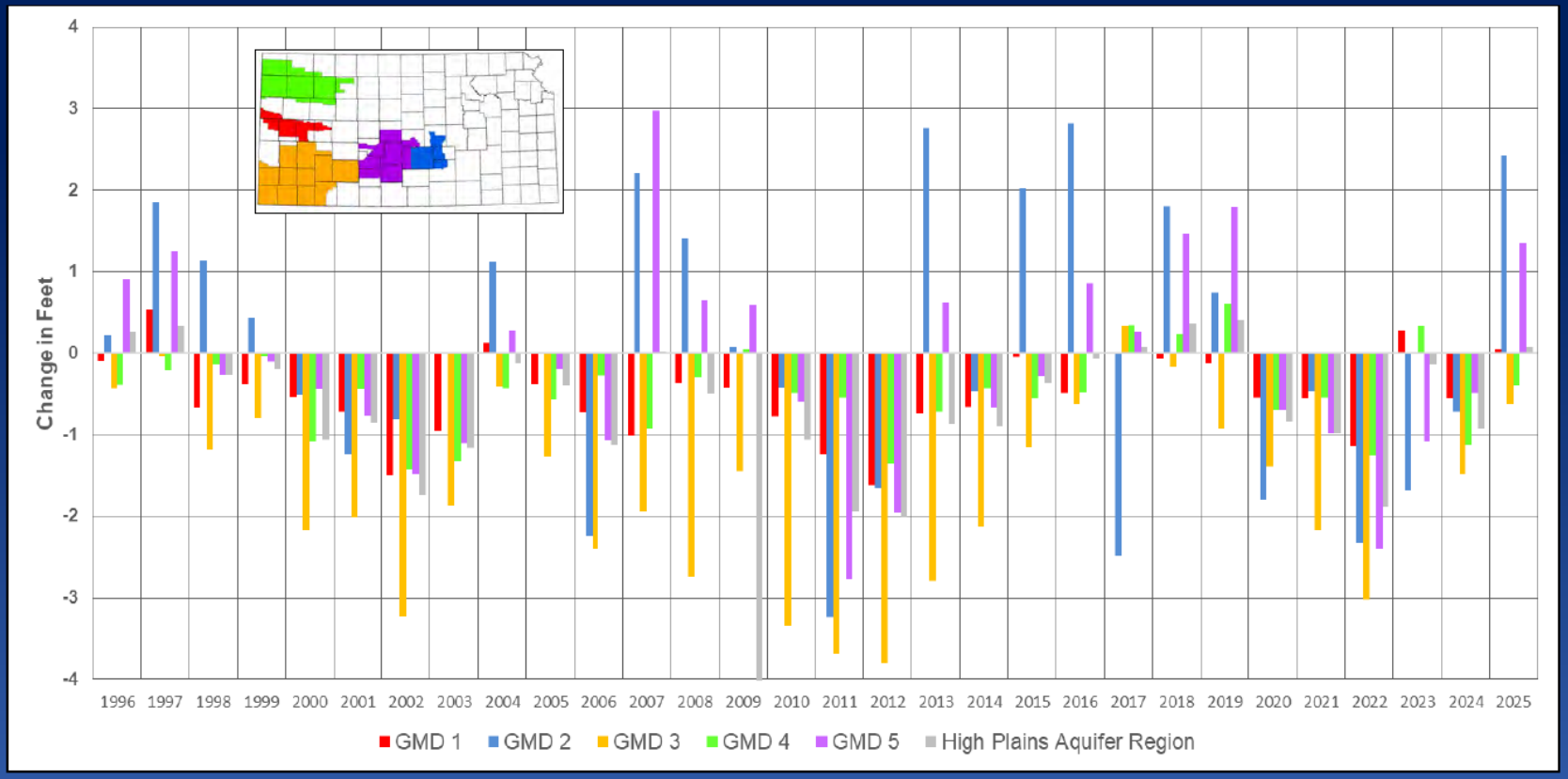
## 2019




*Results are based only on the cooperative network (KGS and KDA-DWR) and do not include sub-regional networks from the KGS, KDA-DWR or local GMDs.

# Average Change (by GMD/Well)




*Results are based only on the cooperative network (KGS and KDA-DWR) and do not include sub-regional networks from the KDA-DWR, KGS, or local GMDs. 2024 water levels are provisional.

**KGS Study found that average water use in GMD2 is within 1.2% of sustainable use**

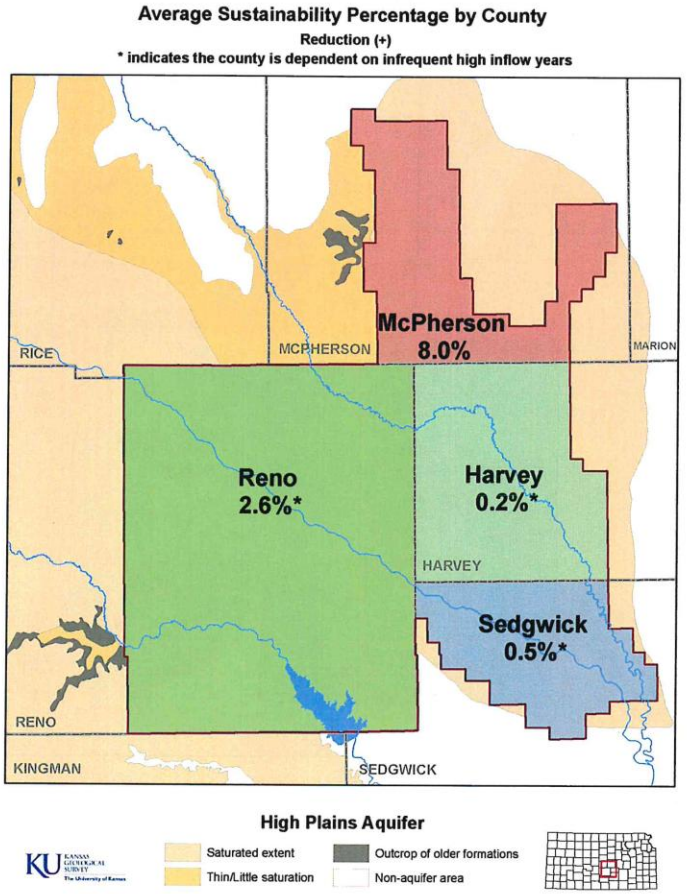
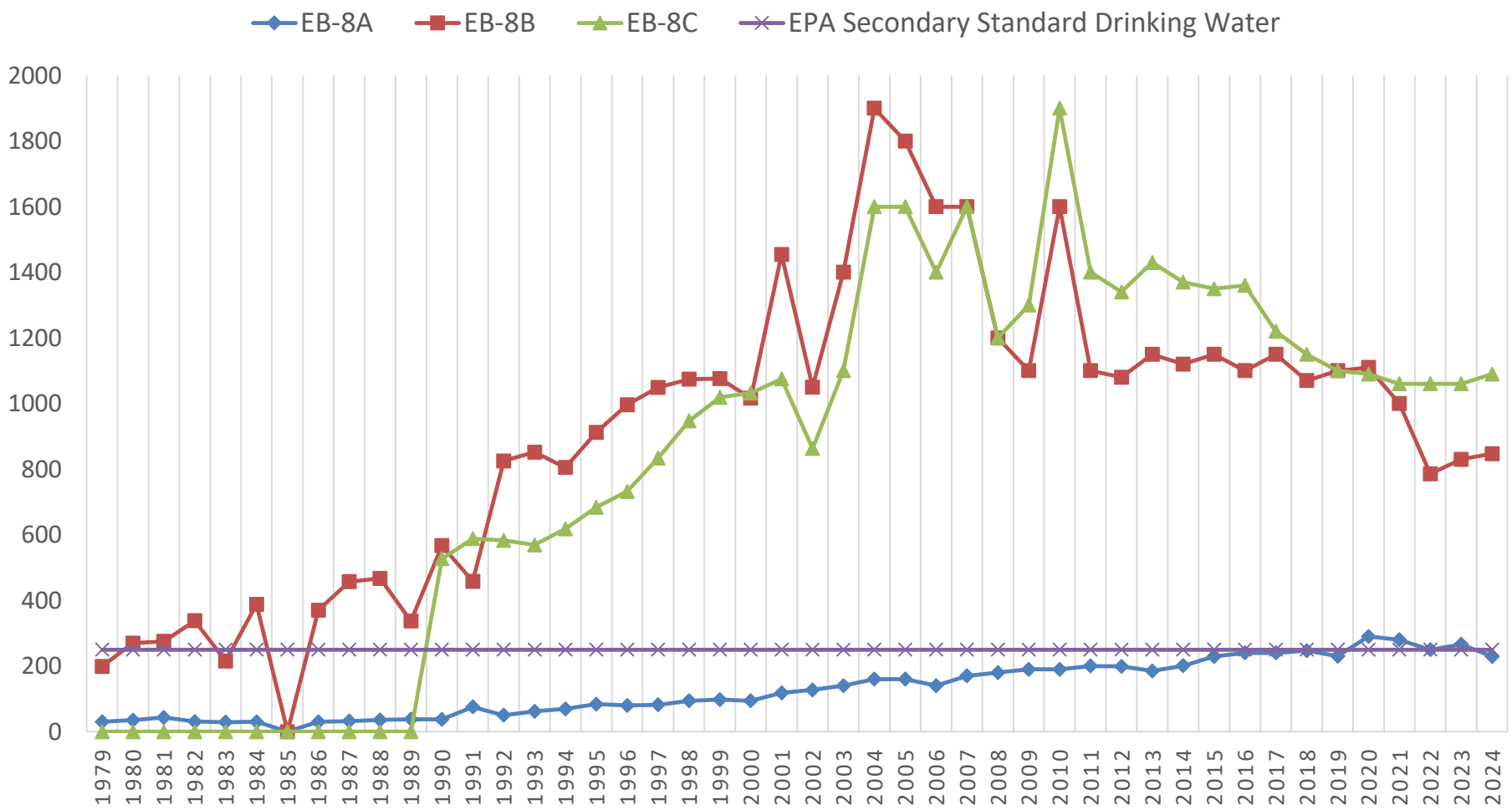


