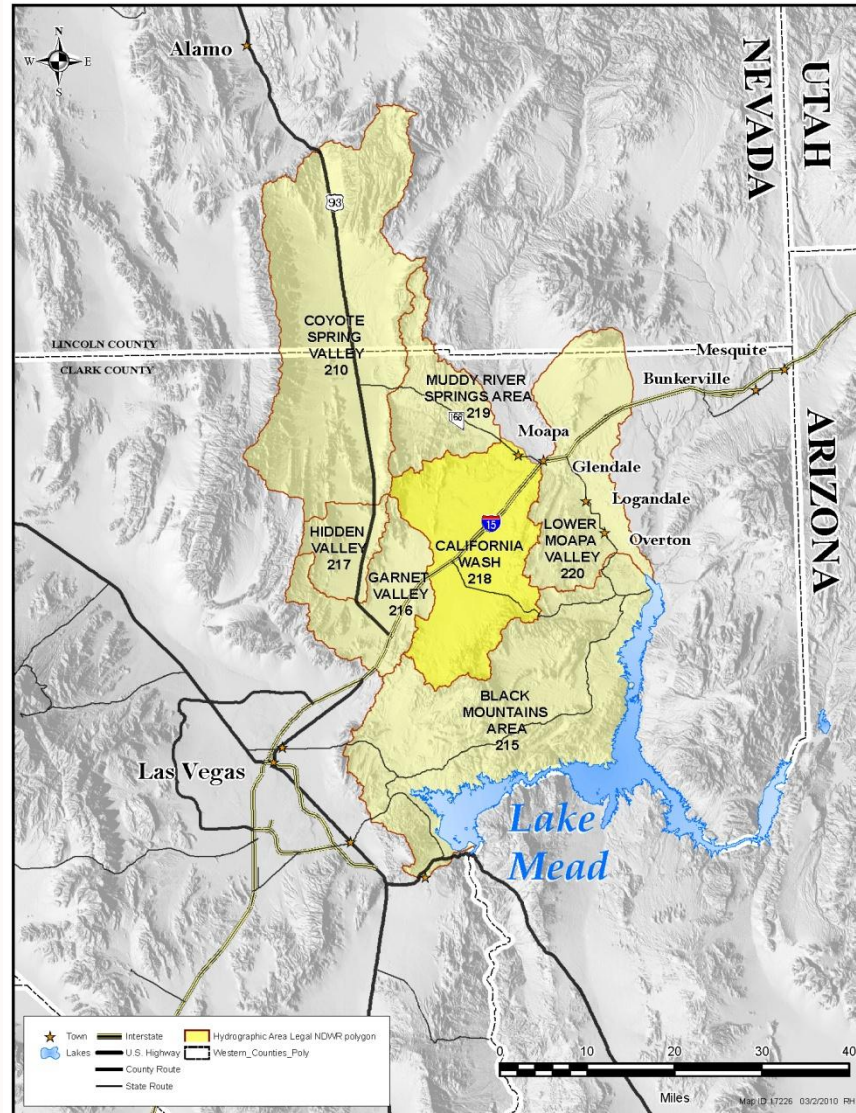




COYOTE 'SPRINGS'

State Engineer Ruling



History

1997 – NSE Permits a total of 16,100 afy

priority date of 1983 - 1986

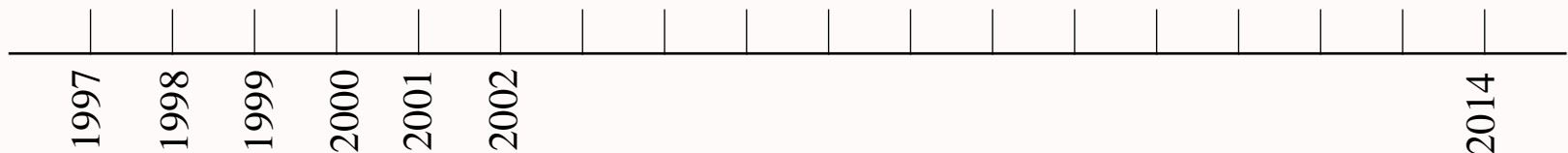
1998 – SNWA purchases 7,500 afy

1998 – CSI files for additional water rights

2000 – Pre-hearing conference

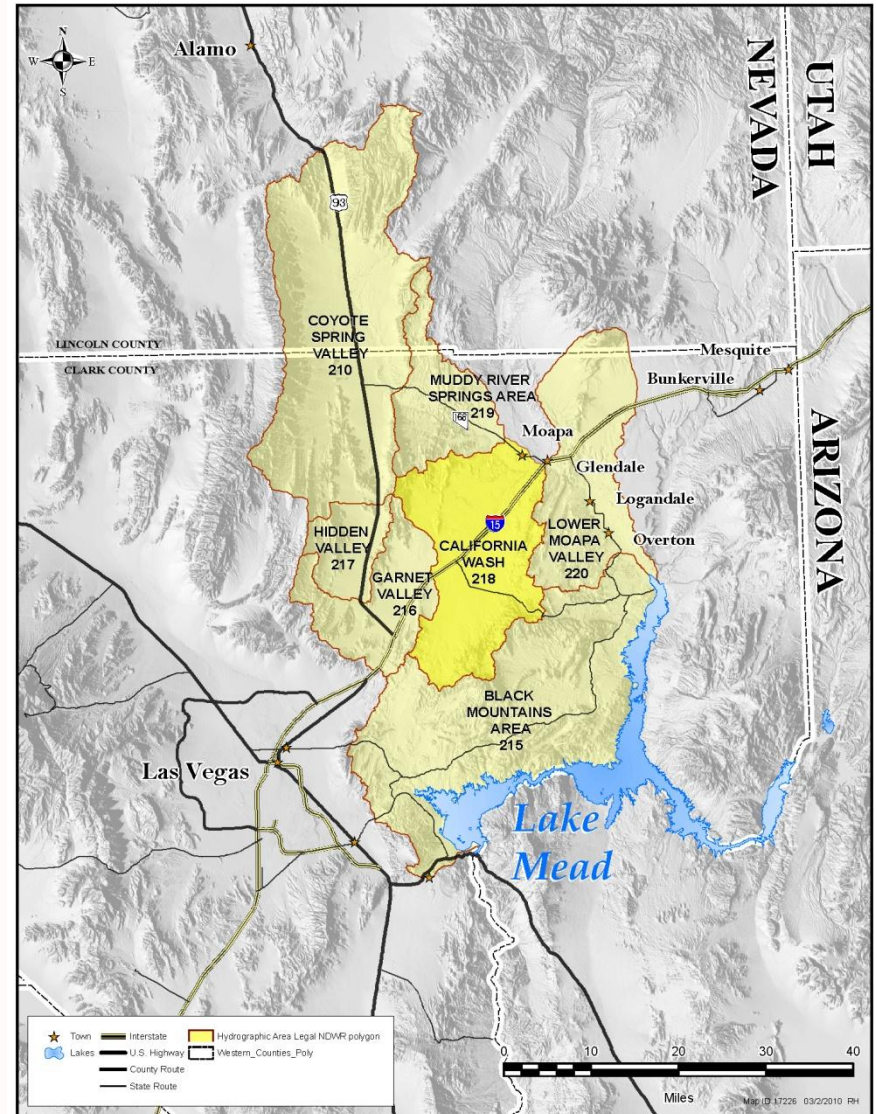
2001 – Hearings

2002 – Order 1169



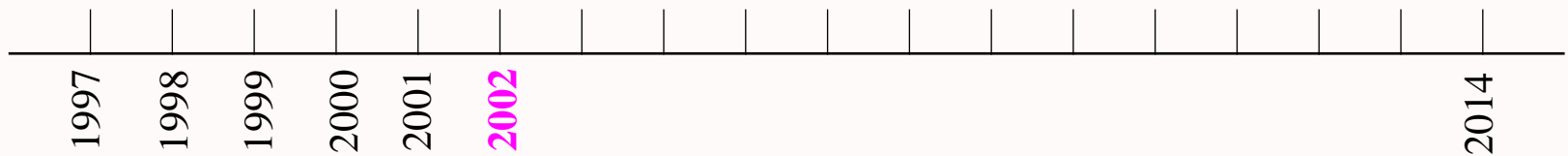
Order 1169

- Existing Water Rights
 - 9,000 afy SNWA
 - 4,600 afy CSI LLC
 - 2,500 afy NV Energy
 - 16,100 afy
- NDWR Order 1169 (March 2002)
 - Holds in abeyance applications
 - 5-year study with 50% of existing rights pumped for 2 consecutive years
 - Compile data and submit to NDWR for evaluation



