Utah Division of Water Rights

Current Water Rights Policy

For the Moab-Spanish Valley

Cash Stallings, EIT
Assistant Regional Engineer
Southeastern Region

Topics that will be covered

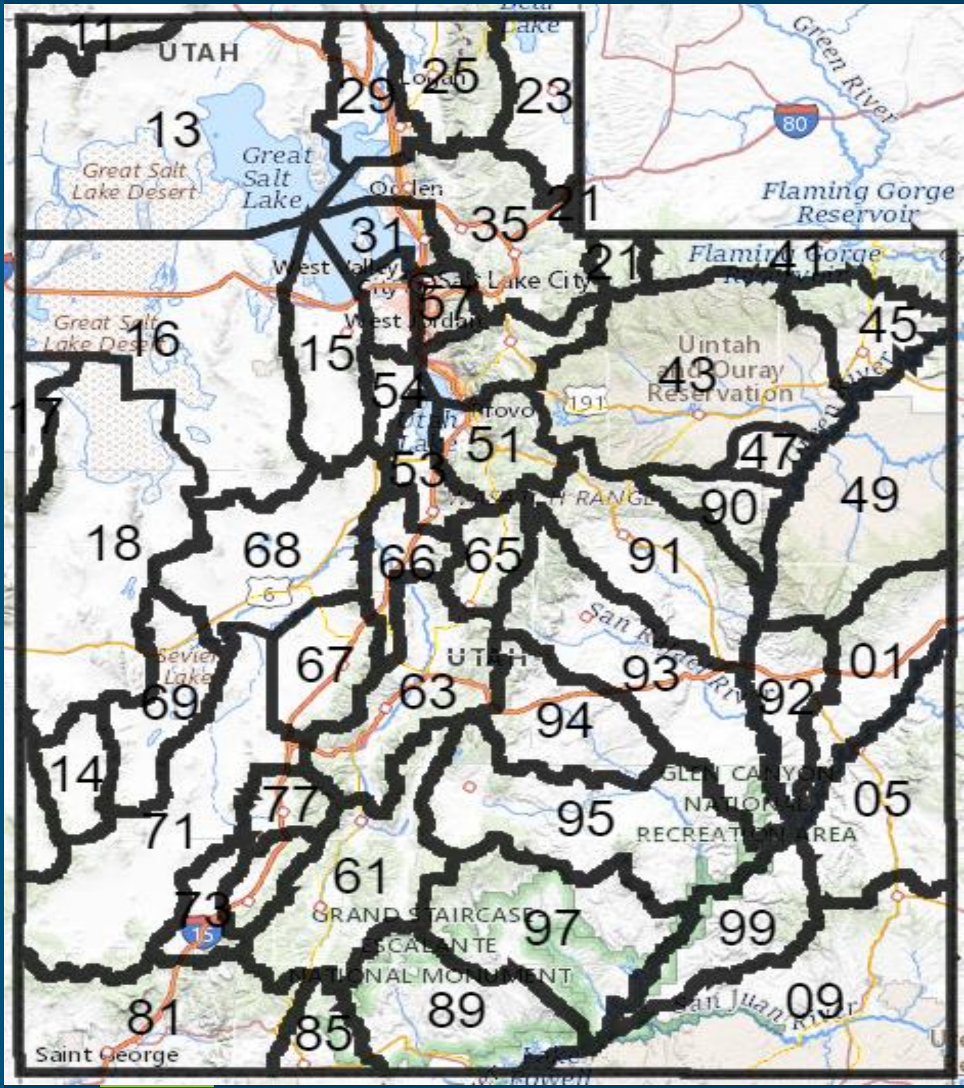
-Geographic Location and Boundaries

-Management

-Applications

-Restrictions

05 Area


UTAH
Great Salt Lake Desert
Great Salt Lake
Ogden
Salt Lake City
West Jordan
Provo
Uintah and Ouray Reservation
Flaming Gorge Reservoir
Green River
GLEN CANYON NATIONAL RECREATION AREA
GRAND STAIRCASE ESCALANTE NATIONAL MONUMENT
Saint George
San Juan River
Sevier Lake
11
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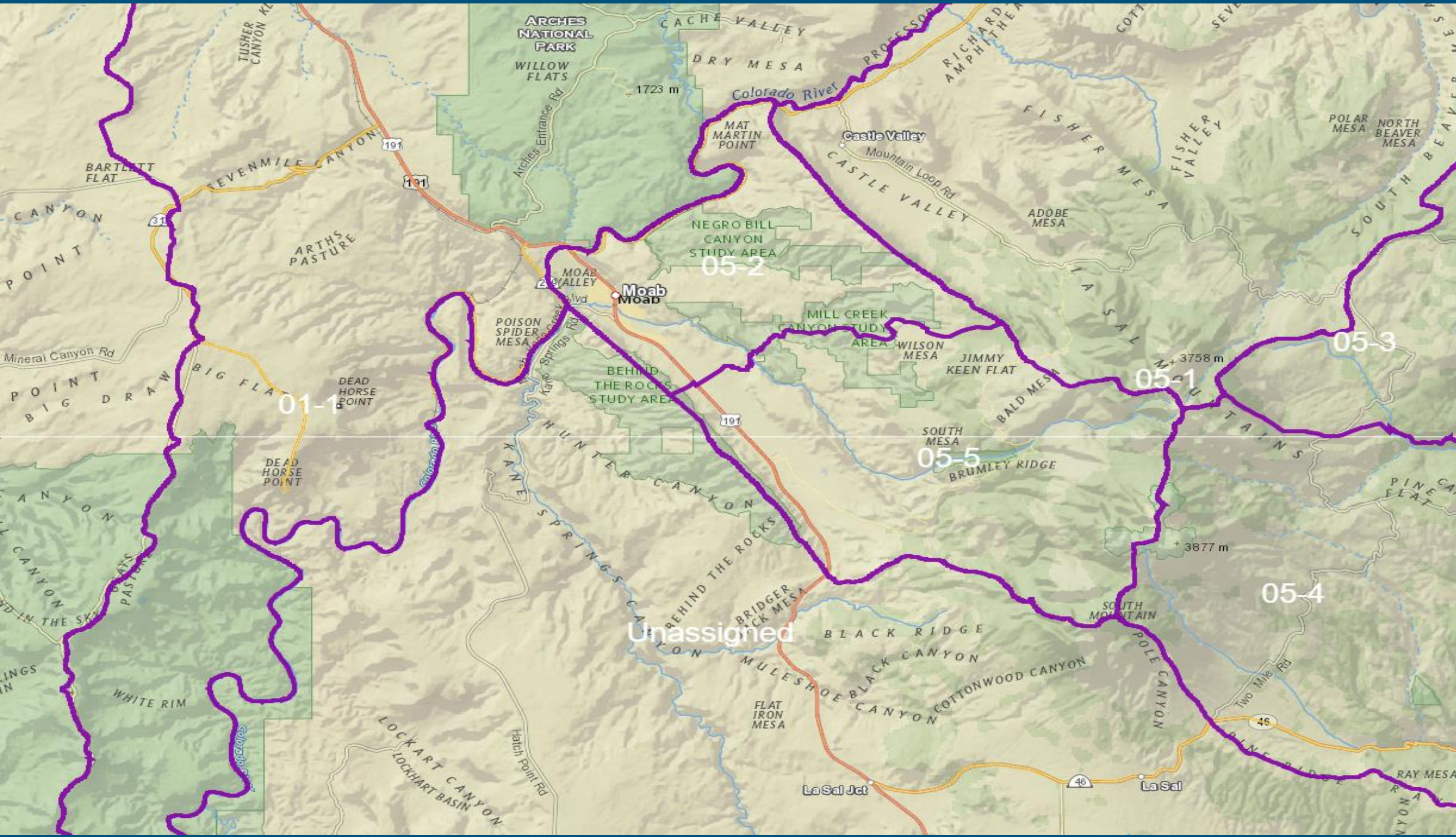


ARCHES NATIONAL PARK
WILLOW FLATS
1723 m
CACHE VALLEY
DRY MESA
Colorado River
PROFESSOR
RICHARD AMPHITHEATER
TUSHER CANYON
BARTLETT FLAT
SEVENMILE CANYON
ARTHS PASTURE
Arches Entrance Rd
MAT MARTIN POINT
Castle Valley
Mountain Loop Rd
CASTLE VALLEY
FISHER MESA
FISHER VALLEY
ADOBE MESA
POLAR MESA
NORTH BEAVER MESA
SOUTH BEAVER MESA
NEGRO BILL CANYON STUDY AREA
05-2
MOAB VALLEY
Moab
POISON SPIDER MESA
MILL CREEK CANYON STUDY AREA
WILSON MESA
JIMMY KEEN FLAT
BALD MESA
3758 m
05-1
05-3
LA SAL MOUNTAINS
Mineral Canyon Rd
BIG FLAT
DEAD HORSE POINT
01-1
BIG DRAW
BEHIND THE ROCKS STUDY AREA
Kane Springs Rd
HUNTER CANYON
SOUTH MESA
05-5
BRUMLEY RIDGE
PINE FLAT
3877 m
05-4
KANE SPRINGS CANYON
BEHIND THE ROCKS
BRIDGER JACK MESA
Unassigned
BLACK RIDGE
SOUTH MOUNTAIN
BLACK CANYON
MULESHOE CANYON
COTTONWOOD CANYON
POLE CANYON
Two Mile Rd
WHITE RIM
FLAT IRON MESA
LOCKHART CANYON
LOCKHART BASIN
Hatch Point Rd
La Sal Jct
La Sal
RAY MESA
PINE RIDGE
191
313
46

Management of 05 Area

-Current Adjudications in 05-2 and 05-5 areas

-13 historic court decrees that primarily deal with surface water rights

-Distribution System on Mill Creek

-Restricted to small or temporary applications

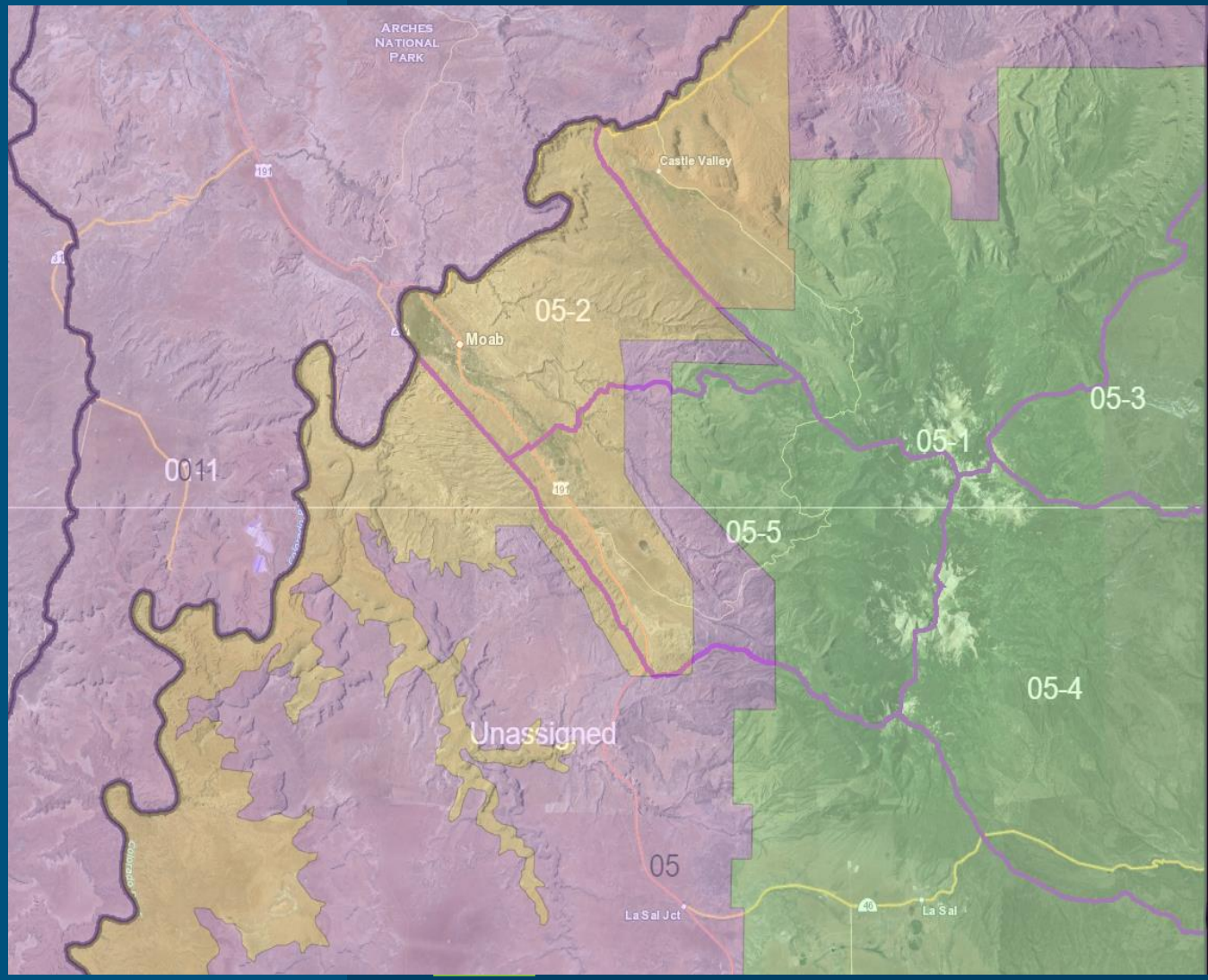
-Subject to Colorado River Compacts and Treaties

Colorado River Basin Policy

- Utah is entitled to 23% of the Upper Basin Allocation
- Currently using less than 23%
- Many Approved but as of yet undeveloped Applications to Appropriate
- 1990 Colorado River Policy

Appropriation Policy

- 1 acre of irrigation
- 10 head of livestock
- 1 full time domestic residence
- 6.73 acre-feet