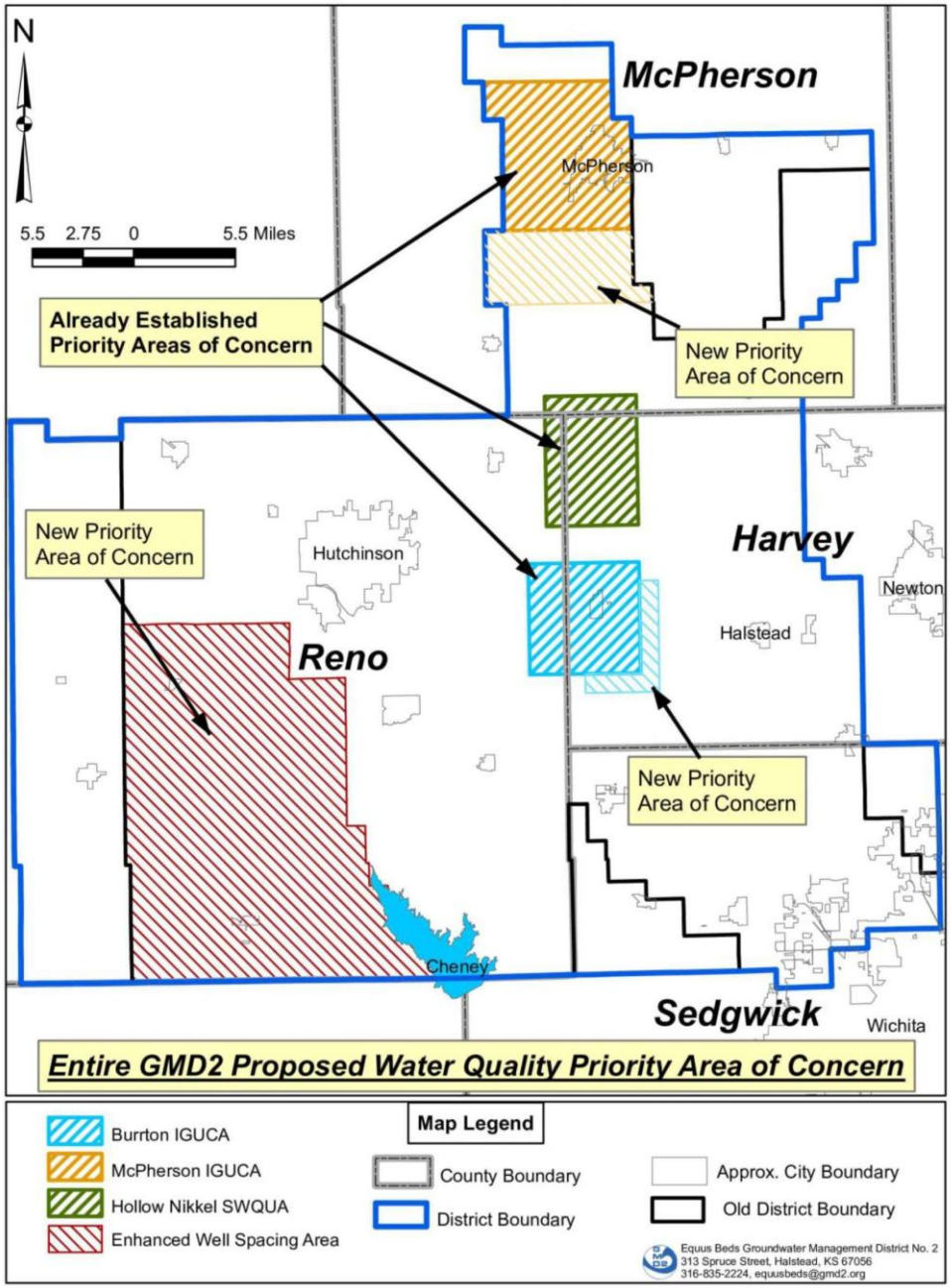

Figure III.B.6. Results of the sustainability assessment at the scale of individual counties within GMD2. Plotted values are the percent reductions (given as positive numbers) in average annual water use that would be needed to reach the sustainable average annual water use volume ($Q_{stable}$) for each county.

291 WATER SAMPLES COLLECTED
2025: 291
2024: 321
2025: 541

## CHLORIDE CONCENTRATION AT MONITORING WELLS EB8A (38 FT), EB8B (130 FT), EB8C (210 FT)



# Equus Beds Groundwater Management District No. 2
# Established and New Priority Areas of Concern



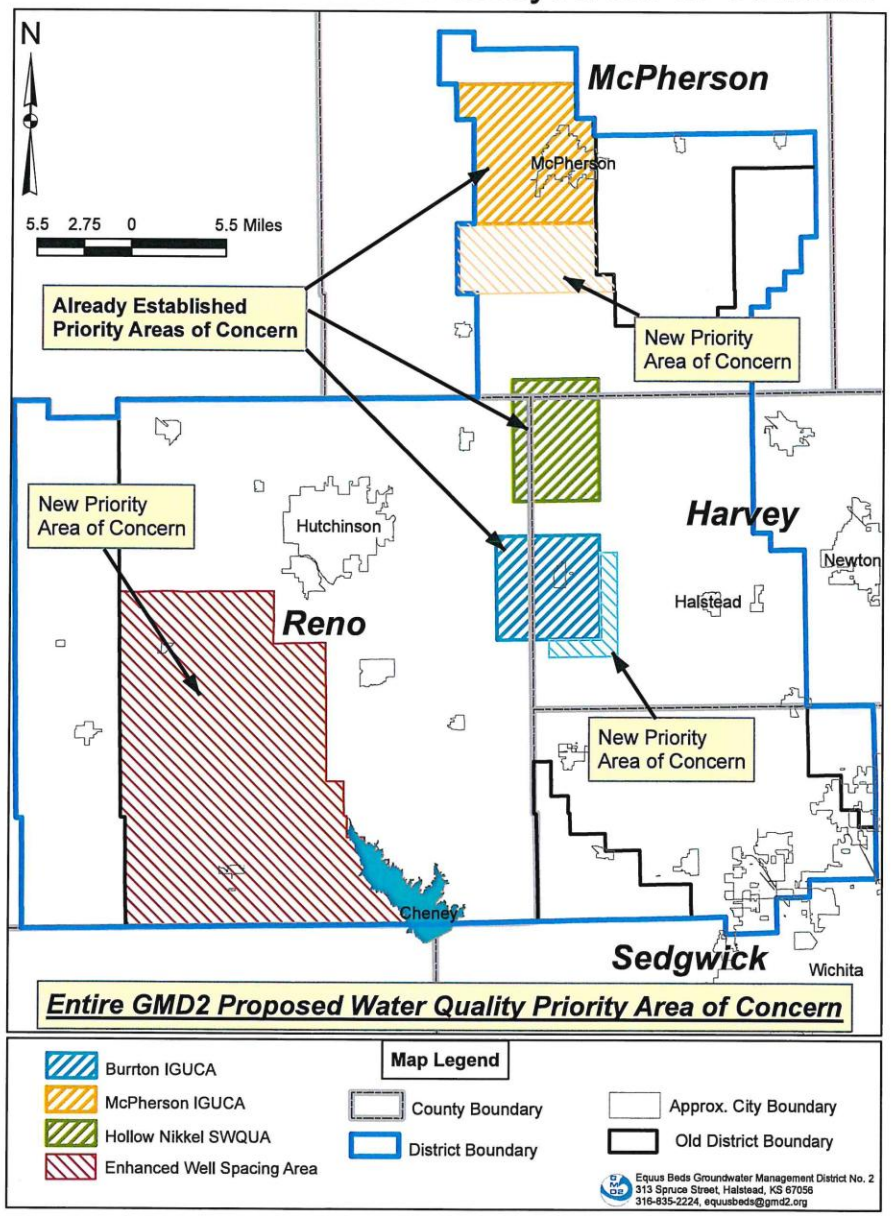
# HOUSE BILL 2279 - KSA 82a-1044

- Requires GMDs to provide annual financial and activities reports to the Kansas Legislature by January 25th of each year.
- 2025 GMD2 Annual Report completed and posted to GMD2 website
- Require GMDs to identify and establish priority areas of concern by July 1, 2024
- Require GMDs to develop action plan for each area of concern by July 1, 2026, and then implement action plan(s) if approved by the Chief Engineer

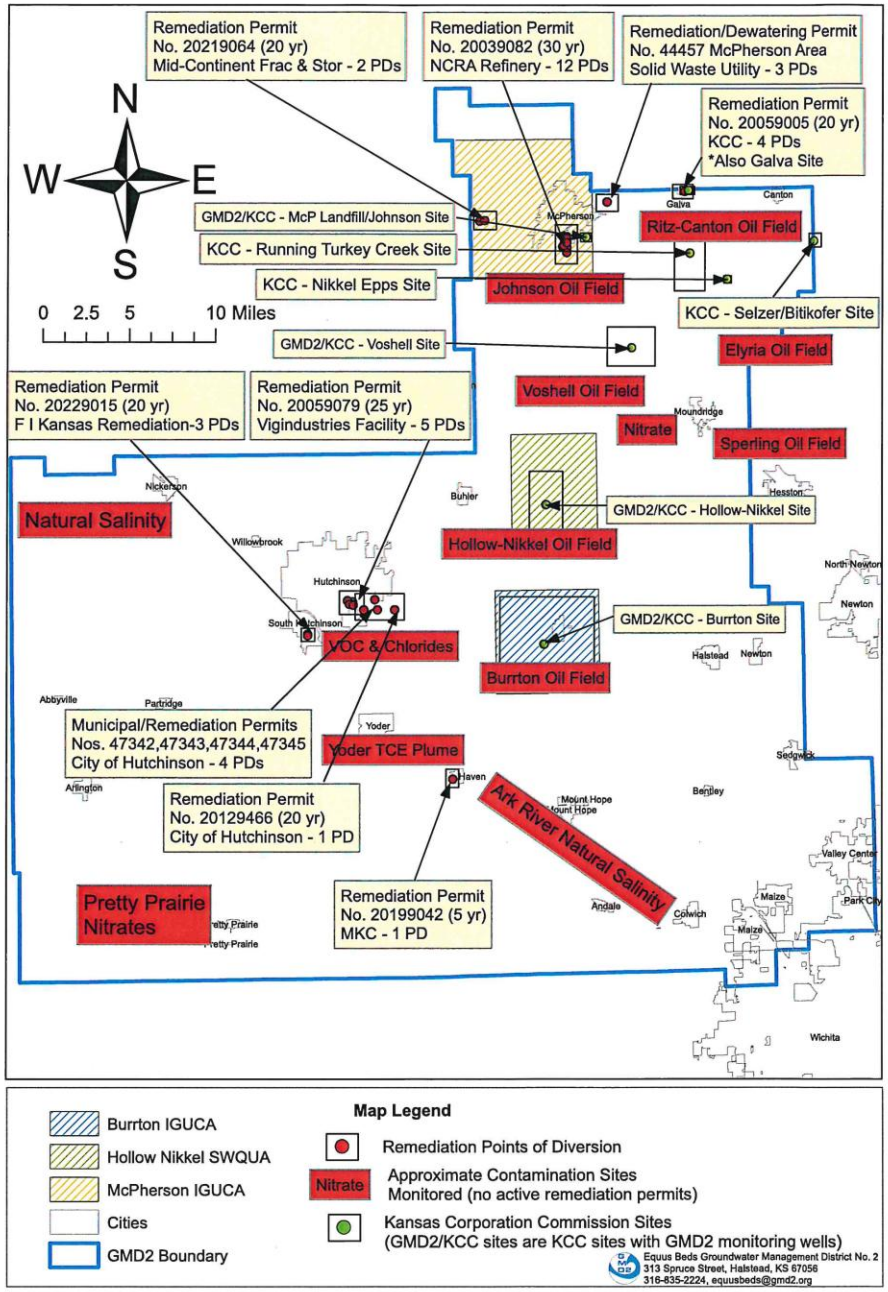
**Existing & New Priority Areas of Concern as Established Pursuant to K.S.A. 82a-1044**

