

- Indian Reservations**
- Hopi
 - Fort Apache
 - Navajo
 - Zuni

- Legend**
- LCR Adjudication Area Boundary
 - Watershed Boundary
 - City/Town
 - Major River
 - Interstate
 - U.S. Route
 - County
 - State Boundary

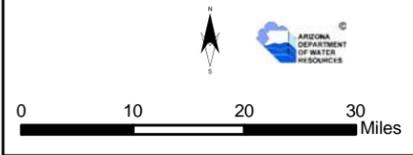
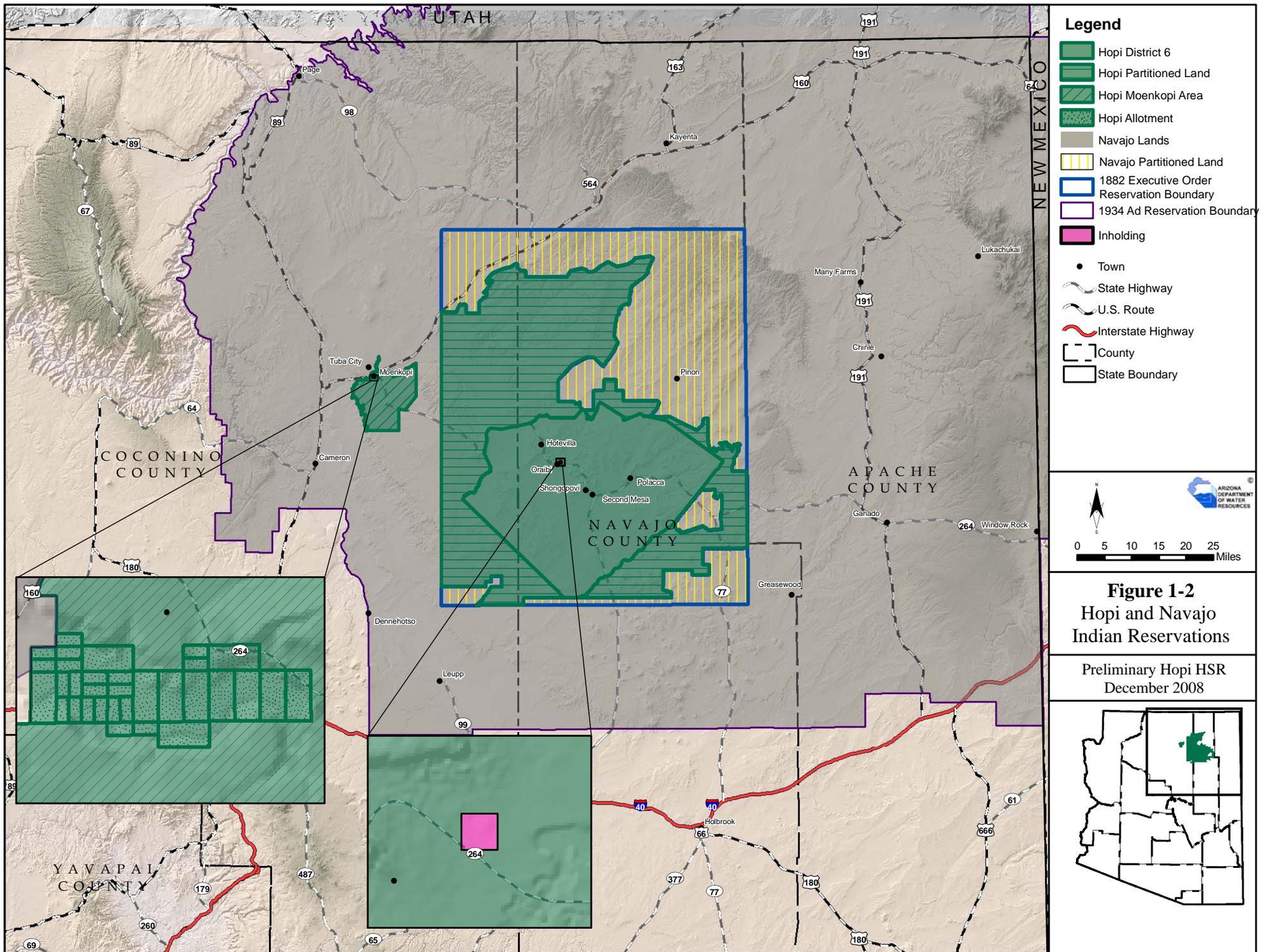


Figure 1-1
 Location of the Hopi Indian Reservation Within the LCR Adjudication Area

Preliminary Hopi HSR, December 2008



Legend

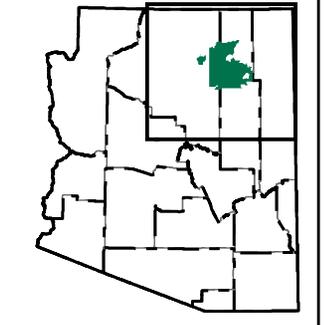
- Hopi District 6
- Hopi Partitioned Land
- Hopi Moenkopi Area
- Hopi Allotment
- Navajo Lands
- Navajo Partitioned Land
- 1882 Executive Order Reservation Boundary
- 1934 Ad Reservation Boundary
- Inholding
- Town
- State Highway
- U.S. Route
- Interstate Highway
- County
- State Boundary

