

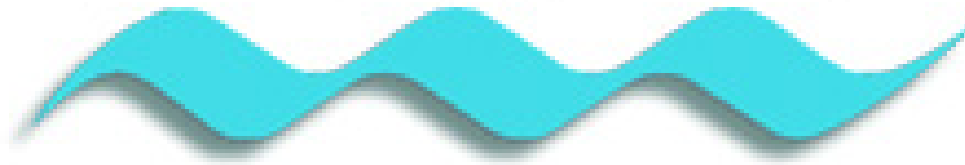


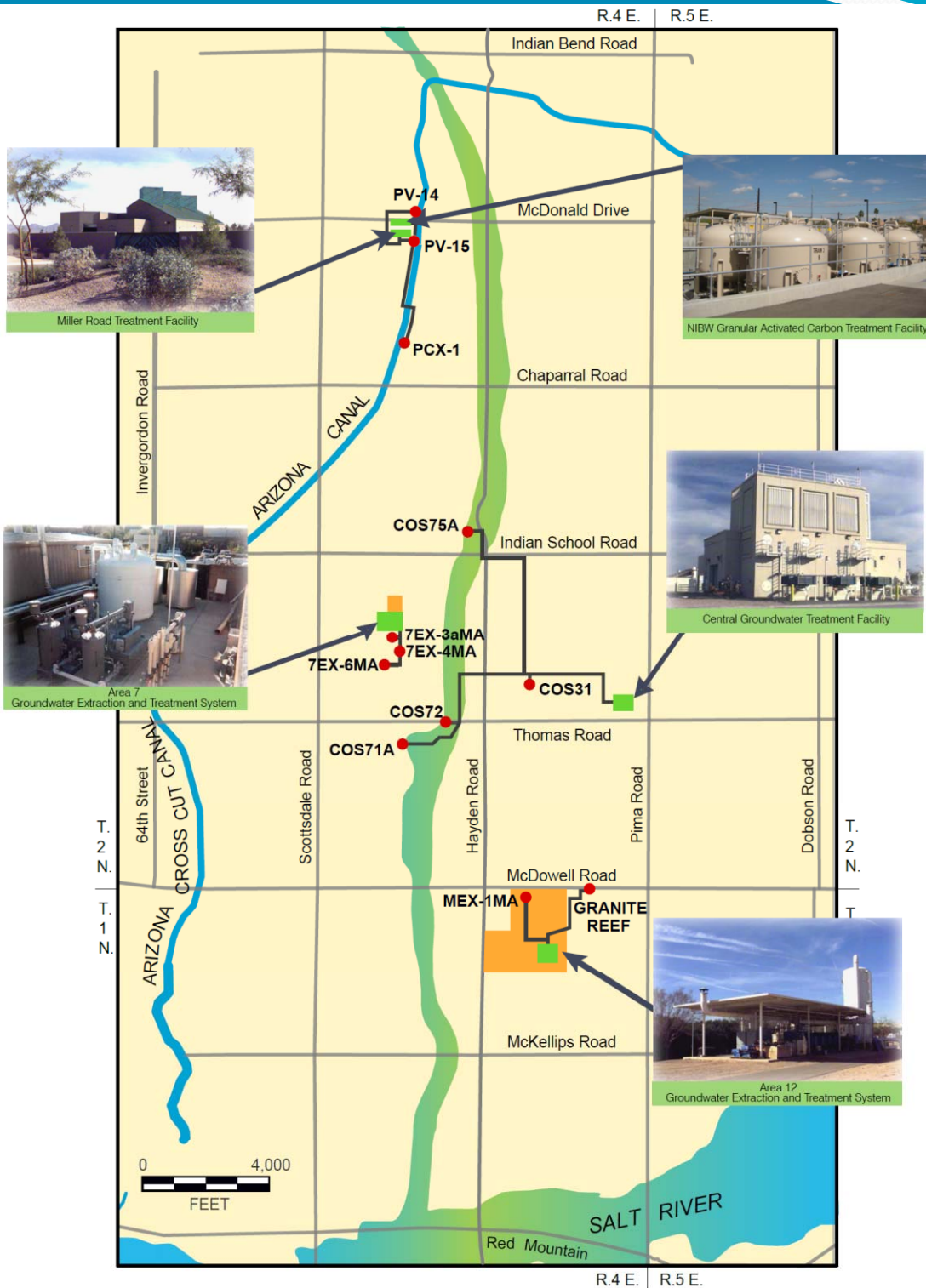
NIBW Site Overview

Five-Year Review Kick-Off

March 4, 2016

North Indian Bend Wash Superfund Site

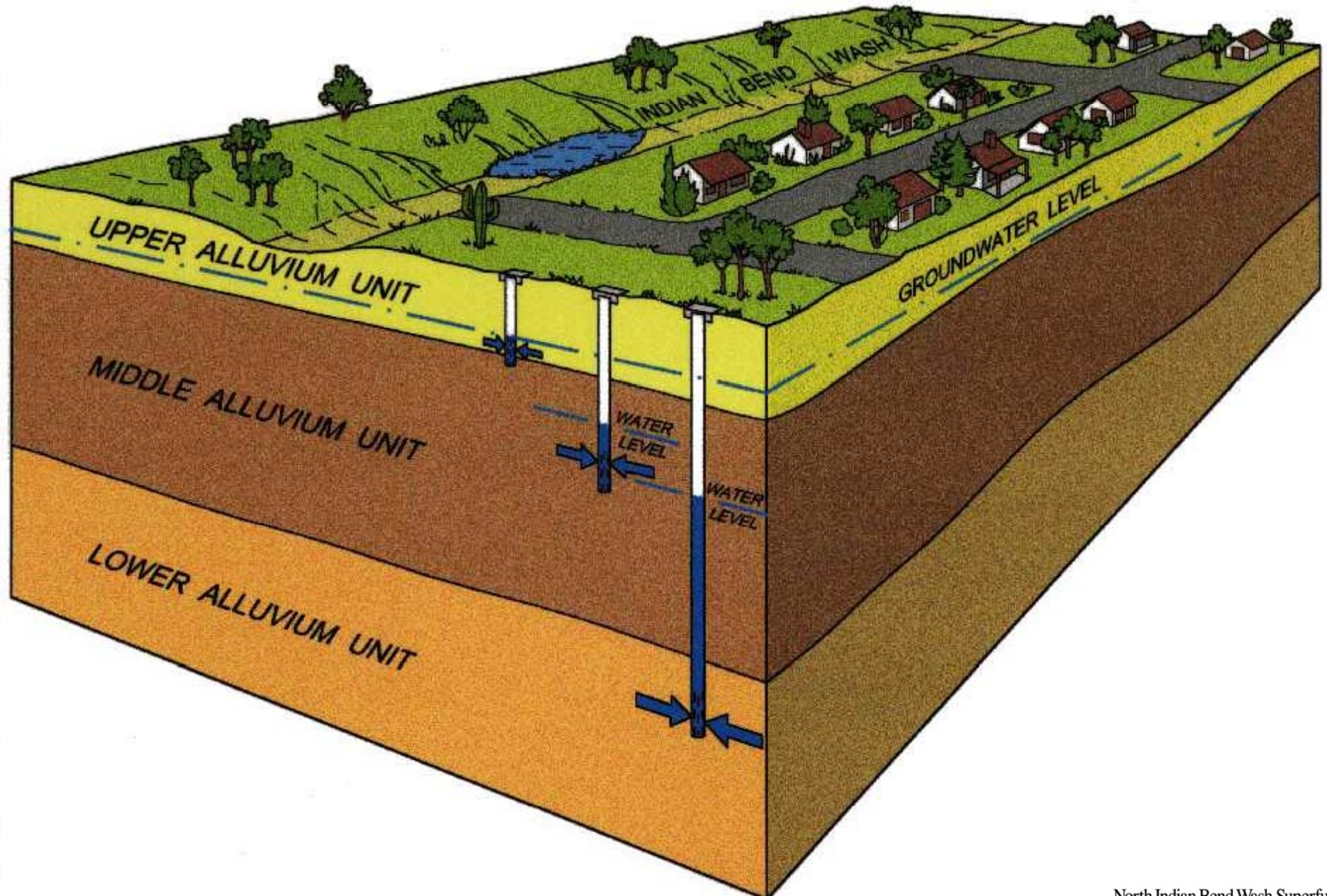




NIBW Extraction Wells and Treatment Facilities



HYDROGEOLOGIC UNITS



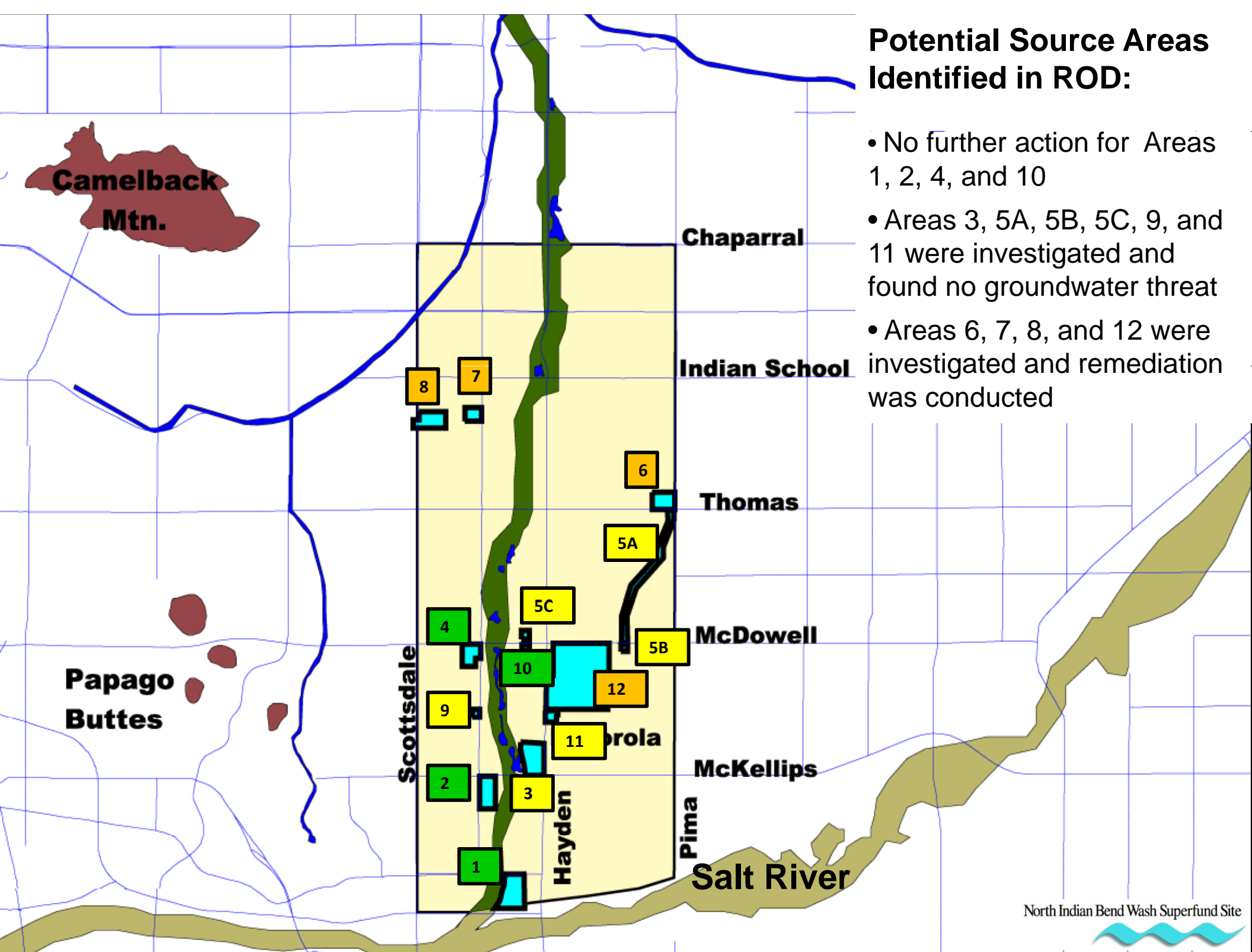
Site History

- Volatile organic compounds (VOCs) detected in groundwater in 1981
- Placed on National Priorities List (NPL) in 1983
- 1991 Record of Decision (ROD) required extraction and treatment of impacted groundwater to meet MCLs in the middle aquifer (MAU) and lower aquifer (LAU)
- 1993 ROD required upper aquifer (UAU) monitoring and soils investigations/cleanups
- CGTF began treating extracting groundwater in 1994 and serving to Scottsdale
- Proactive groundwater remedies implemented at three other facilities
 - MRTF northern LAU containment (1997)
 - Area 7 and Area 12 MAU source control (1999)
