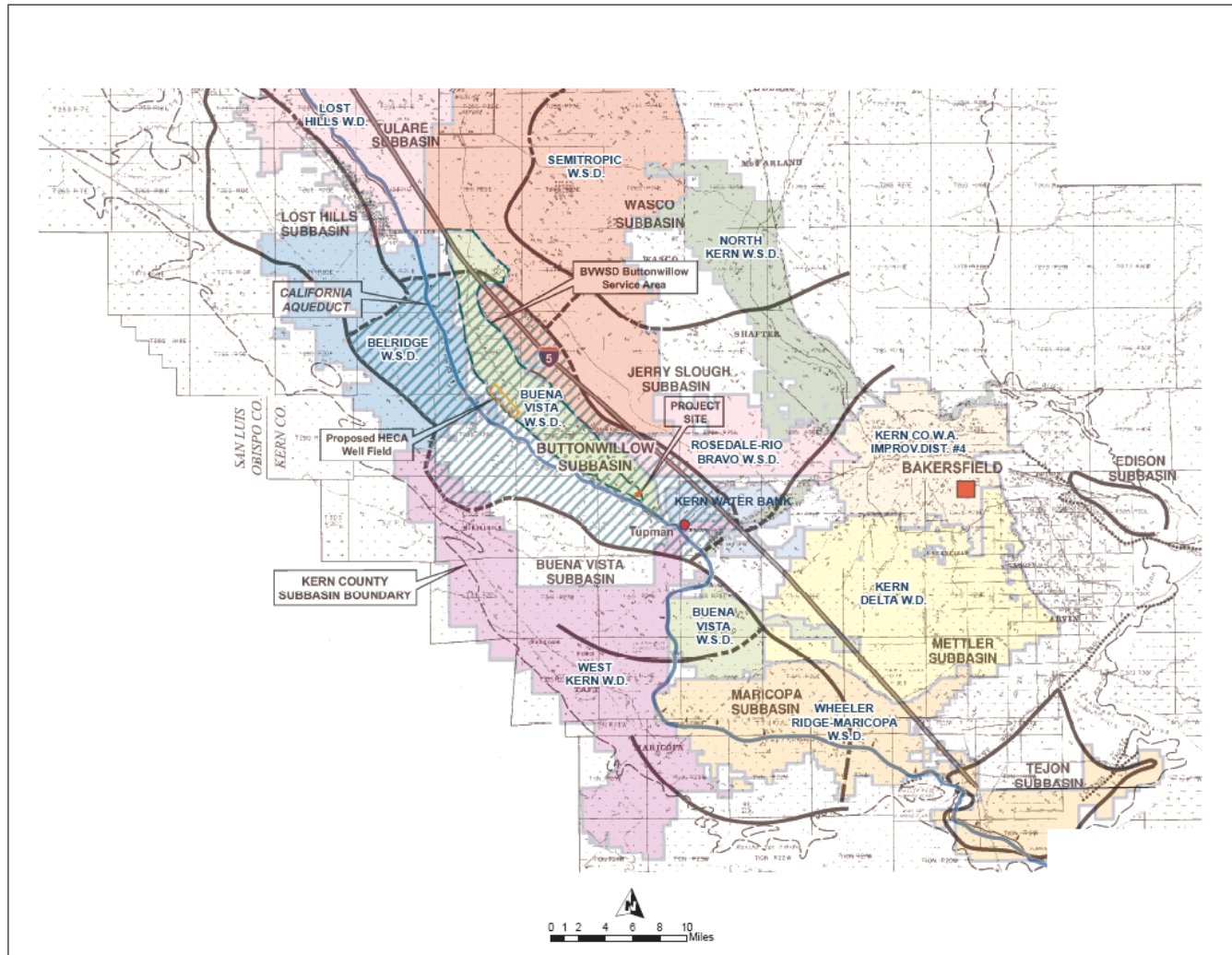
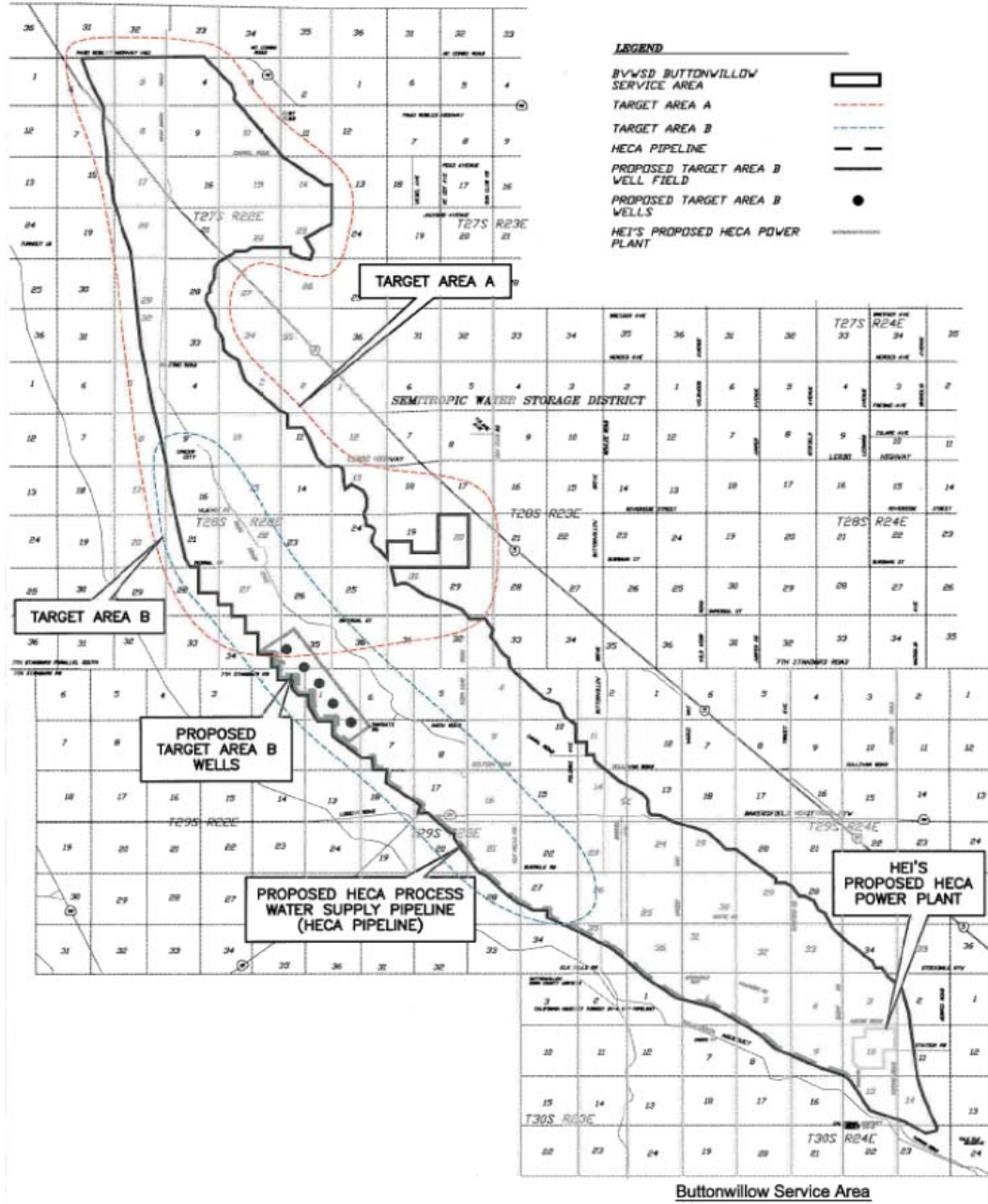
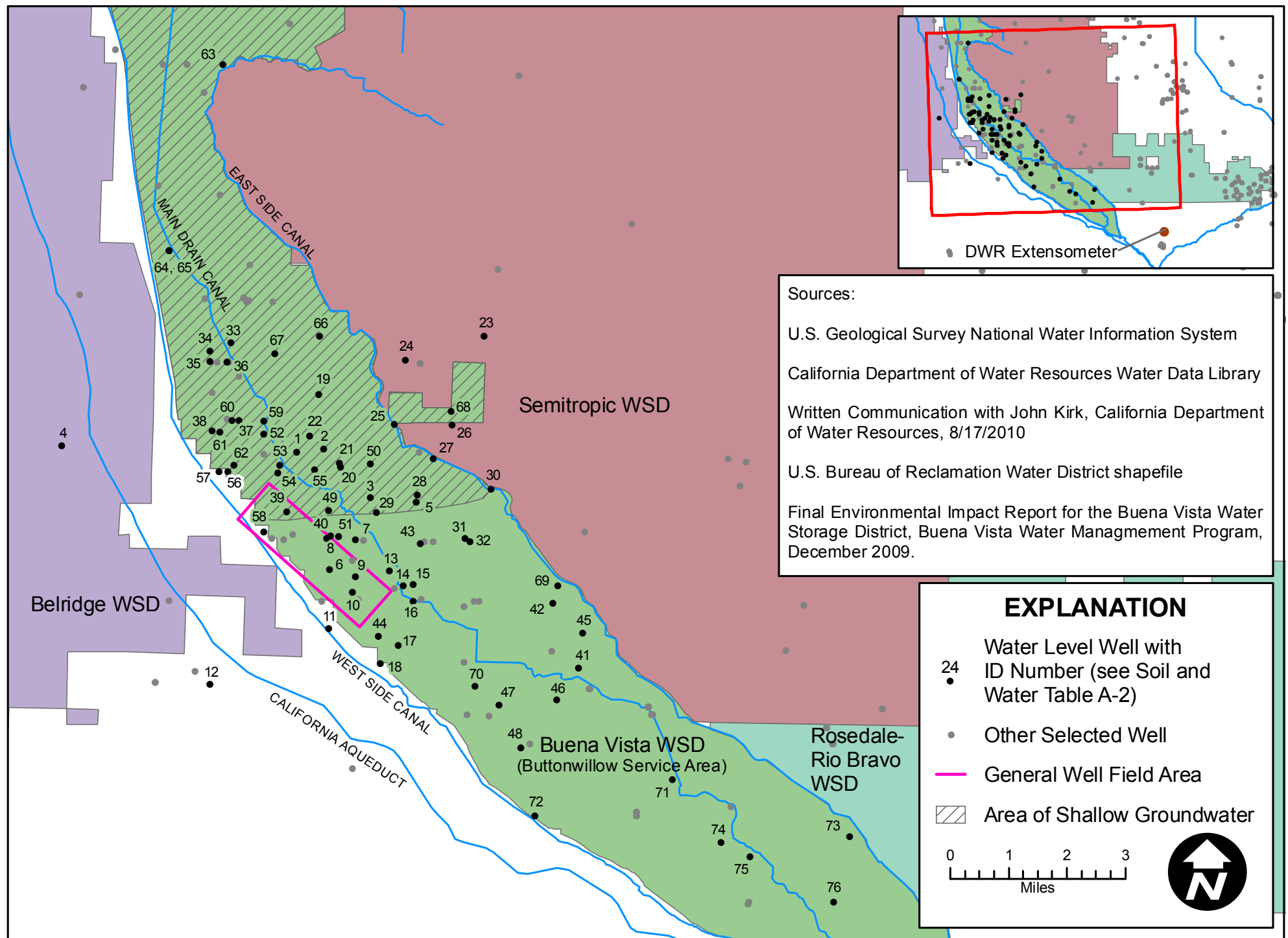


