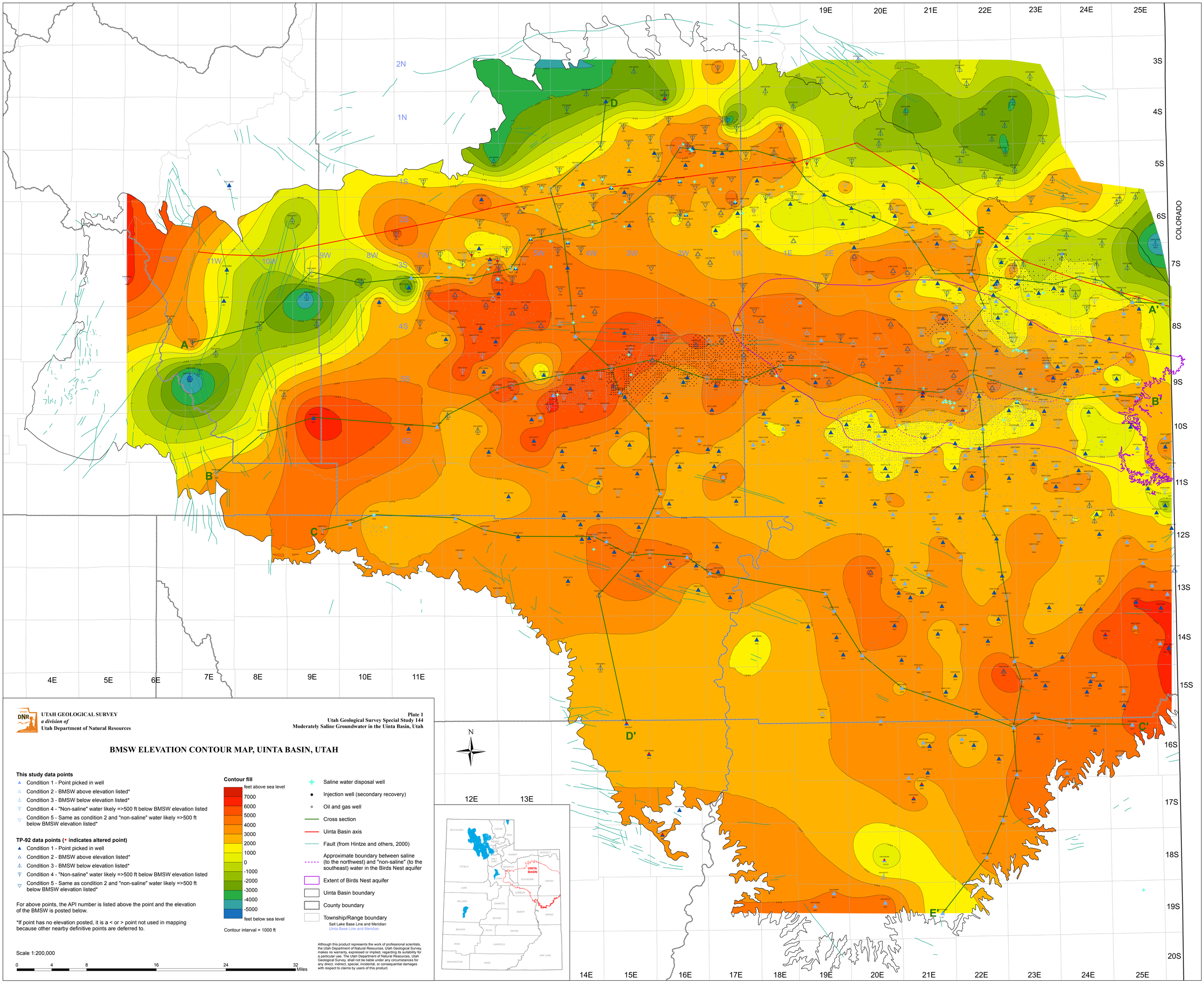

UTAH GEOLOGICAL SURVEY
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Plate 1
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah
BMSW ELEVATION CONTOUR MAP, UINTA BASIN, UTAH
This study data points
Condition 1 - Point picked in well
Condition 2 - BMSW above elevation listed*
Condition 3 - BMSW below elevation listed*
Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*
TP-92 data points (• indicates altered point)
Condition 1 - Point picked in well
Condition 2 - BMSW above elevation listed*
Condition 3 - BMSW below elevation listed*
Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*
For above points, the API number is listed above the point and the elevation of the BMSW is posted below.
*If point has no elevation posted, it is a < or > point not used in mapping because other nearby definitive points are deferred to.
Contour fill
feet above sea level
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
-4000
-5000
feet below sea level
Contour interval = 1000 ft
Saline water disposal well
Injection well (secondary recovery)
Oil and gas well
Cross section
Uinta Basin axis
Fault (from Hintze and others, 2000)
Approximate boundary between saline (to the northwest) and "non-saline" (to the southeast) water in the Birds Nest aquifer
Extent of Birds Nest aquifer
Uinta Basin boundary
County boundary
Township/Range boundary
Salt Lake Base Line and Meridian
Uinta Base Line and Meridian
Scale 1:200,000
0 4 8 16 24 32 Miles
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N
COLORADO
UINTA BASIN
A
A'
B
B'
C
C'
D
D'
E
E'