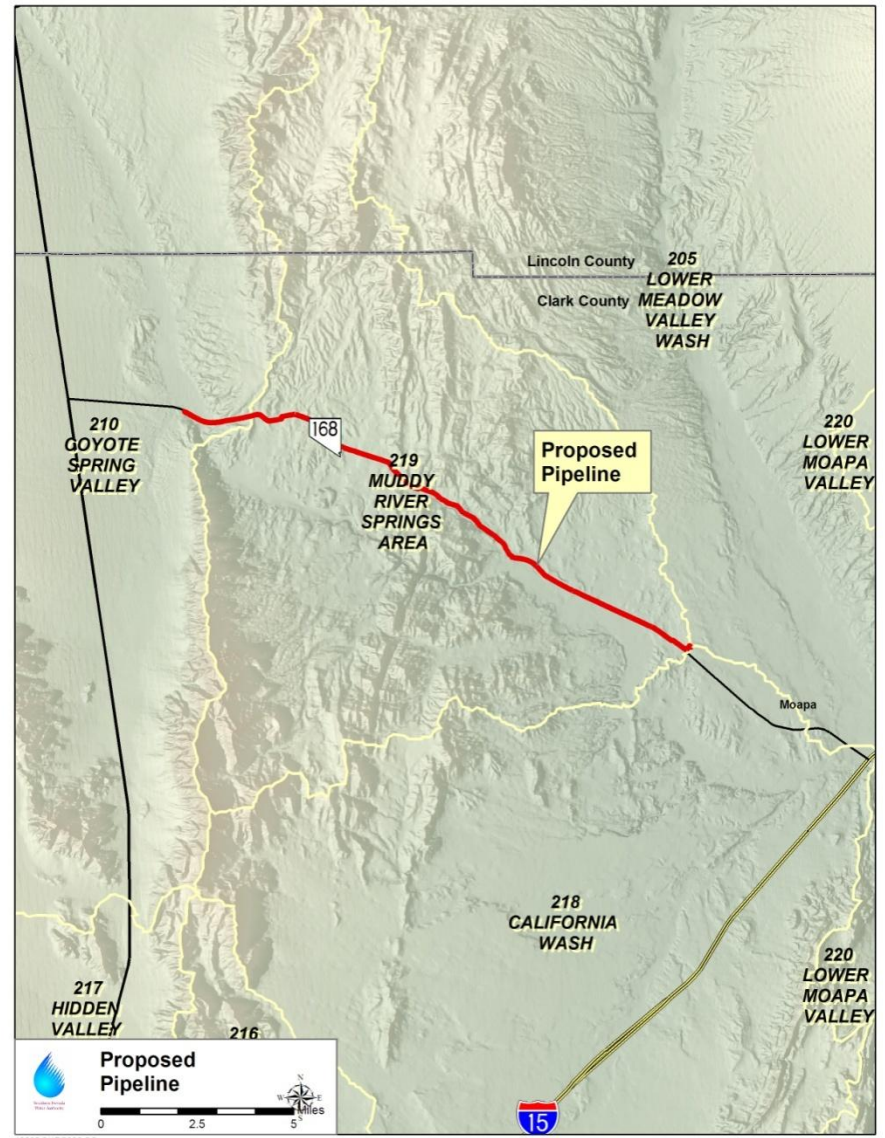
History

2002 – Resource sharing agreement w/ MVWD and CSI



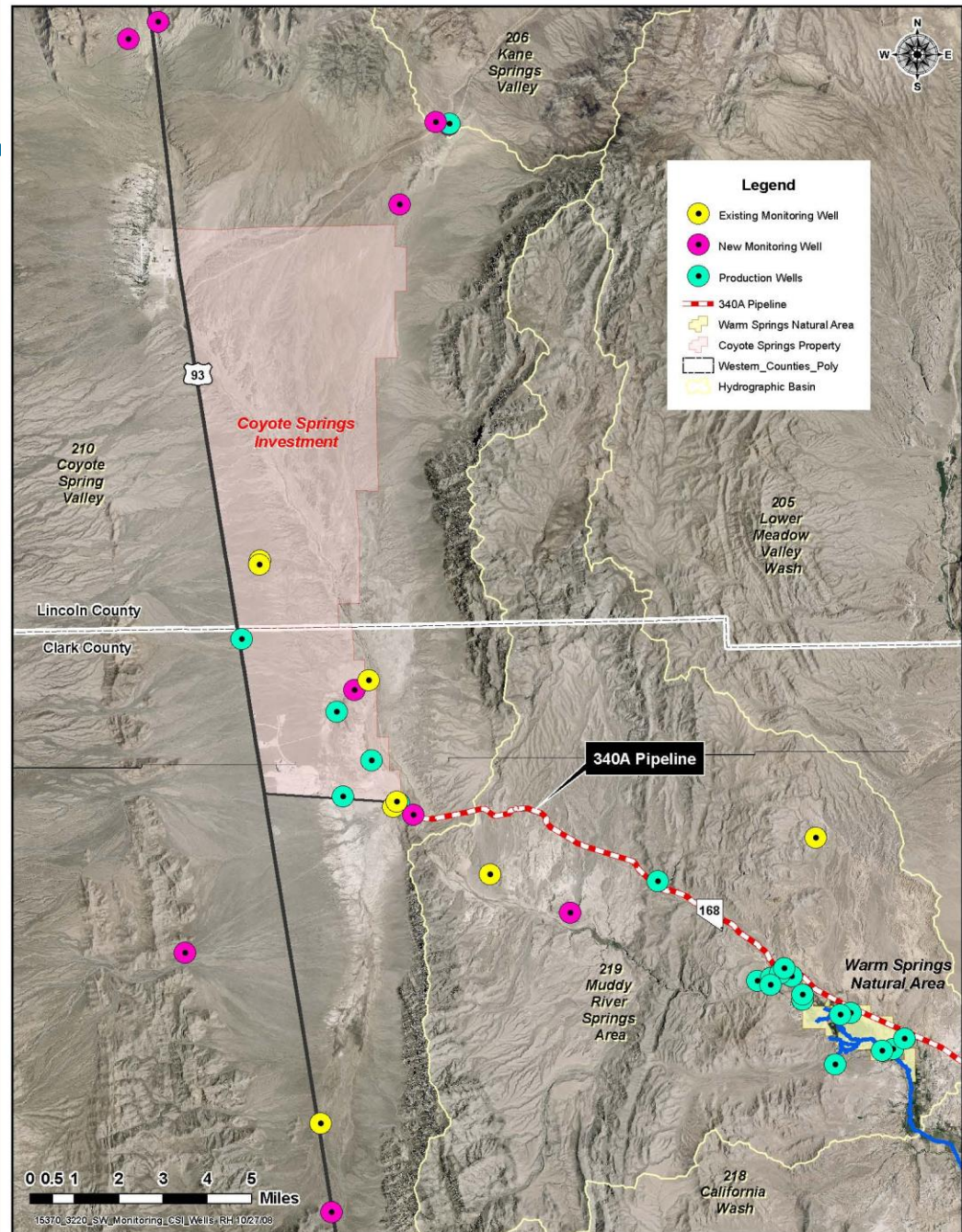
SNWA Groundwater Development

- Proposed Pipeline
 - Convey Existing SNWA Rights
 - Facilitate 1169 Testing
- Extensive Monitoring
- Right-of-Way
 - NEPA and ESA requirements

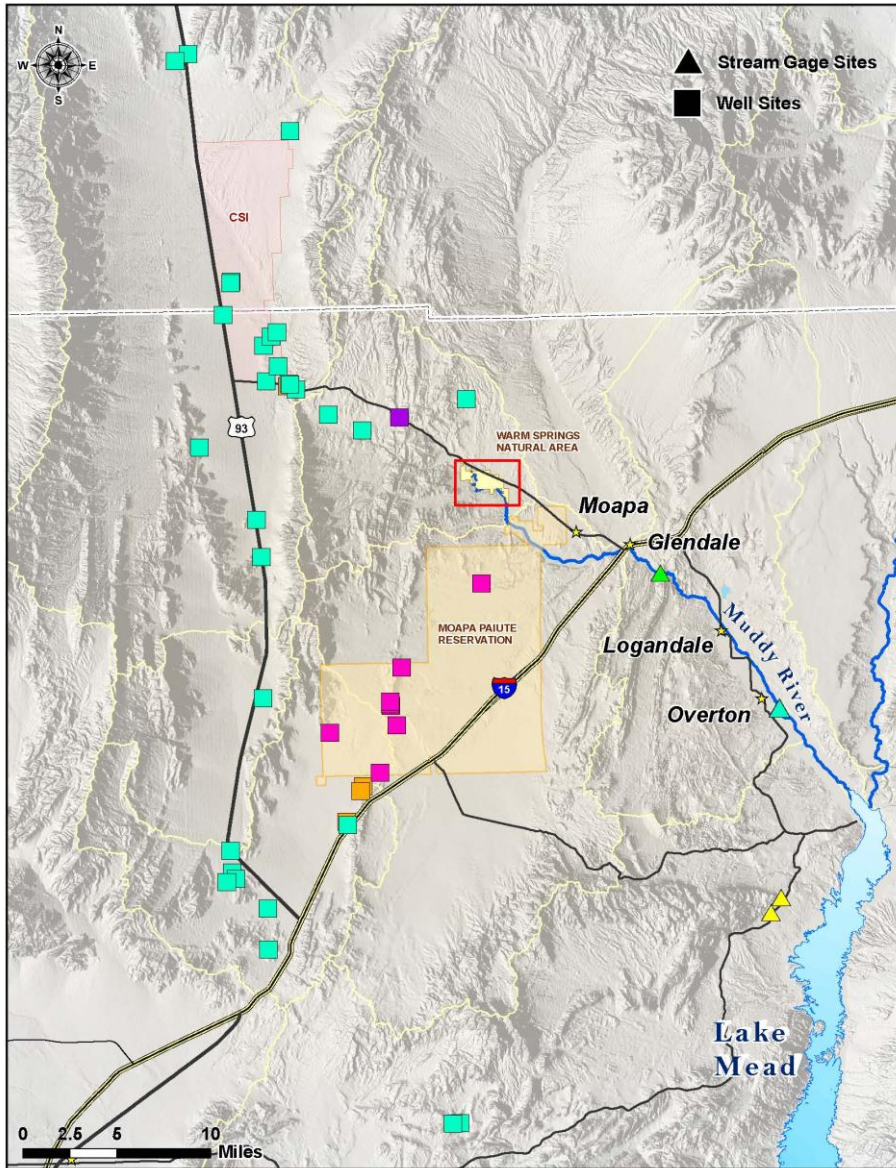


Monitoring

- Existing Monitor Wells
- 2002 / 03 Additional Monitor Wells
- Existing and New (CSI) Production Wells

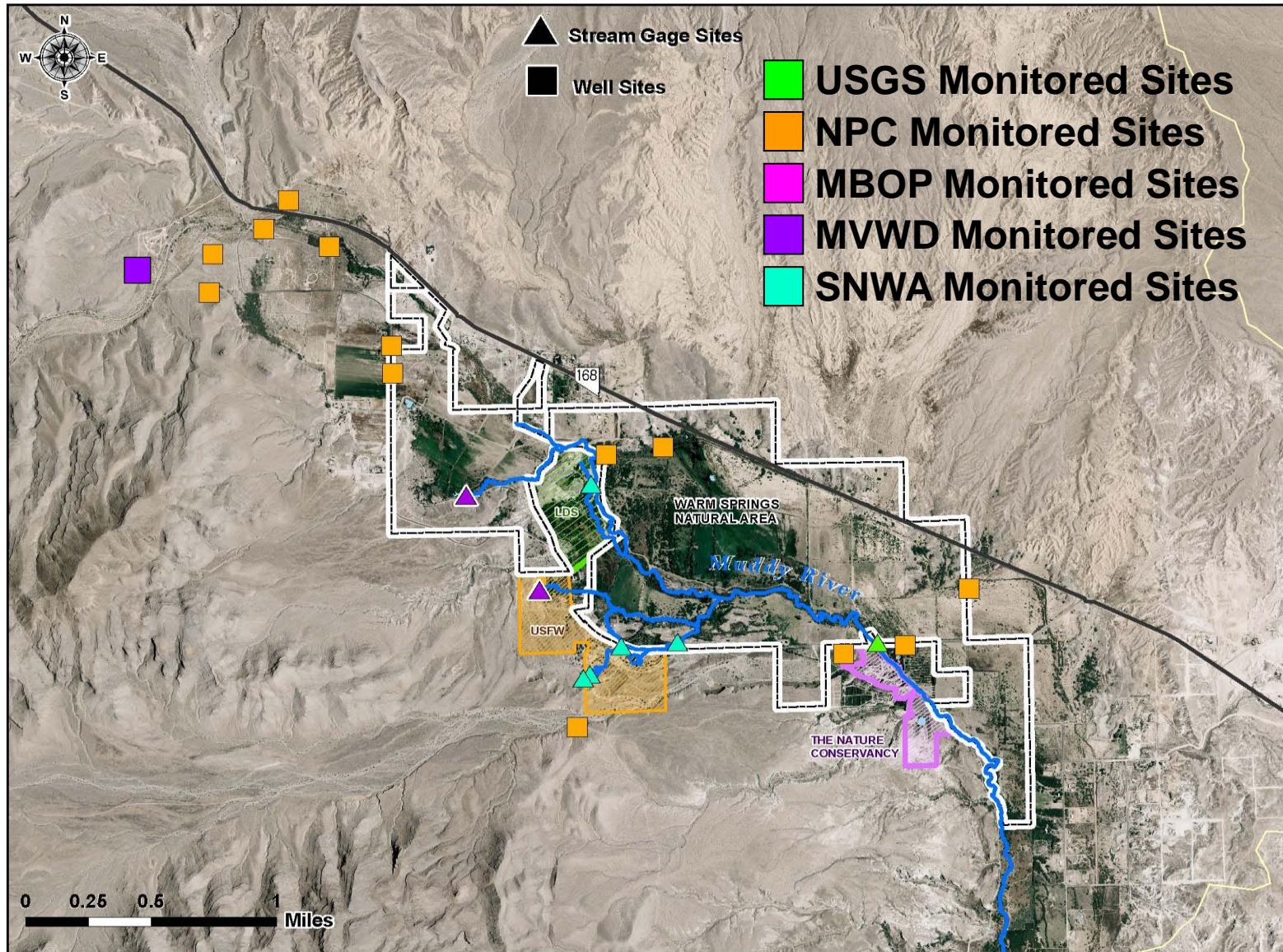


Regional Monitoring



-  USGS Monitored Sites
-  NPC Monitored Sites
-  MBOP Monitored Sites
-  MVWD Monitored Sites
-  NPS Monitored Sites
-  SNWA Monitored Sites