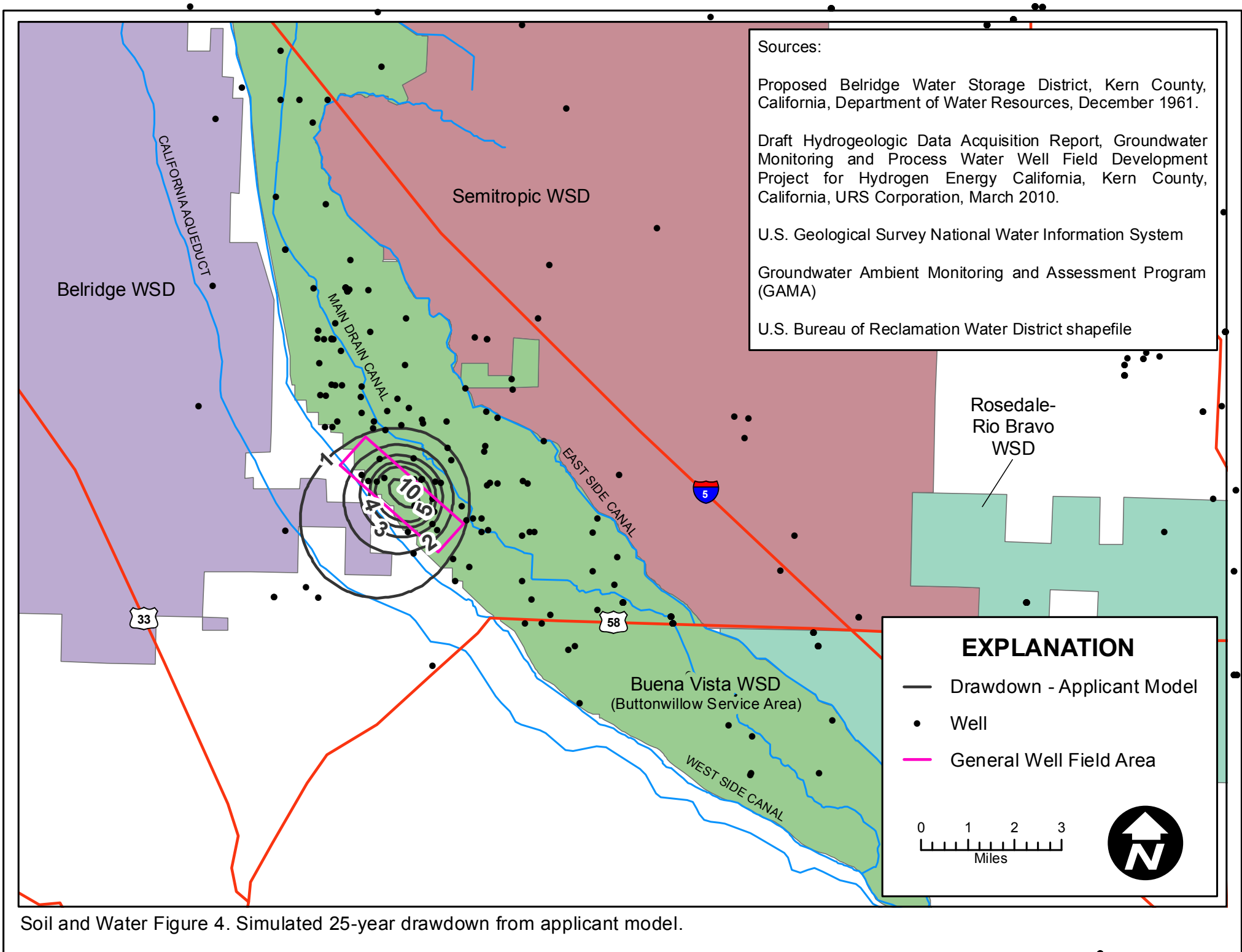
**SOIL&WATER Figure 1: Kern Water Districts and Subbasins**