**(House Bill 2279)**

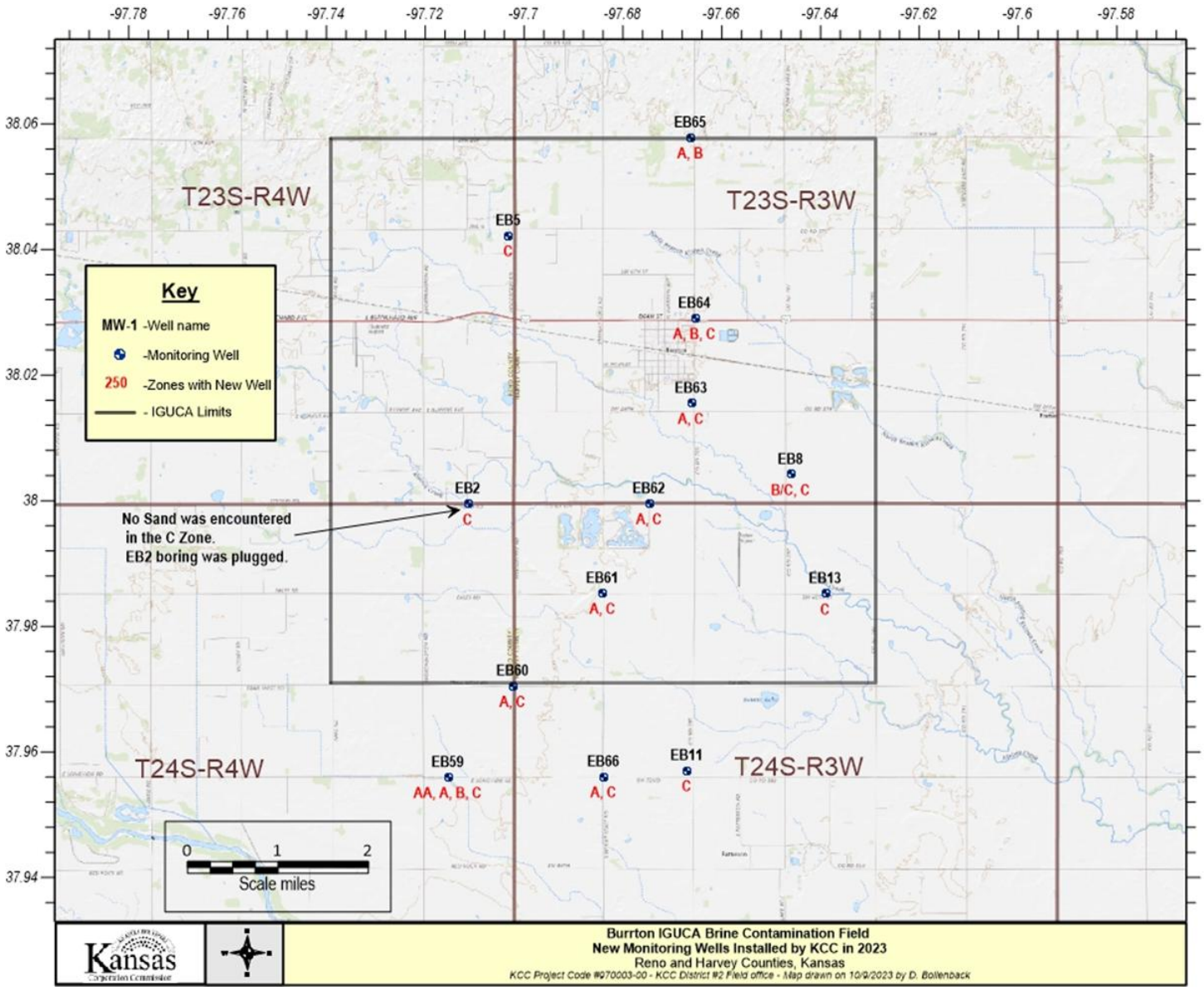
## Equus Beds Groundwater Management District No. 2
## Established and New Priority Areas of Concern

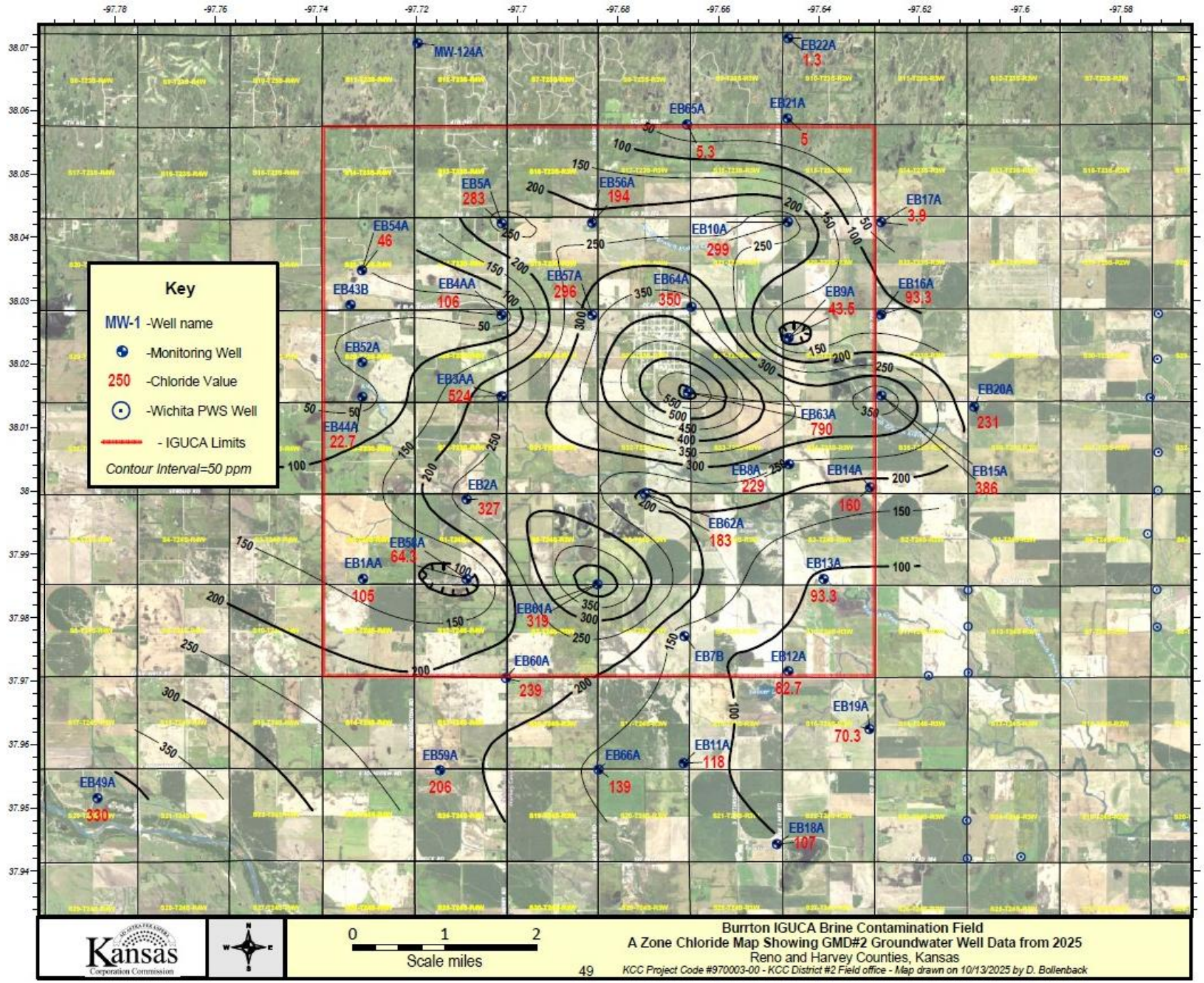


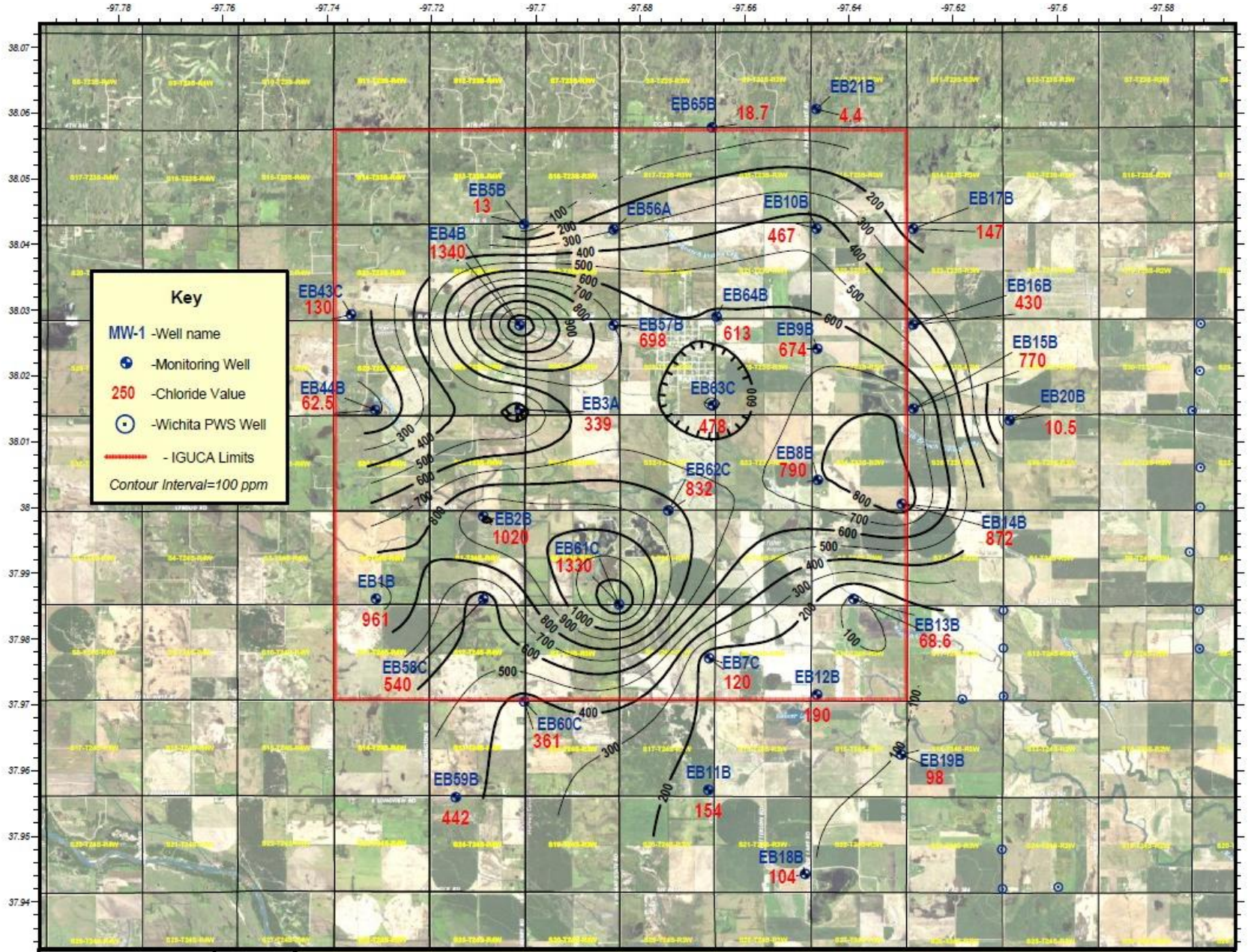
# Equus Beds Groundwater Management District No. 2 Contamination Sites and Active Remediation Permitted Sites within GMD2 Boundary