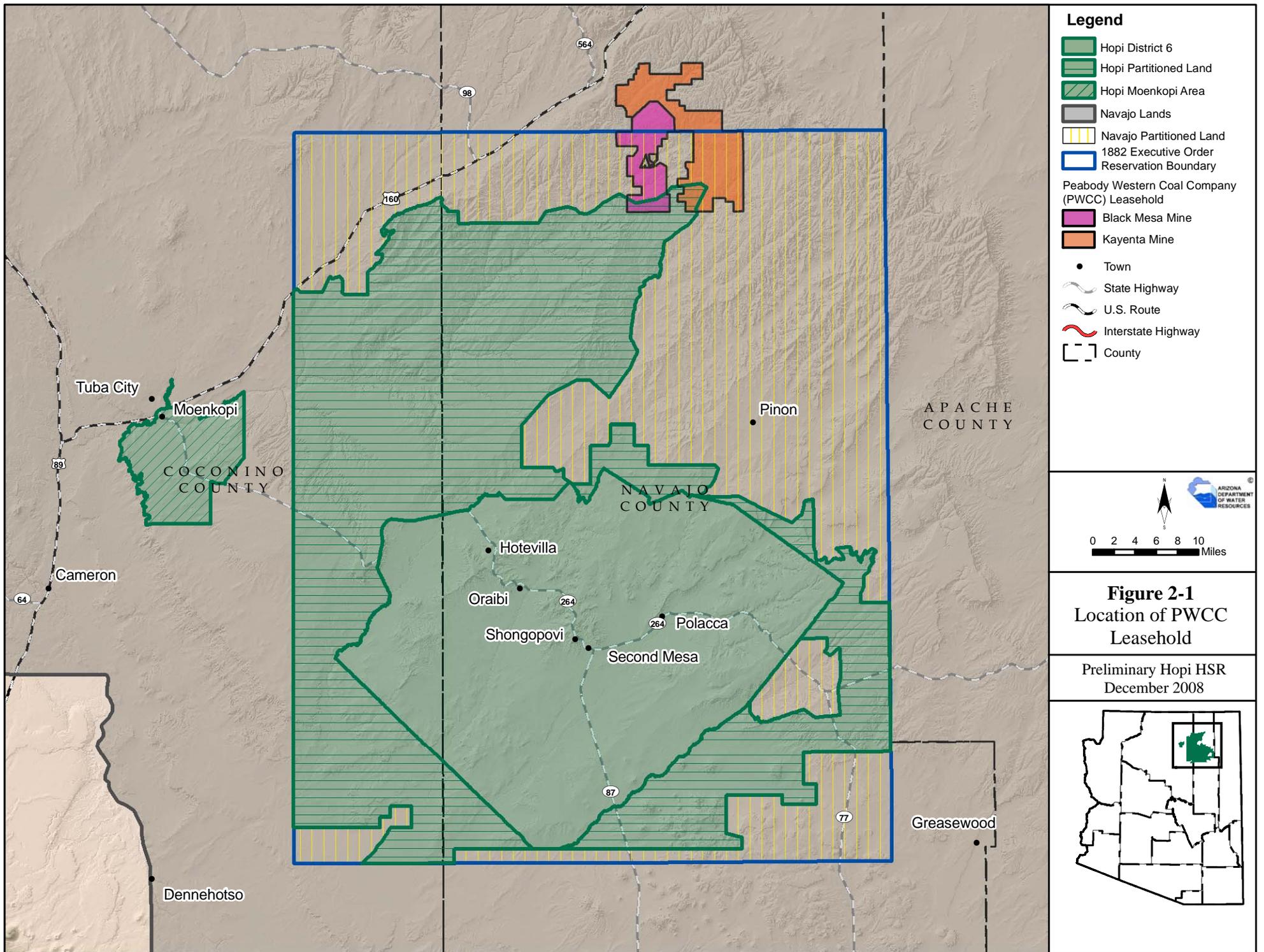
ARIZONA
DEPARTMENT
OF WATER
RESOURCES

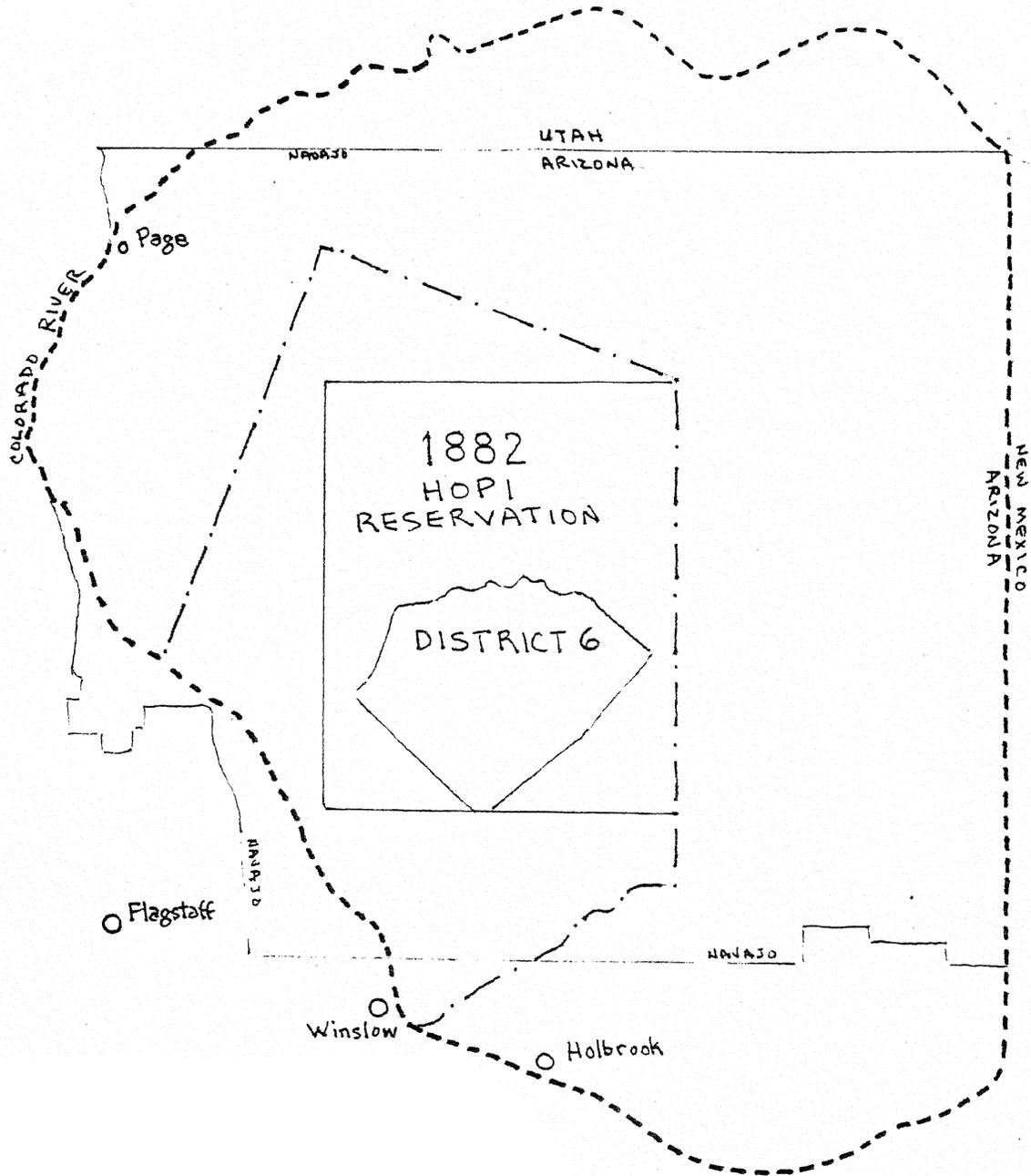
0 5 10 15 20 25
Miles

Figure 1-2
Hopi and Navajo
Indian Reservations

Preliminary Hopi HSR
December 2008







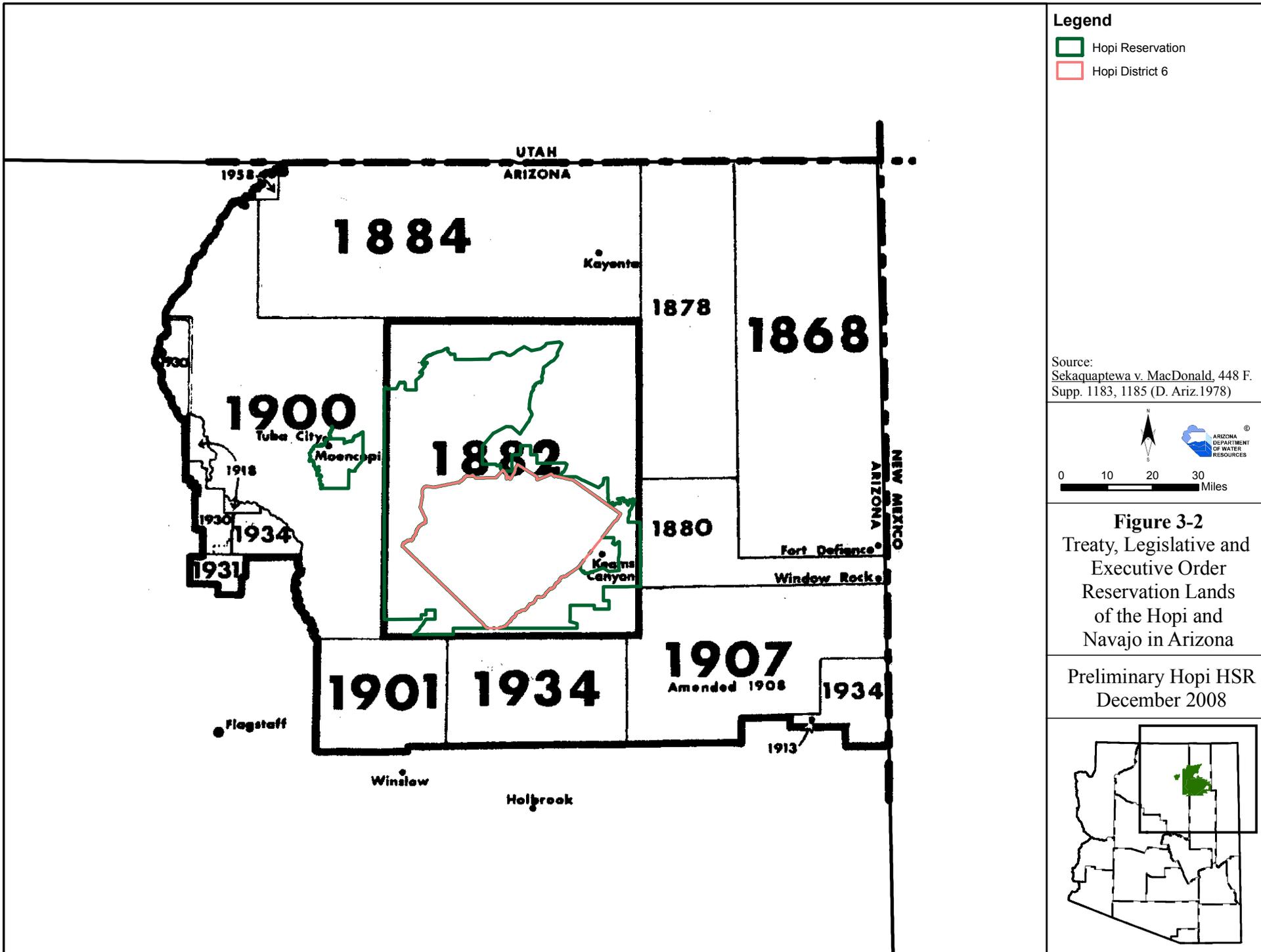
- - - - DOCKET 196 ABORIGINAL CLAIM
 - · - · - DOCKET 196 RULING BY INDIAN CLAIMS COMMISSION ON TOTAL EXTENT OF HOPI ABORIGINAL LAND



Figure 3-1
Boundary of Hopi
Aboriginal Land Claims

Preliminary Hopi HSR
December 2008

Source: Indian Law Resource Center (1979).



Legend

- Hopi Reservation
- Hopi District 6

Source:
 Sekaquaptewa v. MacDonald, 448 F.
 Supp. 1183, 1185 (D. Ariz.1978)

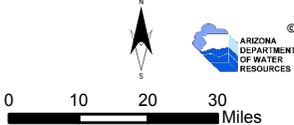
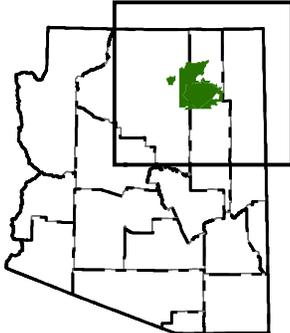
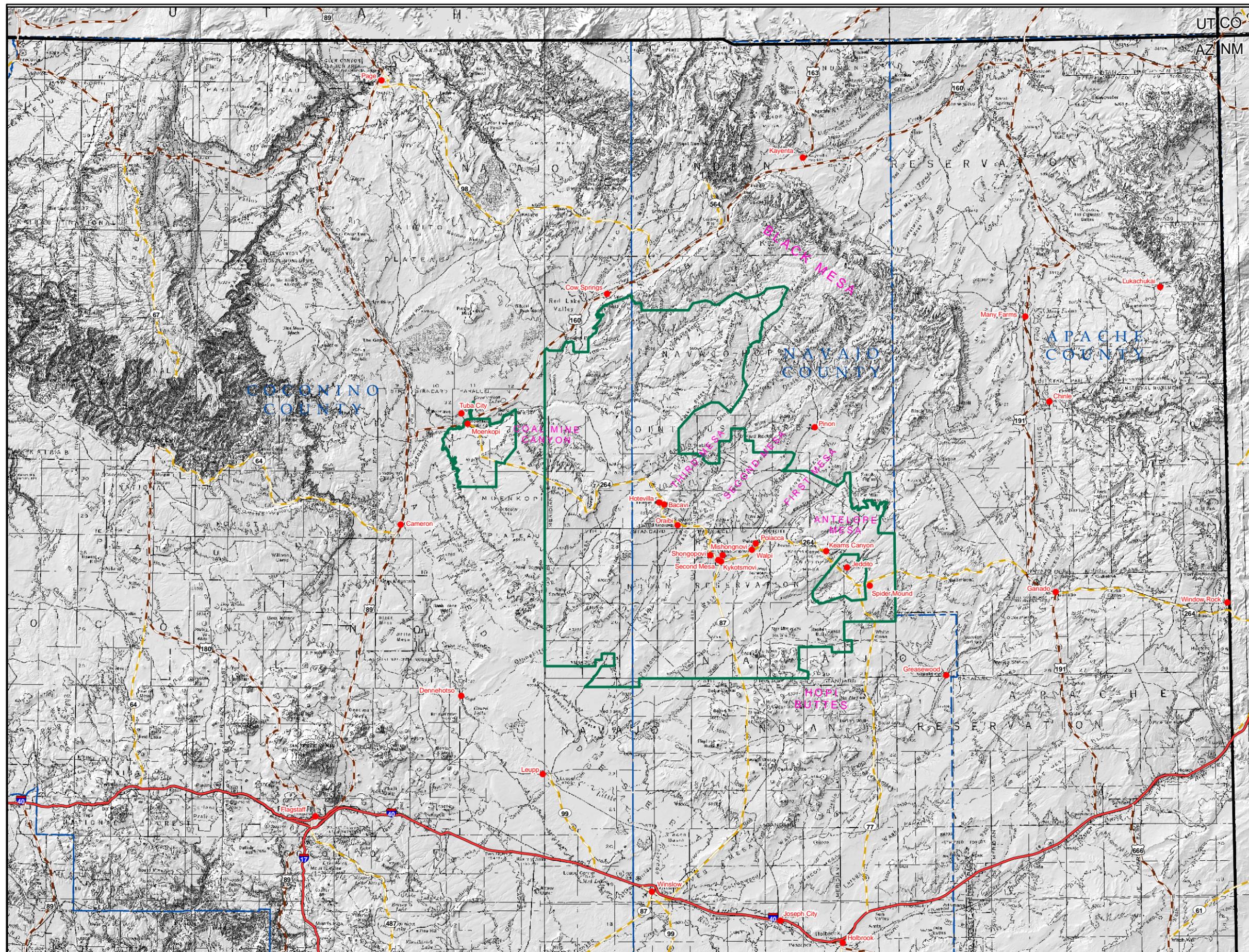


Figure 3-2
 Treaty, Legislative and
 Executive Order
 Reservation Lands
 of the Hopi and
 Navajo in Arizona

Preliminary Hopi HSR
 December 2008





- Legend**
- City/Town/Village
 - Interstate Highway
 - U.S. Route
 - State Highway
 - County
 - State
 - Hopi Reservation