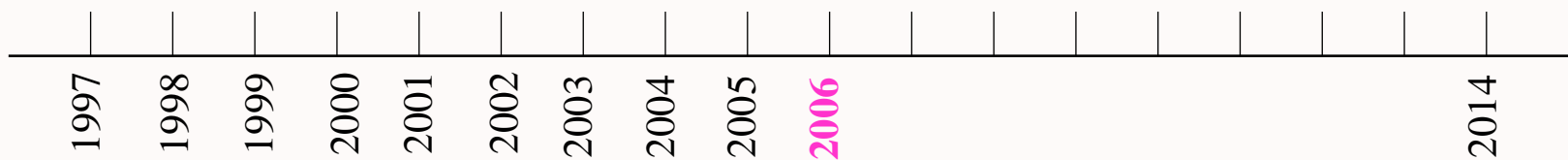
Muddy River Springs Area Monitoring



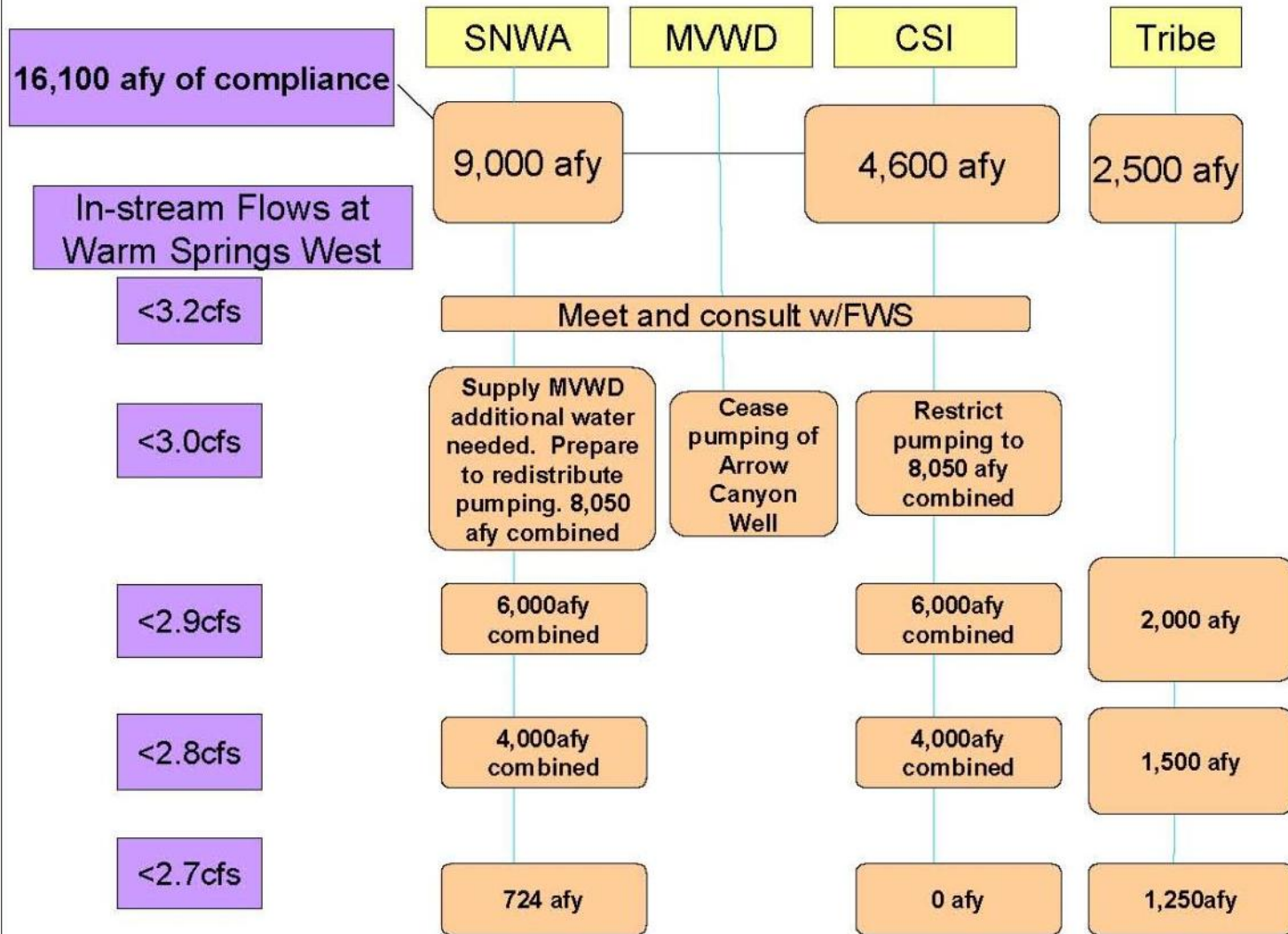
Memorandum of Agreement

April 2006, SNWA entered into a Memorandum of Agreement with U.S. Fish and Wildlife Service, CSI, and MVWD.

- **Dedication of MVWD's Jones Spring water right (1 cfs) as a pass through flow to allow for augmentation of habitat**
- **Trigger flow levels to ensure protection of Moapa Dace**
- **Dedication of 10% of CSI's existing rights to Moapa Dace recovery**
- **Established a Recovery Implementation Program**
- **Established a Hydrologic Review Team**



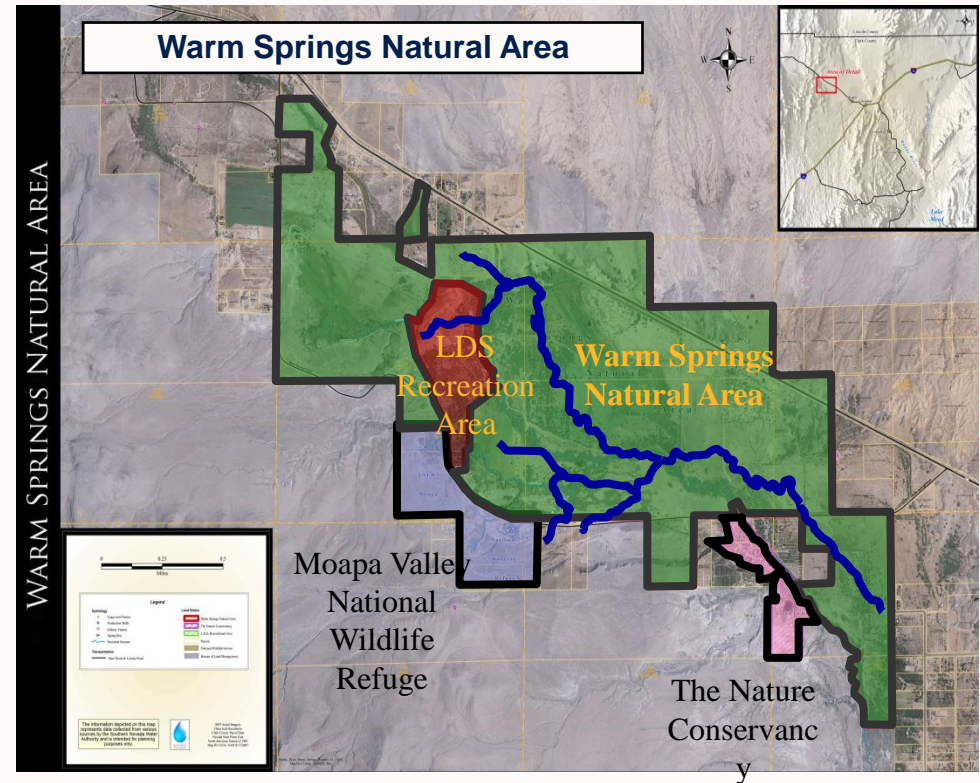
Memorandum of Agreement Triggers



Warm Spring Natural Area

2007 SNWA acquires the Warm Springs Natural with SNPLMA funding for

- 1,220 acres
- Historical habitat of Moapa Dace
- Environmental Conservation



1997

1998

1999

2000

2001

2002

2003

2004

2005

2006

2007

2014



MX-5 Well

340 A Pipeline

Coyote Spring Valley

Warm Springs Natural Area

MVWD Storage Tank

Existing MVWD Pipe

Bowman Reservoir

Gubler Crossing Discharge

SNWA / USGS Lewis Ave Gage

93

169

15

169

Moapa - Paiute Reservation

Muddy River

Logandale

2014

1997

1998

1999

2000

2001

2002

2003

2004

2005

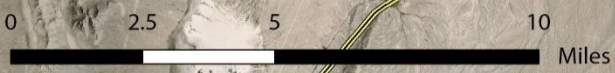
2006

2007

2008

2009

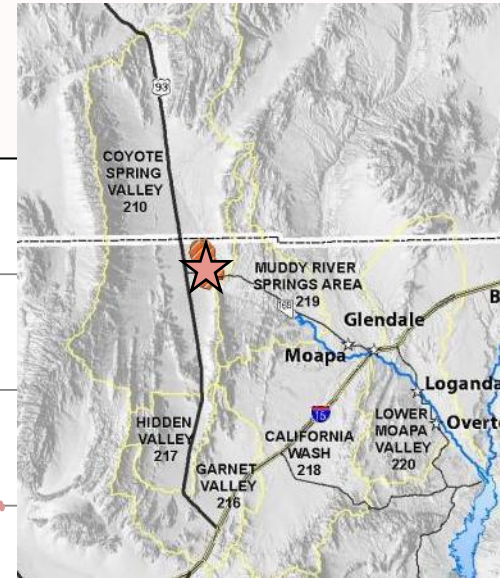
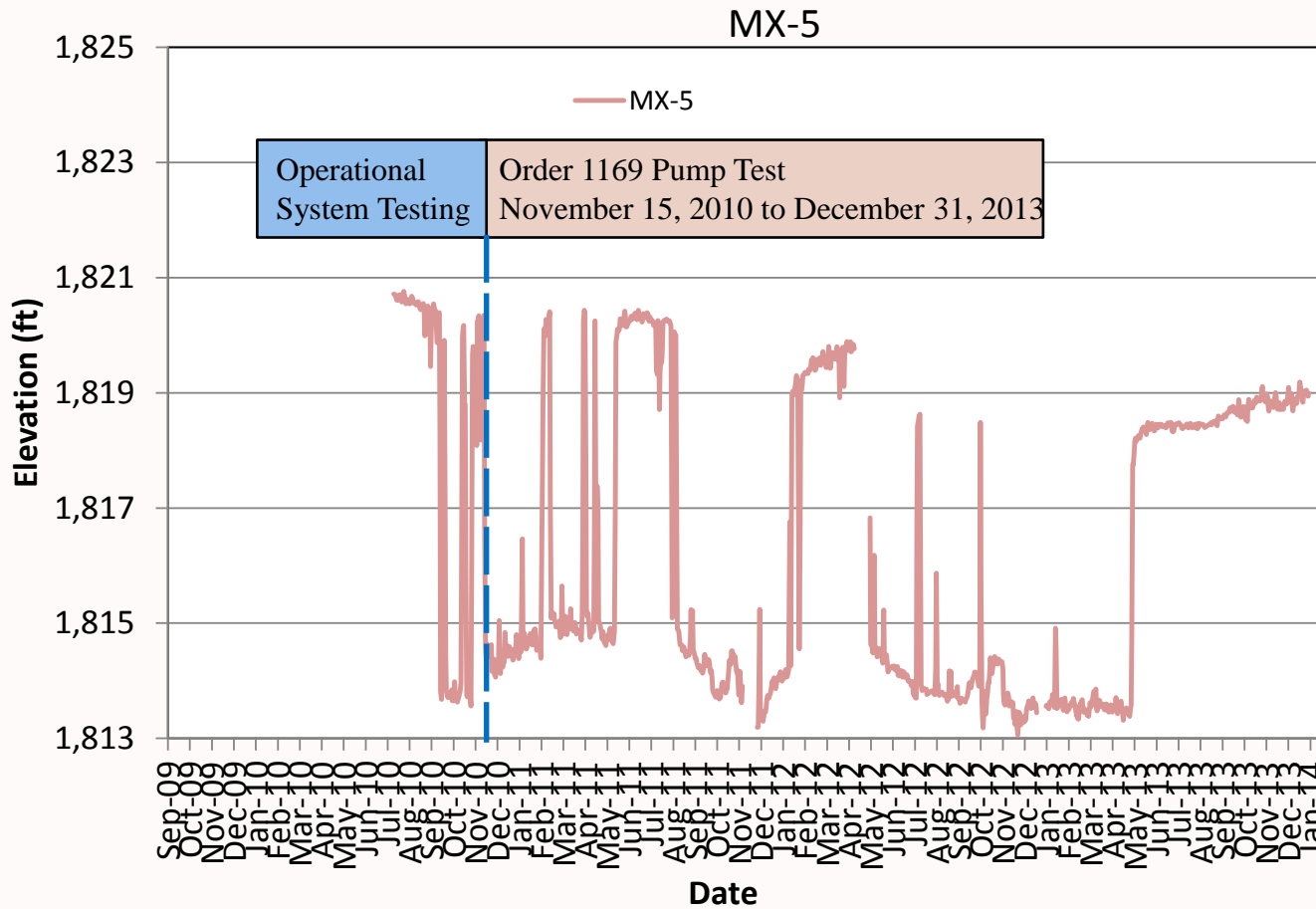
2010