- Amended ROD (2000) and Amended Consent Decree (2002) documented remediation to include proactive remedial actions
- NIBW Granular Activated Carbon Treatment Facility (NGTF) completed in 2013 under an Explanation of Significant Differences



Potential Source Areas Identified in ROD:

- No further action for Areas 1, 2, 4, and 10
- Areas 3, 5A, 5B, 5C, 9, and 11 were investigated and found no groundwater threat
- Areas 6, 7, 8, and 12 were investigated and remediation was conducted

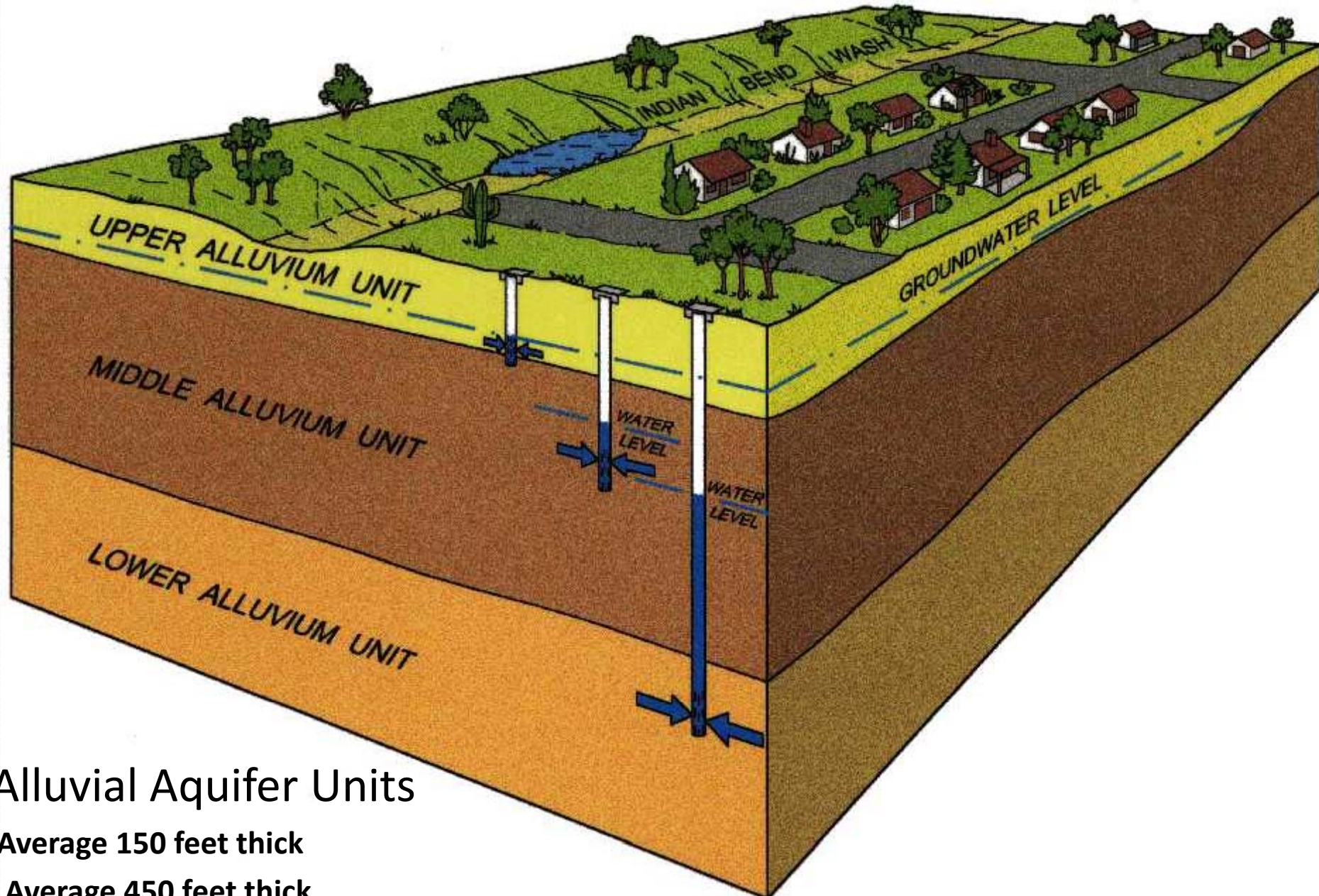


Site Status

- All components of the groundwater pump-and-treat remediation program are functioning properly
 - CGTF
 - MRTF
 - NGTF
 - Area 7
 - Area 12
- *About 85,000 pounds of TCE removed from groundwater*
- All vadose zone remediation programs completed; no remaining threat to groundwater
 - Area 6 – Unknown
 - Area 7 – About 7,000 lbs TCE removed
 - Area 8 – About 650 lbs TCE removed
 - Area 12 – About 950 lbs TCE removed
- *About 9,000 pounds removed from soils*