Change Applications

-Nature of use

-Point of diversion

-Place of use

-Allows transbasin movement of water rights

Fixed Time and Temporary Applications

-Fixed Time limited to 20 years

-Temporary limited to 1 year

-No proof required

Applications

-Considered on their individual merits

-What is the potential to interfere with existing rights

-All applications, except temporary, are advertised in the local newspaper

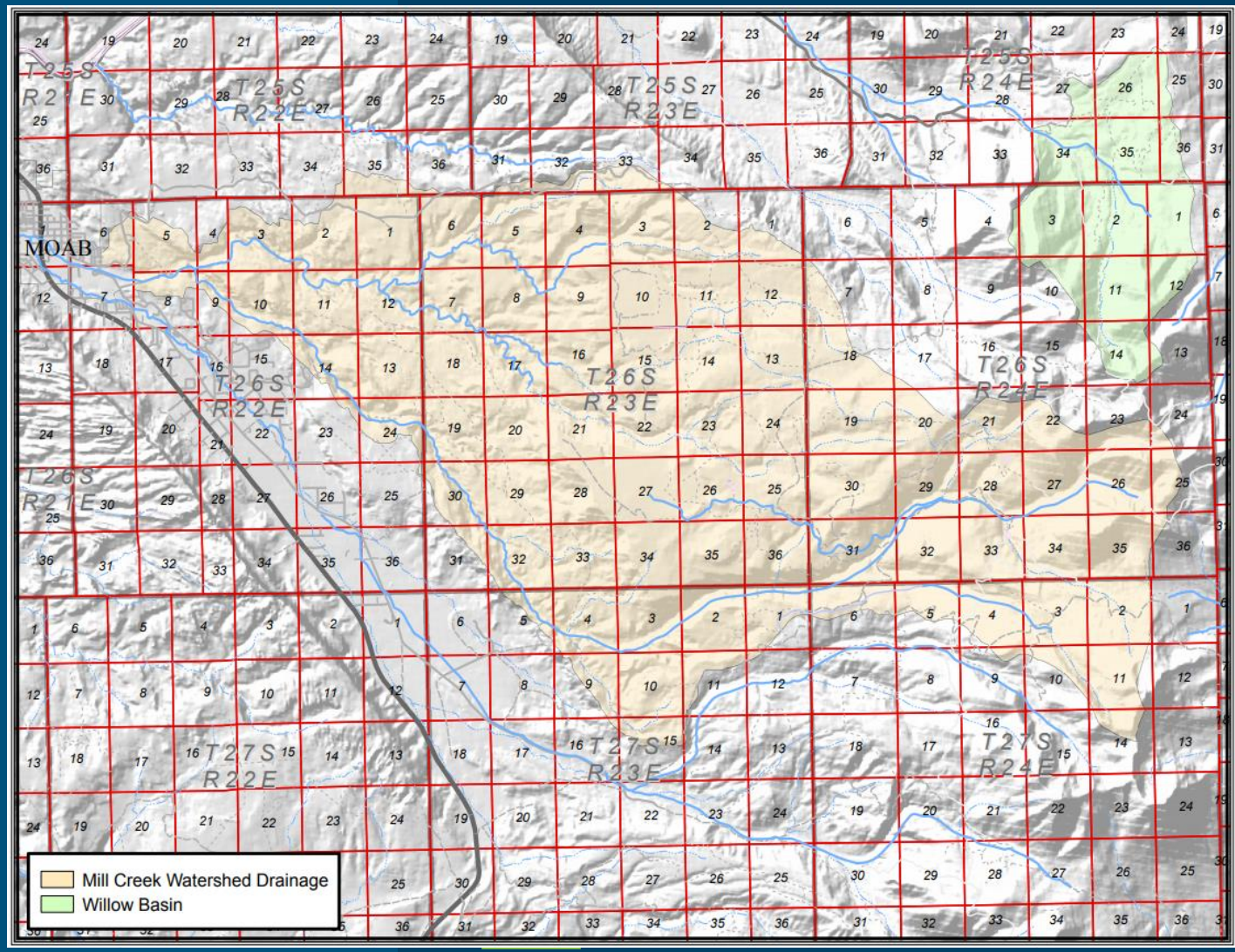
Restrictions w/in Moab City Limits

- No new appropriations for domestic use from wells
- 10 stock and 0.25 acre of irrigation east of Main Street
- 10 Stock and 1 acre west of Main Street

Mill Creek Upper Watershed Restrictions

-Surface and ground waters are closed to new appropriations

-New uses can only be accomplished by filing a change application on shares of stock in Moab Irrigation Company



Summary

- Management
- Applications
- Restrictions

Thank you,

Questions?

Adjudication Update

Michael Drake, P.E.

Assistant State Engineer - Adjudication

Utah Division of Water Rights

www.waterrights.utah.gov

The "What and Why" of General Adjudications

- What is it?:
  - Legal process that brings all rights onto the records of the State Engineer.
- Why do we do them?:
  - Bring pre-statutory and federal reserve rights onto the records.
  - Remove or reduce rights that are wholly or partially forfeited due to non-use.
  - Bring clarity to the water rights in an area.
  - Obtain final judicial decree on all water rights
- What does that mean for the Moab area?

The Adjudication Process

1 PETITION

2 NOTICE

3 SUMMONS

4 PUBLIC MEETING

5 NOTICE TO FILE CLAIMS WITHIN 90 DAYS

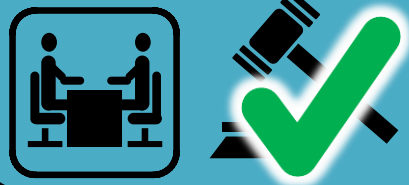
6 LIST OF UNCLAIMED RIGHTS

7 90 DAYS TO FILE OBJECTION

8 PUBLIC MEETING

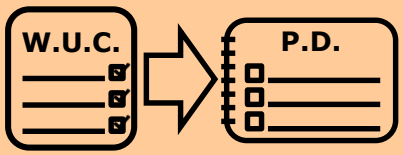
9 FINAL SUMMONS

10 OBJECTION RESOLUTION & DECREE



11 CLAIM INVESTIGATION

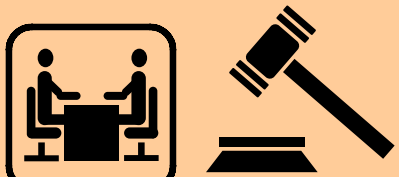
12 PROPOSED DETERMINATION



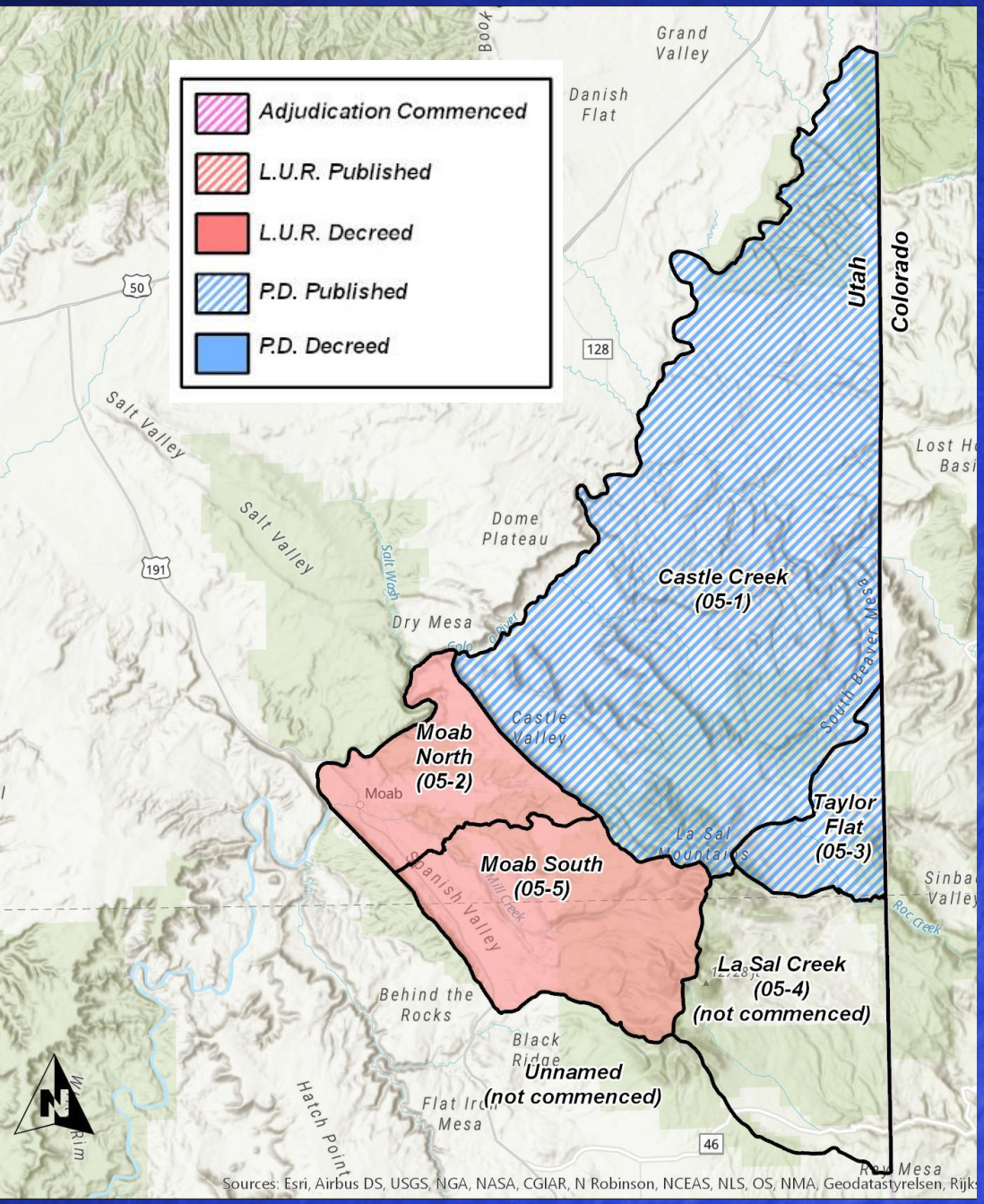
13 90 DAYS TO FILE OBJECTION

14 PUBLIC MEETING

15 OBJECTION RESOLUTION & DECREE

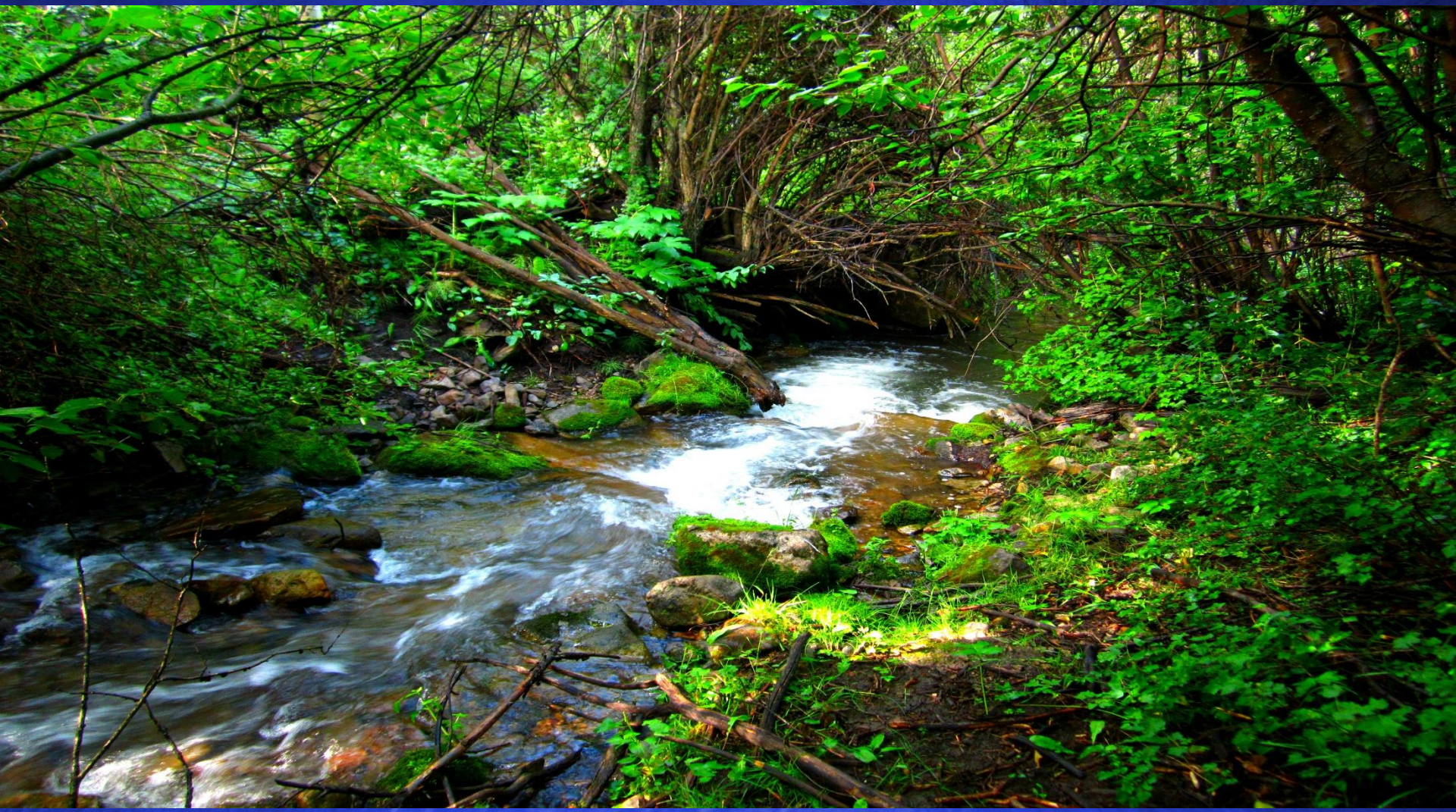


Southeastern Colorado River Adjudication Status



- ***Castle Creek (05-1)***
  - *PD Published: 2008*
- ***Taylor Flat (05-3)***
  - *PD Published: 2014*
- ***Moab North (05-2)*** *(in review)*
  - *LUR Published: 2018*
  - *LUR Decree: 2019 (120 rights abandoned)*
  - *PD Expected: 2021 (approx. 460 rights)*
- ***Moab South (05-5)*** *(47% complete)*
  - *LUR Published: 2019*
  - *LUR Decree: 2020 (35 rights abandoned)*
  - *PD Expected: 2021(approx. 430 rights)*

THANK YOU, QUESTIONS?



Utah Division of Water Rights

Marc Stilson, P.E.
SE Regional Engineer

REVIEW OF: USGS "Evaluation of Groundwater Resources in the Spanish Valley Watershed, Grand and San Juan Counties, Utah" Scientific Investigations Report 2019-5062

Introduction – Groundwater Management

QUESTION?

How much groundwater development has taken place and how much additional groundwater development can be sustained by the aquifers underlying Moab / Spanish Valley?

Why is this important?

Utah Code 73-5-15 4(a)(i) states "…the withdrawal of water from a groundwater basin shall be limited to the basin's safe yield"

Additionally…

Utah Code 73-5-15 4(a)(ii) "Before limiting withdrawals in a groundwater basin to safe yield, the state engineer shall:

- **determine the groundwater basin's safe yield; and**
- **adopt a groundwater management plan for the groundwater basin"**

Groundwater Management Plans

- Est. in Section 73-5-15 Utah Code

Objectives:

- Limit groundwater withdrawals to safe yield
- Protect physical integrity of the aquifer
- Protect water quality

"Safe Yield" - the amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.