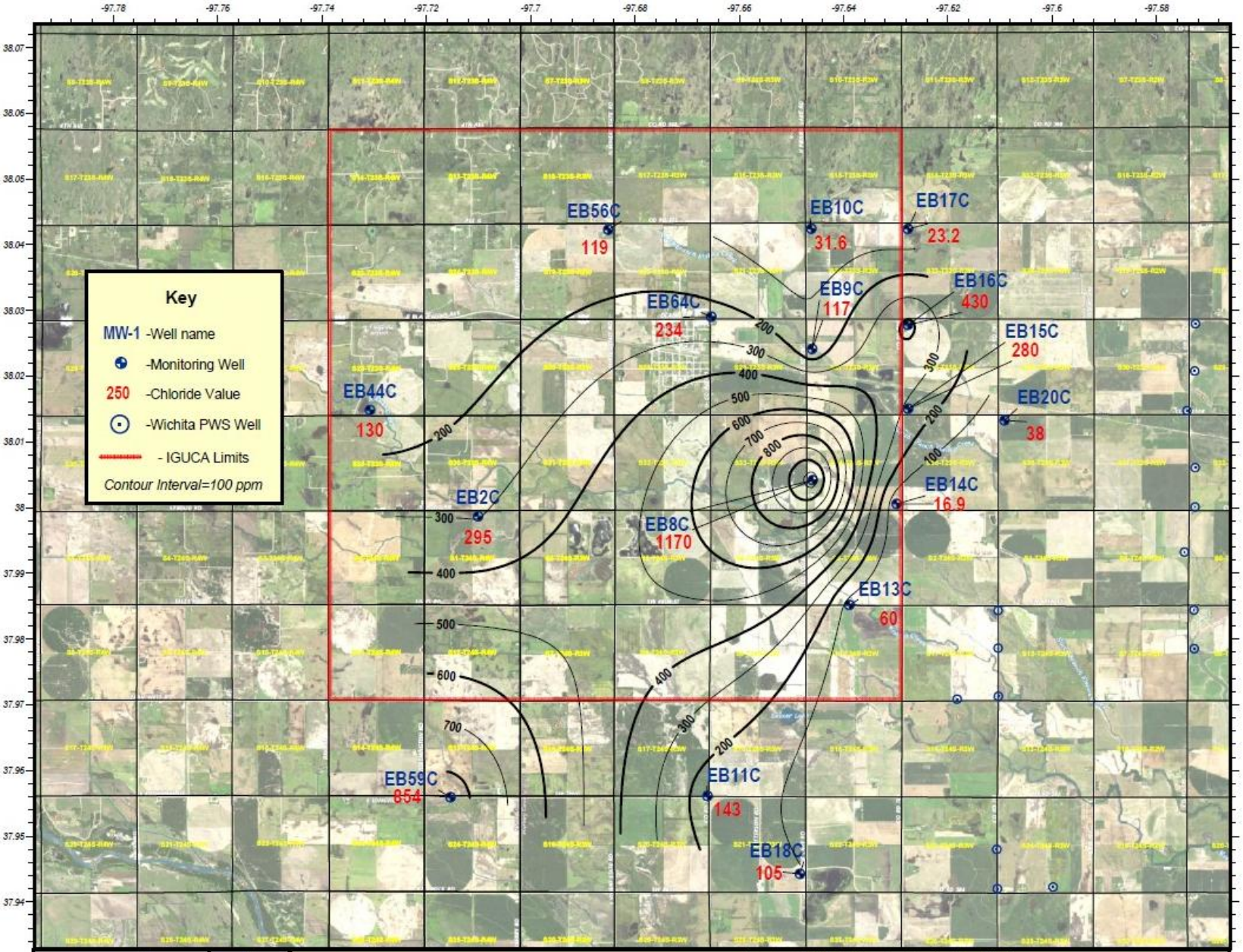


# BURRTON MONITORING WELL REPLACEMENT PROJECT - 2023




-97.78
-97.76
-97.74
-97.72
-97.7
-97.68
-97.66
-97.64
-97.62
-97.6
-97.58
38.07
38.06
38.05
38.04
38.03
38.02
38.01
38
37.99
37.98
37.97
37.96
37.95
37.94
Key
MW-1 -Well name
-Monitoring Well
250 -Chloride Value
-Wichita PWS Well
- IGUCA Limits
Contour Interval=50 ppm
MW-124A
EB22A 1.3
EB65A 5.3
EB21A 5
EB5A 283
EB56A 194
EB17A 3.9
EB54A 46
EB10A 299
EB43B
EB4AA 106
EB57A 296
EB64A 350
EB9A 43.5
EB16A 93.3
EB52A
EB3AA 524
EB20A 231
EB44A 22.7
EB63A 790
EB8A 229
EB14A 160
EB15A 386
EB2A 327
EB62A 183
EB58A 64.3
EB1AA 105
EB13A 93.3
EB61A 319
EB7B
EB12A 82.7
EB60A 239
EB19A 70.3
EB59A 206
EB66A 139
EB11A 118
EB49A 330
EB18A 107
Kansas
Corporation Commission
0 1 2
Scale miles
Burrton IGUCA Brine Contamination Field
A Zone Chloride Map Showing GMD#2 Groundwater Well Data from 2025
Reno and Harvey Counties, Kansas
49
KCC Project Code #970003-00 - KCC District #2 Field office - Map drawn on 10/13/2025 by D. Bollenback


Key
MW-1 -Well name
-Monitoring Well
250 -Chloride Value
-Wichita PWS Well
- IGUCA Limits
Contour Interval=100 ppm
EB65B 18.7
EB21B 4.4
EB5B 13
EB56A
EB10B 467
EB17B 147
EB4B 1340
EB43C 130
EB64B 613
EB16B 430
EB57B 698
EB9B 674
EB15B 770
EB44B 62.5
EB3A 339
EB63C 478
EB20B 10.5
EB8B 790
EB62C 832
EB2B 1020
EB14B 872
EB61C 1330
EB1B 961
EB13B 68.6
EB58C 540
EB7C 120
EB12B 190
EB60C 361
EB19B 98
EB59B 442
EB11B 154
EB18B 104
-97.78
-97.76
-97.74
-97.72
-97.7
-97.68
-97.66
-97.64
-97.62
-97.6
-97.58
38.07
38.06
38.05
38.04
38.03
38.02
38.01
38
37.99
37.98
37.97
37.96
37.95
37.94
Kansas Corporation Commission
0 1 2
Scale miles
Burrton IGUCA Brine Contamination Field
B Zone Chloride Map Showing GMD#2 Groundwater Well Data from 2025
Reno and Harvey Counties, Kansas
KCC Project Code #970003-00 - KCC District #2 Field office - Map drawn on 10/13/2025 by D. Bollenback