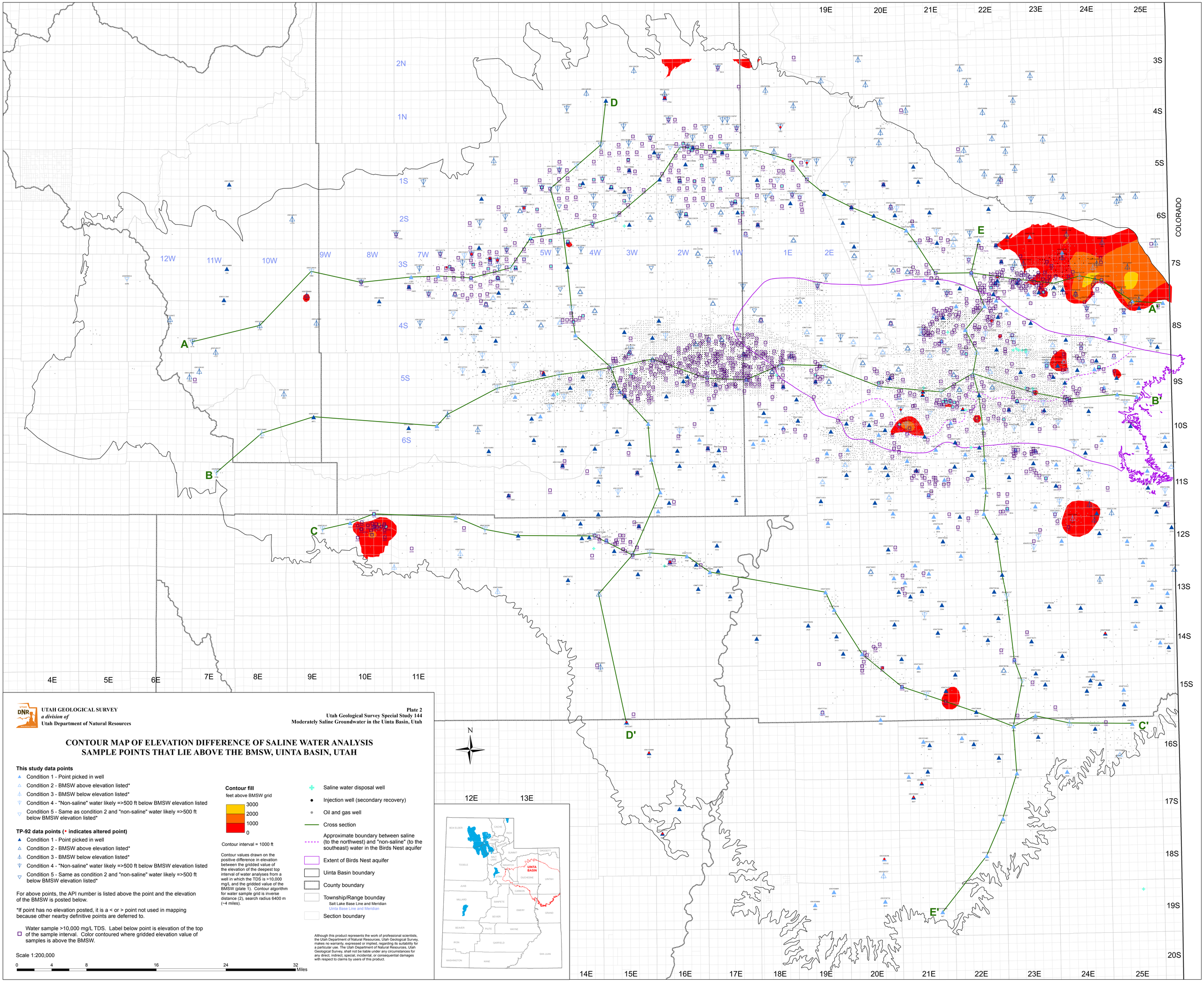

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Plate 2
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah

CONTOUR MAP OF ELEVATION DIFFERENCE OF SALINE WATER ANALYSIS SAMPLE POINTS THAT LIE ABOVE THE BMSW, UINTA BASIN, UTAH

This study data points

- Condition 1 - Point picked in well
- Condition 2 - BMSW above elevation listed*
- Condition 3 - BMSW below elevation listed*
- Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
- Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*

TP-92 data points (• indicates altered point)

- Condition 1 - Point picked in well
- Condition 2 - BMSW above elevation listed*
- Condition 3 - BMSW below elevation listed*
- Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
- Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*

For above points, the API number is listed above the point and the elevation of the BMSW is posted below.

*If point has no elevation posted, it is a < or > point not used in mapping because other nearby definitive points are deferred to.

Water sample >10,000 mg/L TDS. Label below point is elevation of the top of the sample interval. Color contoured where gridded elevation value of samples is above the BMSW.

Scale 1:200,000

0 4 8 16 24 32 Miles

Contour fill

feet above BMSW grid

3000
2000
1000
0

Contour interval = 1000 ft

Contour values drawn on the positive difference in elevation between the gridded value of the elevation of the deepest top interval of water analyses from a well in which the TDS is >10,000 mg/L and the gridded value of the BMSW (plate 1). Contour algorithm for water sample grid is inverse distance (2), search radius 6400 m (~4 miles).