Two Critical Questions:

1. **What is the Supply?**

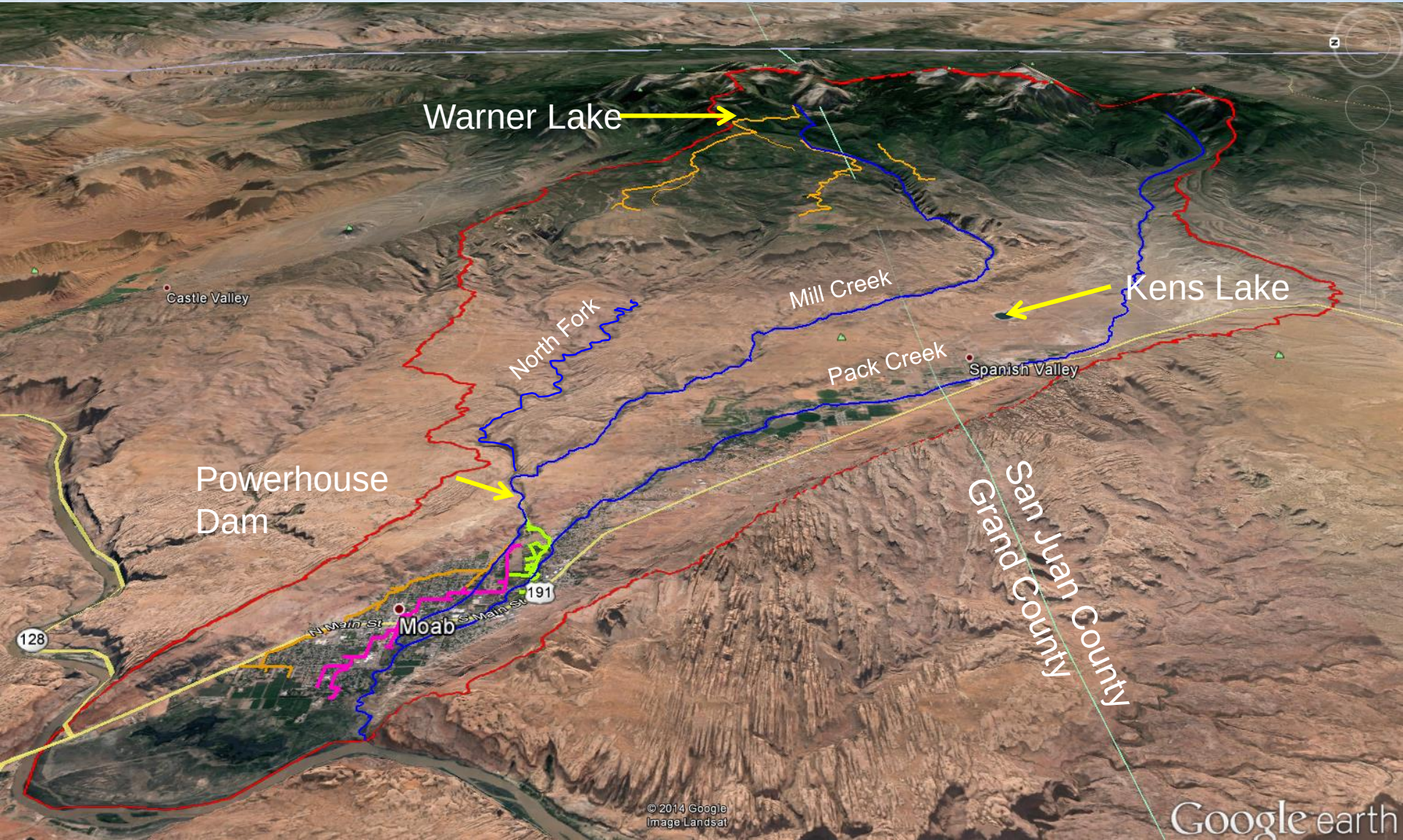
   How much groundwater is available for development without exceeding the safe yield for the basin?

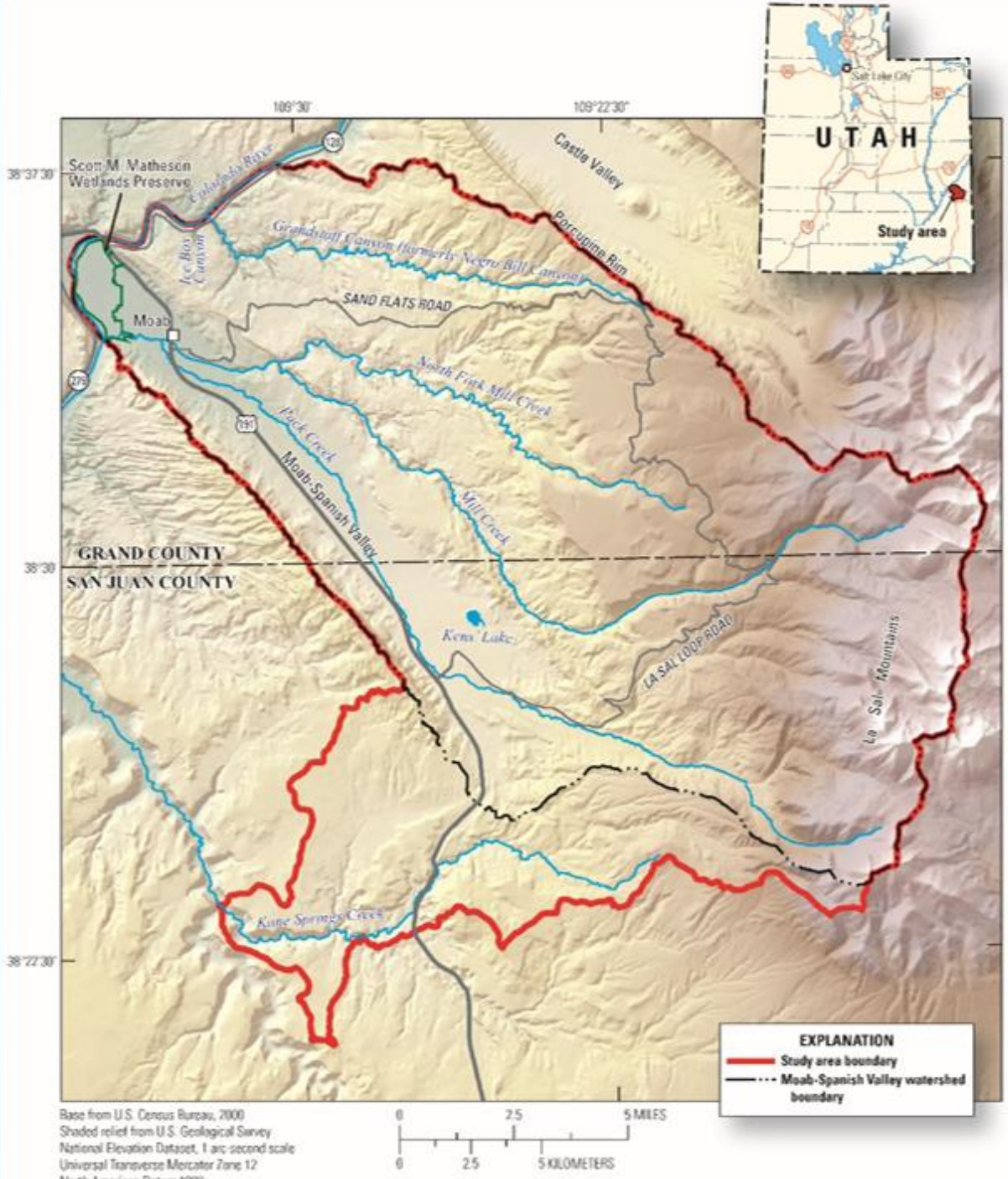
2. **What is the Demand?**

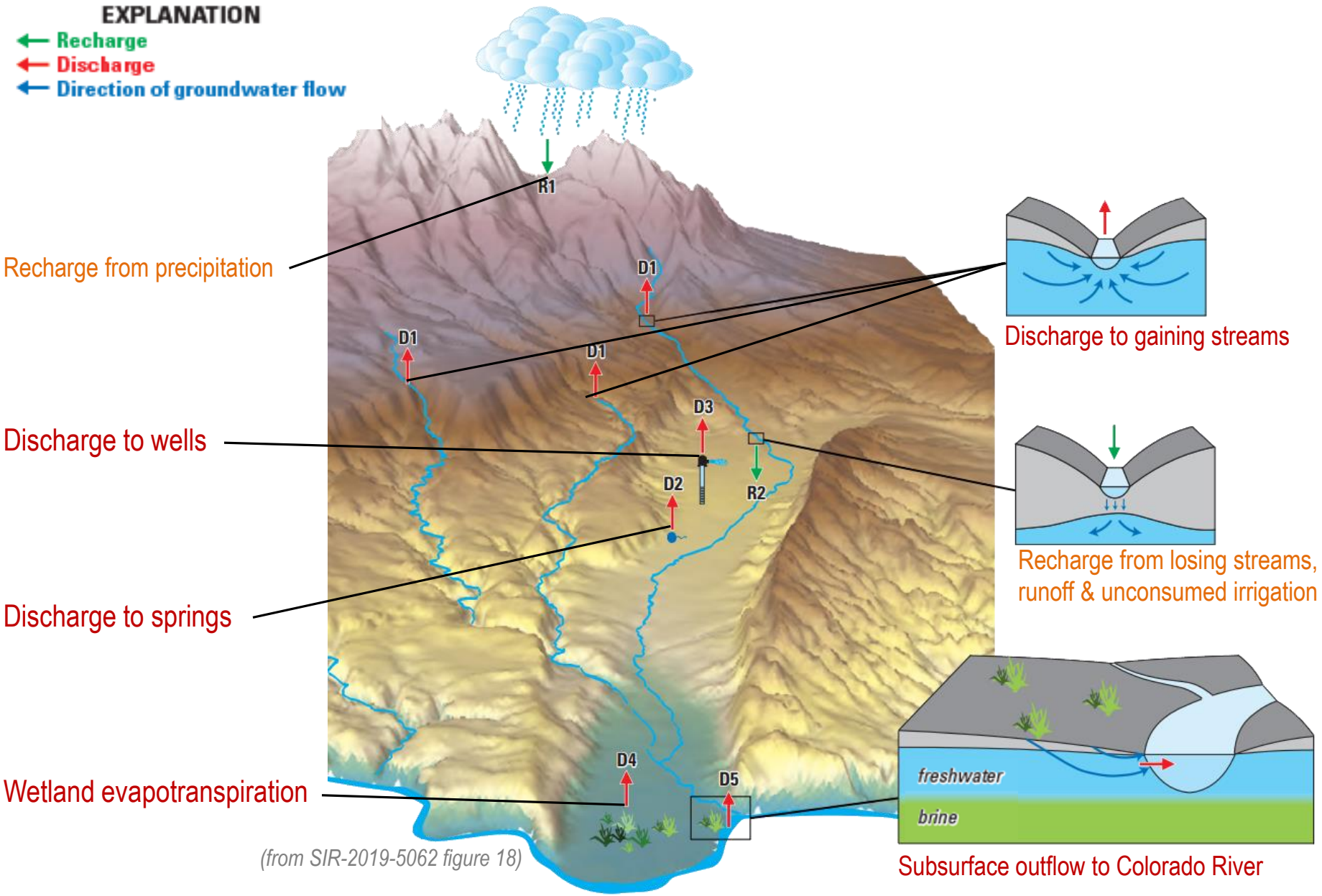
   How much water has been appropriated for use and how much water is currently in use?


Watershed - Geology

Moab / Spanish Valley Watershed



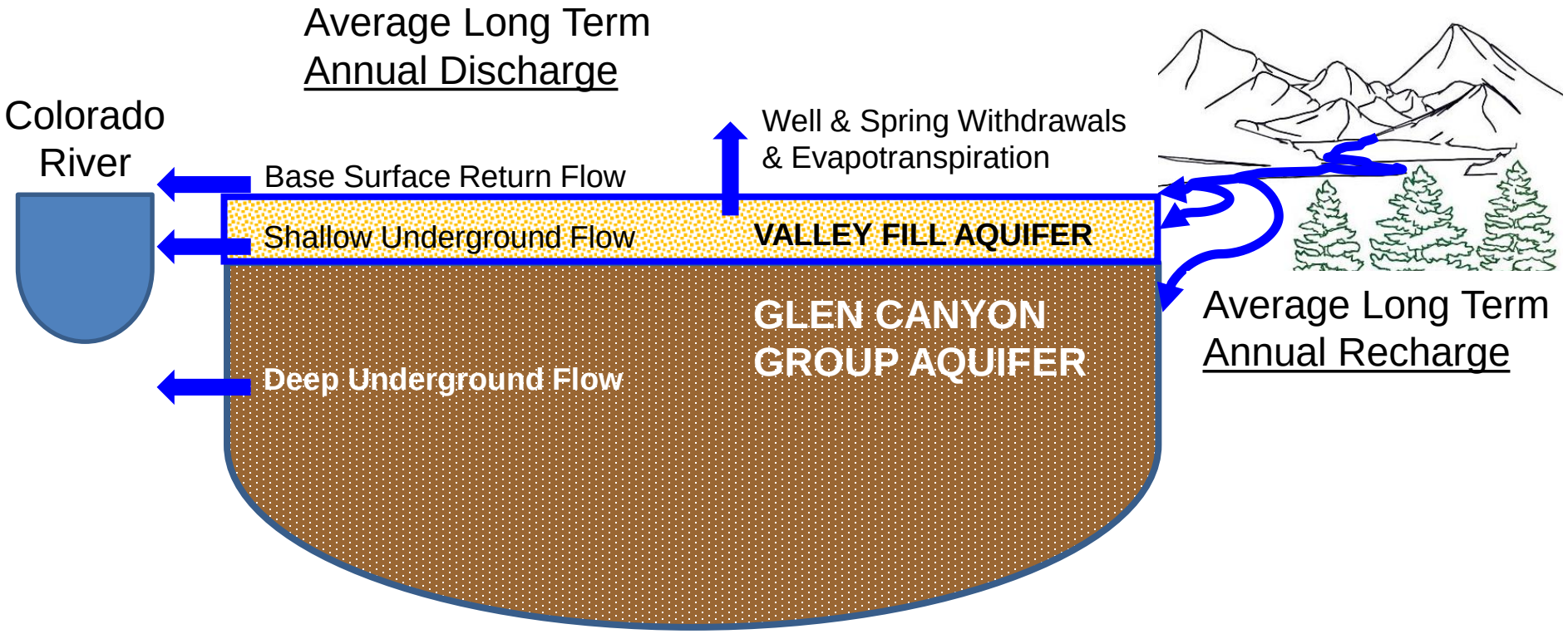

109°30'
109°22'30"
38°37'30"
38°30'
38°22'30"
Scott M. Matheson Wetlands Preserve
Colorado River
Ice Box Canyon
Grandstaff Canyon (formerly Negro Bill Canyon)
Castle Valley
Porcupine Rim
SAND FLATS ROAD
Moab
North Fork Mill Creek
Pack Creek
Moab-Spanish Valley
Mill Creek
GRAND COUNTY
SAN JUAN COUNTY
Kens Lake
LA SAL LOOP ROAD
La Sal Mountains
Kane Springs Creek
UTAH
Salt Lake City
Study area
EXPLANATION
Study area boundary
Moab-Spanish Valley watershed boundary
Base from U.S. Census Bureau, 2000
Shaded relief from U.S. Geological Survey National Elevation Dataset, 1 arc-second scale
Universal Transverse Mercator Zone 12
North American Datum 1983
0 2.5 5 MILES
0 2.5 5 KILOMETERS