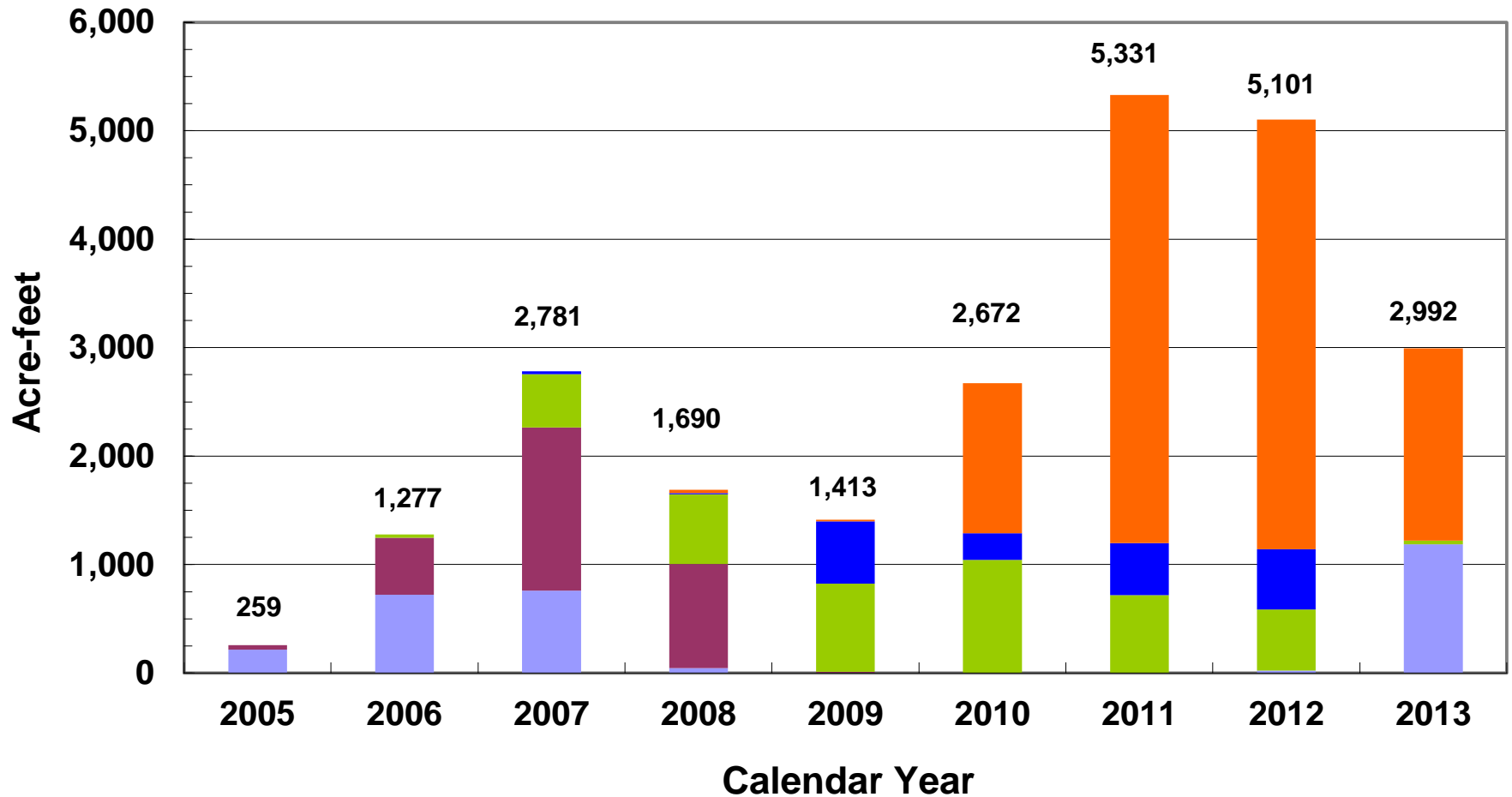
Lake Mead

Virgin River

MX-5 Pumping

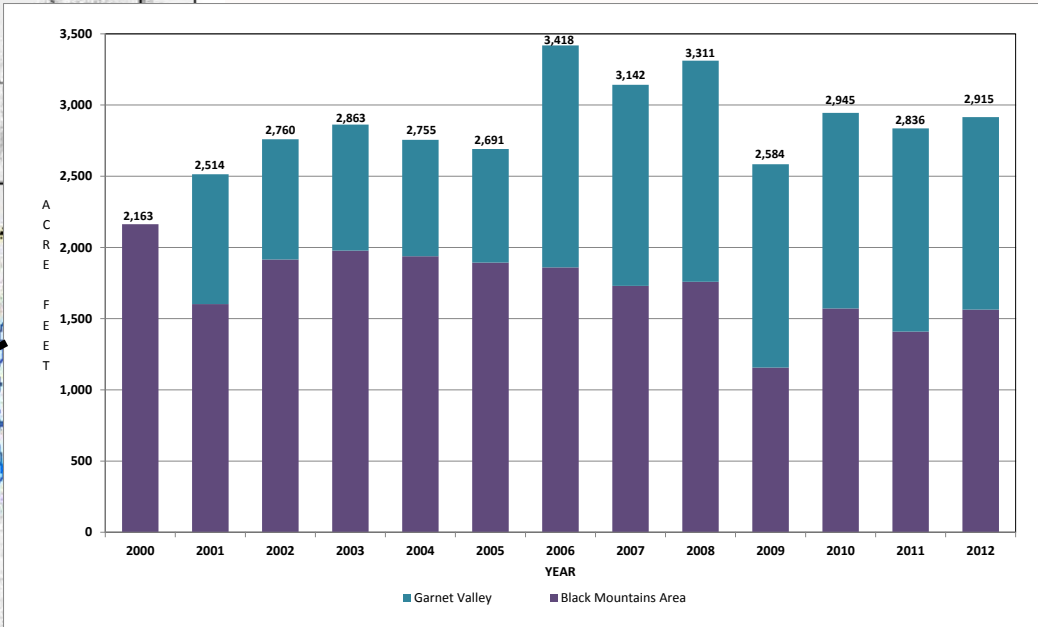
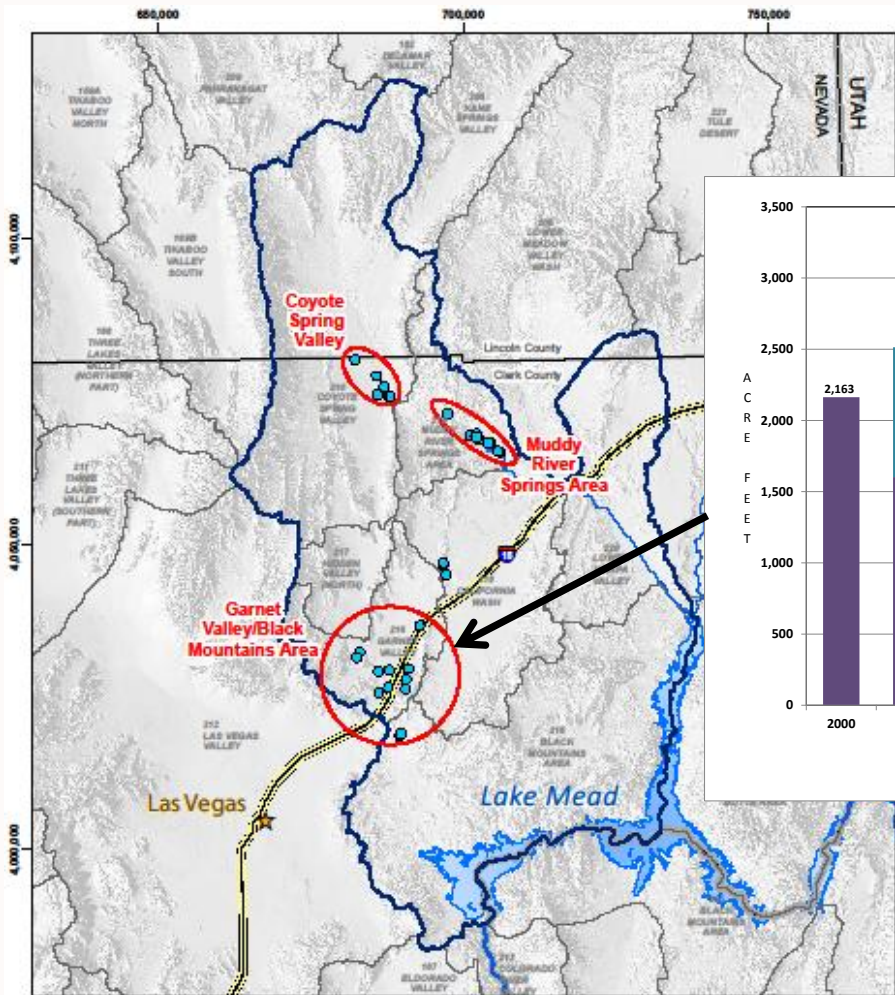