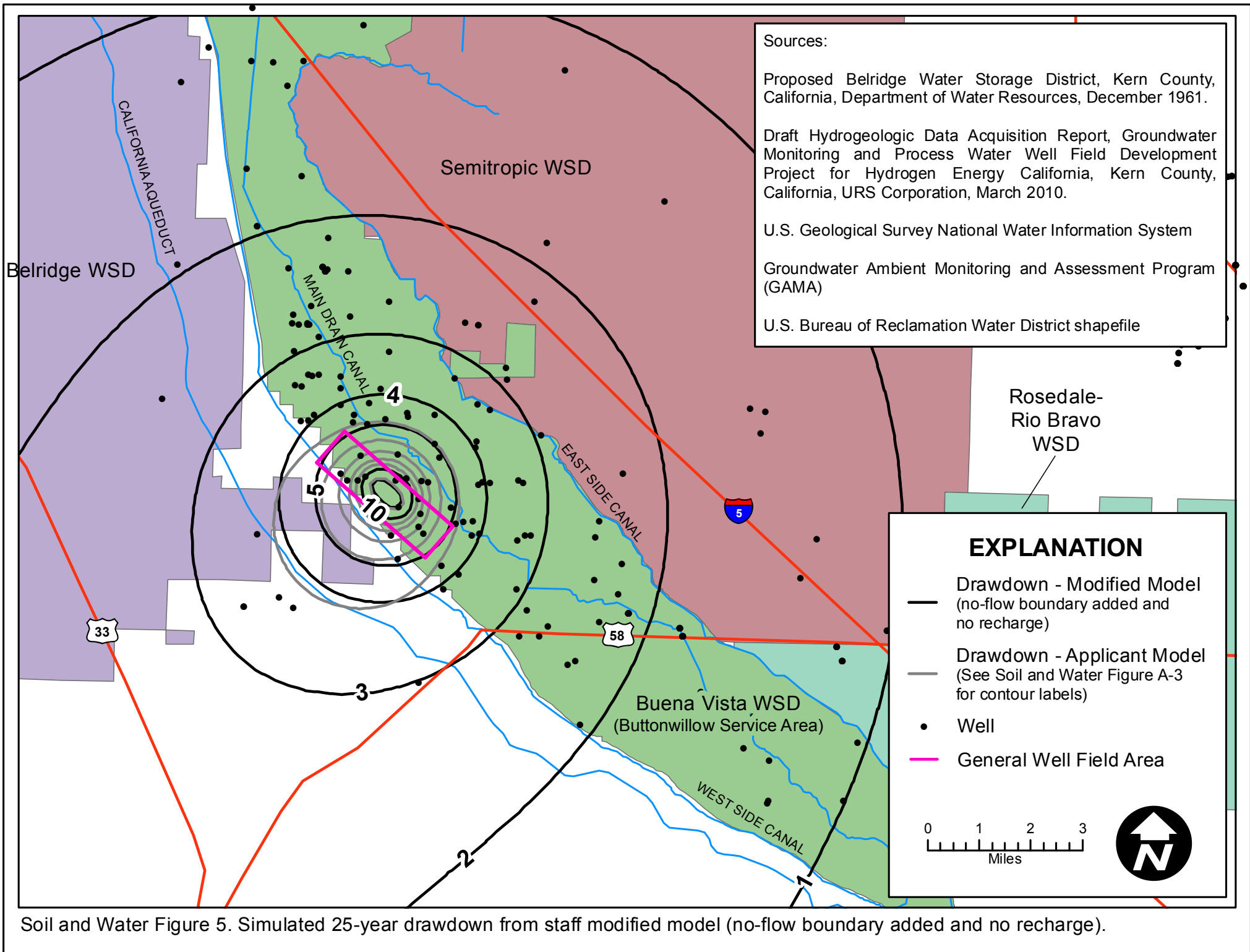
Source: FEIR 2009

## SOIL&WATER Figure 2: Brackish Groundwater Remediation Project

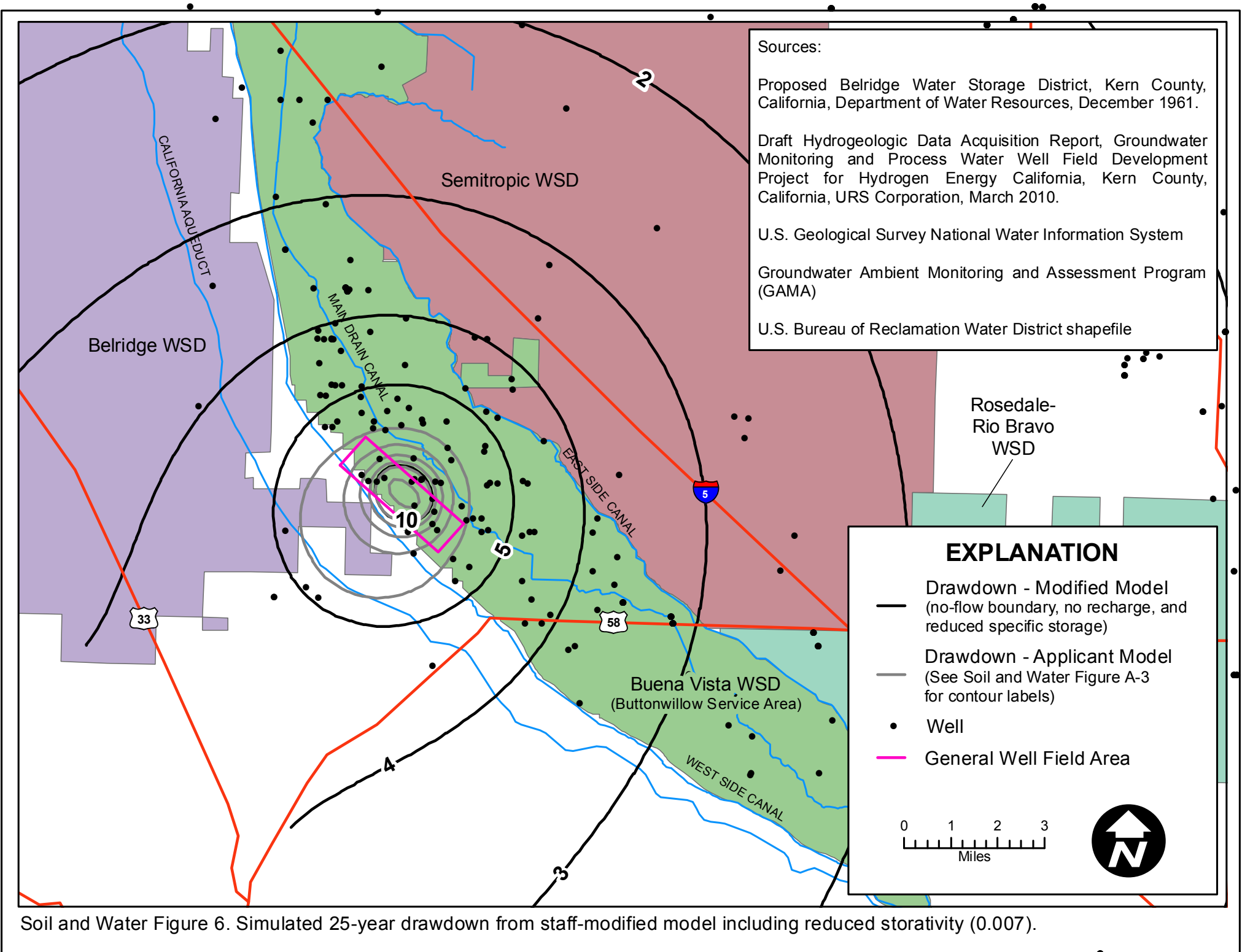


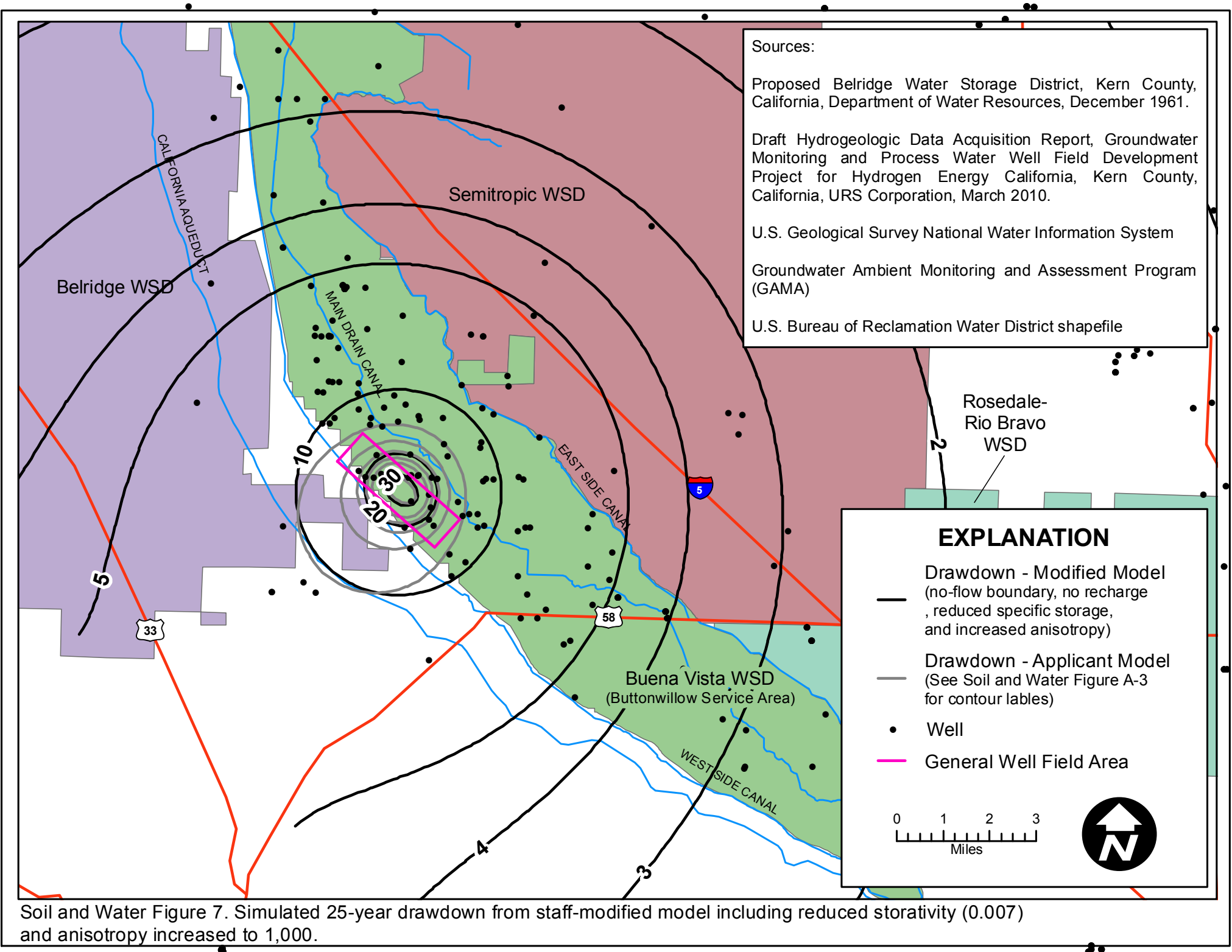


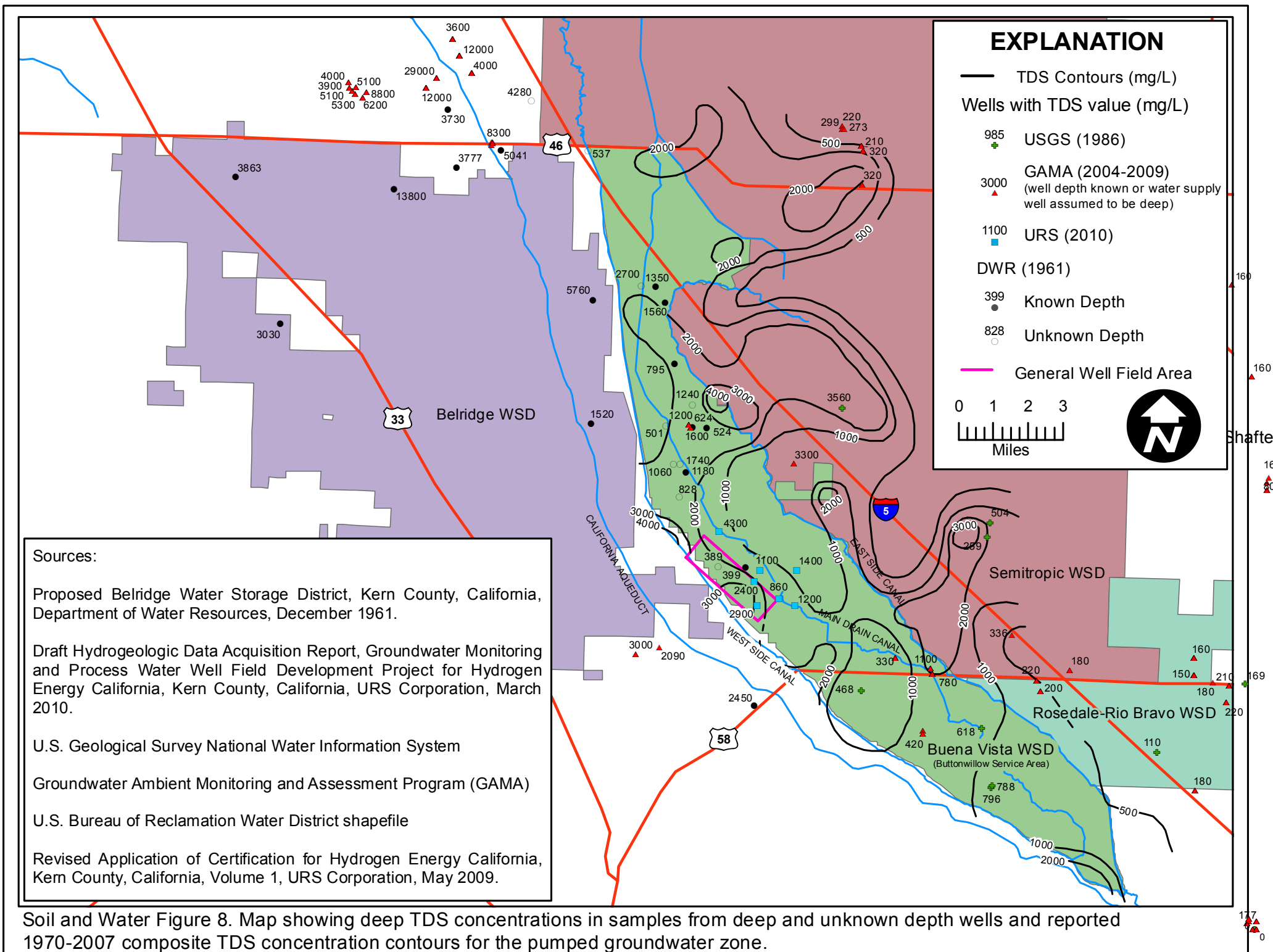




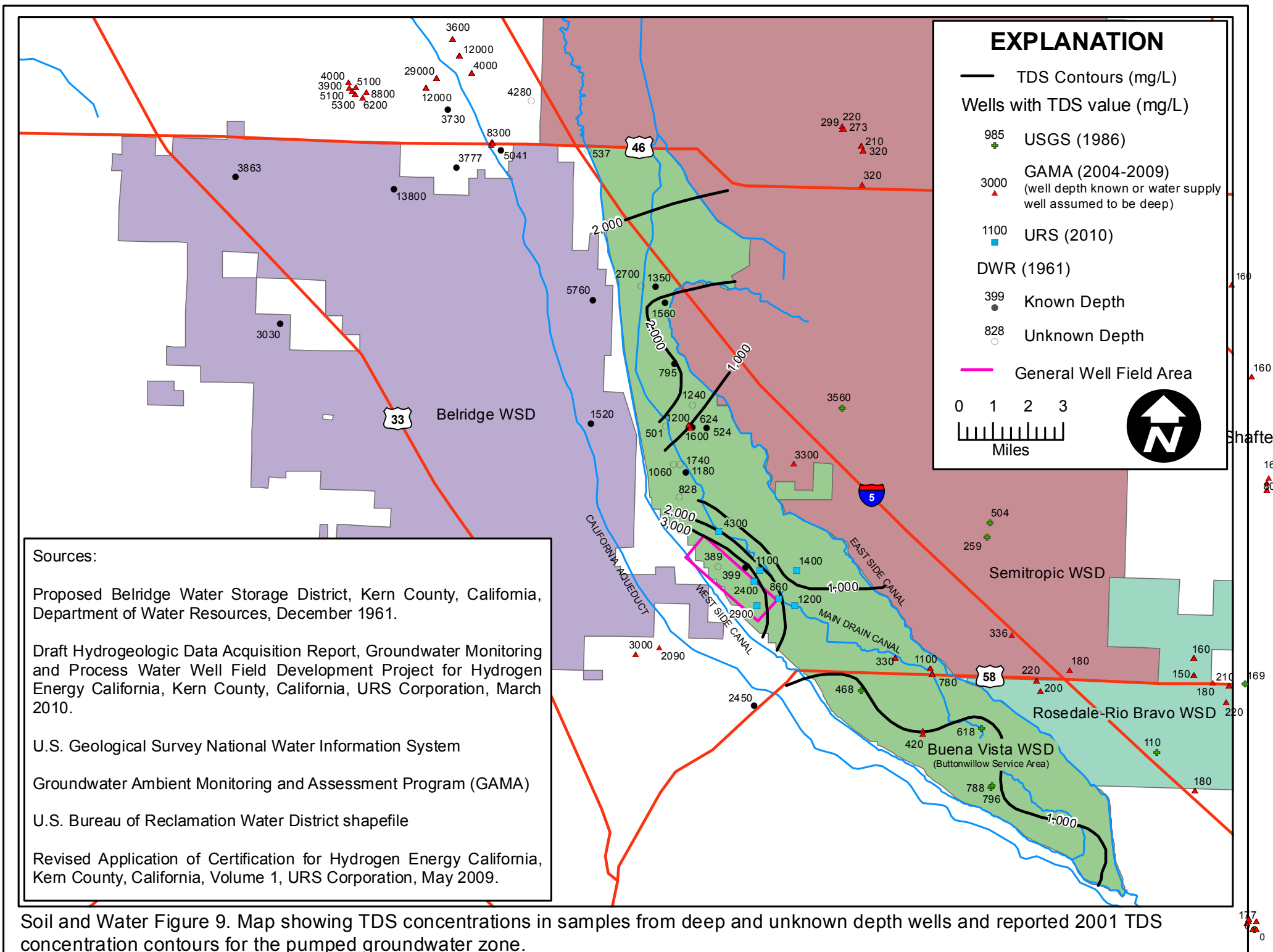




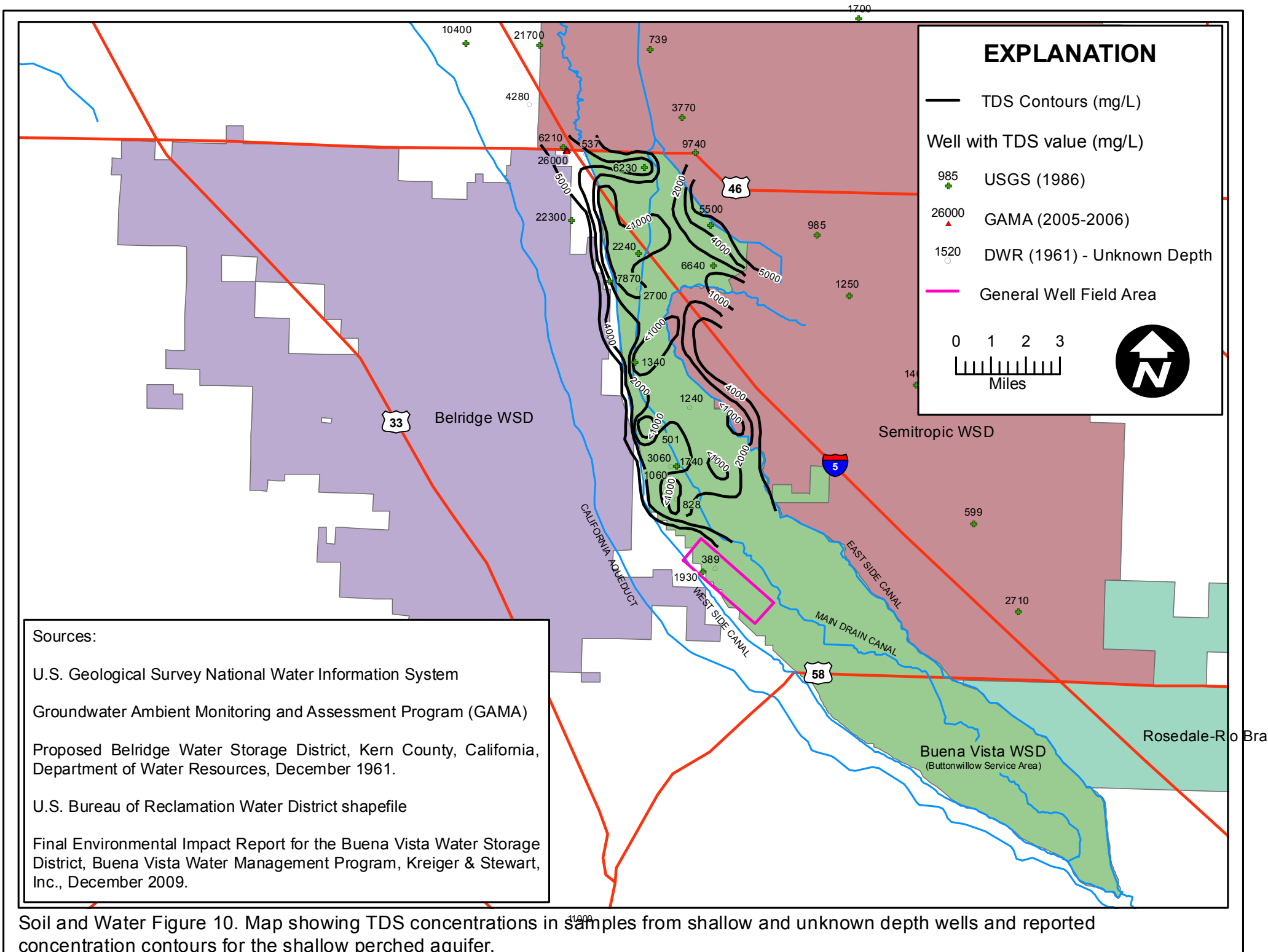


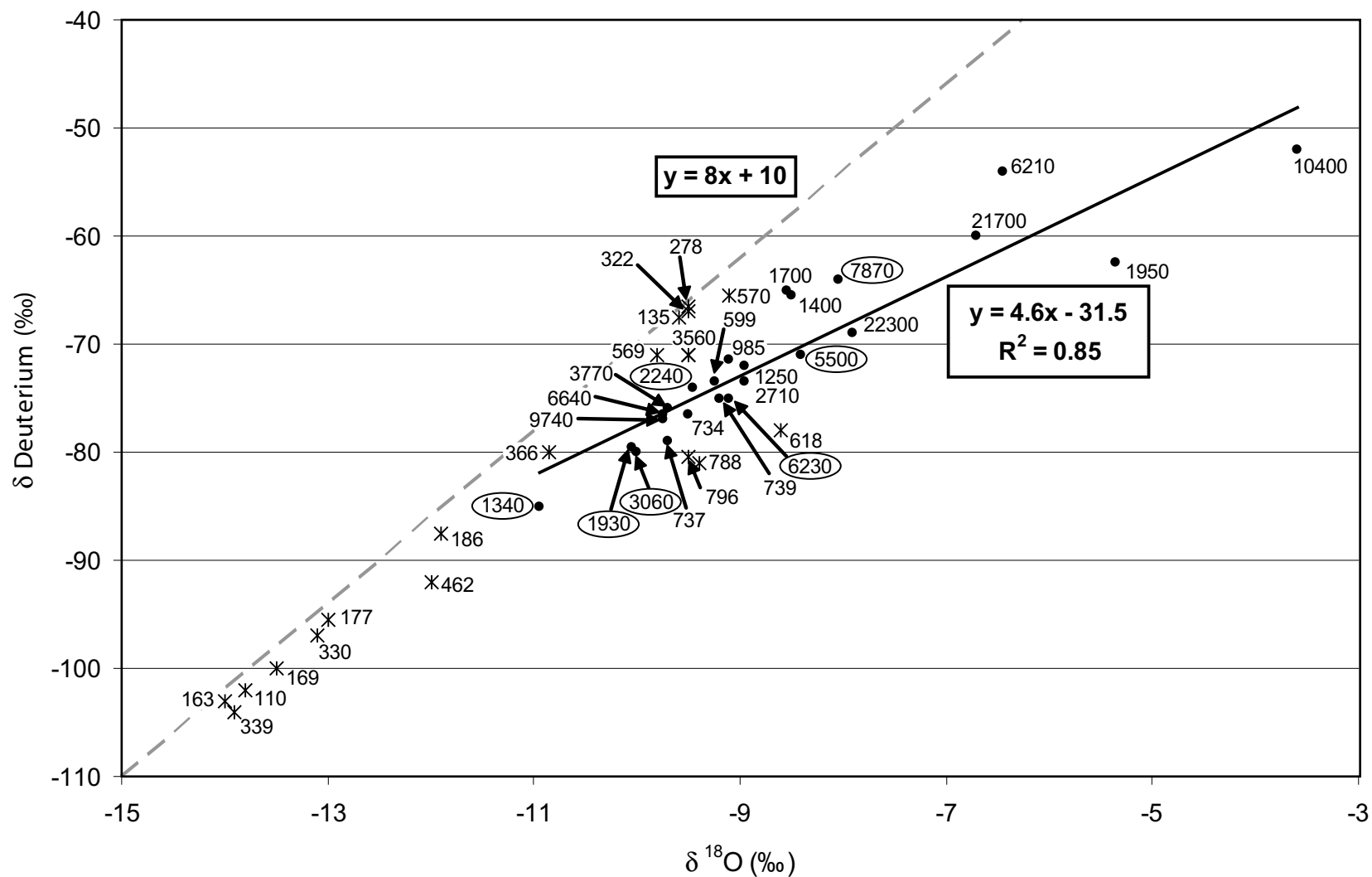