HYDROGEOLOGIC UNITS

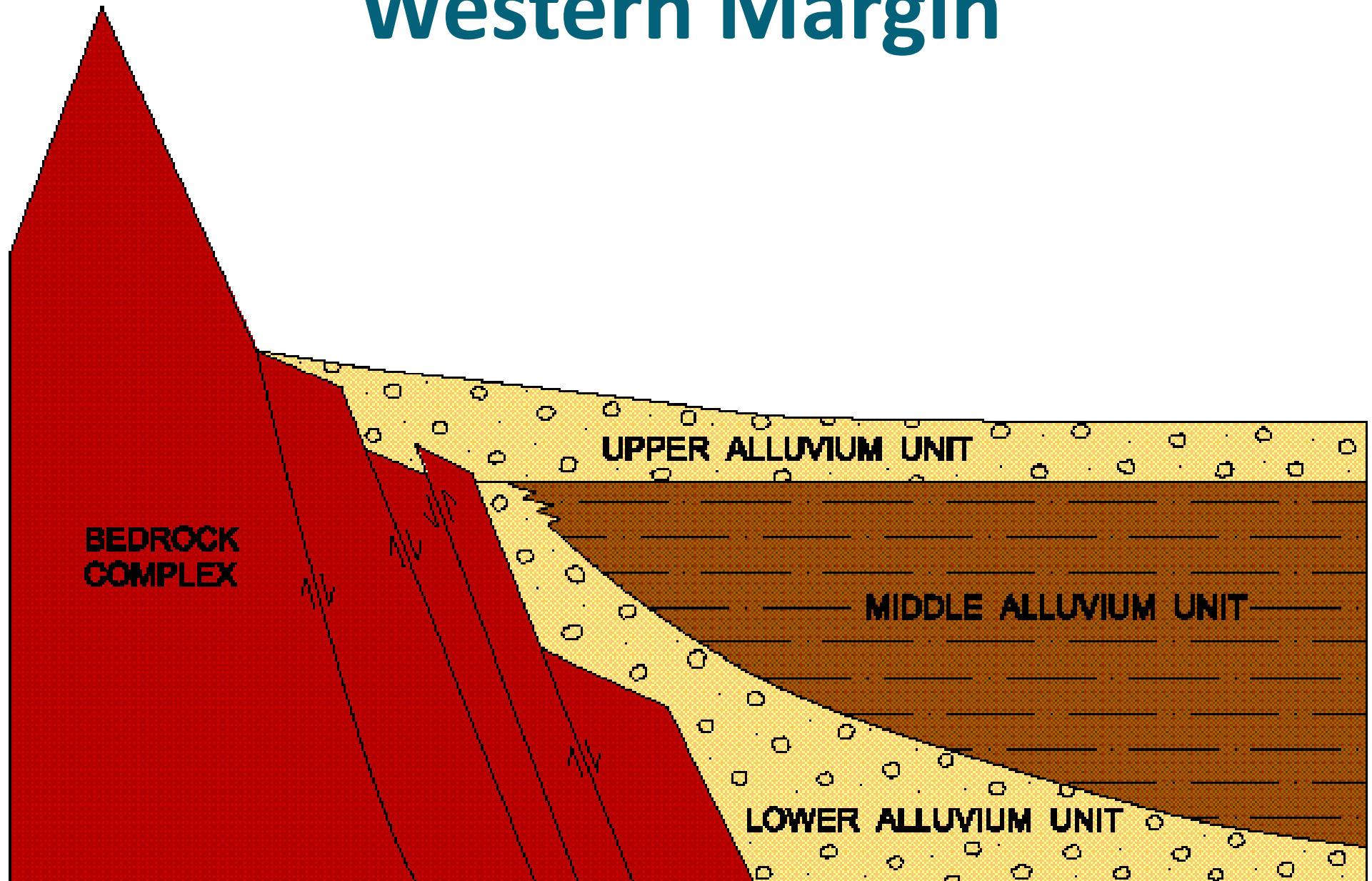


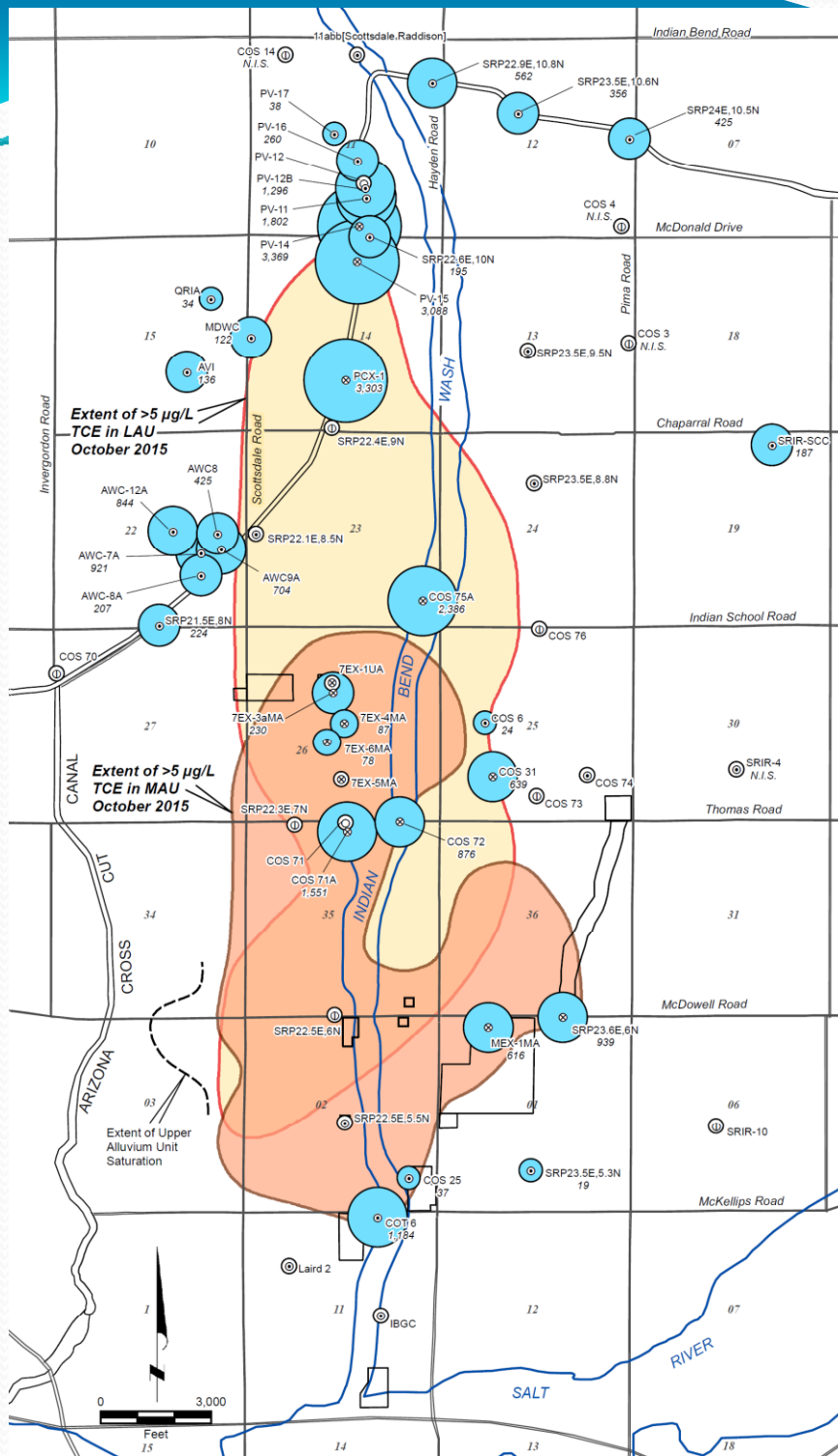
Three Alluvial Aquifer Units

- UAU – Average 150 feet thick
- MAU – Average 450 feet thick
- LAU – >700 feet thick



Western Margin





2015 Pumping

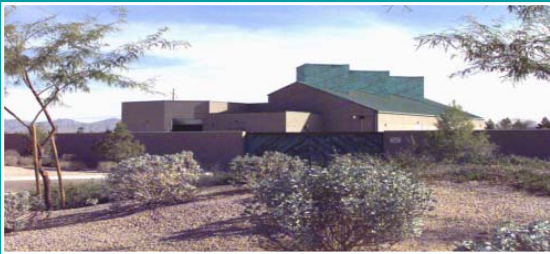


Treatment Facilities



NIBW GAC Treatment Facility

- Completed in 2013, with full operations in 2014
- PCX-1 currently treated, with potential to add PG-41
- Granular activated carbon (GAC) treatment
- Treated groundwater to COS municipal supply or SRP canal



Miller Road Treatment Facility

- Began operations in 1997
- Owned and operated by EPCOR
- Wells PV14 and PV15 treated
- Groundwater treatment by air stripping
- Treated groundwater to EPCOR potable water system

Area 7 Groundwater Extraction and Treatment System

- Began operation in 1999
- Built by Siemens and operated by Motorola
- Ultraviolet oxidation and air stripping treatment
- Treated groundwater recharged to UAU aquifer



Central Groundwater Treatment Facility

- Began operation in 1994
- Owned and operated by City of Scottsdale
- Groundwater treated by air stripping
- Treated groundwater to Scottsdale municipal supply



Area 12 Groundwater Extraction and Treatment System

- Began operation in 1999
- Owned and operated by Motorola Solutions
- Groundwater treated by air stripping
- Treated water to SRP irrigation canal system



NGTF History

Newest Component of Remedy

- Incident at MRTF in January 2008 resulted in release of untreated groundwater to potable water system
- EPA required extensive, independent investigation
- Determined cause was AAW (now EPCOR) operator error
- Well with highest TCE levels, PCX-1, was disconnected from EPCOR potable water system
- MRTF restarted with 24/7 operational coverage and additional redundancy requirements
- Many work plan iterations led to construction of a new GAC treatment facility for PCX-1 – approved September 2011
- NGTF construction and startup testing was completed in December 2013, with connection of pipeline to City of Scottsdale Chaparral Water Treatment Plant in 2014