Basemap:
USGS 1:500,000 Topographic Map

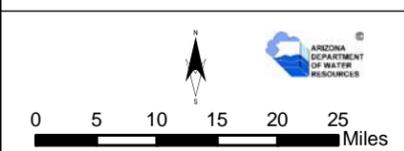
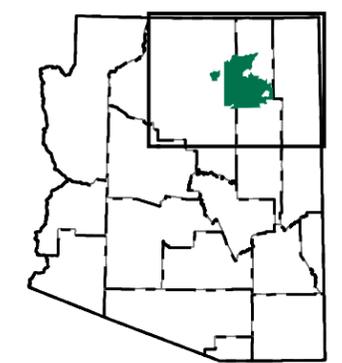
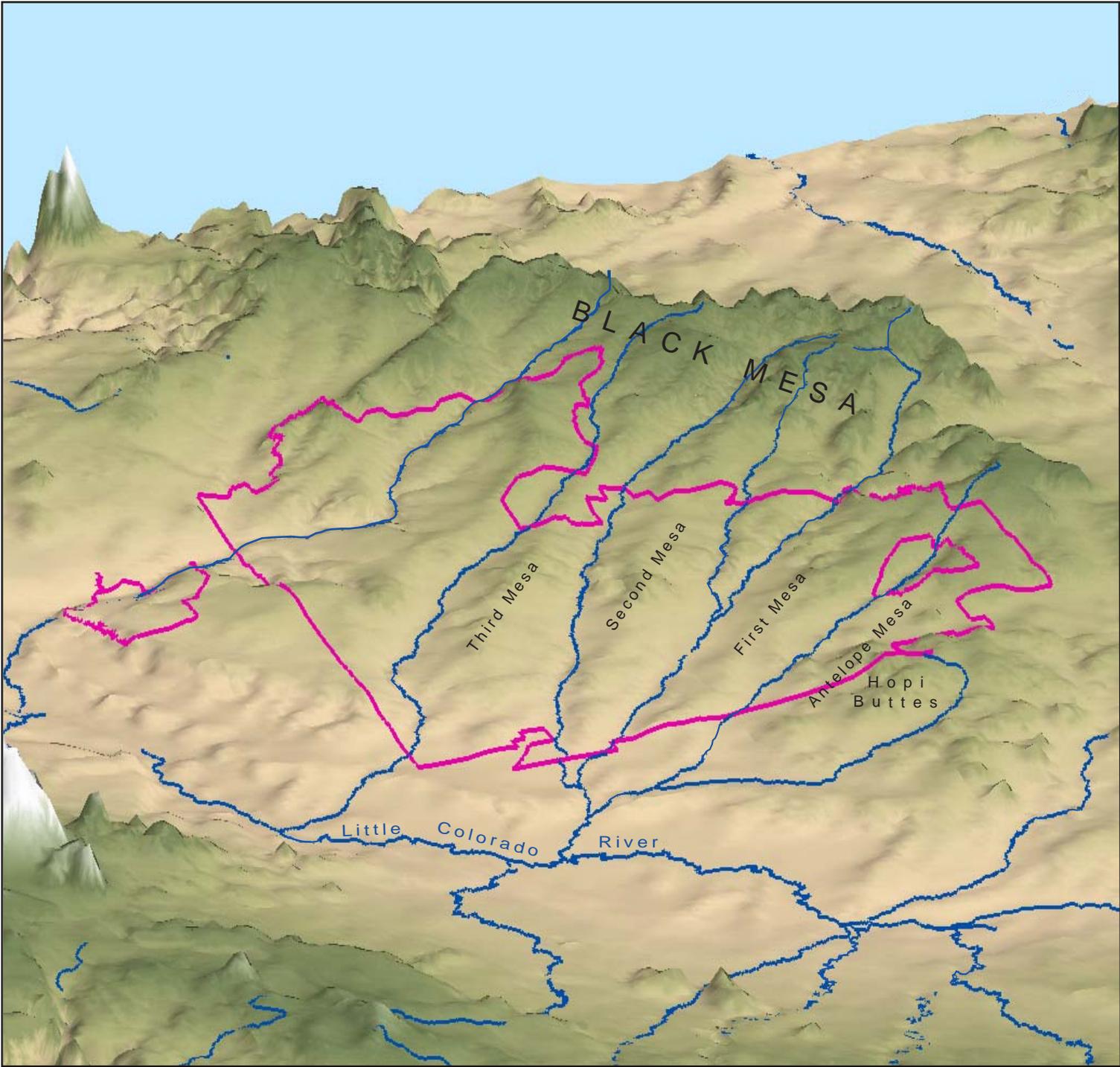


Figure 4-1
Location and Topography
of the Hopi
Indian Reservation

Preliminary Hopi HSR
December 2008





Legend

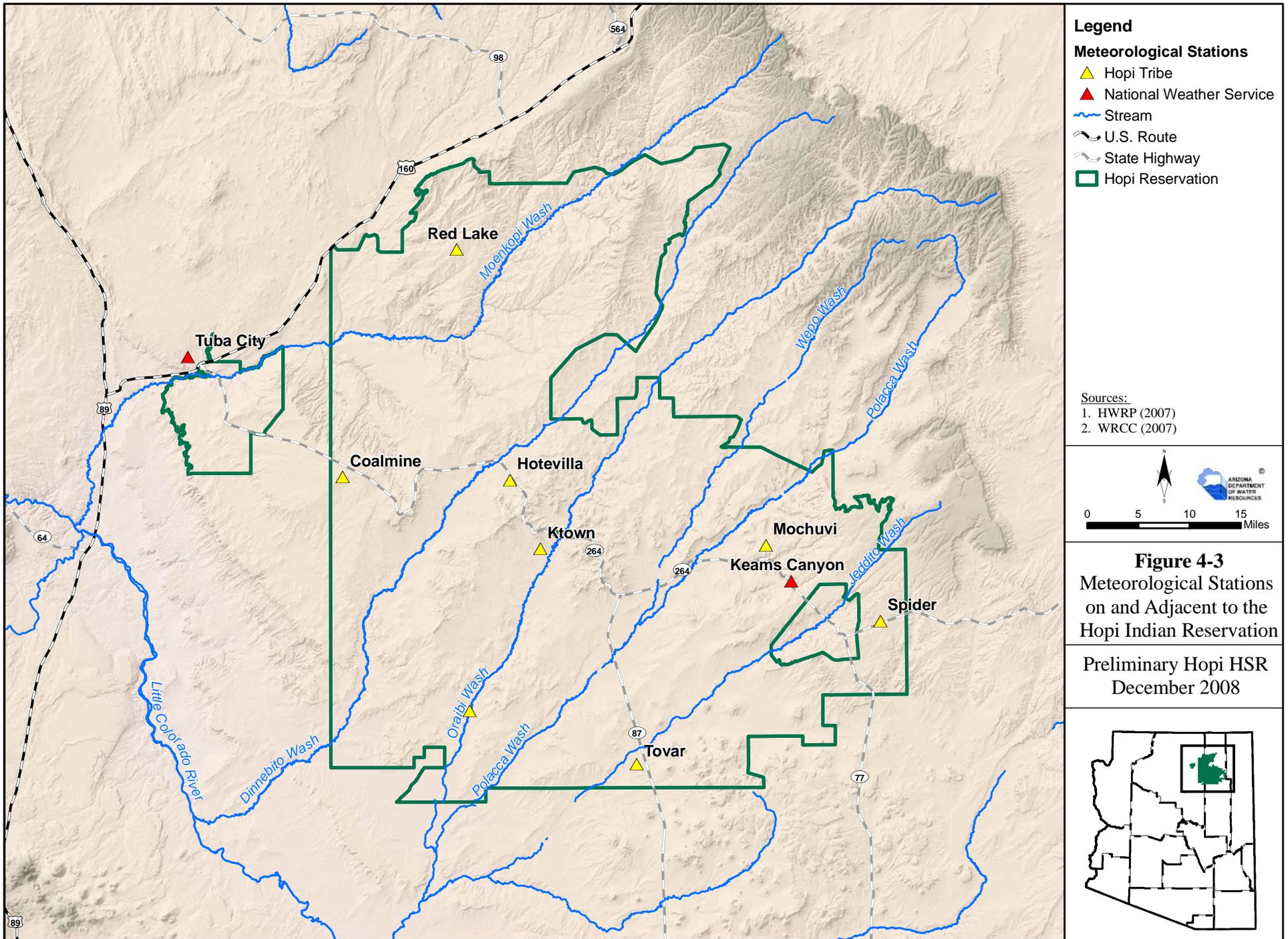
-  Major Stream
-  Hopi Reservation

Base Map:
30 Meter DEM.



Figure 4-2
Oblique Aerial Image of the
Hopi Indian Reservation

Preliminary Hopi HSR
December 2008



- Legend**
- Meteorological Stations**
- ▲ Hopi Tribe
 - ▲ National Weather Service
 - ~ Stream
 - U.S. Route
 - State Highway
 - ▭ Hopi Reservation

Sources:
 1. HWRP (2007)
 2. WRCC (2007)

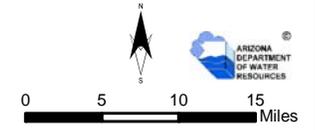
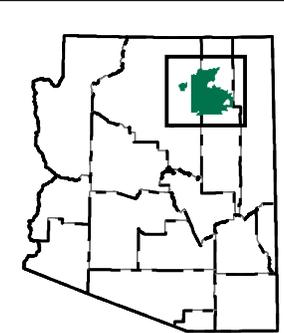
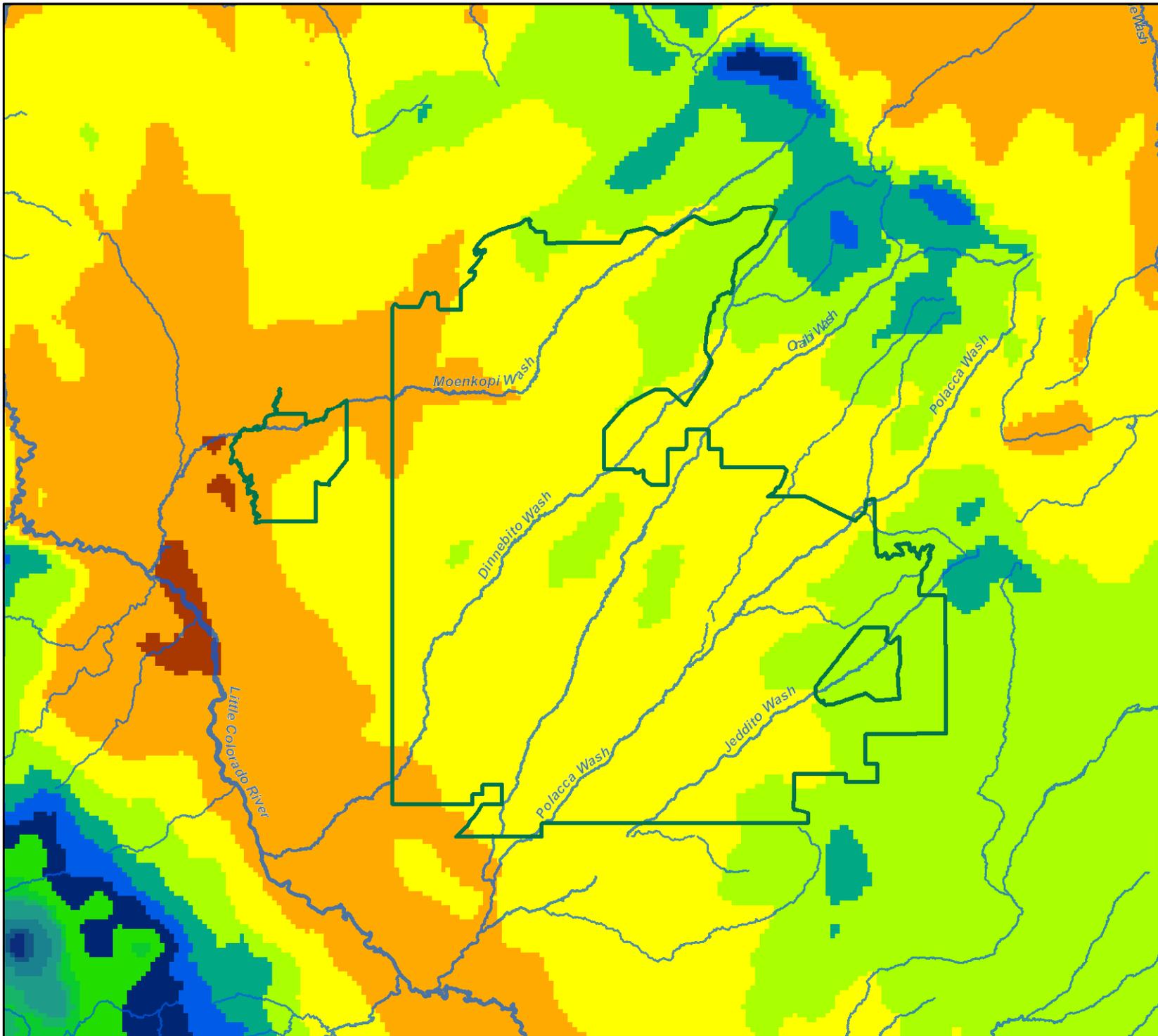