Coyote Spring Valley Pumpage



CSI-1 CSI-2 CSI-3 CSI-4 MX-5

Additional Pumping Stresses



Legend

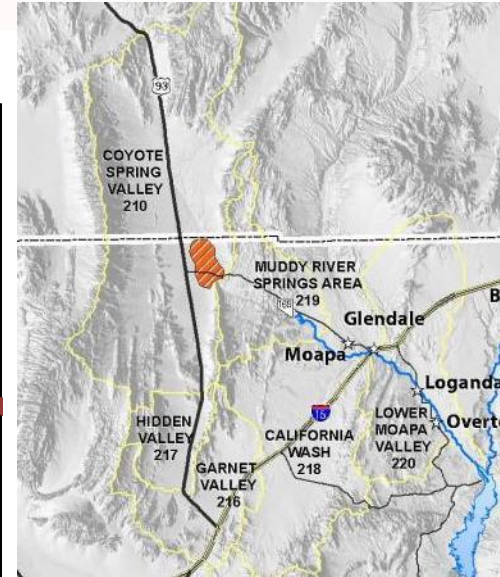
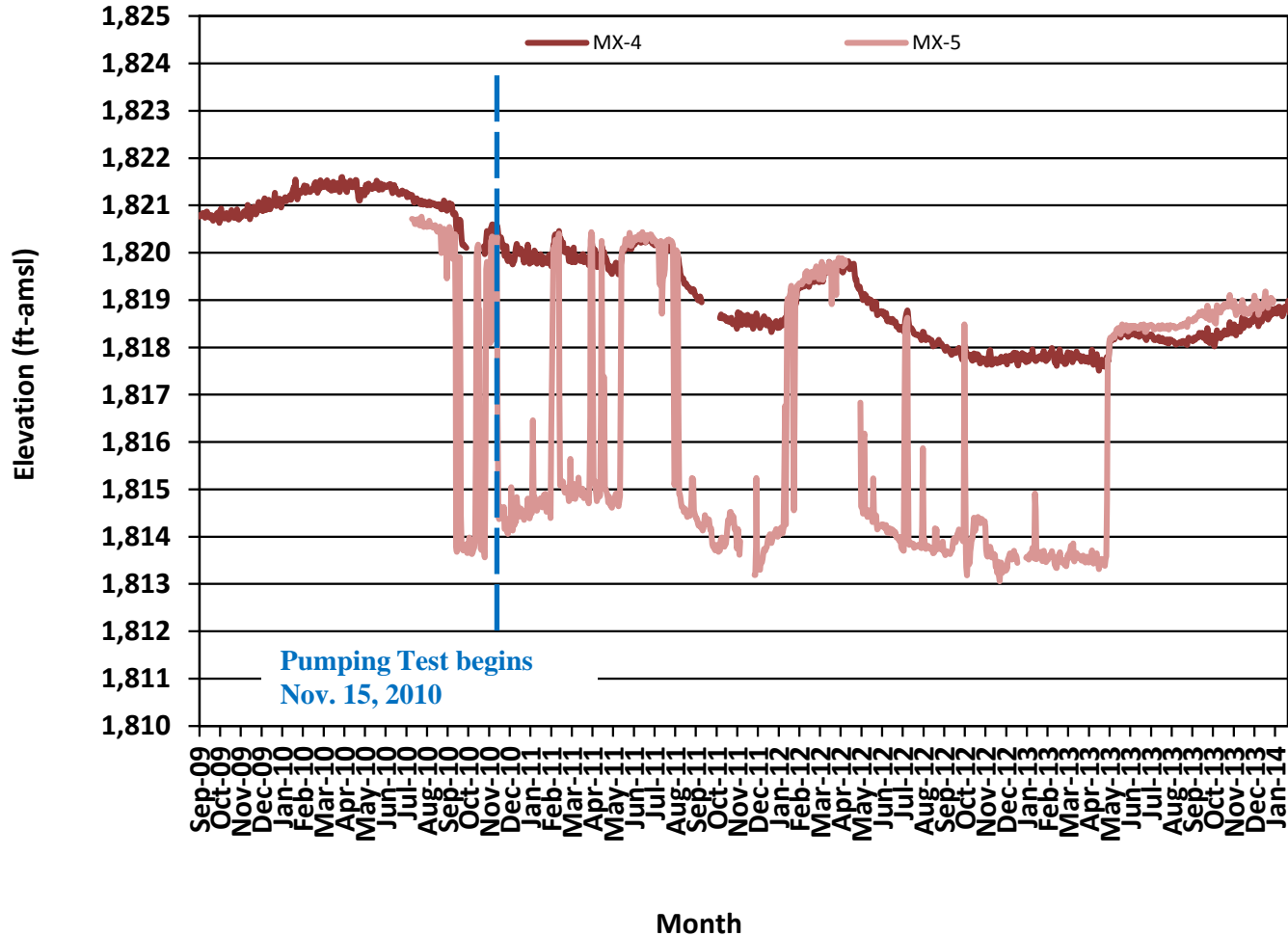
- Interstate
- Hydrographic Area*
- Order 1162 Study Area
- Pumping Centers
- Production Well
- County Boundary
- Western States

*Hydrographic Area name and number shown

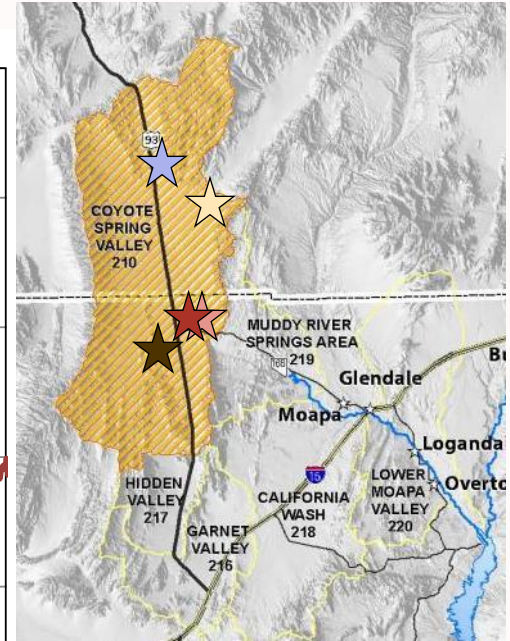
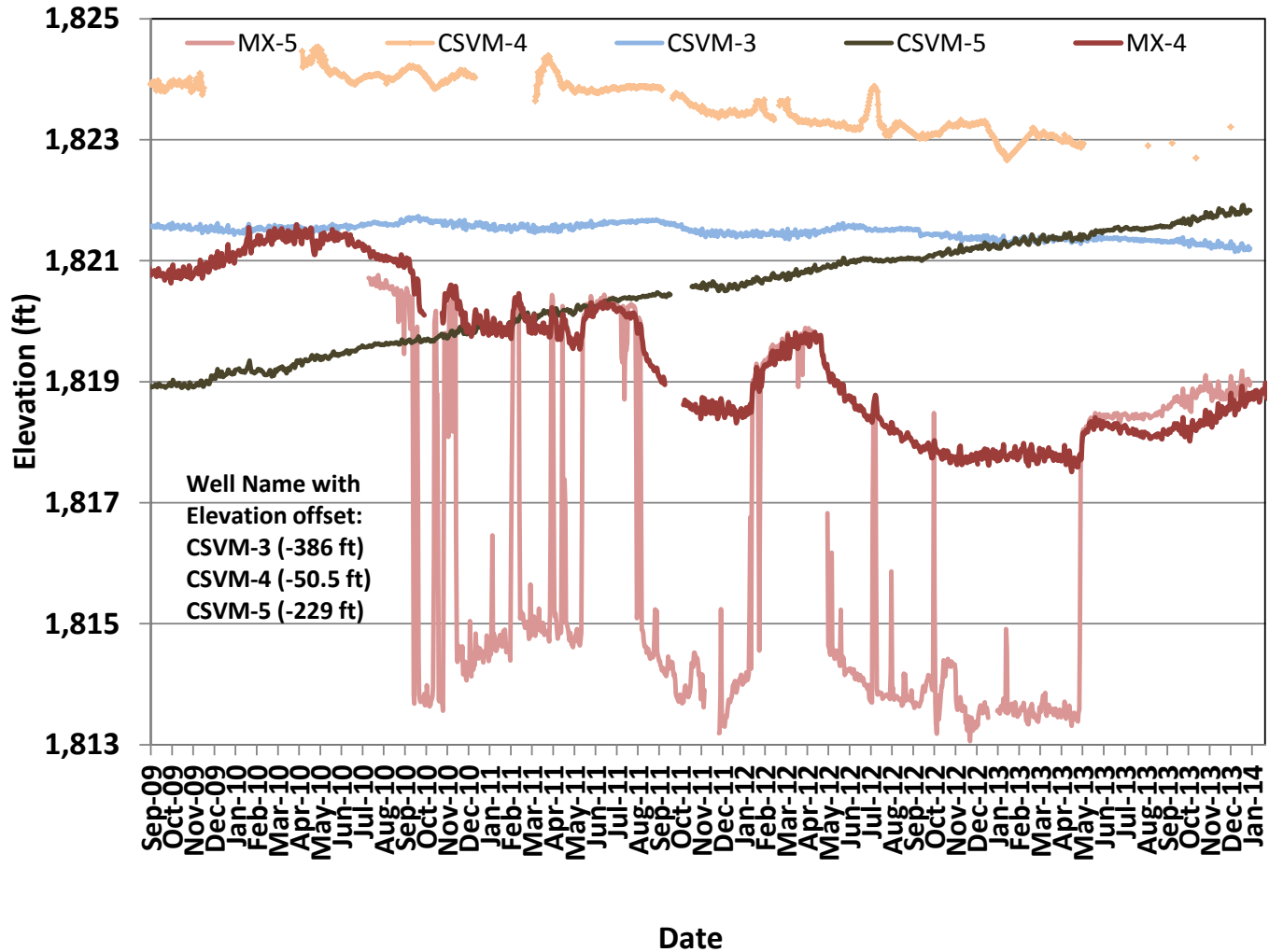
Scale: 1:696,070
 3 1.5 0 3 6 9 12 Miles

20184_X02949 01/17/2013 RH

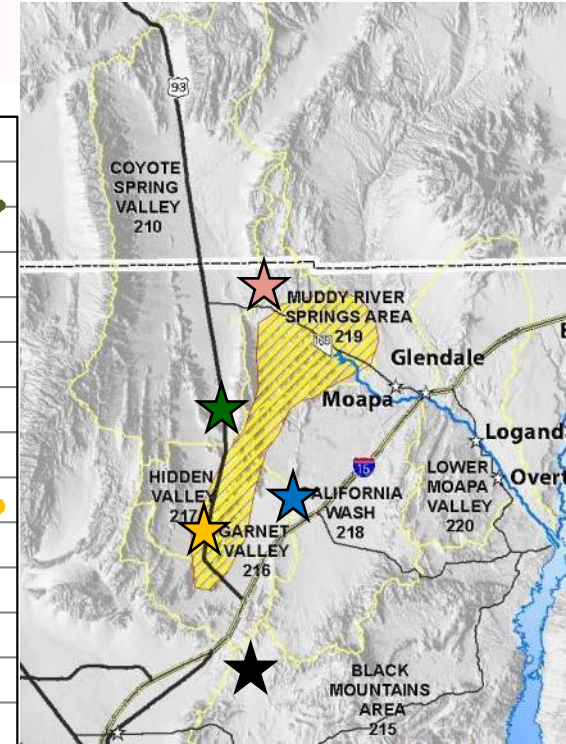
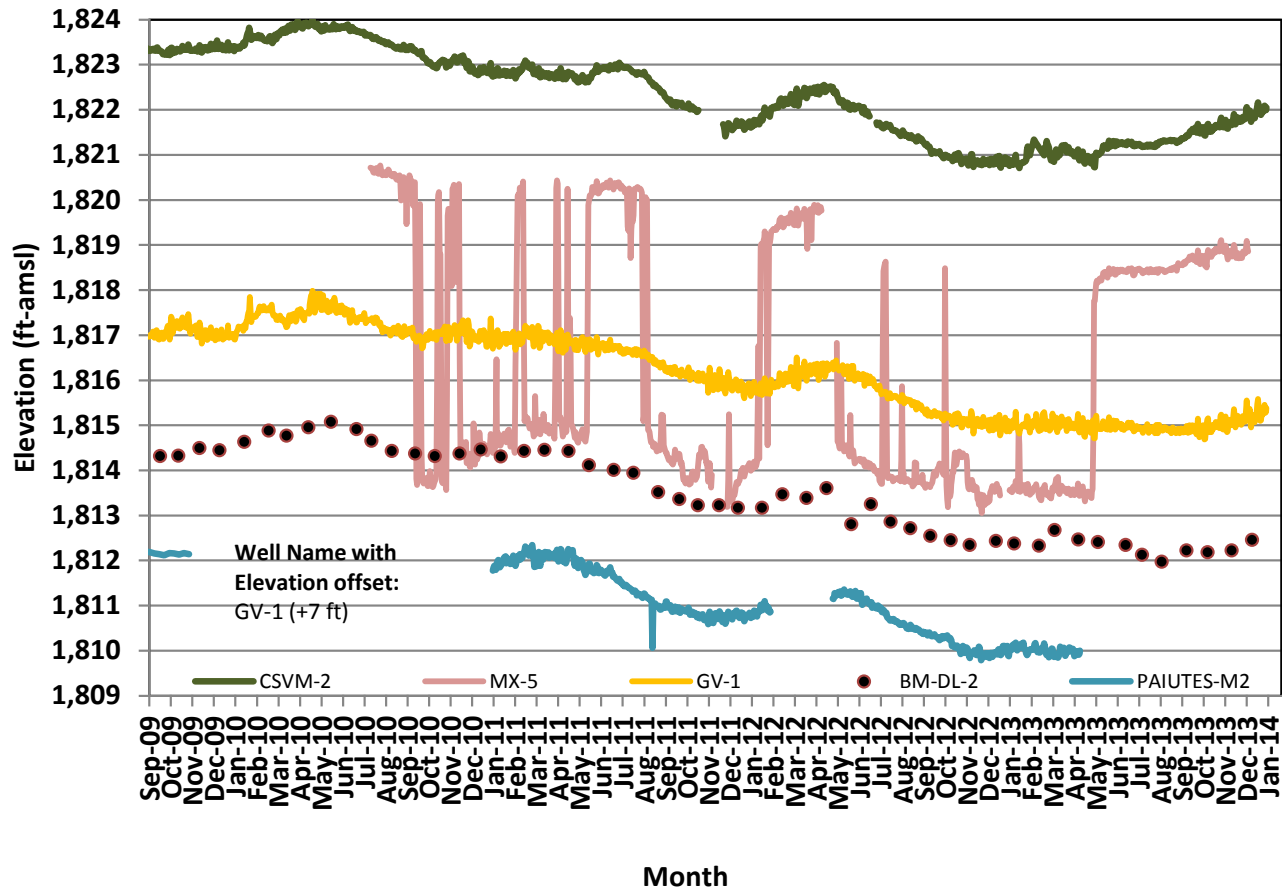
Water Levels in Proximal Wells in Coyote Spring Valley