- Saline water disposal well
- Injection well (secondary recovery)
- Oil and gas well
- Cross section
- Approximate boundary between saline (to the northwest) and "non-saline" (to the southeast) water in the Birds Nest aquifer
- Extent of Birds Nest aquifer
- Uinta Basin boundary
- County boundary
- Township/Range bounday
  - Salt Lake Base Line and Meridian
  - Uinta Base Line and Meridian
- Section boundary

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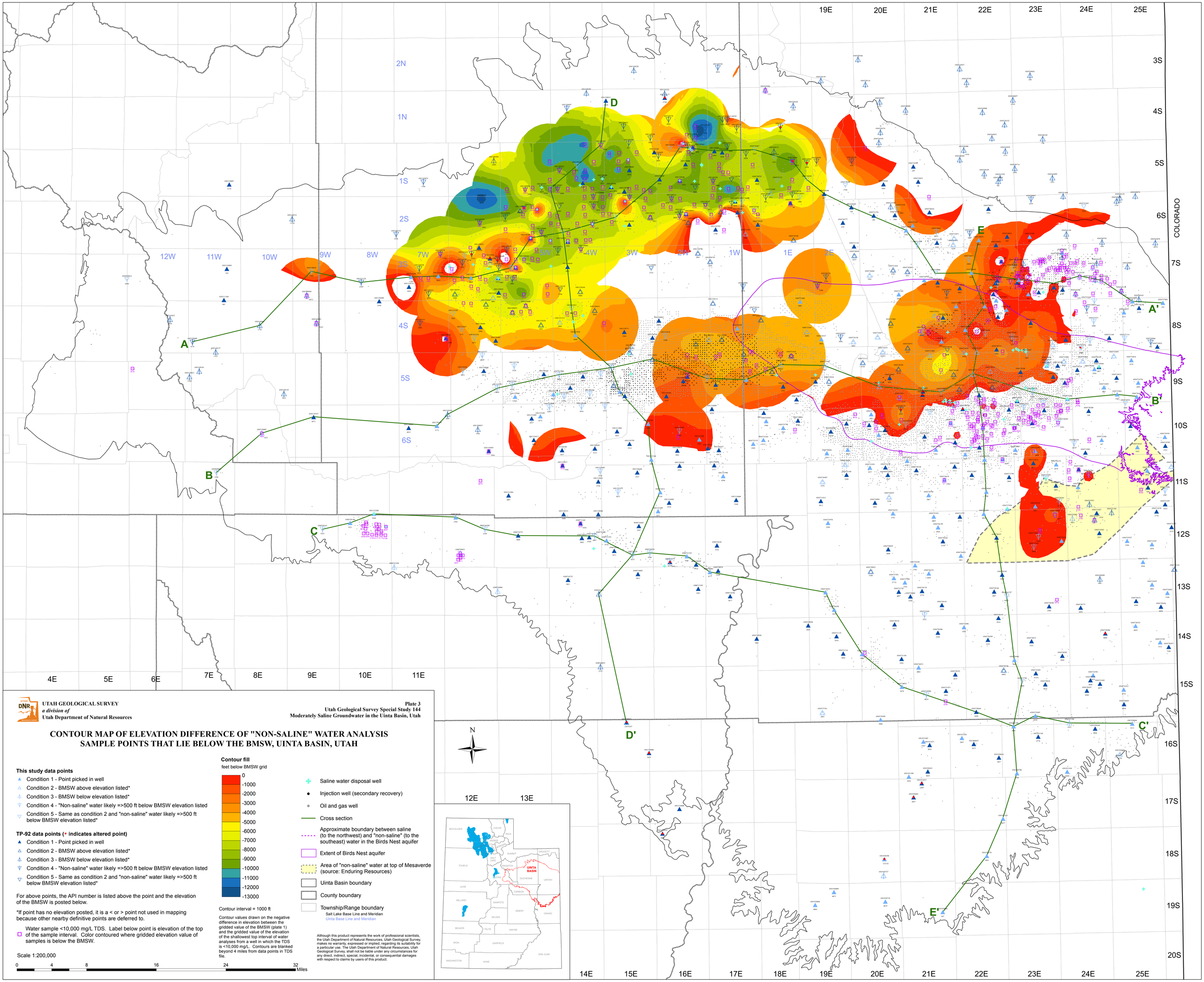

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Plate 3
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah

CONTOUR MAP OF ELEVATION DIFFERENCE OF "NON-SALINE" WATER ANALYSIS SAMPLE POINTS THAT LIE BELOW THE BMSW, UINTA BASIN, UTAH

This study data points

- Condition 1 - Point picked in well
- Condition 2 - BMSW above elevation listed*
- Condition 3 - BMSW below elevation listed*
- Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
- Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*

TP-92 data points (• indicates altered point)

- Condition 1 - Point picked in well
- Condition 2 - BMSW above elevation listed*
- Condition 3 - BMSW below elevation listed*
- Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
- Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*

For above points, the API number is listed above the point and the elevation of the BMSW is posted below.

*If point has no elevation posted, it is a < or > point not used in mapping because other nearby definitive points are deferred to.

Water sample <10,000 mg/L TDS. Label below point is elevation of the top of the sample interval. Color contoured where gridded elevation value of samples is below the BMSW.