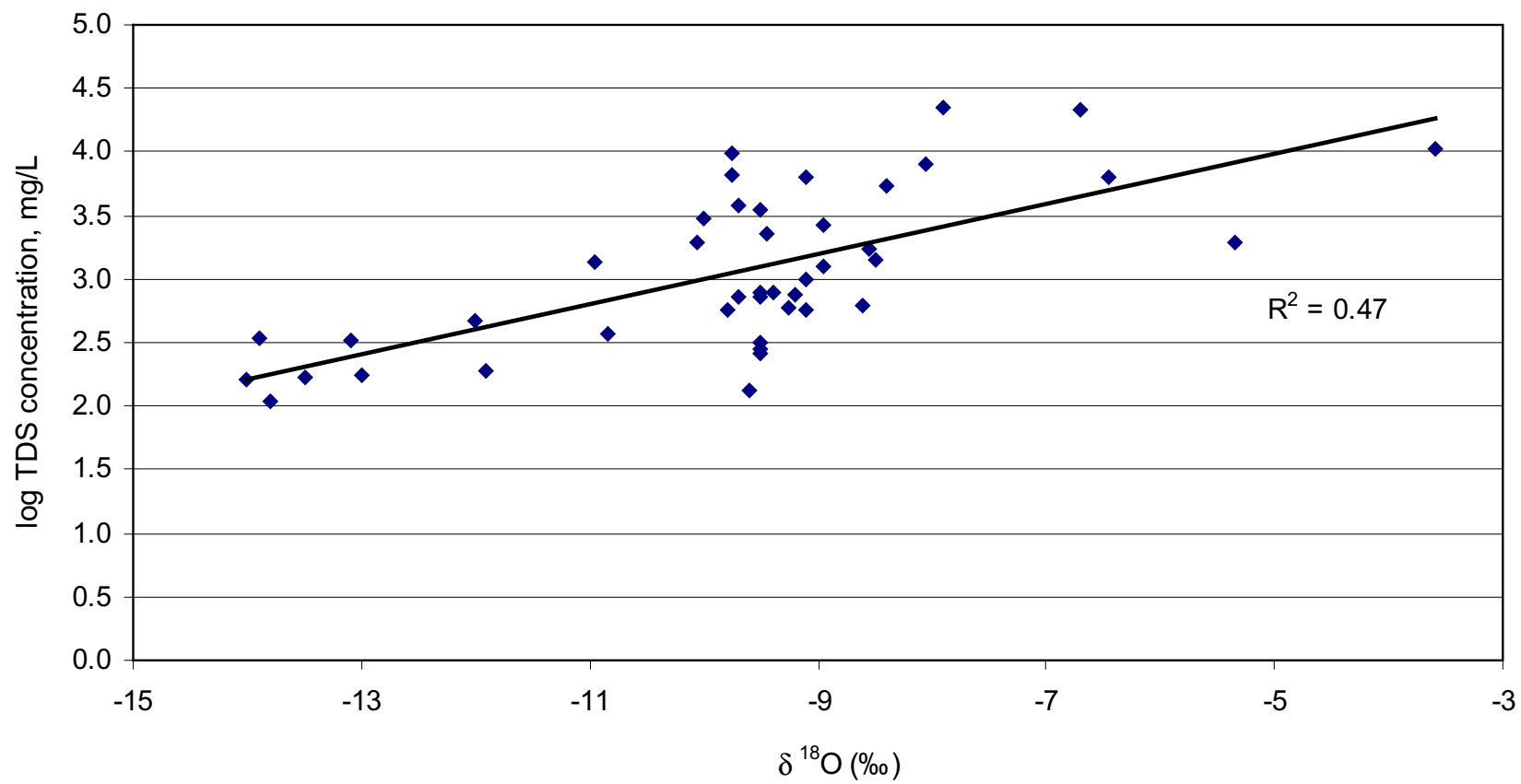
Soil and Water Figure 9. Map showing TDS concentrations in samples from deep and unknown depth wells and reported 2001 TDS concentration contours for the pumped groundwater zone.





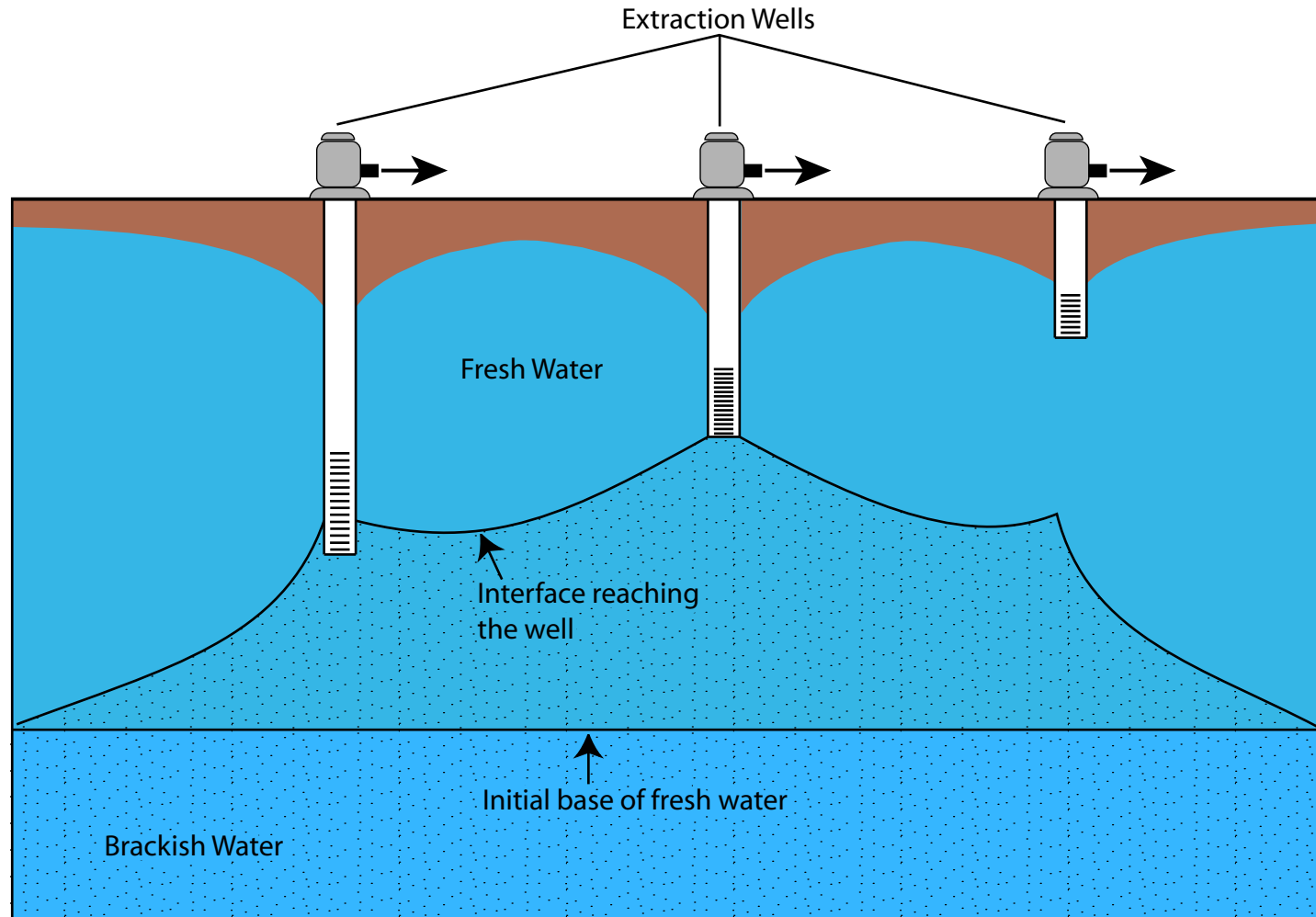
Soil and Water Figure 11. Relationships between  $\delta\text{D}$  and  $\delta^{18}\text{O}$ , TDS concentrations, and well depths using groundwater data collected by the USGS in 1986.





Soil and Water Figure 13. Relationship between TDS concentrations and  $\delta^{18}\text{O}$  for groundwater samples collected by the USGS in 1986.







Soil and Water Figure 14. Conceptual illustration of up-coning beneath partially penetrating water supply wells.