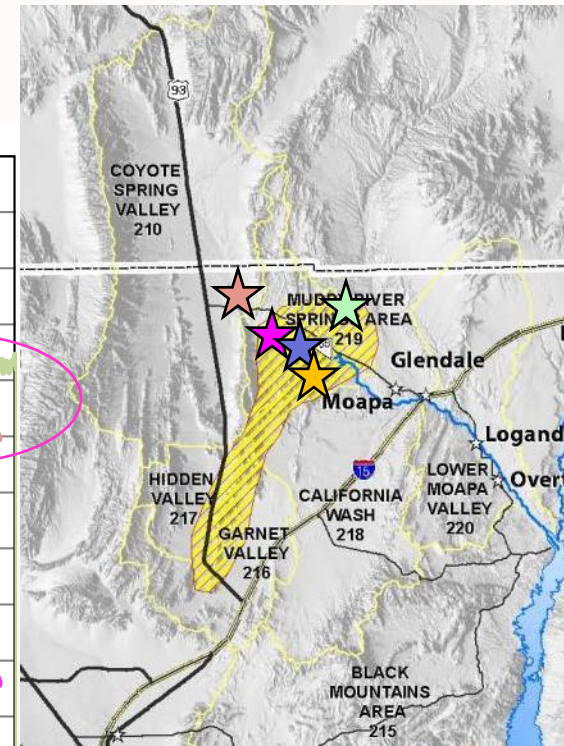
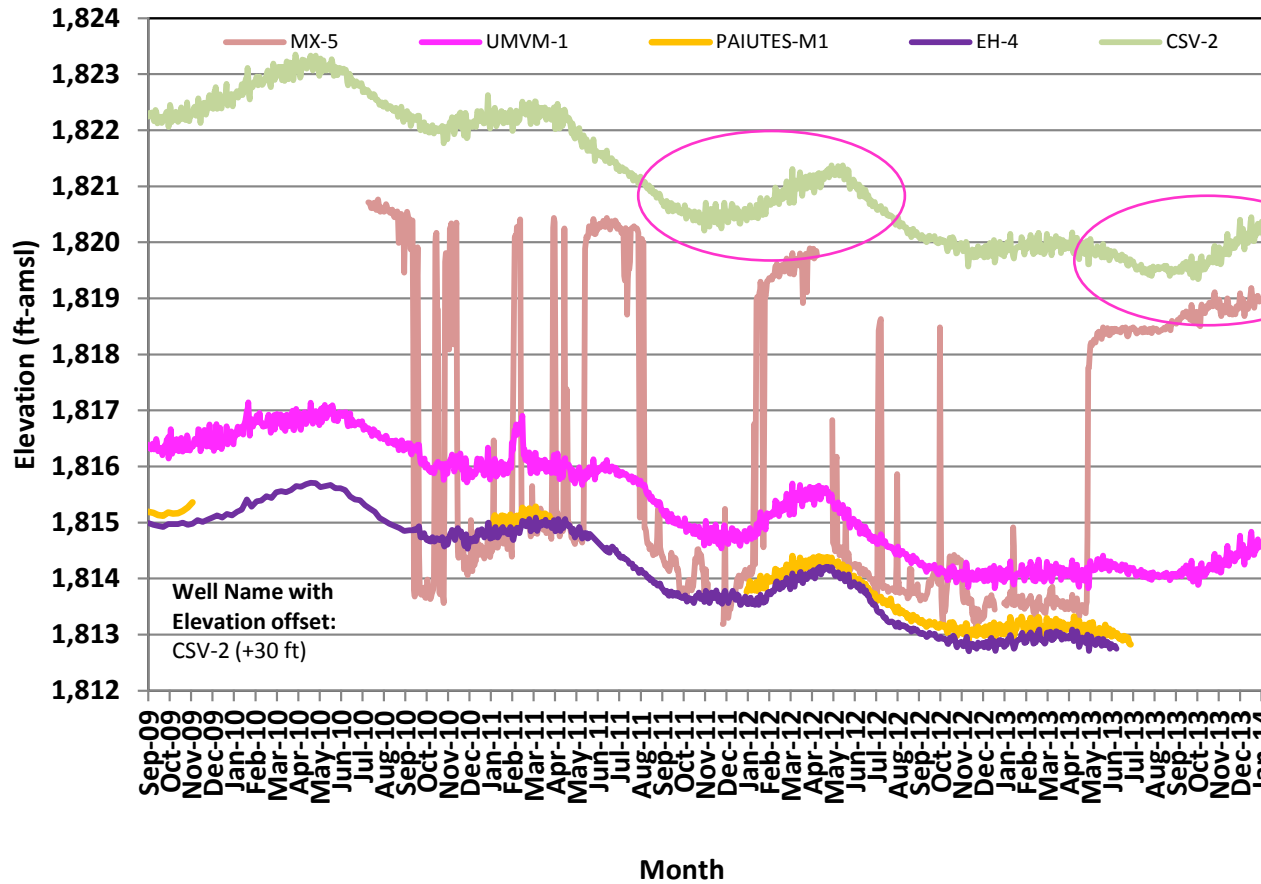
Water Levels in Distal Wells in Coyote Spring Valley



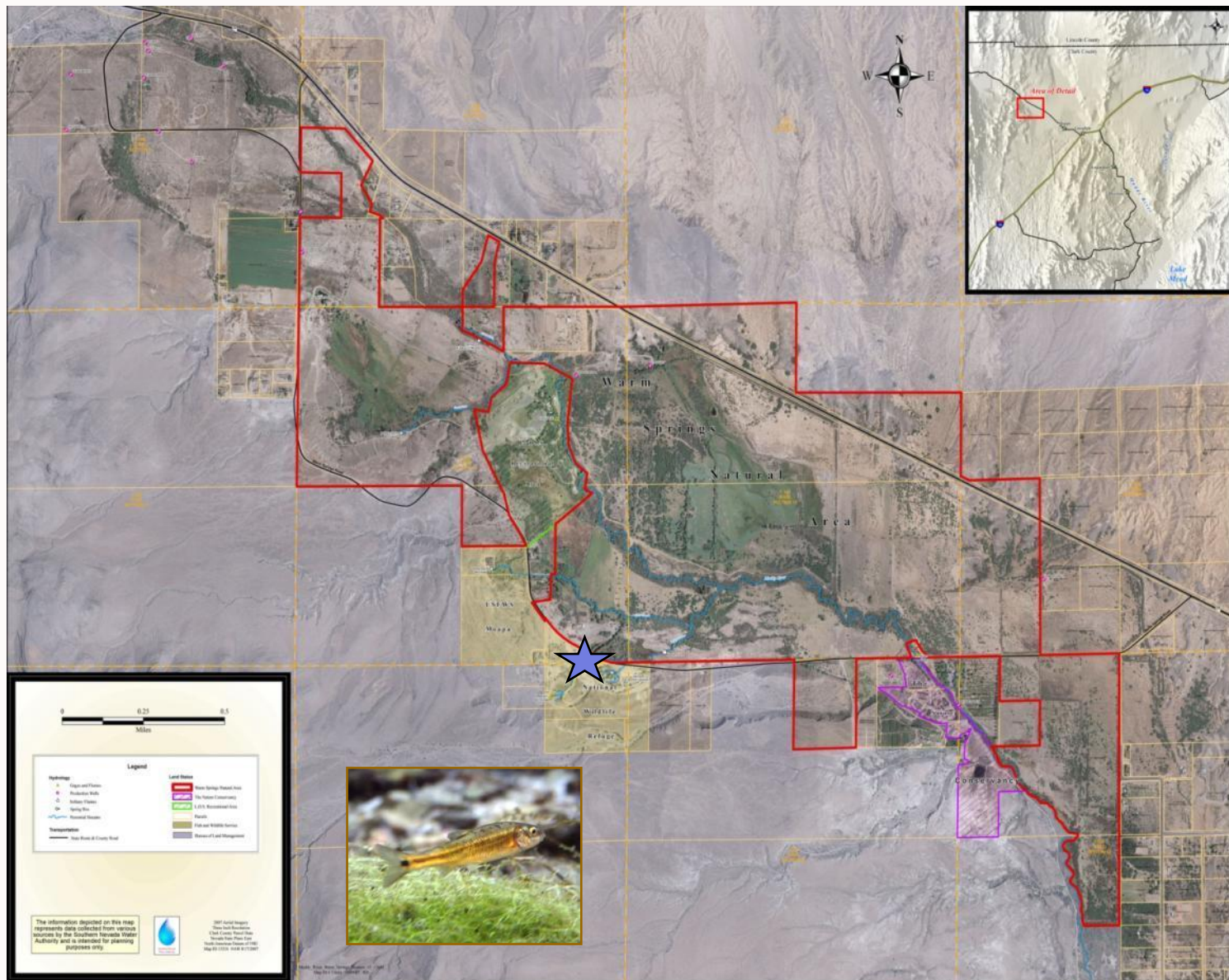
Water Levels in Distal Wells South of MX-5