NIBW GAC Facility



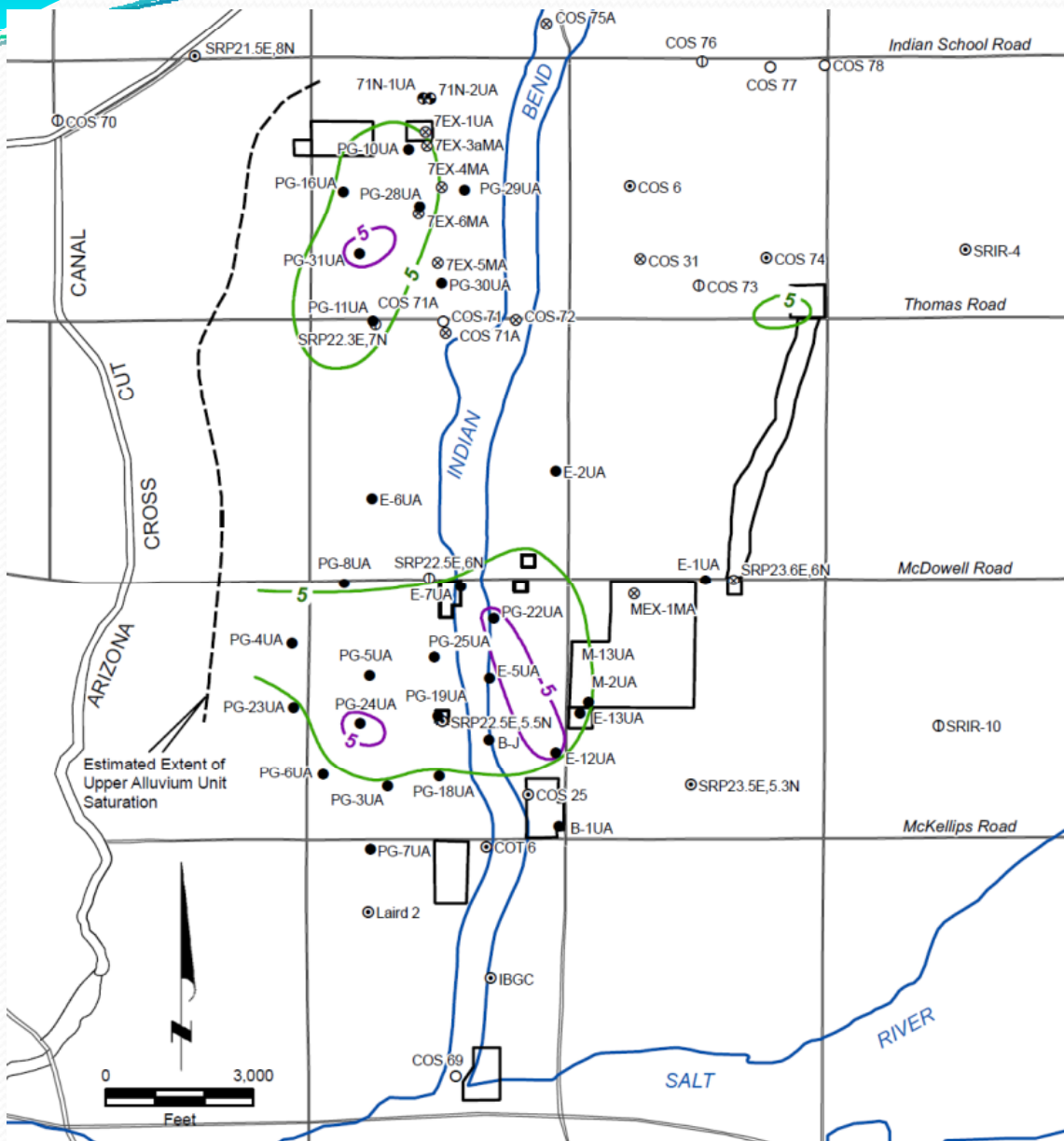
Remedial Action Objectives

- Technical RAOs
 - Containment – maintain hydraulic control and draw plumes to wells tied into treatment
 - Restoration – reduce VOC concentrations over time to below drinking water standards
- Use water level and water quality data to assess effectiveness of remedial actions and achievement of RAOs



UAU Objectives

- Mitigate sources in soils
 - No further action for Areas 1, 2, 4, and 10
 - Areas 3, 5A, 5B, 5C, 9, and 11 were investigated and found no groundwater threat
 - Vadose zone remediation conducted at Areas 6, 7, 8, and 12
- Allow remaining mass to migrate via western margin into LAU for treatment

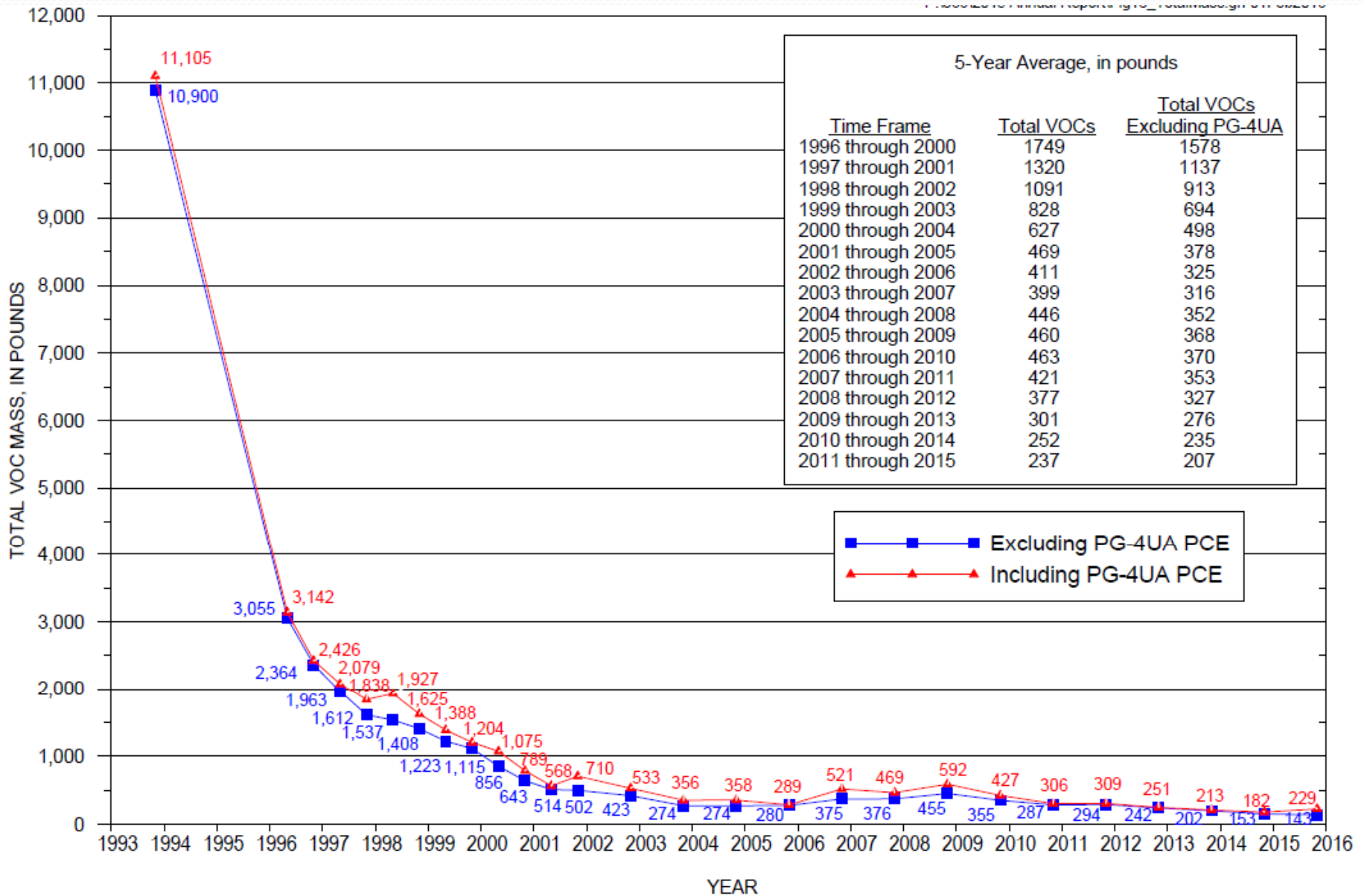


UAU TCE

Oct 2001 – Oct 2015



VOC Mass Flux in UAU



UAU Remedy Progress

- Vadose zone clean up complete at all areas
 - Letter of Determination for Area 7 SVE in 2015
 - Certification of decommissioning in 2016
- Reduction in VOC mass of about 98% in UAU groundwater from 1993
- Reduction in plume area by about 90% since 2001
- Abandoned 30 wells in 2013; 28 wells remaining
- Effective migration of remainder of mass into LAU for treatment in accordance with remedy
- Significant concentration reductions and progress toward restoration

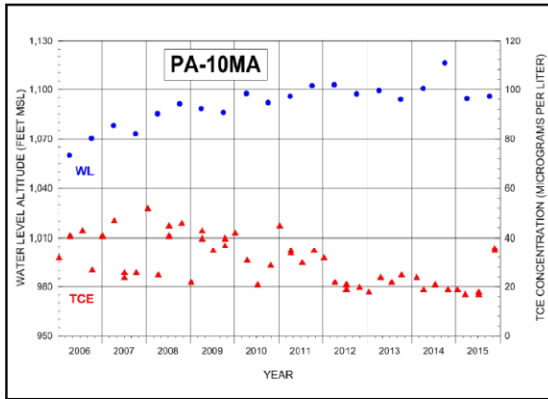
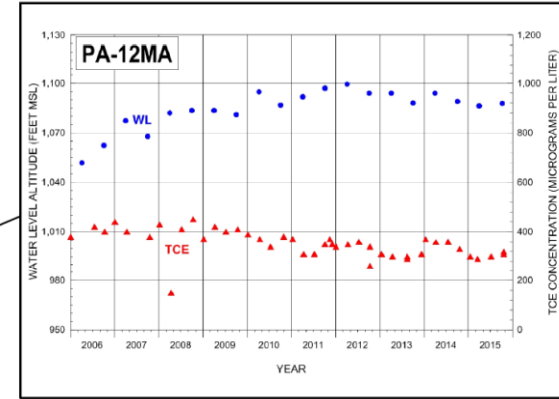
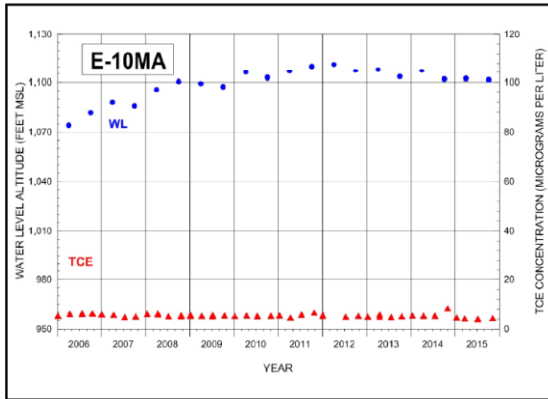
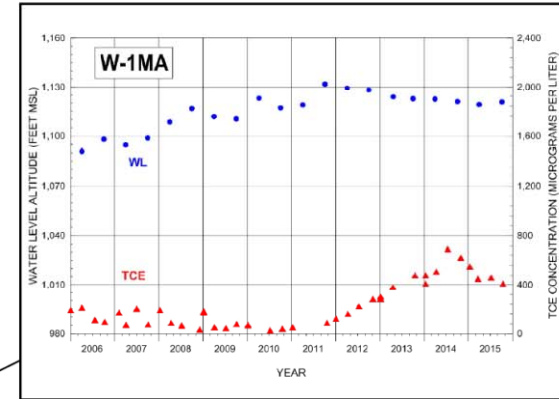
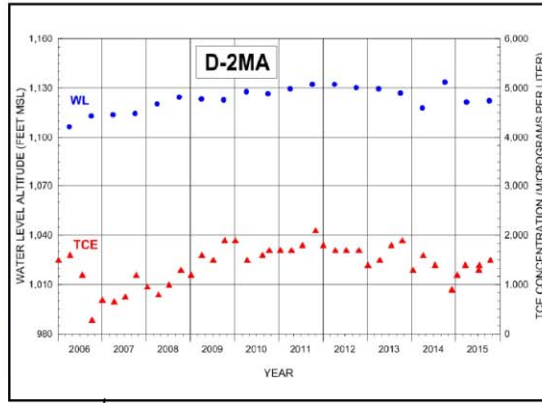
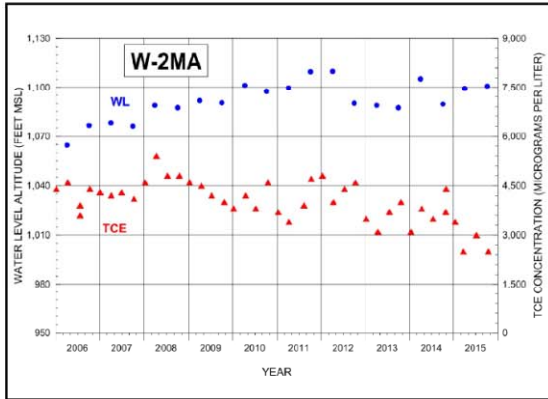


