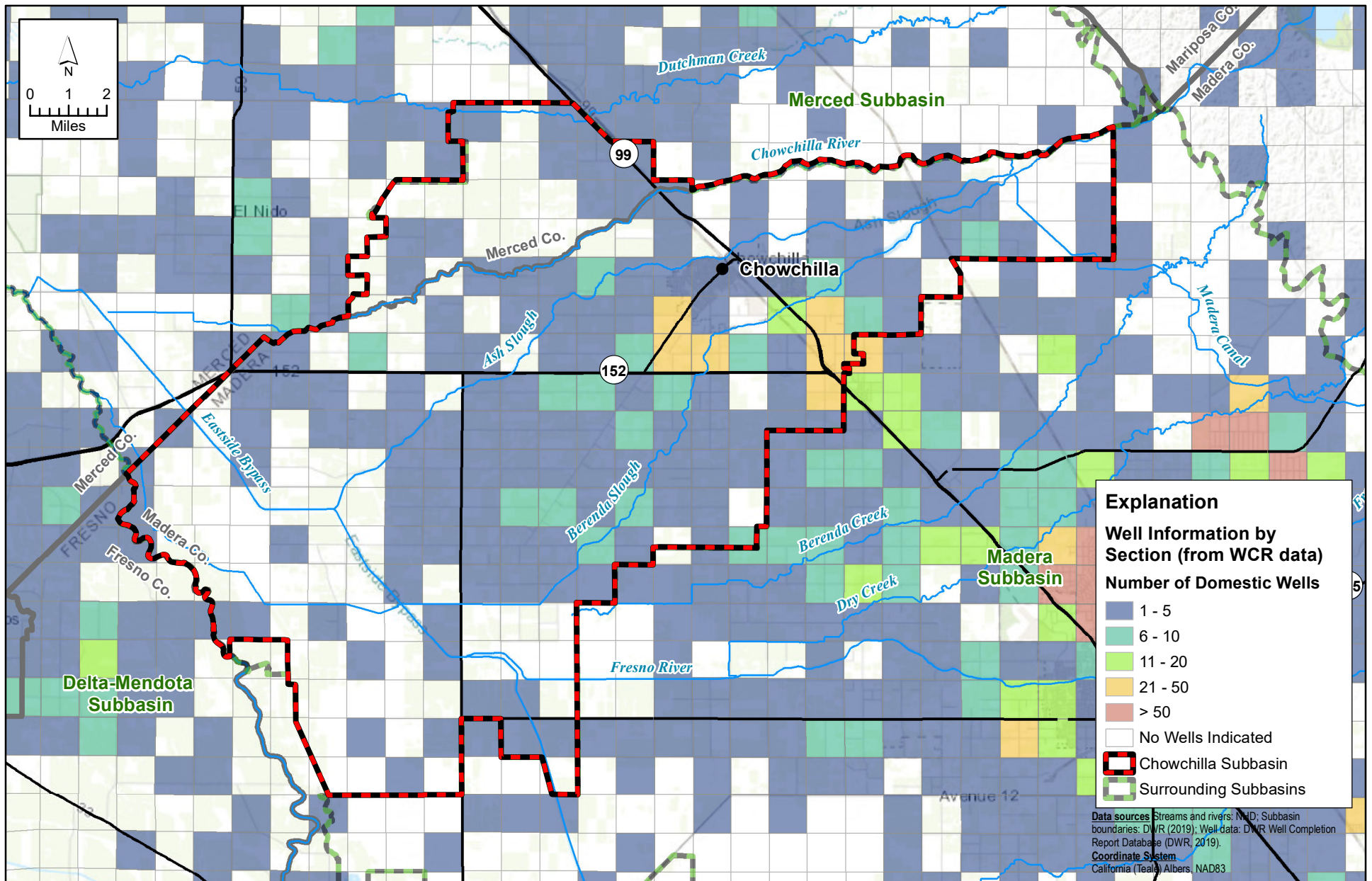


## CHAPTER 2 PLAN AREA AND BASIN SETTING

### *2.3 Selected Figures*

The following figures can be found after this page: Figures 2-4 to 2-6, Figures 2-9 to 2-76 and 2-94.

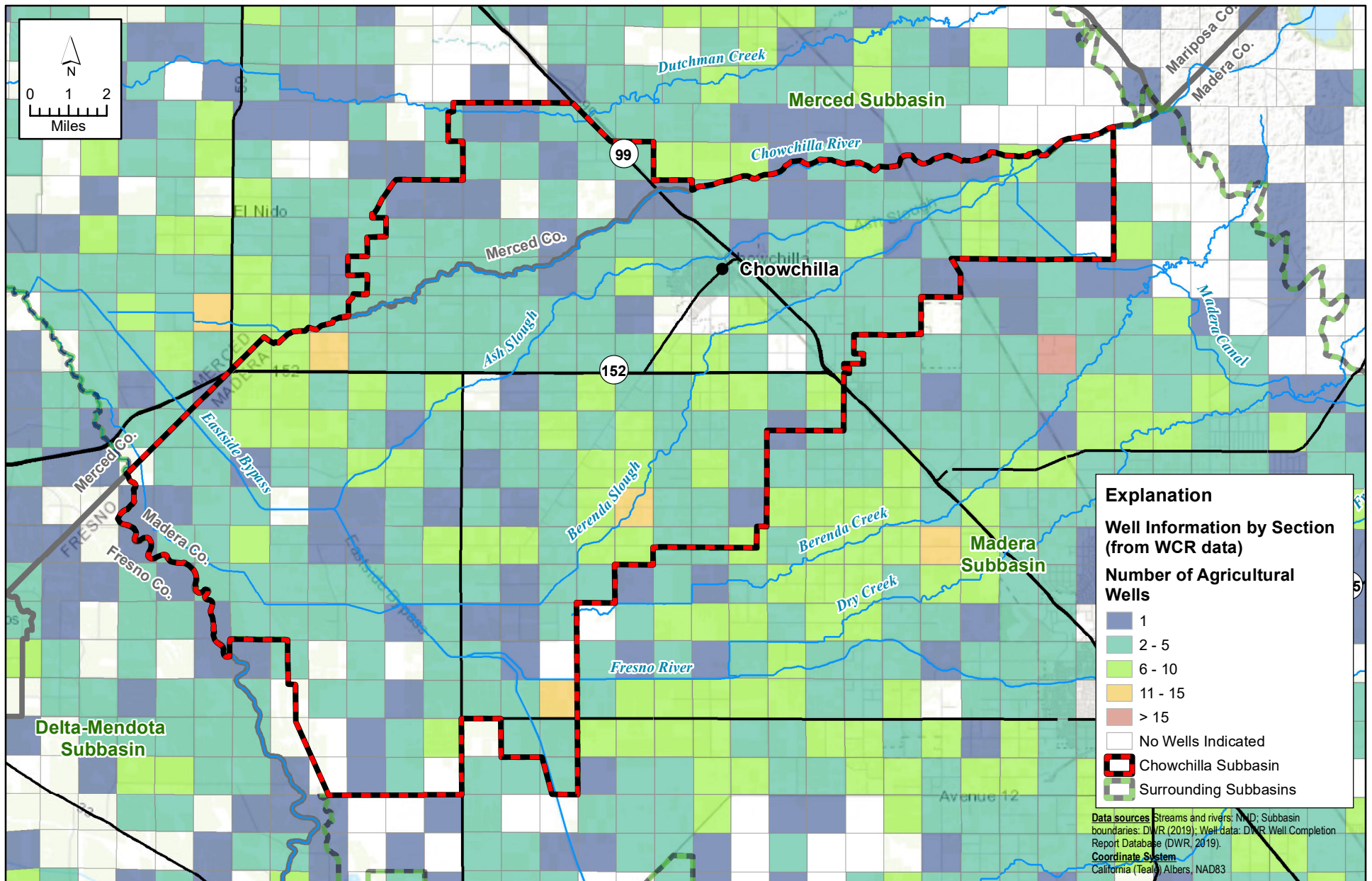


X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\REPORT\Revised\GSP\Sections from Bernadette\Water Levels\MAPS\Figure 2-4 Chowchilla Subbasin Wells By Section Dom Well Count.mxd



**FIGURE 2-4A**  
**Map of Well Information by Section:**  
**Number of Domestic Wells (from WCR data)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

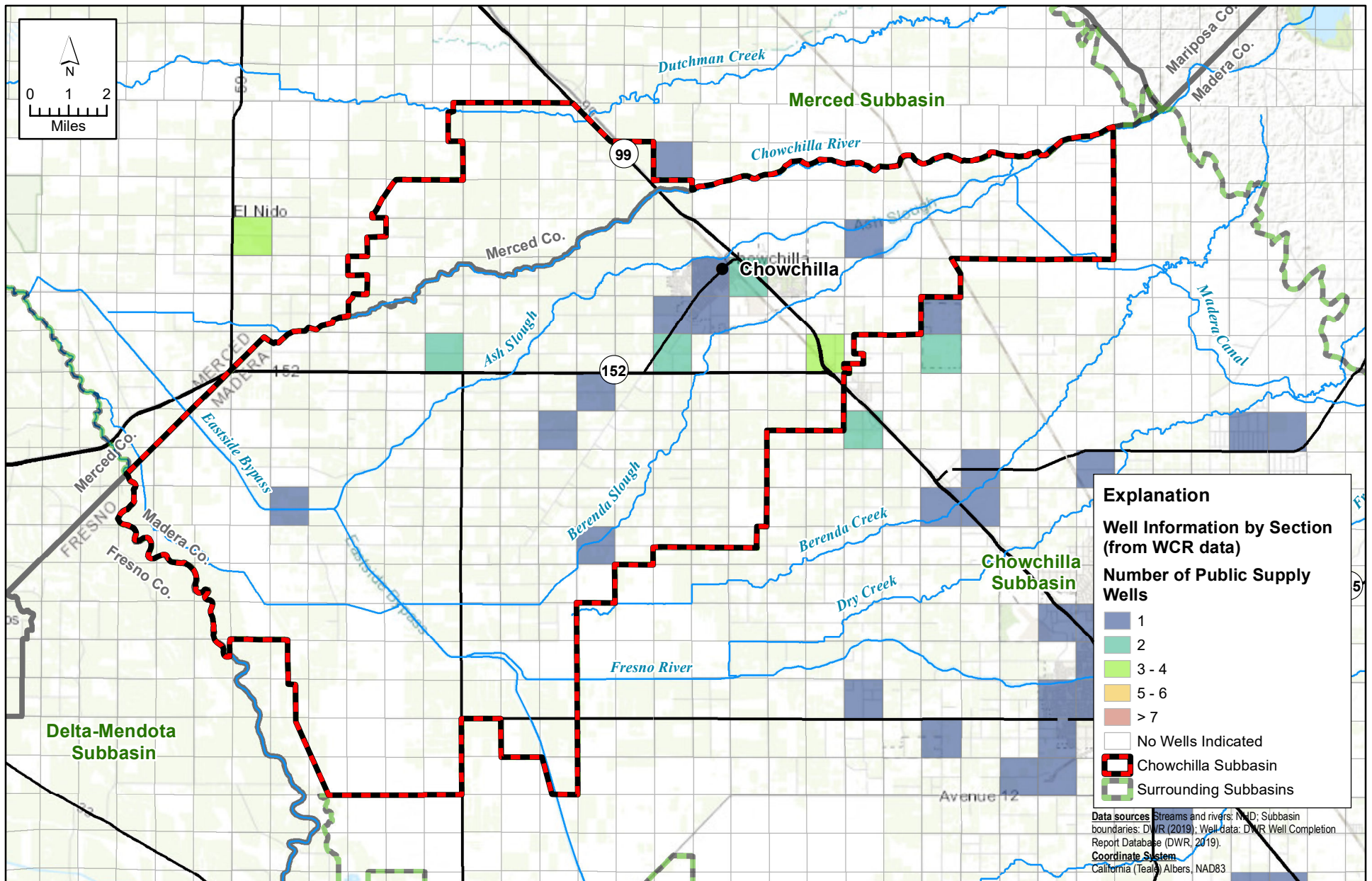


X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\REPORT\Revised\GSP\Sections from Bernadette\Water Levels\MAPS\Figure 2-5 Chowchilla Subbasin Wells By Section Ag Well Count.mxd



**FIGURE 2-4B**  
**Map of Well Information by Section:**  
**Number of Agricultural Wells (from WCR data)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

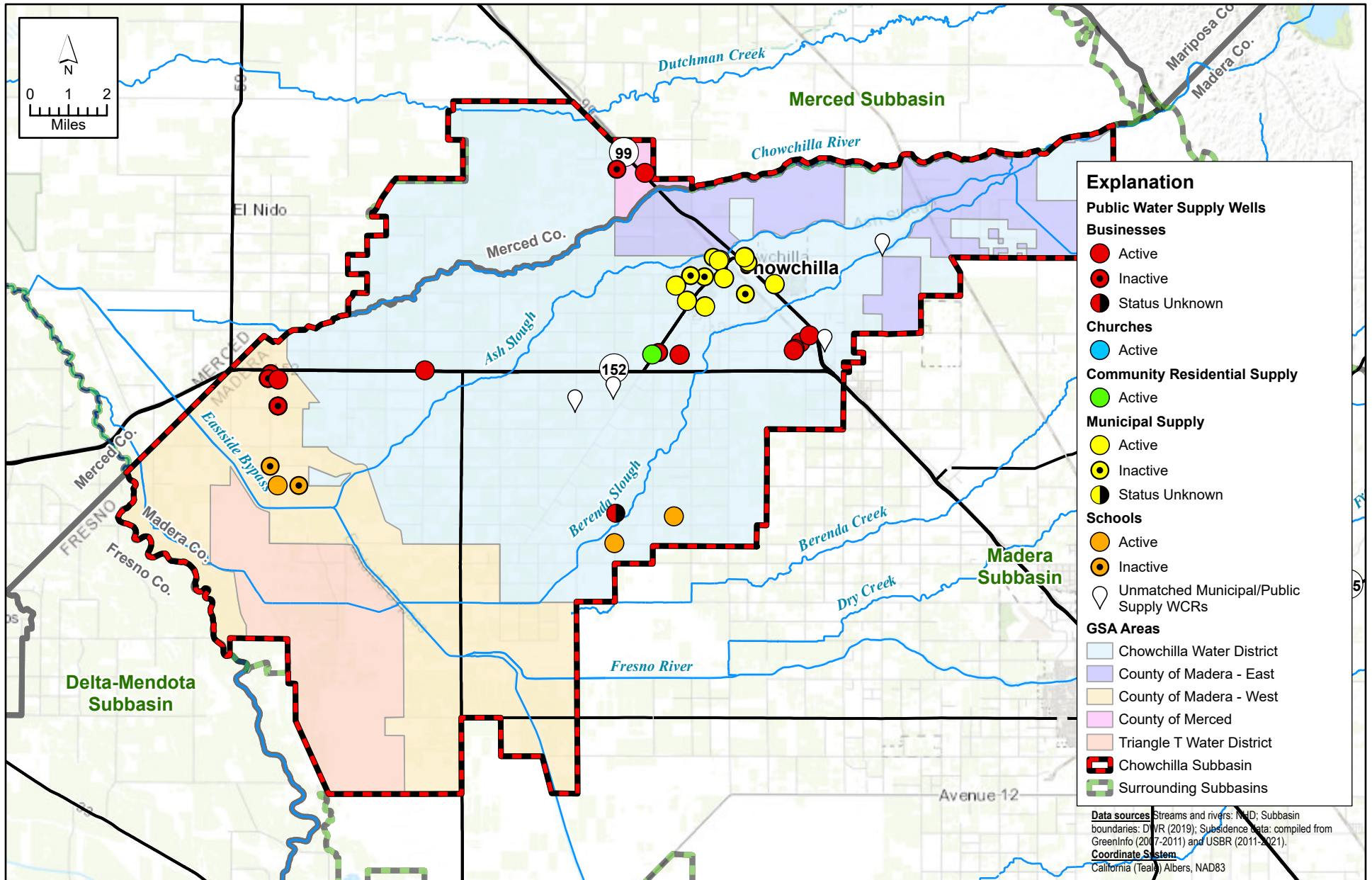


X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\REPORT\Revised\GSP\Sections from Bernadette\Water Levels\MAPS\Figure 2-6 Chowchilla Subbasin Wells By Section PWS Well Count.mxd



**FIGURE 2-5A**  
**Map of Well Information by Section:**  
**Number of Public Supply Wells (from WCR data)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



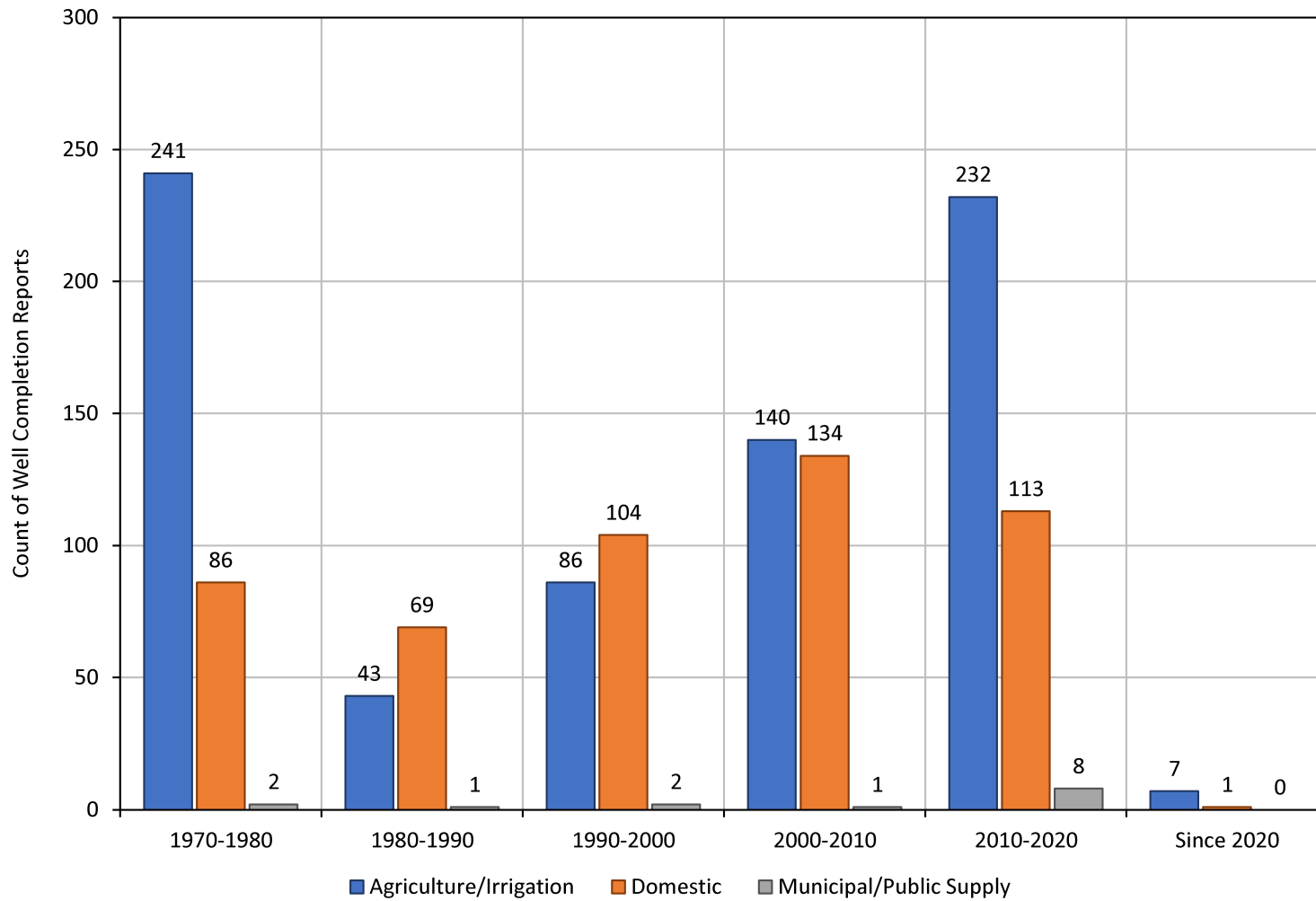
X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx

FIGURE 2-5B



Map of Public Supply Wells in Chowchilla Subbasin

Chowchilla Subbasin  
Groundwater Sustainability Plan



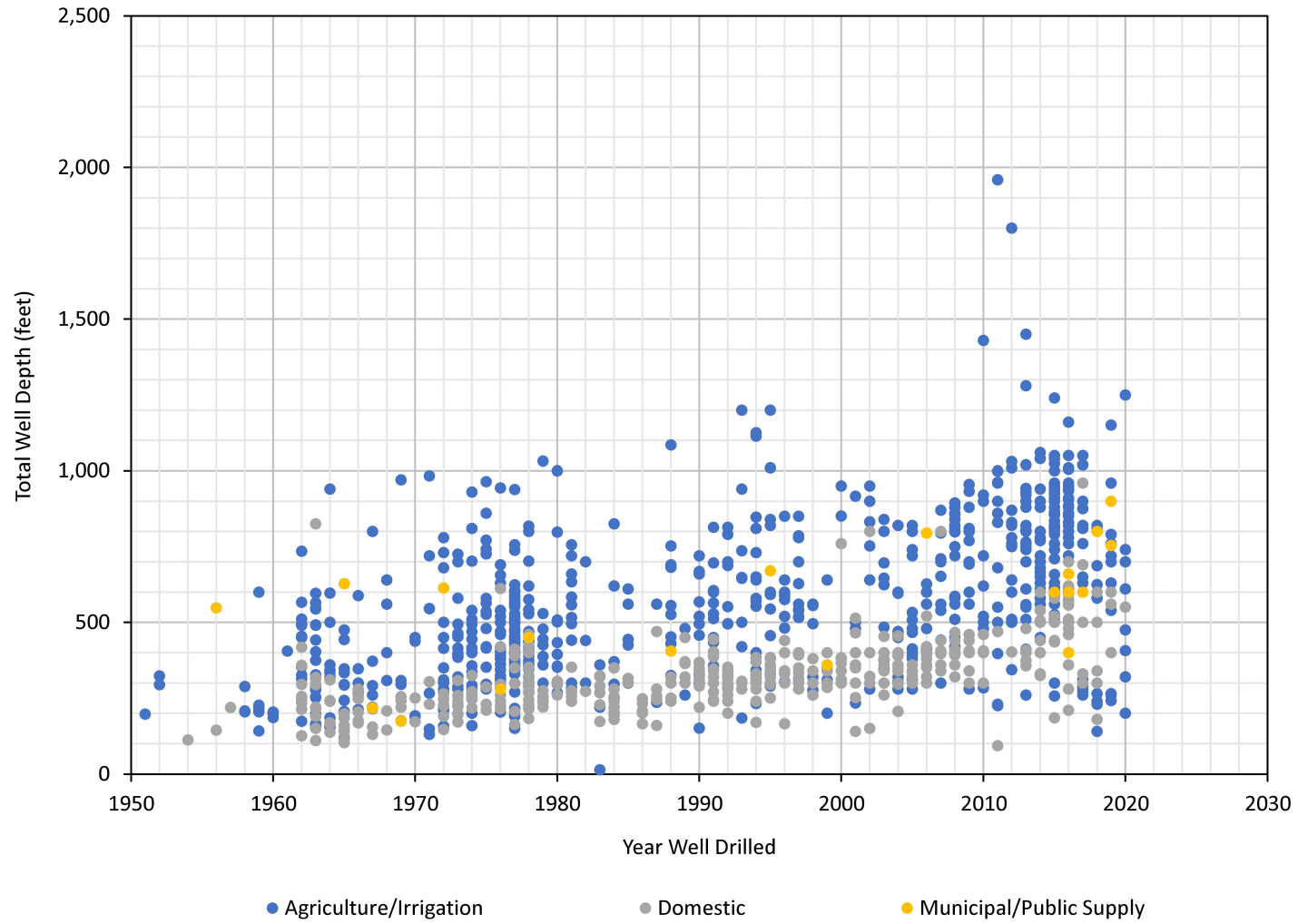
X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx



**FIGURE 2-6A**

**Number of Wells Constructed by Decade**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*



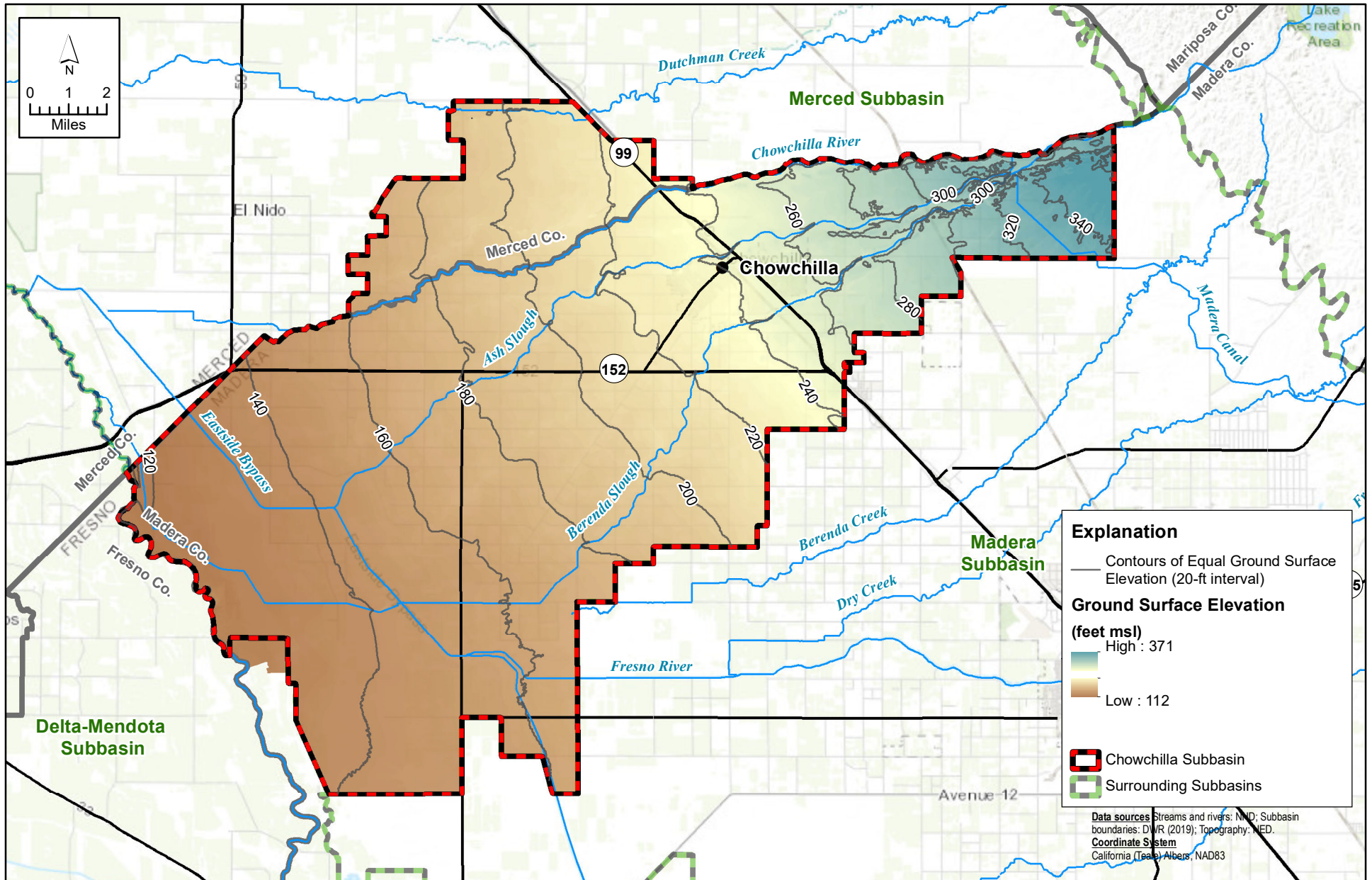
X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx



**FIGURE 2-6B**

**Typical Well Depths by Well Type through Time**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-9 Chowchilla Subbasin Topographic Map.mxd

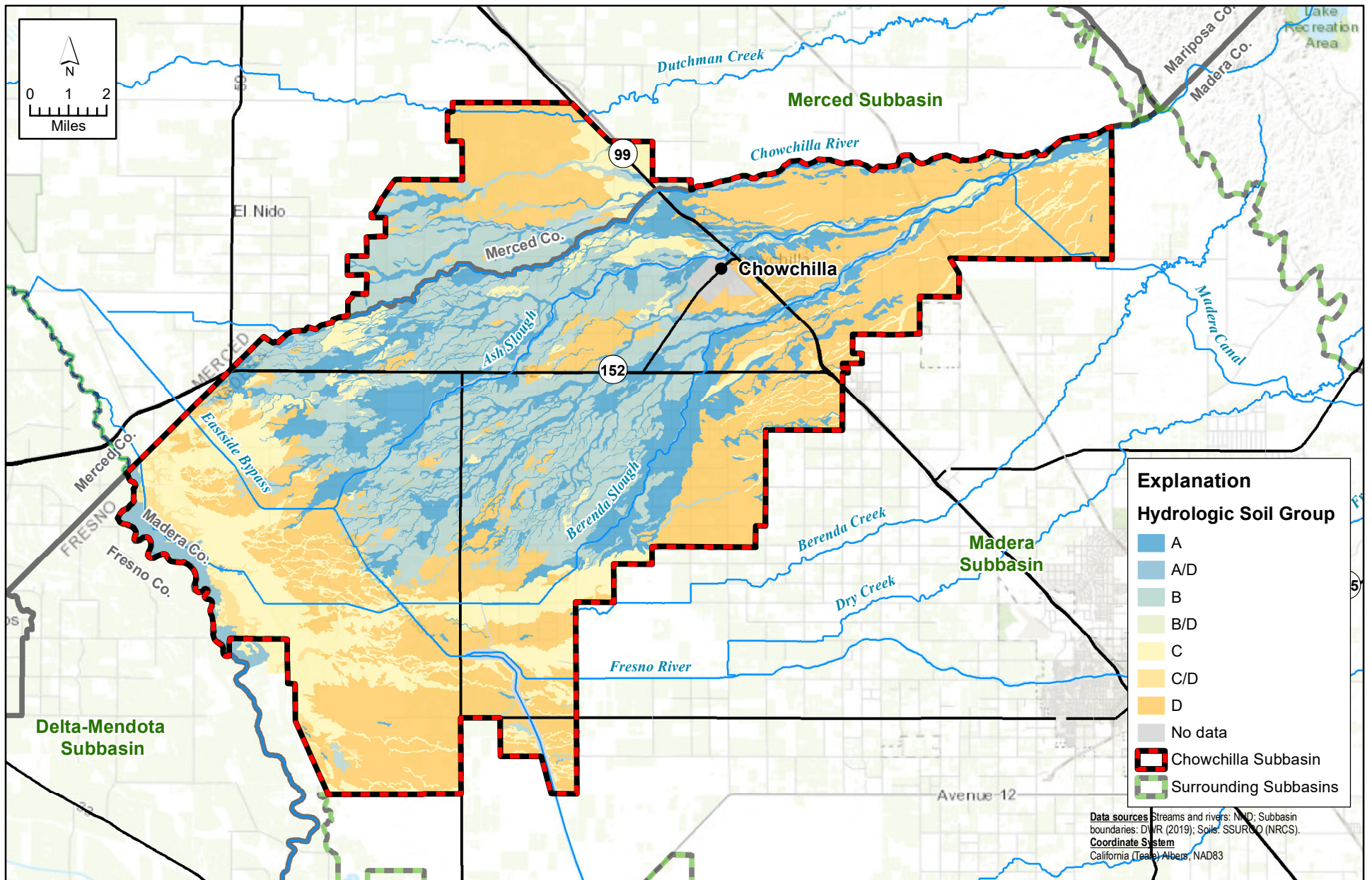
**FIGURE 2-9**

**Topographic Map**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*





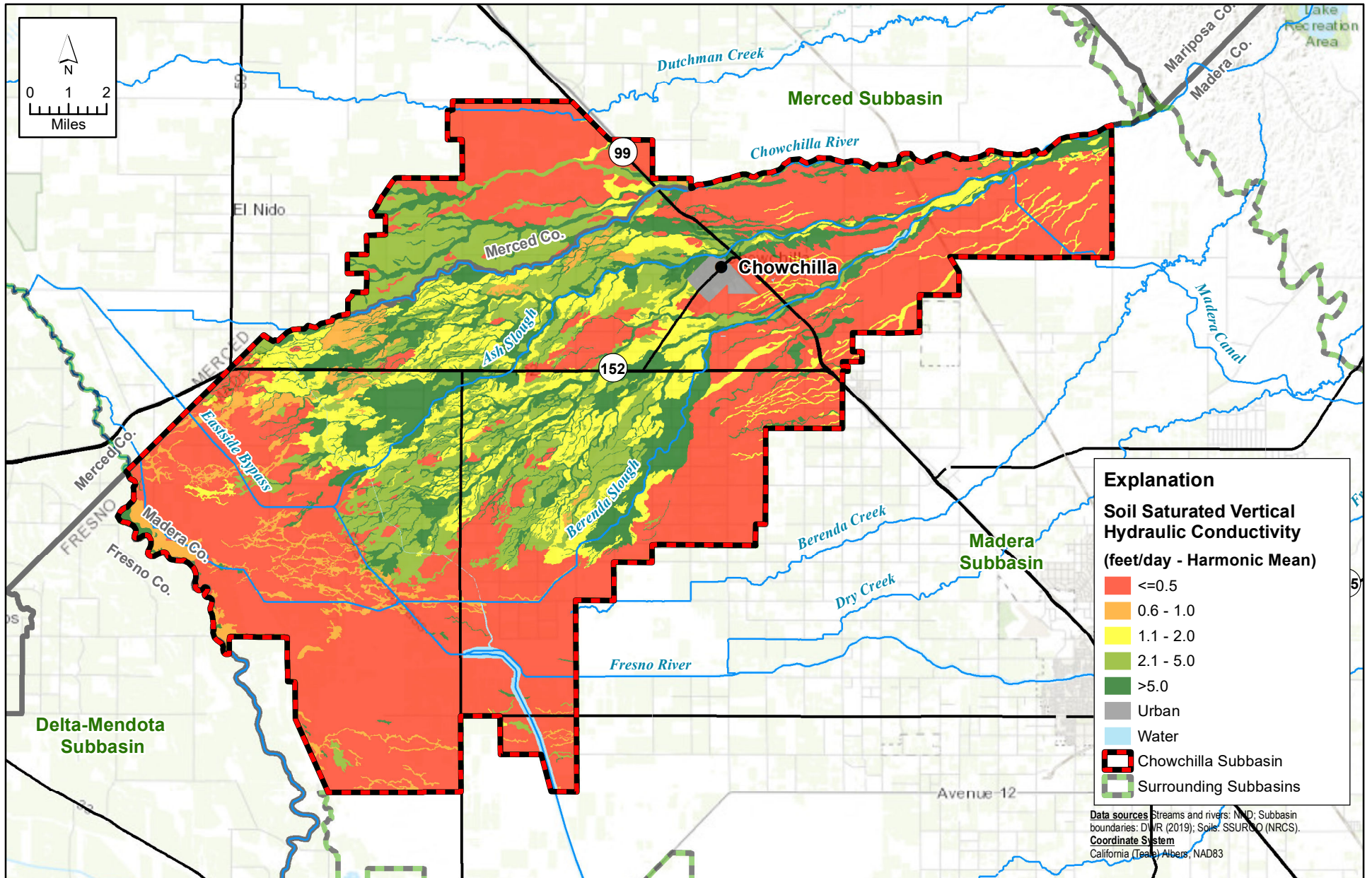


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-10 Chowchilla Subbasin Soil Unit Map.mxd



**FIGURE 2-10**

**Soil Unit Map**



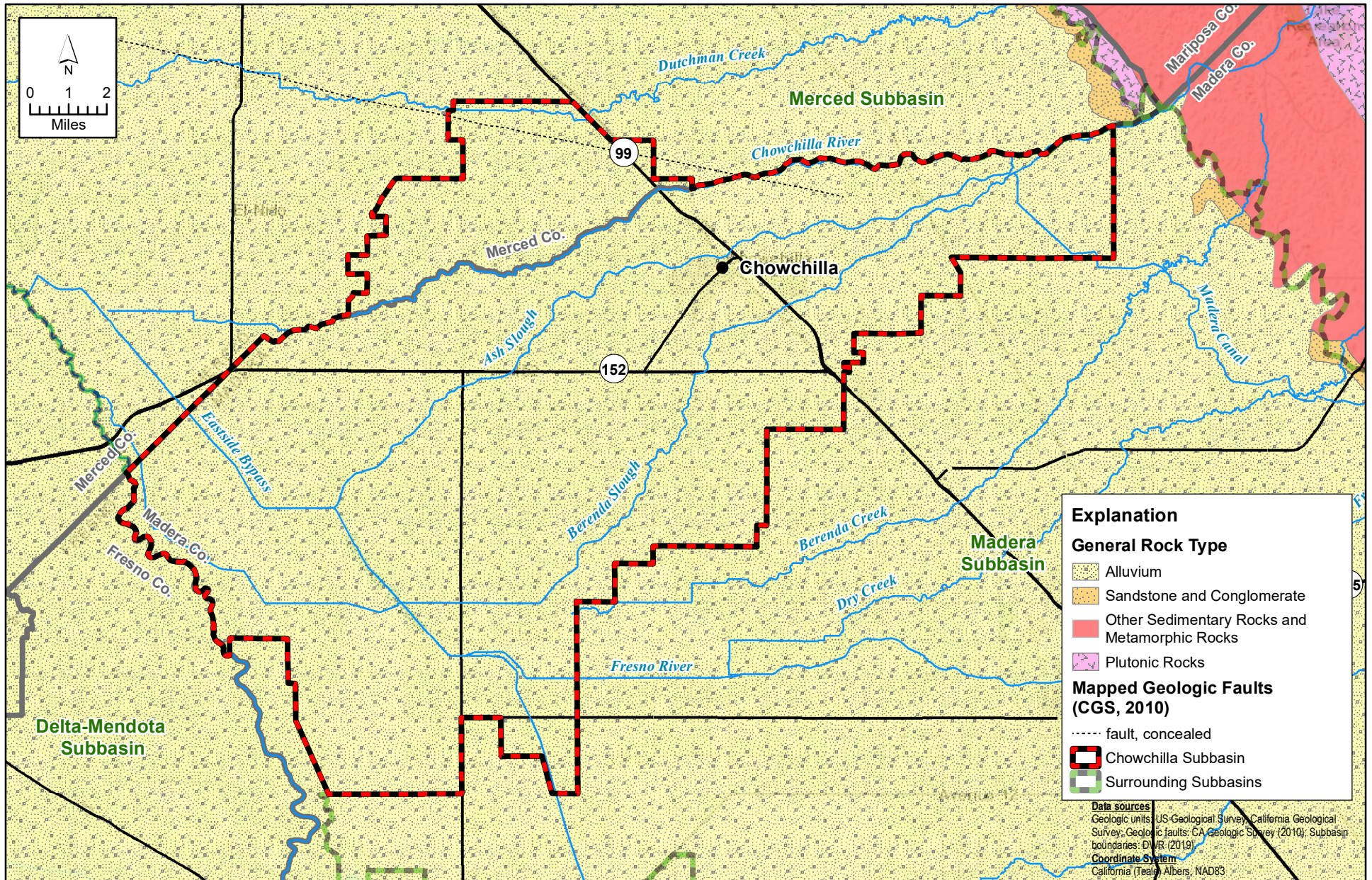
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-11 Chowchilla Subbasin Soil Hydraulic Conductivity Map.mxd