Water Levels Outside of Coyote Spring Valley - Eastern

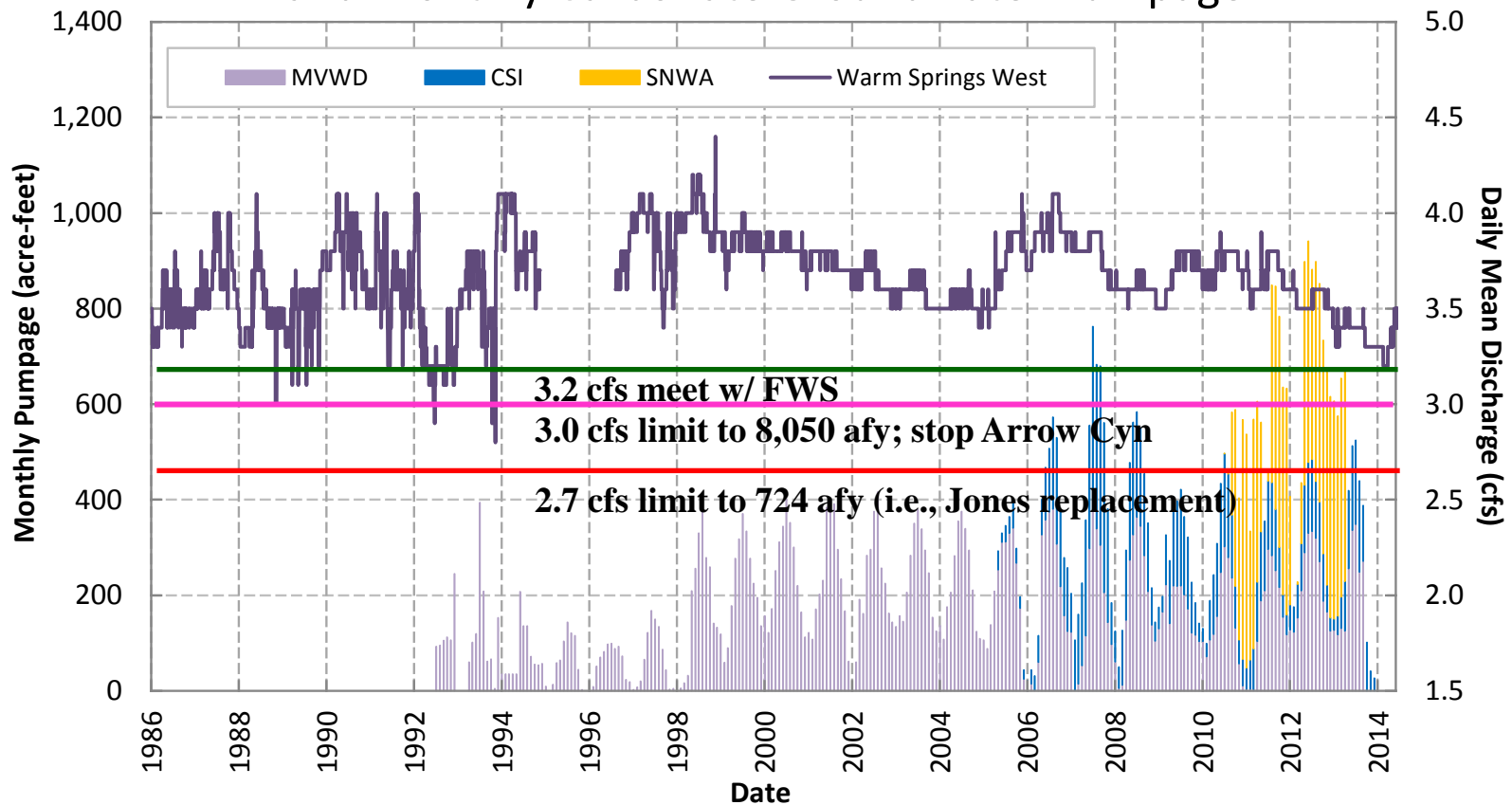


Muddy River Springs Observations



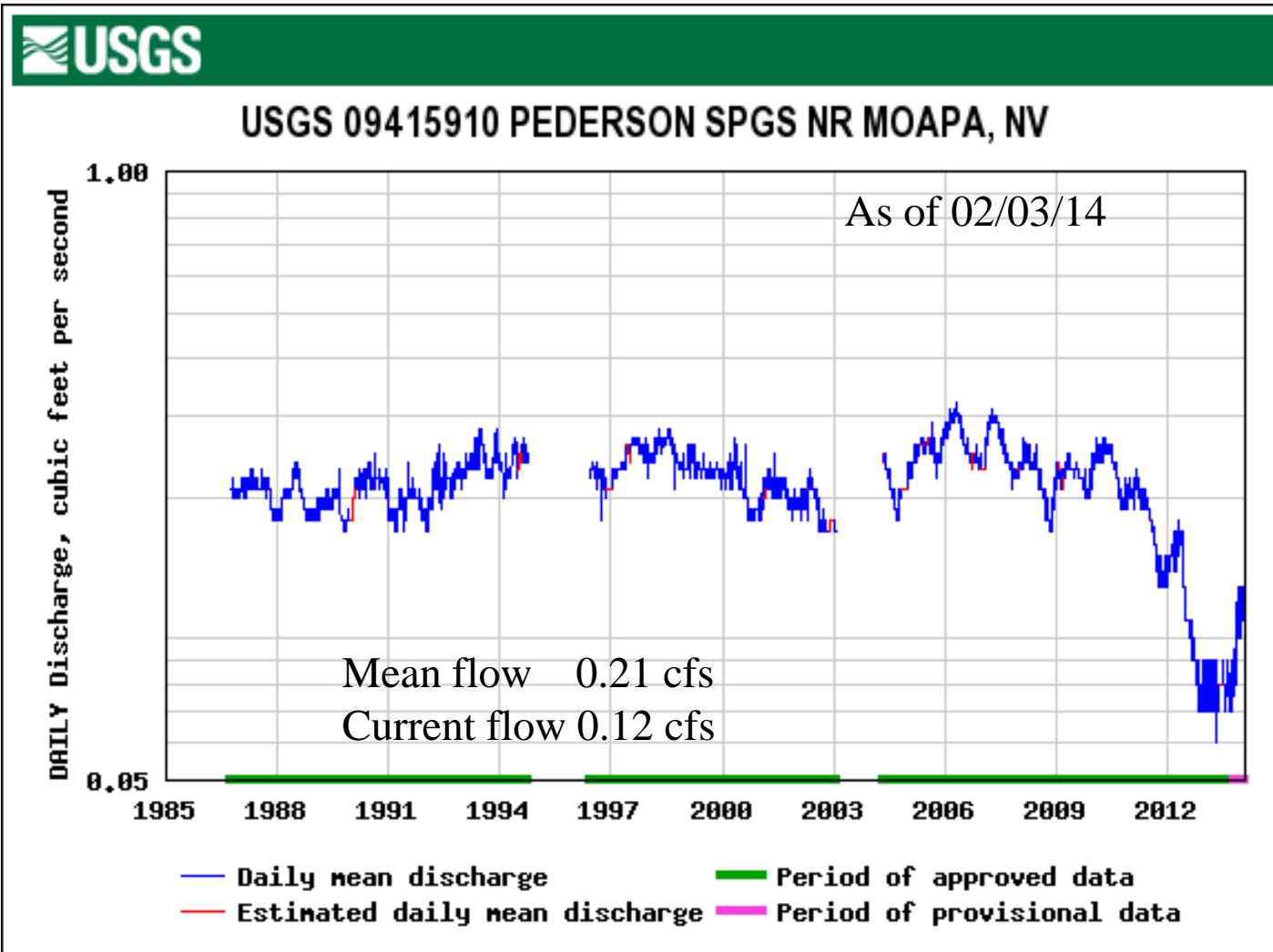
Stream flow and Triggers

USGS Warm Springs West Gage, Daily Mean Flows and Monthly Carbonate Groundwater Pumpage

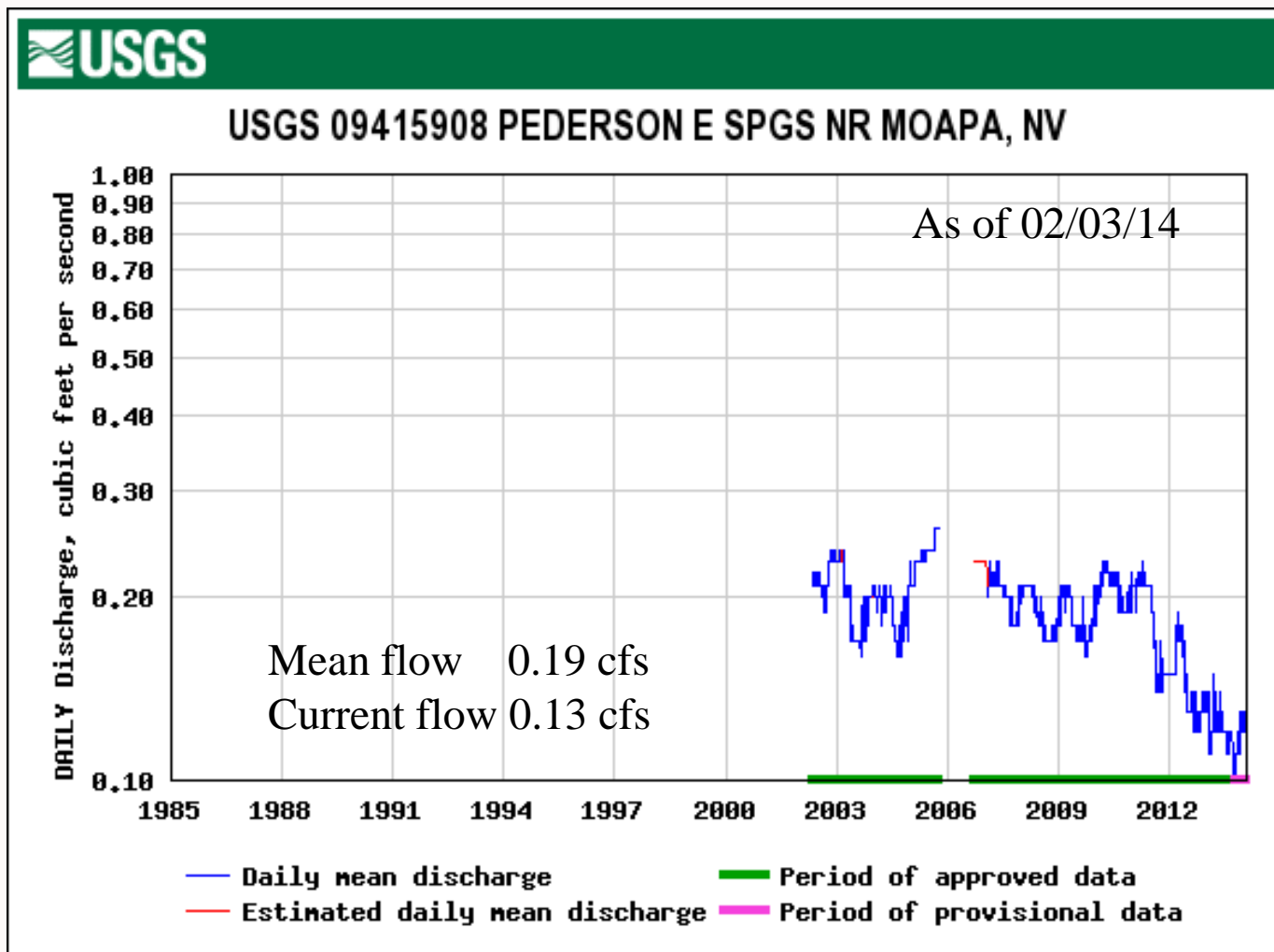


*Note: USGS daily mean flows are provisional for October 2013 thru February 2, 2014.
CSI and SNWA pumpage data through December 2013, MVWD through September 2013.