Figure 4-3
 Meteorological Stations
 on and Adjacent to the
 Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008





Legend
Average Annual Precipitation from 1971-2000 (in inches)

- 4.01-6
- 6.01-8
- 8.01-10
- 10.01-12
- 12.01-14
- 14.01-16
- 16.01-18

- Stream
- Hopi Reservation

Source:
Daly and others (2002)

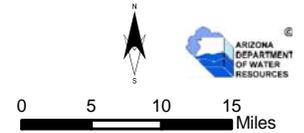
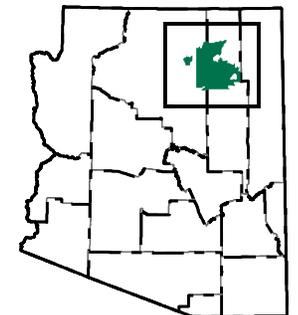
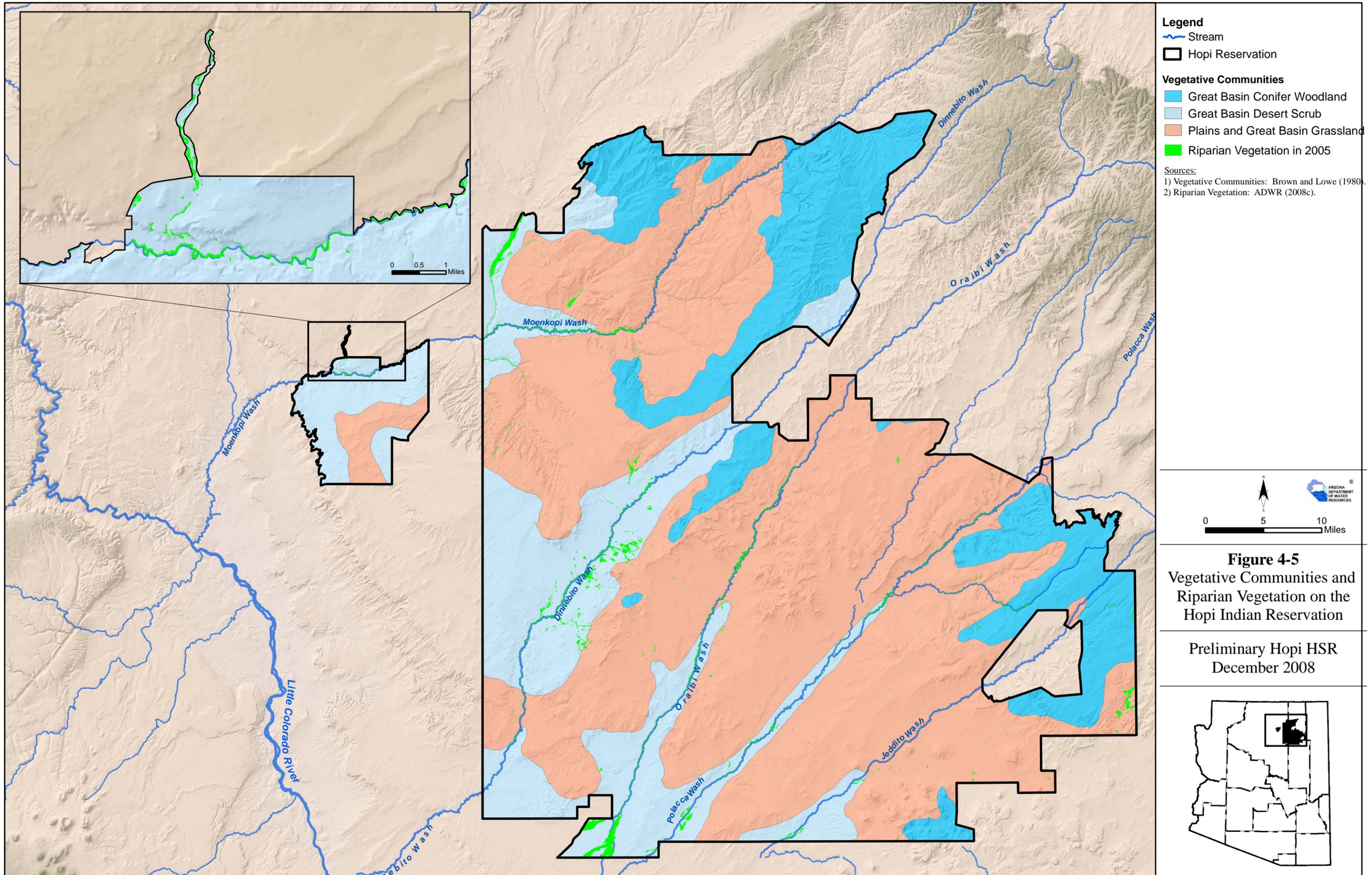


Figure 4-4
Mean Annual
Precipitation in the
Vicinity of the Hopi
Indian Reservation