**FIGURE 2-11**



**Soil Hydraulic Conductivity Map**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*



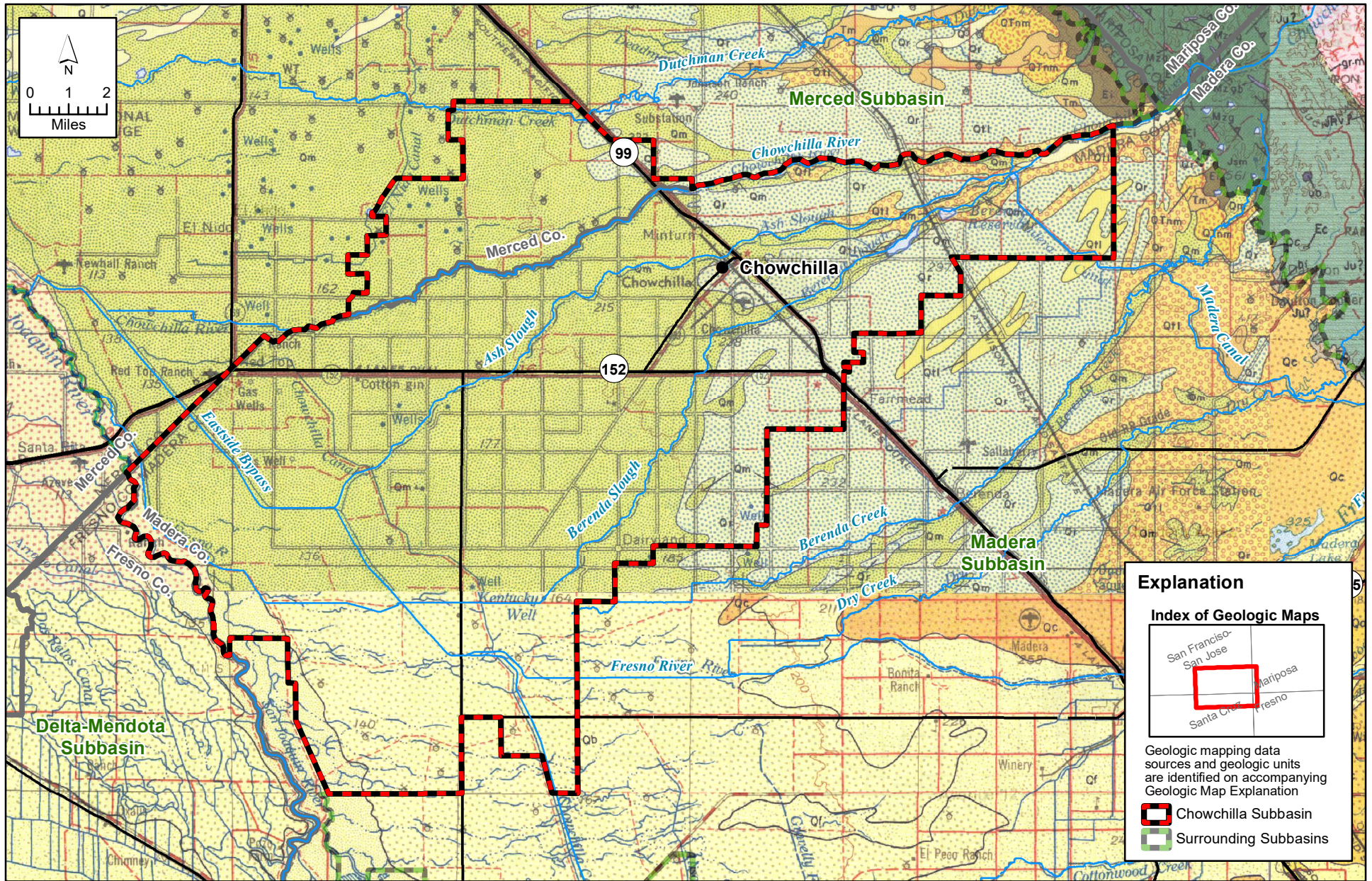
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-12 Chowchilla Subbasin General Geologic Map.mxd

**FIGURE 2-12**

**General Geologic Map**

*Chowchilla Subbasin  
 Groundwater Sustainability Plan*





X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-13 Chowchilla Subbasin Surficial Geologic Map.mxd

**FIGURE 2-13**

**Surficial Geologic Map**



















*Chowchilla Subbasin  
Groundwater Sustainability Plan*



# Compiled Geologic Map Explanation San Francisco - San Jose Quadrangle

 Alluvium	 Mehrten Formation ( <i>Andesitic conglomerate</i> )
 Dos Palos Alluvium	 Valley Springs Formation ( <i>Rhyolitic tuff and sedimentary rocks</i> )
 Alluvial fan deposits	 Ione Formation ( <i>Quartzose sandstone and kaolinitic clay; mostly nonmarine</i> )
 San Luis Ranch Alluvium	 "Auriferous" Gravels
 Patterson Alluvium	 Locatelli Formation ( <i>Marine sandstone and conglomerate</i> )
 Turlock Lake Formation ( <i>Nonmarine sand, silt, and gravel</i> )	 Lower Cretaceous marine sandstone and shale
 Laguna Formation ( <i>Consolidated alluvium</i> )	 Granitic rocks
 Modesto Formation	 Gabbroic rocks
 Riverbank Formation	 Ultramafic rocks
 Los Banos Alluvium	 Mariposa Formation ( <i>Slate, graywacke, and conglomerate; marine</i> )
 North Merced Gravel ( <i>Thin pediment veneer</i> )	 Salt Springs and Merced Falls Slates
 Jasper Point Formation ( <i>Chert, tuff, pillow basalt; marine</i> )	 Jurassic(?) metasedimentary rocks
 Metasedimentary rocks*	 Copper Hill Volcanics
 Crystalline limestone and dolomite*	 Logtown Ridge Volcanics
 Calaveras Complex ( <i>Metasedimentary rocks</i> )	 Gopher Ridge Volcanics
 Metavolcanic rocks*	 Penon Blanco Volcanics
 Table Mountain Latite	 Jurassic metavolcanic rocks

## Santa Cruz, Mariposa, and Fresno Quadrangles

 Alluvium	 Eocene nonmarine
 Stream channel deposits	 Eocene marine
 Fan deposits	 Tertiary volcanic: $Tv^r$ —rhyolite; $Tv^a$ —andesite; $Tv^b$ —basalt; $Tv^p$ —pyroclastic rocks
 Basin deposits	 Upper Jurassic marine
 Pleistocene nonmarine	 Pre-Cretaceous metamorphic rocks (ls = limestone or dolomite)
 Plio-Pleistocene nonmarine	 Pre-Cretaceous metasedimentary rocks
 Pleistocene volcanic: $Qpv^r$ —rhyolite; $Qpv^a$ —andesite; $Qpv^b$ —basalt; $Qpv^p$ —pyroclastic rocks	 Pre-Cenozoic granitic and metamorphic rocks
 Tertiary nonmarine	 Paleozoic metavolcanic rocks
 Permian metavolcanic rocks	 Carboniferous metavolcanic rocks

Geologic Map compiled from:

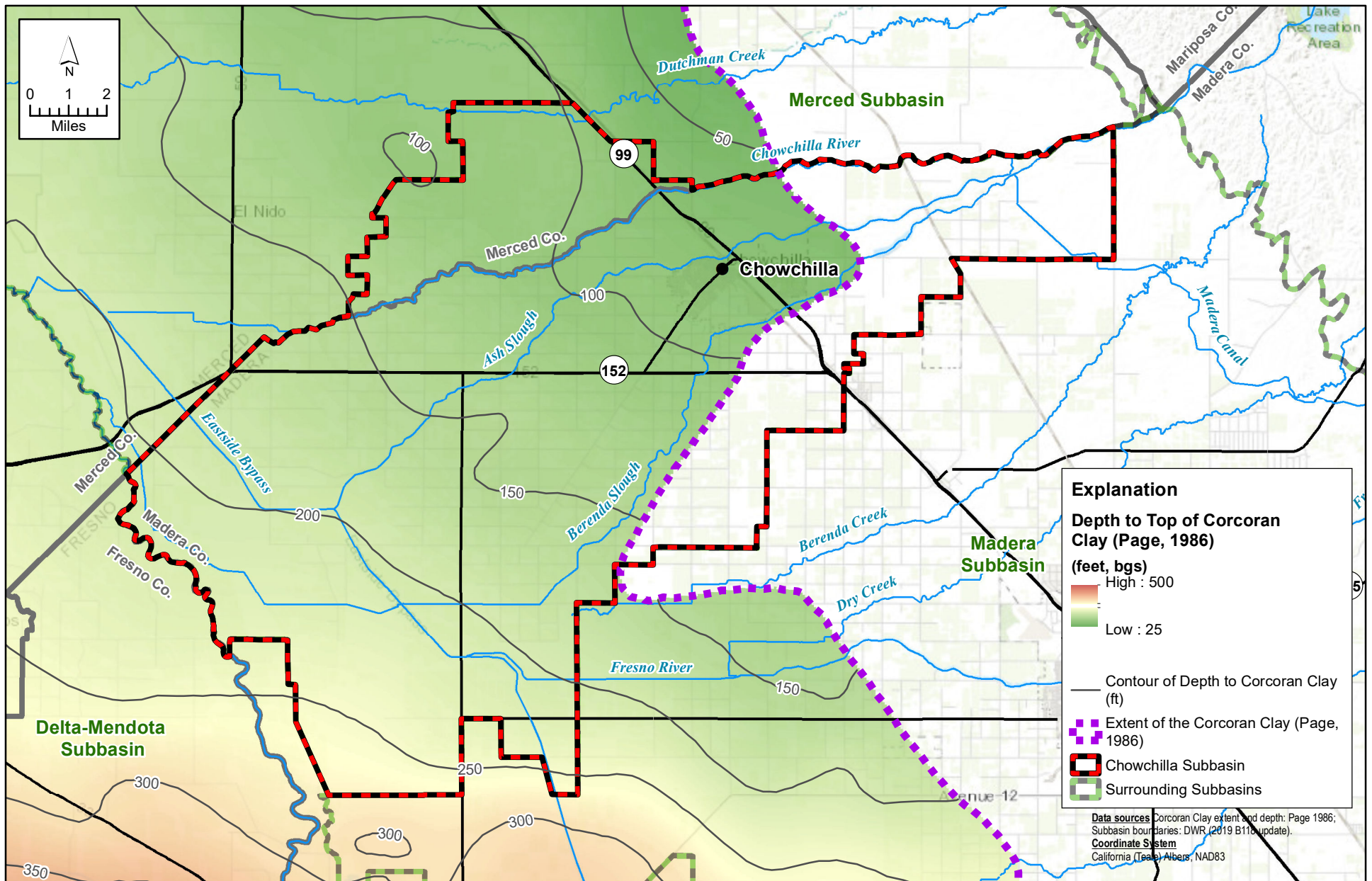
1. Wagner, D.L., Bortugno, E.J., and Mc Junkin, R.D., 1991, Geologic Map of the San Francisco - San Jose Quadrangle, California Geological Survey, Regional Geologic Map No. 5A, 1:250,000 scale.
2. Jennings, C.W. and Strand, R.G., 1958, Geologic Atlas of California - Santa Cruz Quadrangle, California Geological Survey, Geologic Atlas of California Map No. 020, 1:250,000 scale.
3. Strand, R.G., 1967, Geologic Atlas of California - Mariposa Quadrangle, California Geological Survey, Geologic Atlas of California Map No. 009, 1:250,000 scale.
4. Matthews, R.A. and Burnett, J.L., 1965, Geologic Atlas of California - Fresno Quadrangle, California Geological Survey, Geologic Atlas of California Map No. 005, 1:250,000 scale.

X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-13 Chowchilla Subbasin Surficial Geologic Map Explanation.mxd



## FIGURE 2-13 EXPLANATION Surficial Geology Map Explanation

Chowchilla Subbasin  
Groundwater Sustainability Plan

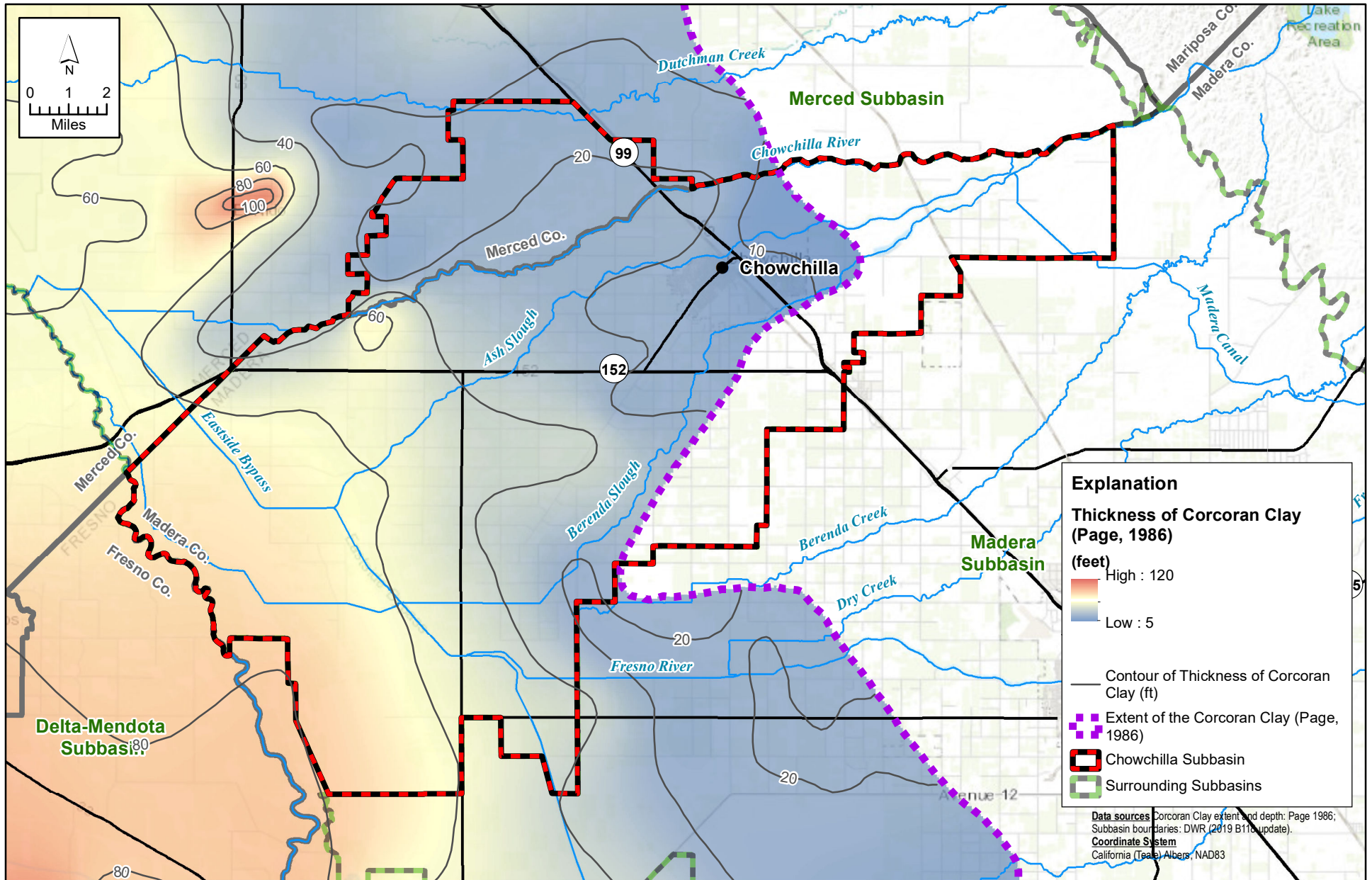


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-14 Chowchilla Subbasin Extent and Depth of the Corcoran Clay.mxd



**FIGURE 2-14**  
**Extent and Depth of the Corcoran Clay:**  
**After Page (1986)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

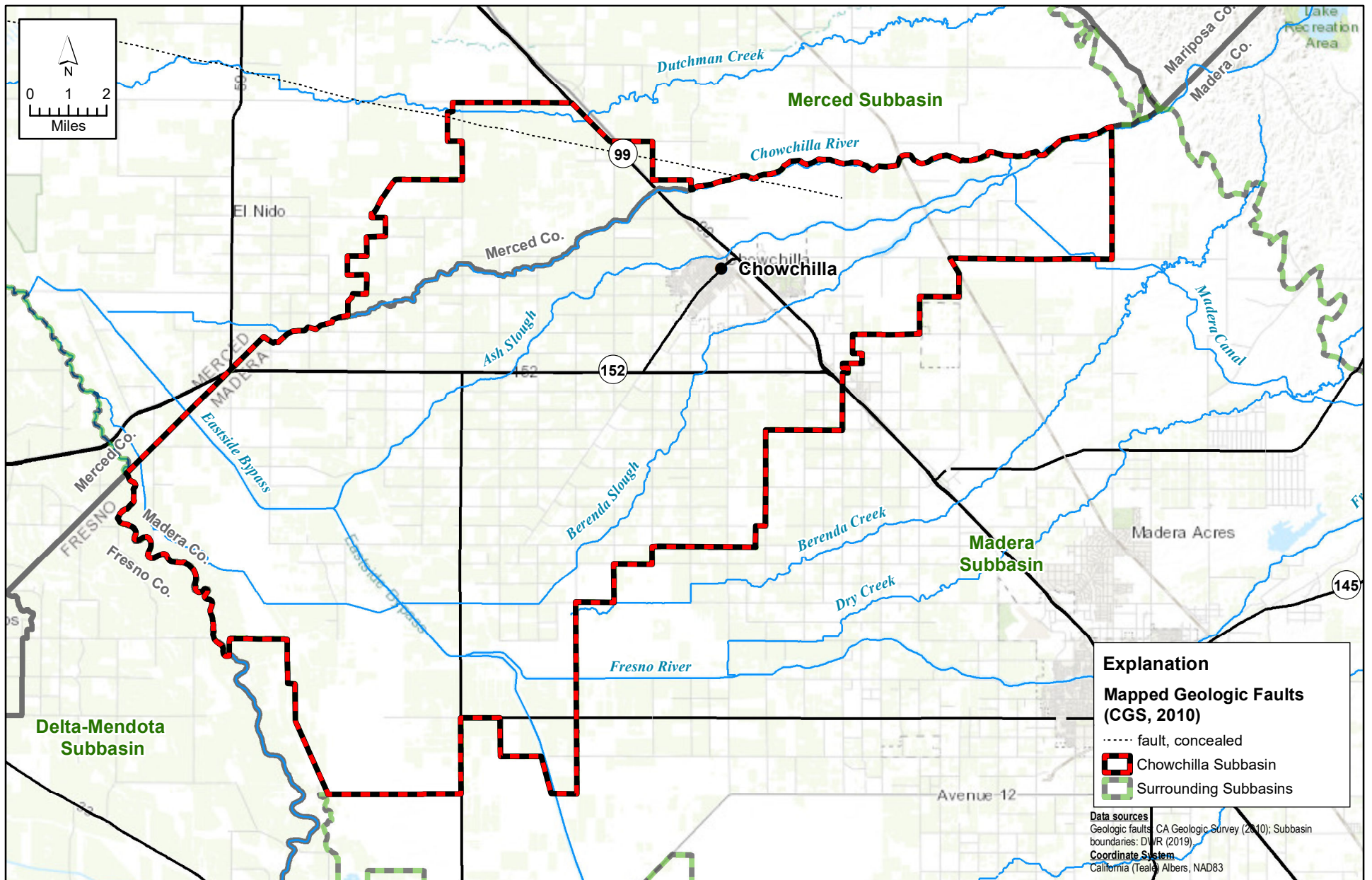


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-15 Chowchilla Subbasin Thickness of the Corcoran Clay.mxd



**FIGURE 2-15**  
**Thickness of the Corcoran Clay:**  
**After Page (1986)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



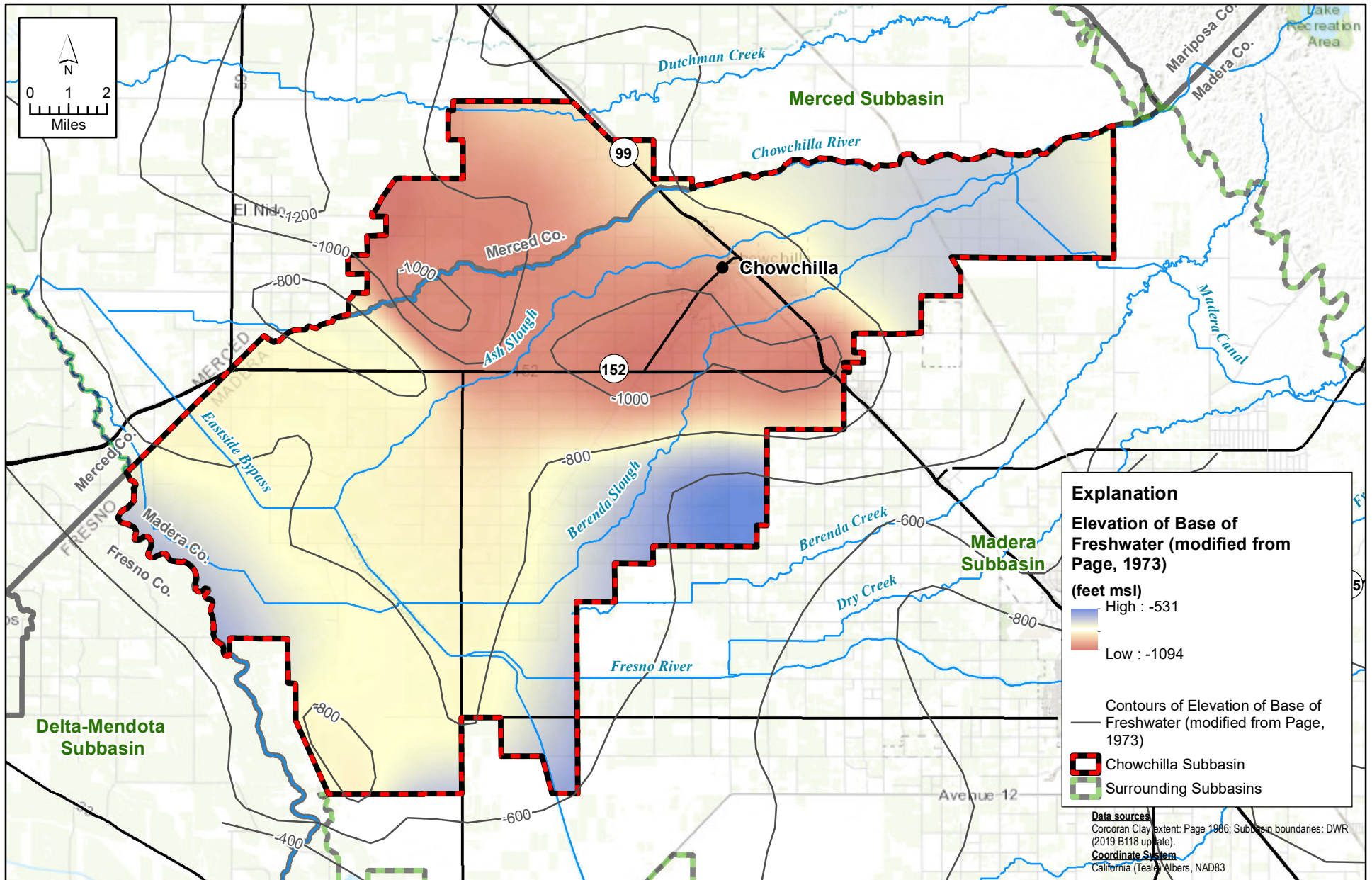
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-16 Chowchilla Subbasin Geologic Fault Map.mxd

**FIGURE 2-16**

**Geologic Fault Map**





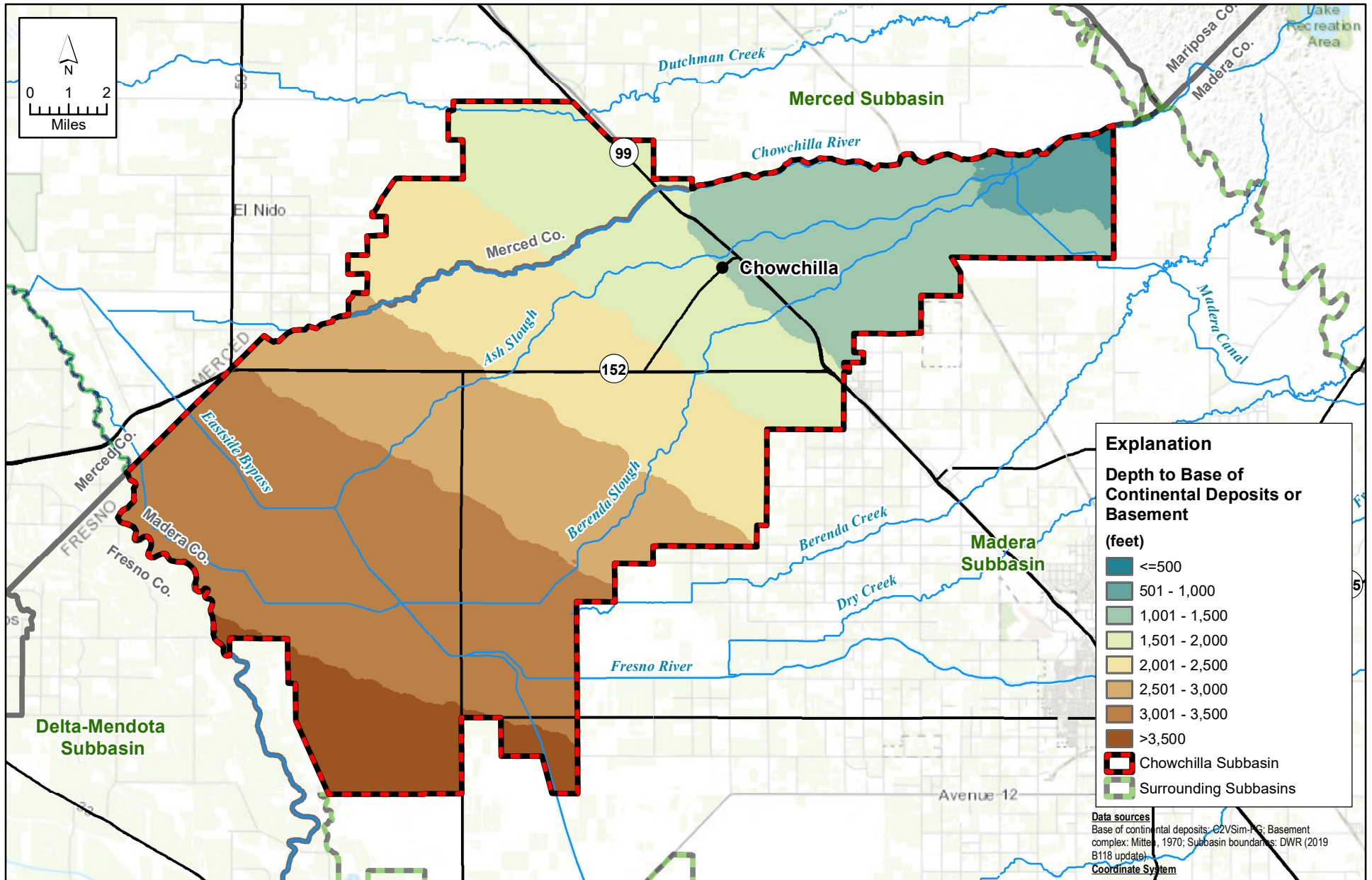


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-17 Chowchilla Subbasin Base of Freshwater Map.mxd



**FIGURE 2-17**  
**Elevation of Base of Freshwater:**  
**Modified from Page (1973)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

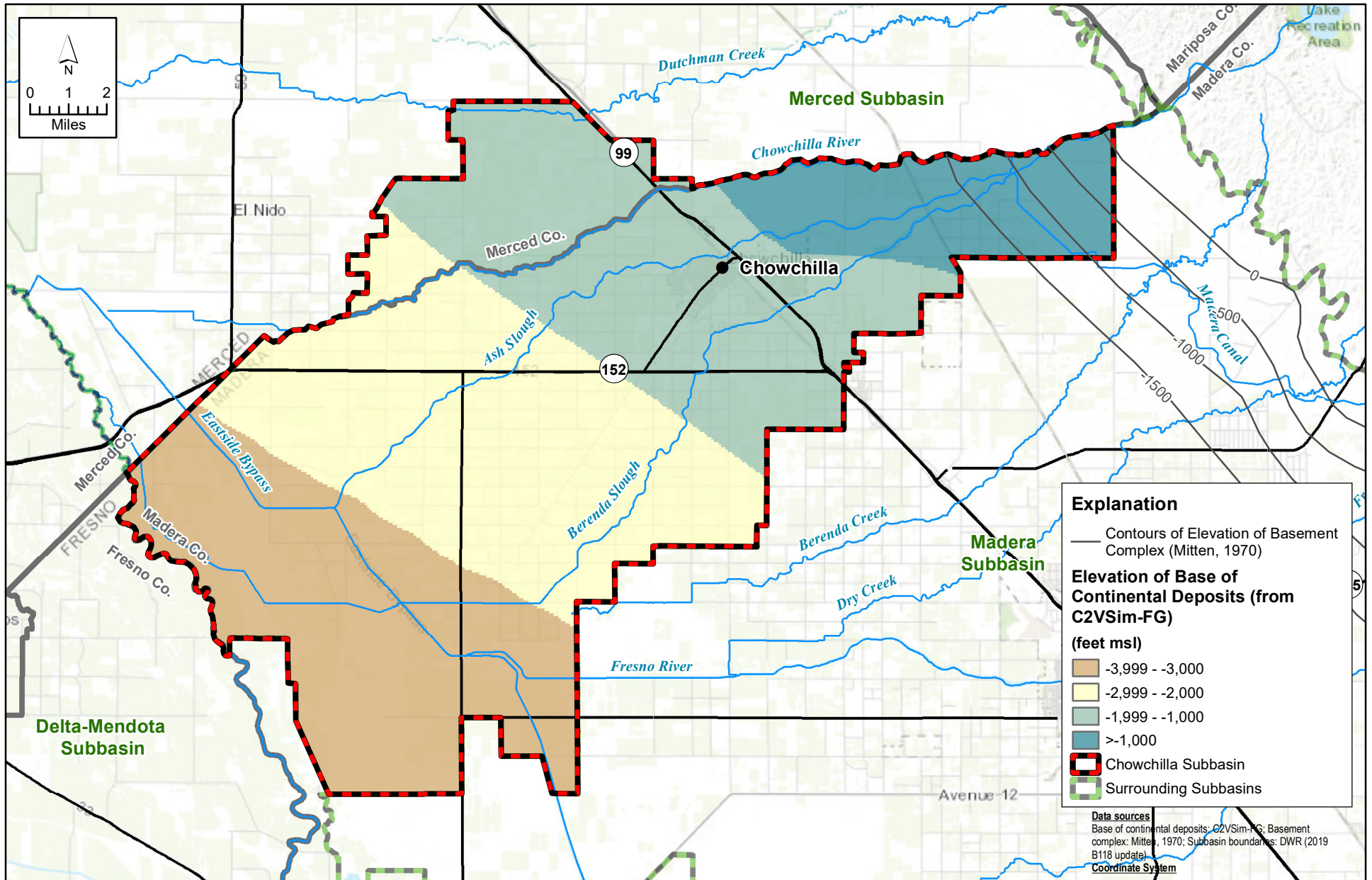


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-18 Chowchilla Subbasin Depth to Basement Map.mxd



**FIGURE 2-18**  
**Depth to Base of Continental Deposits or Basement Complex**

*Chowchilla Subbasin  
 Groundwater Sustainability Plan*

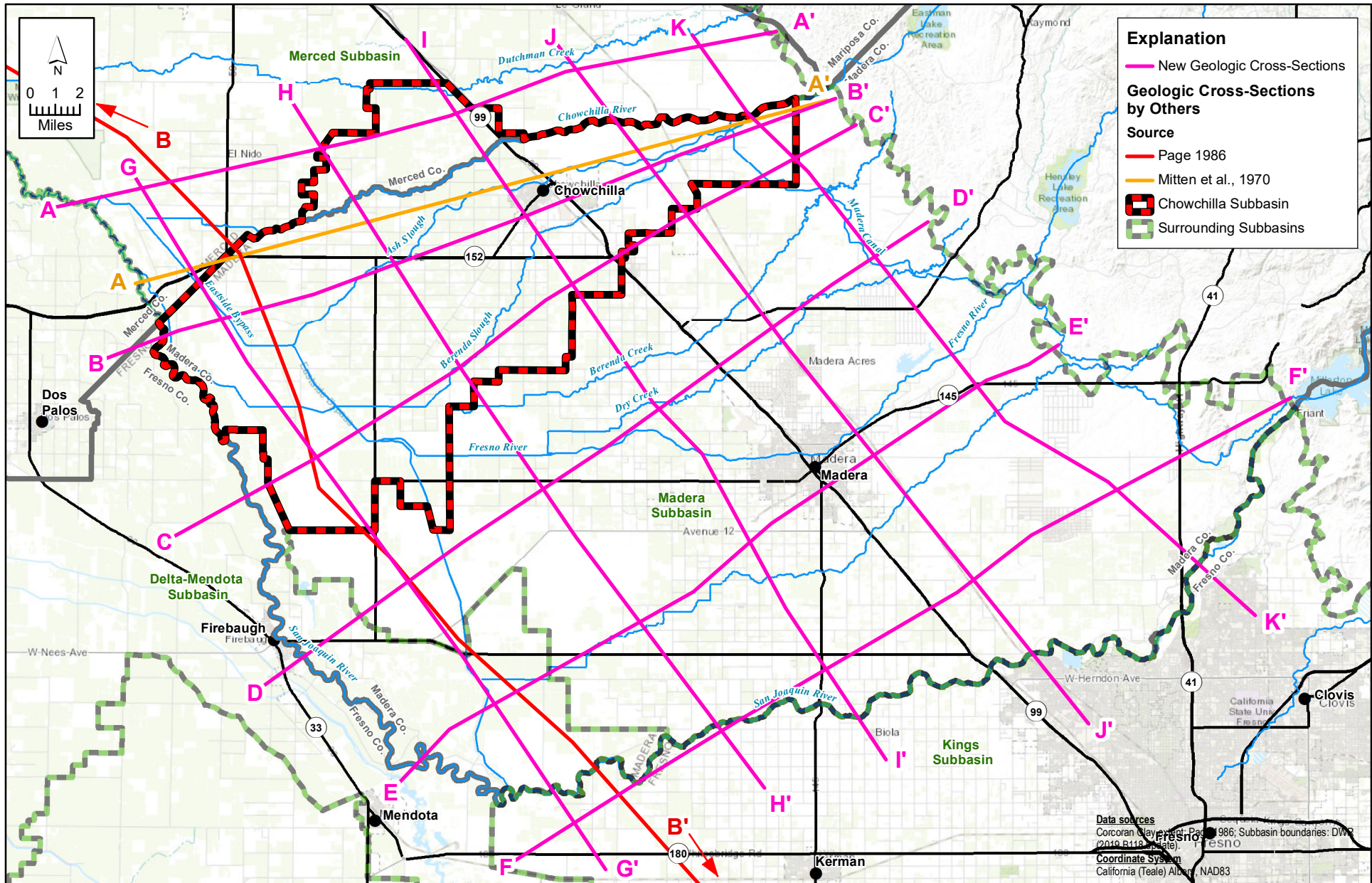


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-19 Chowchilla Subbasin Elevation of Basement Complex Map.mxd

**FIGURE 2-19**  
**Elevation of Top of Basement Complex (from Mitten, 1970) and**  
**Bottom of Continental Deposits (from C2VSim-FG, 2018)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*