## EXPLANATION

### 25-Year Zone of Influence

-  Applicant Model
-  Modified Model  
(no-flow boundary added  
and recharge removed)

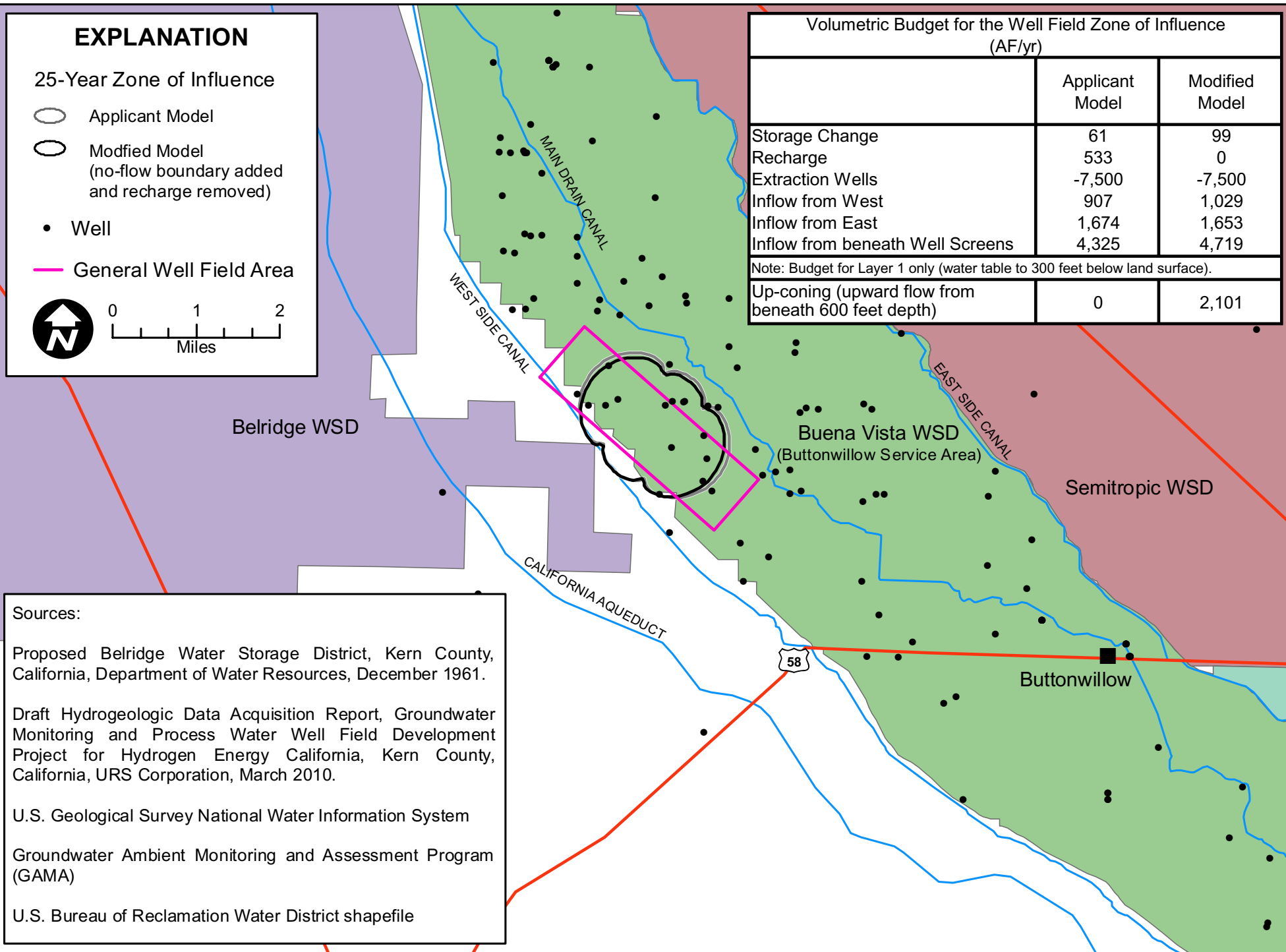
- Well

 General Well Field Area



0 1 2  
Miles

Volumetric Budget for the Well Field Zone of Influence (AF/yr)		
	Applicant Model	Modified Model
Storage Change	61	99
Recharge	533	0
Extraction Wells	-7,500	-7,500
Inflow from West	907	1,029
Inflow from East	1,674	1,653
Inflow from beneath Well Screens	4,325	4,719
Note: Budget for Layer 1 only (water table to 300 feet below land surface).		
Up-coning (upward flow from beneath 600 feet depth)	0	2,101



### Sources:

Proposed Belridge Water Storage District, Kern County, California, Department of Water Resources, December 1961.

Draft Hydrogeologic Data Acquisition Report, Groundwater Monitoring and Process Water Well Field Development Project for Hydrogen Energy California, Kern County, California, URS Corporation, March 2010.

U.S. Geological Survey National Water Information System





Groundwater Ambient Monitoring and Assessment Program (GAMA)

U.S. Bureau of Reclamation Water District shapefile

Soils and Water Figure 15. Simulated 25-year Zone of Influence (ZOI) and volumetric budget for the applicant model and staff-modified model (no-flow boundary and no recharge).

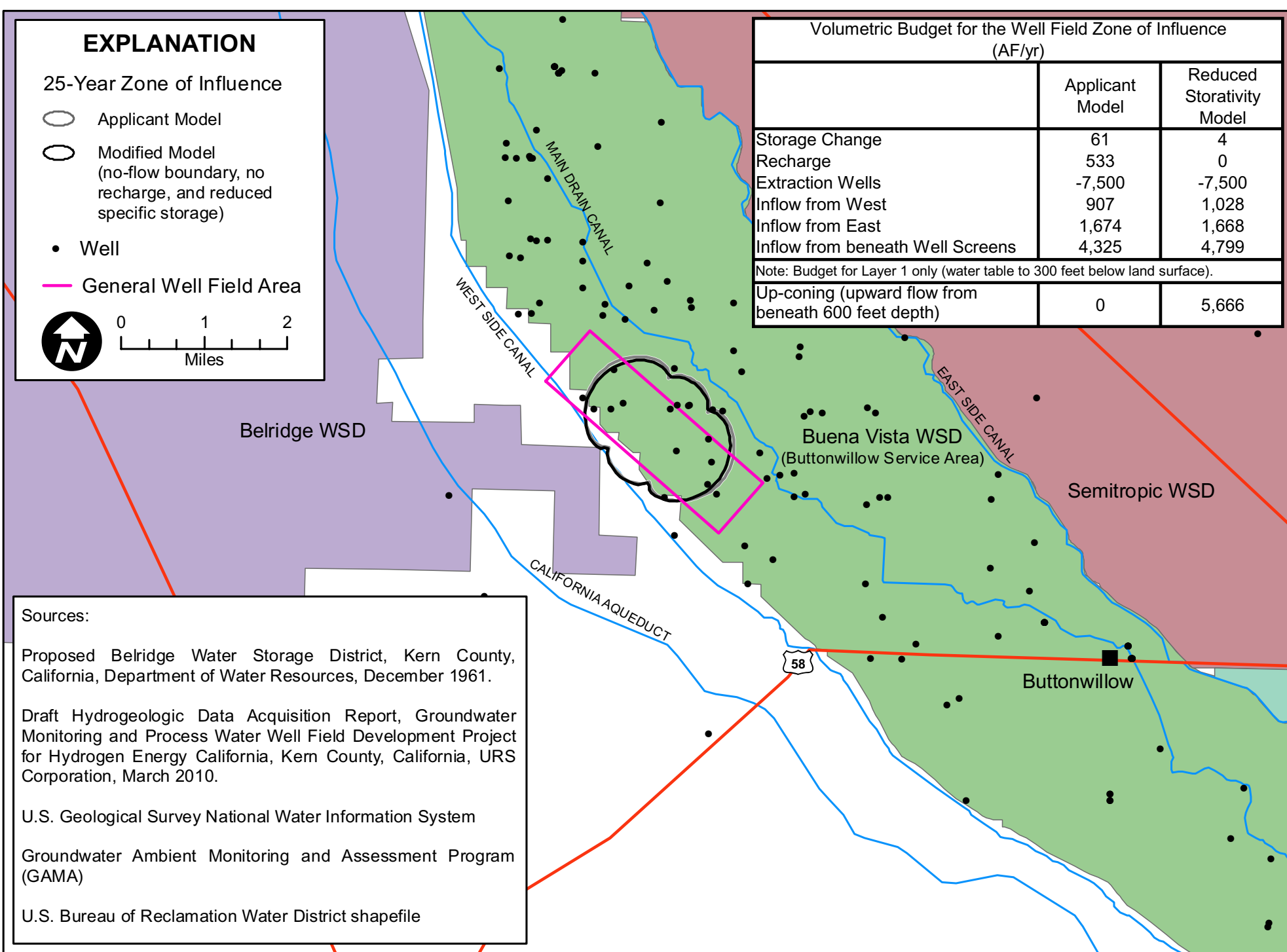
## EXPLANATION

### 25-Year Zone of Influence

-  Applicant Model
-  Modified Model (no-flow boundary, no recharge, and reduced specific storage)
-  Well
-  General Well Field Area



Volumetric Budget for the Well Field Zone of Influence (AF/yr)		
	Applicant Model	Reduced Storativity Model
Storage Change	61	4
Recharge	533	0
Extraction Wells	-7,500	-7,500
Inflow from West	907	1,028
Inflow from East	1,674	1,668
Inflow from beneath Well Screens	4,325	4,799
Note: Budget for Layer 1 only (water table to 300 feet below land surface).		
Up-coning (upward flow from beneath 600 feet depth)	0	5,666



### Sources:

Proposed Belridge Water Storage District, Kern County, California, Department of Water Resources, December 1961.

Draft Hydrogeologic Data Acquisition Report, Groundwater Monitoring and Process Water Well Field Development Project for Hydrogen Energy California, Kern County, California, URS Corporation, March 2010.

U.S. Geological Survey National Water Information System

Groundwater Ambient Monitoring and Assessment Program (GAMA)



U.S. Bureau of Reclamation Water District shapefile

Soil and Water Figure 16.

Simulated 25-year Zone of Influence (ZOI) and volumetric budget for the applicant model and staff-modified model including reduced storativity (0.007).