Scale 1:200,000

0 4 8 16 24 32 Miles

Contour fill
feet below BMSW grid

0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
-8000
-9000
-10000
-11000
-12000
-13000

Contour interval = 1000 ft

Contour values drawn on the negative difference in elevation between the gridded value of the BMSW (plate 1) and the gridded value of the elevation of the shallowest top interval of water analyses from a well in which the TDS is <10,000 mg/L. Contours are blanked beyond 4 miles from data points in TDS file.

- Saline water disposal well
- Injection well (secondary recovery)
- Oil and gas well
- Cross section
- Approximate boundary between saline (to the northwest) and "non-saline" (to the southeast) water in the Birds Nest aquifer
- Extent of Birds Nest aquifer
- Area of "non-saline" water at top of Mesaverde (source: Enduring Resources)
- Uinta Basin boundary
- County boundary
- Township/Range boundary
  - Salt Lake Base Line and Meridian
  - Uinta Base Line and Meridian

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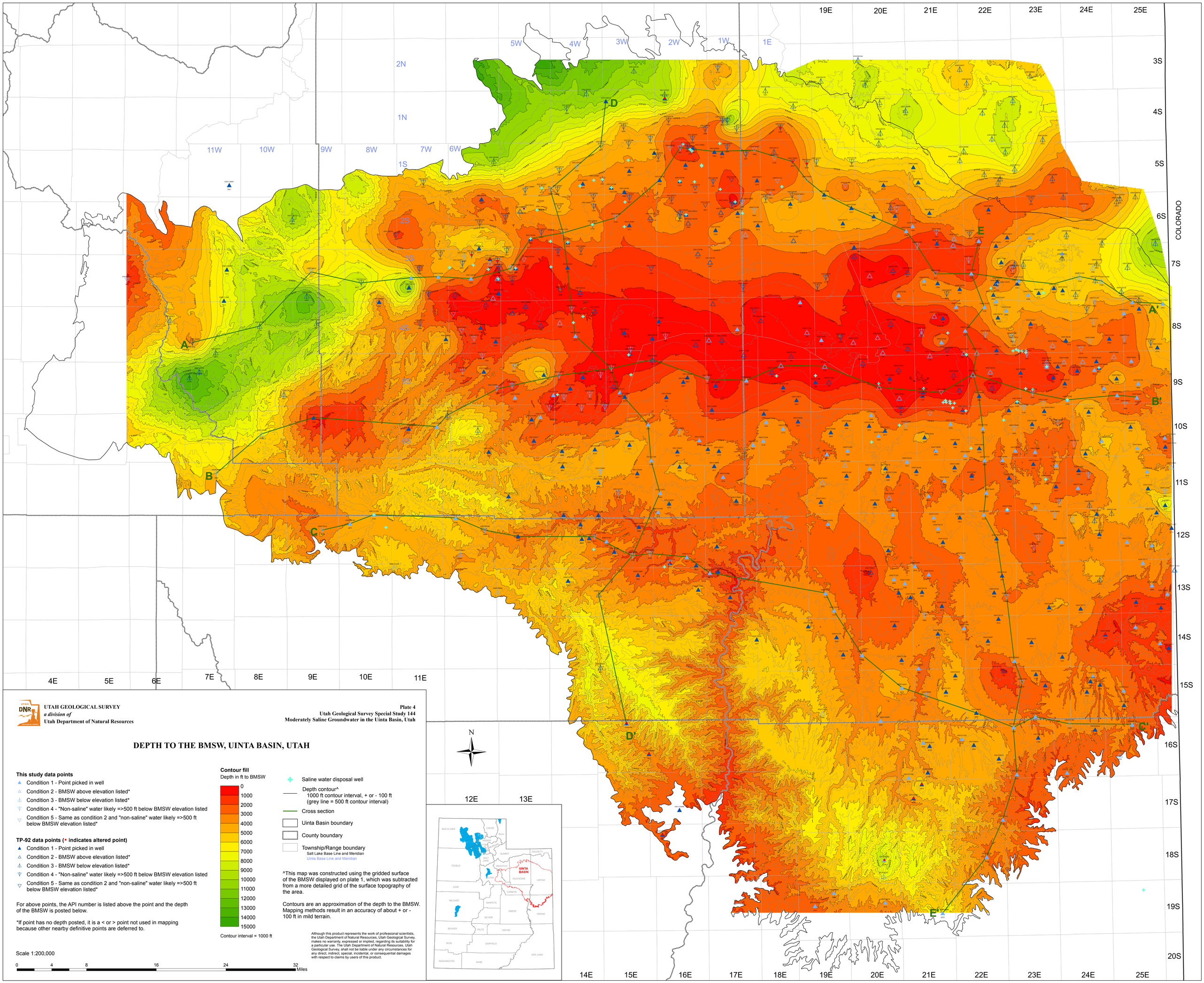

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Plate 4
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah

DEPTH TO THE BMSW, UINTA BASIN, UTAH

This study data points

- Condition 1 - Point picked in well
- Condition 2 - BMSW above elevation listed*
- Condition 3 - BMSW below elevation listed*
- Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
- Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*

TP-92 data points (• indicates altered point)

- Condition 1 - Point picked in well
- Condition 2 - BMSW above elevation listed*
- Condition 3 - BMSW below elevation listed*
- Condition 4 - "Non-saline" water likely =>500 ft below BMSW elevation listed
- Condition 5 - Same as condition 2 and "non-saline" water likely =>500 ft below BMSW elevation listed*

For above points, the API number is listed above the point and the depth of the BMSW is posted below.