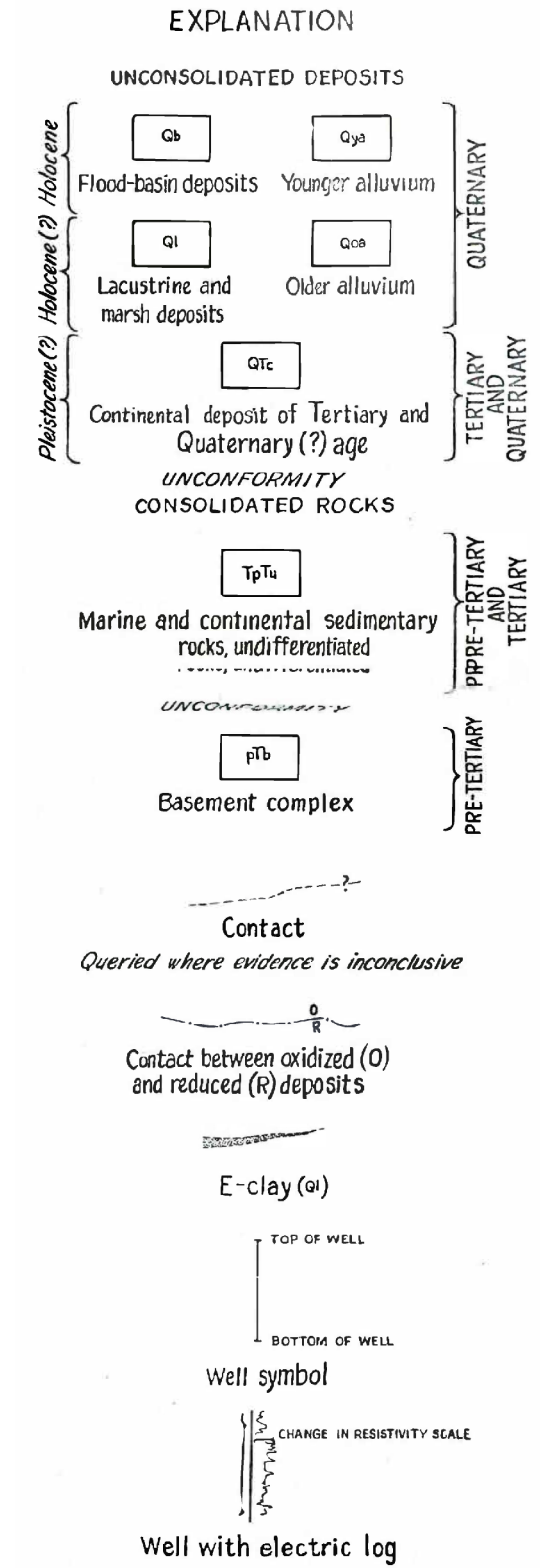
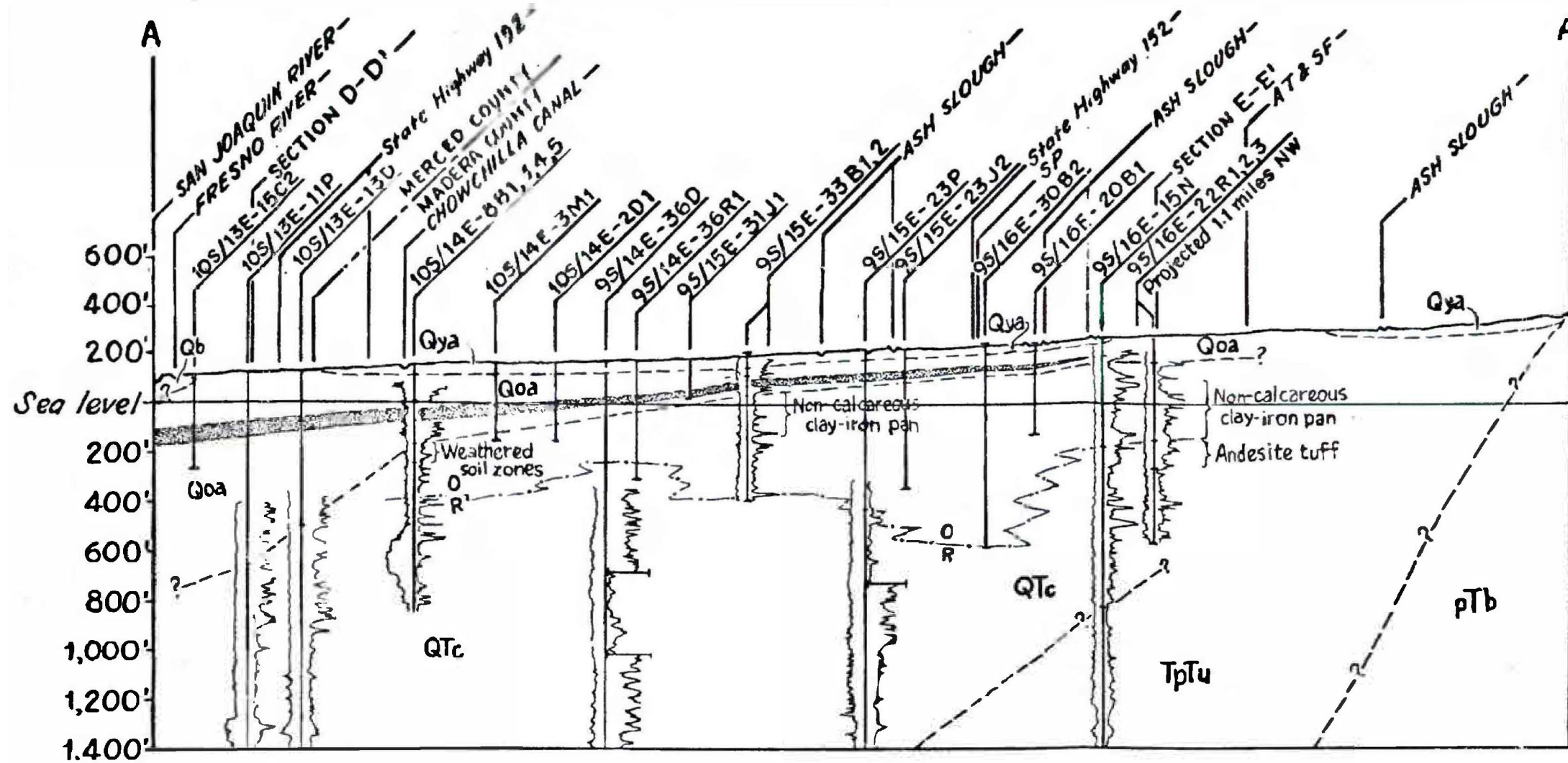
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-20 Chowchilla Subbasin CrossSection Location Map.mxd

**FIGURE 2-20**

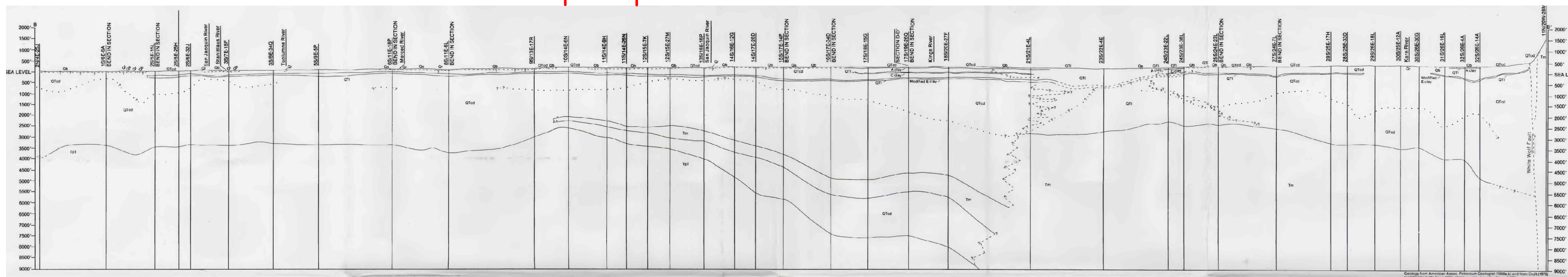
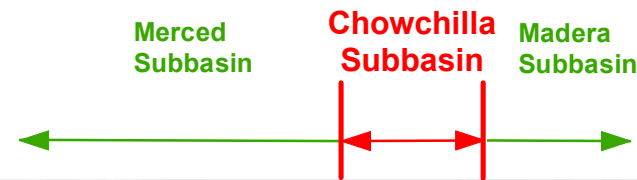
**Geologic Cross-Section Location Map**

*Chowchilla Subbasin  
 Groundwater Sustainability Plan*

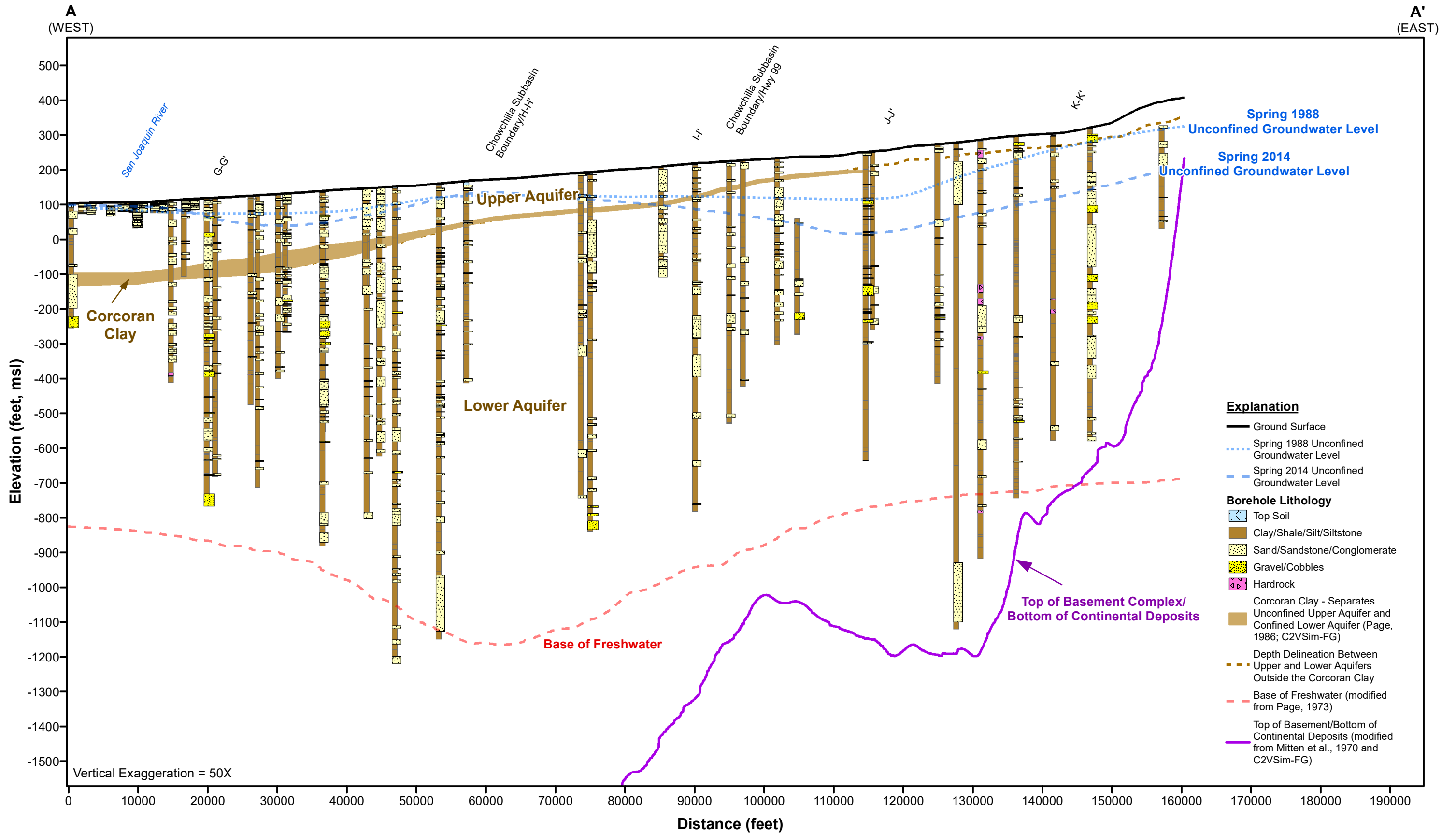




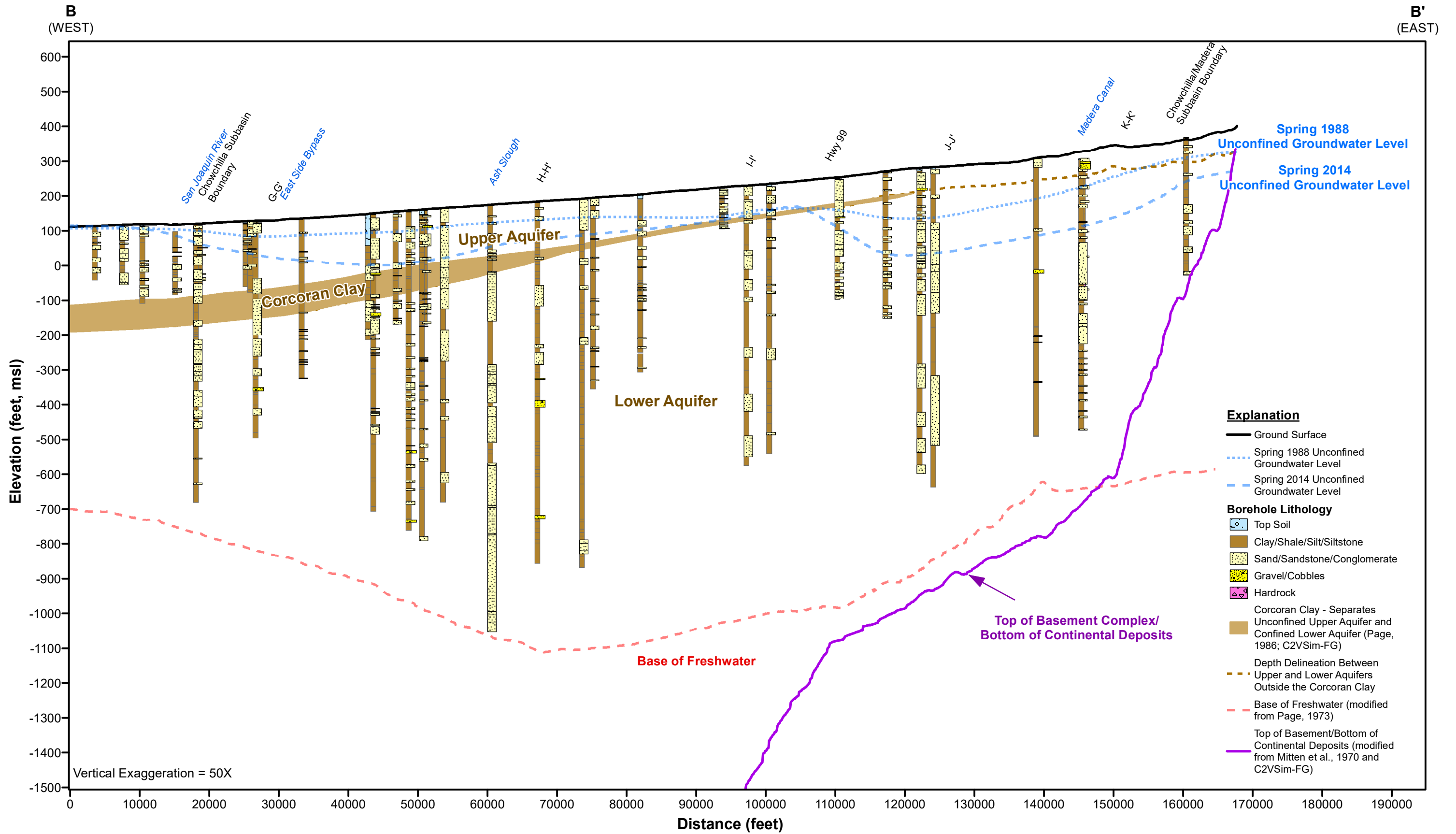
Horizontal scale same as scale of maps;  
vertical scale X 26.4. Datum is  
mean sea level



SAN JOAQUIN VALLEY SECTION B - B' and D - D'		B - B'
Qs	<b>Sand dunes (Holocene)</b> Windblown sand and dune sand	Description at left
Qb	<b>Flood-basin deposits (Holocene)</b> Clay, silt, and some sand;	Near northern end of section consist of muck, peat, and other organic soils
Qr	<b>River deposits (Holocene)</b> Gravel, sand, silt, and minor amounts of clay; deposited along channels, flood plains, and natural levees of main streams.	Description at left
QTl	<b>Lacustrine and marsh deposits (Pliocene to Holocene)</b> Clay, silt, and some sand; in subsurface include three widespread clays: A clay (Pleistocene and Holocene?), C clay (Pleistocene); and modified E clay (Pleistocene), includes Corcoran Clay Member of Tulare Formation	Description at left
QTcd	<b>Continental rocks and deposits (Oligocene to Holocene)</b> Heterogeneous mix of generally poorly sorted clay, silt, sand, and gravel, some beds of claystone, siltstone, sandstone, and conglomerate...	On this section, principal unit, continental rocks and deposits (Miocene to Holocene); in northern part of section may include continental rocks and deposits (Miocene and Pliocene)-mostly Mehrten Formation or an equivalent, and continental rocks and deposits (Oligocene and Miocene)-mostly Valley Springs Formation or an equivalent. Include continental rocks and deposits (Miocene and Pliocene)-chiefly the Chanac Formation (Miocene) at extreme southern end of section, and the Zilch Formation of informal subsurface usage, which is considered to be the continental equivalent of the Marine Temblor Formation (Oligocene and Miocene)
Tm	<b>Marine rocks and deposits (Eocene, Oligocene, Miocene, and Pliocene)</b> Sand, clay, silt, sandstone, shale, mudstone, and siltstone. On these section include marine rocks and deposits of Miocene and Pliocene age only	Description at left
TpT	<b>Continental and marine rocks and deposits (Pre-Tertiary to Oligocene)</b> Continental rocks and deposits of clay, shale, sand, sandstone and conglomerate; marine rocks and deposits of clay, shale, sandstone, and conglomerate...	On this section include marine rocks and deposits of Eocene and Oligocene age, also include some Paleocene marine rocks. Include continental rocks and deposits (Eocene to Miocene)- chiefly Walker Formation (Eocene to Miocene) at depths off the section - greater than 13,000ft, where the Walker Formation underlies Eocene, marine sediments. Include marine rocks (Pre-Tertiary)
pTgm	<b>Granitic and metamorphic rocks (Pre-Tertiary)</b> Granitic rocks with some mafic intrusive rocks, and metasedimentary and metavolcanic rocks. Include granitic rocks (Pre-Tertiary) and metamorphic rocks (Pre-Tertiary)	Not present

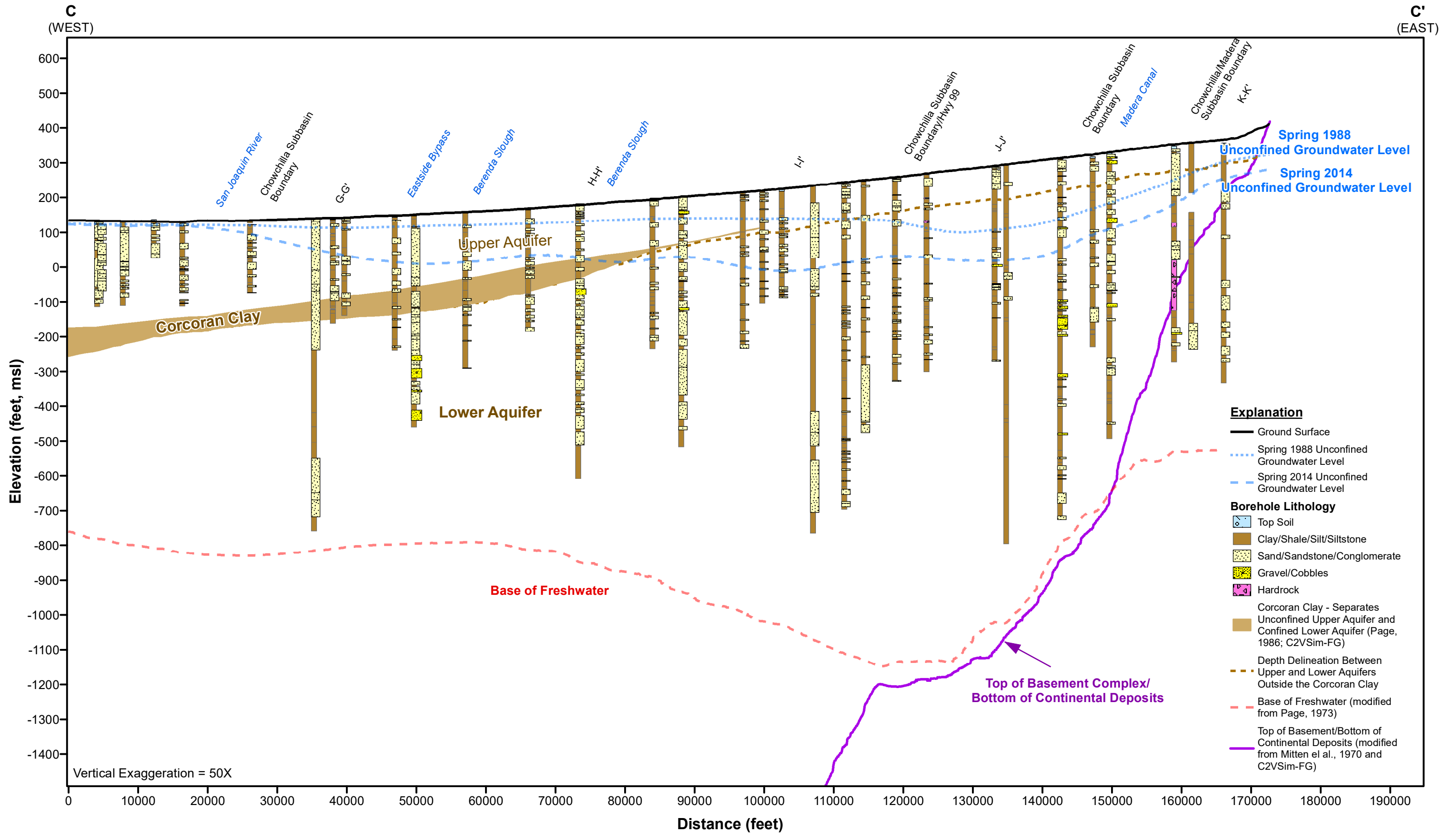


X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-24 CrossSection\_LSCE\_A.mxd

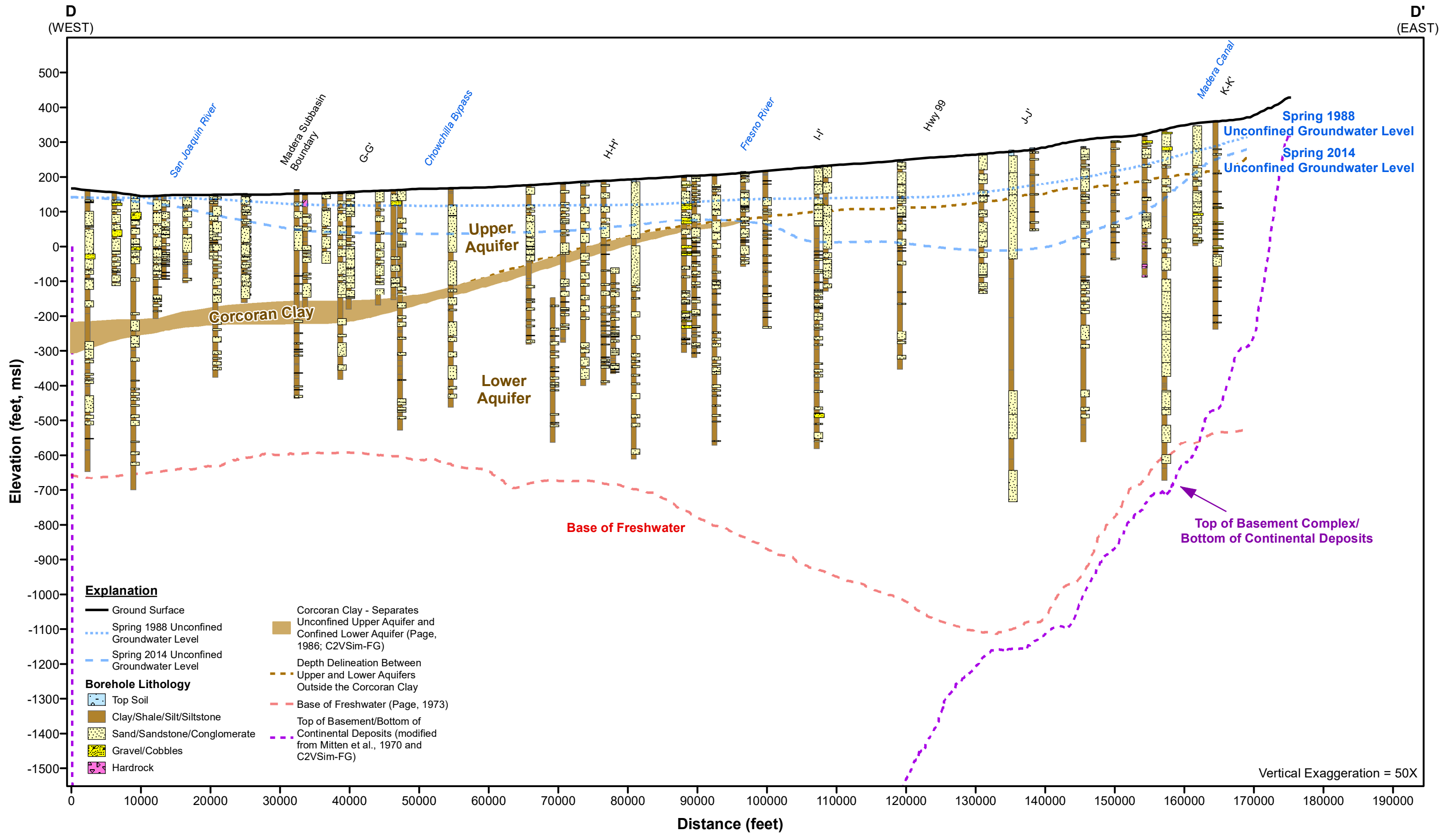


X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-25 CrossSection\_LSCE\_B.mxd

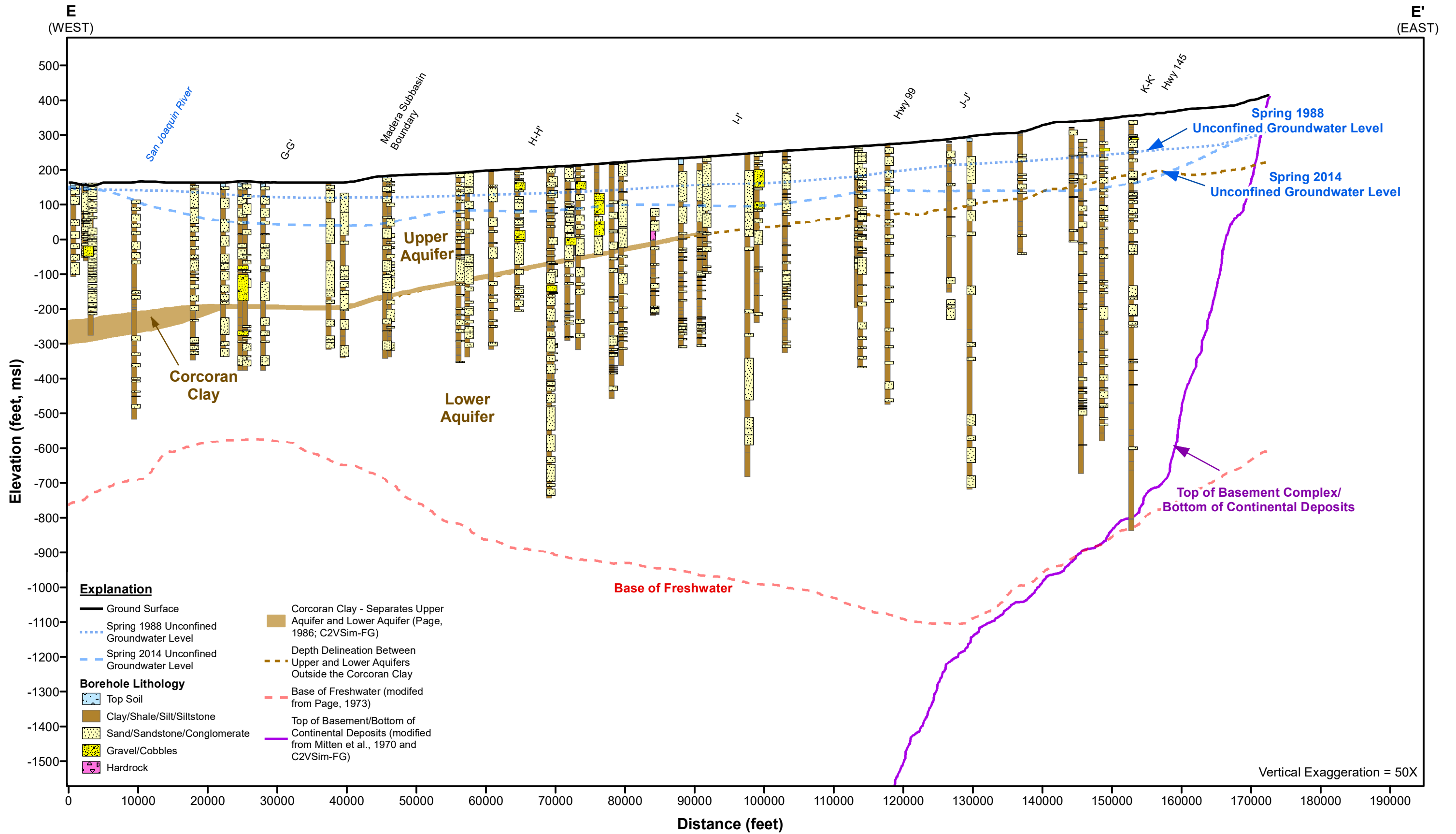




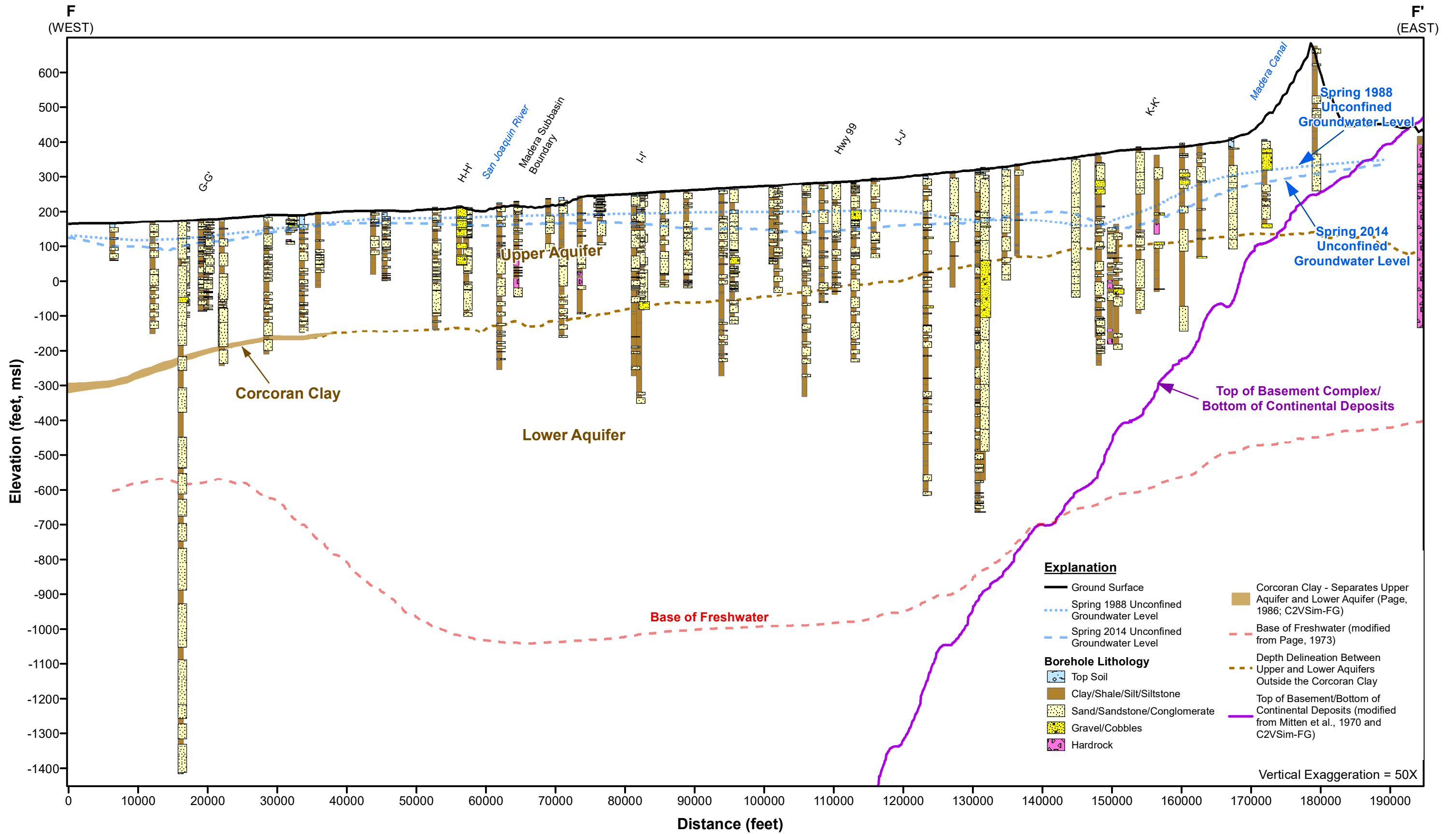
X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-26 CrossSection\_LSCE\_C.mxd

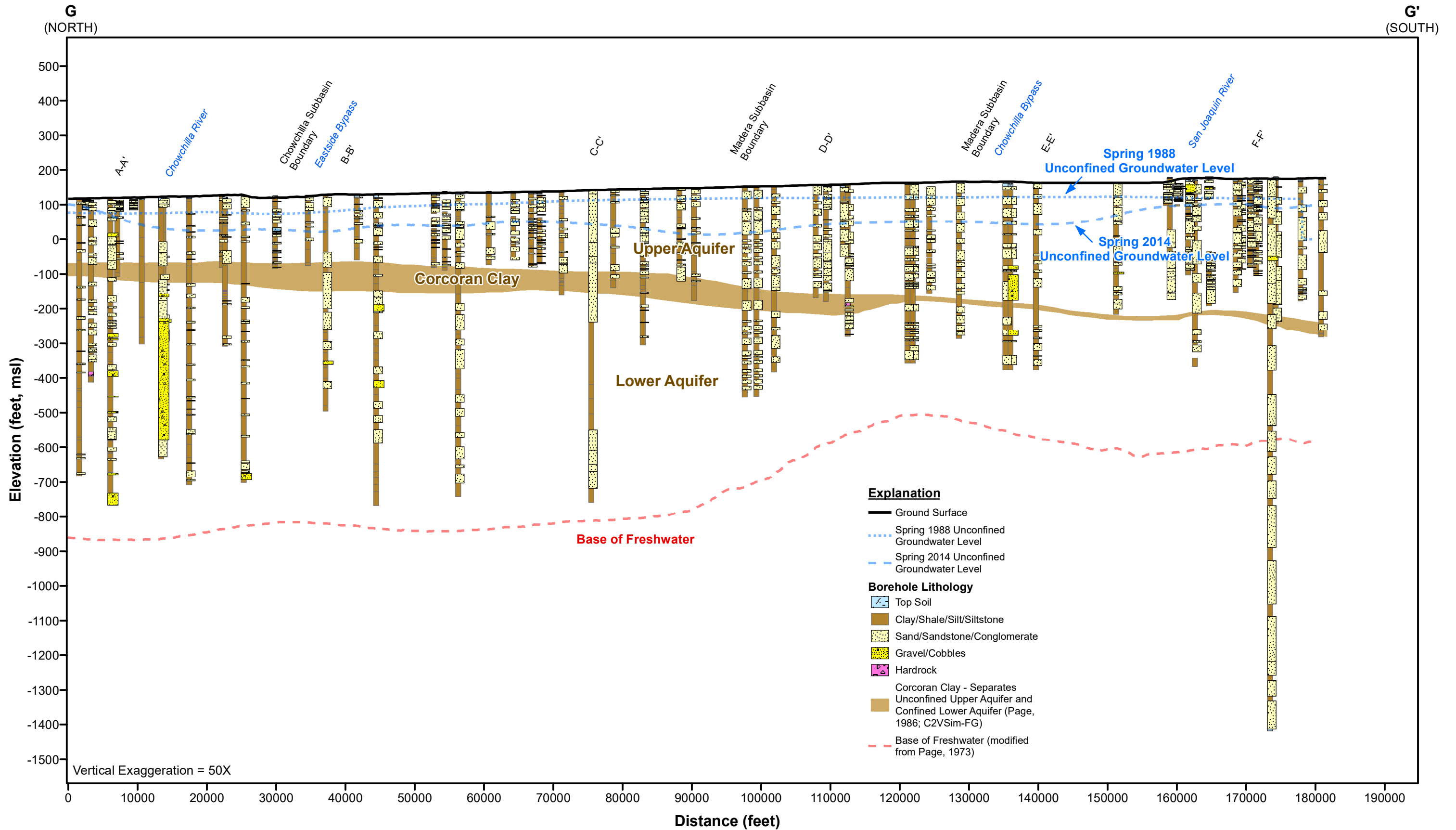


X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-27 CrossSection\_LSCE\_D.mxd