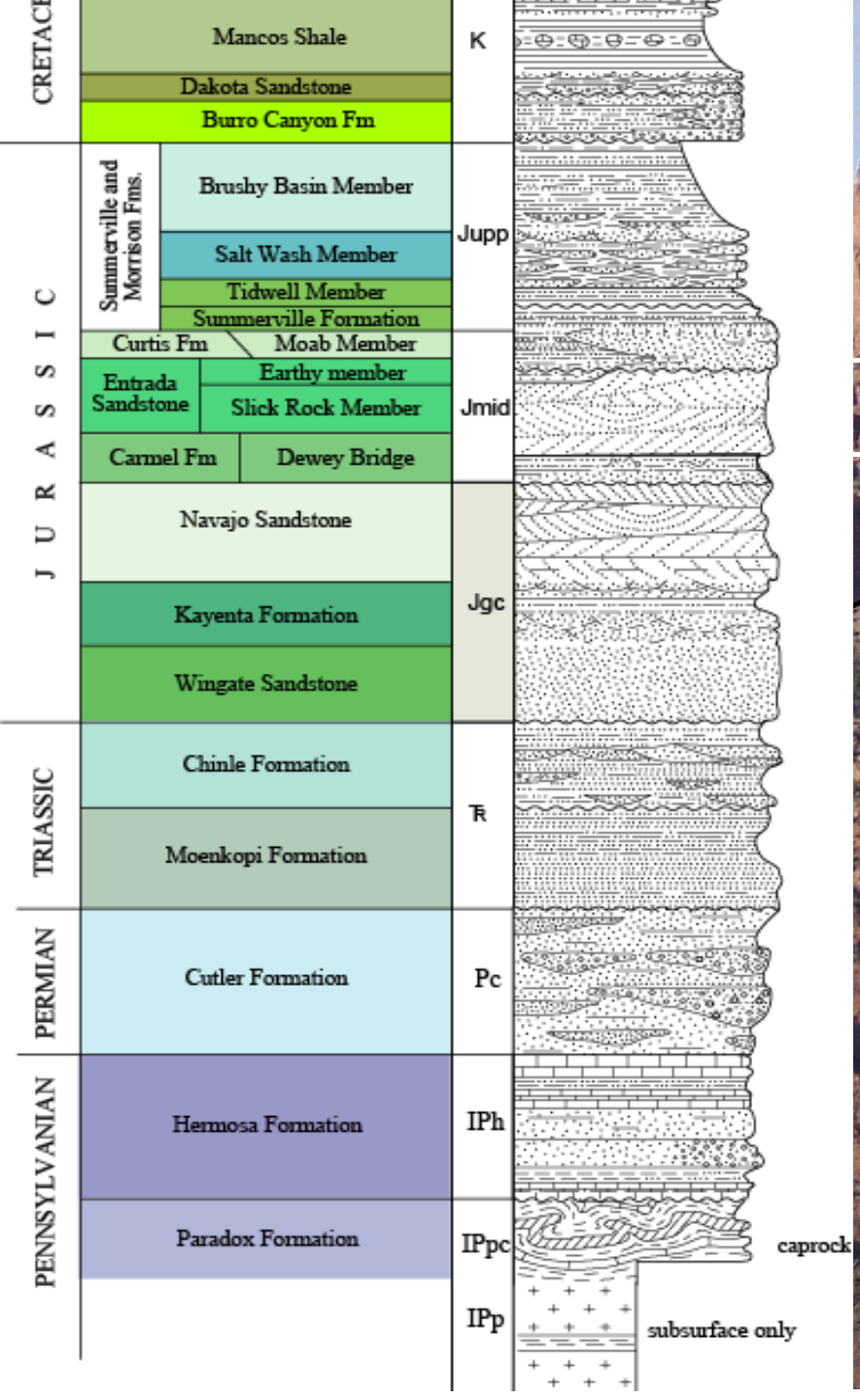


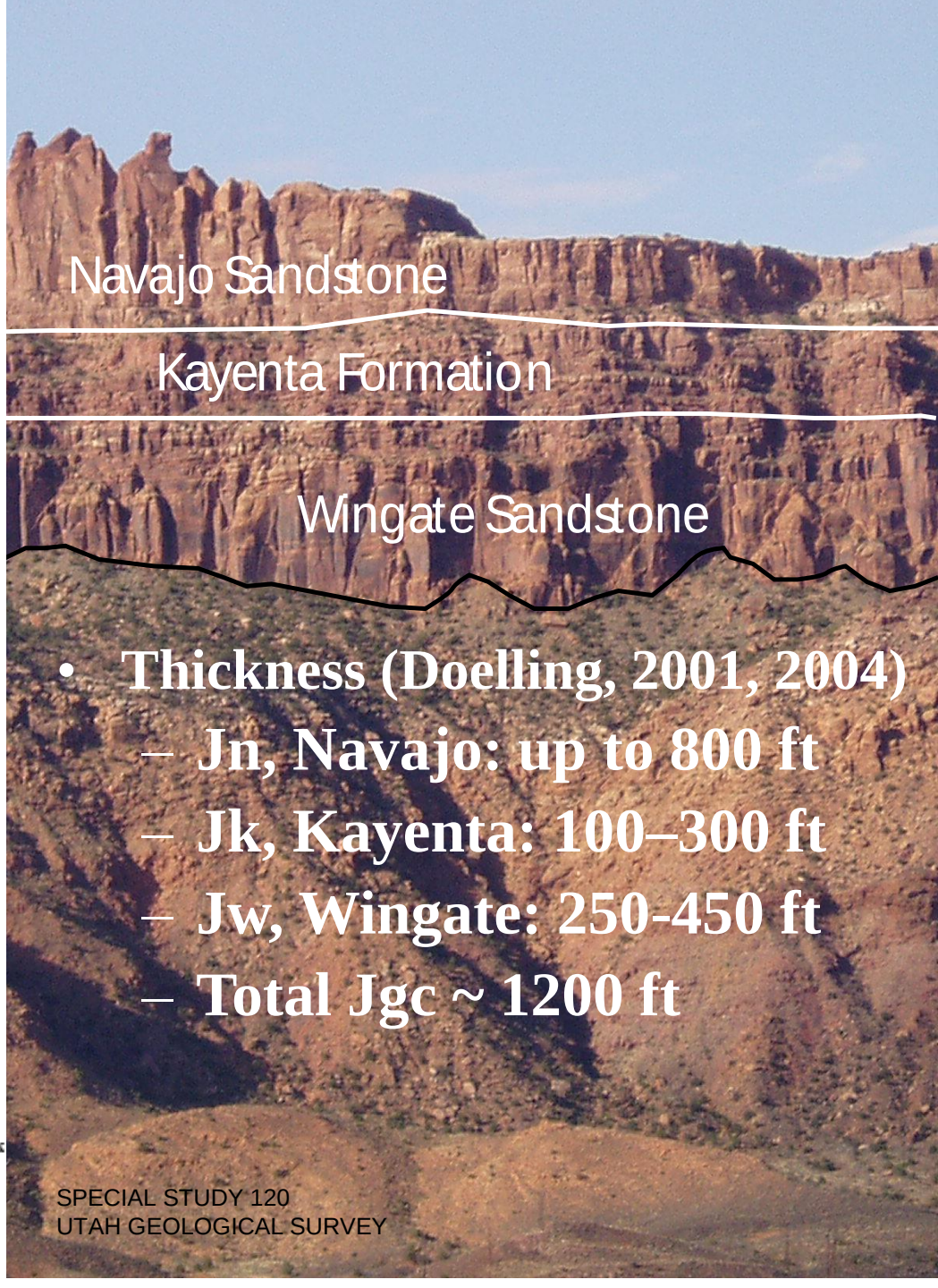
(from SIR-2019-5062 figure 18)

Two Aquifer Systems:

- Valley Fill Aquifer (primarily sand & gravel)
- Glen Canyon Group Aquifer (sandstone bedrock; Navajo, Kayenta, Wingate)



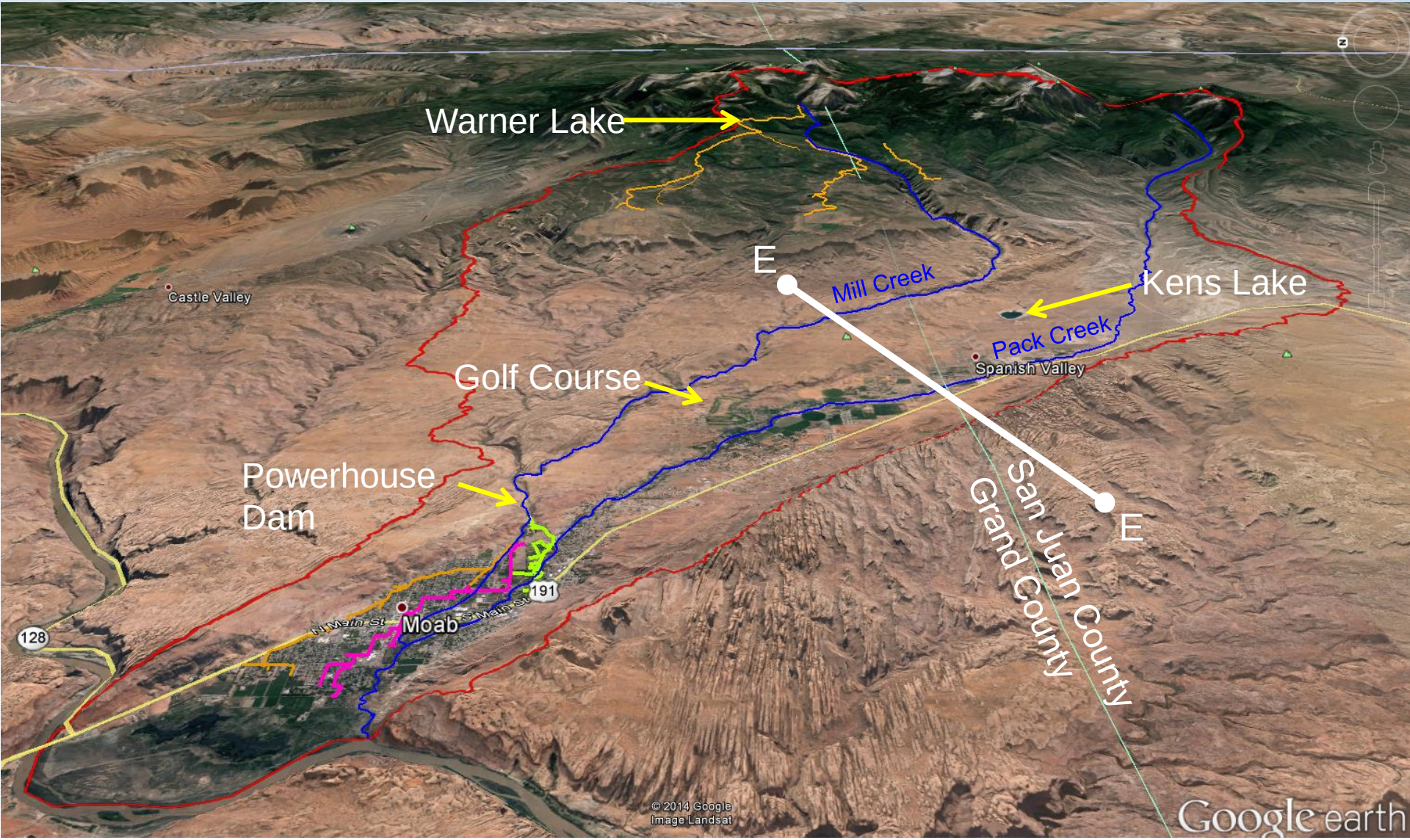


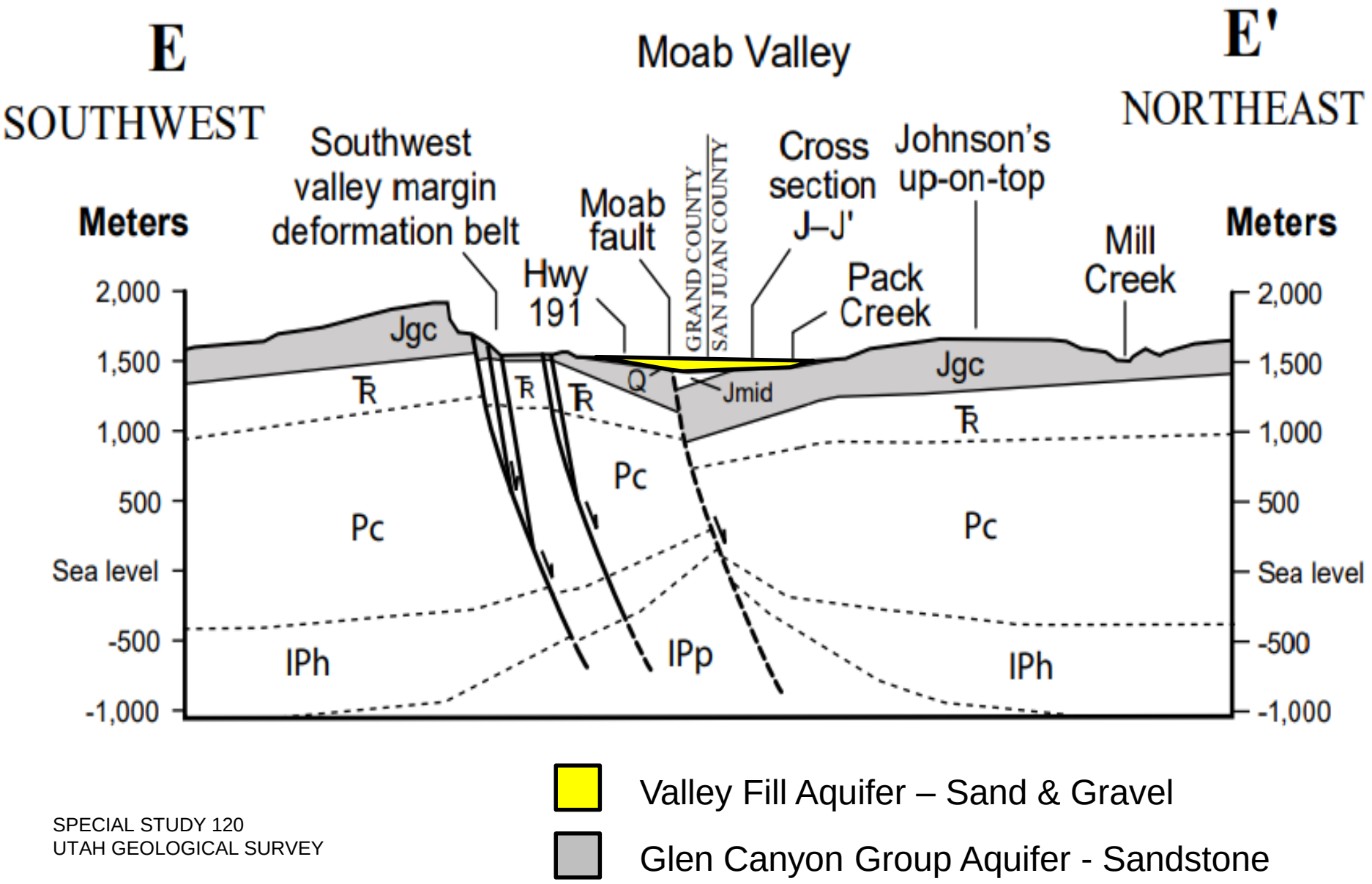


- **Thickness (Doelling, 2001, 2004)**
  - **Jn, Navajo: up to 800 ft**
  - **Jk, Kayenta: 100–300 ft**
  - **Jw, Wingate: 250-450 ft**
  - **Total Jgc ~ 1200 ft**

SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

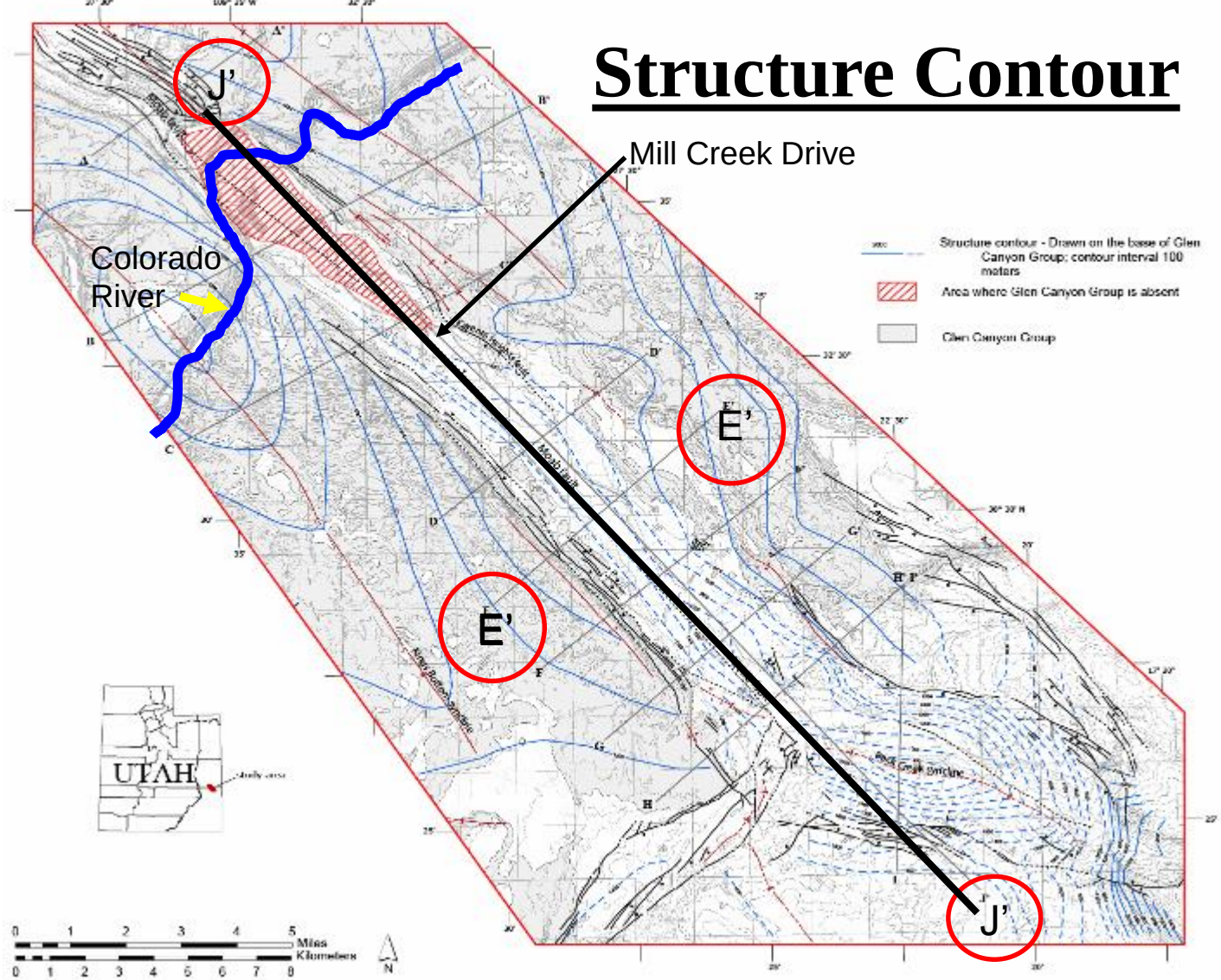
Moab / Spanish Valley Watershed





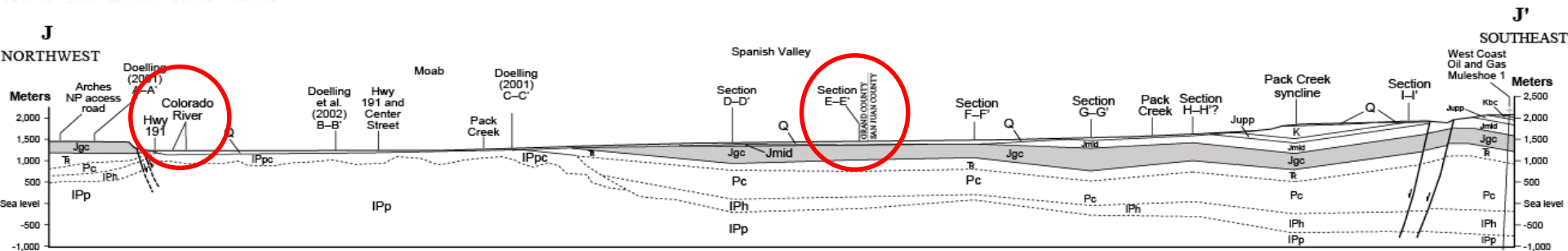
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

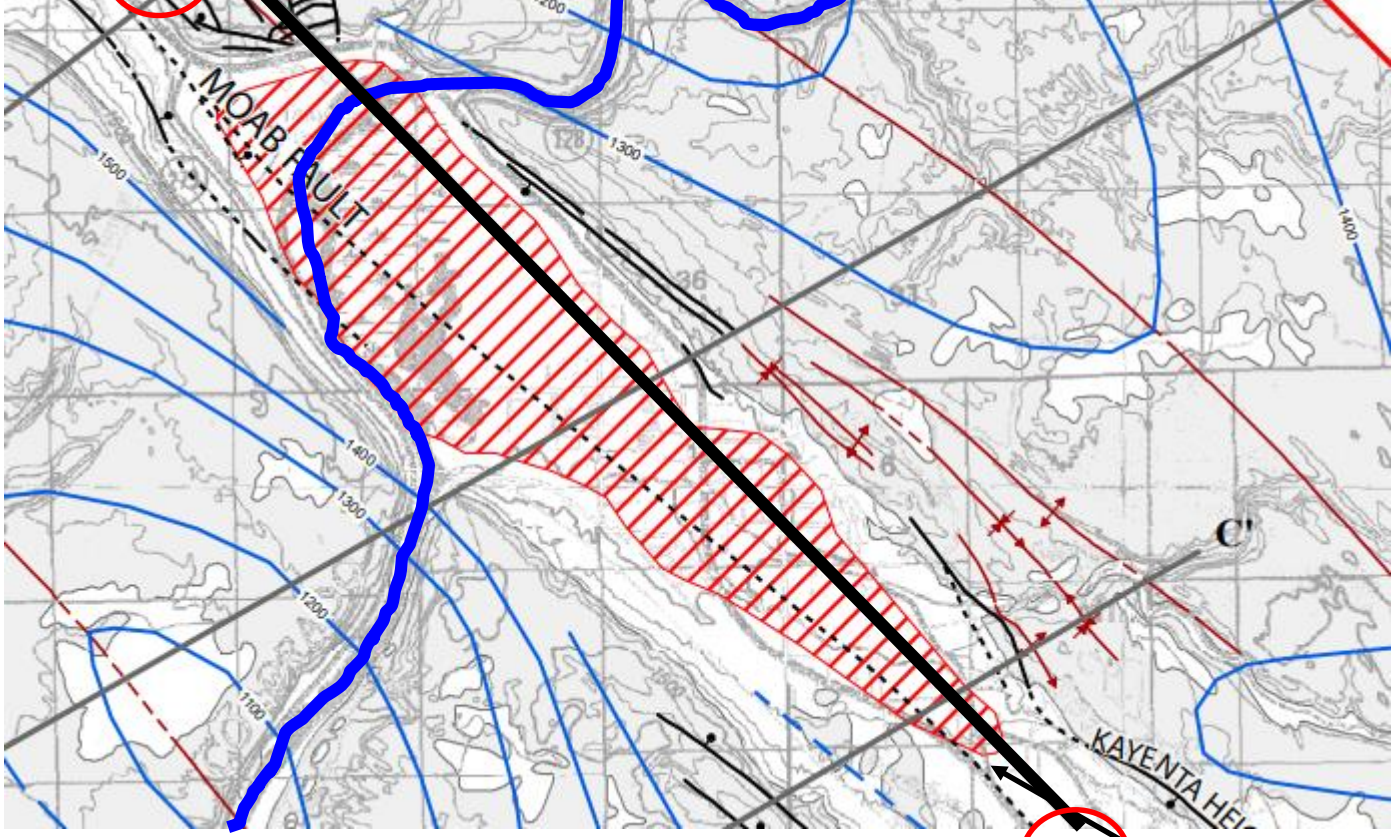
Structure Contour



- **The Glen Canyon Group ranges in thickness from about 330 feet south and southeast of Moab to about 1300 feet beneath southeastern Moab-Spanish Valley**
- **Glen Canyon Group is absent in the subsurface near Moab**

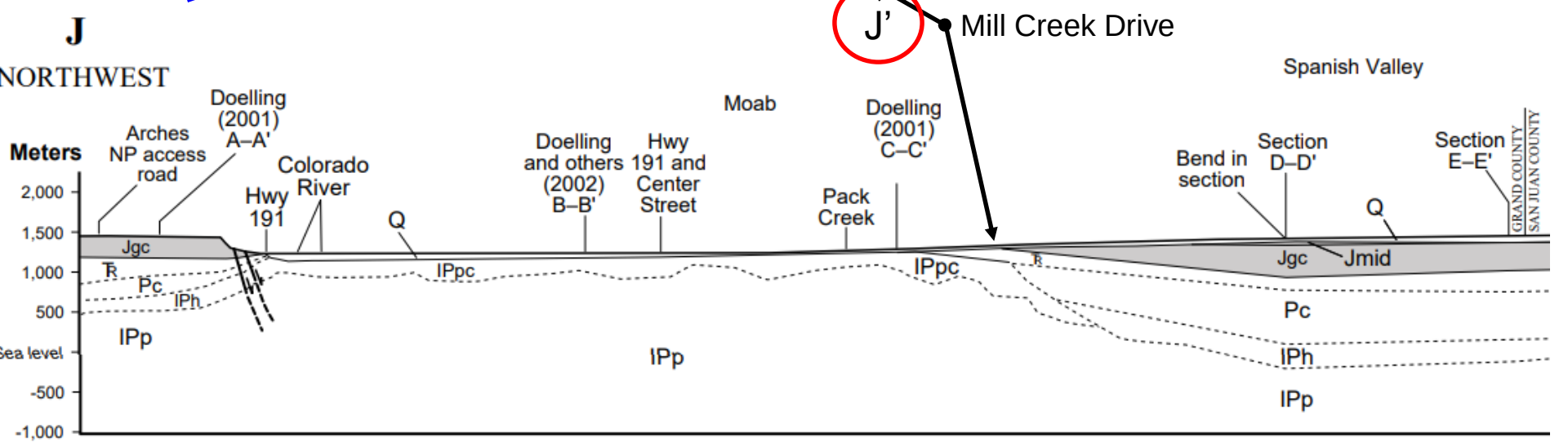
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY





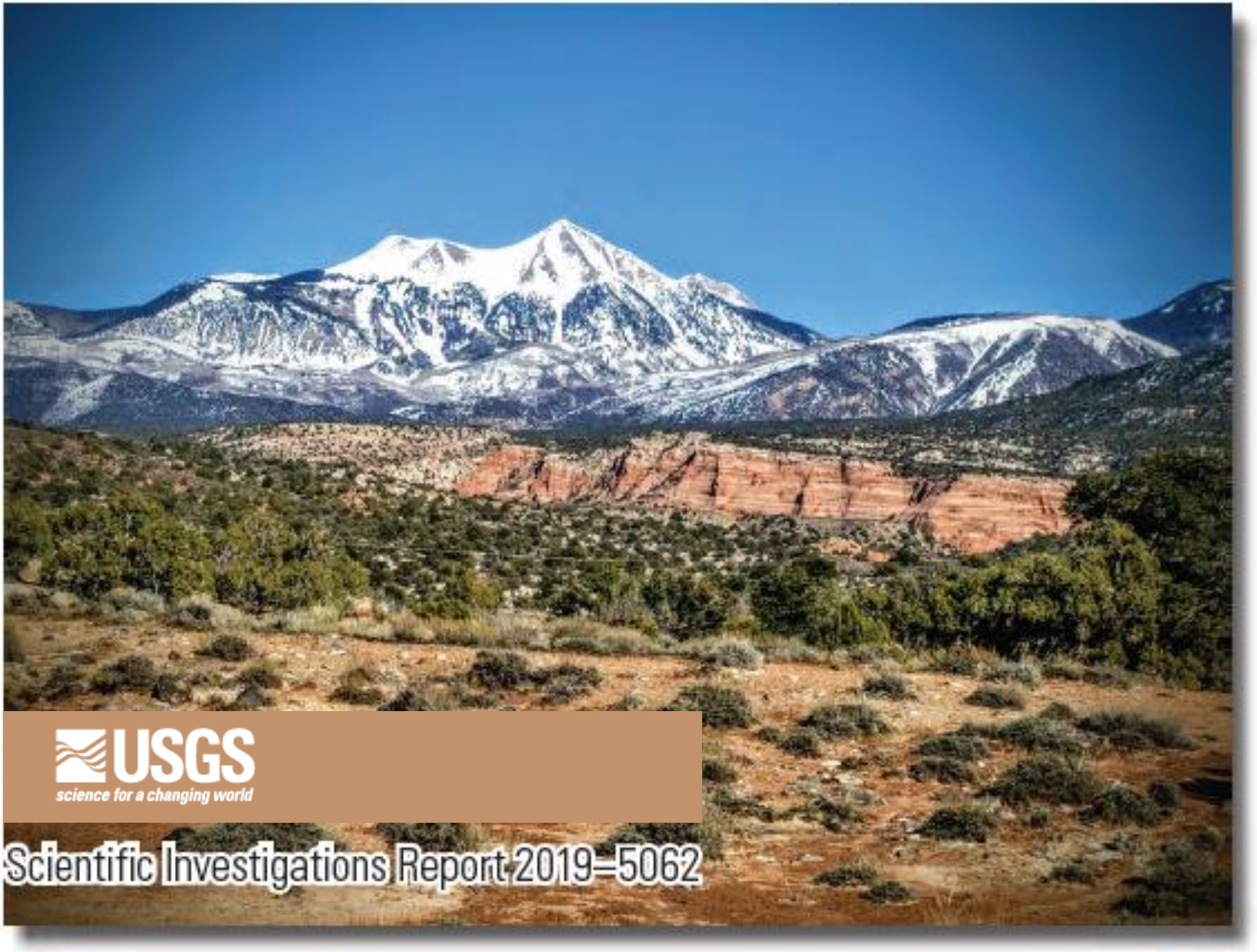
Glen Canyon Group is absent in the subsurface below Moab

Paradox Formation



SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

Evaluation of Groundwater Resources in the Spanish Valley Watershed, Grand and San Juan Counties, Utah