*If point has no depth posted, it is a < or > point not used in mapping because other nearby definitive points are deferred to.

Contour fill
Depth in ft to BMSW

0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
15000

Contour interval = 1000 ft

- Saline water disposal well
- Depth contour^
  1000 ft contour interval, + or - 100 ft
  (grey line = 500 ft contour interval)
- Cross section
- Uinta Basin boundary
- County boundary
- Township/Range boundary
  Salt Lake Base Line and Meridian
  Uinta Base Line and Meridian

^This map was constructed using the gridded surface of the BMSW displayed on plate 1, which was subtracted from a more detailed grid of the surface topography of the area.

Contours are an approximation of the depth to the BMSW. Mapping methods result in an accuracy of about + or - 100 ft in mild terrain.

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Scale 1:200,000

0 4 8 16 24 32 Miles

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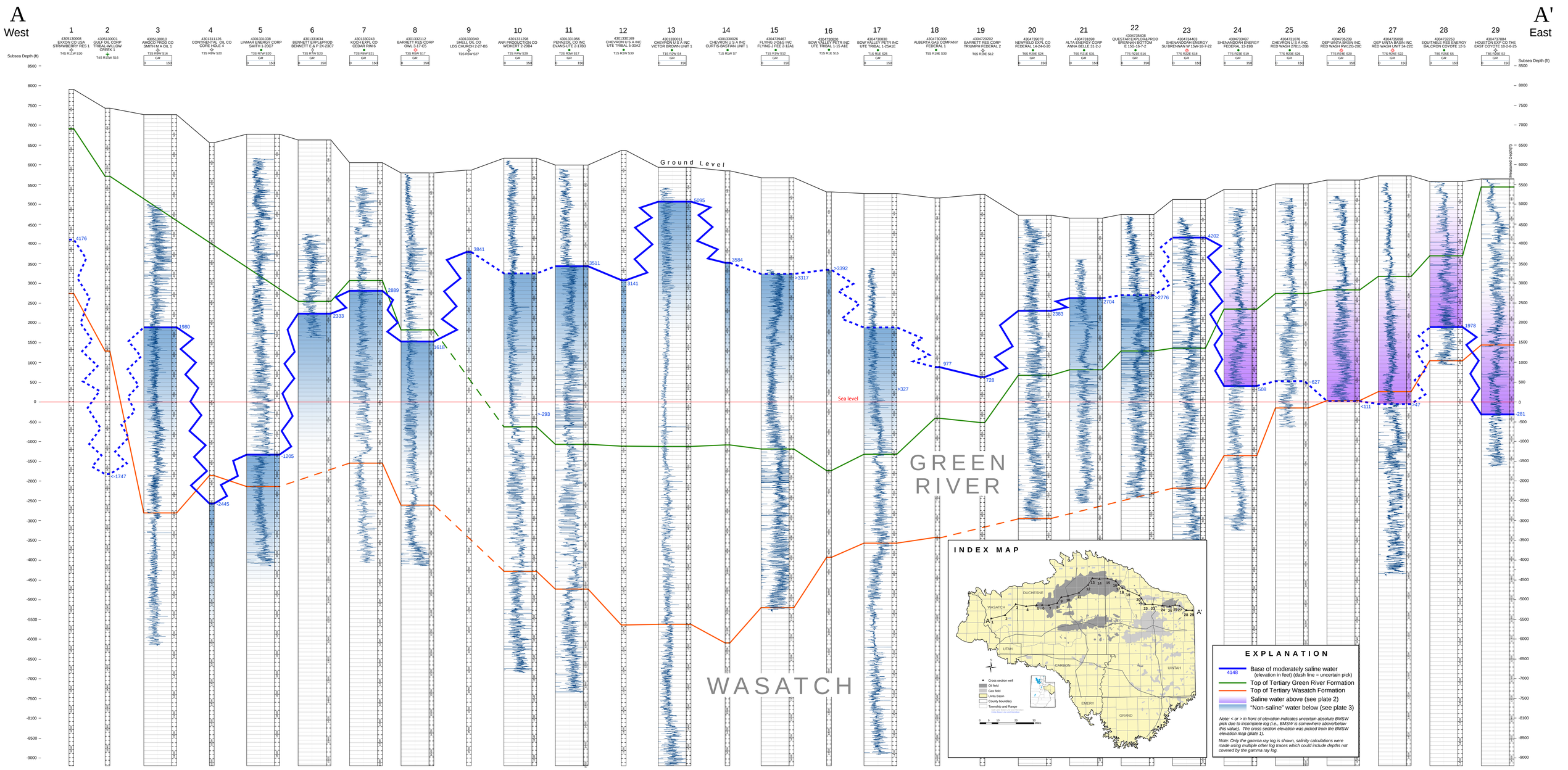
A-A' WEST TO EAST CROSS SECTION (NORTHERN)