## EXPLANATION

### 25-Year Zone of Influence

-  Applicant Model
-  High Anisotropy Model (no-flow boundary added, recharge removed, semi-confined conditions, and high anisotropy)

• Well

 General Well Field Area



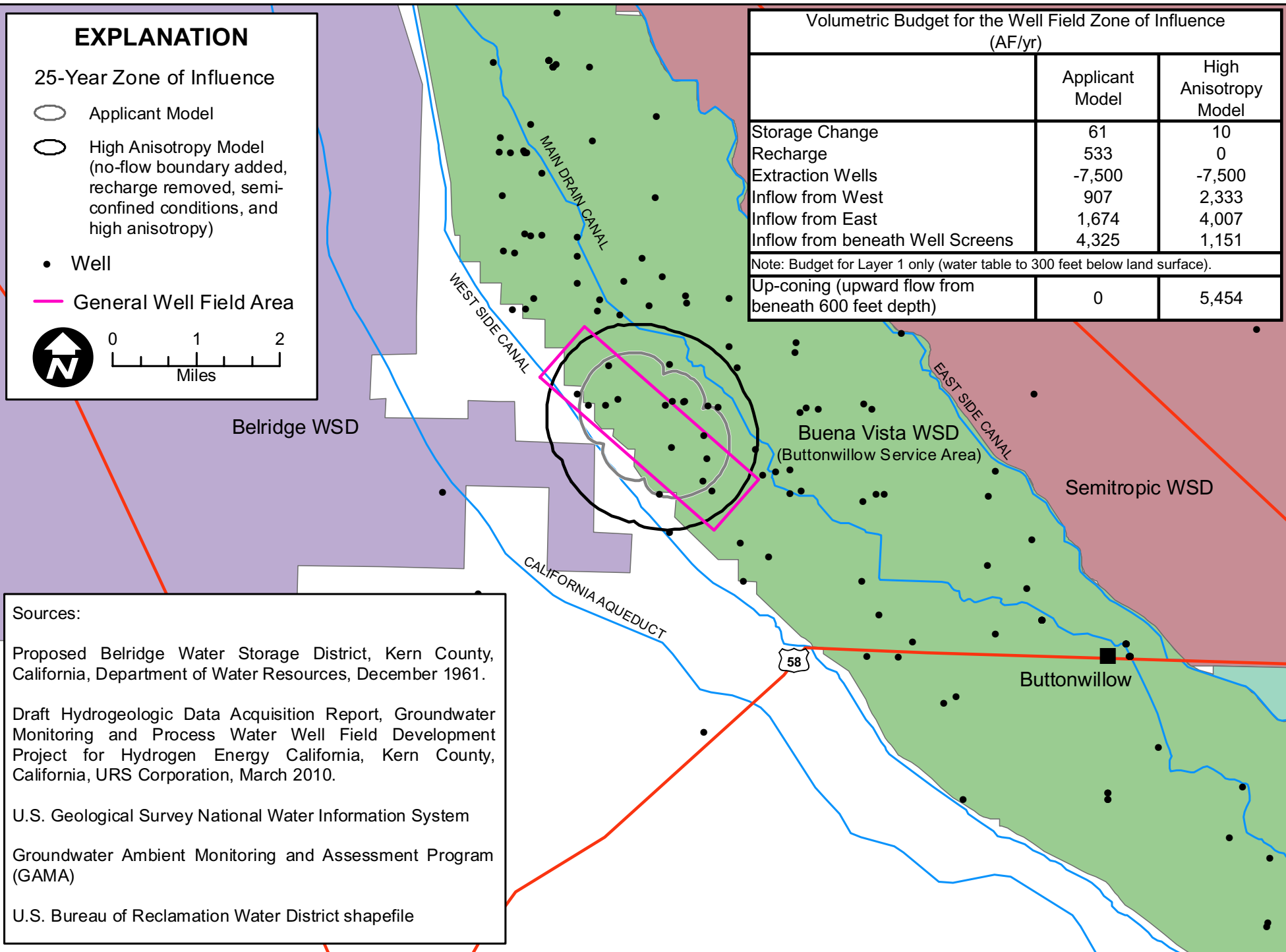
0 1 2  
Miles

### Volumetric Budget for the Well Field Zone of Influence (AF/yr)

	Applicant Model	High Anisotropy Model
Storage Change	61	10
Recharge	533	0
Extraction Wells	-7,500	-7,500
Inflow from West	907	2,333
Inflow from East	1,674	4,007
Inflow from beneath Well Screens	4,325	1,151

Note: Budget for Layer 1 only (water table to 300 feet below land surface).

Up-coning (upward flow from beneath 600 feet depth)	0	5,454
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### Sources:

Proposed Belridge Water Storage District, Kern County, California, Department of Water Resources, December 1961.

Draft Hydrogeologic Data Acquisition Report, Groundwater Monitoring and Process Water Well Field Development Project for Hydrogen Energy California, Kern County, California, URS Corporation, March 2010.

U.S. Geological Survey National Water Information System

Groundwater Ambient Monitoring and Assessment Program (GAMA)

U.S. Bureau of Reclamation Water District shapefile

Soil and Water Figure 17.

Simulated 25-year Zone of Influence (ZOI) and volumetric budget for the applicant model and staff-modified model and reduced storativity (0.007) with anisotropy increased to 1,000.

Sources:

Proposed Belridge Water Storage District, Kern County, California, Department of Water Resources, December 1961.

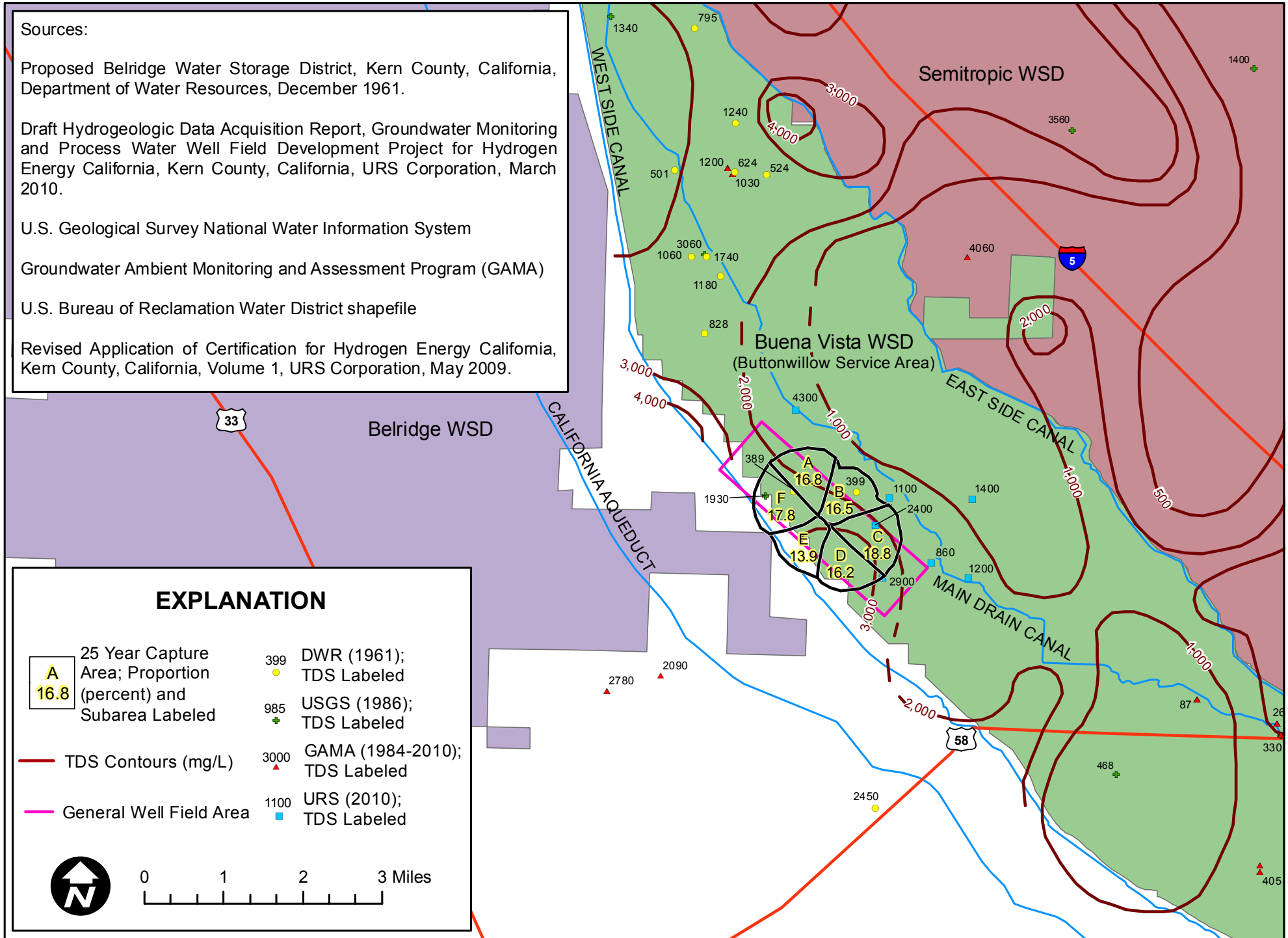
Draft Hydrogeologic Data Acquisition Report, Groundwater Monitoring and Process Water Well Field Development Project for Hydrogen Energy California, Kern County, California, URS Corporation, March 2010.

U.S. Geological Survey National Water Information System

Groundwater Ambient Monitoring and Assessment Program (GAMA)

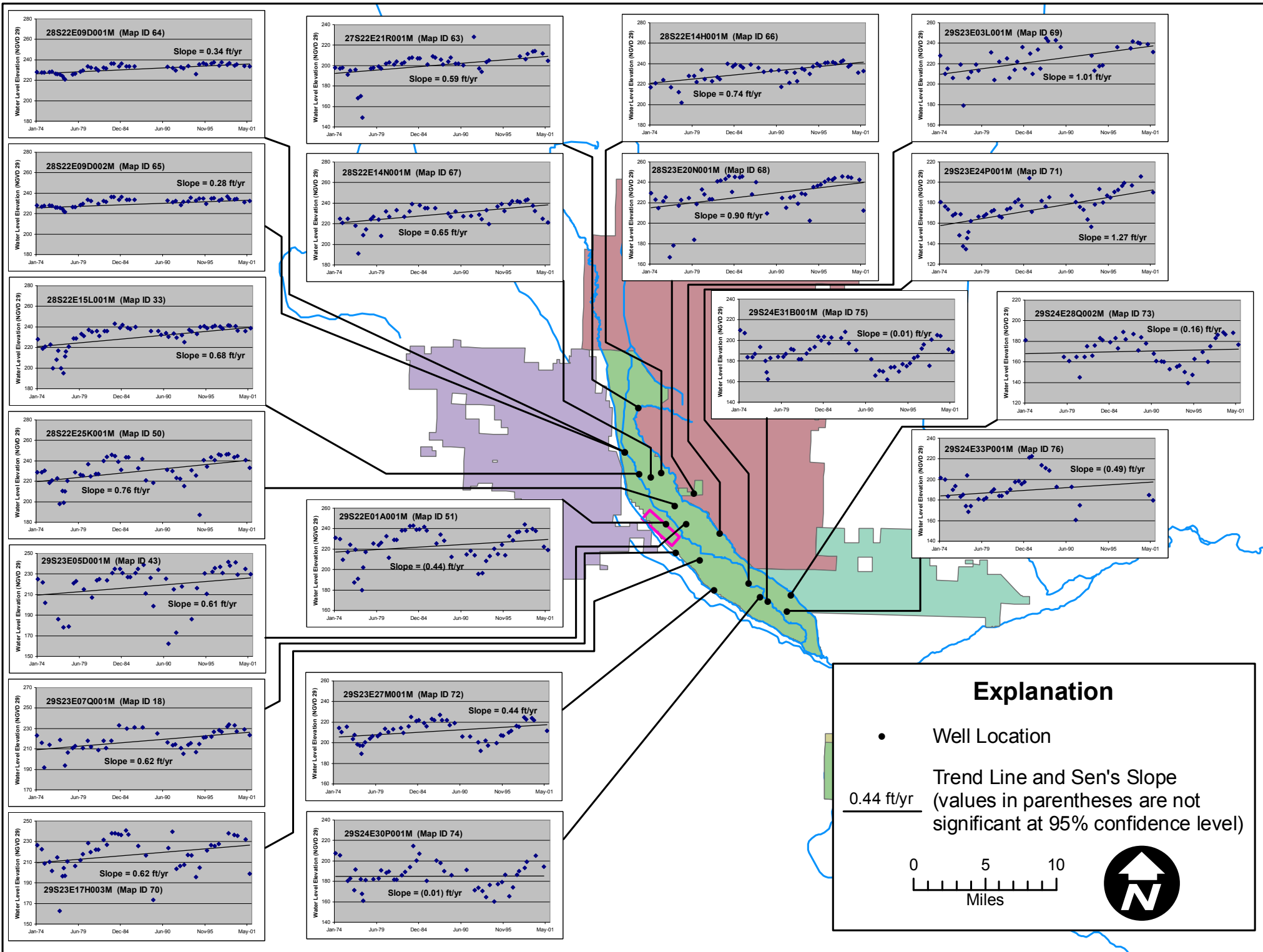
U.S. Bureau of Reclamation Water District shapefile