Preliminary Hopi HSR
December 2008







4-18-2007

Cottonwood in Keams Canyon



6-27-2006

Russian Olive near Keams Canyon



4-20-2007

Salt Cedar along Lower Coal Mine Wash

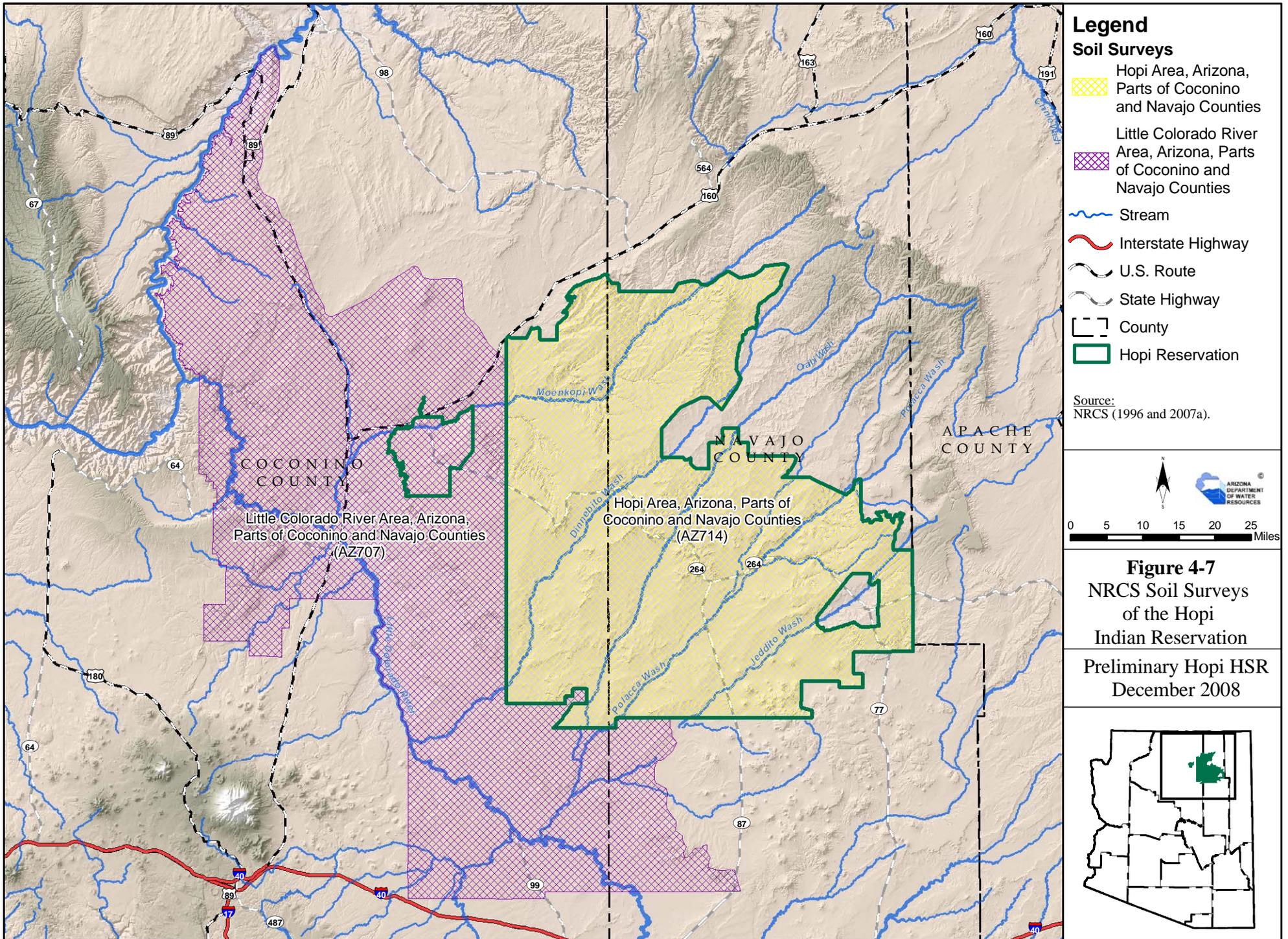


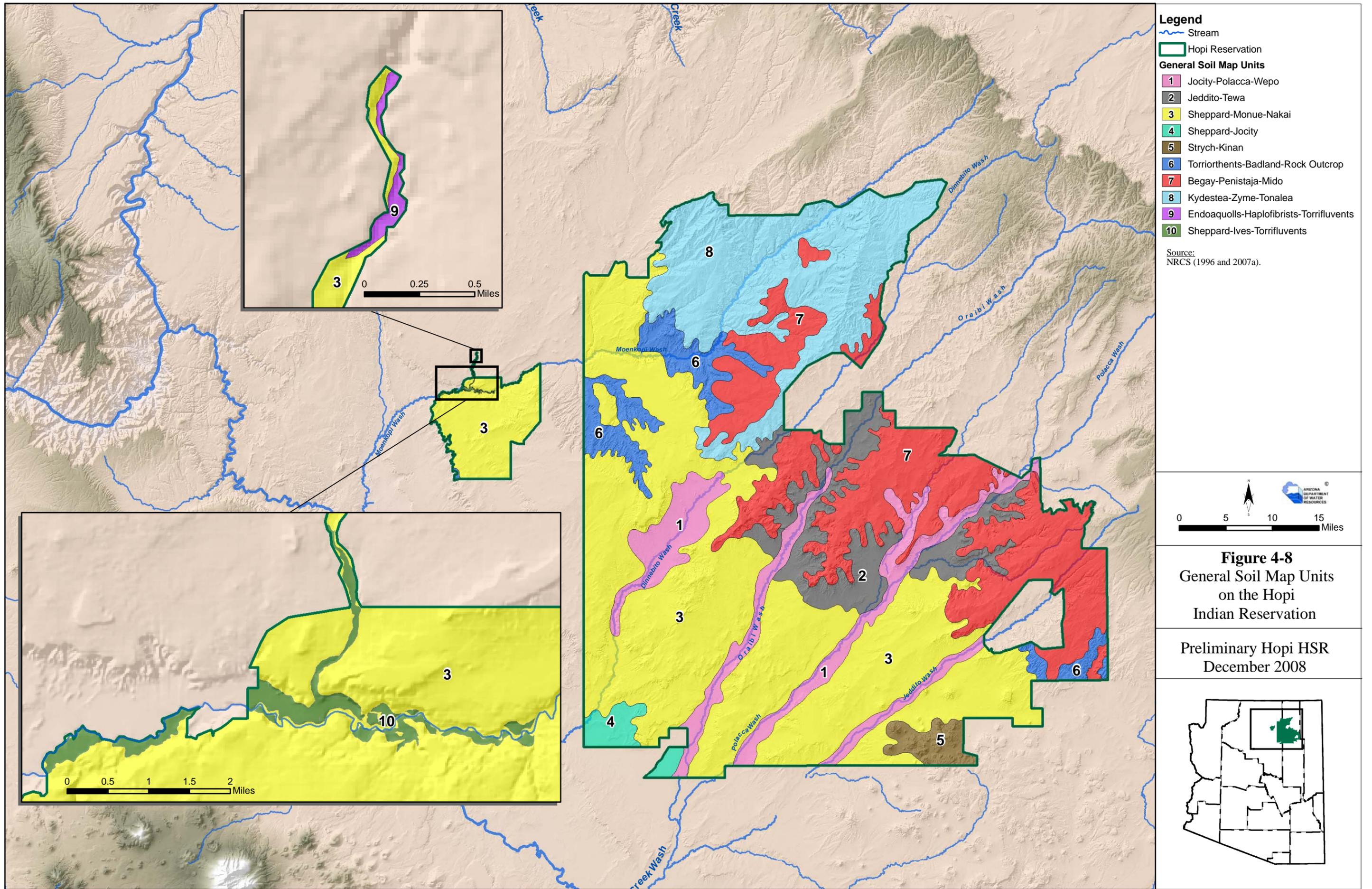
4-17-2007

Willow along Moenkopi Wash

Figure 4-6
Riparian Vegetation on the
Hopi Indian Reservation

Preliminary Hopi HSR, December 2008





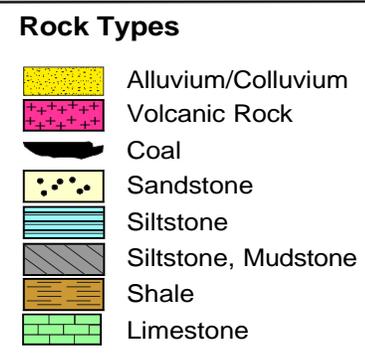
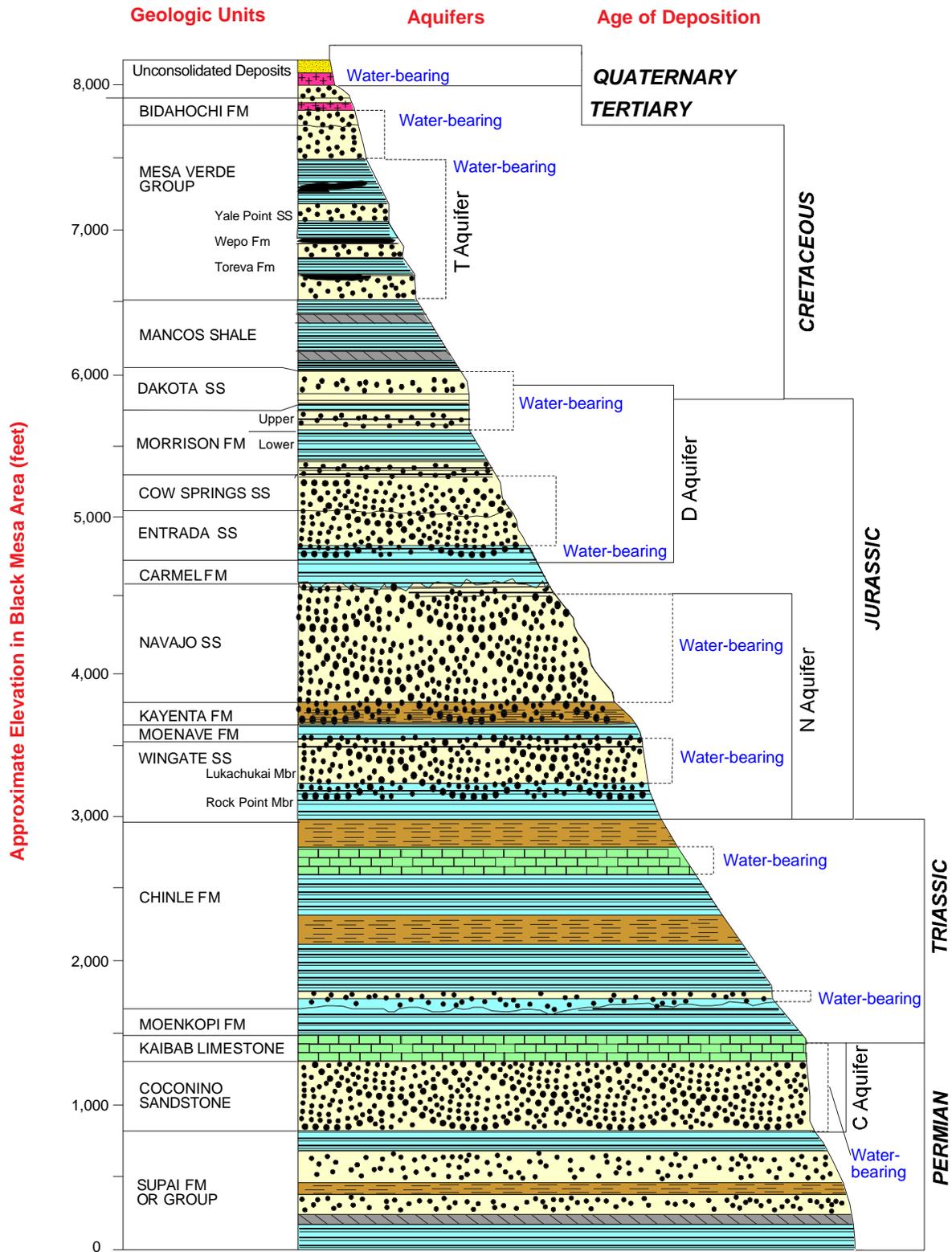


Figure 4-9
 Important Geologic Units
 and Aquifers Underlying the
 Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008

Source: GeoTrans and Waterstone (1999).

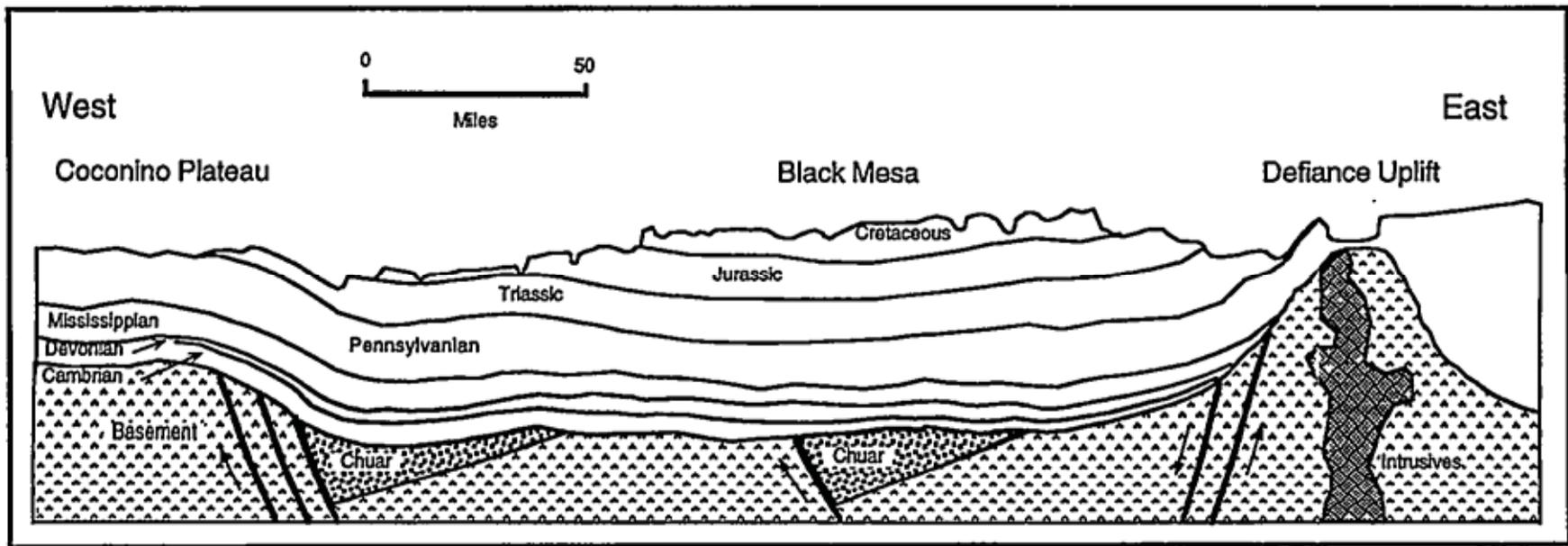
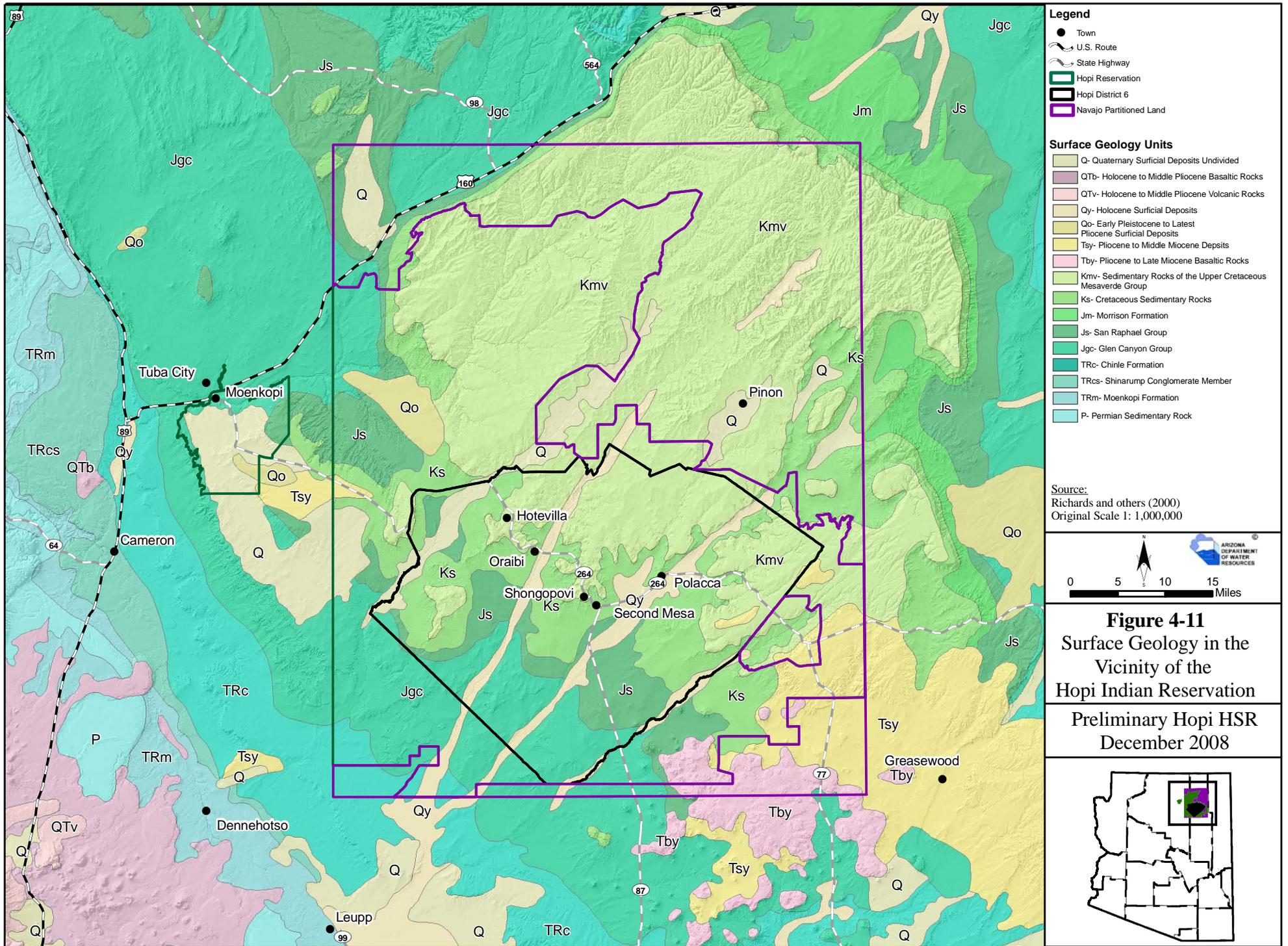
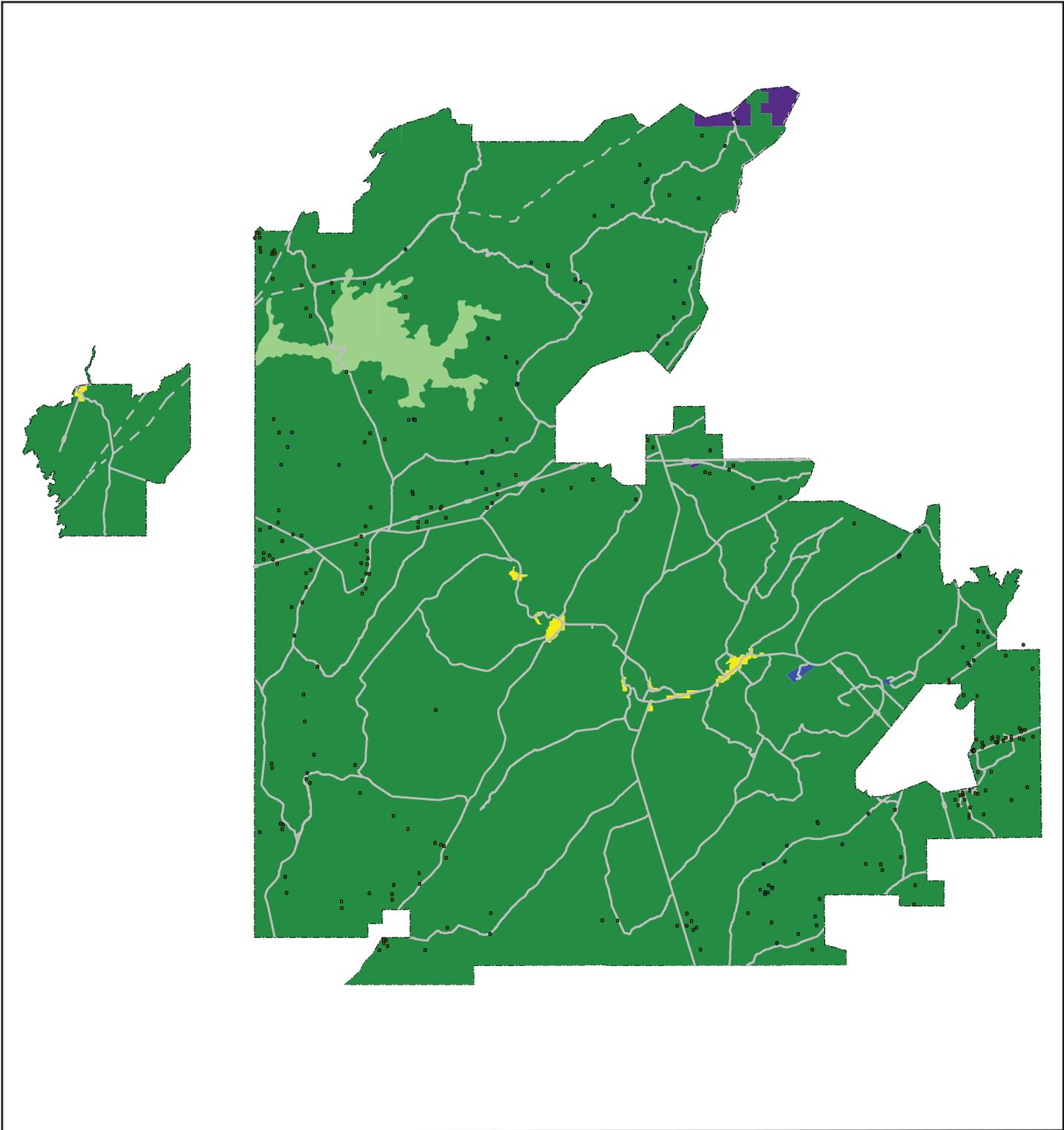