MAU Objectives

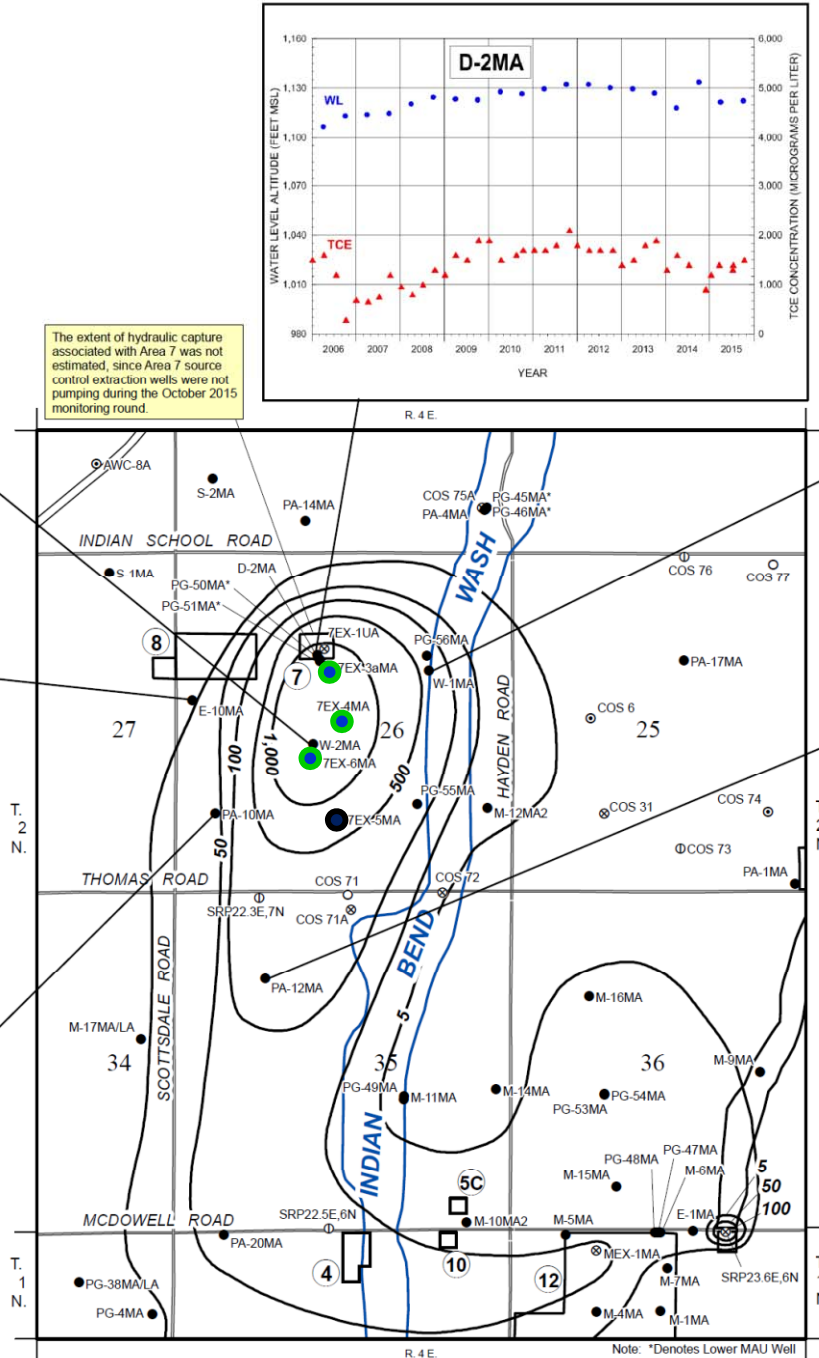
- Contain, extract, and treat higher concentration areas (Area 7 and Area 12)
- Allow remaining mass to migrate into LAU for treatment



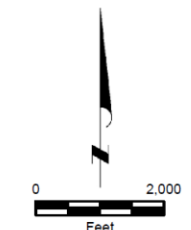
Area 7 MAU Source Control



The extent of hydraulic capture associated with Area 7 was not estimated, since Area 7 source control extraction wells were not pumping during the October 2015 monitoring round.



EXPLANATION
 — 5 — TCE Concentration Contour, in micrograms per liter



NORTH INDIAN BEND WASH AREA
 MARICOPA COUNTY, ARIZONA

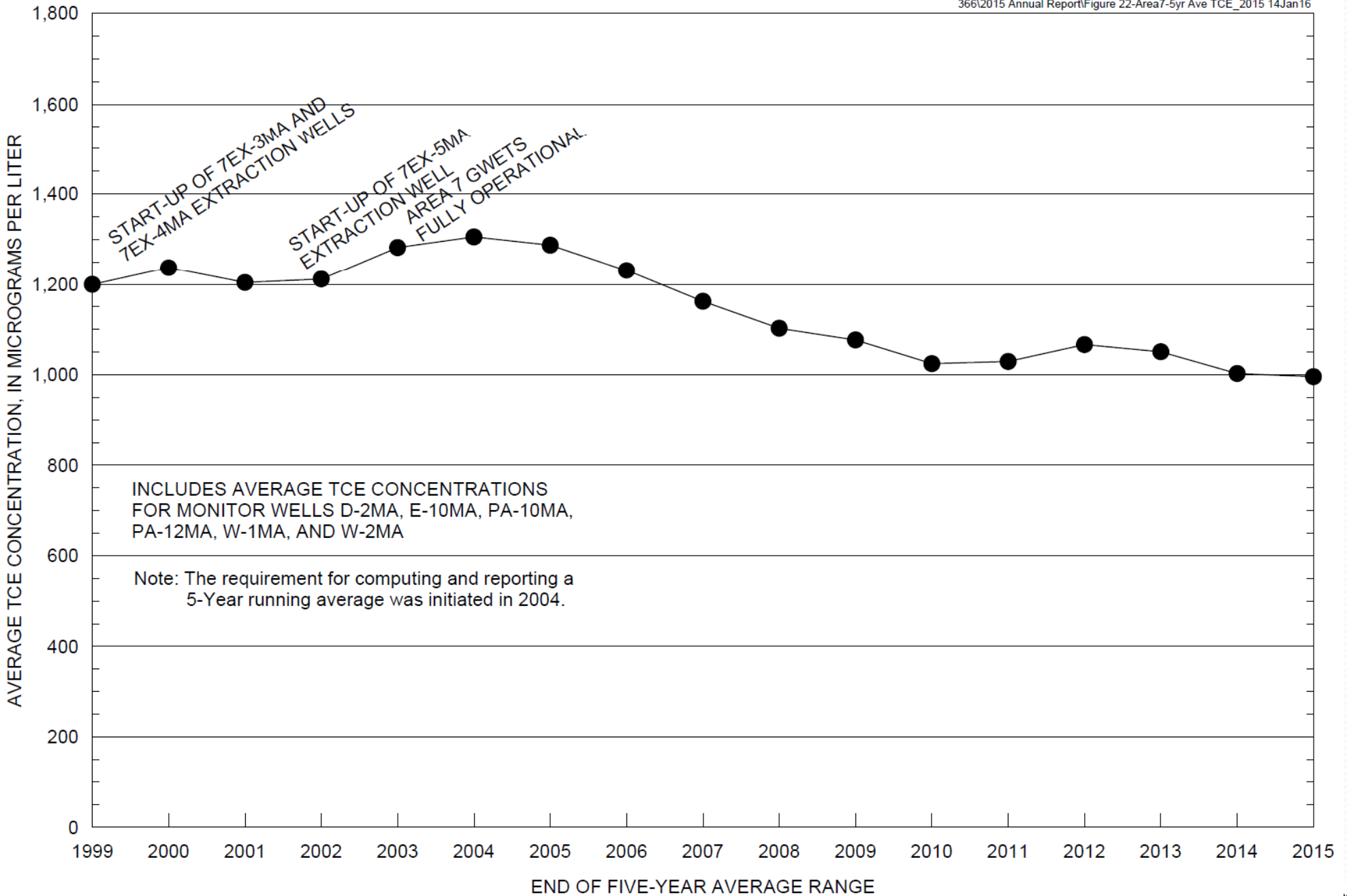
WATER LEVELS, TCE CONCENTRATIONS, AND ESTIMATED HYDRAULIC CAPTURE UPPER MIDDLE ALLUVIUM UNIT VICINITY OF AREA 7 OCTOBER 2015