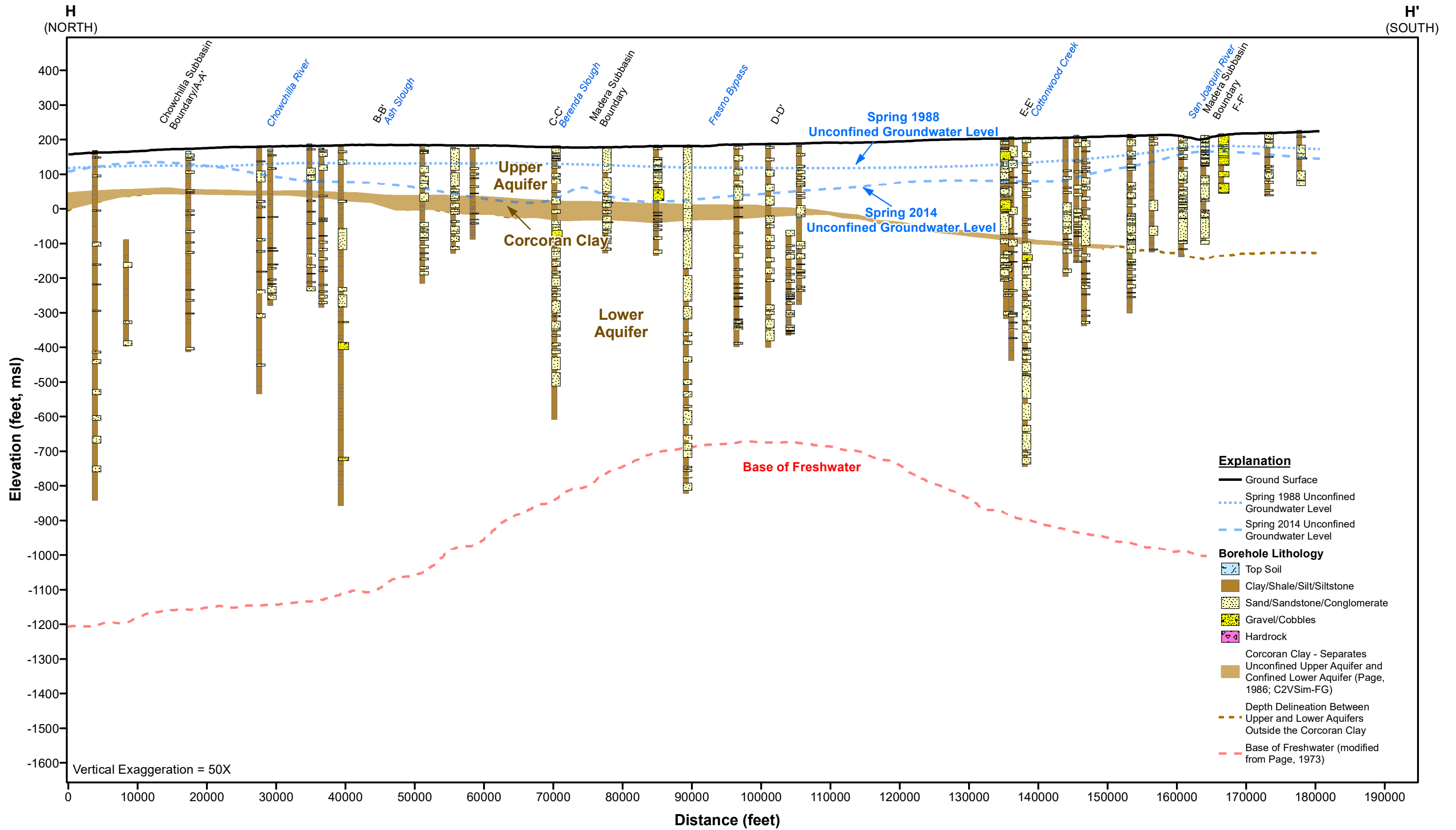


X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-28 CrossSection\_LSCE\_E.mxd





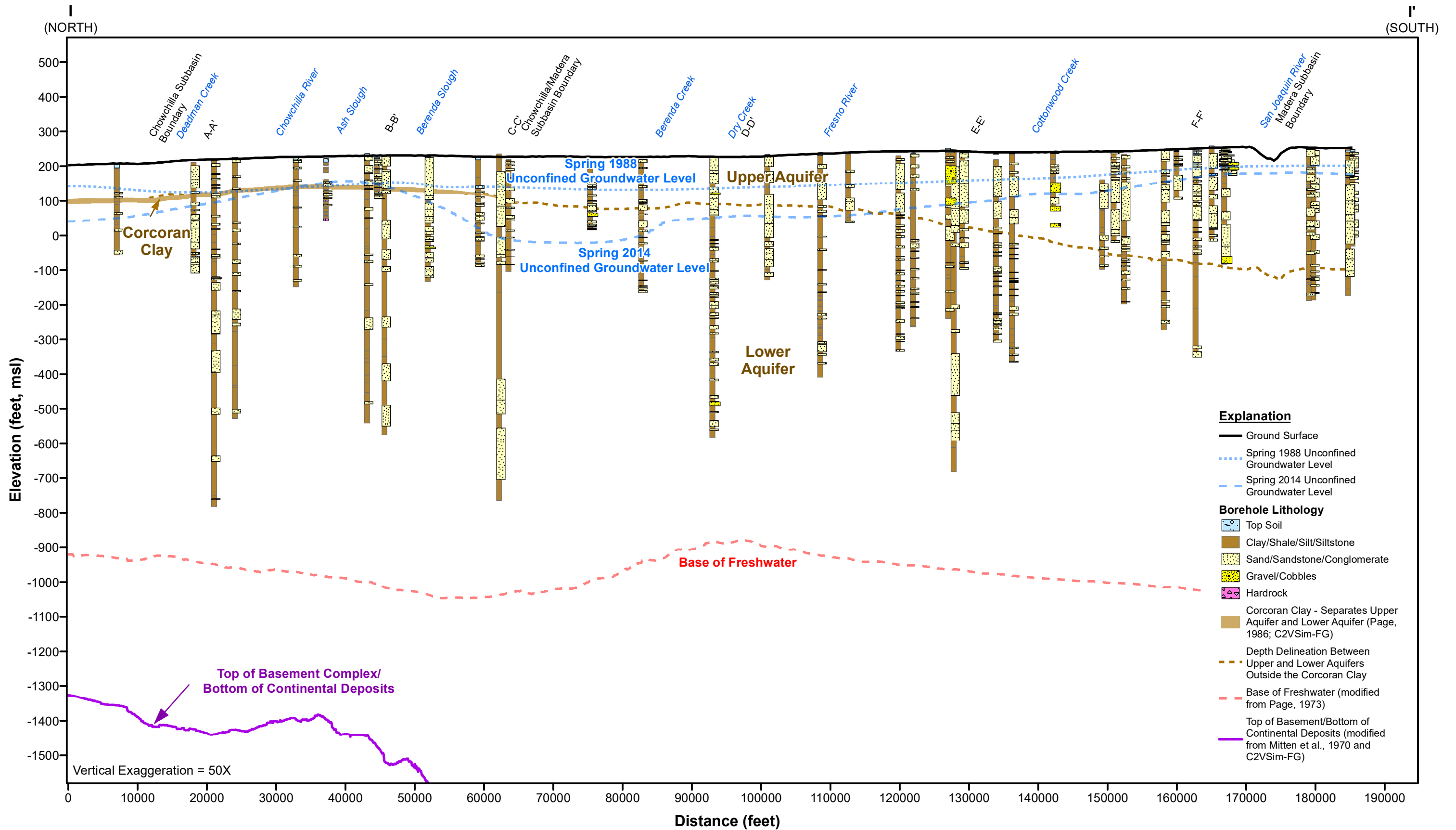
X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-30 CrossSection\_LSCE\_G.mxd



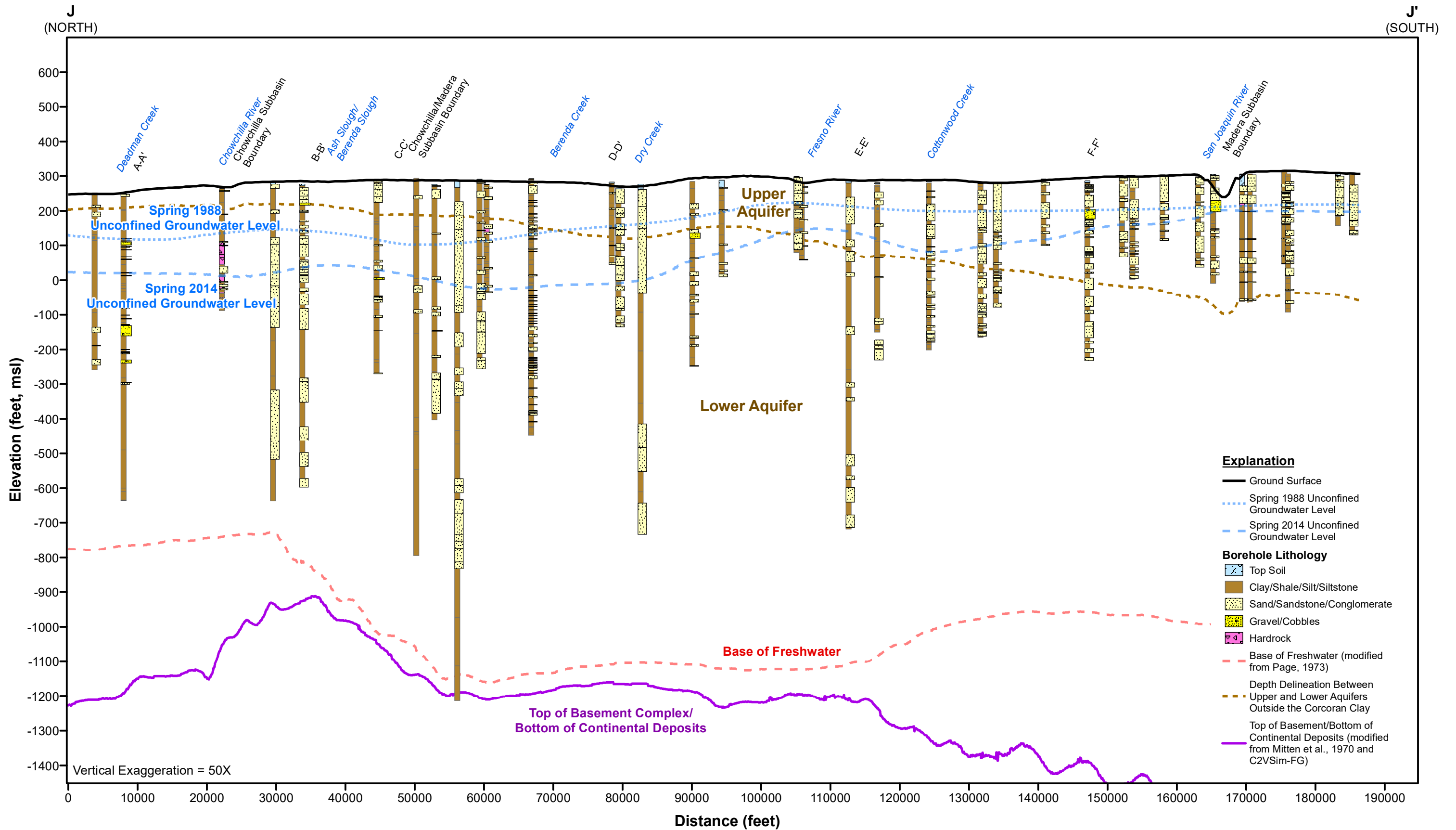
X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-31 CrossSection\_LSCE\_H.mxd

**FIGURE 2-30**

**Madera County Geologic Cross-Section H**

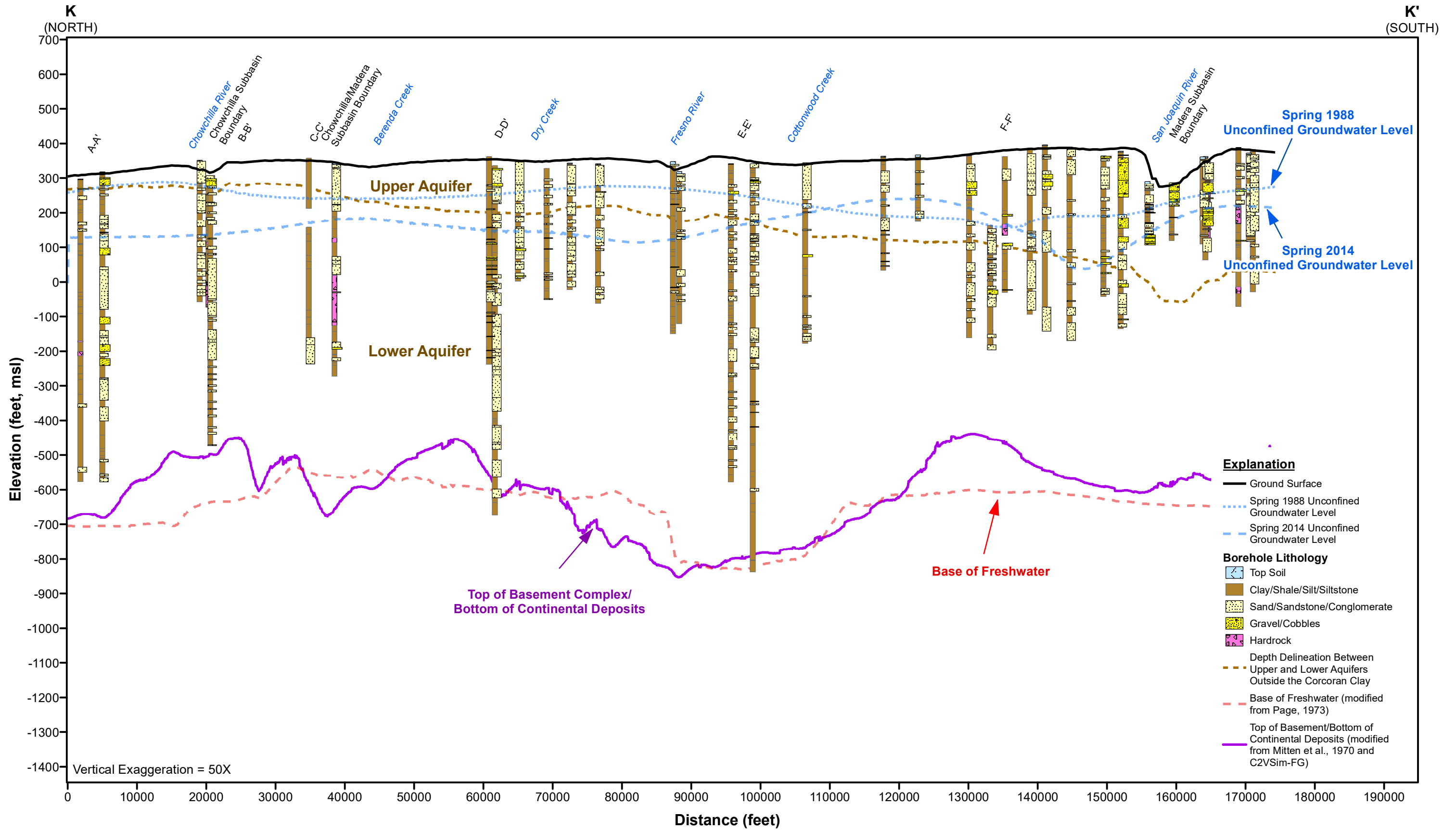


X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-32 CrossSection\_LSCE\_I.mxd

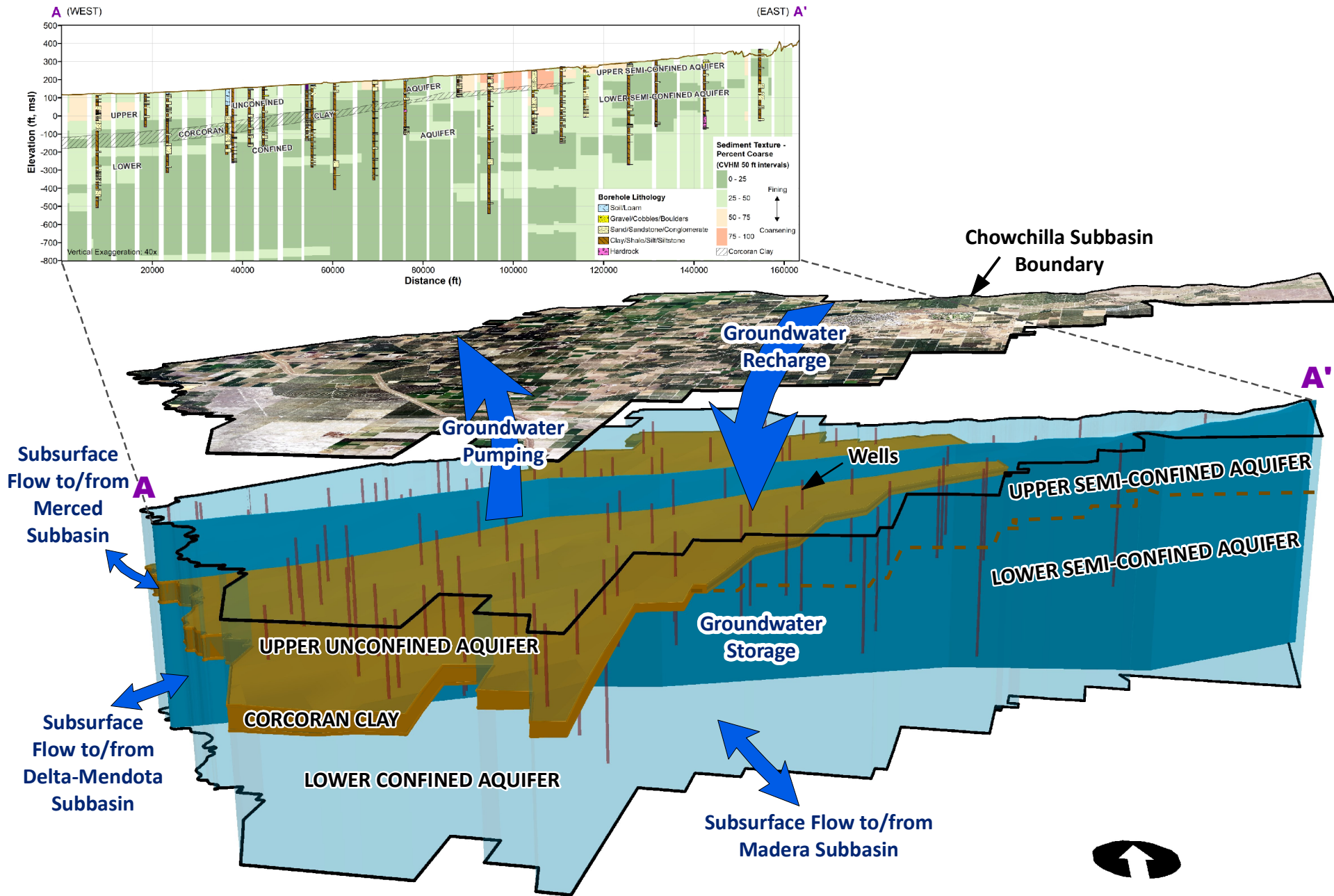


X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-33 CrossSection\_LSCE\_J.mxd





X:\2017\17-113 Madera Subbasin GSP Development\GIS\Map Files\REPORT map files\Chapter 2\Figure 2-34 CrossSection\_LSCE\_K.mxd



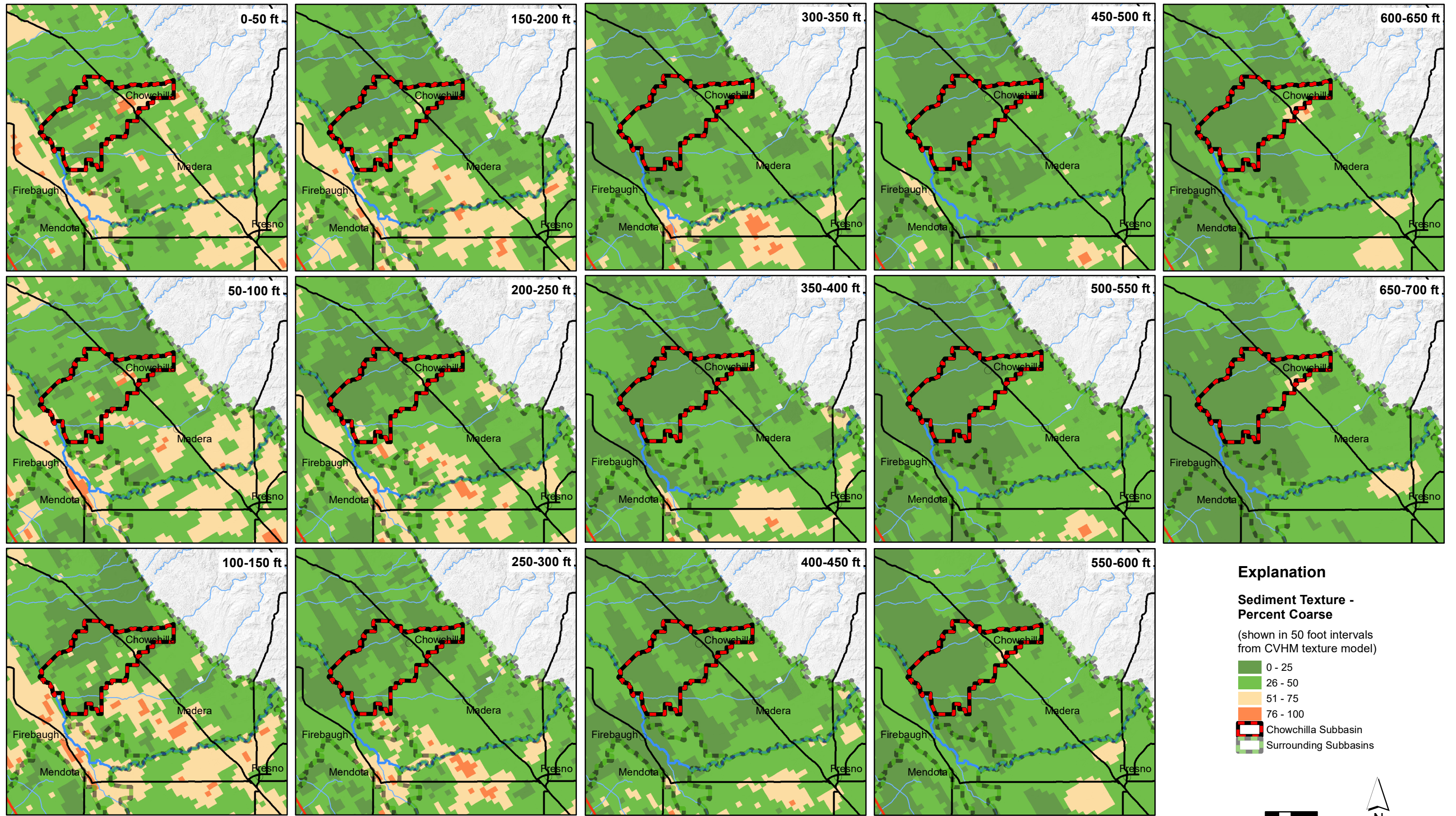
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-34 Chowchilla Subbasin Hydrogeologic Conceptual Diagram.mxd

FIGURE 2-34



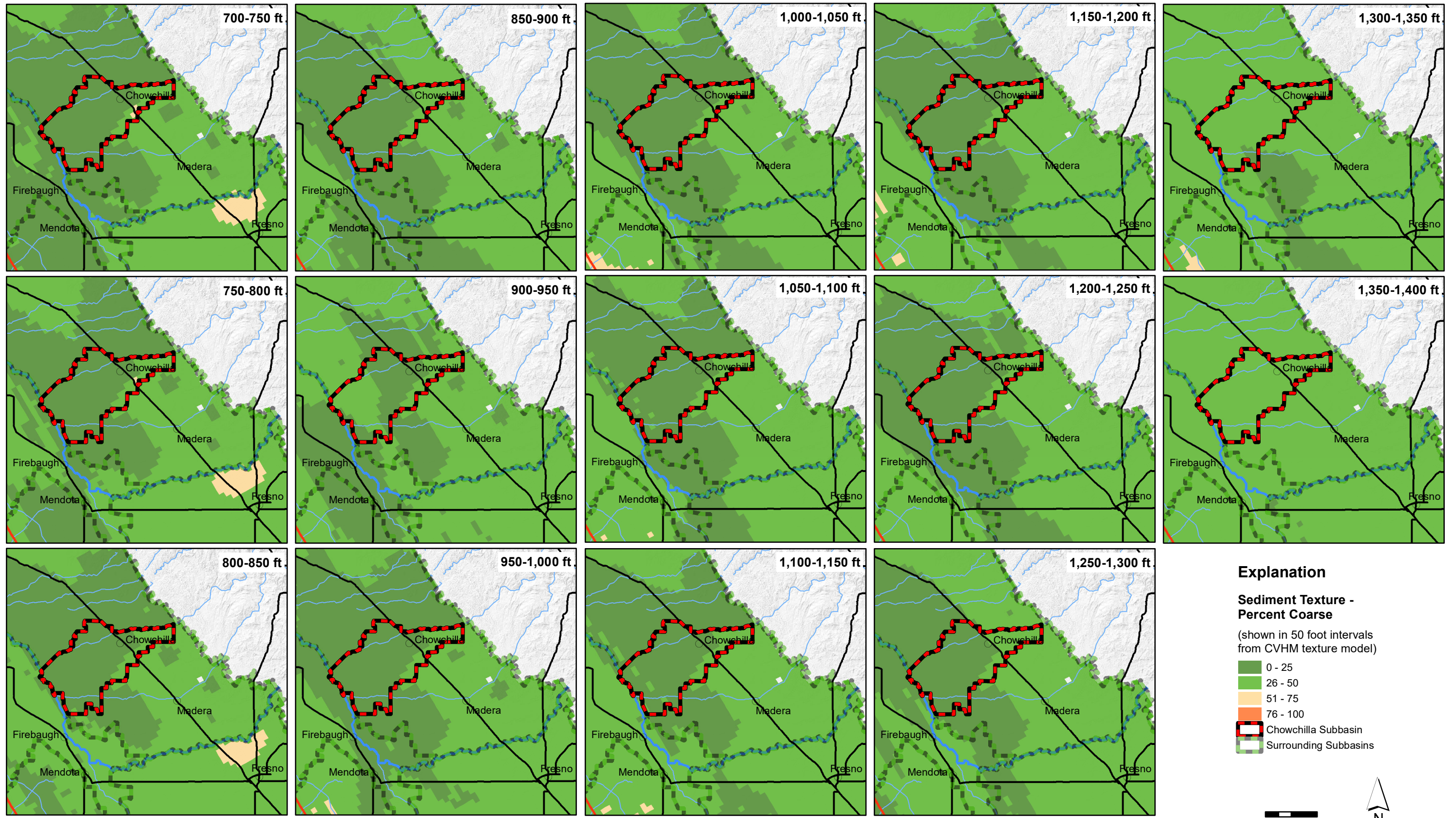
Chowchilla Subbasin Conceptual Hydrogeologic System

Chowchilla Subbasin  
Groundwater Sustainability Plan



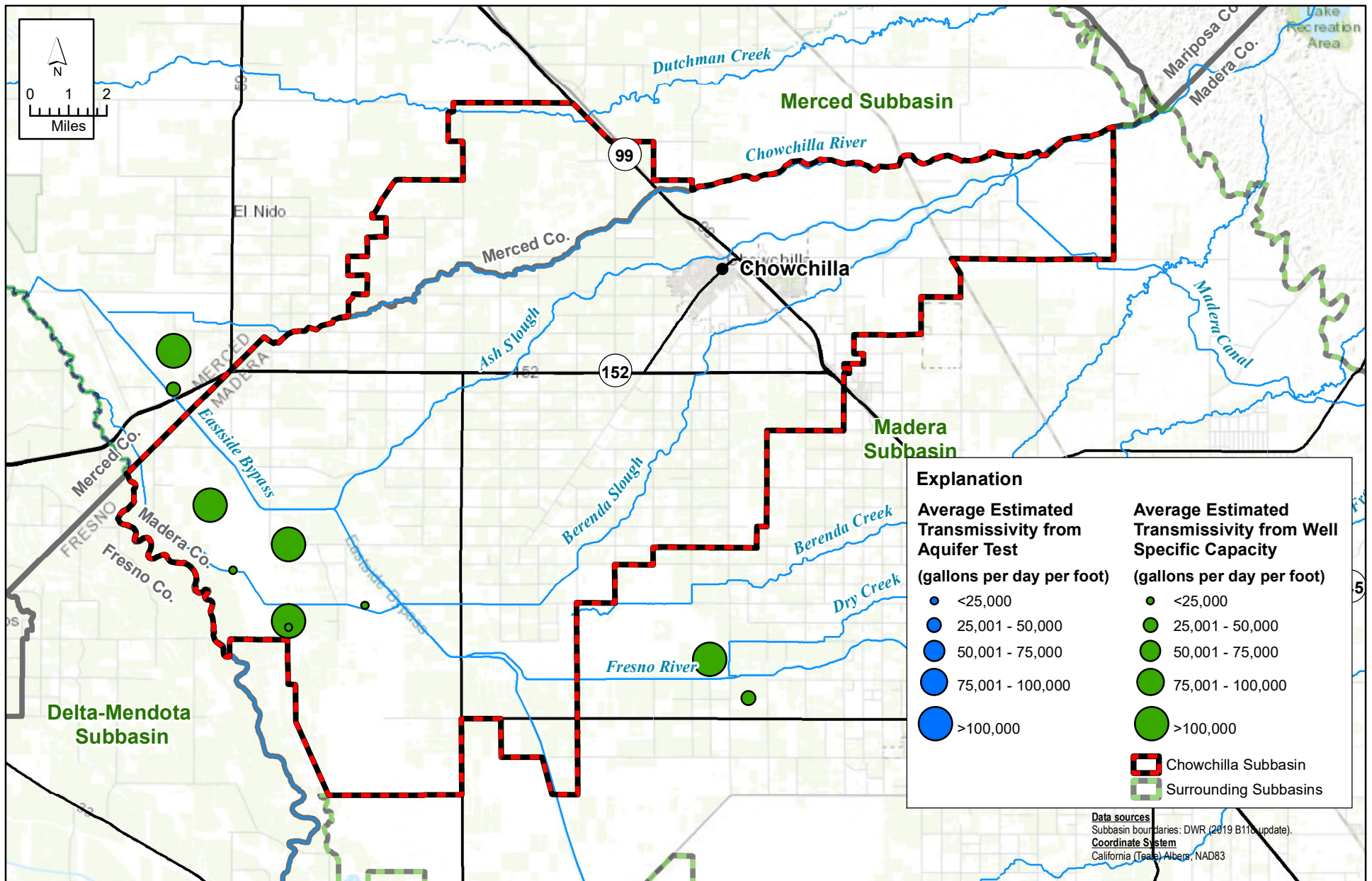
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-35 CVHM Sediment Texture Model 0 to 700.mxd

**FIGURE 2-35**  
**CVHM Sediment Texture Model: 0 to 700 feet**



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-36 CVHM Sediment Texture Model 700 to 1400.mxd

**FIGURE 2-36**  
**CVHM Sediment Texture Model: 700 to 1,400 feet**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

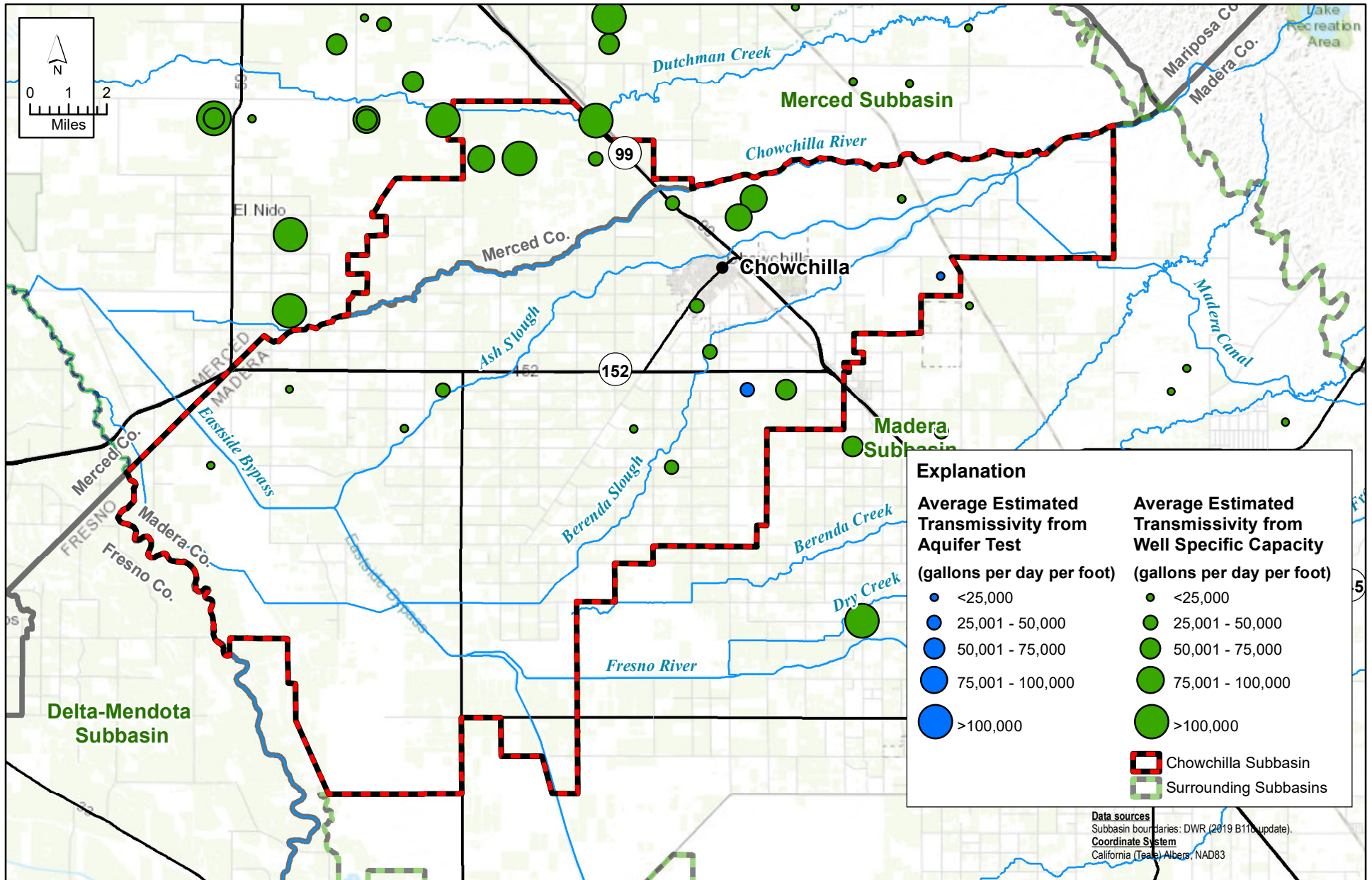


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-37 Chowchilla Subbasin Aquifer Property Data\_Upper.mxd



**FIGURE 2-37**  
**Map of Well Test Aquifer Property Data:**  
**Upper Aquifer**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

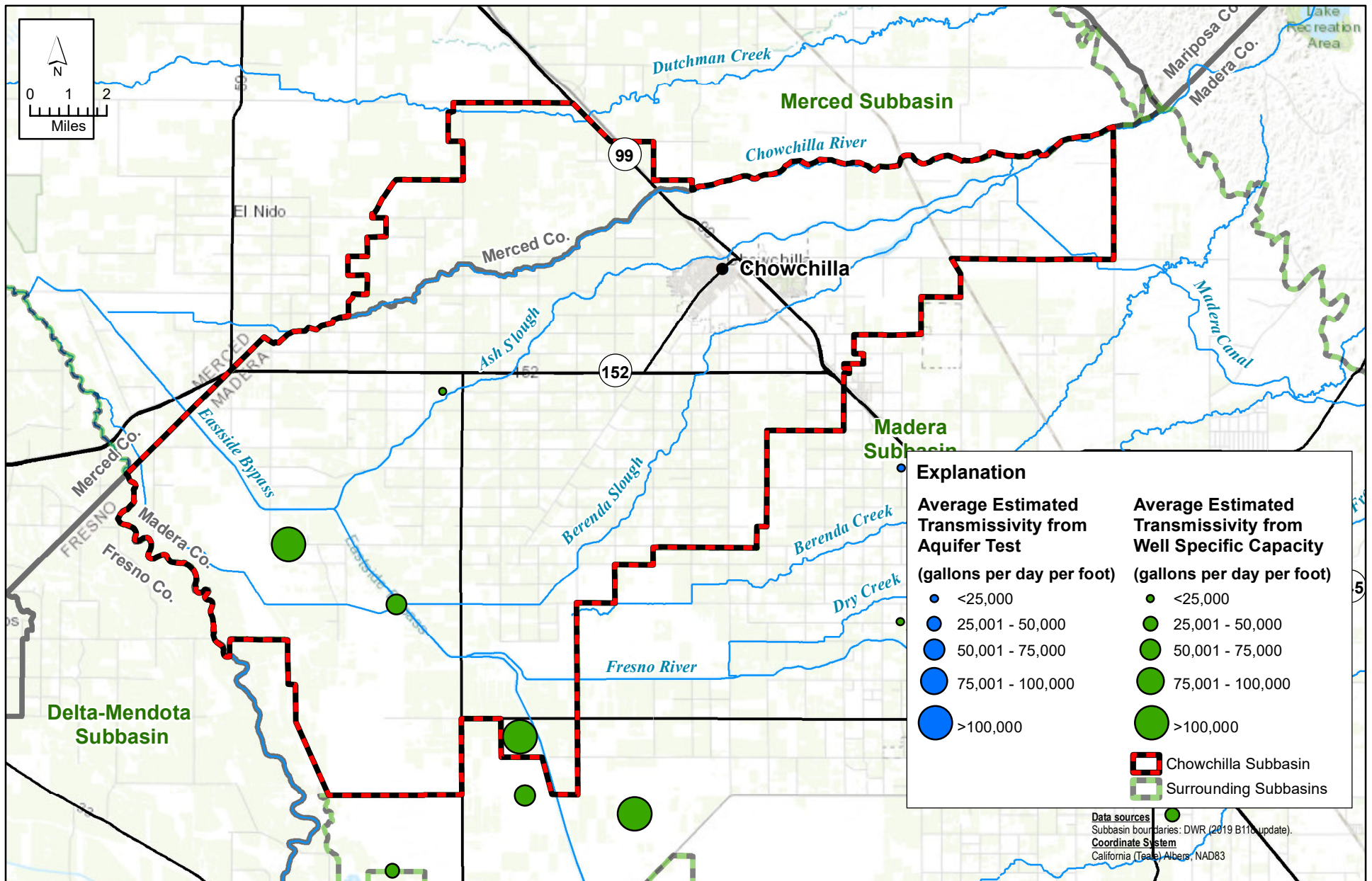


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-38 Chowchilla Subbasin Aquifer Property Data\_Lower.mxd



**FIGURE 2-38**  
**Map of Well Test Aquifer Property Data:**  
**Lower Aquifer**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