Plate 5
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah



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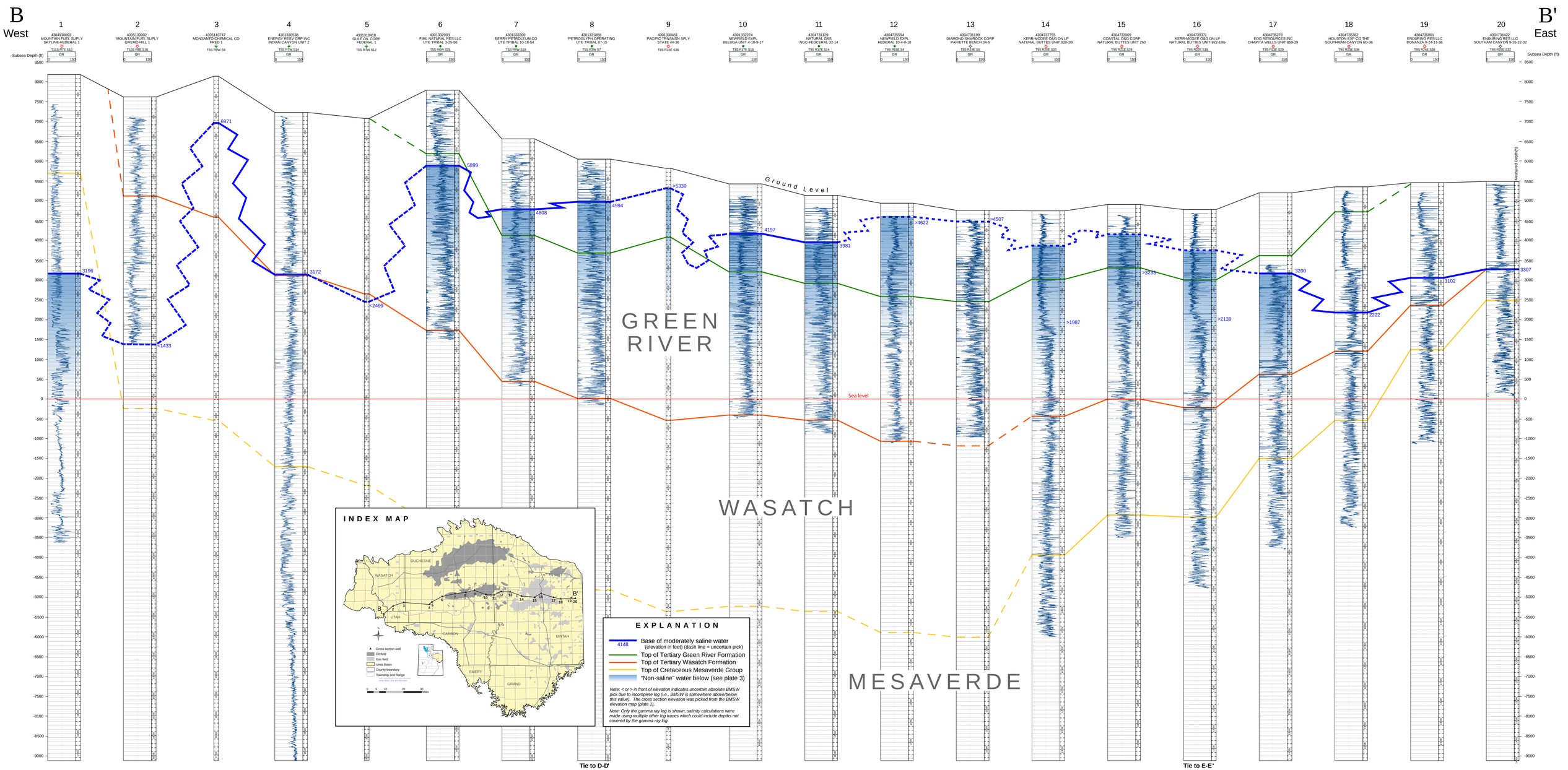
B-B' WEST TO EAST CROSS SECTION (MIDDLE)