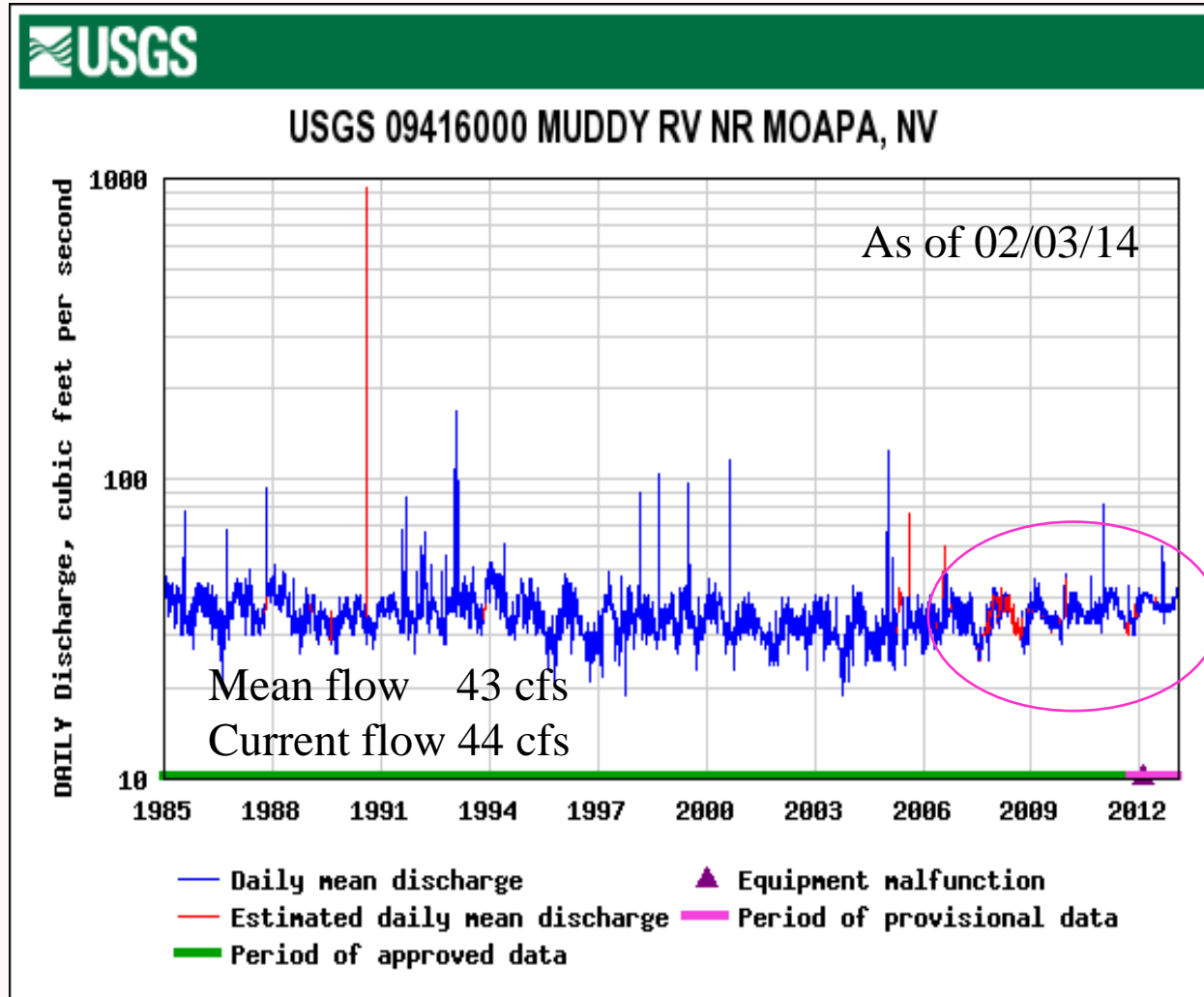
Pederson Spring Experiencing Probable MX-5 Drawdown Affects



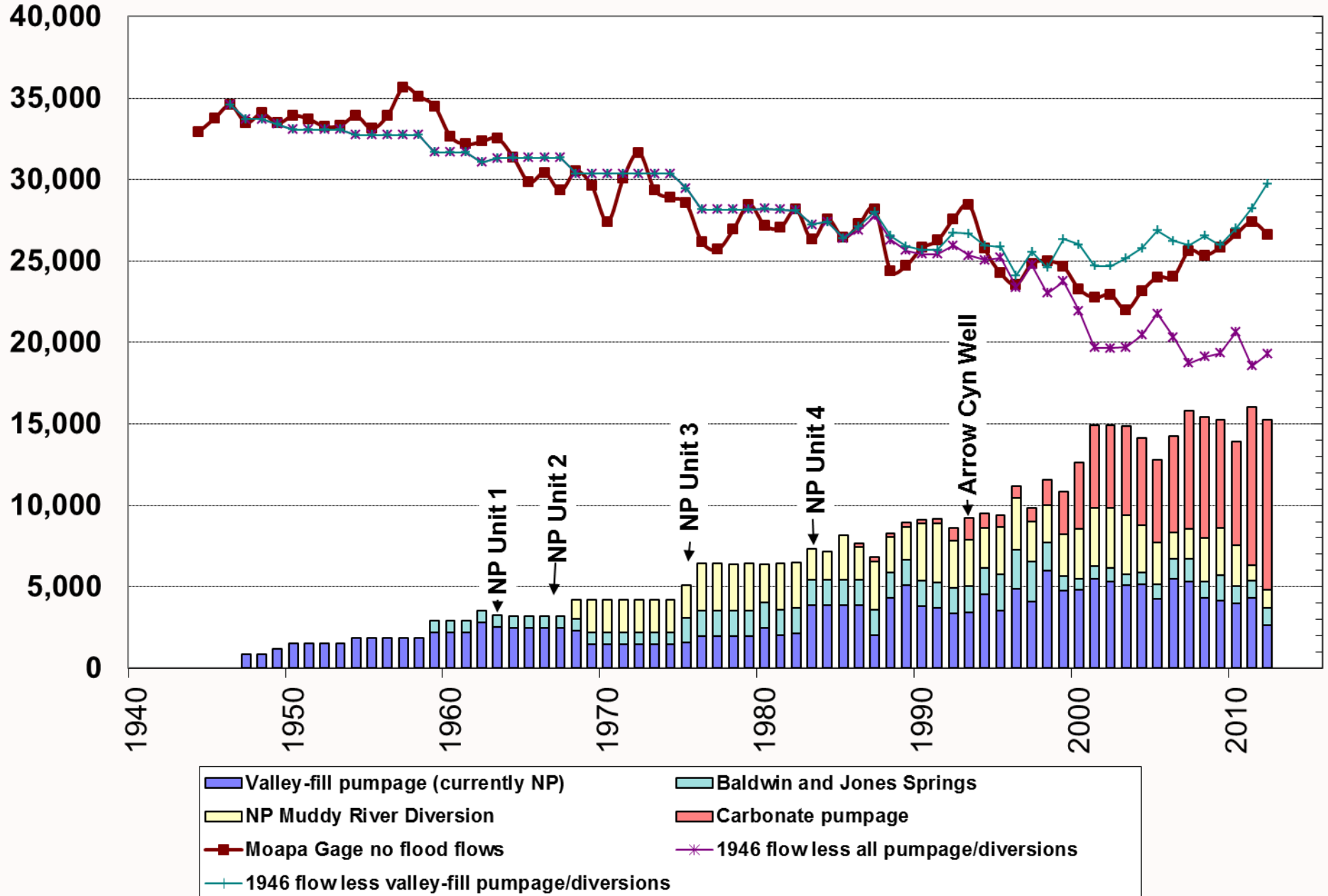
Pederson Spring East Experiencing Probable MX-5 Drawdown Affects



Moapa Gage



Historical Yearly Flow of the Upper Muddy River WY 1944-2012 USGS Gage (Regional Carbonate Pumpage)



Observations

- **GW level trends driven by 3 pumping centers and conditions preceding and during the test**
- **Reasonable GW lowering, recovery when pumping stopped**
- **Lack of response north of Kane Springs fault**
- **Declines in highest elevation springs anticipated, magnitude of decline minimal compared to Muddy River flow**
- **No discernible effects to flows at Moapa gage**
- **Local alluvial pumpage is the primary stressor to Muddy River flows**

Observations

- **Ability to manage existing rights**
- **SNWA owns and controls more than 50% of the surface water rights on the Muddy River**
- **Pipeline and facilities enhance regional water resource management**
- **Environmental conservation programs effective**

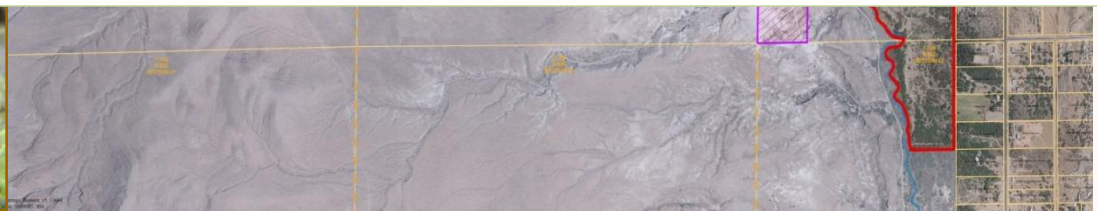
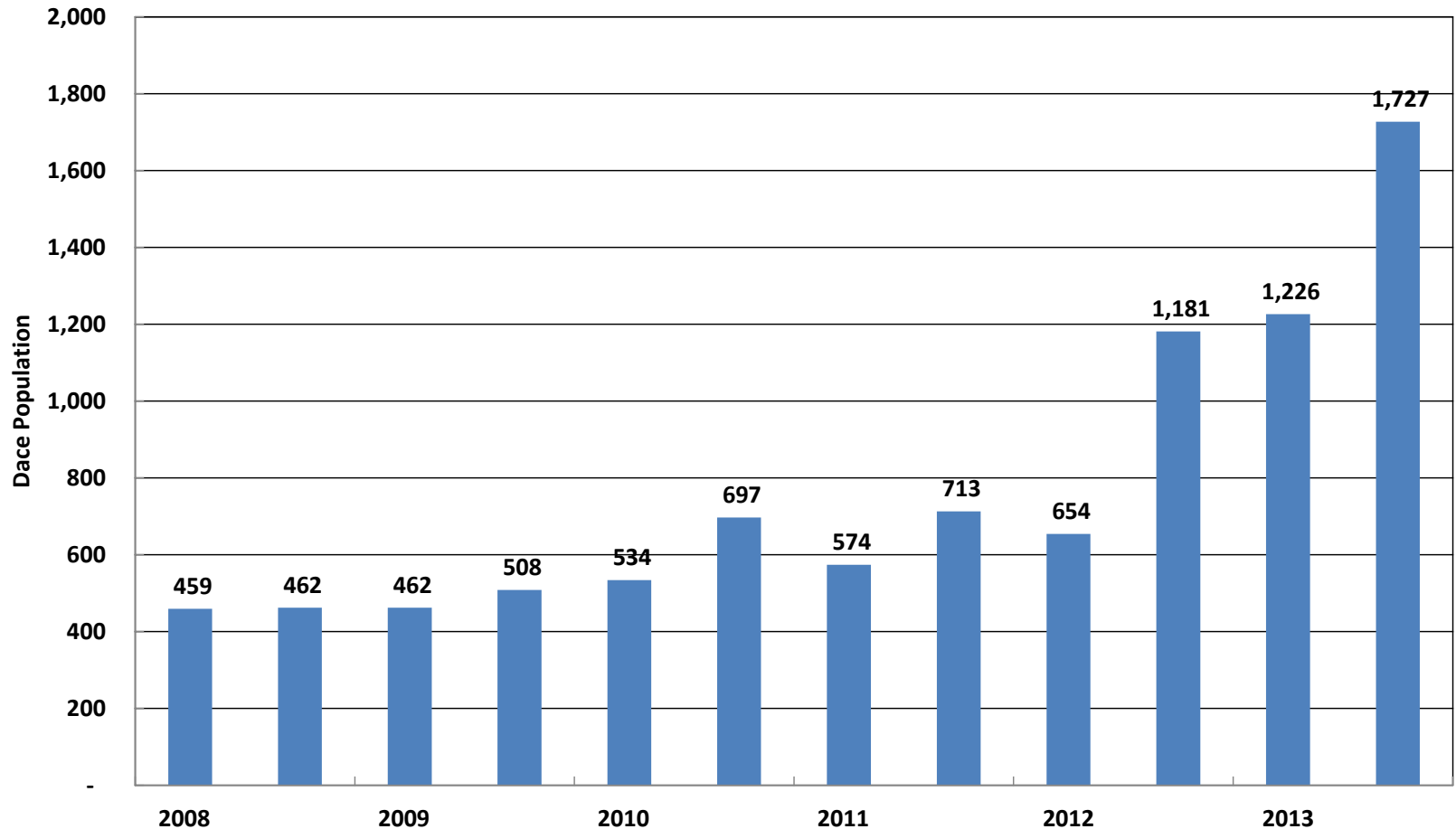


SOUTHERN NEVADA WATER AUTHORITY



Muddy River Springs Area

Moapa Dace Snorkle Counts-2013



CSV-2 and UMVM-1