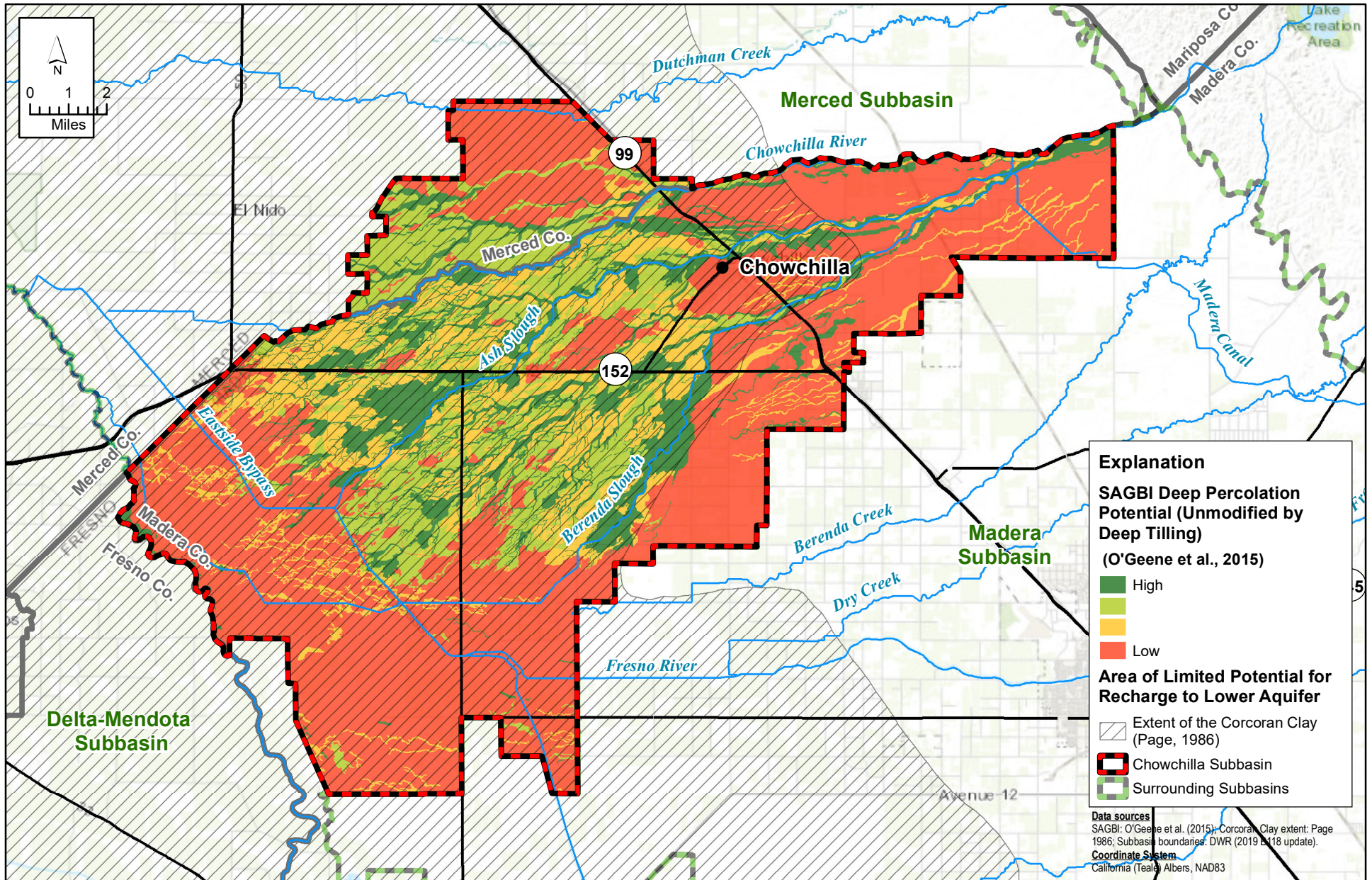


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-39 Chowchilla Subbasin Aquifer Property Data\_CompositeUnknown.mxd



**FIGURE 2-39**  
**Map of Well Test Aquifer Property Data:**  
**Composite Wells or Unknown Depth**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



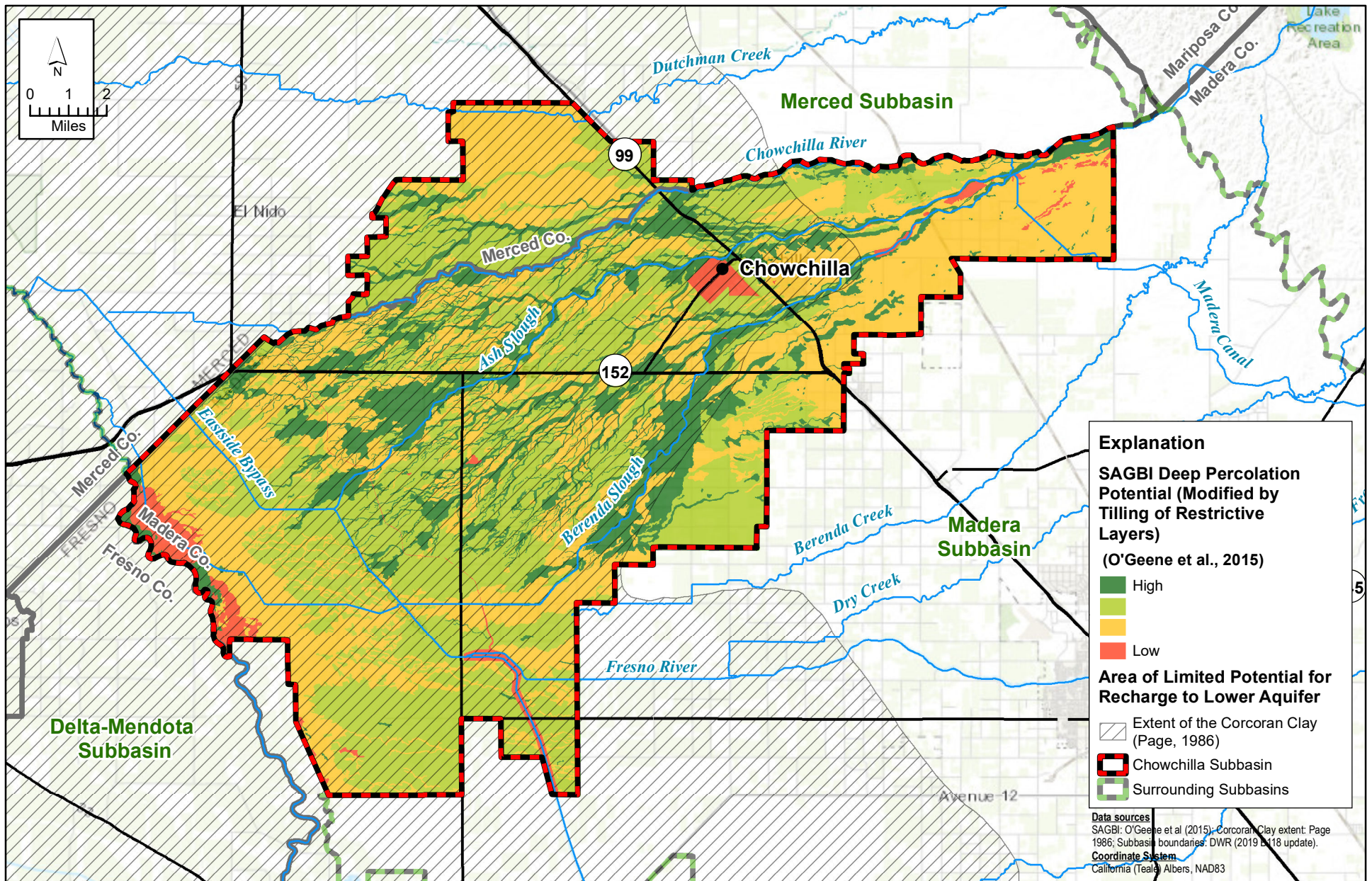
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-40 Chowchilla Subbasin SAGBI Higher Recharge Potential Areas\_unmodified.mxd



**FIGURE 2-40**  
**SAGBI Deep Percolation Potential:**  
**Unmodified by Tilling**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

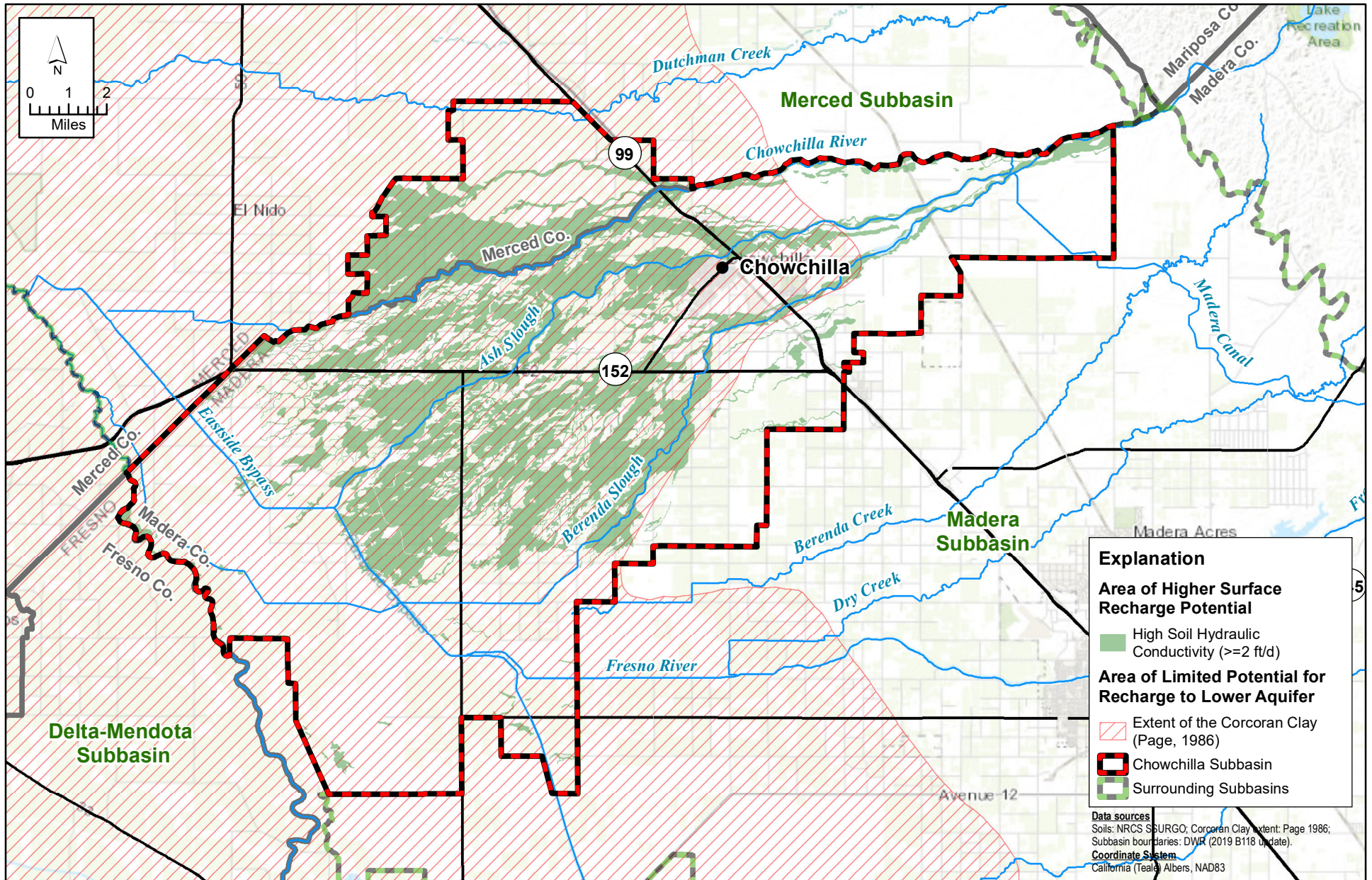




X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-41 Chowchilla Subbasin SAGBI Higher Recharge Potential Areas\_modified.mxd



**FIGURE 2-41**  
**SAGBI Deep Percolation Potential:**  
**Modified by Tilling of All Restrictive Layers**  
Chowchilla Subbasin  
Groundwater Sustainability Plan



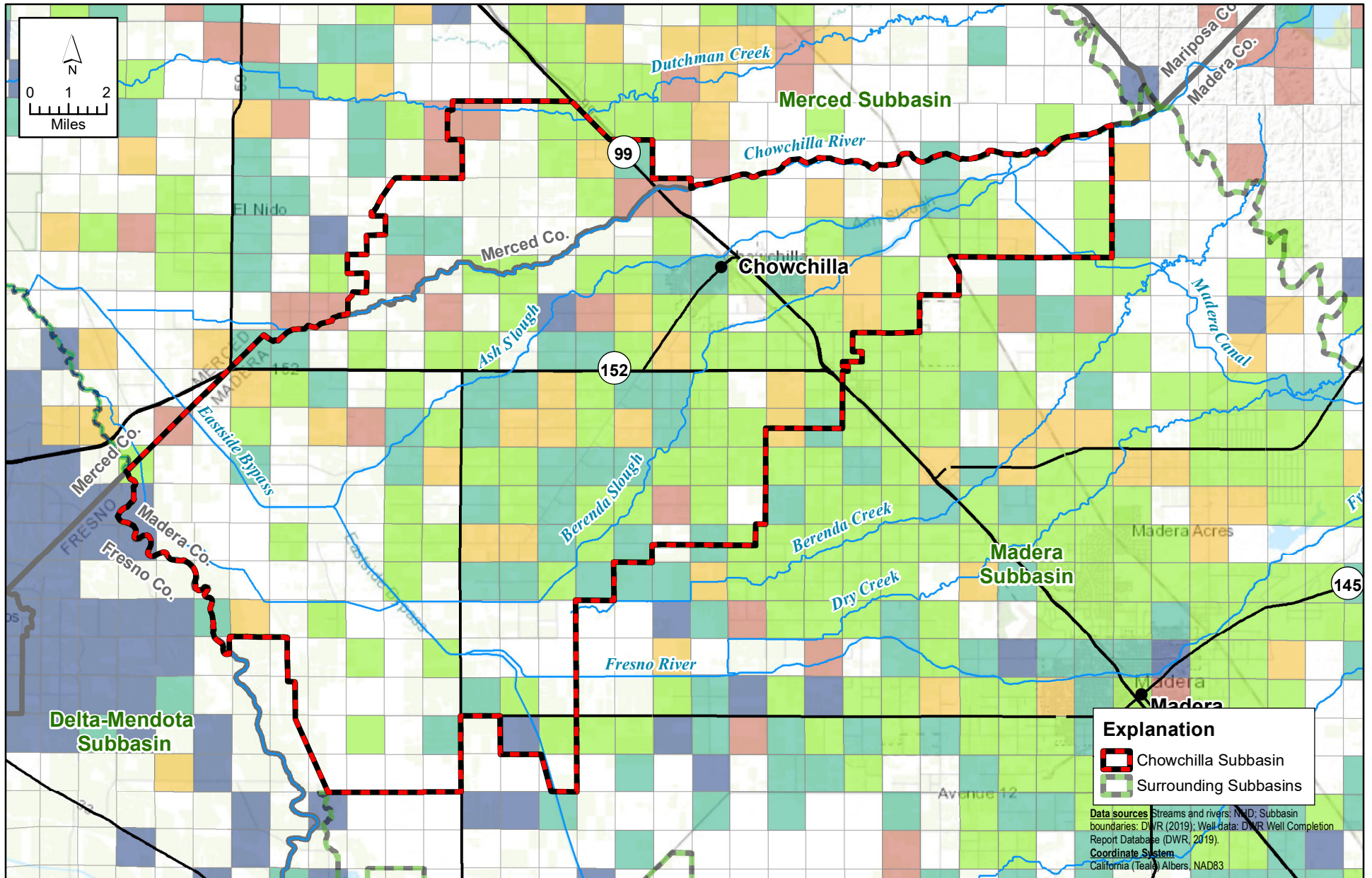
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-42 Chowchilla Subbasin Potential Recharge Areas.mxd

**FIGURE 2-42**

**Areas of Higher Recharge Potential**

*Chowchilla Subbasin  
 Groundwater Sustainability Plan*



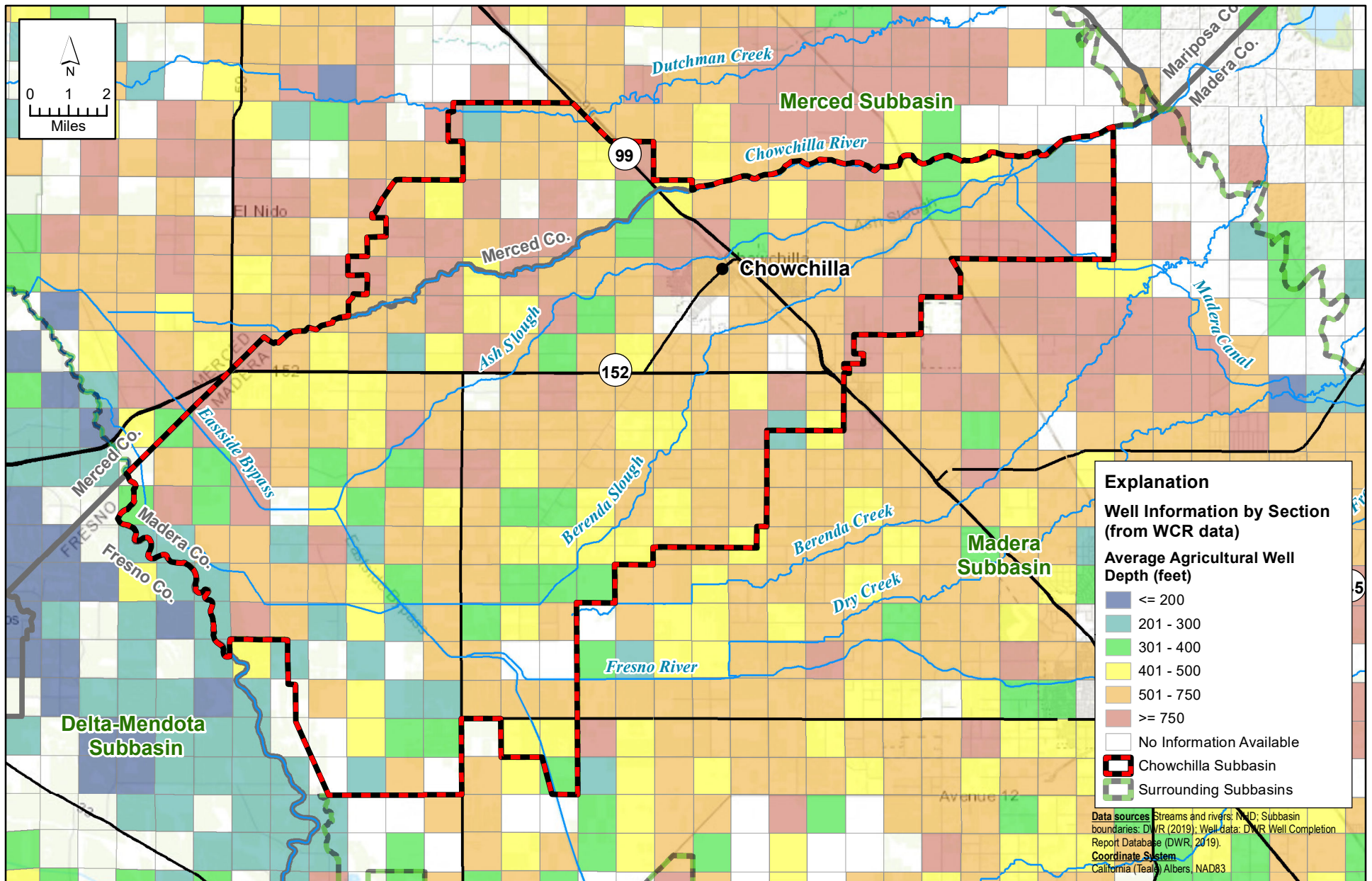


\\SERVER-01\Clerical\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-43 Chowchilla Subbasin Wells By Section Dom Well Depth.mxd



**FIGURE 2-43**  
**Map of Well Information by Section:**  
**Average Domestic Well Depth (from WCR data)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

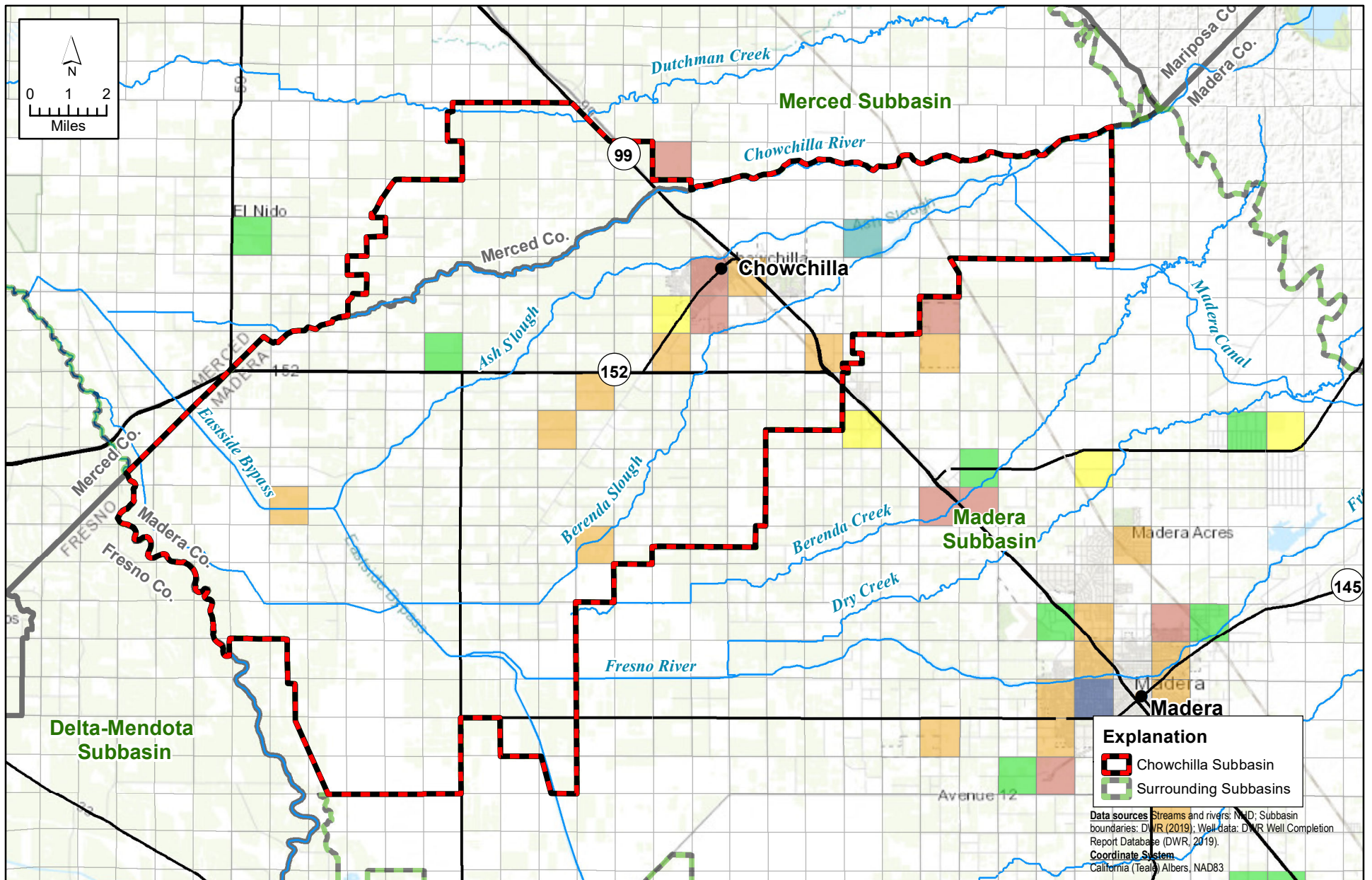


\\SERVER-01\Clerical\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-44 Chowchilla Subbasin Wells By Section Ag Well Depth.mxd



**FIGURE 2-44**  
**Map of Well Information by Section:**  
**Average Agricultural Well Depth (from WCR data)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

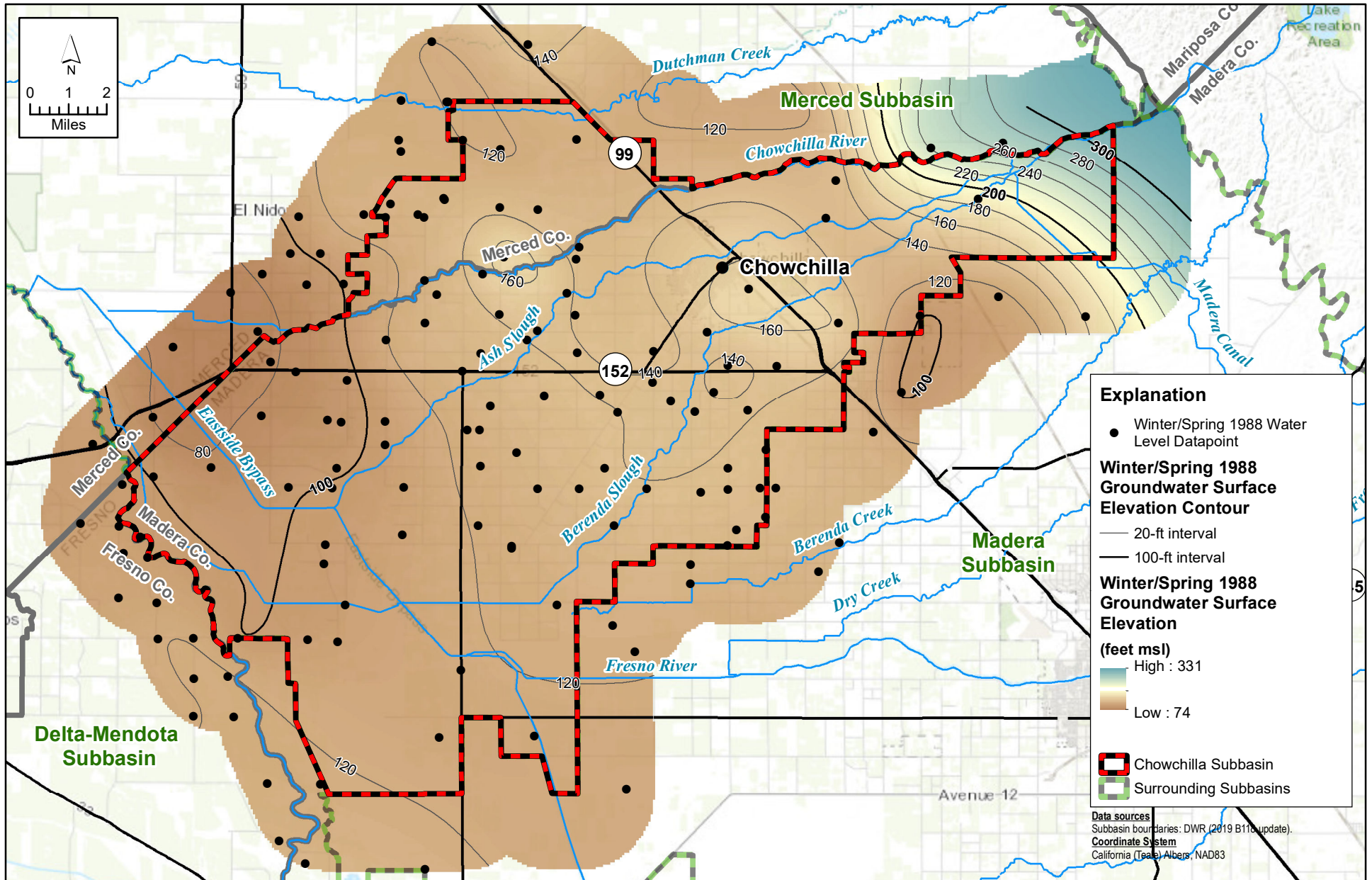


\\SERVER-01\Clerical\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-45 Chowchilla Subbasin Wells By Section PWS Well Depth.mxd



**FIGURE 2-45**  
**Map of Well Information by Section:**  
**Average Public Supply Well Depth (from WCR data)**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

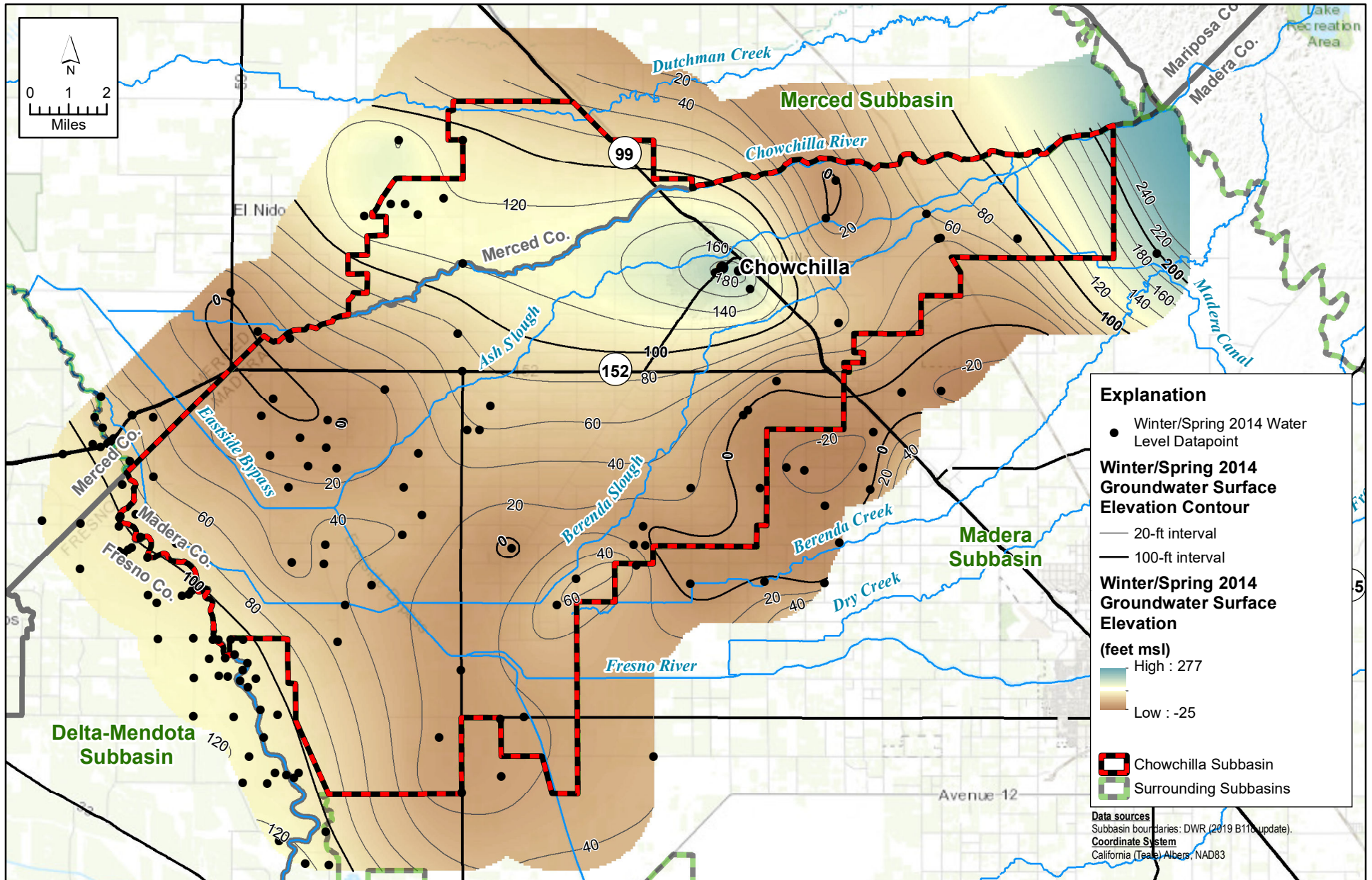


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-46 Chowchilla Subbasin SpW1988 GWEL Contours\_Unconfined.mxd



**FIGURE 2-46**  
**Groundwater Surface Elevation Map:**  
**Winter/Spring 1988 - Unconfined Groundwater**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

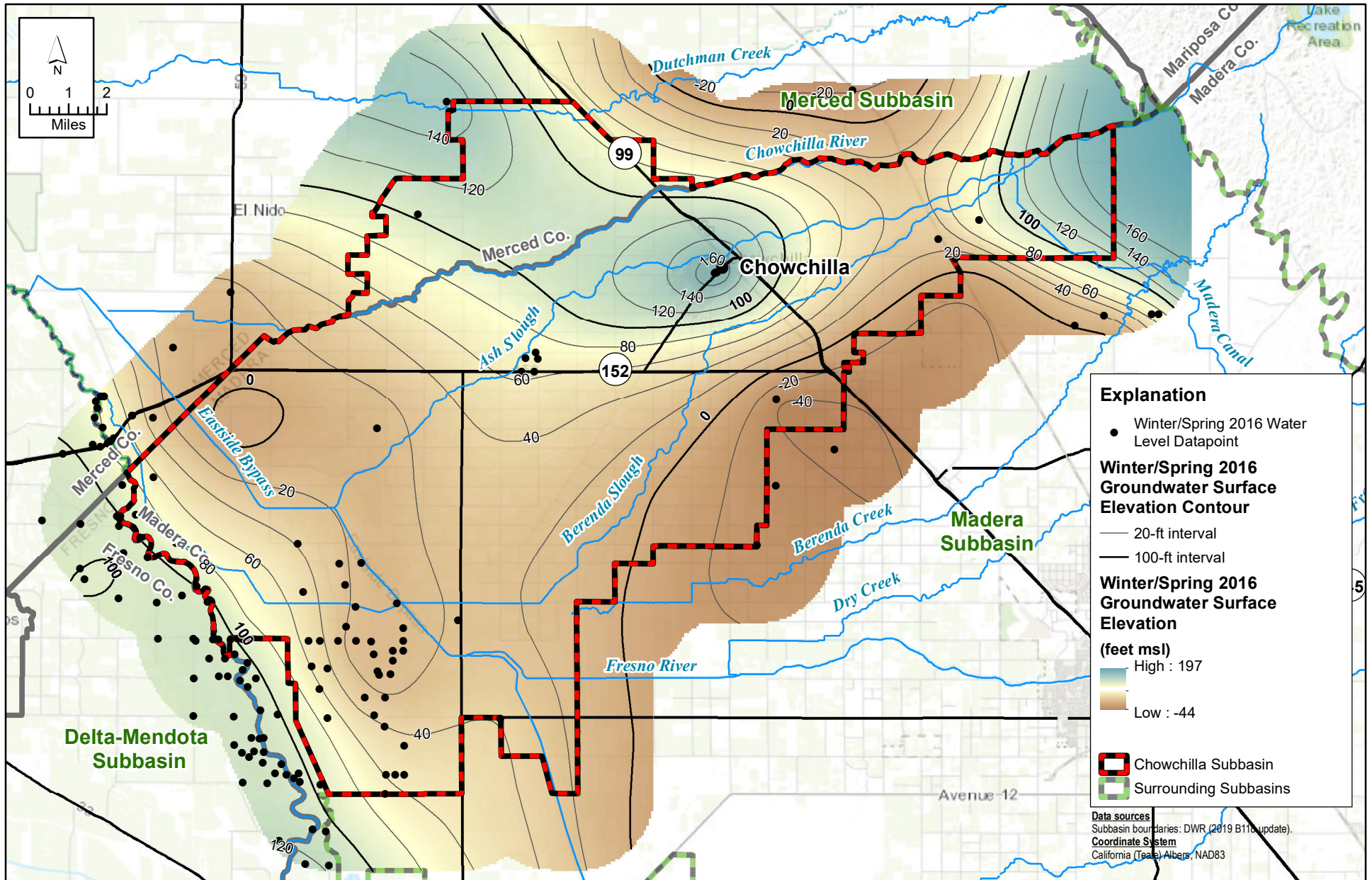


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-47 Chowchilla Subbasin SpW2014 GWEL Contours\_Unconfined.mxd



**FIGURE 2-47**  
**Groundwater Surface Elevation Map:**  
**Winter/Spring 2014 - Unconfined Groundwater**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



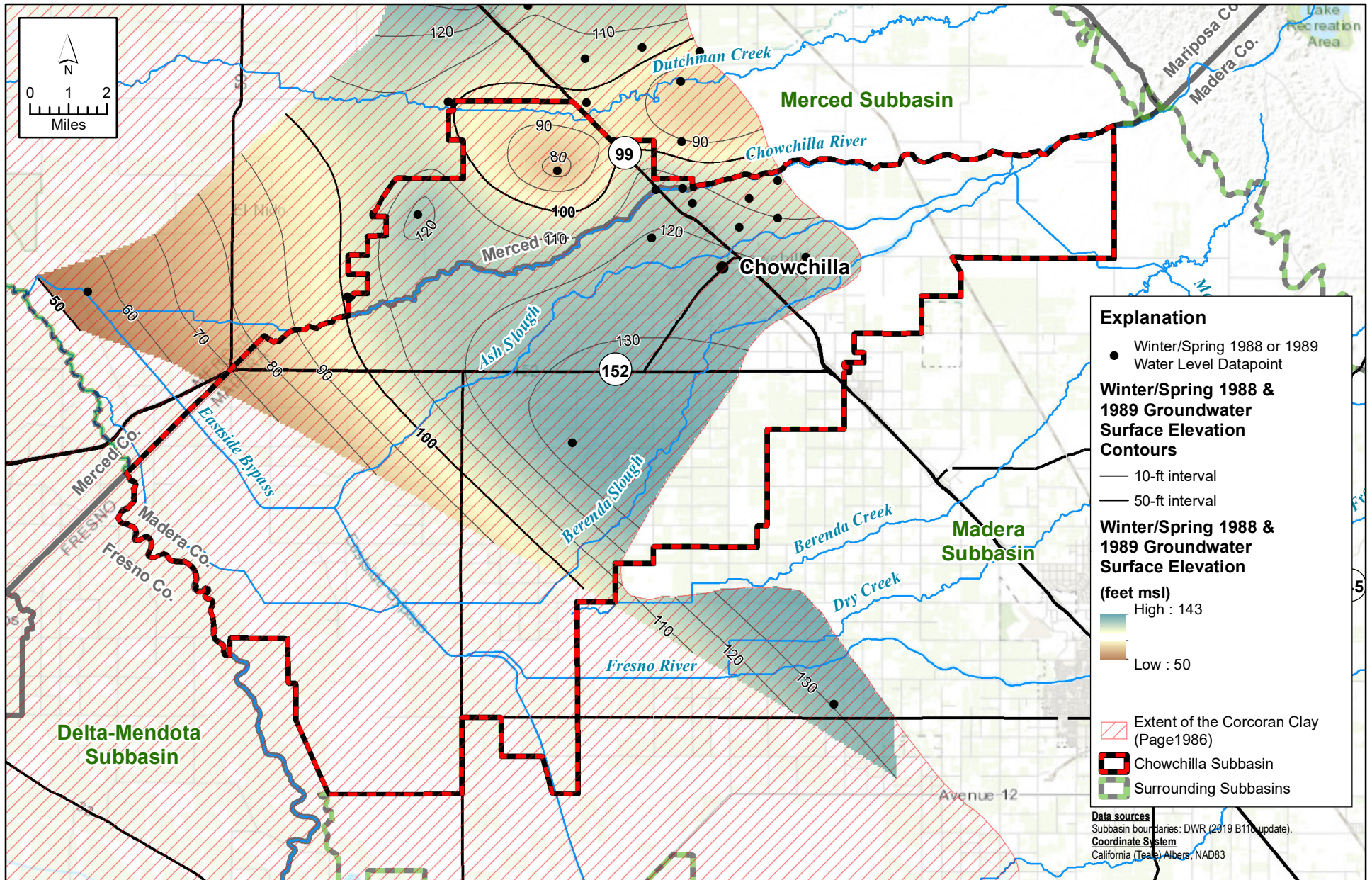
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-48 Chowchilla Subbasin SpW2016 GWEL Contours\_Unconfined.mxd