-97.78
-97.76
-97.74
-97.72
-97.7
-97.68
-97.66
-97.64
-97.62
-97.6
-97.58
38.07
38.06
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38.04
38.03
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38.01
38
37.99
37.98
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Key
MW-1 -Well name
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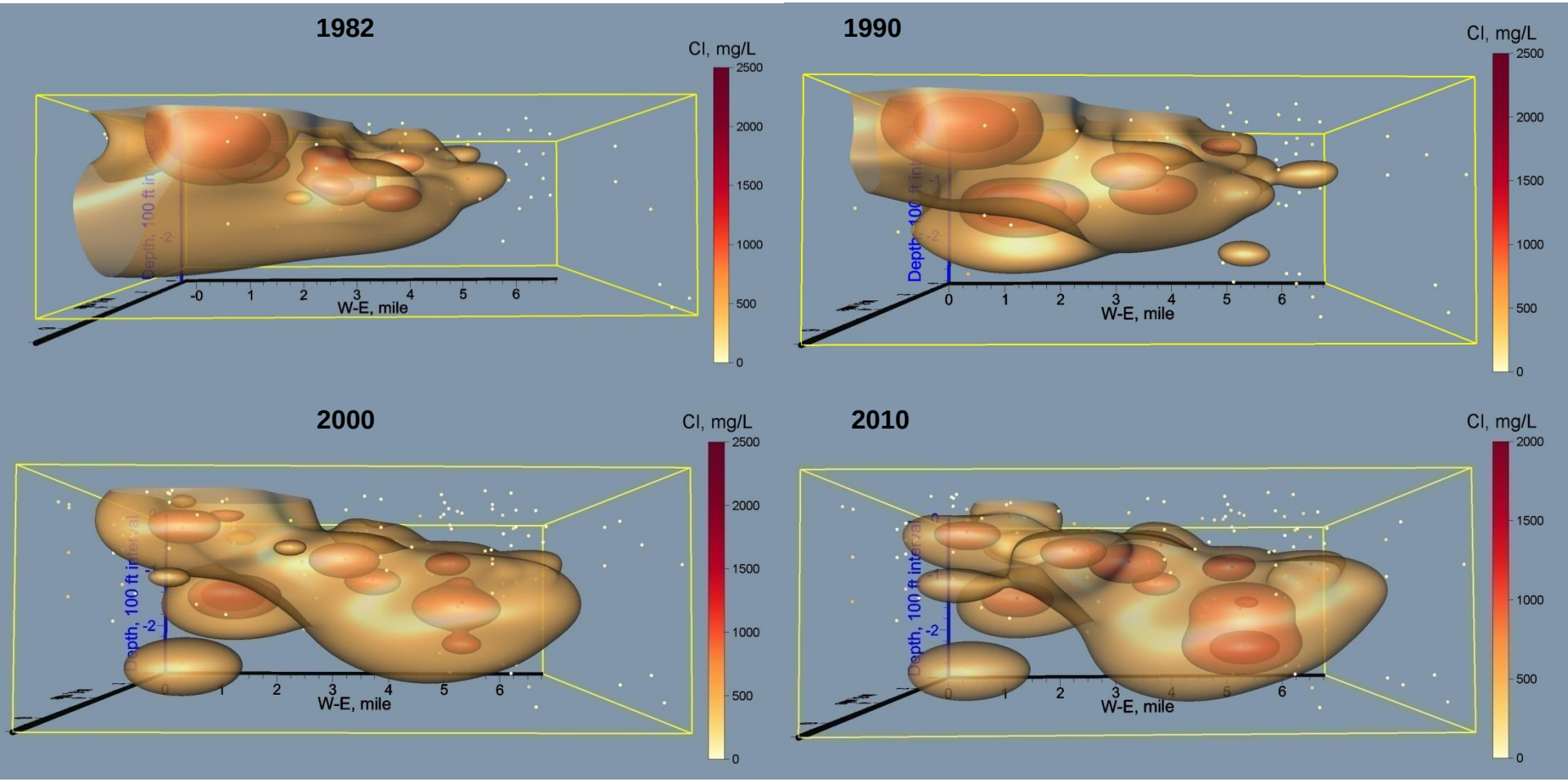
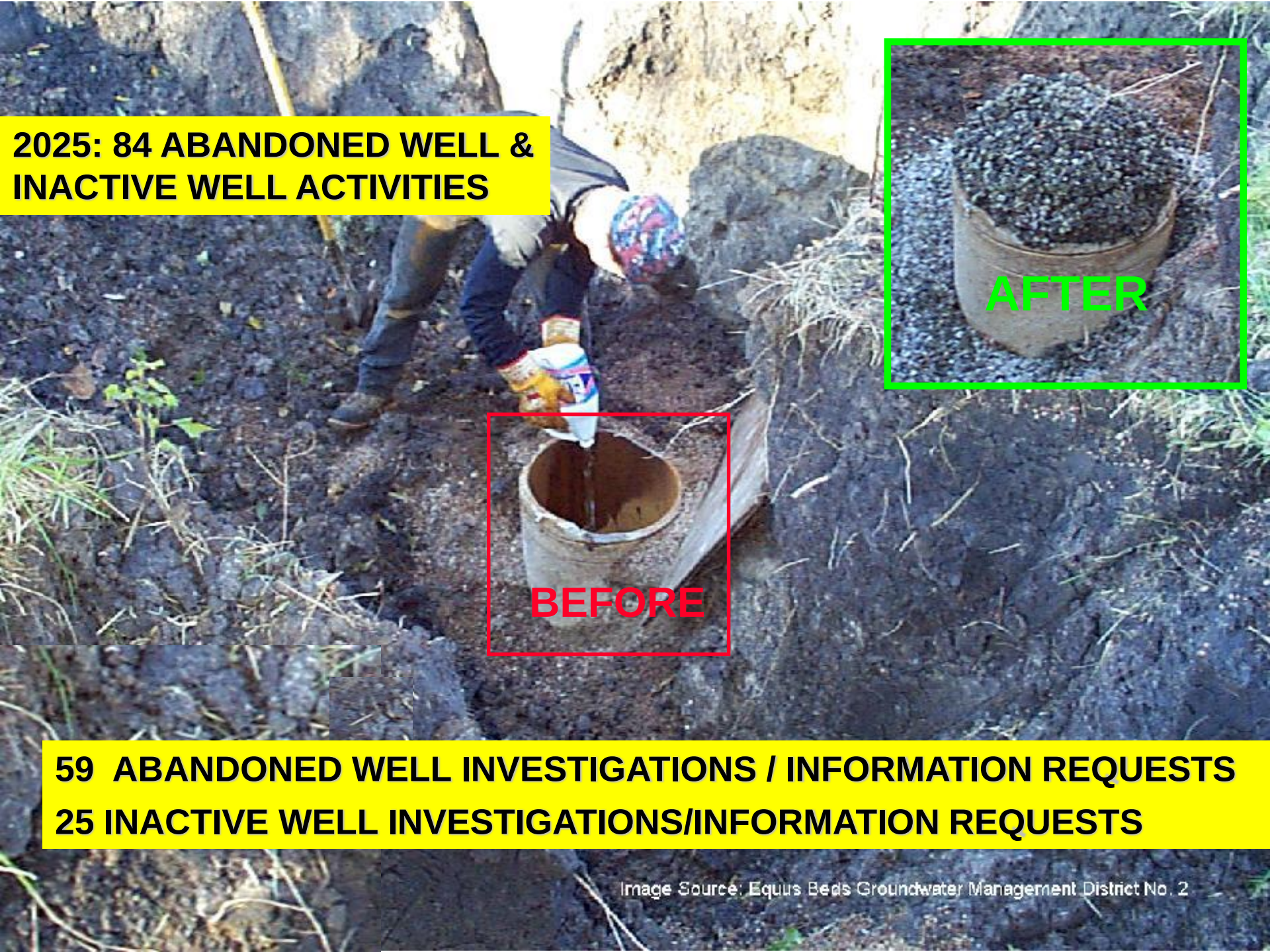
250 -Chloride Value
-Wichita PWS Well
- IGUCA Limits
Contour Interval=100 ppm
EB56C
119
EB10C
31.6
EB17C
23.2
EB64C
234
EB9C
117
EB16C
430
EB15C
280
EB44C
130
EB20C
38
EB2C
295
EB8C
1170
EB14C
16.9
EB13C
60
EB59C
854
EB11C
143
EB18C
105
200
300
400
500
600
700
800
100
0
1
2
Scale miles
Burrton IGUCA Brine Contamination Field
C Zone Chloride Map Showing GMD#2 Groundwater Well Data from 2025
Reno and Harvey Counties, Kansas
KCC Project Code #970003-00 - KCC District #2 Field office - Map drawn on 10/13/2025 by D. Bollenback
53

# Burrton Chloride Plume




**500, 1000, and 1500 mg/L isosurfaces**

**View to north: south face of bounding box toward viewer, west face is on the left, and east face is on the right.**


2025: 84 ABANDONED WELL & INACTIVE WELL ACTIVITIES
AFTER
BEFORE
59 ABANDONED WELL INVESTIGATIONS / INFORMATION REQUESTS
25 INACTIVE WELL INVESTIGATIONS/INFORMATION REQUESTS
Image Source: Equus Beds Groundwater Management District No. 2

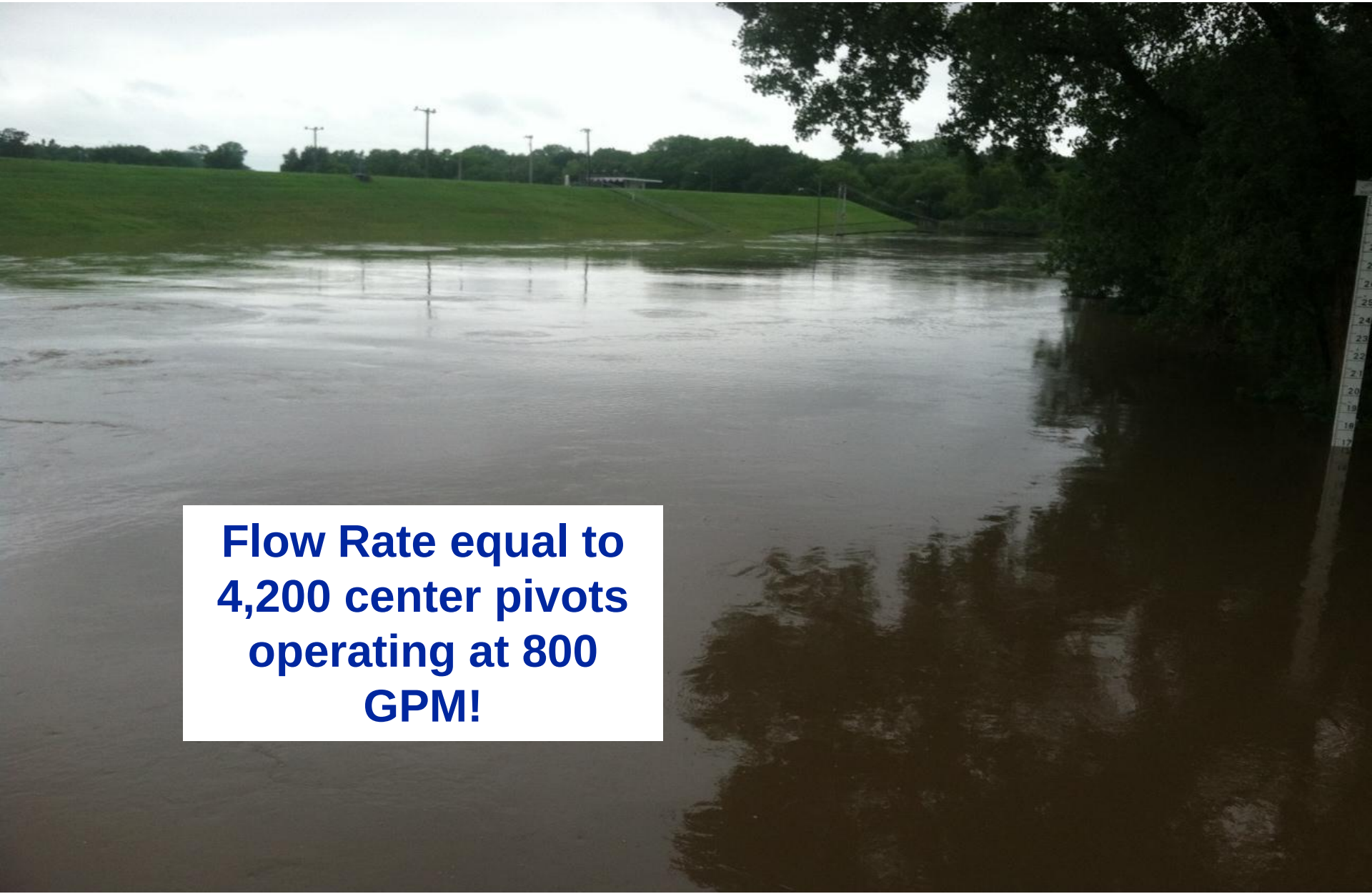
# Drought Impacts

# ARKANSAS RIVER – AUGUST 2012

# LITTLE ARKANSAS RIVER – AUGUST 2012

# LITTLE ARKANSAS RIVER – JULY 30, 2013
## ~7,500 CFS

# LITTLE ARKANSAS RIVER – JULY 30, 2013
## ~7,500 CFS



**Flow Rate equal to 4,200 center pivots operating at 800 GPM!**

# RECENT CONSERVATION EFFORTS

- Irrigation Technology Initiative
- McPherson BPU New South Well Field
- City of Wichita Aquifer Storage and Recovery (ASR) Project

# Irrigation Technology Initiative

- All 5 GMDs working with the Kansas Department of Agriculture – Division of Conservation (KDA-DOC) to implement the Irrigation Technology Initiative.
- Provides funding for irrigation system evaluations and technical and financial assistance in GMDs for implementation of irrigation efficiency practices to reduce groundwater use.

# MCPHERSON BPU NEW SOUTH WELL FIELD

- McPherson BPU existing municipal wells located in the McPherson IGUCA
- Continued groundwater declines due to groundwater pumping exceeding recharge
- BPU filed three new water permit applications in Harvey County (SWF) in 2011, and the permits were approved in 2017
- Water Permit Applications reviewing and processing delayed as BPU conducted studies to determine aquifer conditions and water quality impacts in the Hollow-Nikkel Special Water Quality Use Area.