North Indian Bend Wash Superfund Site

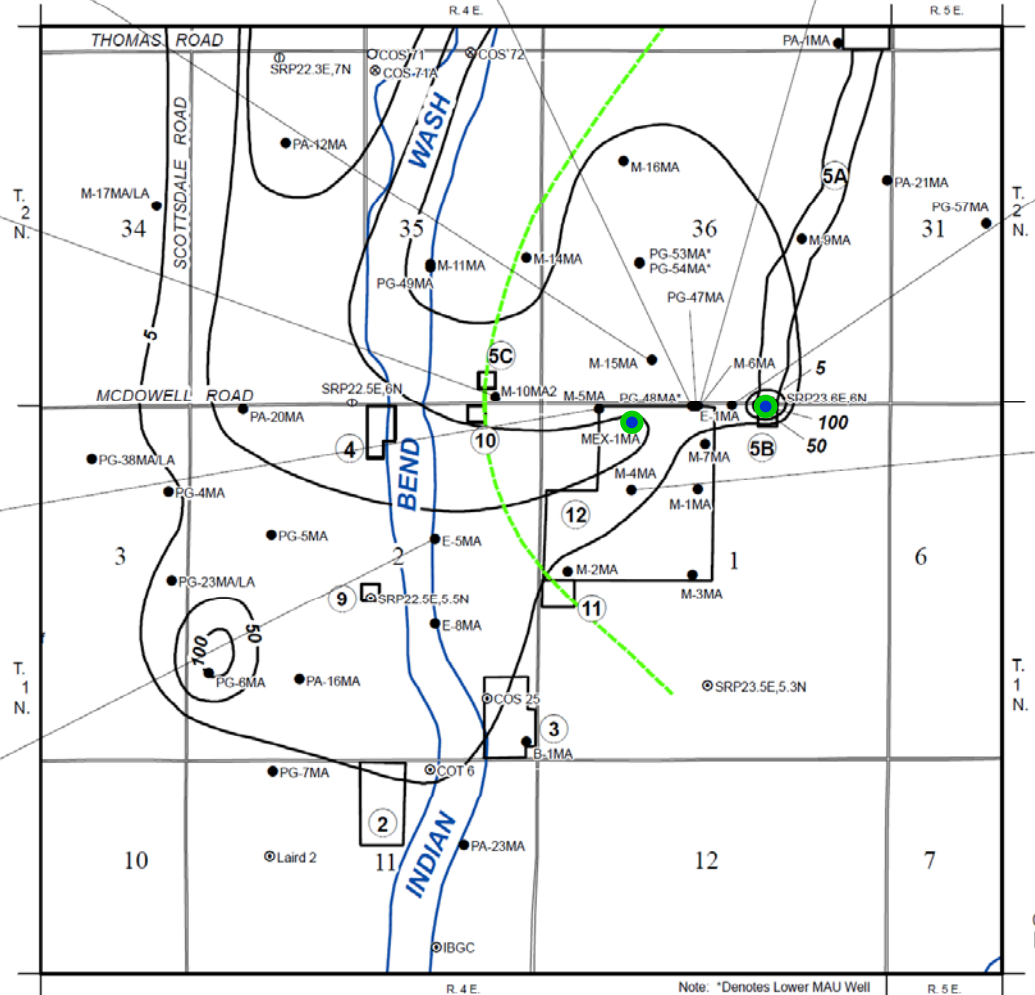
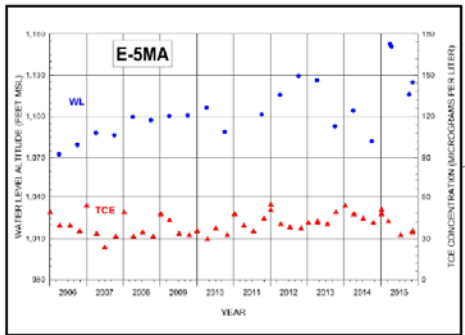
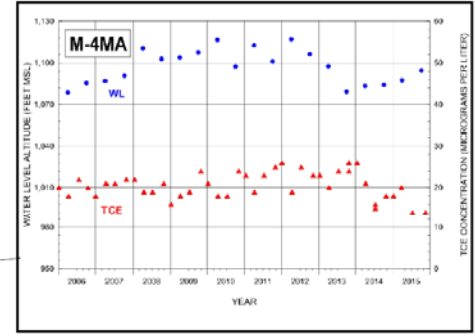
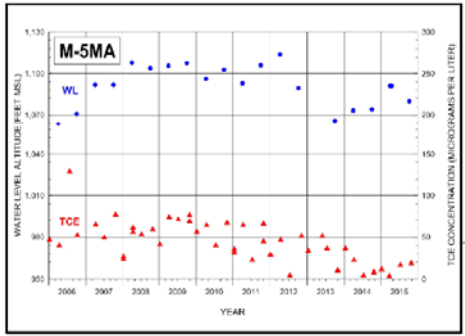
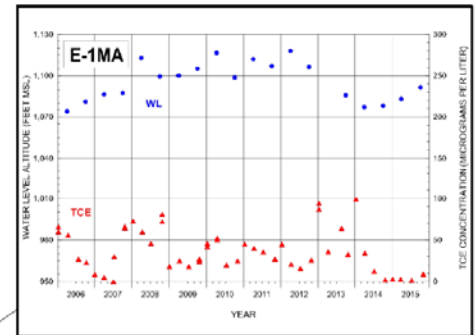
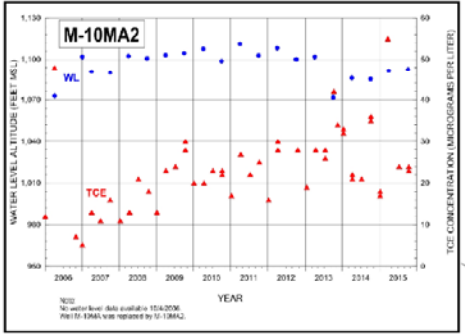
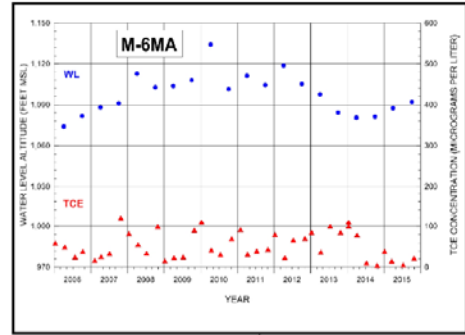
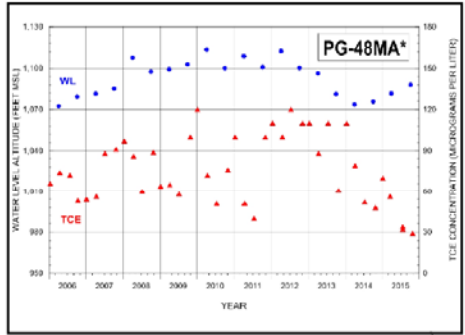
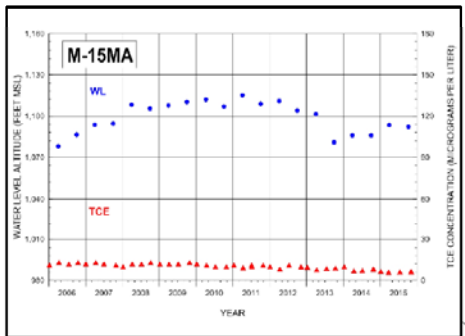
FIGURE 21

Area 7: 5-Year Running Average

366|2015 Annual Report|Figure 22-Area7-5yr Ave TCE_2015 14Jan16

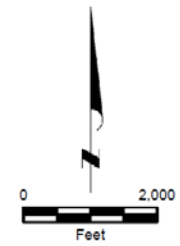


Area 12 MAU Source Control



EXPLANATION

- 5 — TCE Concentration Contour, in micrograms per liter
- Estimated Extent of Hydraulic Capture



NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

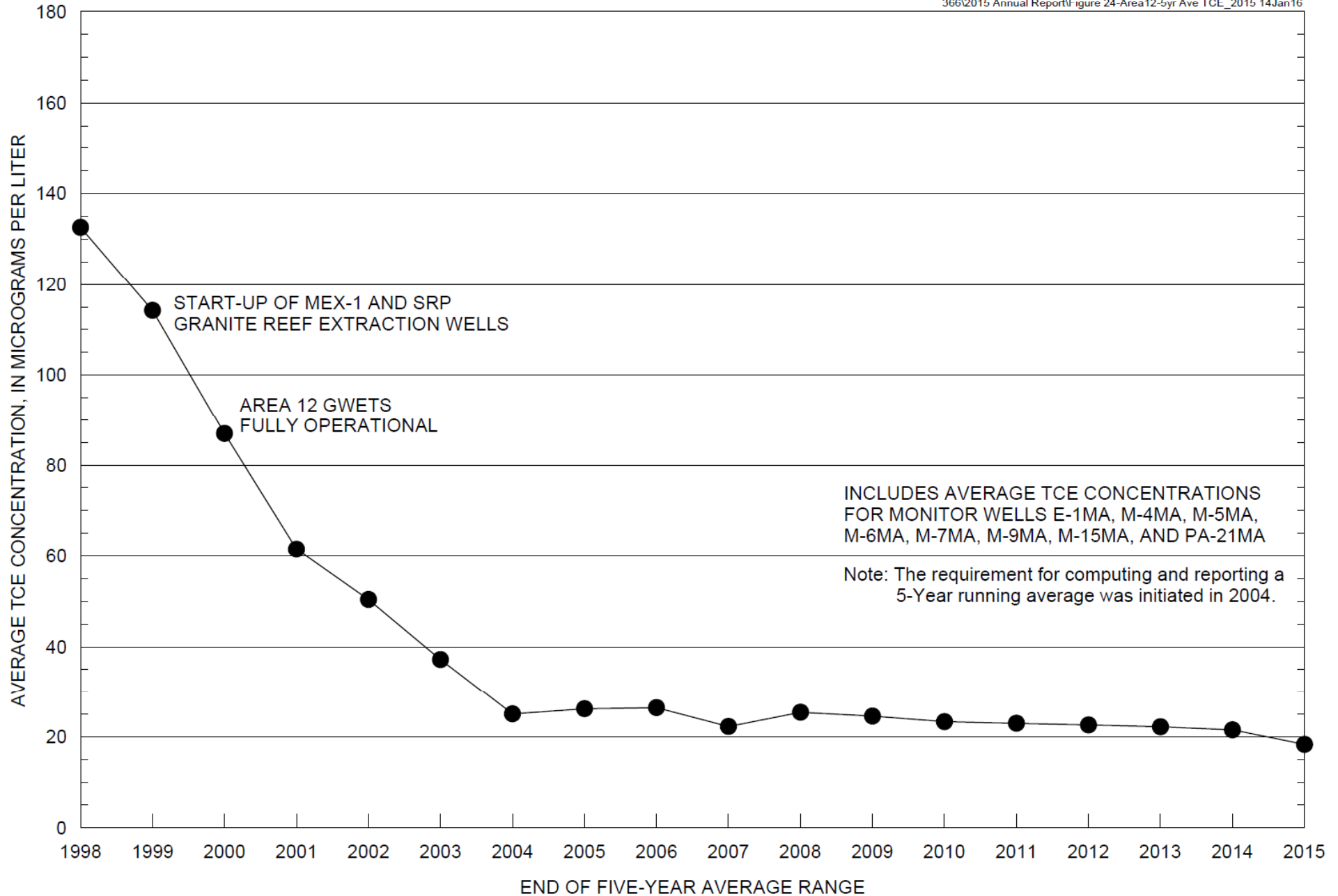
WATER LEVELS, TCE CONCENTRATIONS,
AND ESTIMATED HYDRAULIC CAPTURE
UPPER MIDDLE ALLUVIUM UNIT
VICINITY OF AREA 12
OCTOBER 2015

North Indian Bend Wash Superfund Site

FIGURE 23

Area 12: 5-Year Running Average

366\2015 Annual Report\Figure 24-Area12-5yr Ave TCE_2015 14Jan16



MAU Source Control Effectiveness

- Water level data and modeling: hydraulic containment of higher concentration areas
- VOC concentration data: significant decreases at monitor and extraction wells
- Extraction well data: combined Area 7 and Area 12 TCE mass removal of about 25,000 lbs