**FIGURE 2-48**  
**Groundwater Surface Elevation Map:**  
**Winter/Spring 2016 - Unconfined Groundwater**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

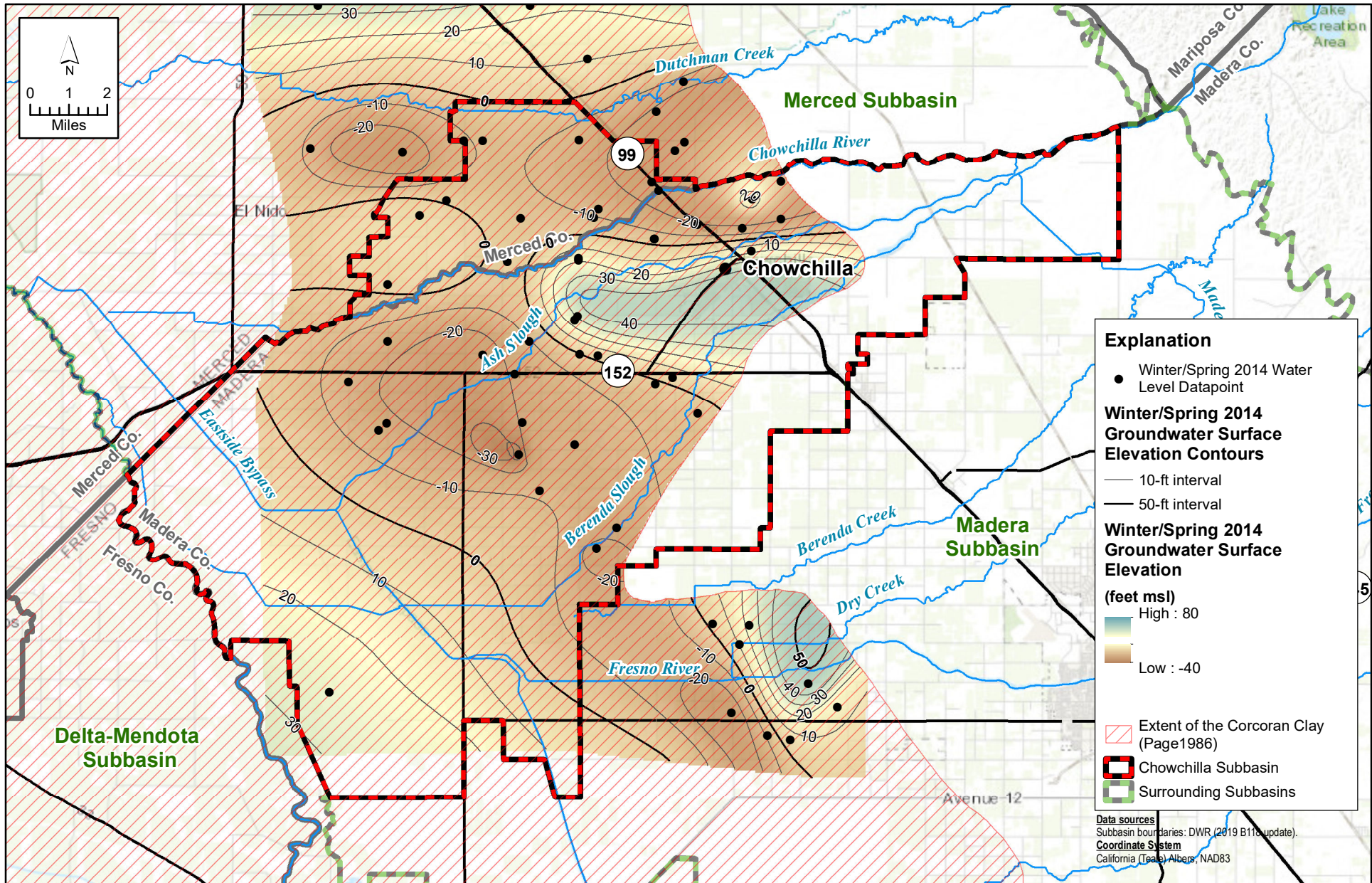




X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-49 Chowchilla Subbasin SpW1988 GWEL Contours\_Lower.mxd

**FIGURE 2-49**  
**Groundwater Surface Elevation Map:**  
**Winter/Spring 1988 and 1989 - Lower Aquifer within Corcoran Clay**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

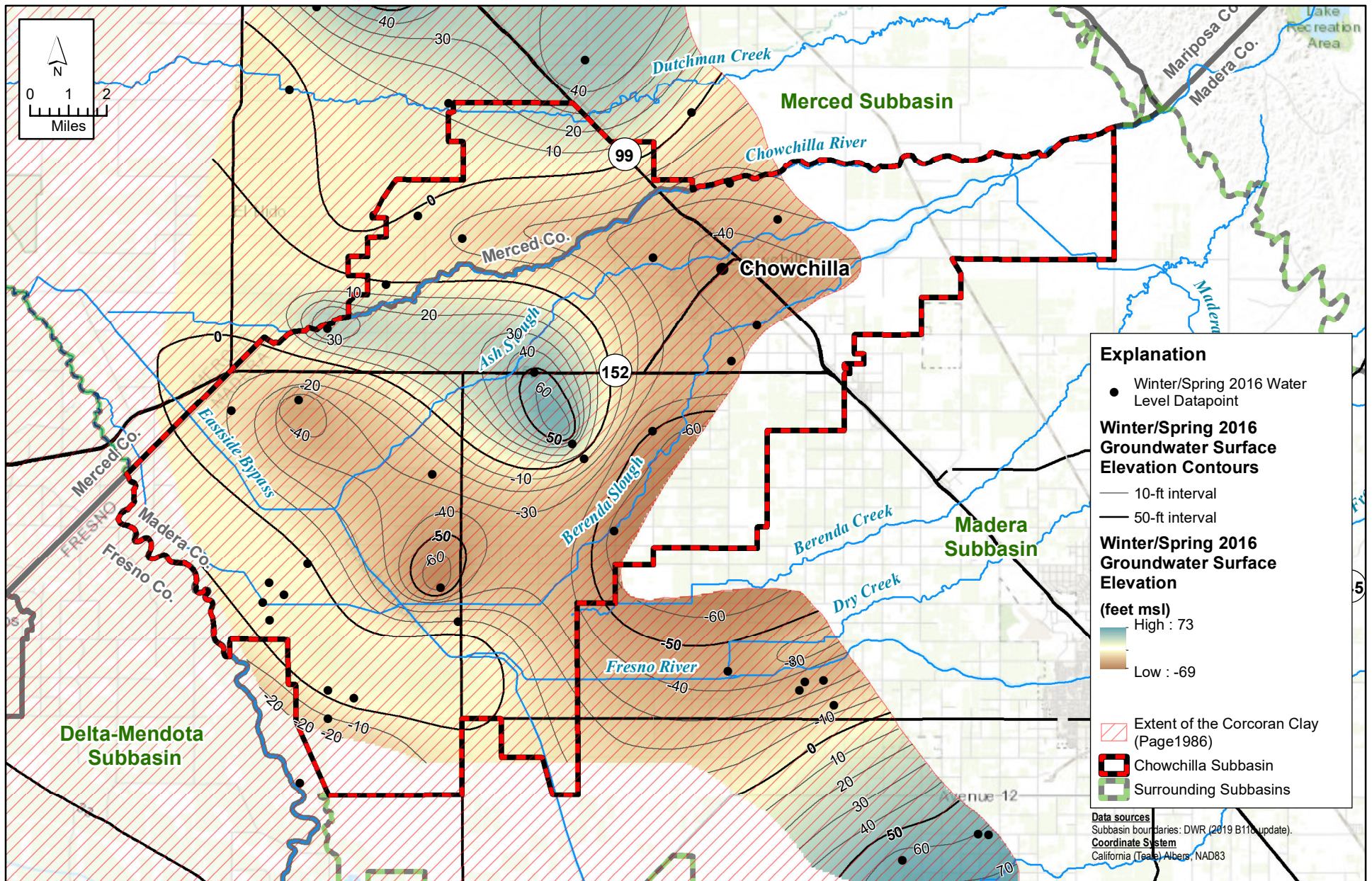




X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-50 Chowchilla Subbasin SpW2014 GWEL Contours\_Lower.mxd



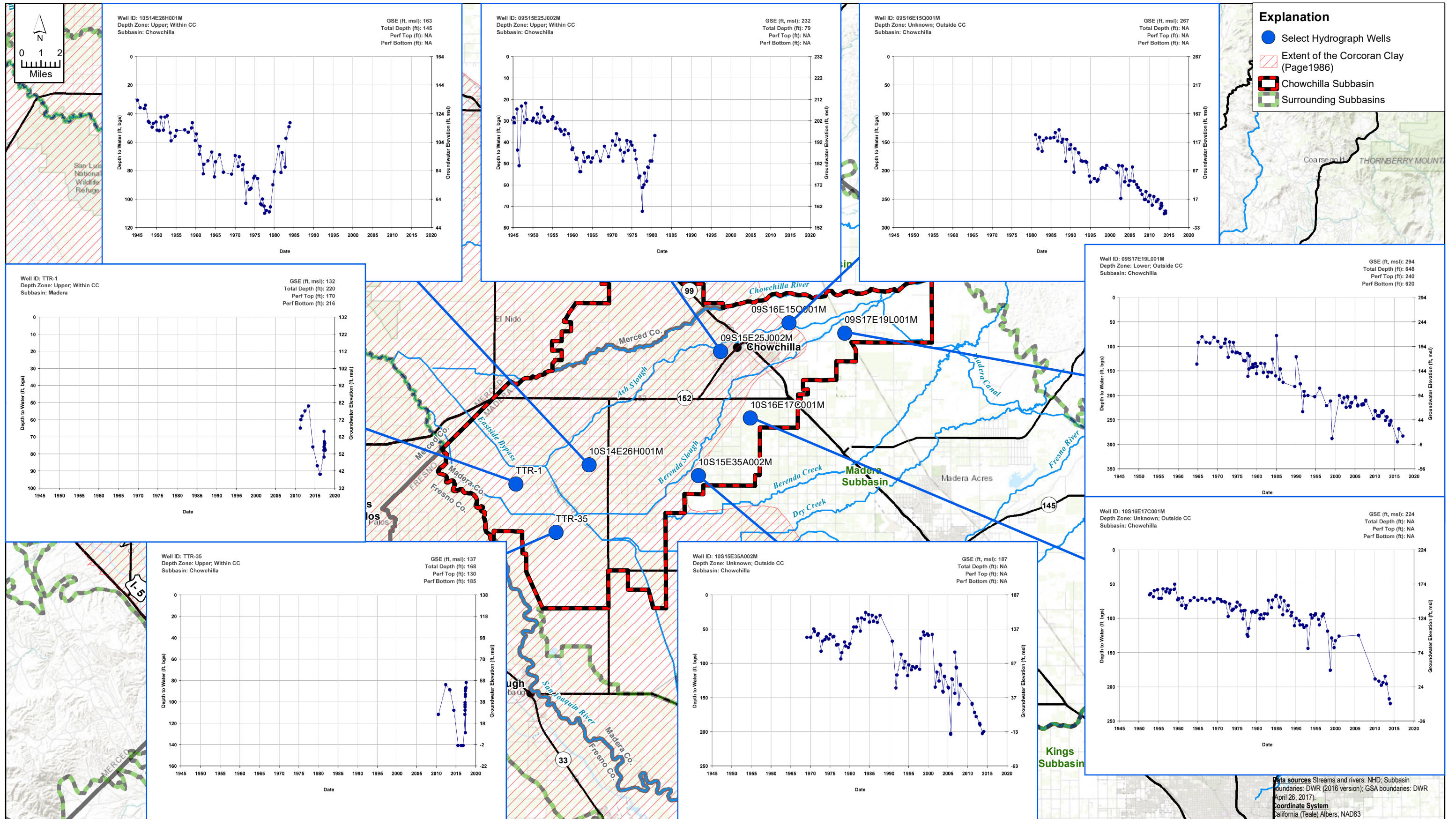
**FIGURE 2-50**  
**Groundwater Surface Elevation Map:**  
**Winter/Spring 2014 - Lower Aquifer within Corcoran Clay**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-51 Chowchilla Subbasin SpW2016 GWEL Contours\_Lower.mxd

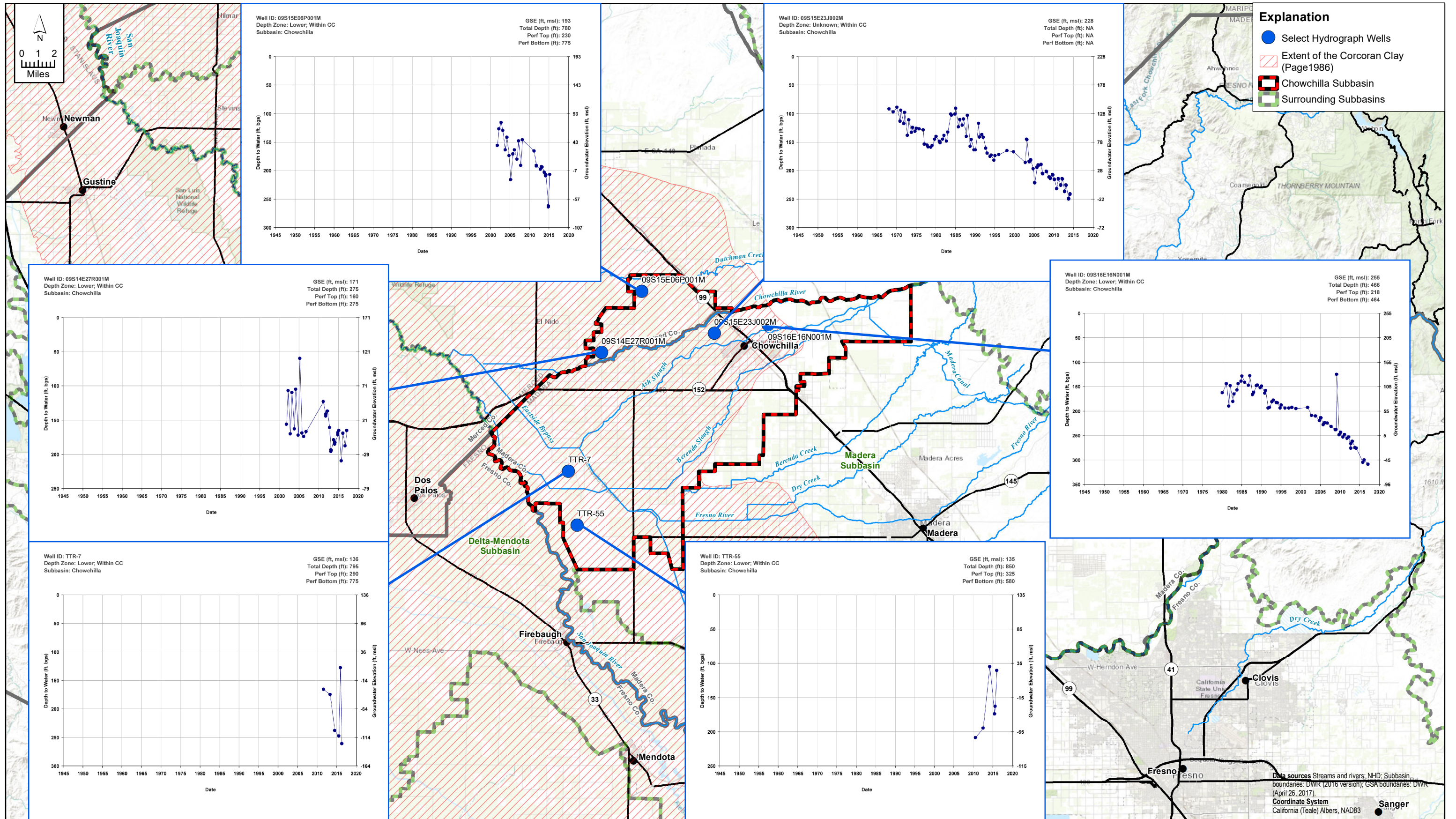


**FIGURE 2-51**  
**Groundwater Surface Elevation Map:**  
**Winter/Spring 2016 - Lower Aquifer within Corcoran Clay**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-52 Chowchilla Subbasin GW Level Hydrographs\_Upper.mxd

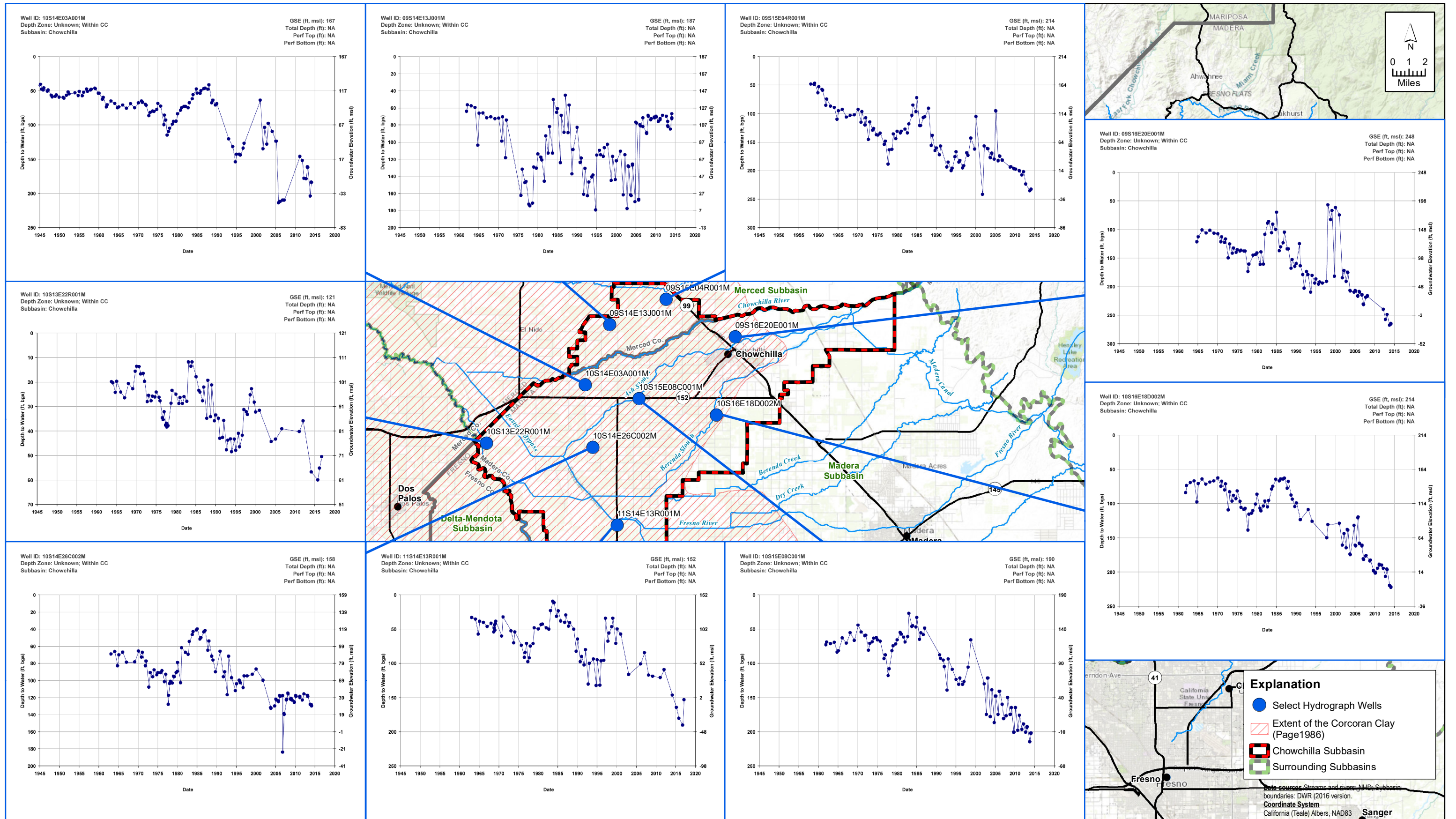
**FIGURE 2-52**  
**Select Groundwater Level Hydrographs:**  
**Outside the Corcoran Clay or Upper Aquifer within the Corcoran Clay**  
 Chowchilla Subbasin  
 Groundwater Sustainability Plan



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-53 Chowchilla Subbasin GW Level Hydrographs\_Lower.mxd

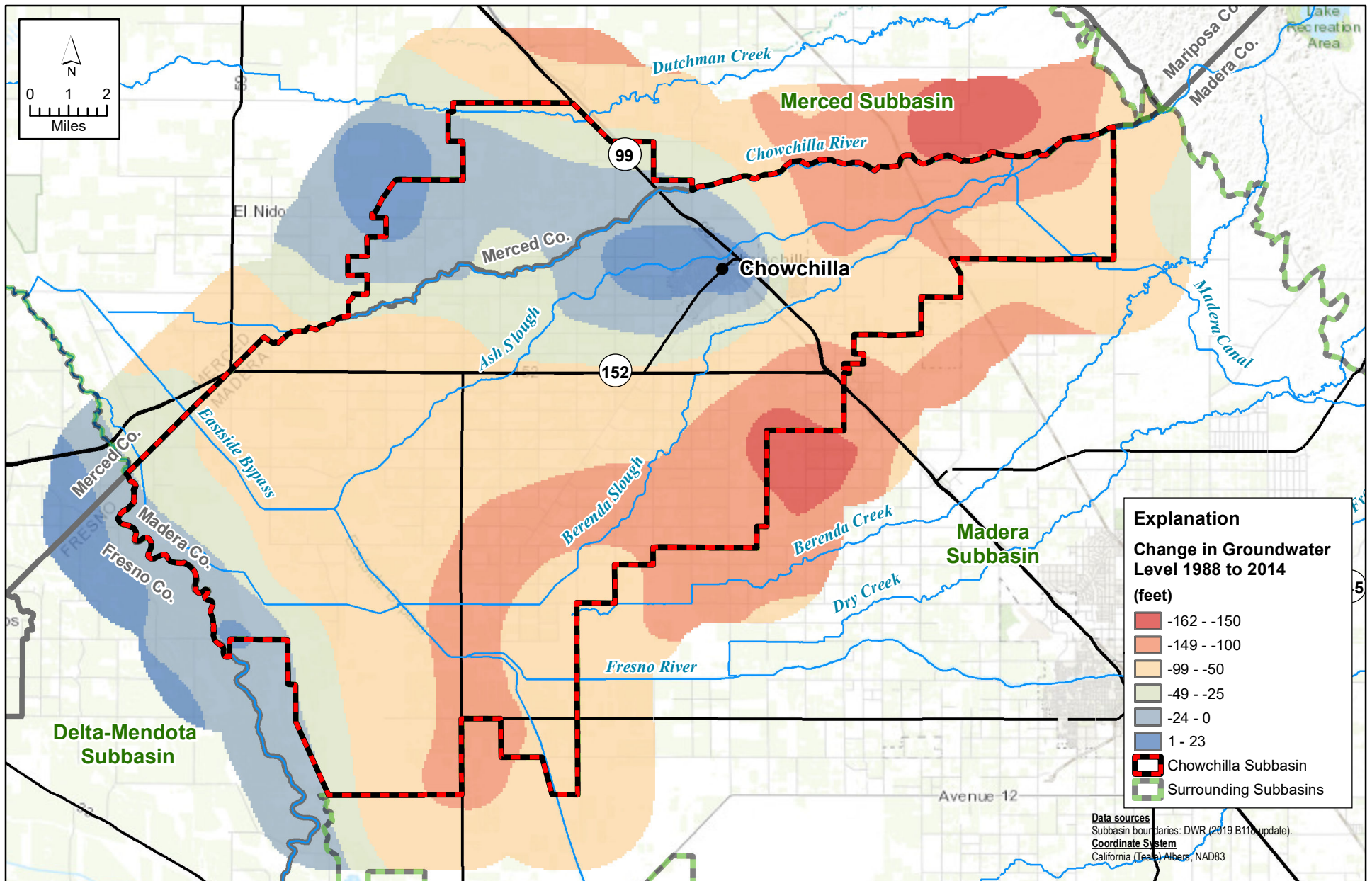
**FIGURE 2-53**  
**Select Groundwater Level Hydrographs:**  
**Lower Aquifer within the Corcoran Clay**  
 Chowchilla Subbasin  
 Groundwater Sustainability Plan

Data sources: Streams and rivers: NHD; Subbasin boundaries: DWR (2016 version); GSA boundaries: DWR (April 26, 2017).  
 Coordinate System: California (Teale) Albers, NAD83



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-54 Chowchilla Subbasin GW Level Hydrographs\_Unknown.mxd

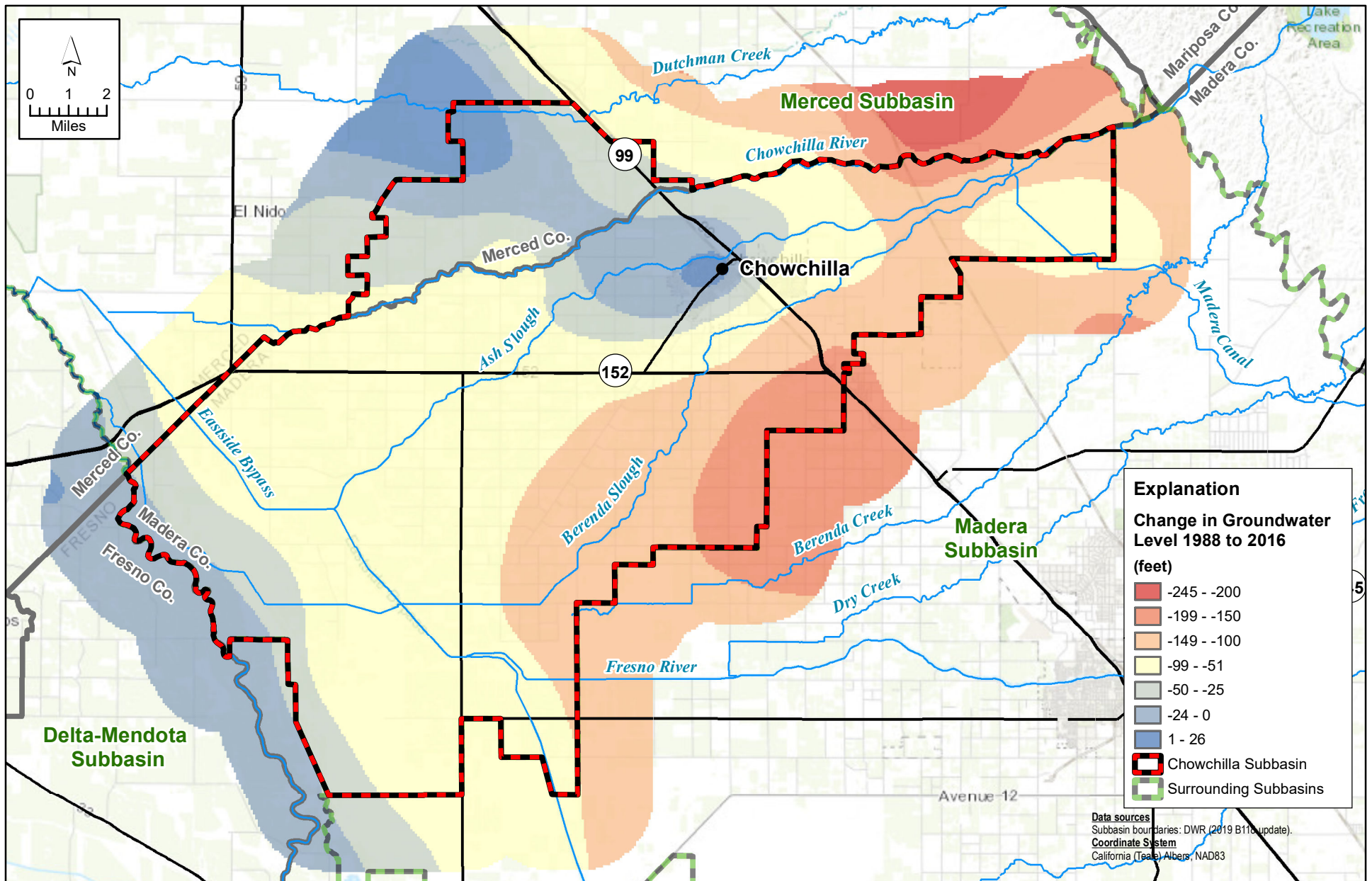
**FIGURE 2-54**  
**Select Groundwater Level Hydrographs:**  
**Wells of Unknown Construction**  
 Chowchilla Subbasin  
 Groundwater Sustainability Plan



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-55 Chowchilla Subbasin SpW1988 to 2014 GWEL Change\_Unconfined.mxd



**FIGURE 2-55**  
**Groundwater Level Change Map:**  
**Winter/Spring 1988 to 2014 - Unconfined Groundwater**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

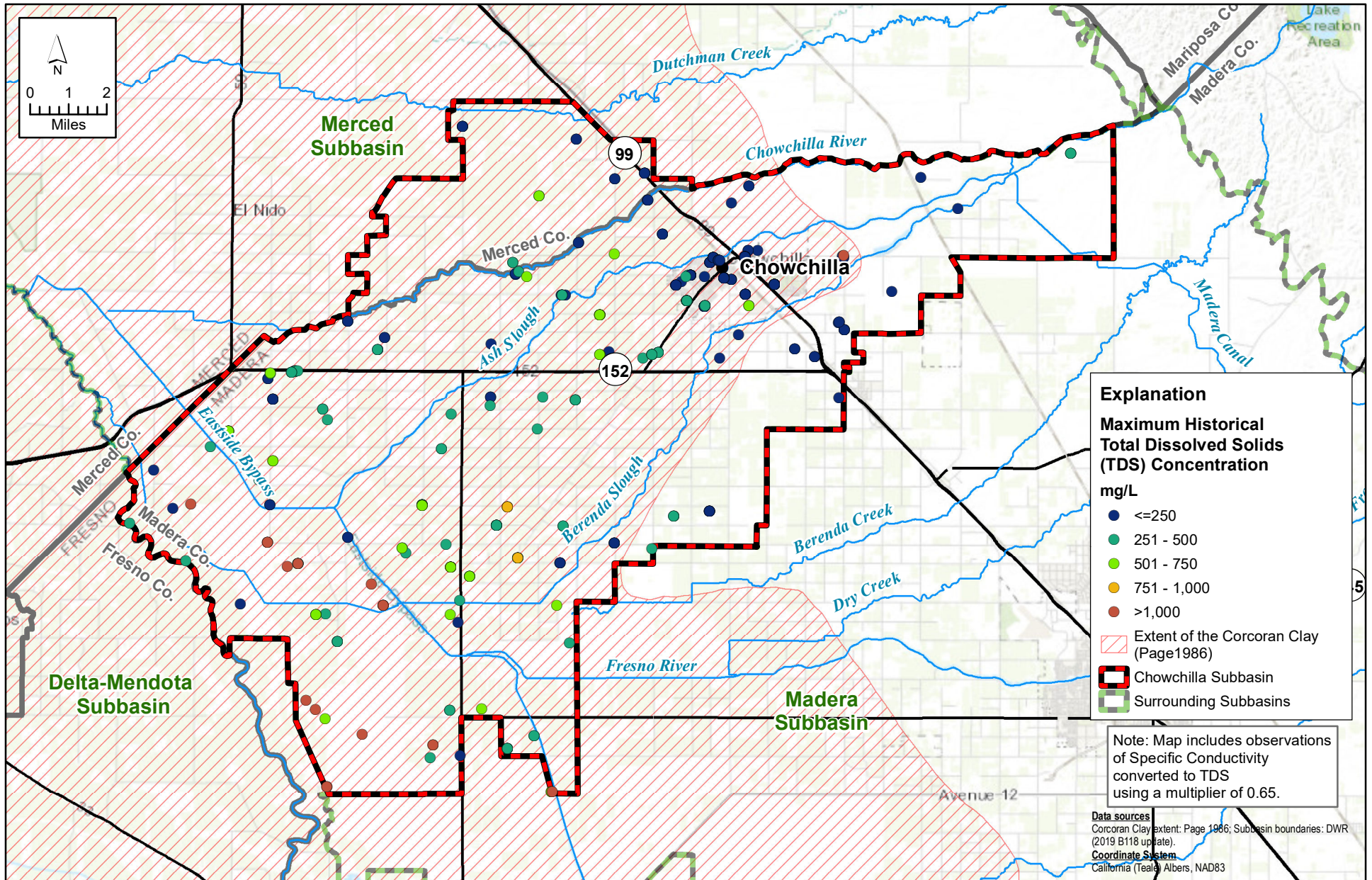


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-56 Chowchilla Subbasin SpW1988 to 2016 GWEL Change\_Unconfined.mxd



**FIGURE 2-56**  
**Groundwater Level Change Map:**  
**Winter/Spring 1988 to 2016 - Unconfined Groundwater**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

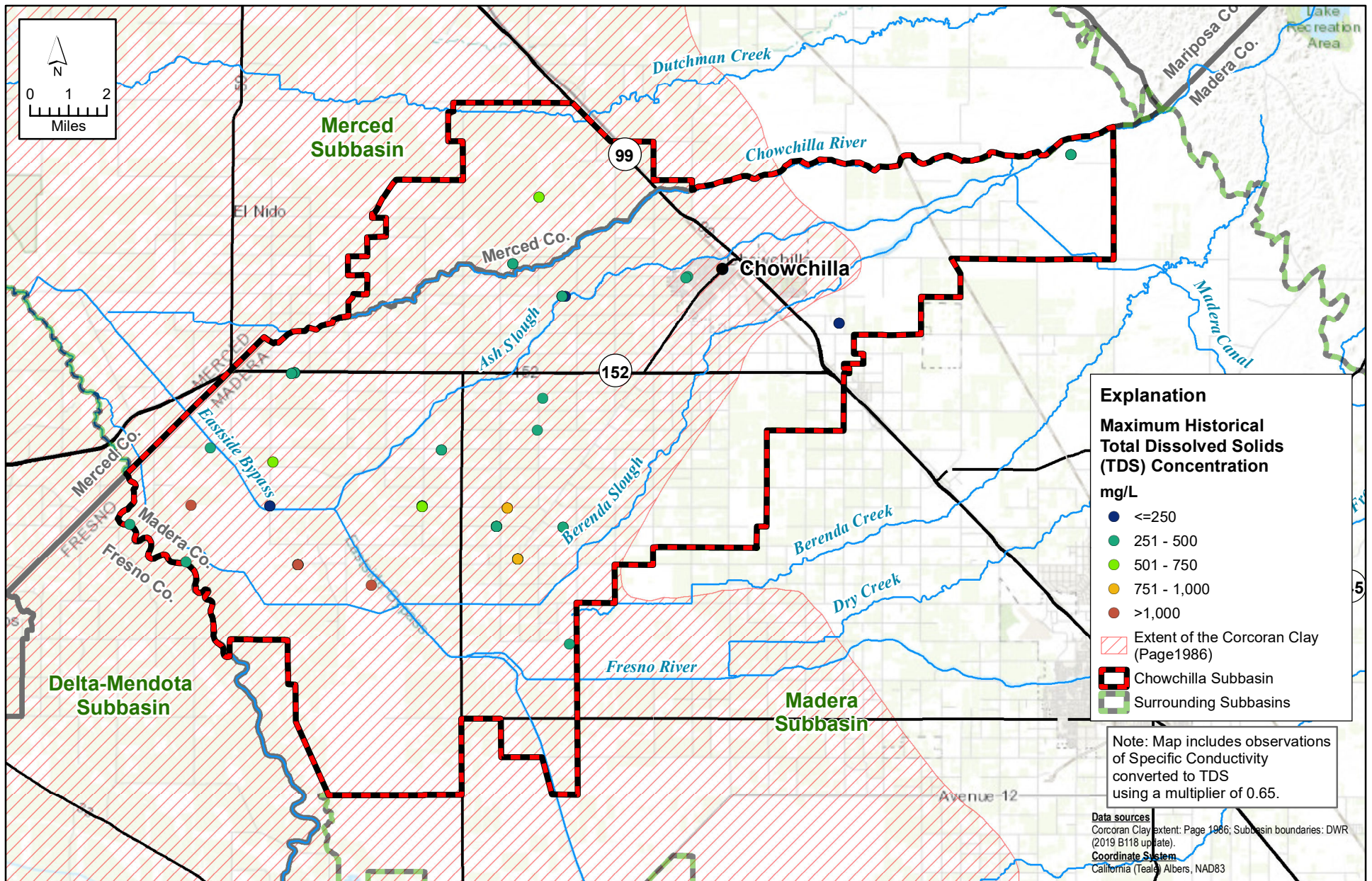




X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-57 Chowchilla Subbasin GW Quality Map TDS All Wells\_20190710.mxd