Plate 6
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah



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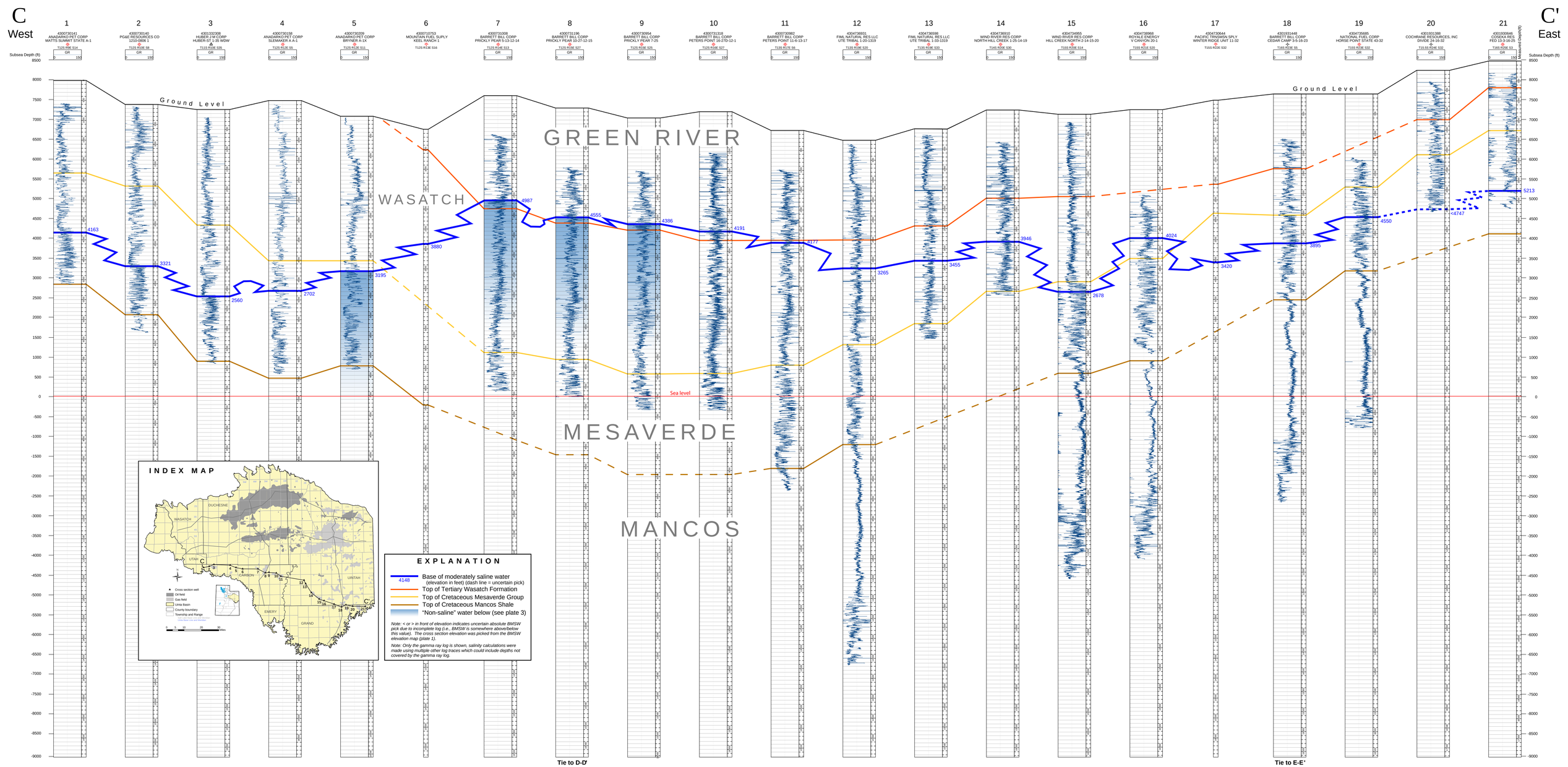
C-C' WEST TO EAST CROSS SECTION (SOUTHERN)

Plate 7
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah



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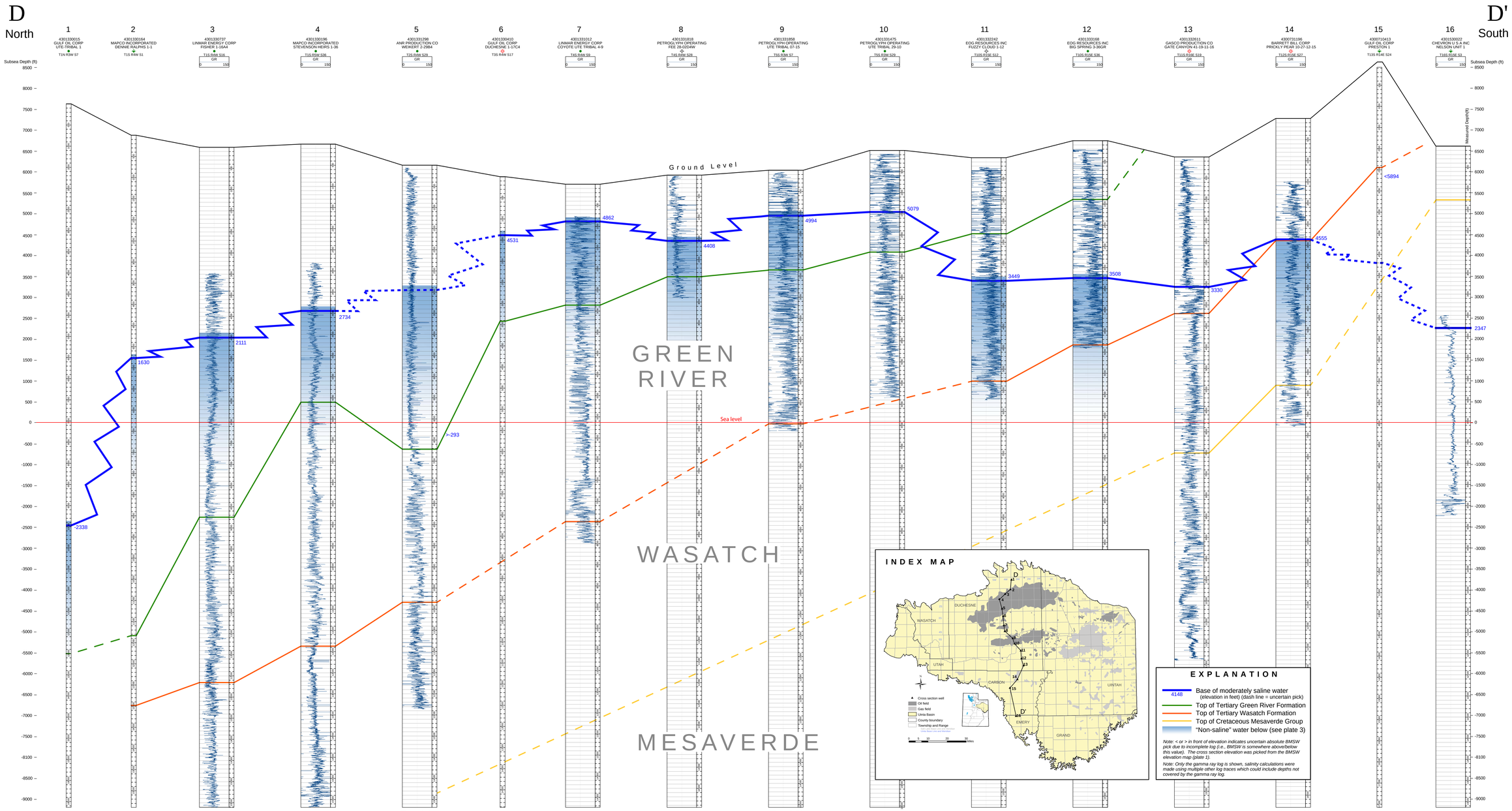
D-D' NORTH TO SOUTH CROSS SECTION (WESTERN)