# Pipeline


LITTLE ARKANSAS RIVER
PROPOSED SWF TRANSMISSION LINE
WHEAT STATE RD
12TH AVE
13TH AVE
14TH AVE
HWY 61
EXISTING McPHERSON BPU BLENDING PLANT AND PROPOSED WTP
LATITUDE: 38.3617°
LONGITUDE: -97.6825°
NW 48TH ST
NW 60TH ST
NW 72ND ST
W DUTCH AVE
NW 96TH ST
NW 108TH ST
APACHE RD
ARROWHEAD RD
BUCKSKIN RD
CHEROKEE RD
CHEYENNE RD
CHISHOLM RD
CIMARRON RD
COMANCHE RD
DAKOTA RD
EISENHOWER RD
AVE A
HWY 61
CITY OF McPHERSON
FRONTIER ROAD
IRON HORSE ROAD
BURMAC RD
PROPOSED SOUTH WELL FIELD
EXISTING CITY OF McPHERSON WWTF
LATITUDE: 38.3560°
LONGITUDE: -97.6553°
NW 36TH ST
OLD U.S. 81
NORTH

# MCPHERSON BPU NEW SOUTH WELL FIELD

- New water permits authorize a total of 2,909 acre-feet per year
- Construction completed, including ~20 miles of 20” pipeline
- New SWF water is projected to account for 94% of BPU’s water needs initially and ~50% after 40 years.
- Reduction of BPU’s groundwater pumping in the McPherson IGUCA will help stabilize groundwater levels
- Groundwater Monitoring Plan developed for the SWF to monitor water-levels and water quality

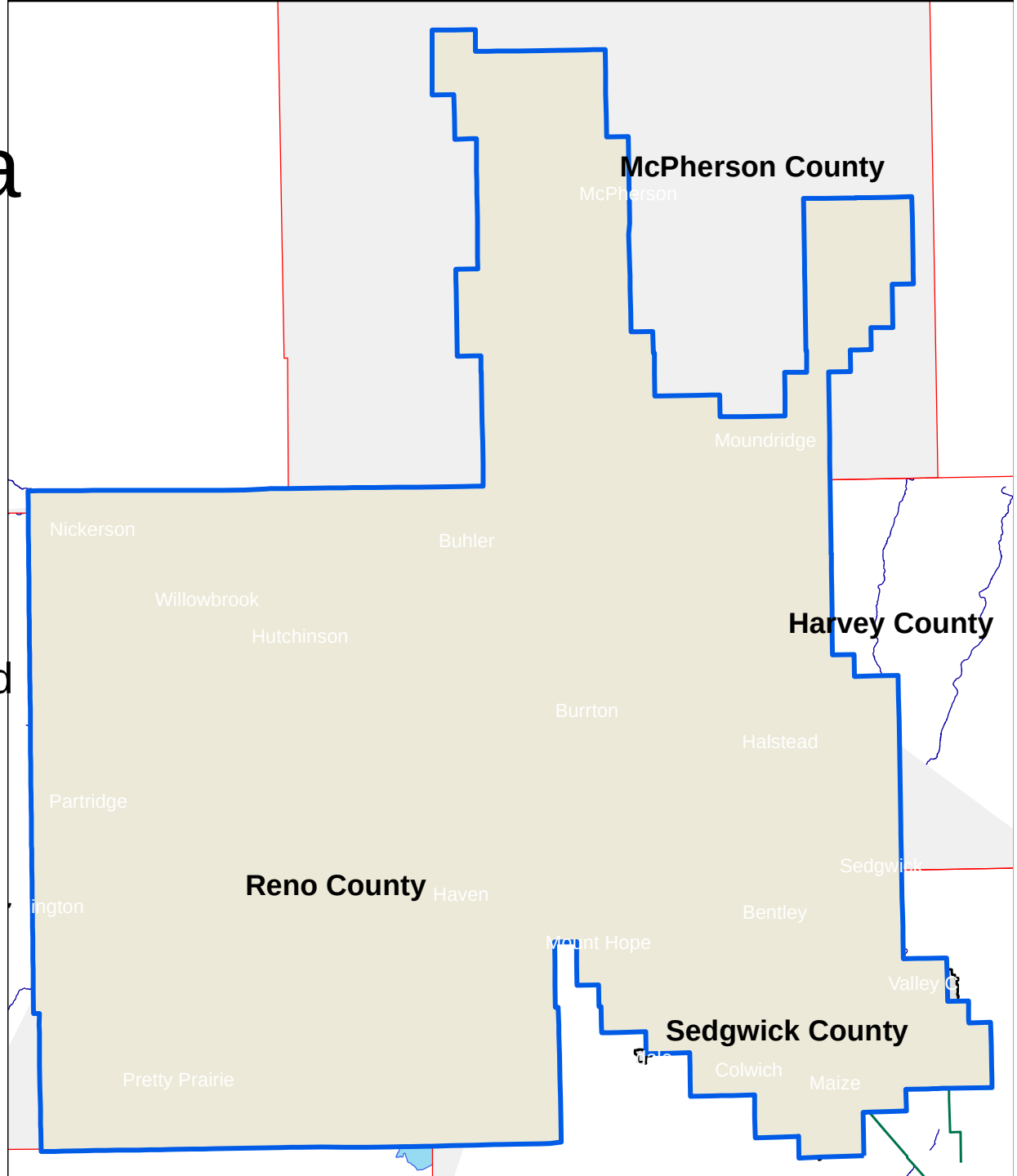
# Aquifer Storage and Recovery

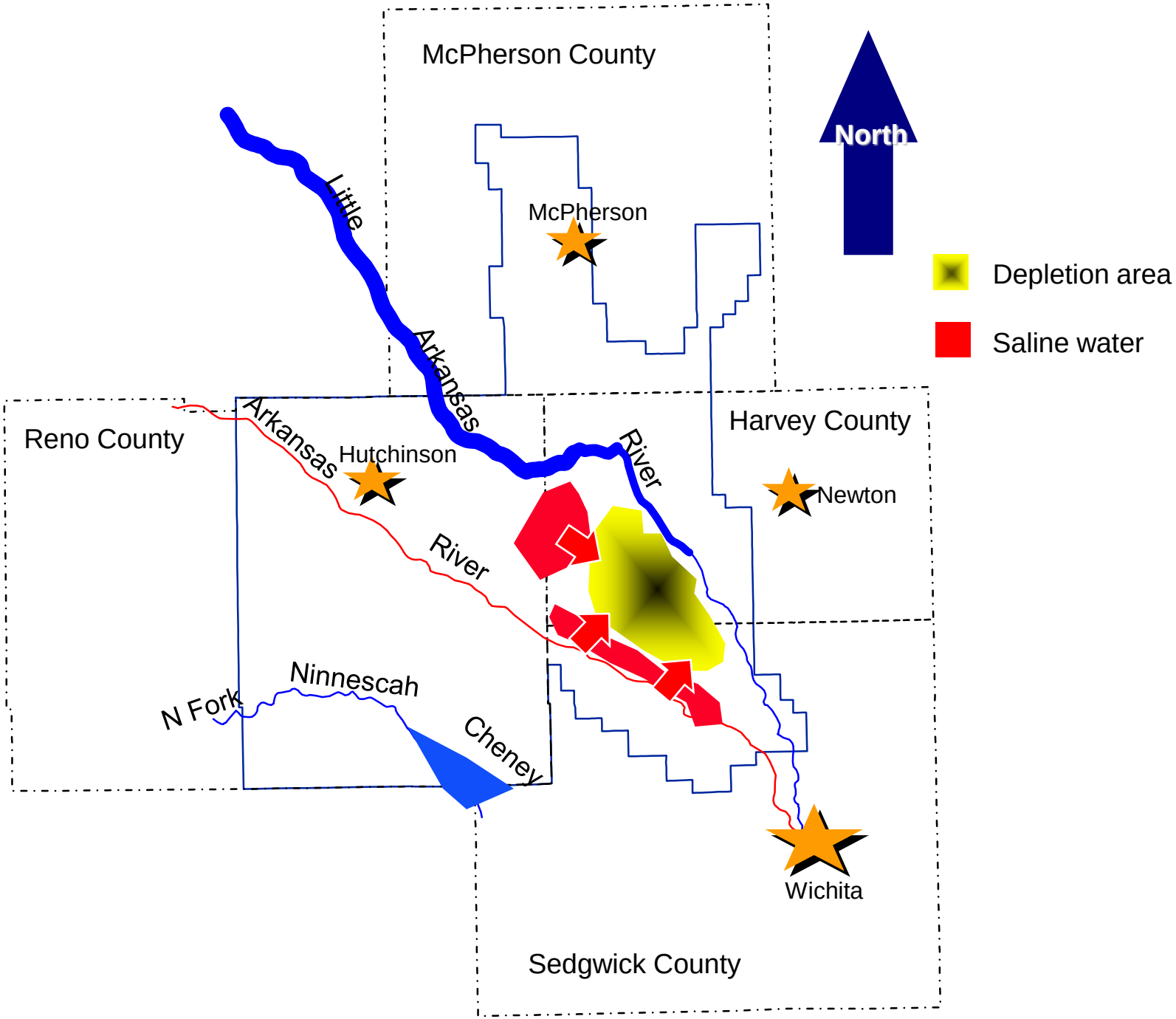
# (groundwater recharge)