USGS
science for a changing world

Scientific Investigations Report 2019–5062

STUDY OBJECTIVES (pg 1)

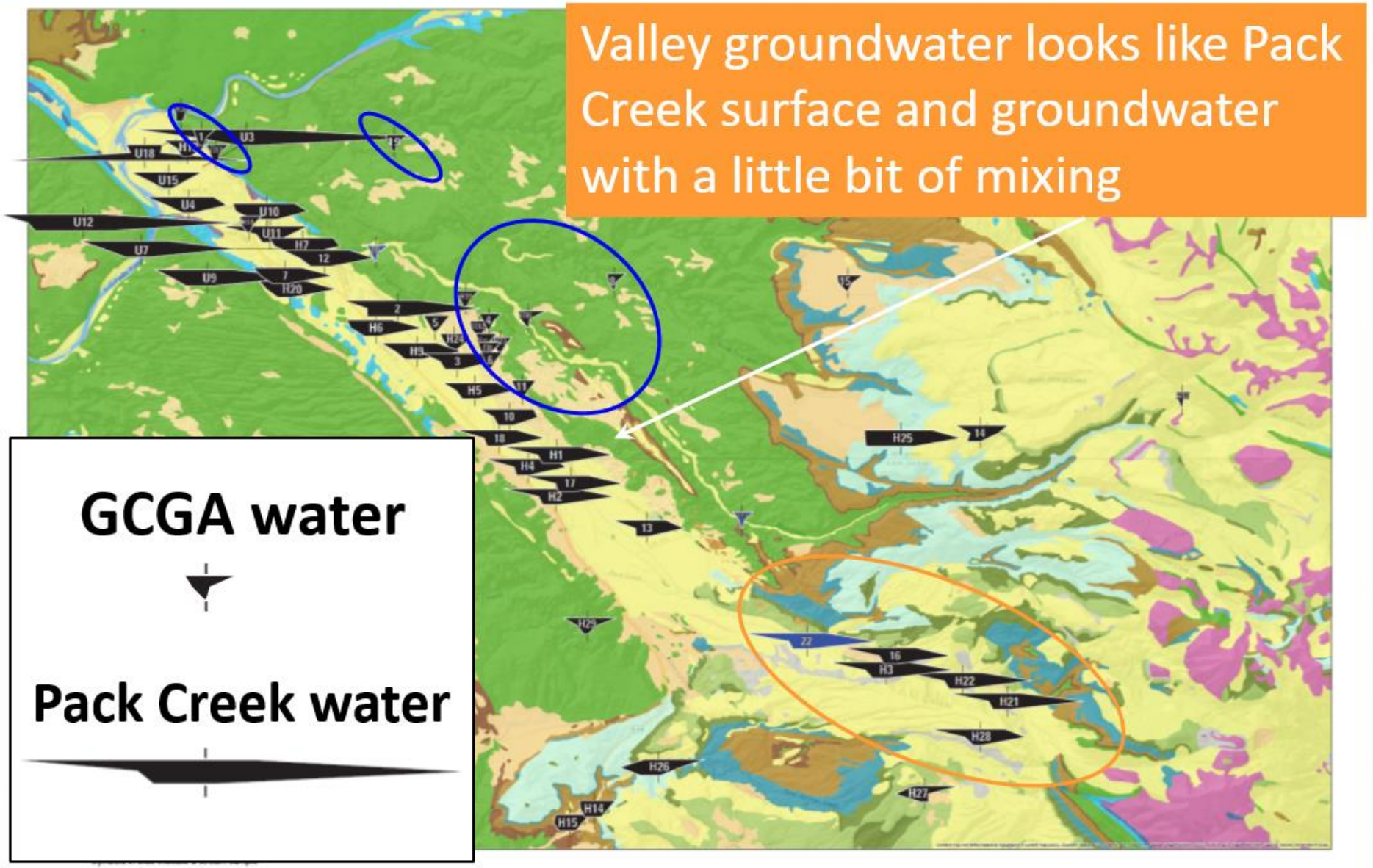
- Better understand sources of recharge to, groundwater flow directions within, and discharge points for both the Valley Fill (VFA) and Glen Canyon Group (GCGA) aquifers

- Quantify groundwater budget components of the combined VFA & GCGA, including both recharge and discharge

KEY FINDINGS (pg 49-51)

- GCGA & VFA have distinct geochemical characteristics
- Limited connectivity between GCGA & VFA
- Recharge to GCGA occurs at high altitudes
- Recharge to VFA occurs from losing reaches of Pack Creek

GENERAL CHEMISTRY

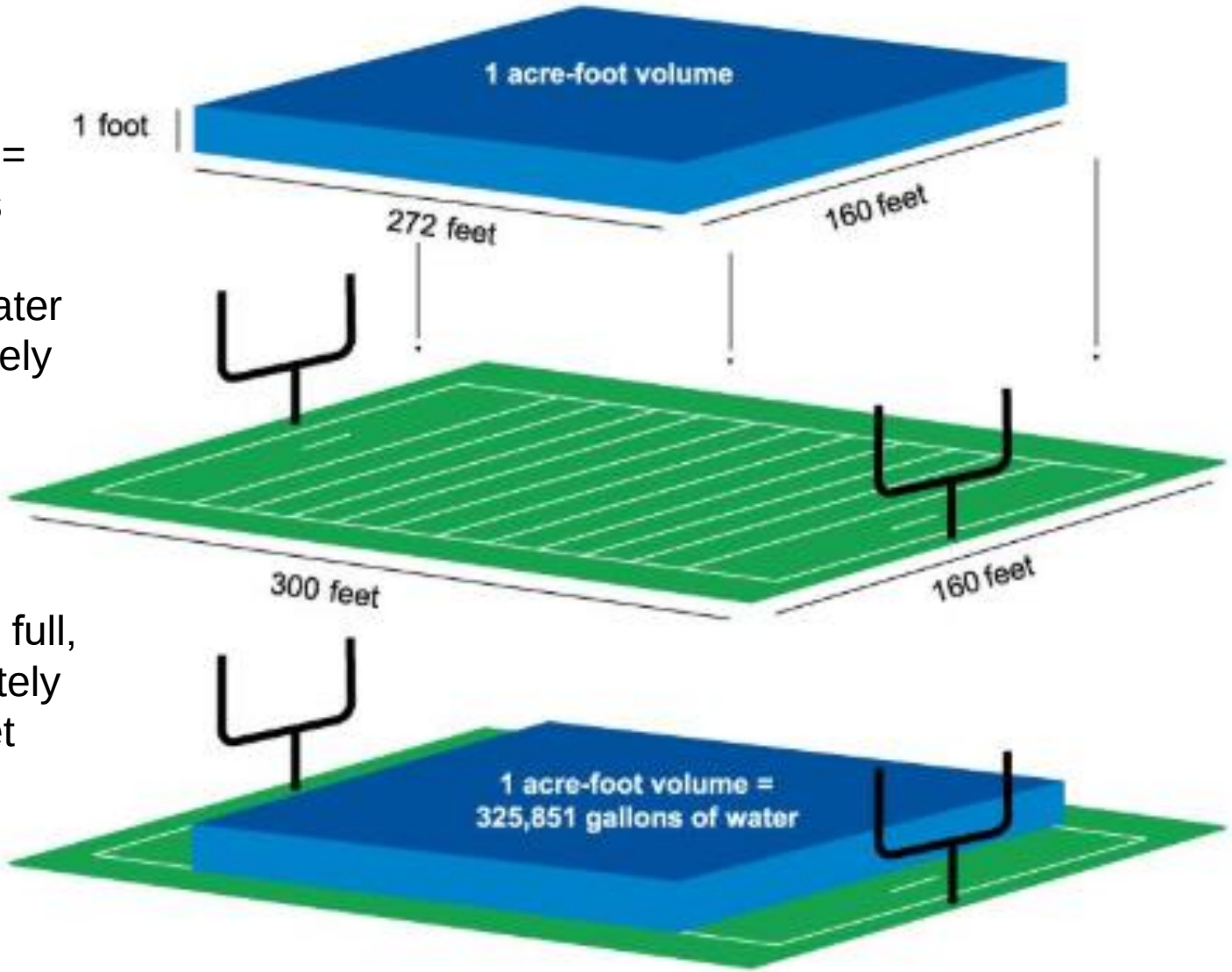


WHAT IS AN ACRE-FOOT?

1 Acre-foot (AF) = 325,851 gallons

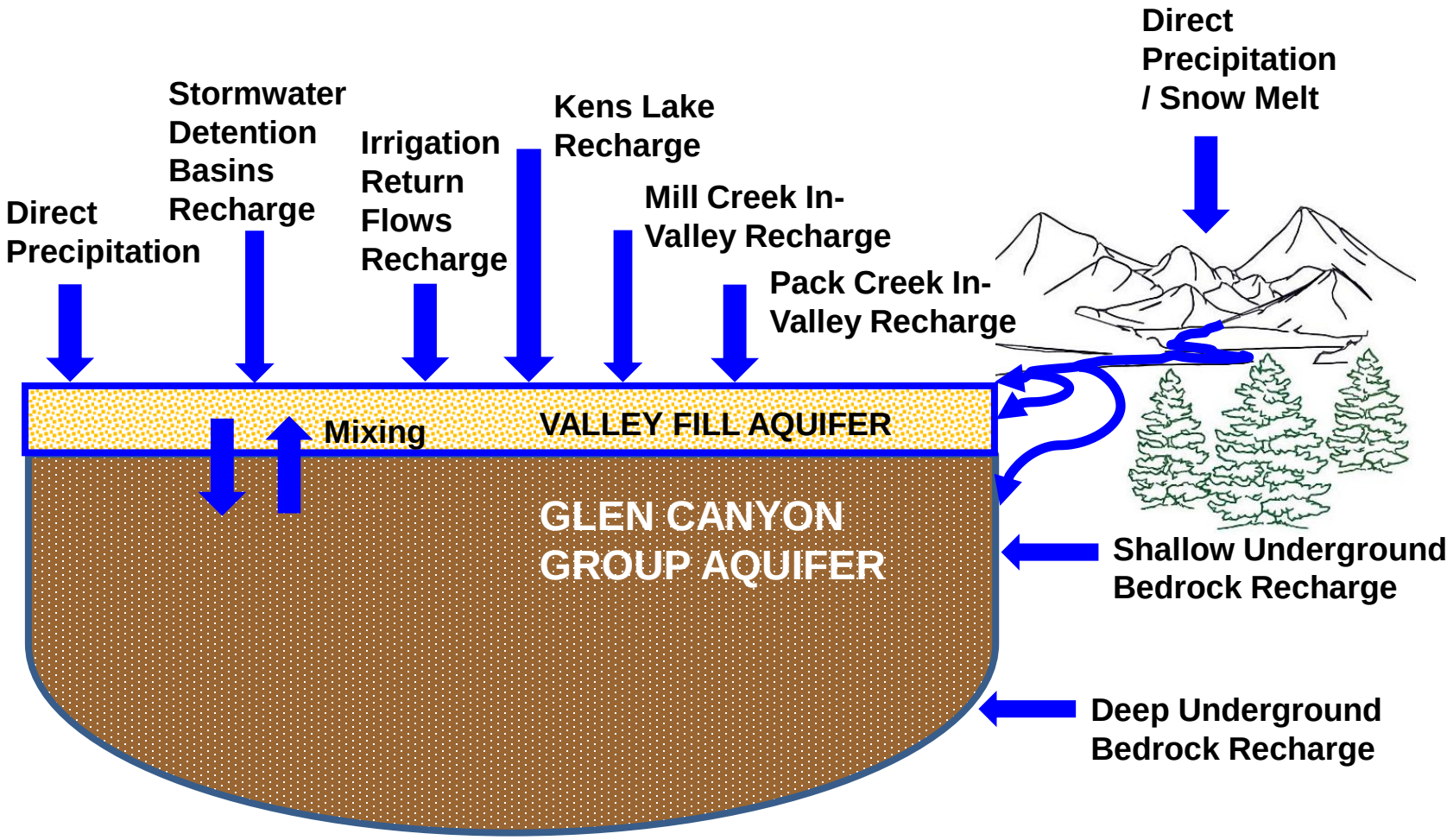
One acre-foot of water covers approximately 1 acre of land 1 foot deep

Ken's Lake, when full, holds approximately 3,000 acre-feet



http://www.twdb.texas.gov/kids

Recharge


Direct Precipitation / Snow Melt
Stormwater Detention Basins Recharge
Irrigation Return Flows Recharge
Kens Lake Recharge
Mill Creek In-Valley Recharge
Pack Creek In-Valley Recharge
Direct Precipitation
Mixing
VALLEY FILL AQUIFER
GLEN CANYON GROUP AQUIFER
Shallow Underground Bedrock Recharge
Deep Underground Bedrock Recharge

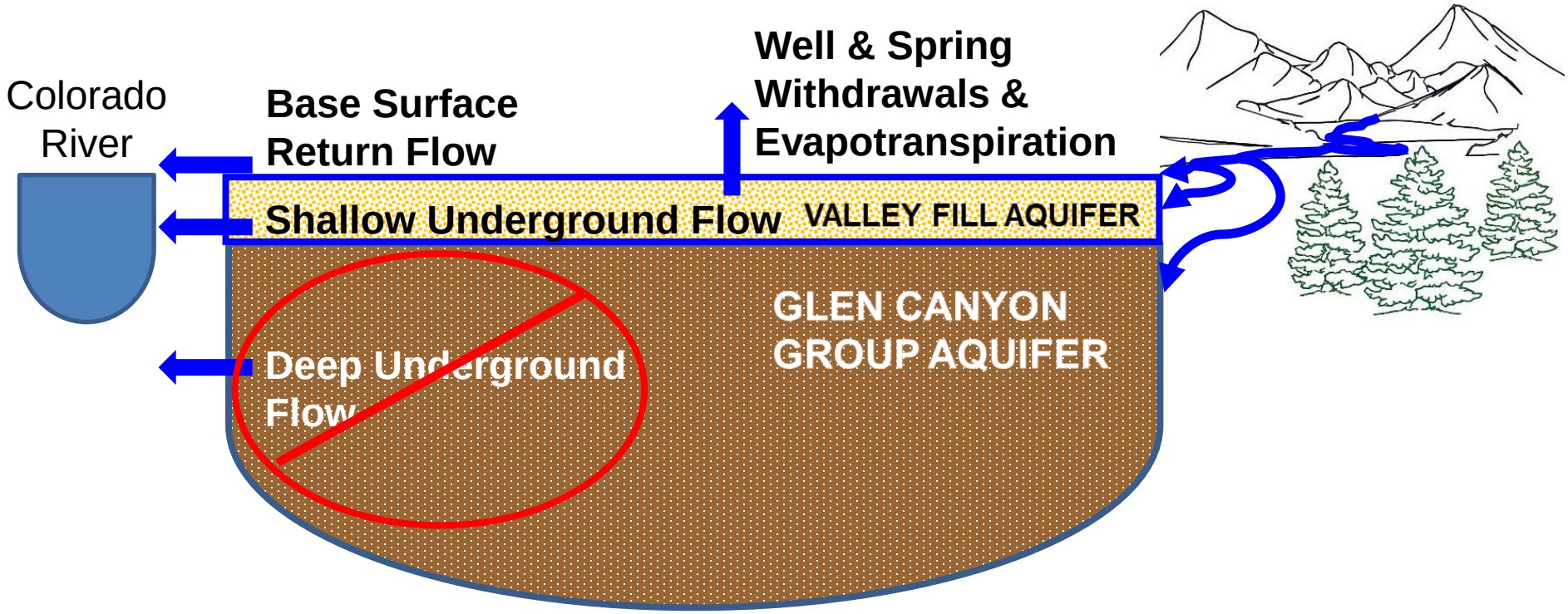
RECHARGE (pg 55-56)