**FIGURE 2-57**  
**Groundwater Quality Map: Total Dissolved Solids Concentrations in All Wells**



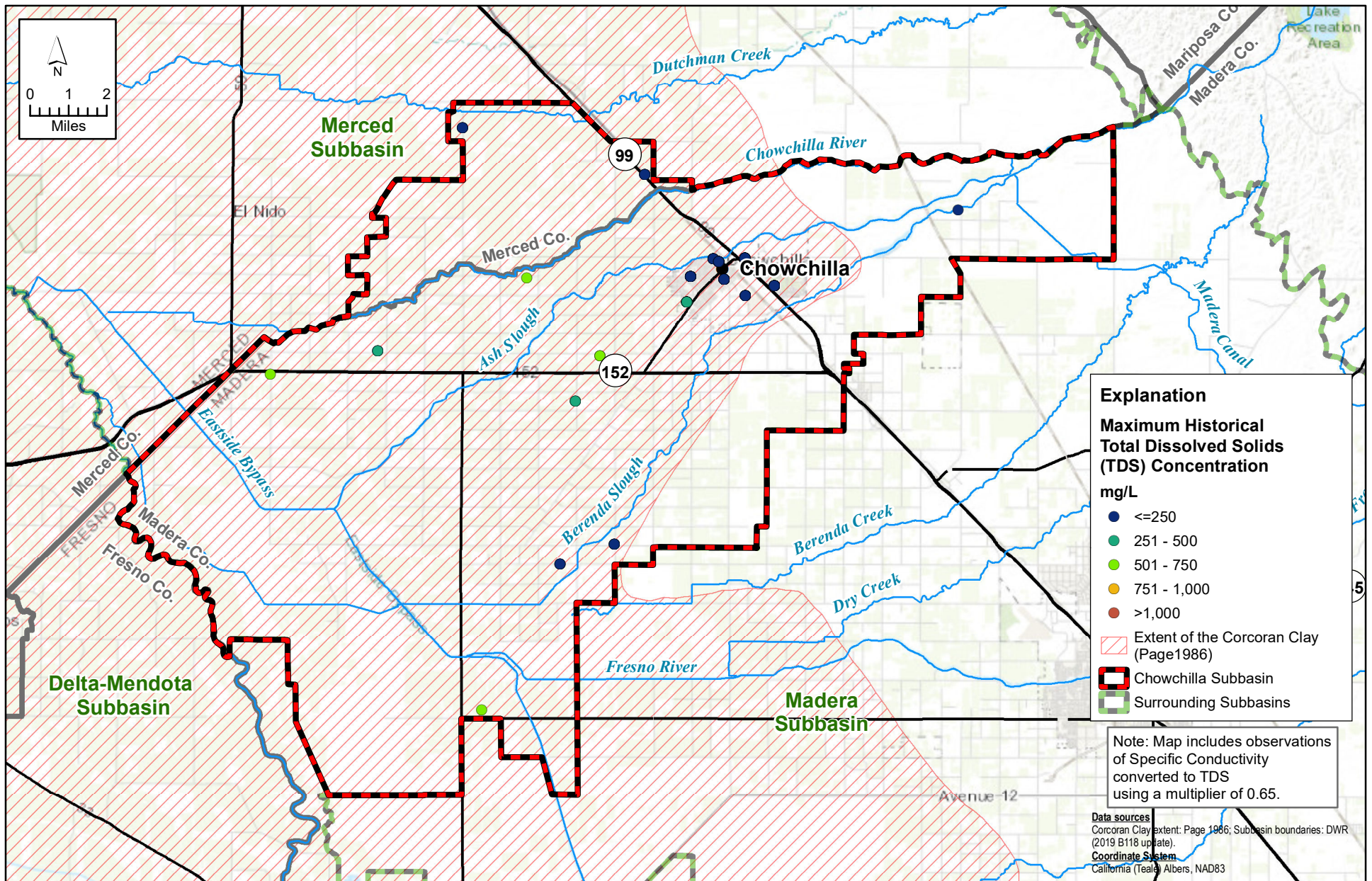


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-58 Chowchilla Subbasin GW Quality Map TDS Upper\_20190710.mxd

**FIGURE 2-58**  
**Groundwater Quality Map: Total Dissolved Solids Concentrations in Upper Aquifer Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



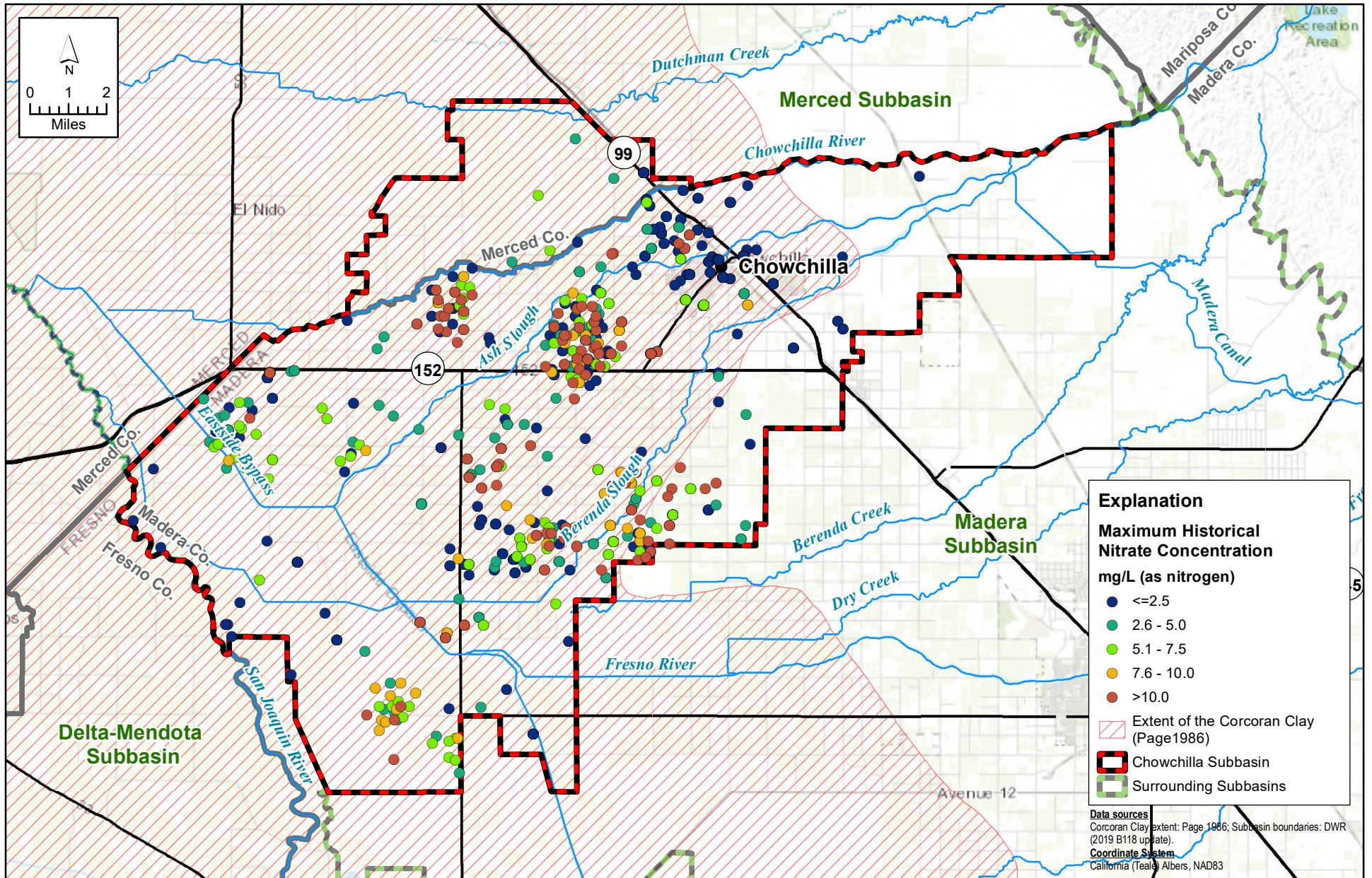


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-59 Chowchilla Subbasin GW Quality Map TDS Lower\_20190710.mxd

**FIGURE 2-59**  
**Groundwater Quality Map: Total Dissolved Solids Concentrations in Lower Aquifer Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



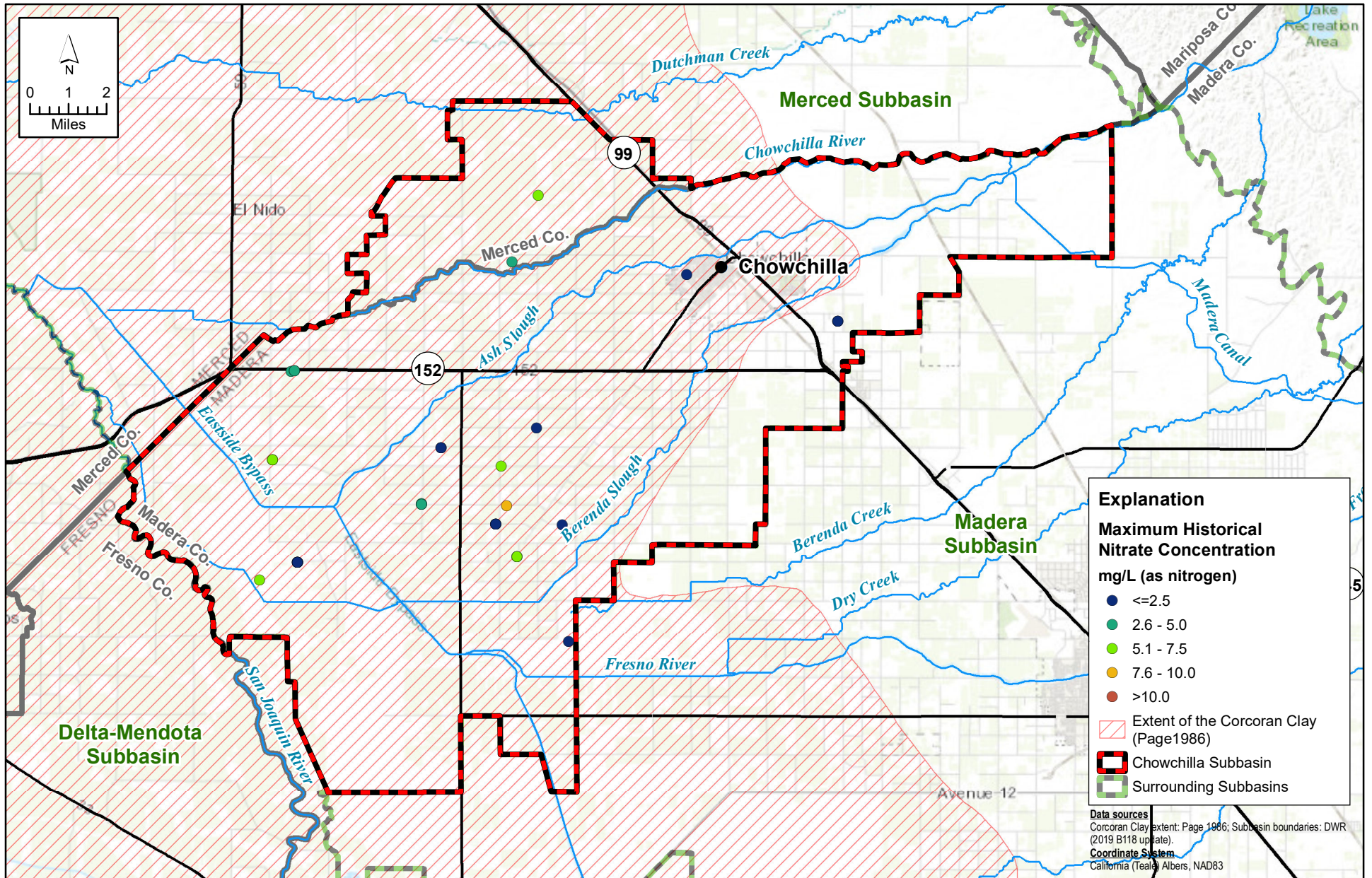


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-60 Chowchilla Subbasin GW Quality Map Nitrate All Wells\_20190710.mxd



**FIGURE 2-60**  
**Map of Groundwater Quality: Nitrate Concentrations**  
**in All Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

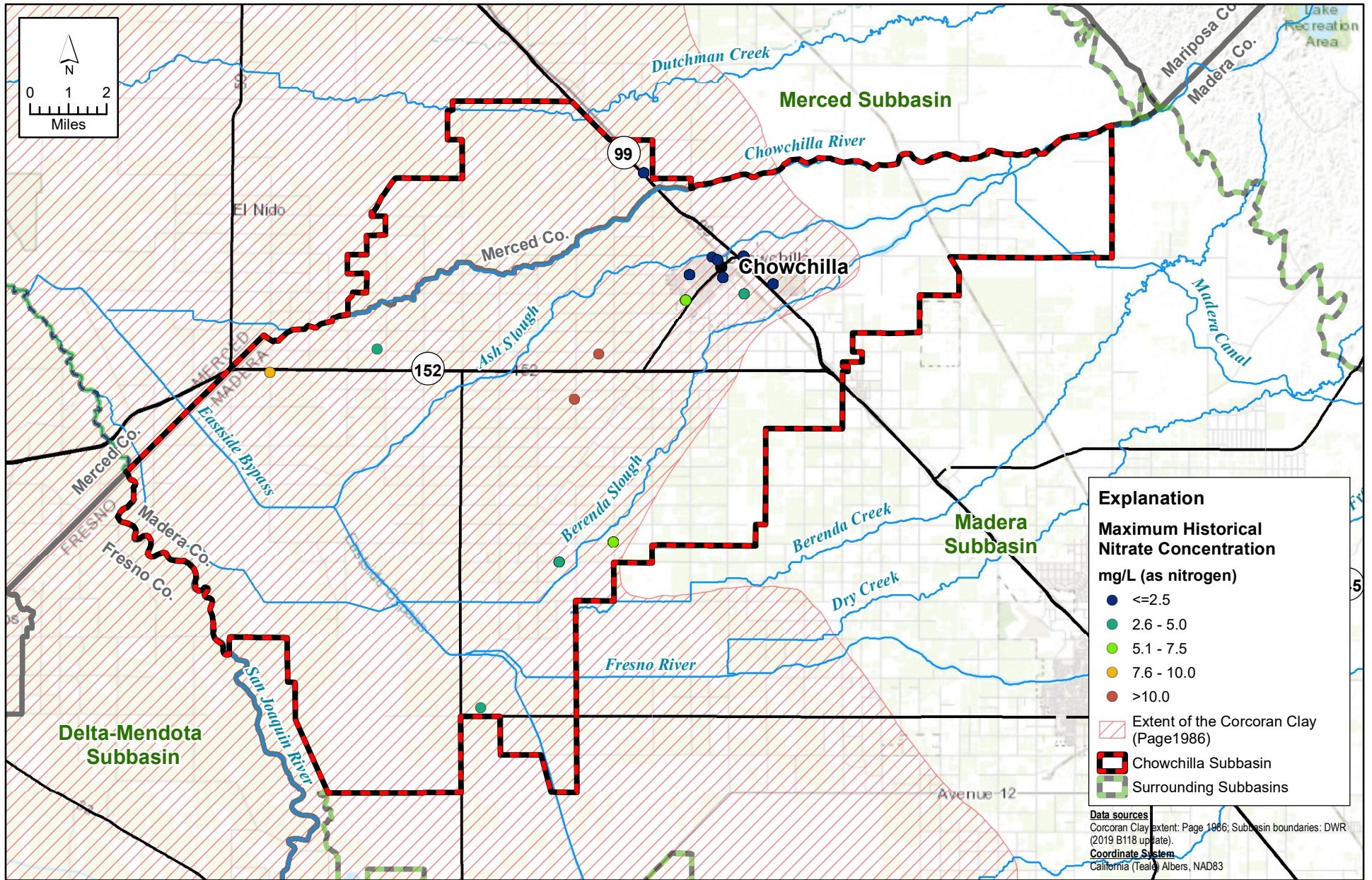


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-61 Chowchilla Subbasin GW Quality Map Nitrate Upper\_20190710.mxd



**FIGURE 2-61**  
**Map of Groundwater Quality: Nitrate Concentrations**  
**in Upper Aquifer Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

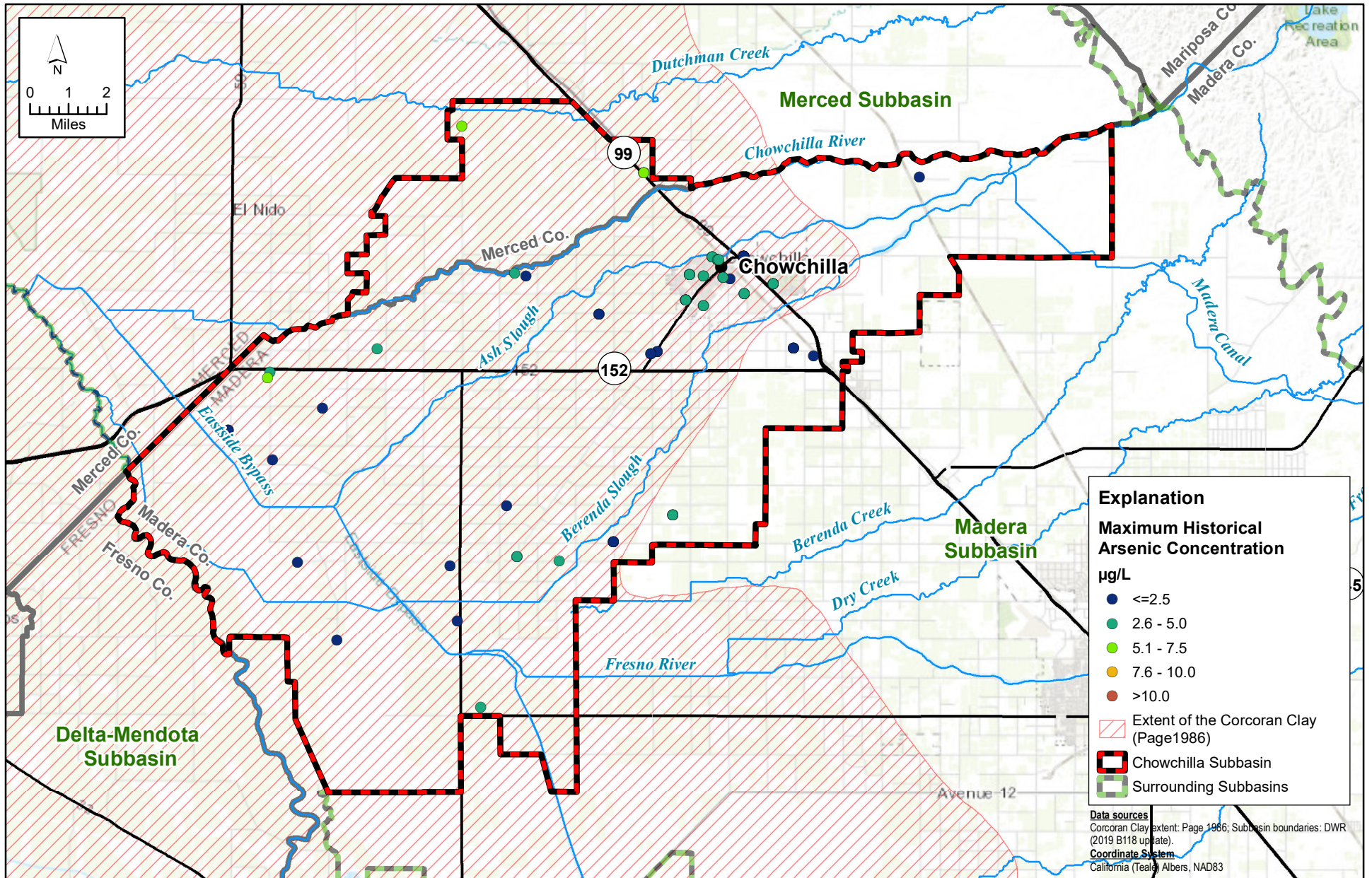


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-62 Chowchilla Subbasin GW Quality Map Nitrate Lower\_20190710.mxd

**FIGURE 2-62**  
**Map of Groundwater Quality: Nitrate Concentrations**  
**in Lower Aquifer Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



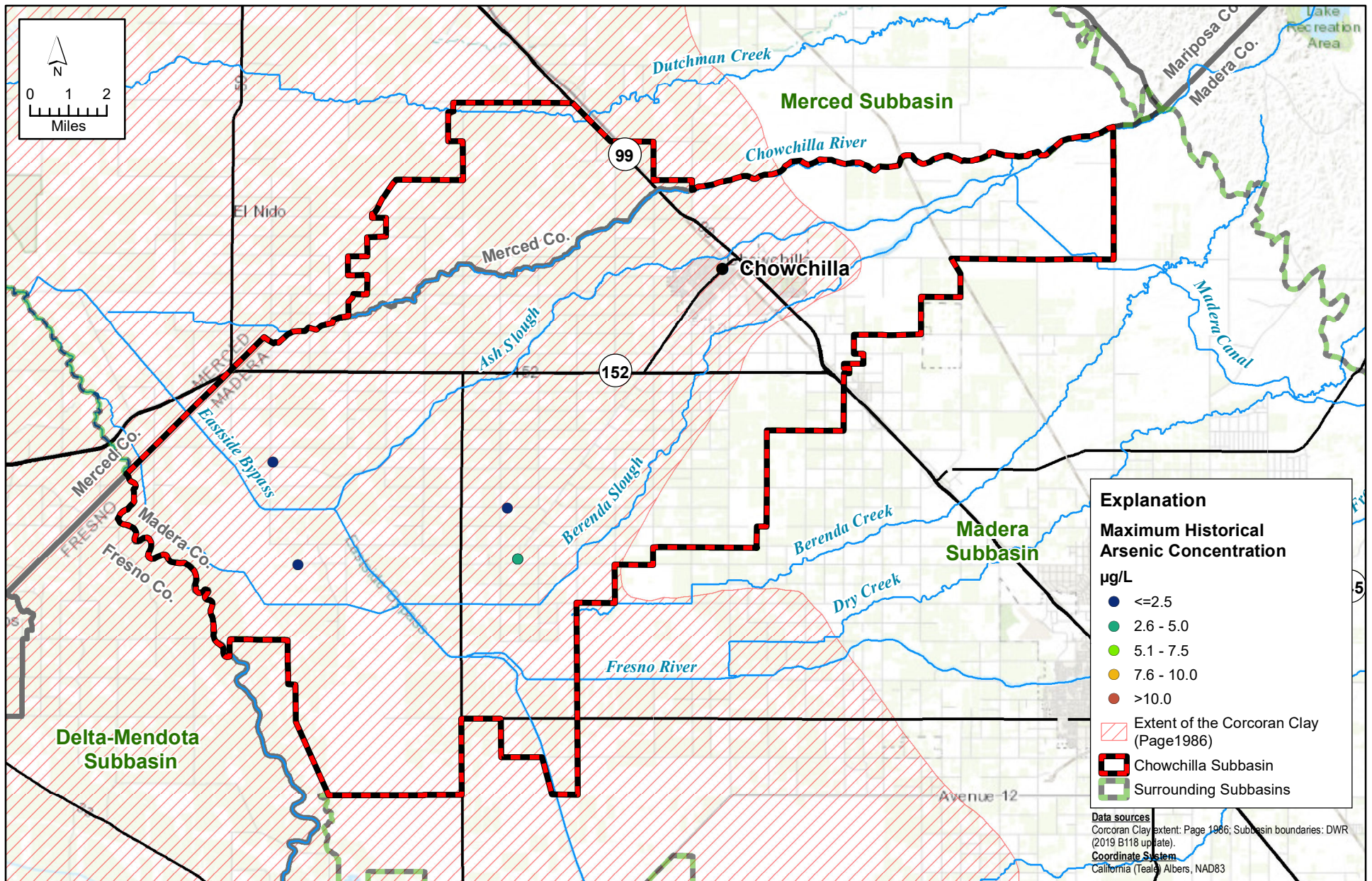


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-63 Chowchilla Subbasin GW Quality Map Arsenic All Wells\_20190710.mxd



**FIGURE 2-63**  
**Map of Groundwater Quality: Arsenic Concentrations**  
**in All Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



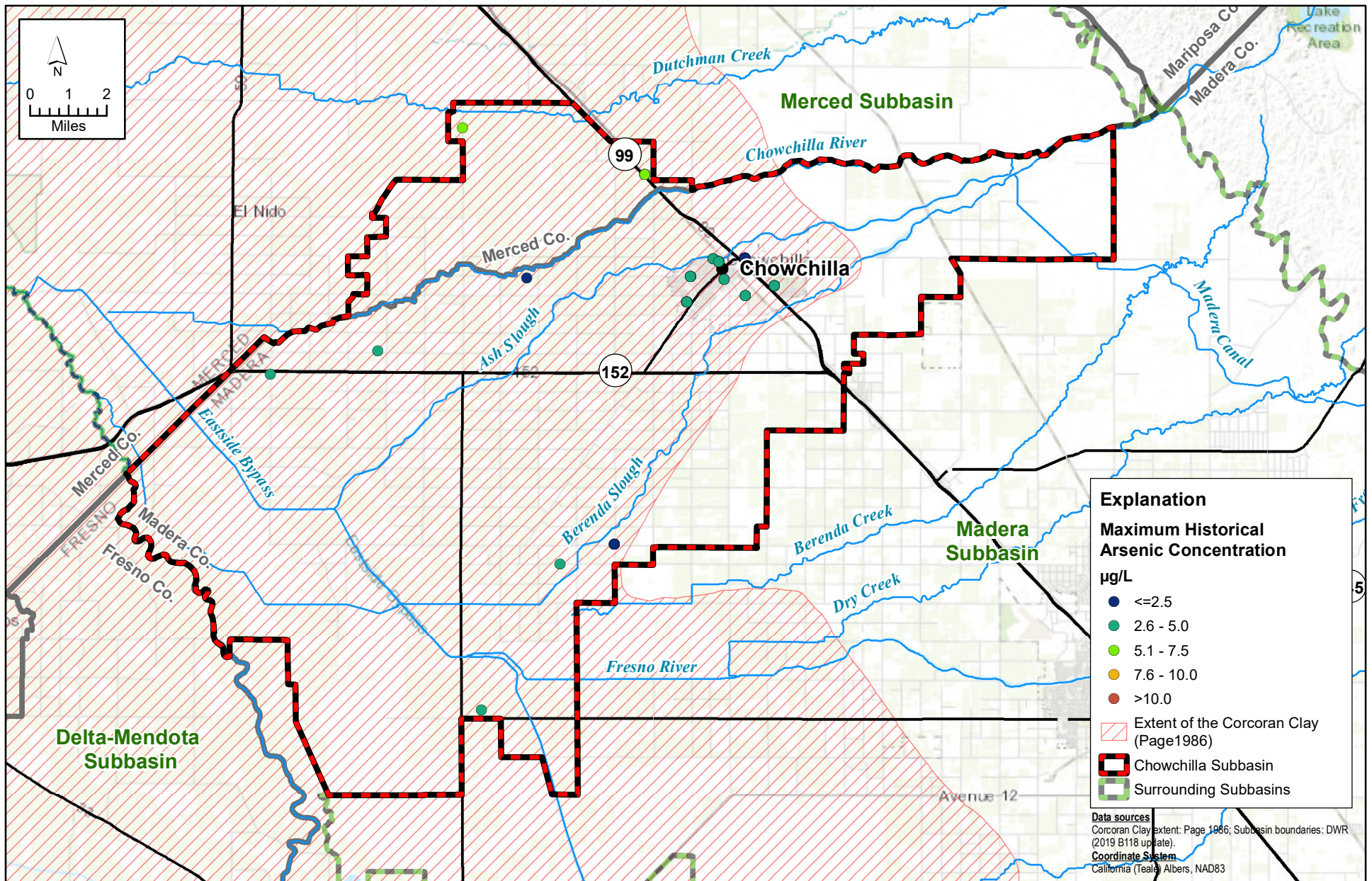
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-64 Chowchilla Subbasin GW Quality Map Arsenic Upper\_20190710.mxd



**FIGURE 2-64**  
**Map of Groundwater Quality: Arsenic Concentrations**  
**in Upper Aquifer Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



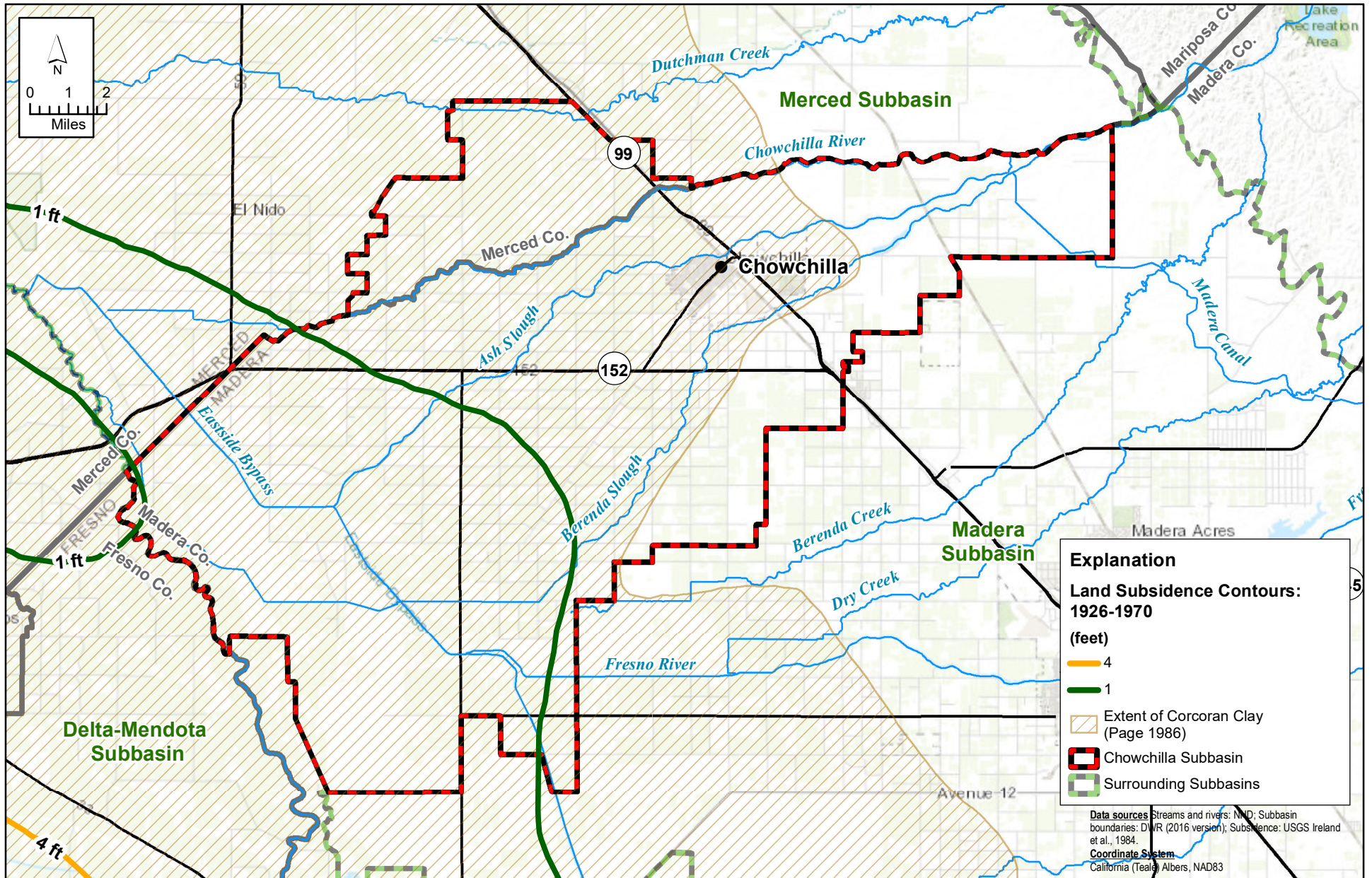


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-65 Chowchilla Subbasin GW Quality Map Arsenic Lower\_20190710.mxd



**FIGURE 2-65**  
**Map of Groundwater Quality: Arsenic Concentrations**  
**in Lower Aquifer Wells**

*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*



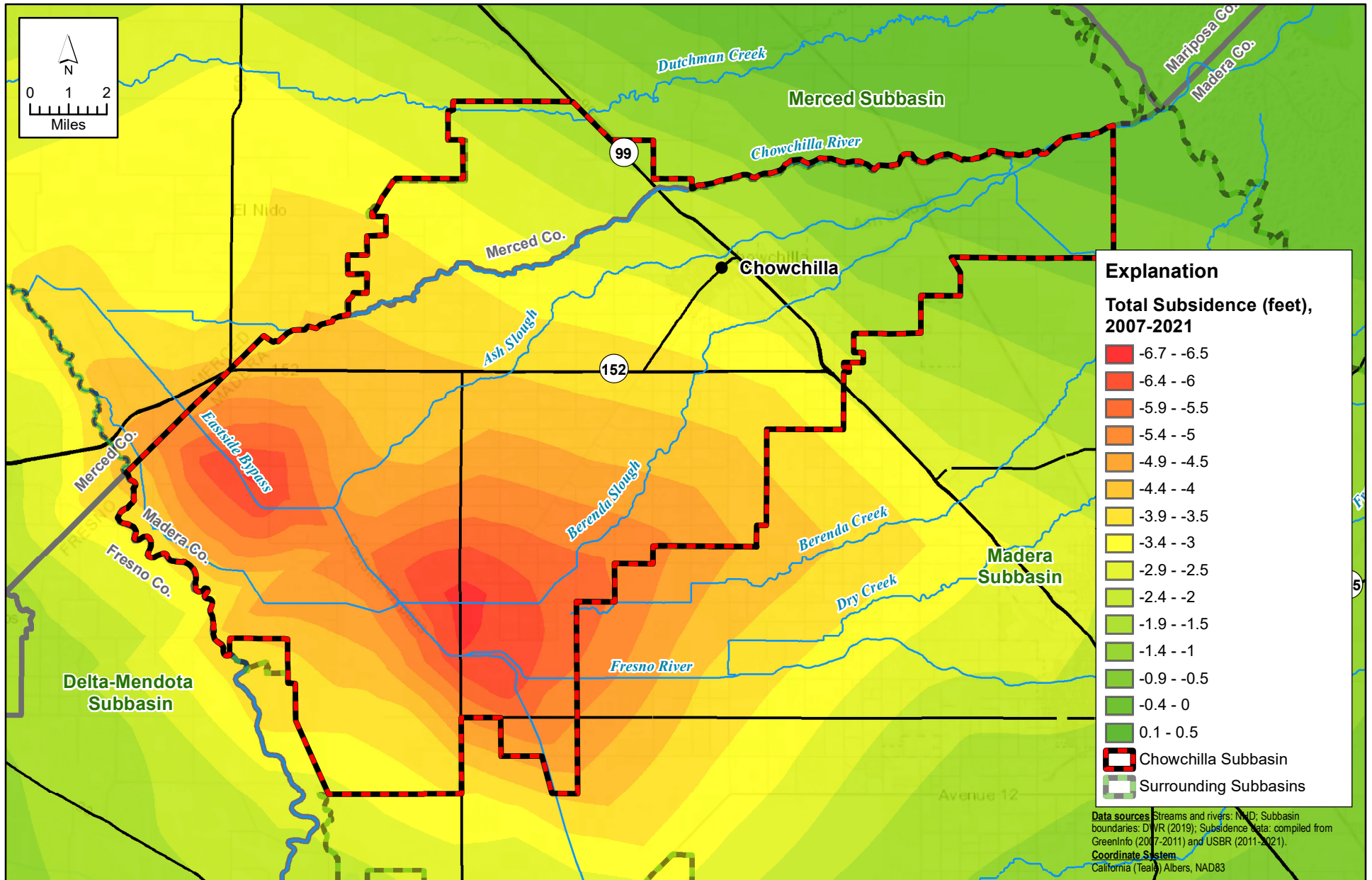
X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-66 Chowchilla Subbasin Land Subsidence 1926-1970.mxd

**FIGURE 2-66**



**Map of Historical Land Subsidence Contours: 1926-1970**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*

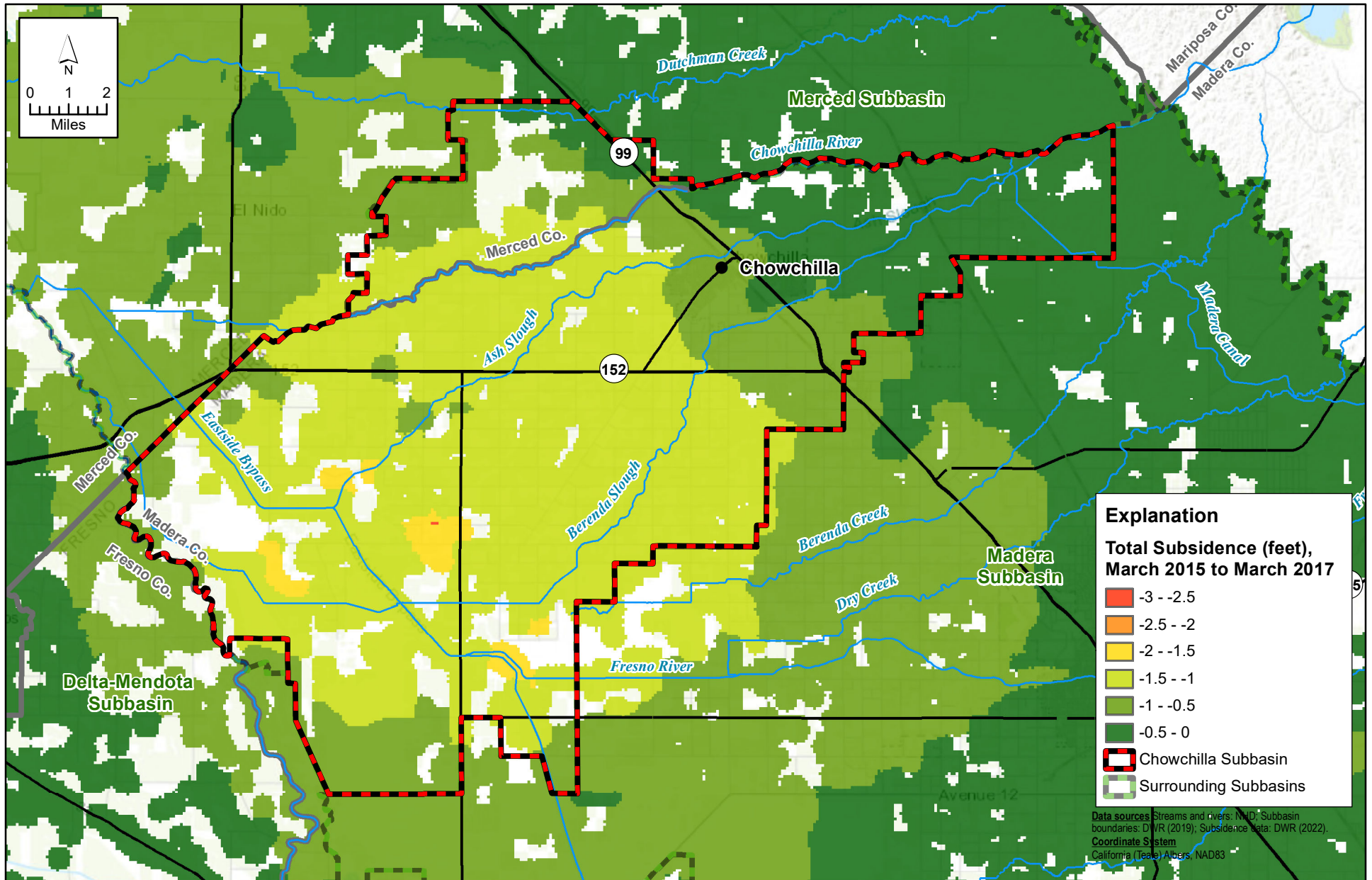


X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\REPORT\RevisedGSP\Sections from Bernadette\Subsidence\MAPS\Figure X-X Chowchilla Subbasin Total Subsidence 2007-2021.mxd