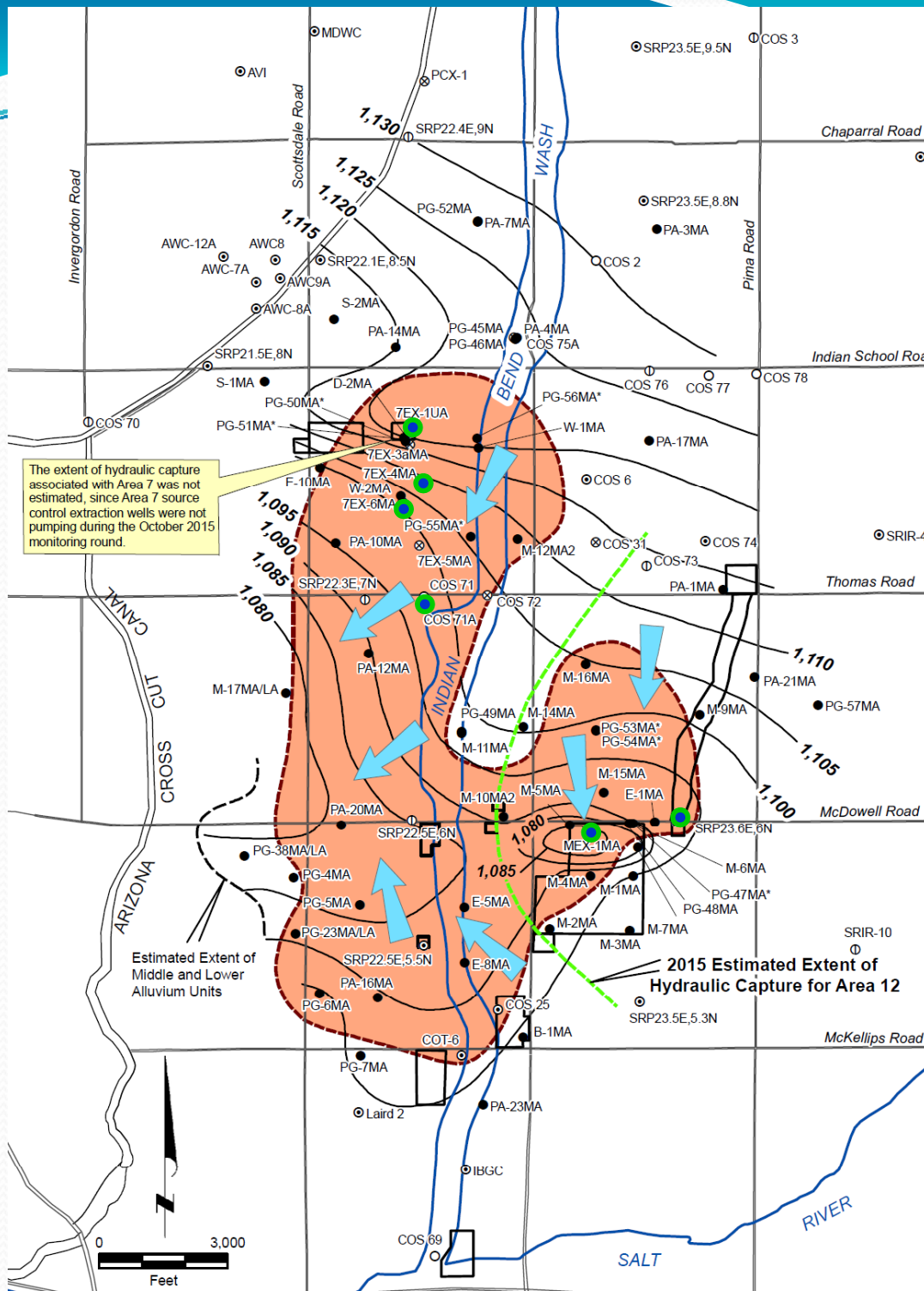


MAU/LAU Objectives

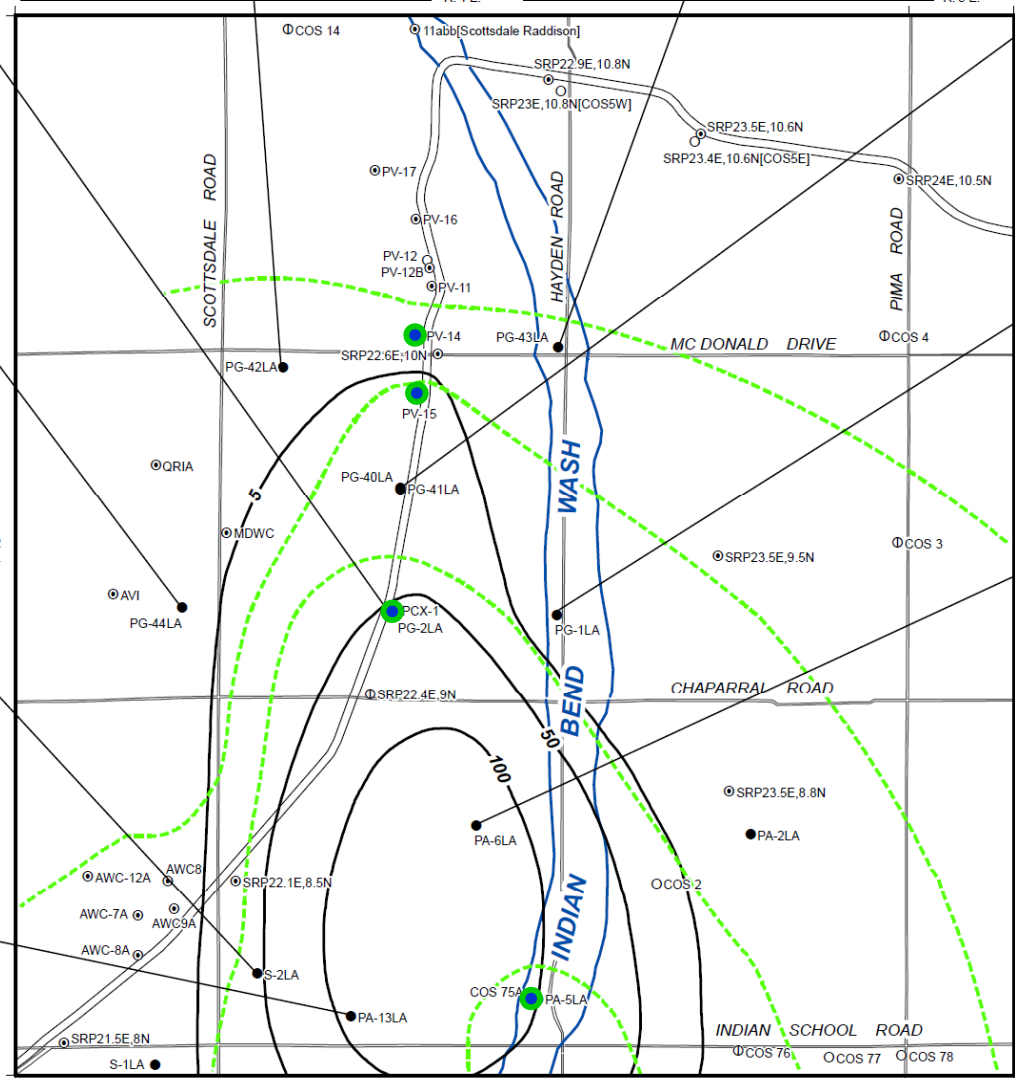
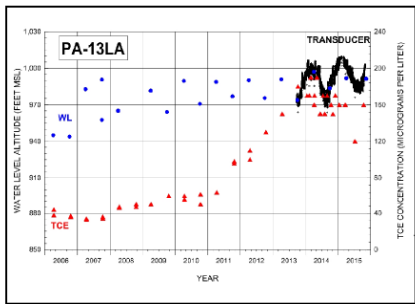
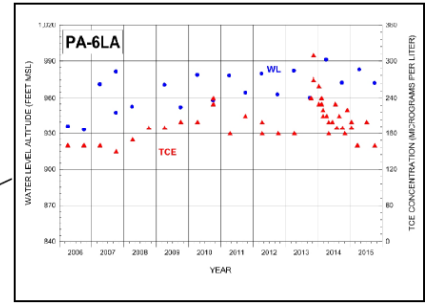
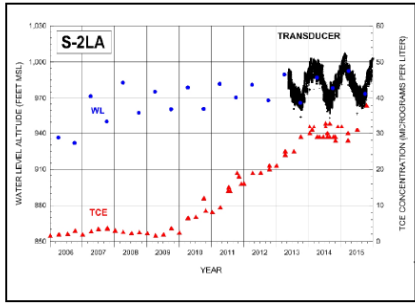
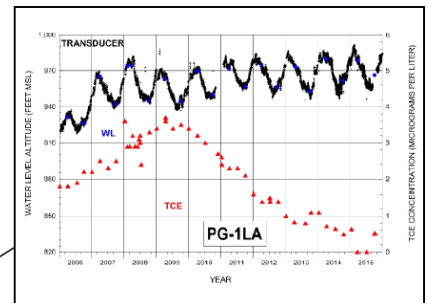
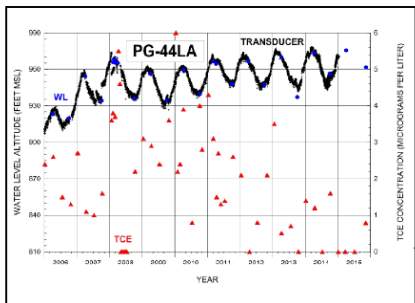
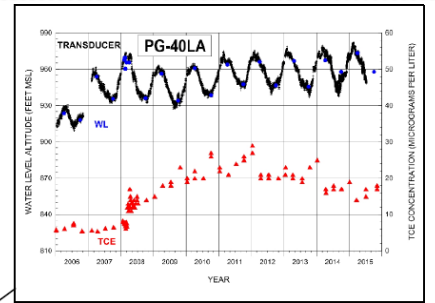
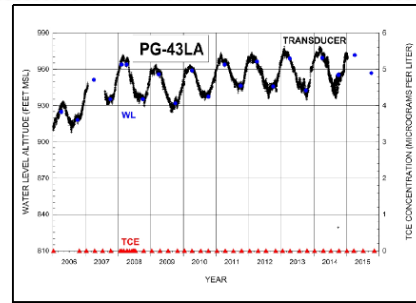
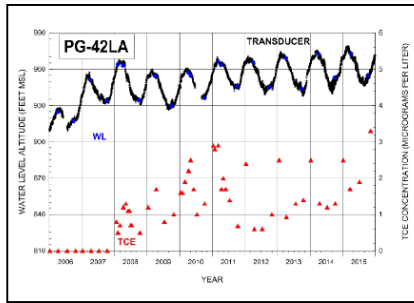
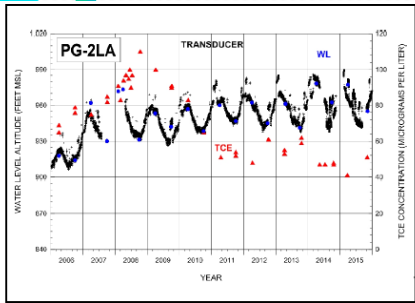
- Contain TCE plume
- Prevent migration to wells not tied into treatment



MAU Hydraulic Containment

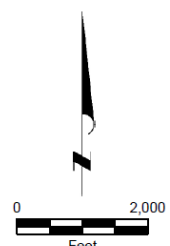


N. LAU Capture/Containment



EXPLANATION

- 5 — TCE Concentration Contour, in micrograms per liter
- NIBW Model Plan A Projected Extent of Hydraulic Capture



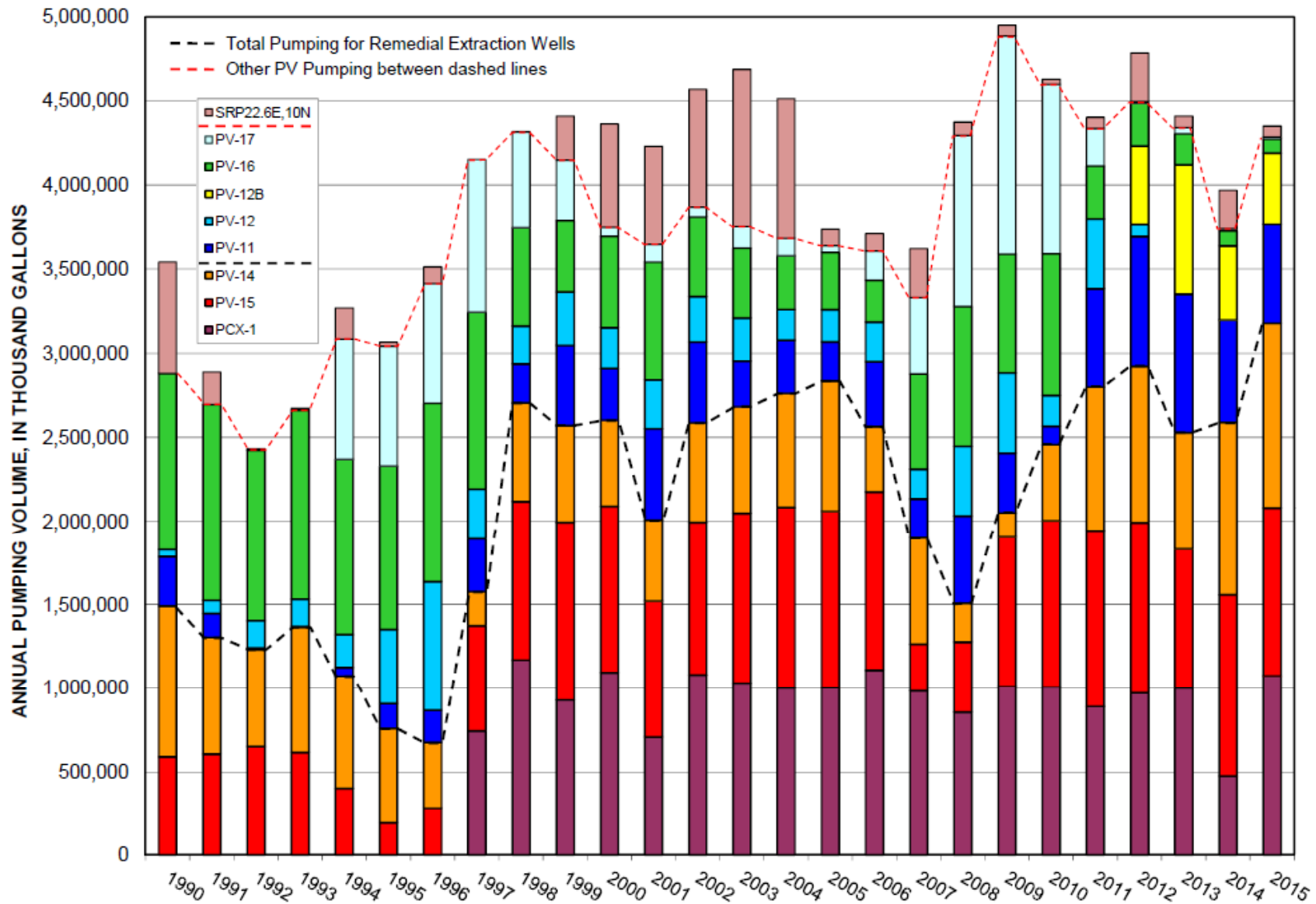
NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

**WATER LEVELS, TCE CONCENTRATIONS,
AND ESTIMATED HYDRAULIC CAPTURE
NORTHERN LOWER ALLUVIUM UNIT
OCTOBER 2015**

North Indian Bend Wash Superfund Site

FIGURE 25

Distribution of Pumping in N. LAU



MAU/LAU Groundwater Remedy Effectiveness

- Water level data and model: hydraulic containment of MAU and LAU plumes
- Water quality data: significant progress toward aquifer restoration, particularly in LAU
- Extraction well data: removal and treatment of about 84,000 lbs of TCE since 1994 (about 25,000 lbs from source control)



Key Accomplishments Since Last 5YR

- Completion of final component of vadose zone remediation, with Letter of Determination for Area 7 in 2015 and Certification in 2016
- Significant decrease in UAU mass and plume area, allowing for abandonment of 30 wells in 2013
- Installation of replacement Area 7 extraction well 7EX-6MA in 2015
- Replacement of COS71 with COS71A in 2014
- Increase in pumping capacity at COS75A in 2012
- Addition of NGTF to treat PCX-1 in 2013, increasing system reliance and decreasing down-time at MRTF
- Increase in pumping capacity at PCX-1 in 2014
- Coordinated south-north pumping of PV wells since 2010
- Continued cooperation of parties – PCs, COS, SRP, and EPCOR – and agencies – EPA and ADEQ – toward remedy success



LAU TCE Plume Animation