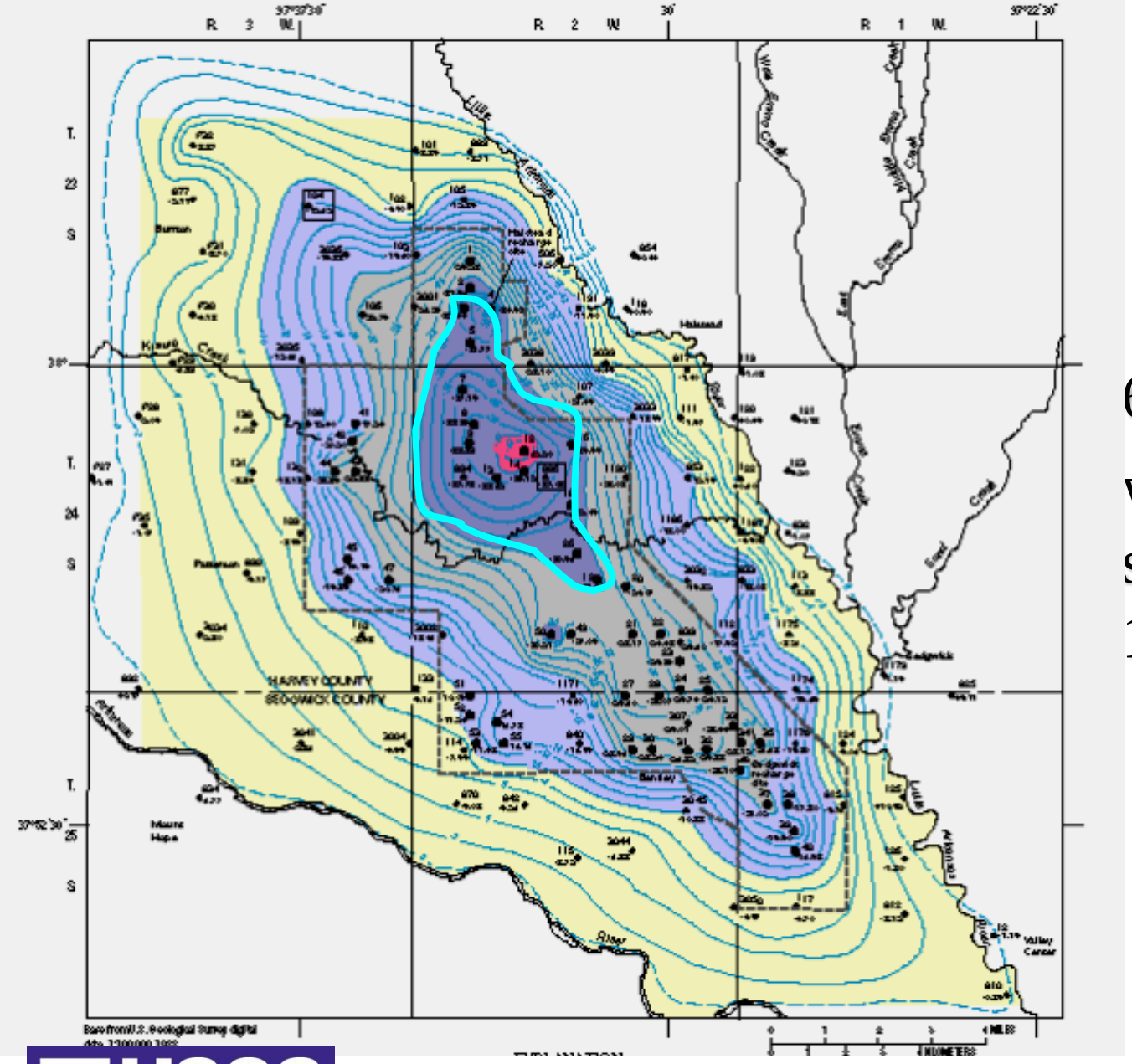
# City of Wichita Wells

55 Wells
40,000
AF/Y.

City Well Field area
is over-appropriated.
No new permits are allowed.




McPherson County
North
Little
Arkansas
River
McPherson
Depletion area
Saline water
Reno County
Arkansas
River
Hutchinson
Harvey County
Newton
Ninnescah
N Fork
Cheney
Wichita
Sedgwick County




65 billion gallons was available for storage to return to 1940 water levels.

USGS

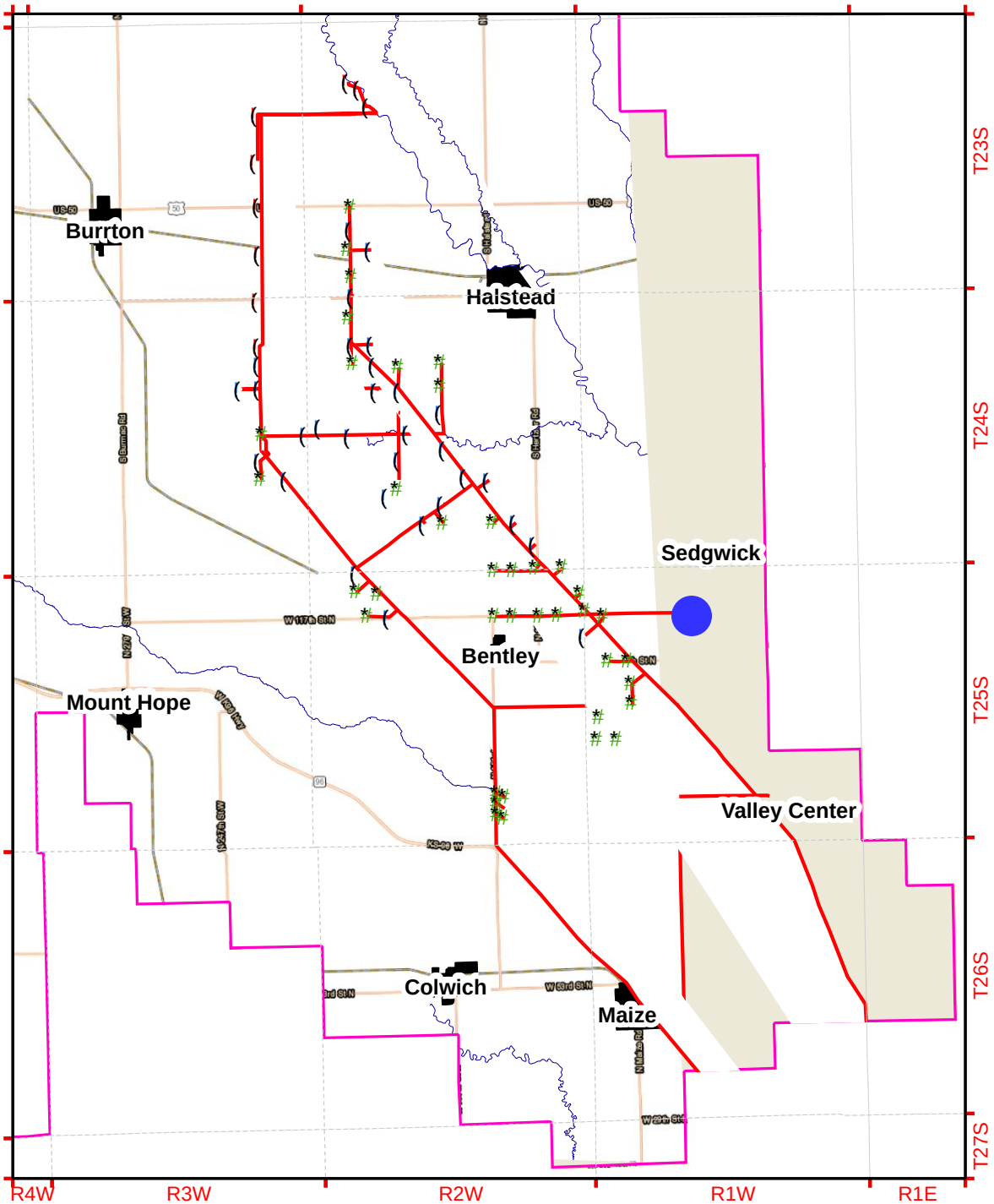
# Diversions and Projections

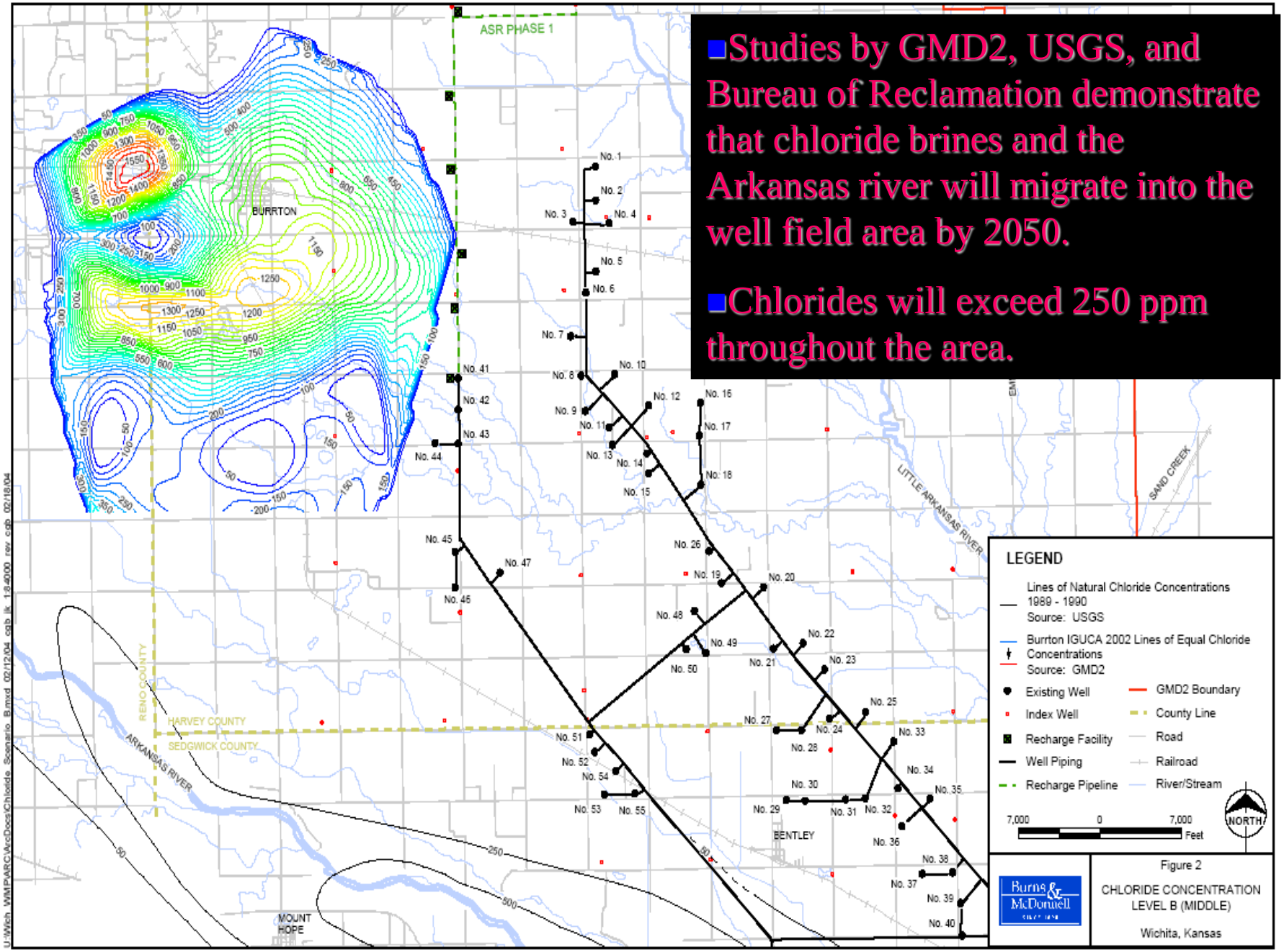
**Red Circle = Phase 1:**
**3 bank storage wells & 6 injections sites**