Revised Application of Certification for Hydrogen Energy California, Kern County, California, Volume 1, URS Corporation, May 2009.

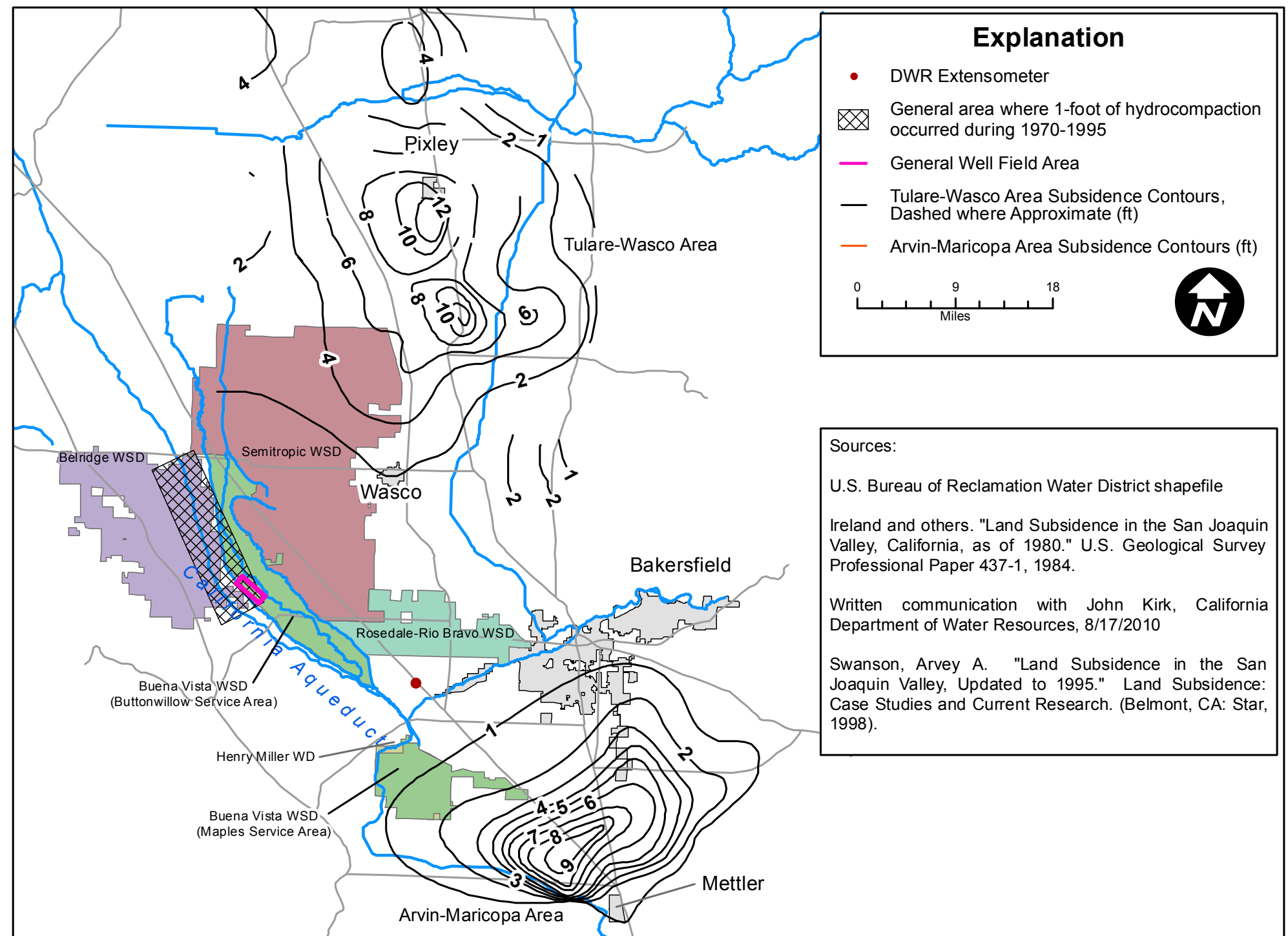


Soil and Water Figure 18. Composite 1970-2007 TDS concentration contours and 25-year Zone of Influence (ZOI) simulated by the applicant model.

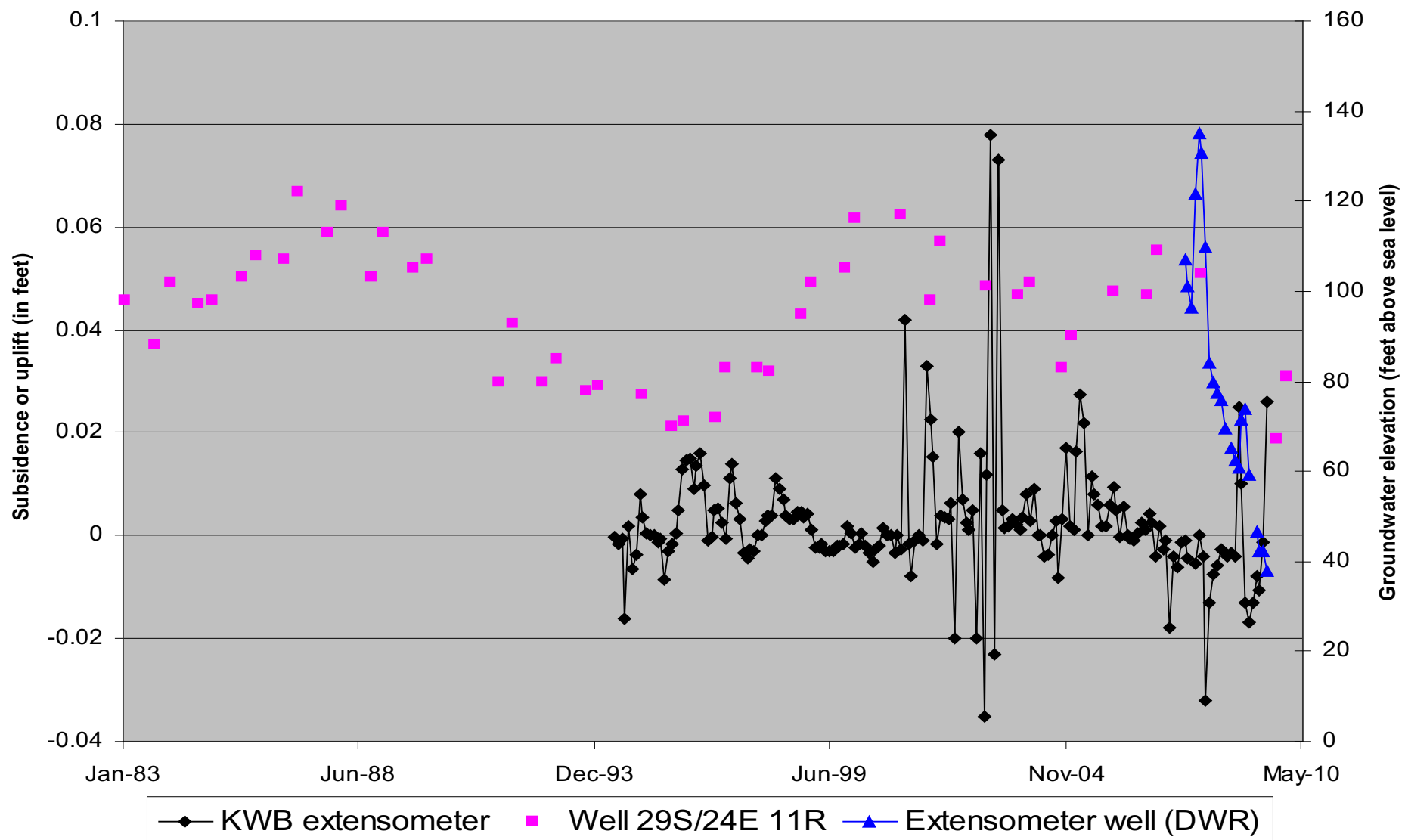




Soil and Water Figure 19. Water level locations and trends in Buttonwillow Service Area, 1974-2001.



Soil and Water Figure 20. Historical subsidence/hydrocompaction areas and DWR extensometer location relative to BVWSD.



Sources:

Written communication with John Kirk, California Department of Water Resources (DWR), 8/17/2010.

California DWR Water Data Library

Soil and Water Figure 21. Water level changes in wells and observed aquifer compaction at the Kern Water Bank extensometer.