- **BASIN CHARACTERIZATION MODEL (BCM)**
  - Regional-Scale Water-Balance Methodology
  - Developed for Colorado River Basin
  - Estimates Direct Infiltration of Precipitation & Runoff

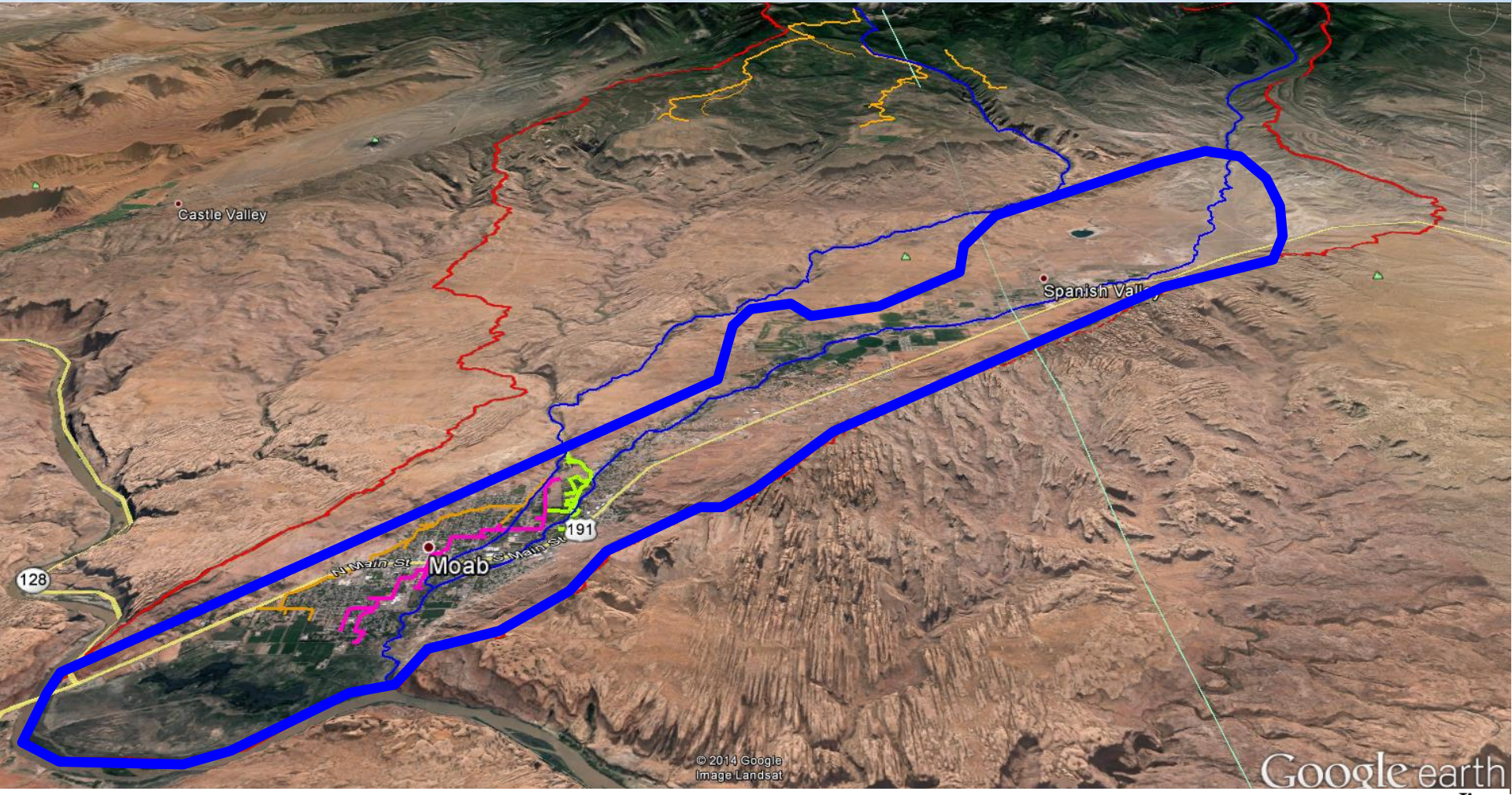
DIRECT INFILTRATION OF PRECIPITATION:	9,000 TO 27,000 acre-feet
INFILTRATION OF RUNOFF:	510 TO 2,550 acre-feet
Total:	9,550 – 30,000 acre-feet*

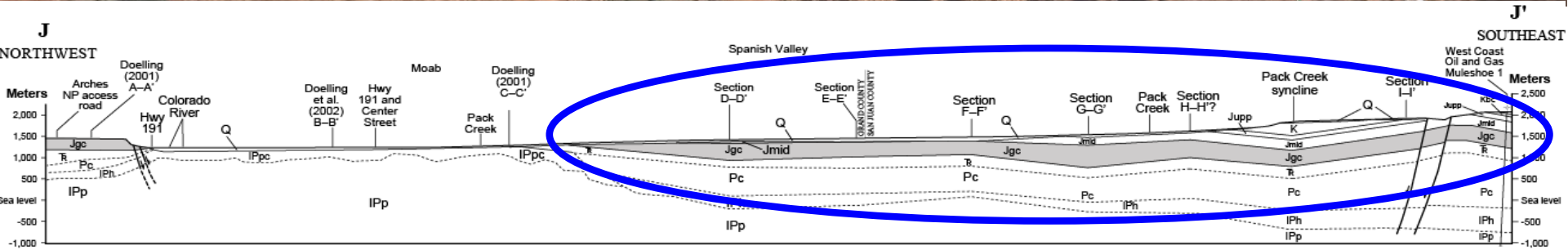
*Uncertainty (%): 50

Discharge


Colorado River
Base Surface Return Flow
Well & Spring Withdrawals & Evapotranspiration
Shallow Underground Flow
VALLEY FILL AQUIFER
Deep Underground Flow
GLEN CANYON GROUP AQUIFER

Valley Aquifers – GCGA / VFA





DISCHARGE (pg 55)

- Measured Discharge to Streams
- Measured Discharge to Springs
- Reported & Estimated Well & Spring Withdrawals
- Discharge as Subsurface Outflow to Colorado River

Total Study Area: 14,000 – 16,000 acre-feet

IMPORTANT CAVEATS

- **Measurements made in the Fall & represent a minimum estimate of groundwater discharge to streams and lower valley springs.** (pg. 56)

- **The Colorado River is the terminal groundwater discharge point, however, it is difficult to quantify the amount of groundwater discharging to the river.** (pg 64)

- **Not all water has been accounted for: Withdrawals from private wells for irrigation & domestic use are currently unmetered thus not accounted for in this study.** (pg. 64)

STREAMS (pg 59-64)

- **Measured Groundwater Discharge to Streams**
  - **Upper Watershed: 6,300 to 8,800 acre-feet**

  Moab / Spanish Valley Aquifers

  - **Lower Pack Creek / Mill Creek 1,000 to 2,500 acre-feet**

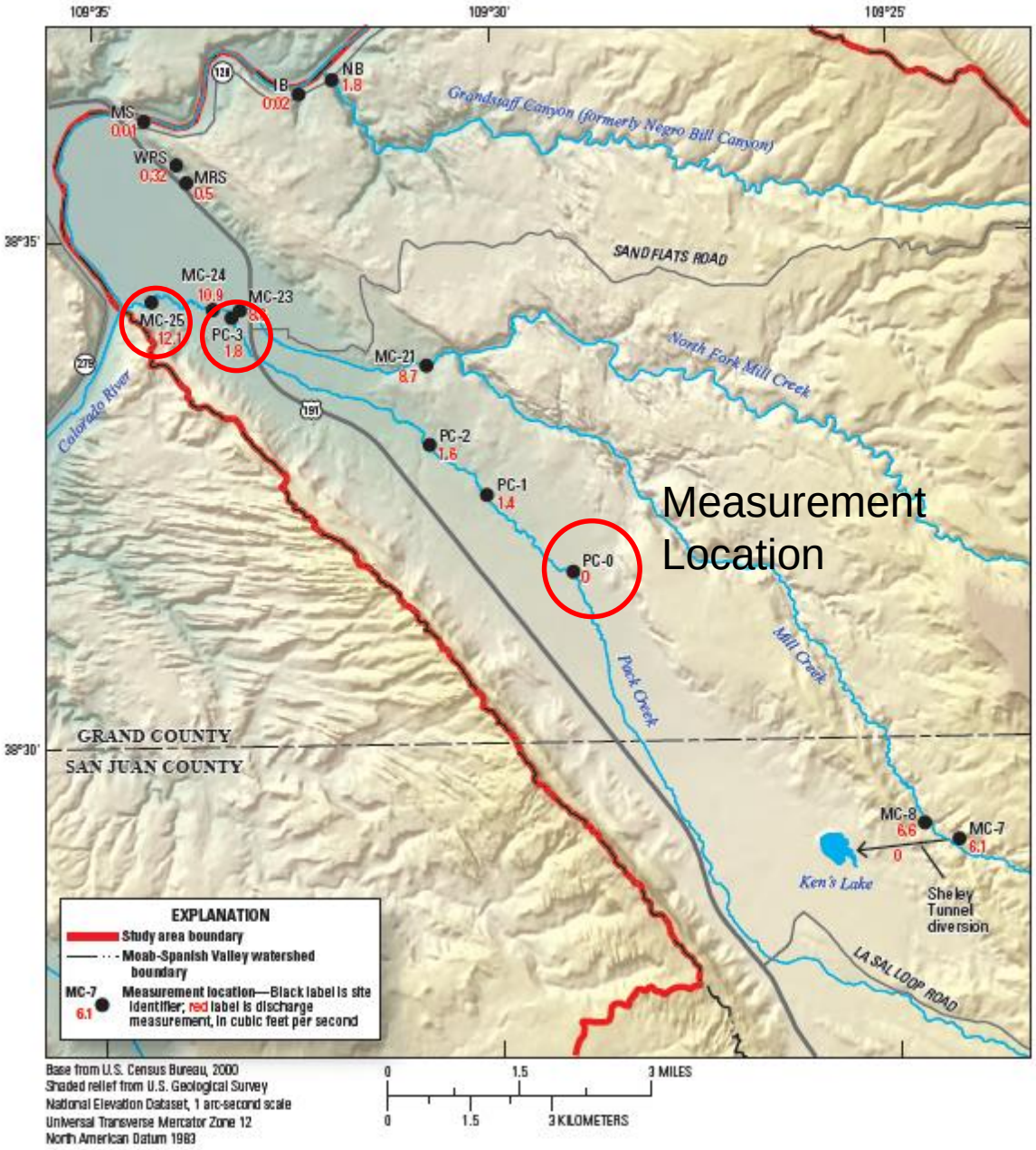
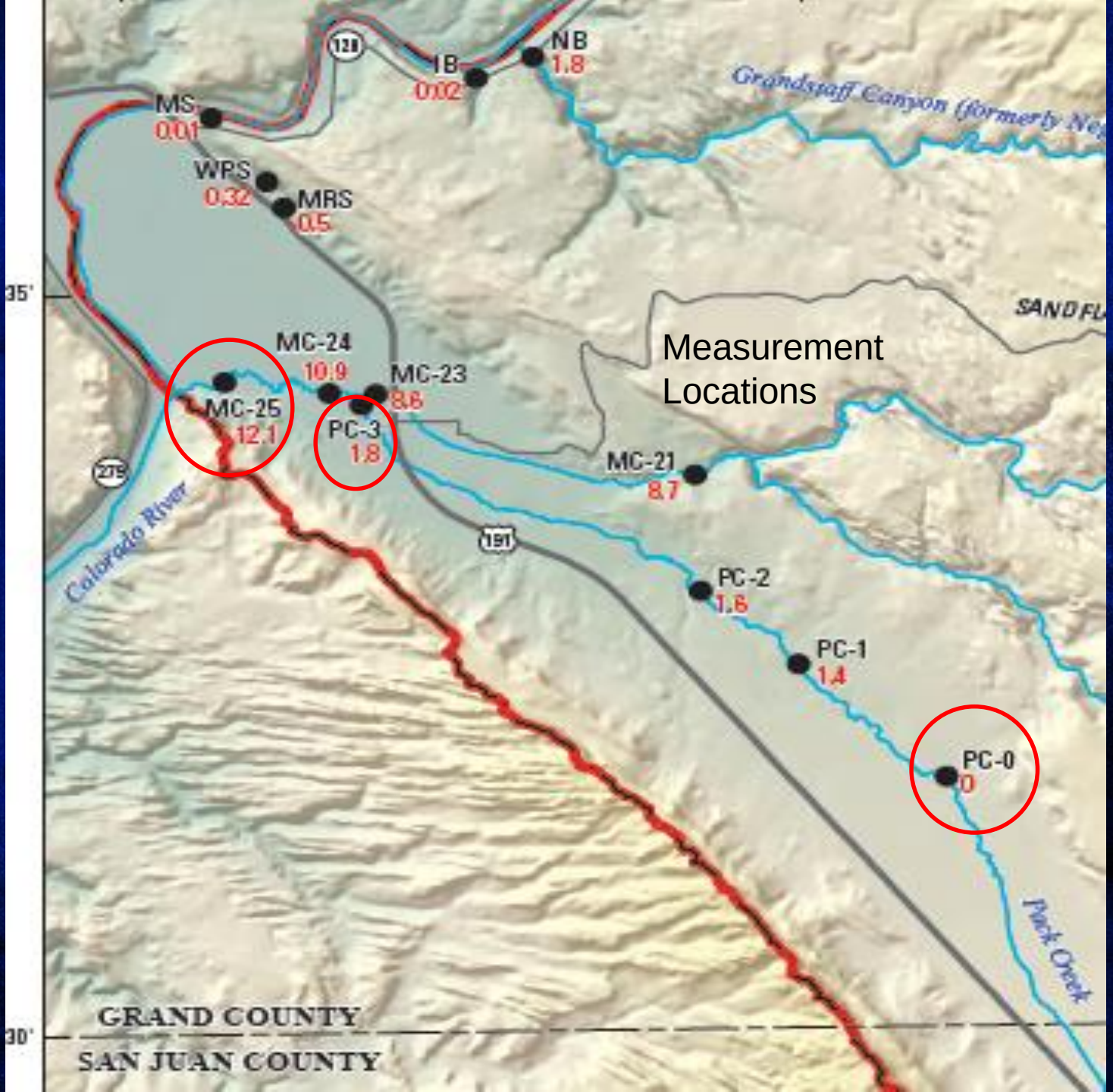


Figure 23. Location of groundwater and stream discharge measurements made during fall 2014 in the Spanish Valley study area, Utah.