Figure 4-10
 Structural Geologic
 Cross Section of the Black Mesa Area
 Preliminary Hopi HSR
 December 2008

Source: Reeves and others (1999).





Land Uses

- Recreation
- Industrial
- Community Residential
- Agriculture & Range
- Institutional

Rights-of-way

- BIA Indian Reservation Roads System
- Electrical Transmission Line
- Pipeline

Home Sites

- Navajo
- Hopi



Figure 4-12
2000 Land Use on the
Hopi Indian Reservation

Preliminary Hopi HSR
December 2008

Source: Hopi, (2001).



6-14-2006

Range



5-15-2001

Dryland Farming



4-17-2007

Irrigated Agriculture



5-16-2001

Institutional



4-20-2007

Mining

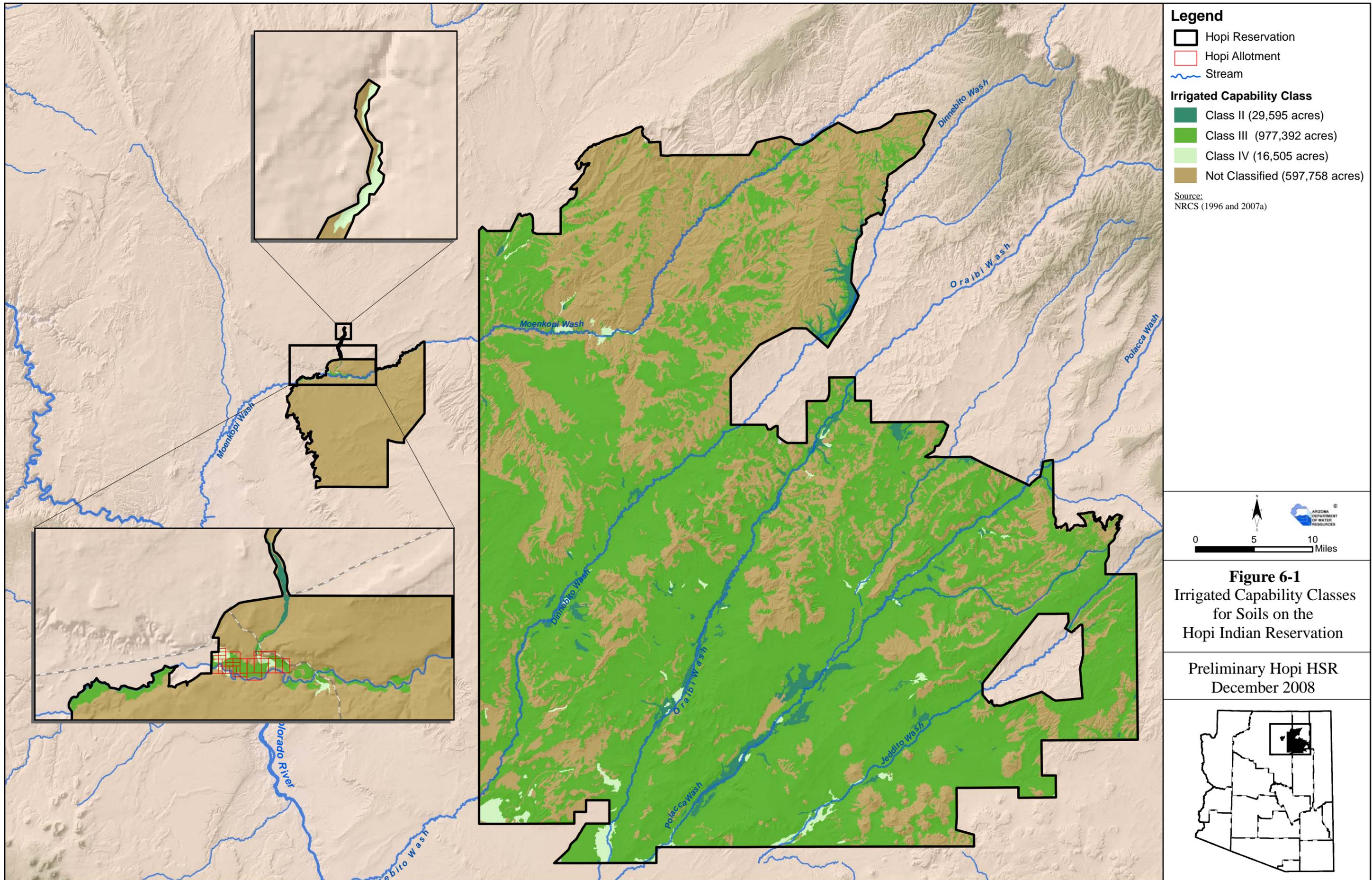


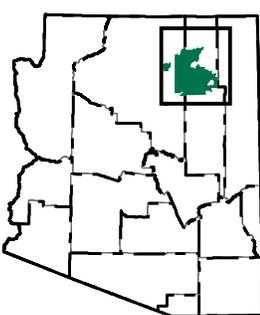
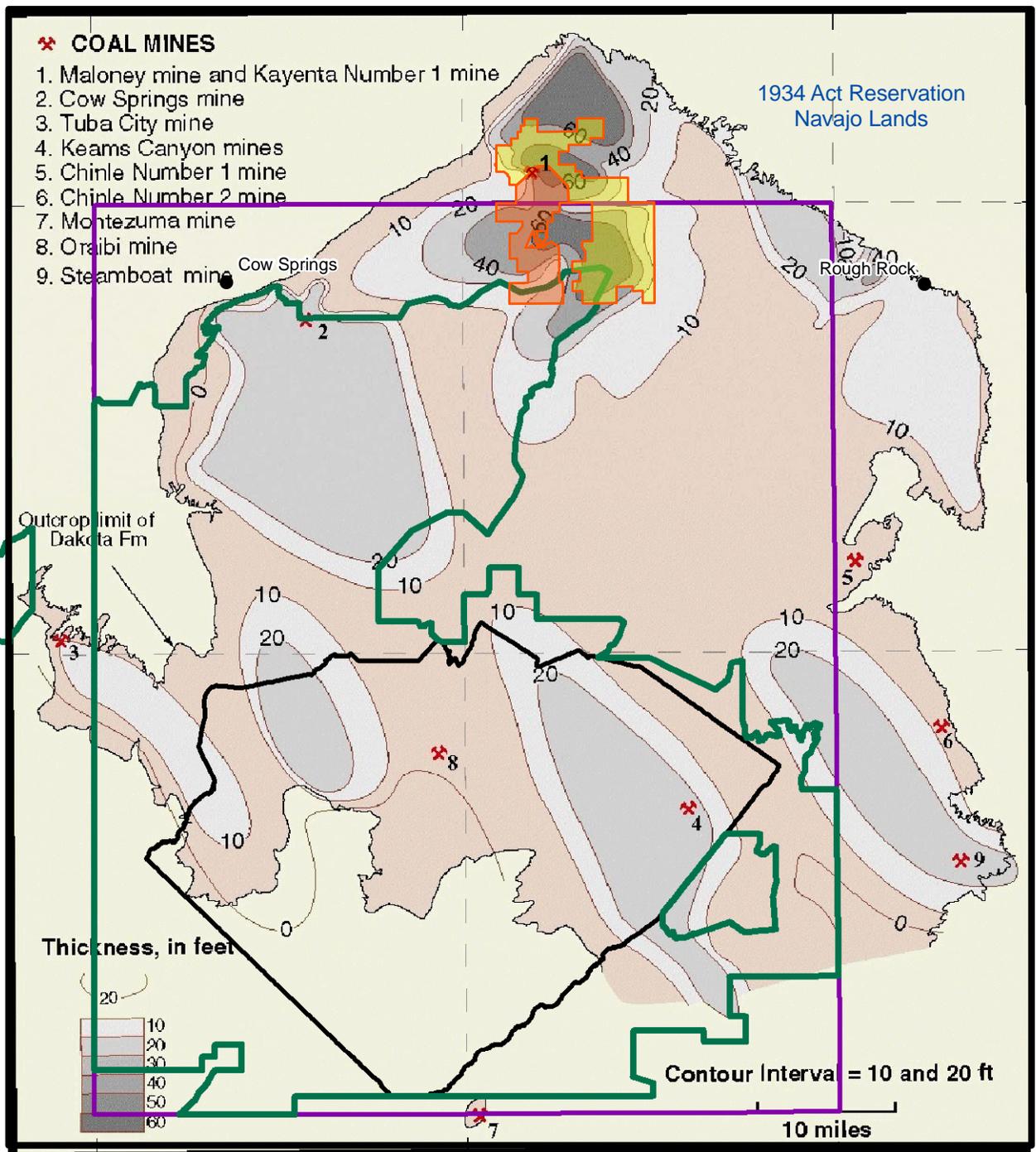
circa 2008