Plate 8
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah



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D-D' NORTH TO SOUTH CROSS SECTION (EASTERN)
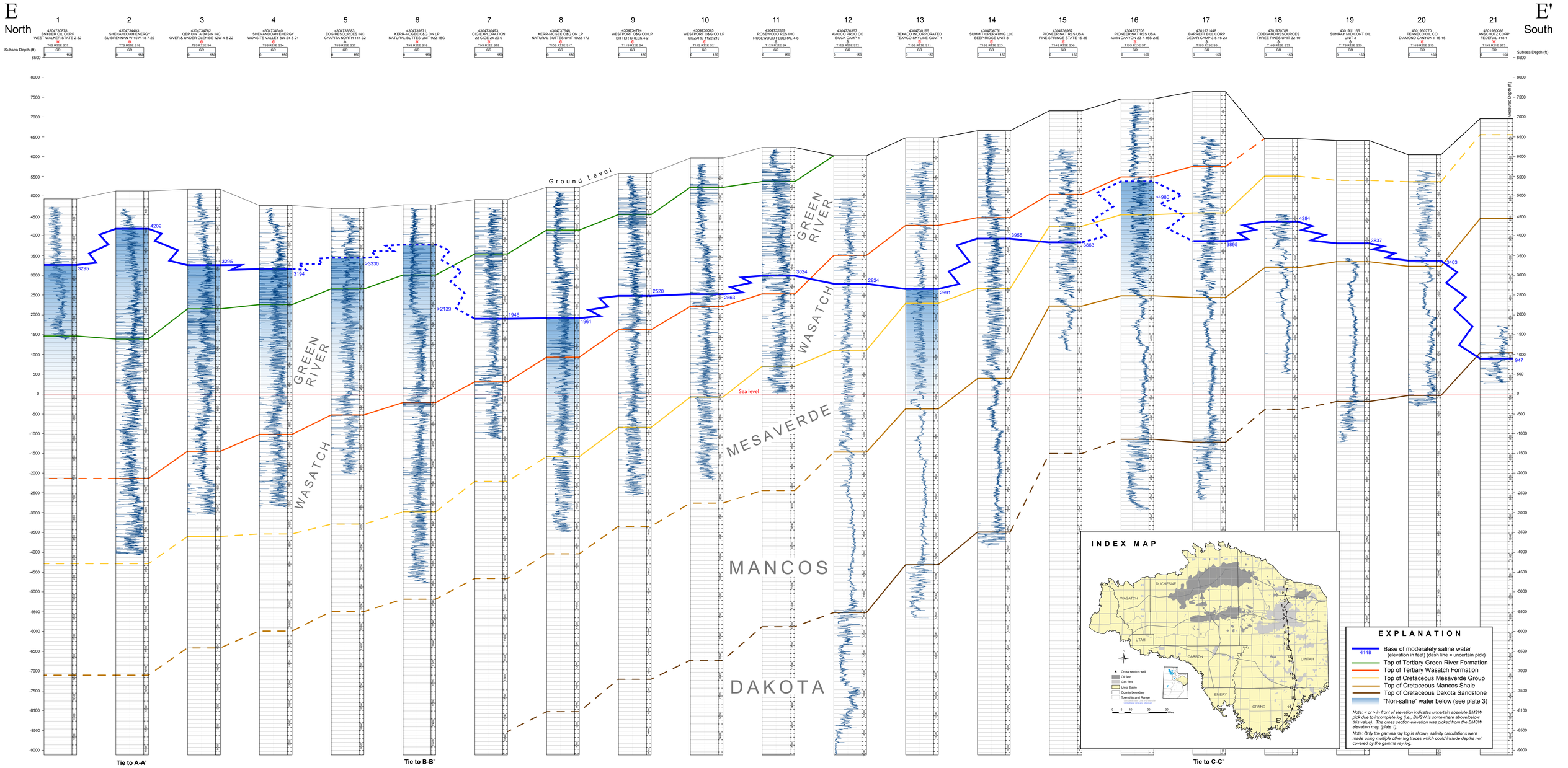
Plate 9
Utah Geological Survey Special Study 144
Moderately Saline Groundwater in the Uinta Basin, Utah