NB
1.8
IB
0.02
MS
0.01
WPS
0.32
MRS
0.5
MC-24
10.9
MC-23
8.6
MC-25
12.1
PC-3
1.8
MC-21
8.7
PC-2
1.6
PC-1
1.4
PC-0
0
Measurement Locations
Grandstaff Canyon (formerly
Colorado River
Pack Creek
GRAND COUNTY
SAN JUAN COUNTY
35'
30'
128
279
191

LOWER VALLEY SPRINGS (pg 60, 62, 63)

- Measured Groundwater Discharge

  - Matrimony
  - Old Waterpark Springs
  - Watercress Spring (Moab Springs Ranch)

  Range: 600 – 900 acre-feet

MUNICIPAL WELLS & SPRINGS (pg. 64)


Imagery

Underground Flow

Silver Holyoak Spring

McGinty/Jackson Springs

Hidden Valley Spring

SV Drive Springs

McConkie Spring

Wiz Spring

Old City Park Springs

Unnamed Spring

Sommerville Springs

GS6

Golf Course Springs

GCMW

GW5

GW4

GS9

GS5

Andrea

White Horse

Chapman

Whitney

Corbin

E

E

Grand

San Juan

MUNICIPAL WELLS & SPRINGS (pg. 64)

- Reported Withdrawals (culinary & irrigation)
  - Moab City
    - Low: 1,600 acre-feet
    - High: 2,300 acre-feet
  - Grand Water & Sewer Service Agency
    - Low: 1,000 acre-feet
    - High: 1,100 acre-feet

Total Range: 2,600 to 3,400 acre-feet

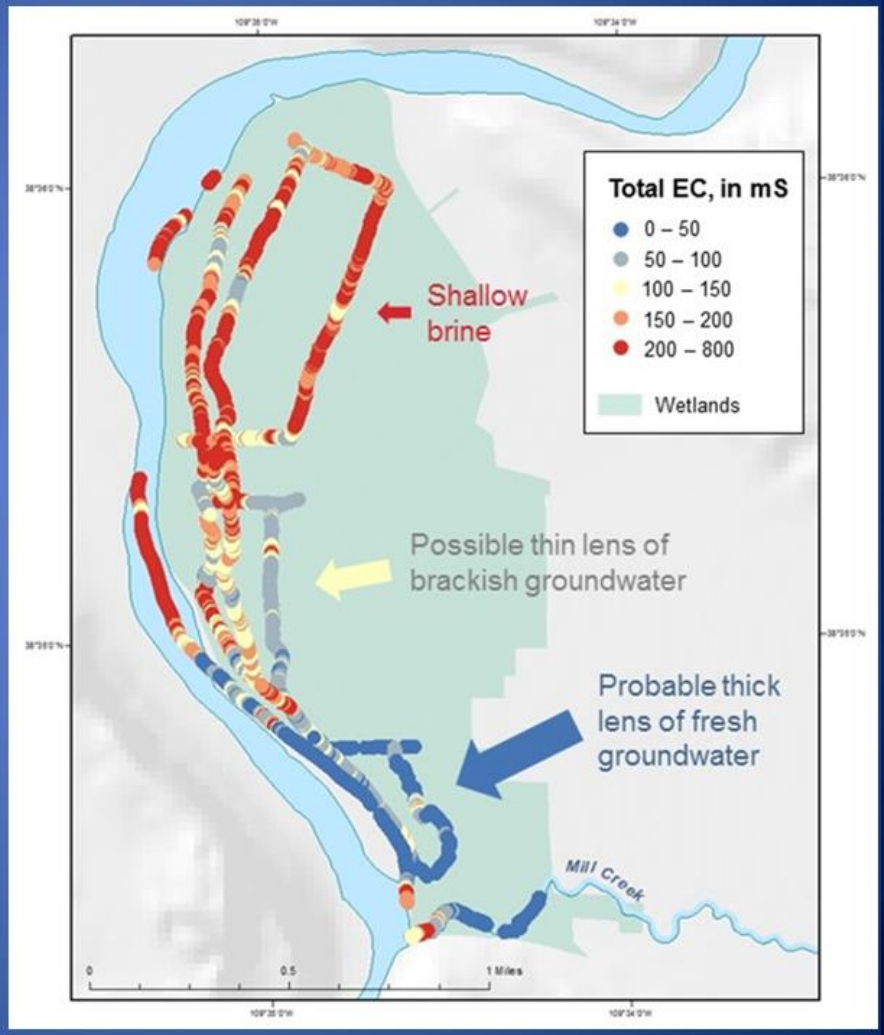
SUBSURFACE OUTFLOW (pg 66-76)

- **Discharge as Subsurface Outflow to Colorado River**

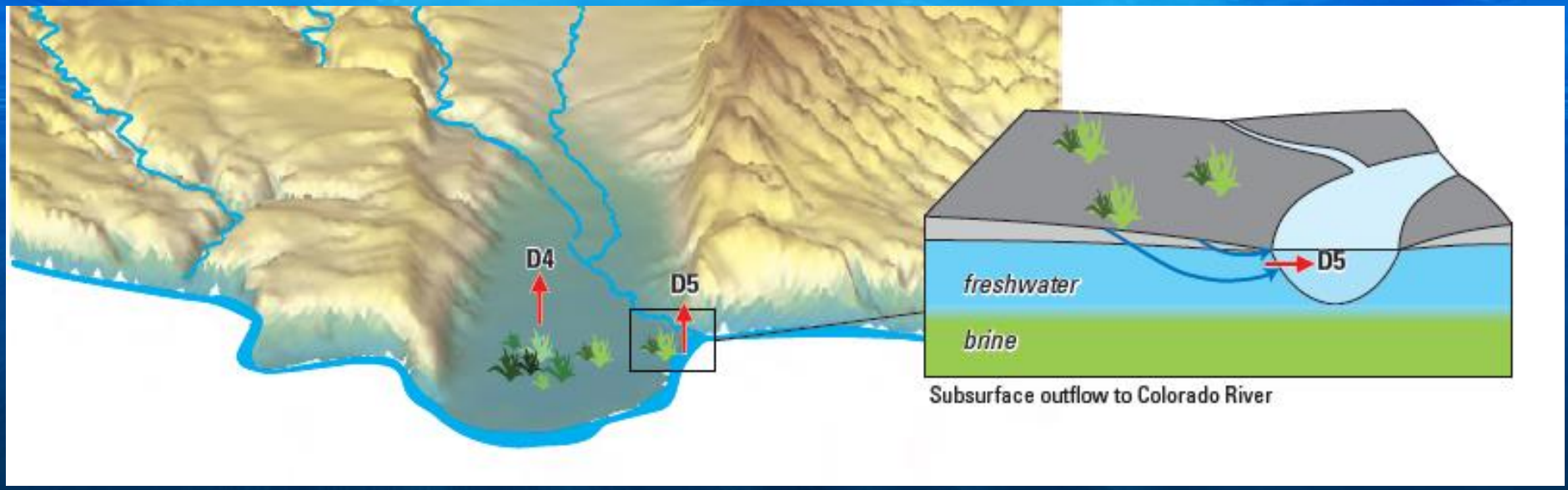
Geophysical Survey – Electrical Conductivity

Designed to:

- Delineate brine-freshwater interface near the river
- Help site locations for new observation wells



USGS



Sumsion (1971): **8,000 acre-feet**

USGS (2019): **300 – 1,000 acre-feet**

Average Annual Discharge (pg 55)

Full Study Area
(2014–2016): ~ 14,000 – 16,000 acre-ft/year

Discharge				
Streams and springs (base flow)	10,600	11,700	10,200	N/A
Springs and well withdrawals for culinary use	2,400	3,000	3,300	N/A
Well withdrawals for irrigation (net depletion)	250	80	89	N/A
Subsurface outflow	N/A	N/A	N/A	300 to 1,000
Total:				**14,000 to 16,000**

Average Annual Discharge (MIN)

COMPONENT	Total Watershed Drainage Area (acre-ft/yr)	Excluding Upper Watershed (acre-ft/yr)
Upper Watershed	6,300	(excluded – used by senior surface rights)
Lower Pack Creek / Mill Creek Gains	1,000	**1,000**
Lower Valley Springs	600	600
Subsurface outflow to Colorado River	300	**300**
Municipal Well & Spring Withdrawals	2,600	2,600
Private Well & Spring Withdrawals	unknown	unknown
TOTAL	**10,800+**	**4,500+**

Average Annual Discharge (MAX)

COMPONENT	Total Watershed Drainage Area (acre-ft/yr)	Excluding Upper Watershed (acre-ft/yr)
Upper Watershed	8,800	(excluded – used by senior surface rights)
Lower Pack Creek / Mill Creek Gains	2,500	**2,500**
Lower Valley Springs	900	900
Subsurface outflow to Colorado River	1,000	**1,000**
Municipal Well & Spring Withdrawals	3,400	3,400
Private Well & Spring Withdrawals	unknown	unknown
TOTAL	**16,600+**	**7,800+**

SUMMARY OF FINDINGS

USGS SIR 2019-5062

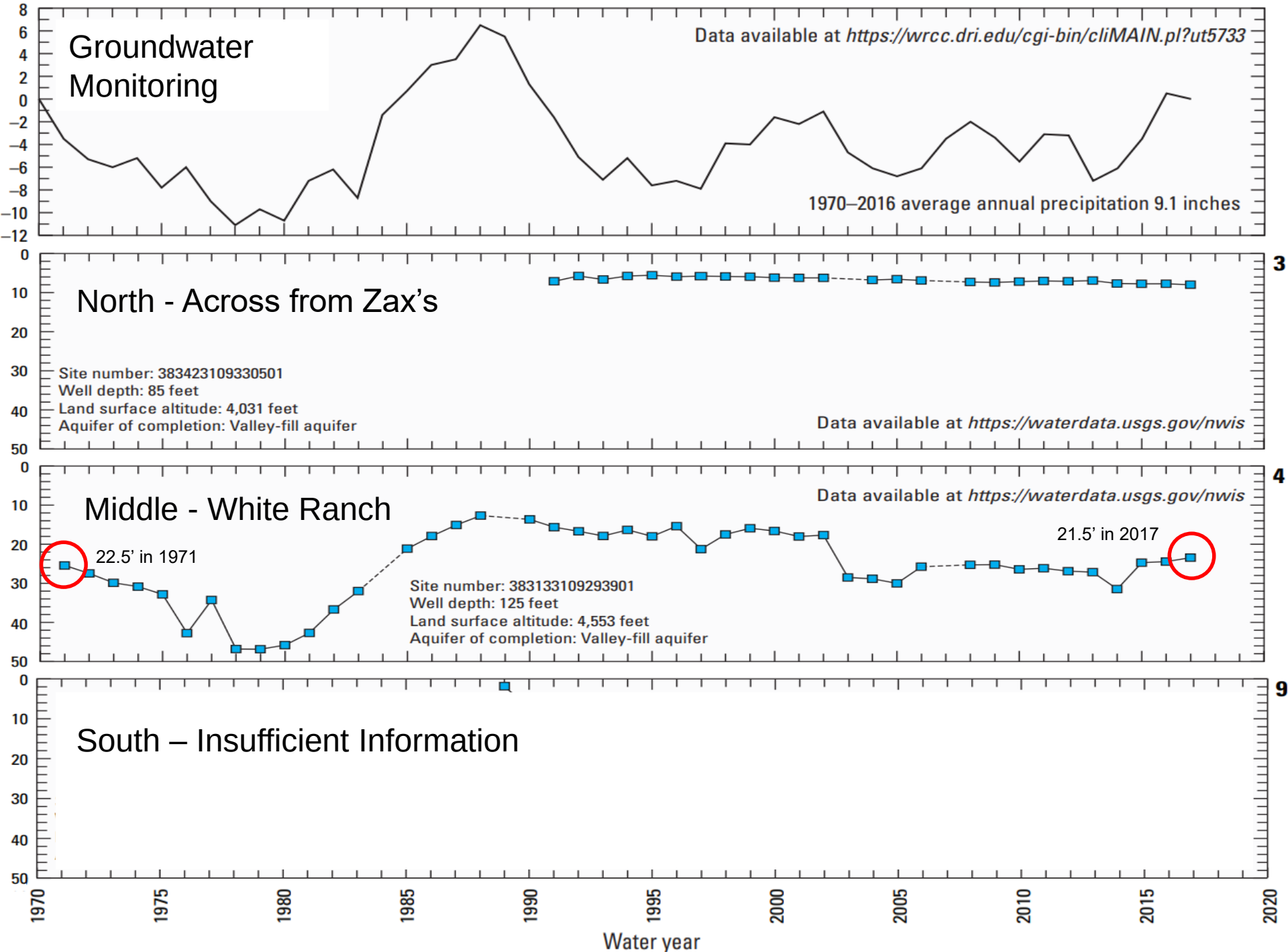
- Recharge Estimate: 9,550 to 30,000 acre-feet
- Discharge Estimate: 14,000 to 16,000 acre-feet

DIVISION OF WATER RIGHTS ANALYSIS

- Valley Aquifers Estimate: 4,500 to 7,800+ acre-feet
  (+ Private Well & Spring Use)

- Groundwater Available for Future Use:
  Valley Aquifers Estimate: 1,300 to 3,500 acre-feet


Groundwater Monitoring


Groundwater Monitoring
Data available at https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ut5733
1970–2016 average annual precipitation 9.1 inches
North - Across from Zax's
Site number: 383423109330501
Well depth: 85 feet
Land surface altitude: 4,031 feet
Aquifer of completion: Valley-fill aquifer
Data available at https://waterdata.usgs.gov/nwis
Middle - White Ranch
Data available at https://waterdata.usgs.gov/nwis
22.5' in 1971
21.5' in 2017
Site number: 383133109293901
Well depth: 125 feet
Land surface altitude: 4,553 feet
Aquifer of completion: Valley-fill aquifer
South – Insufficient Information
Water year

Thank You… Any Questions?

Utah Division of Water Rights

Utah Division of Water Rights

Teresa Wilhemsen, P.E.

State Engineer

SUMMARY & CONCLUSIONS

SUMMARY

CURRENT POLICY

- Open but Limited

CURRENT ADJUDICATION

- PD scheduled for publication Fall 2021

CURRENT GROUNDWATER SUPPLY

- In-Valley Total: 4,500 – 7,800+ af
- Available for Future Uses: 1,300 – 3,500 af

INTERIM POLICY CONSIDERATIONS

- Additional Restrictions of New Appropriations
- Close Valley to New Appropriations
- Close Valley to Change Applications seeking to move additional water rights into the valley
- Development of Groundwater Water Bank

NEXT STEPS

- Complete General Water Rights Adjudication: Fall 2021
- Promote Discussion & Study of Safe Yield Estimate for Valley Aquifers
- Promote Discussion & Study of the Need for a Groundwater Management Plan
- Work on Improvements to Groundwater Monitoring System
- Additional Research Specific to Certain Areas

ADDITIONAL CONSIDERATIONS

- Climate Change
- Research Paper: Gardner, et al., *Journal of Hydrology* (2020)
- Transition from Agricultural Use & Outdoor Watering to Municipal Use
- Colorado River Issues

Thank You… Any Questions?

Please provide any additional comments to:

Utah Division of Water Rights

Email: waterrights@utah.gov; or PO Box 718, Price, UT 84501