Tourism



Figure 4-13
Photographs of Recent Land Use on
and Near the Hopi Indian Reservation
Preliminary Hopi HSR, December 2008





Legend

- Hopi Reservation
- Hopi District 6
- Navajo Partitioned Land
- Town/Village
- Peabody Western Coal Company (PWCC) Leasehold
- Kayenta Mine
- Black Mesa Mine

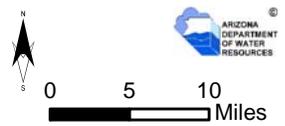
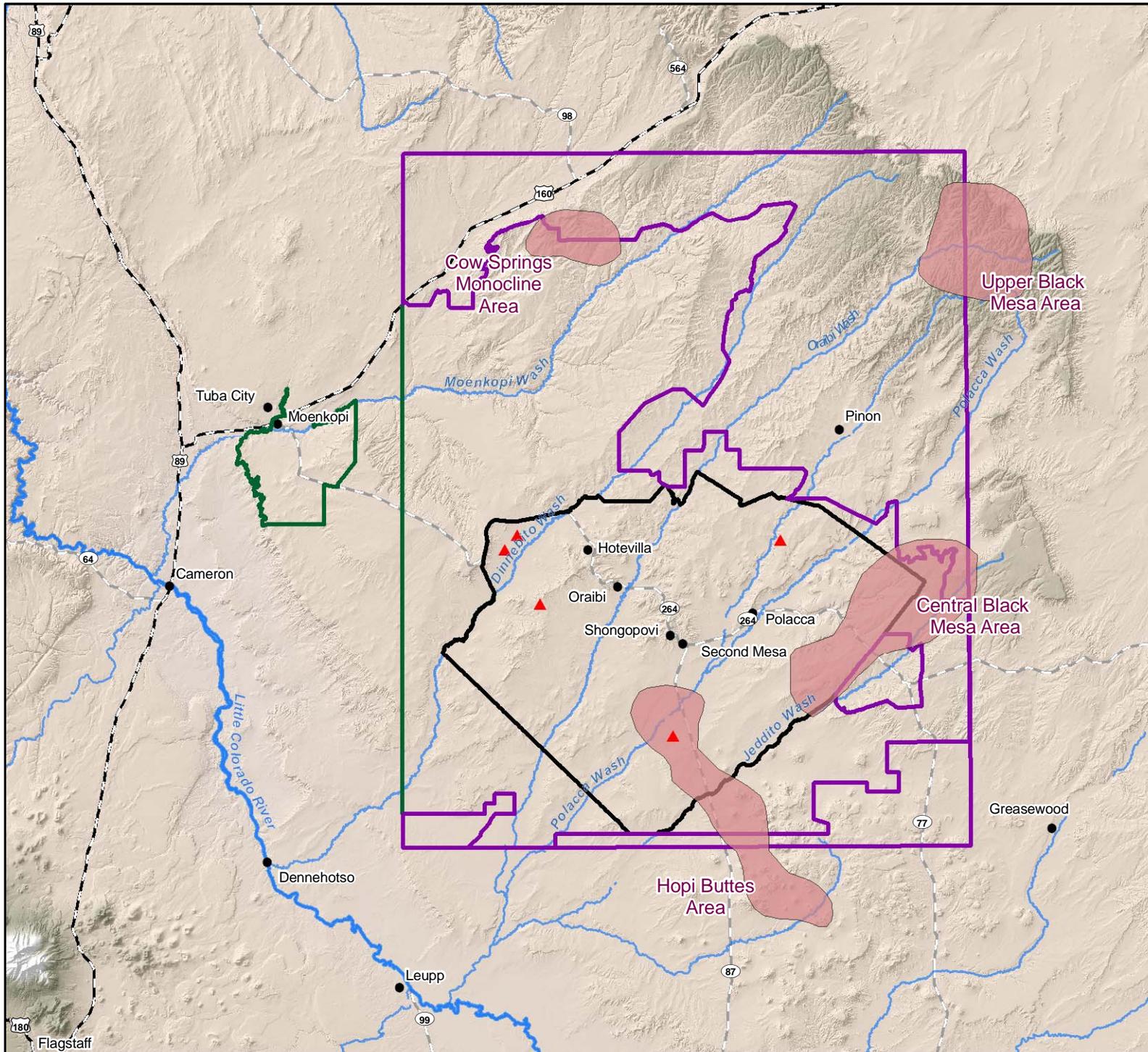


Figure 6-3
Coal Mines and Deposits
in the Vicinity of the
Hopi Indian Reservation

Preliminary Hopi HSR, December 2008

Source: Nations and others (2000).



Legend

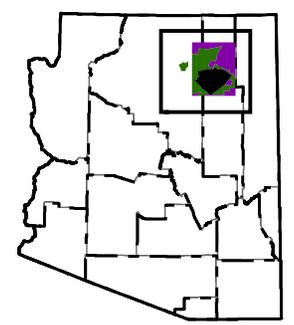
- ▲ Hydrocarbon Show
- Potential Oil and Gas Reserve
- Hopi Reservation
- Hopi District 6
- Navajo Partitioned Land
- Town/Village
- ~ Streams
- ~ U.S. Route
- ~ State Highway

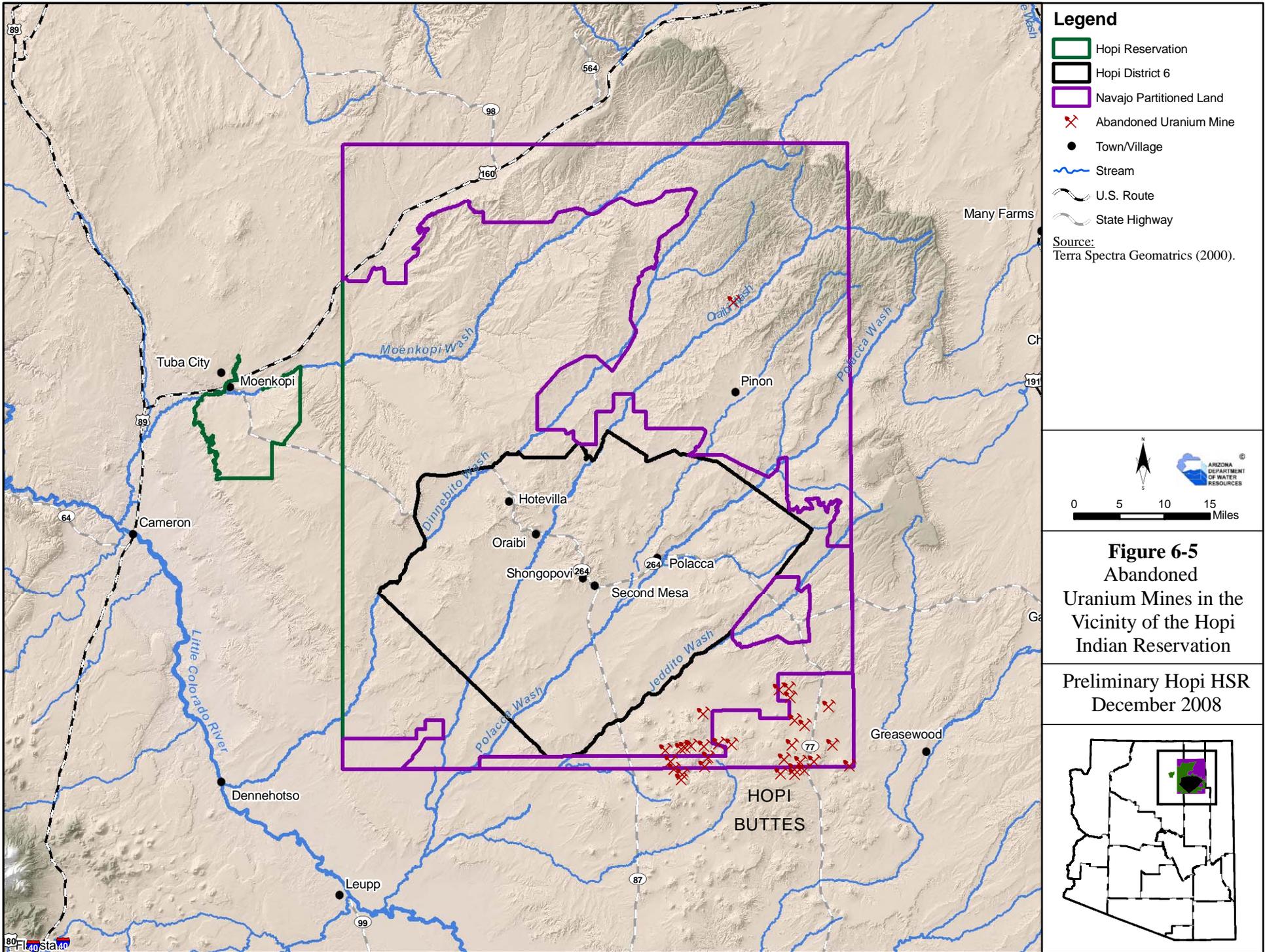
Source:
Sharme and others (1999).

0 5 10 15 Miles

ARIZONA DEPARTMENT OF WATER RESOURCES

Figure 6-4
 Hydrocarbon Shows and Potential Oil and Gas Reserves in the Vicinity of the Hopi Indian Reservation
 Preliminary Hopi HSR
 December 2008





- Legend**
- Hopi Reservation
 - Hopi District 6
 - Navajo Partitioned Land
 - X Abandoned Uranium Mine
 - Town/Village
 - ~ Stream
 - U.S. Route
 - State Highway

Source:
Terra Spectra Geomatics (2000).