**FIGURE 2-67**  
**Map of Total Subsidence 2007-2021**  
**[combined from GreenInfo (2007-2011) and USBR (2011-2021)]**

*Chowchilla Subbasin  
 Groundwater Sustainability Plan*



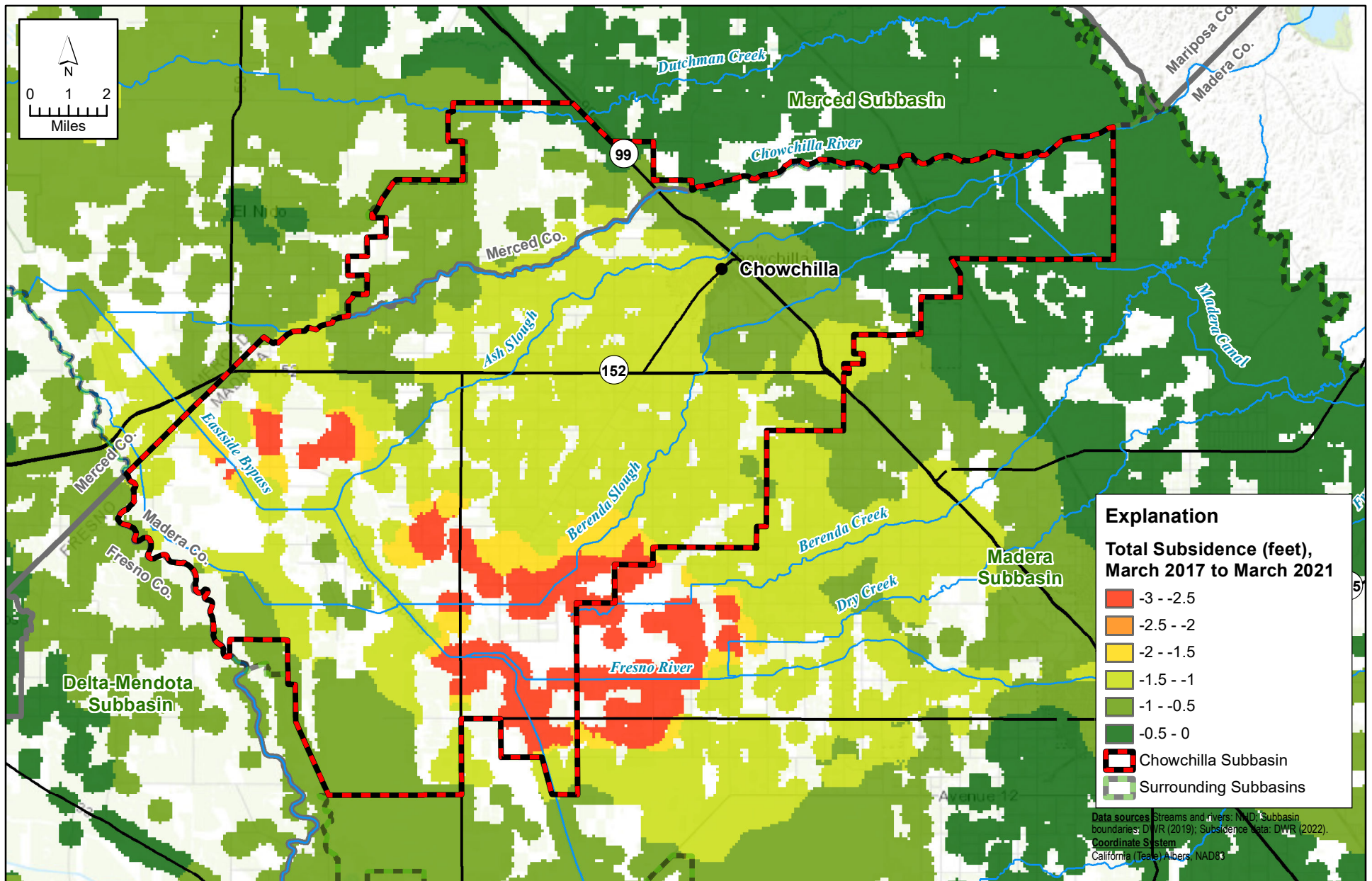
X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\REPORT\RevisedGSP\Sections from Bernadette\Subsidence\MAPS\Figure X-X Chowchilla Subbasin Total Subsidence 2015-2017.mxd

**FIGURE 2-68A**



**Map of Total Subsidence 2015-2017 from DWR InSAR data**

*Chowchilla Subbasin  
 Groundwater Sustainability Plan*



X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\REPORT\RevisedGSP\Sections from Bernadette\Subsidence\MAPS\Figure X-X Chowchilla Subbasin Total Subsidence 2017-2021.mxd

**FIGURE 2-68B**

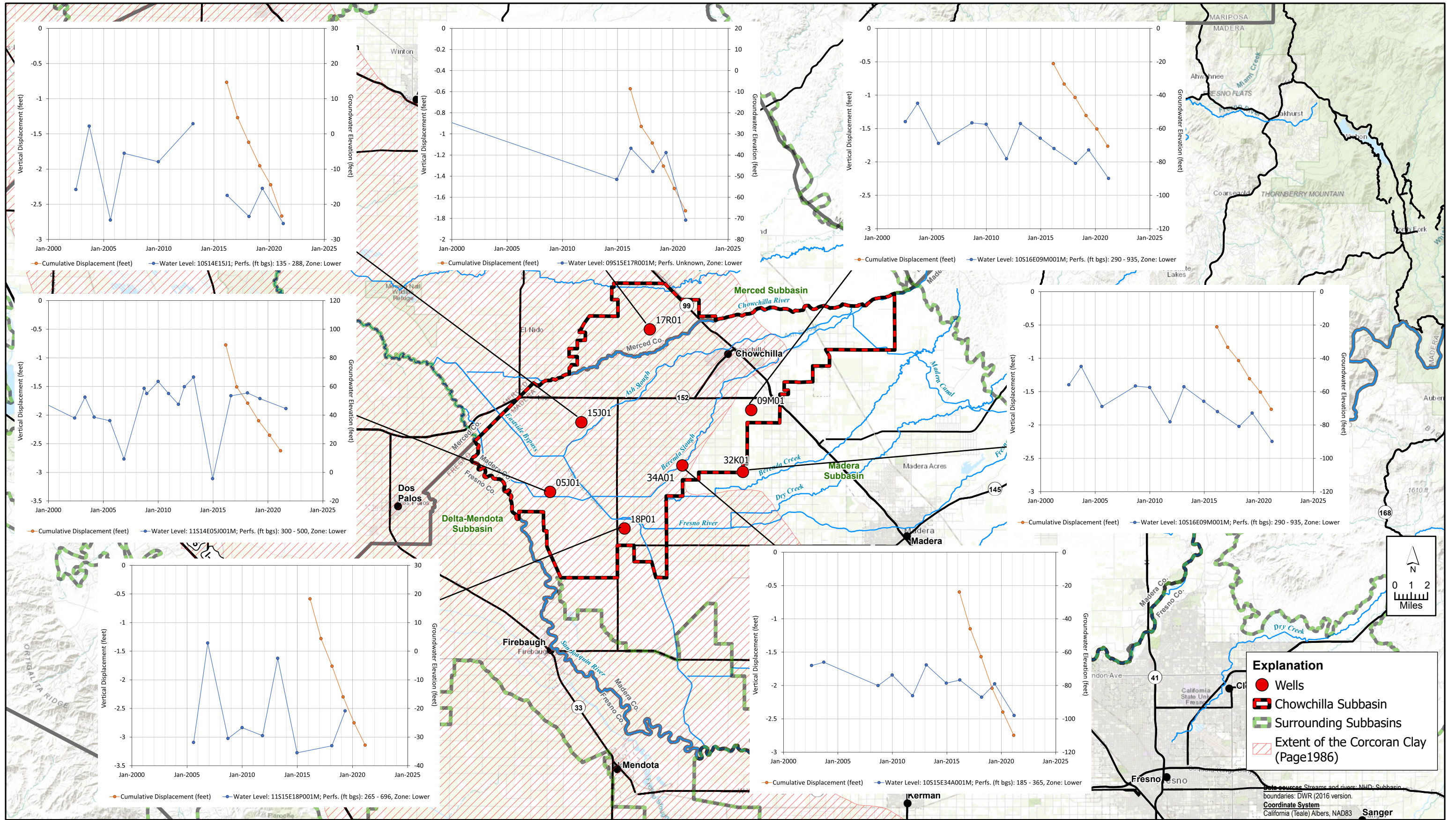


**Map of Total Subsidence 2017-2021 from DWR InSAR data**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*



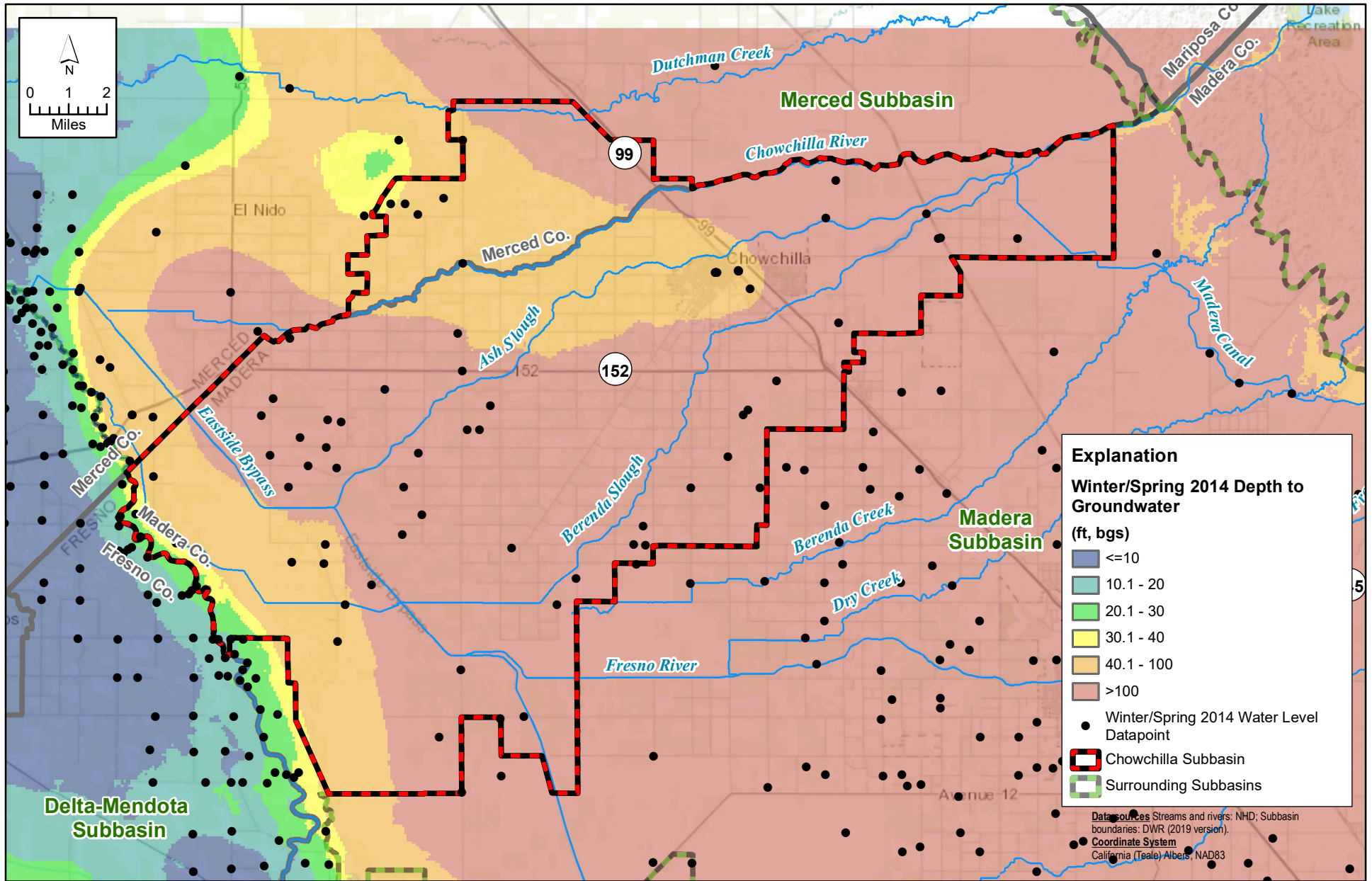




X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx

**FIGURE 2-70B**  
**Select Subsidence and Groundwater Level Hydrographs:**  
**DWR Tre Altamira InSAR**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

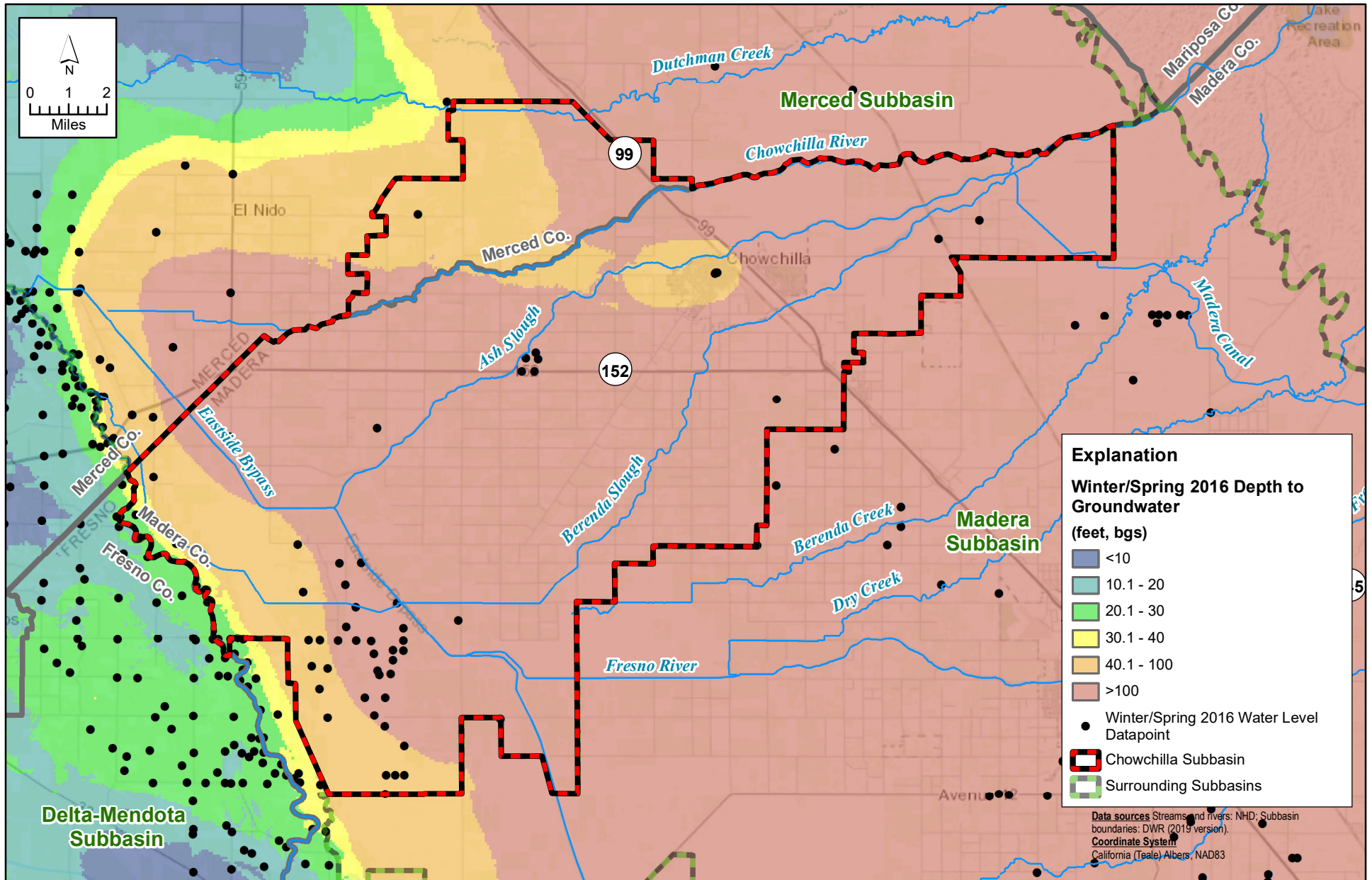




X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-70 Chowchilla Subbasin Depth to Unconfined GW WinterSpring 2014.mxd



**FIGURE 2-71**  
**Map of Depth to Groundwater:**  
**Winter/Spring 2014 - Unconfined Groundwater**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

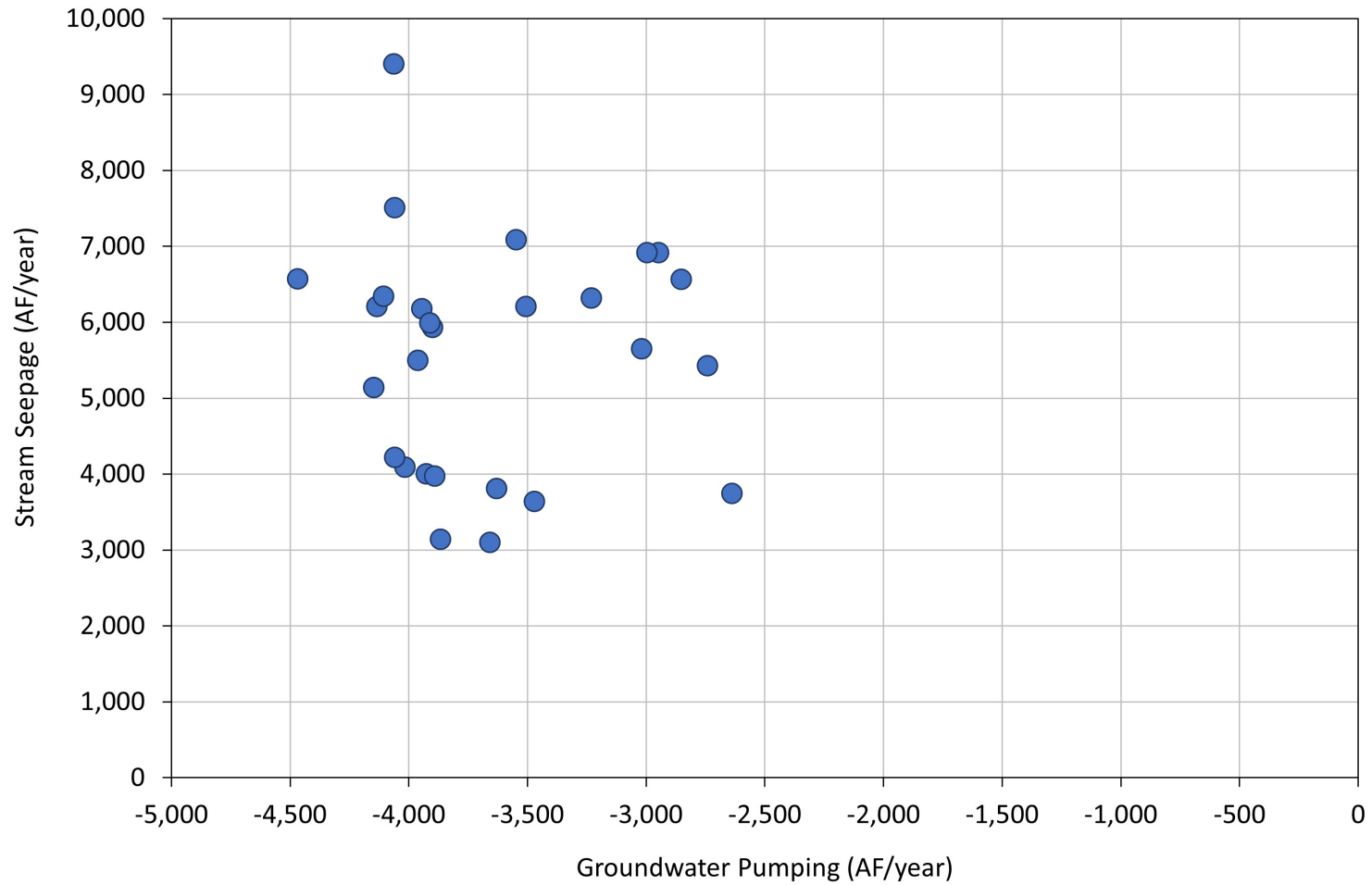


X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-71 Chowchilla Subbasin Depth to Unconfined GW Winter/Spring 2016.mxd



**FIGURE 2-72**  
**Map of Depth to Groundwater:**  
**Winter/Spring 2016 - Unconfined Groundwater**  
*Chowchilla Subbasin*  
*Groundwater Sustainability Plan*

### Groundwater Pumping along the San Joaquin River vs. Stream Seepage from the San Joaquin River



Data for chart from Madera-Chowchilla Groundwater-Surface Water Simulation Model (MCSim)

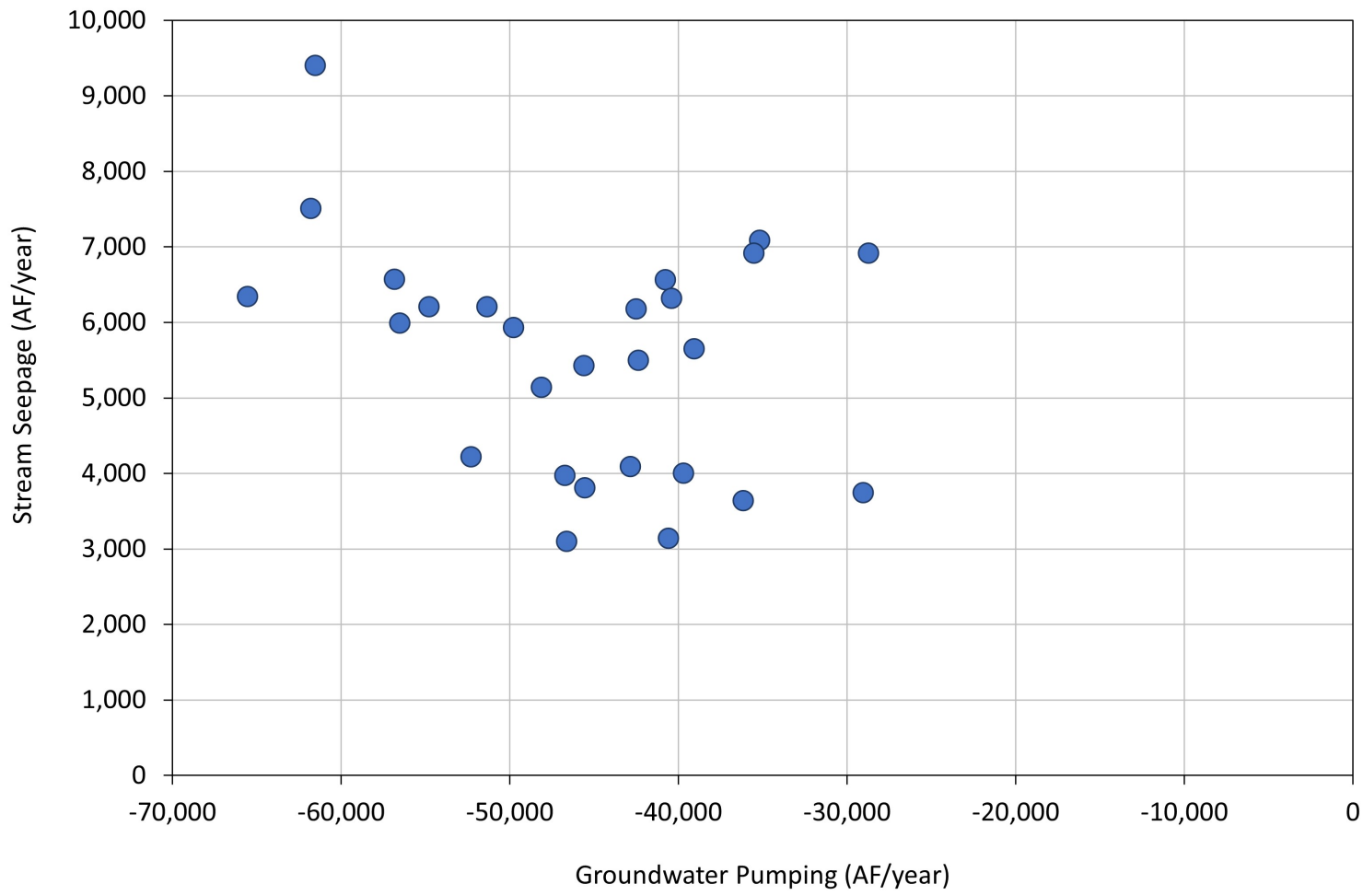
X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx



**FIGURE 2-73**  
**Groundwater Pumping along the San Joaquin River vs.**  
**Stream Seepage from the San Joaquin River**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*

### Groundwater Pumping in the Western Management Area vs. Stream Seepage from the San Joaquin River



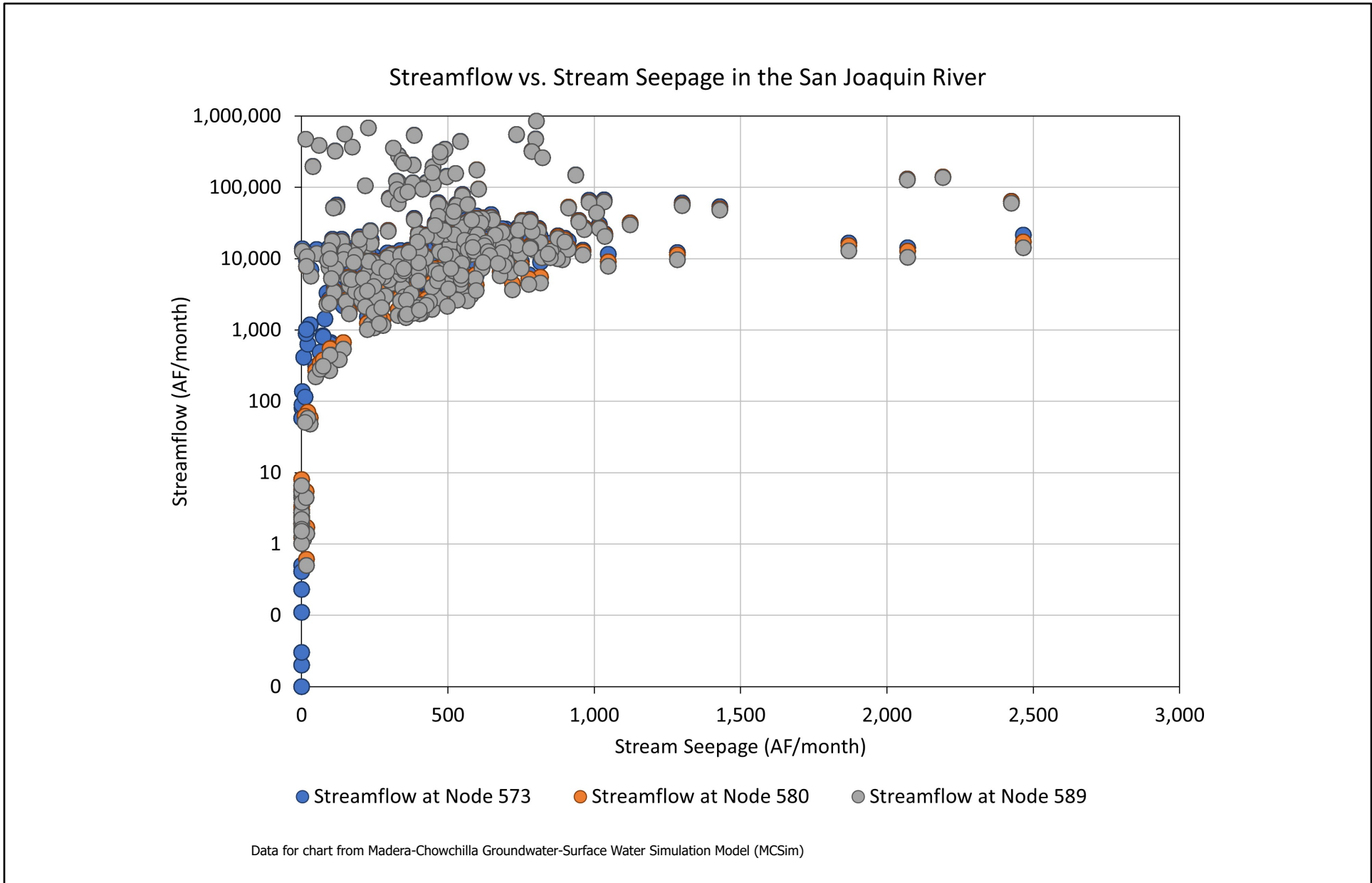
Data for chart from Madera-Chowchilla Groundwater-Surface Water Simulation Model (MCSim)

X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx



**FIGURE 2-74**  
**Groundwater Pumping in the Western Management Area vs.**  
**Stream Seepage from the San Joaquin River**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*



X:\2021\21-166 Davids Engineering - Chowchilla Subbasin GSP DWR Consultation Letter\GIS\CHOW\_GSP\_UPDATE\CHOW\_GSP\_UPDATE.aprx



**FIGURE 2-75**

**Streamflow vs. Stream Seepage in the San Joaquin River**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*

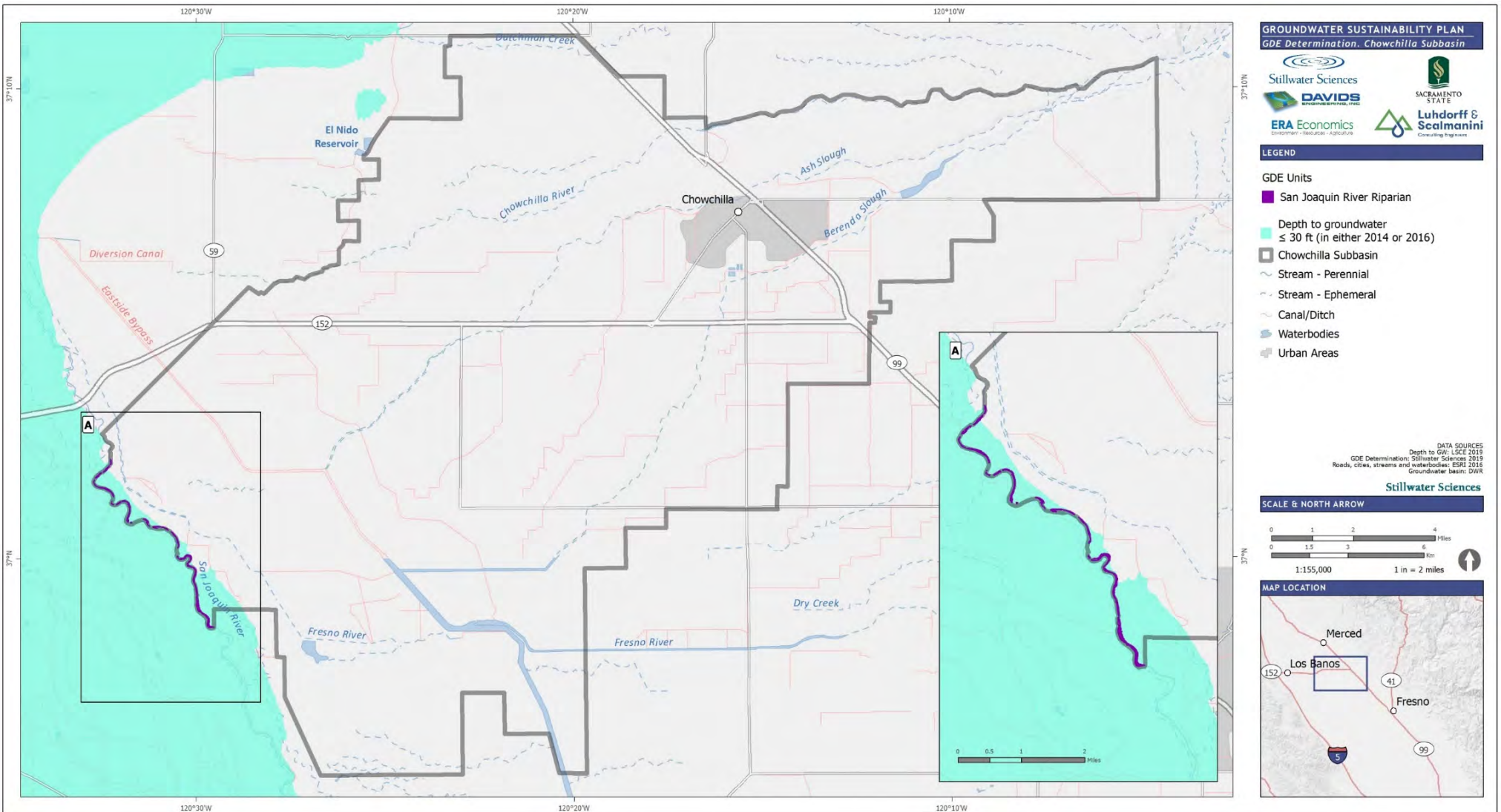
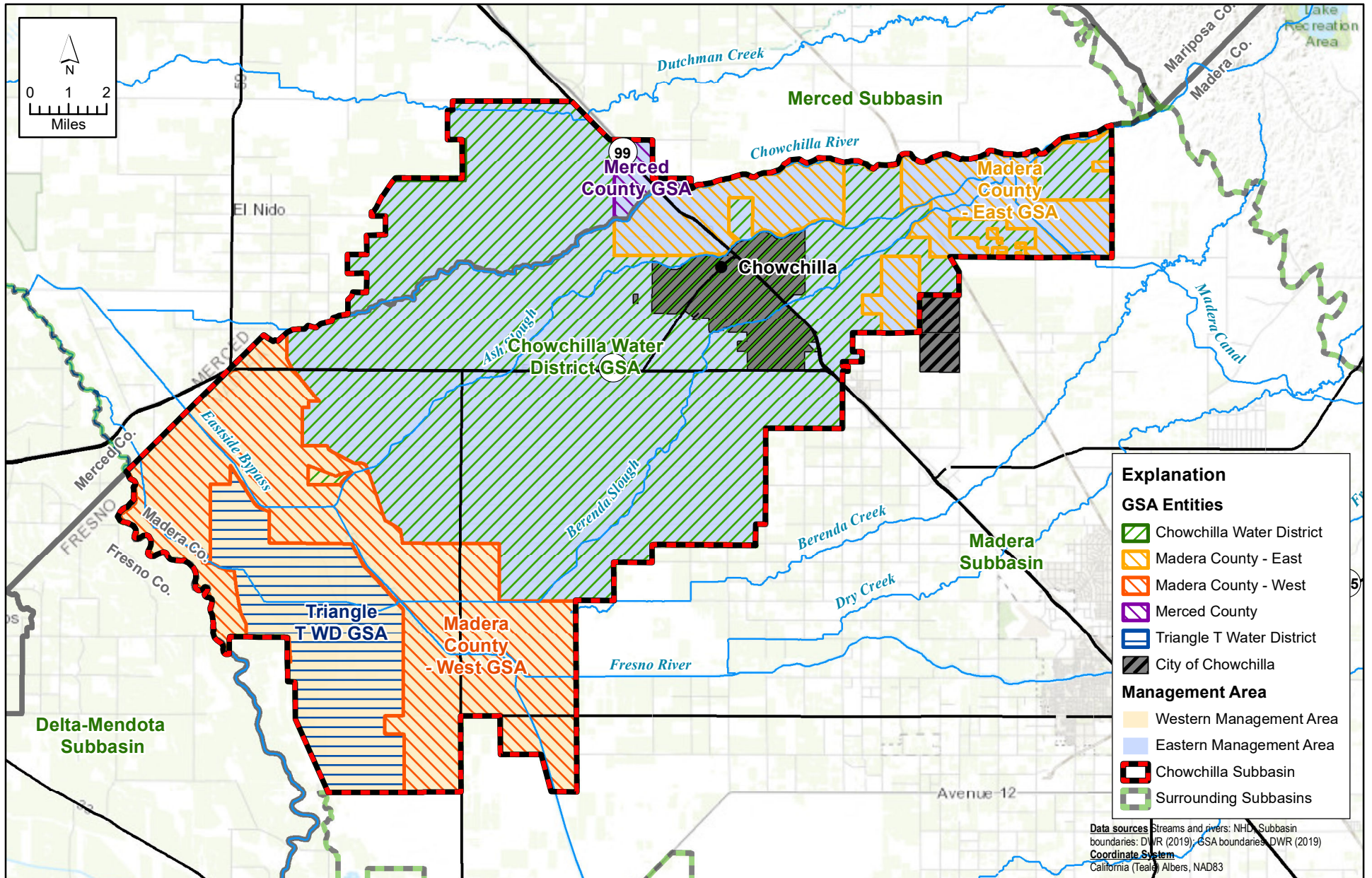


Figure 2-76. GDE units and depth to groundwater in the Chowchilla Subbasin.



X:\2018\18-017 Chowchilla GSP Development\GIS\Map files\Report Figures\Figure 2-93 Chowchilla Subbasin Management Areas.mxd

**FIGURE 2-94**

**Management Areas**