**Blue Circle = Phase 2:**
**30 MGD surface intake and 30 injection sites**

**Green Triangle = other City wells**

**Red Line = ASR pipeline**

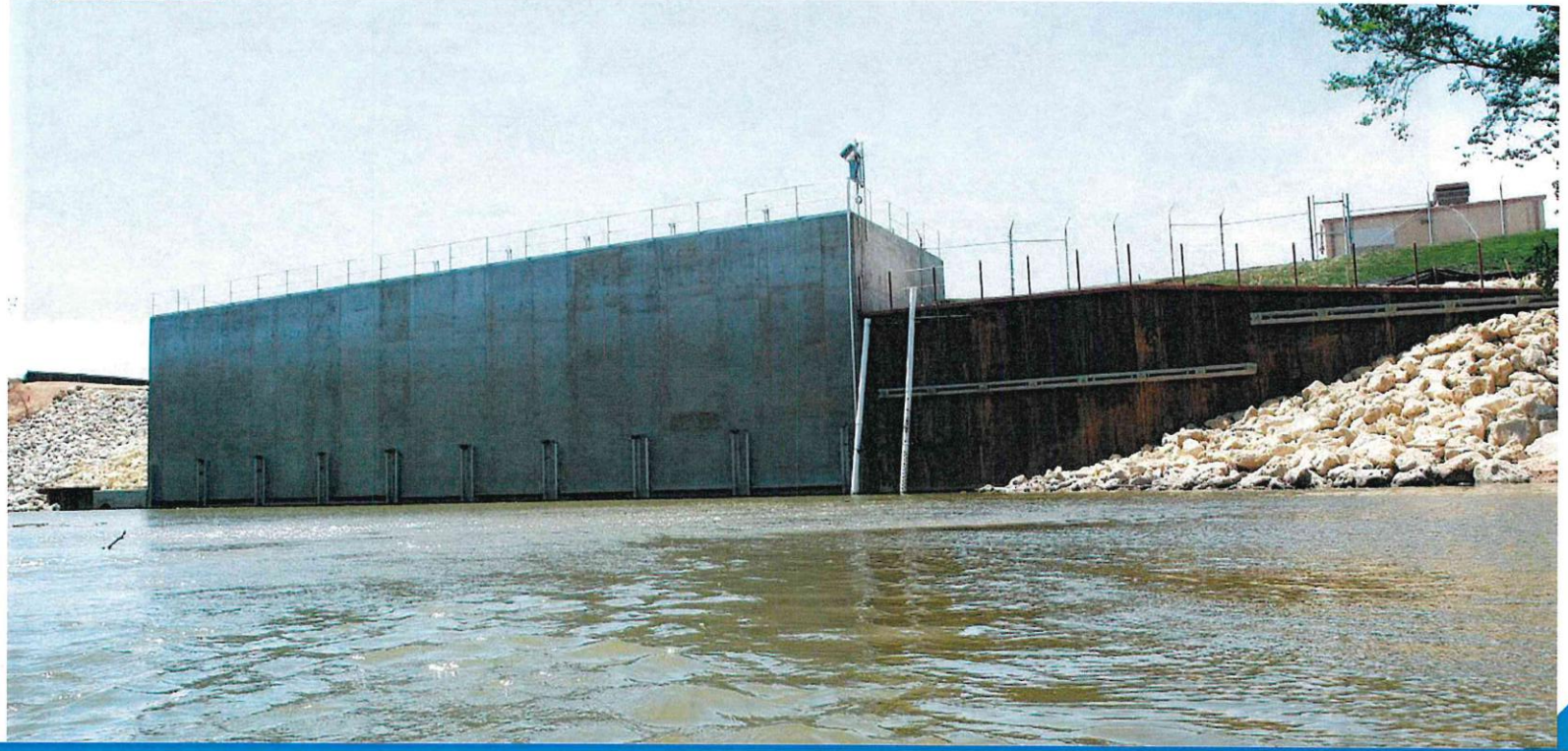




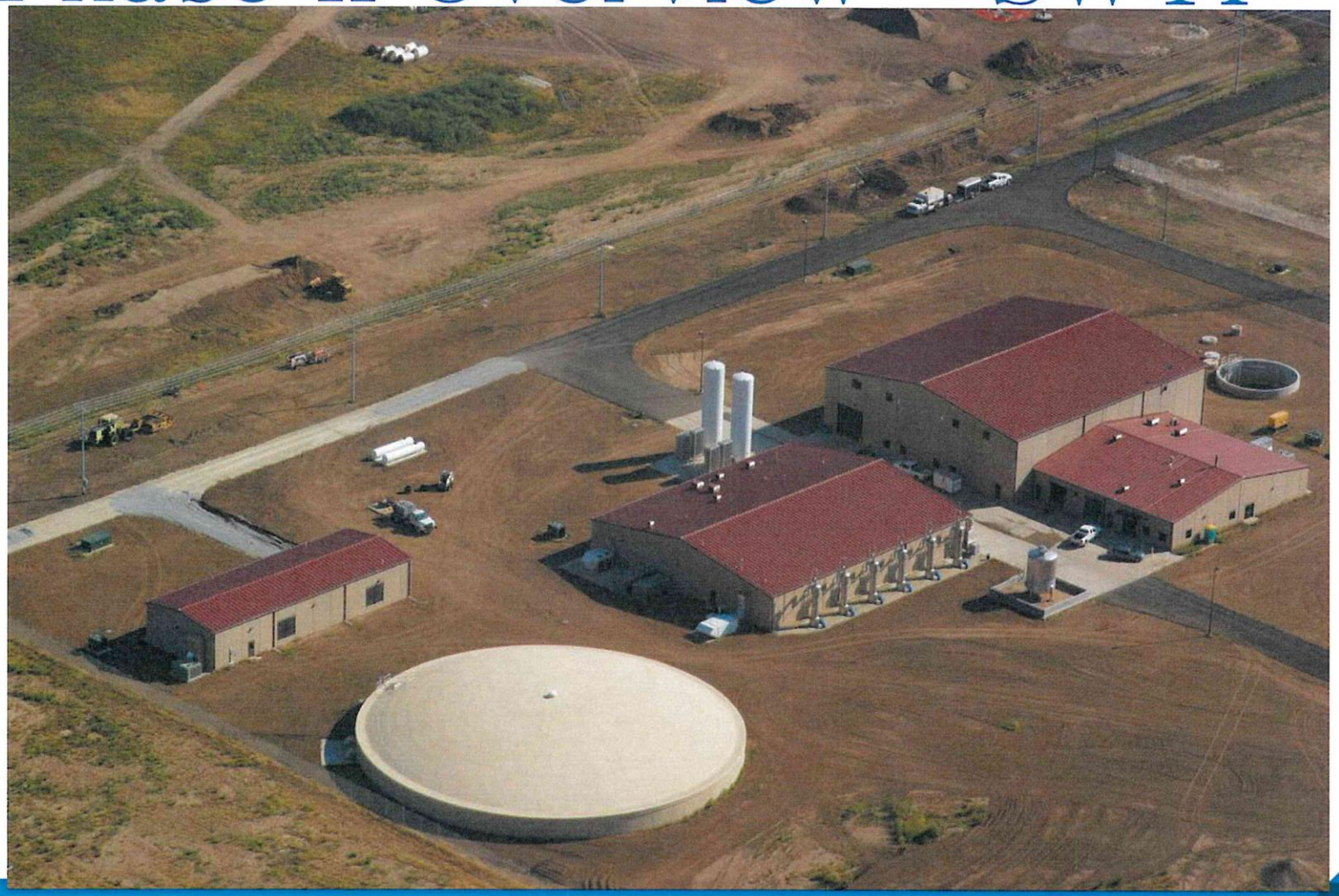

- Studies by GMD2, USGS, and Bureau of Reclamation demonstrate that chloride brines and the Arkansas river will migrate into the well field area by 2050.
- Chlorides will exceed 250 ppm throughout the area.

# Phase II Overview – Intake

## Divert Water from Little Arkansas River

# Phase II Overview – SWTP

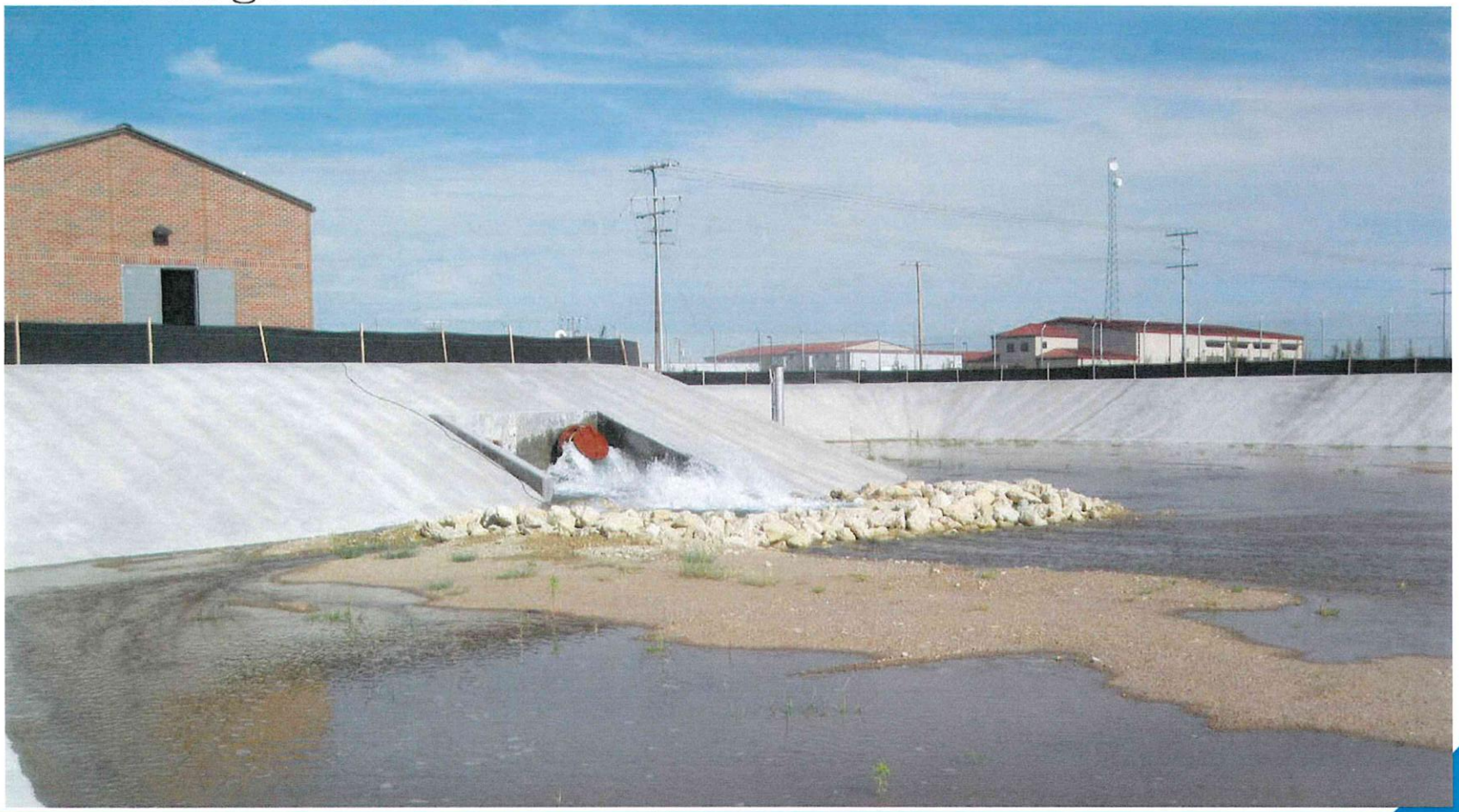


# Phase II Overview – Recharge

RRW Construction

# Phase II Overview – Recharge

## Recharge Basin 36



# QUESTIONS?

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tboese@gmd2.org