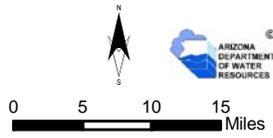
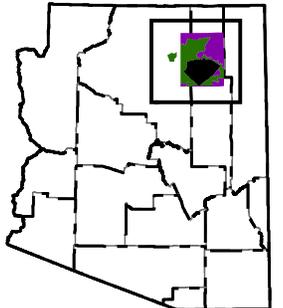
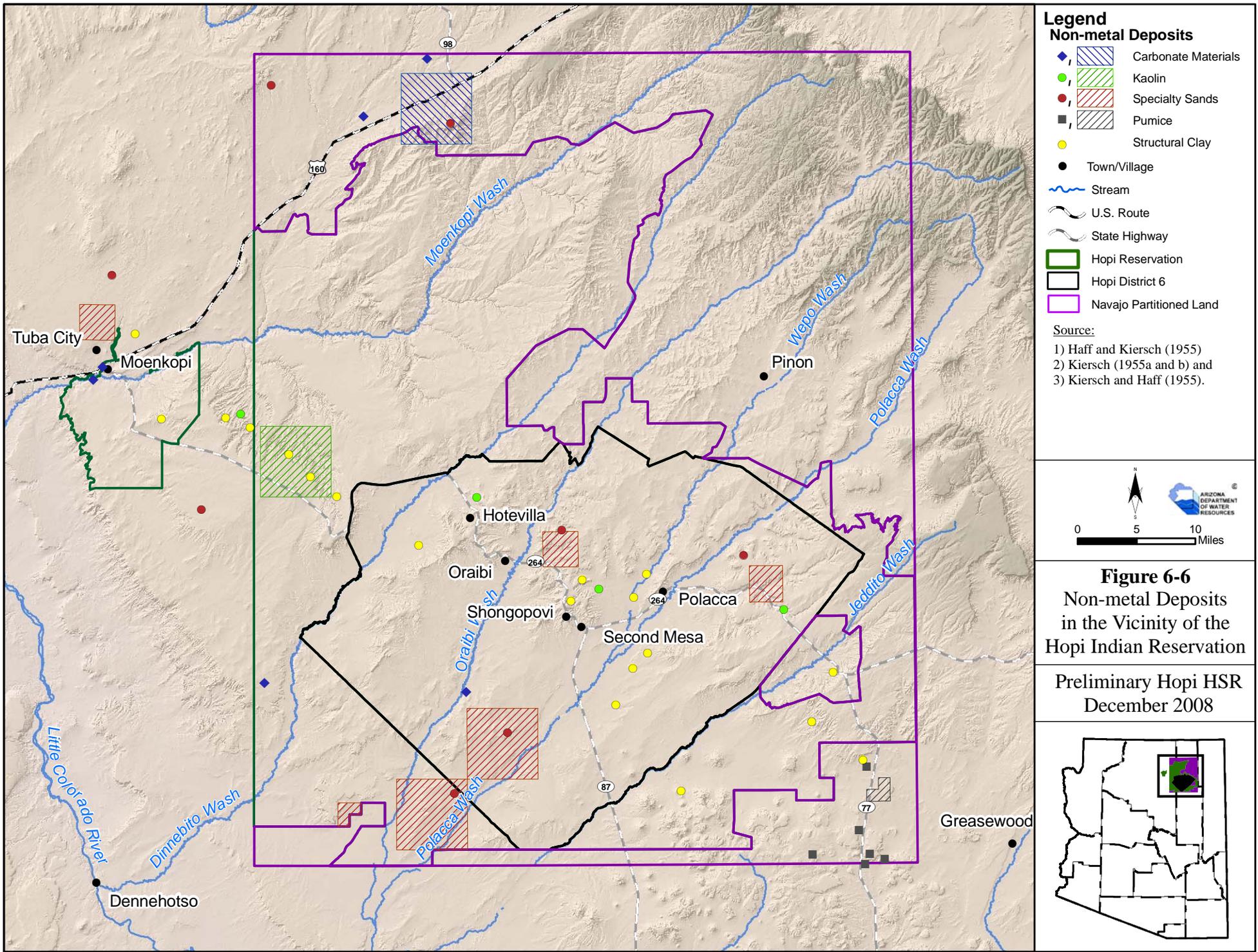
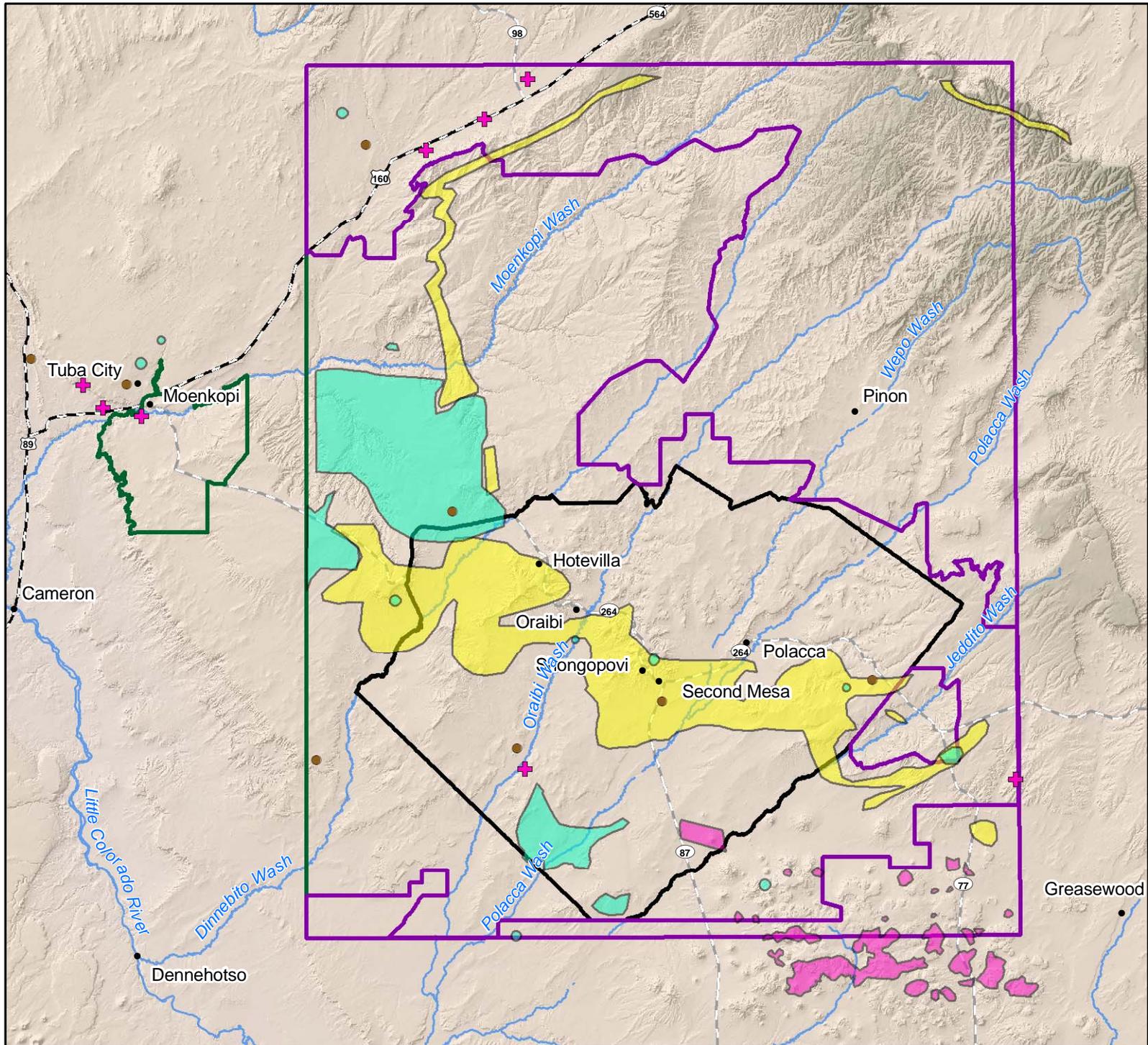


Figure 6-5
Abandoned
Uranium Mines in the
Vicinity of the Hopi
Indian Reservation

Preliminary Hopi HSR
December 2008







Legend

Construction Material Deposits

- Natural Aggregate
- Rip Rap
- Sand Stabilizer
- Dimension Stone
- Town/Village
- Stream
- U.S. Route
- State Highway
- Hopi Reservation
- Hopi District 6
- Navajo Partitioned Land

Sources:
 1) Haff and Kiersch (1955)
 2) Kiersch (1955c and d)
 3) Kiersch and Haff (1955b)
 4) Peirce (1955).

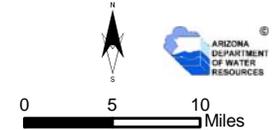
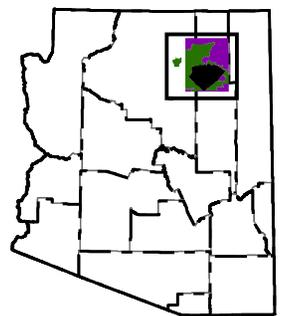
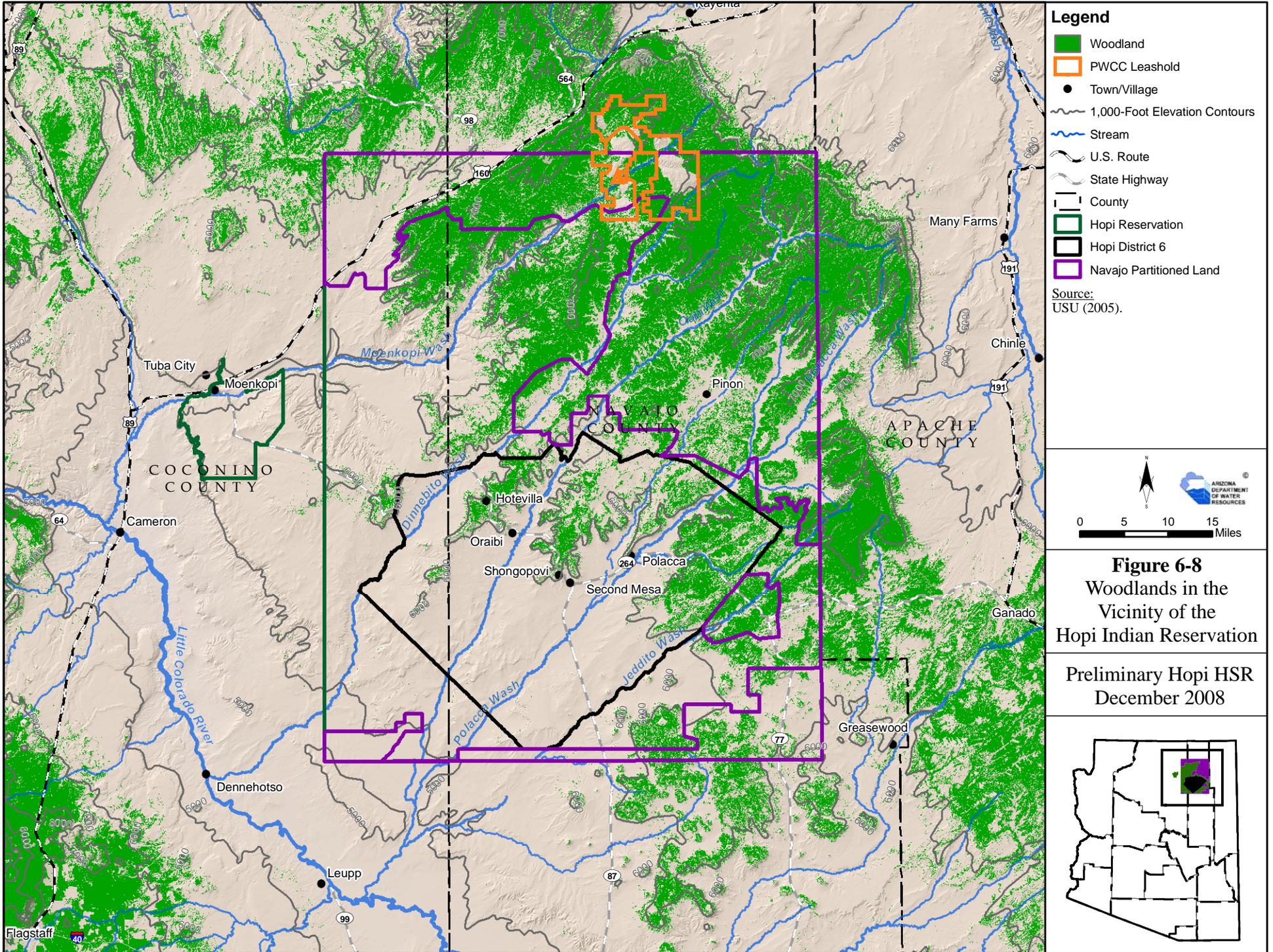


Figure 6-7
 Construction Material Deposits in the Vicinity of the Hopi Indian Reservation
 Preliminary Hopi HSR
 December 2008





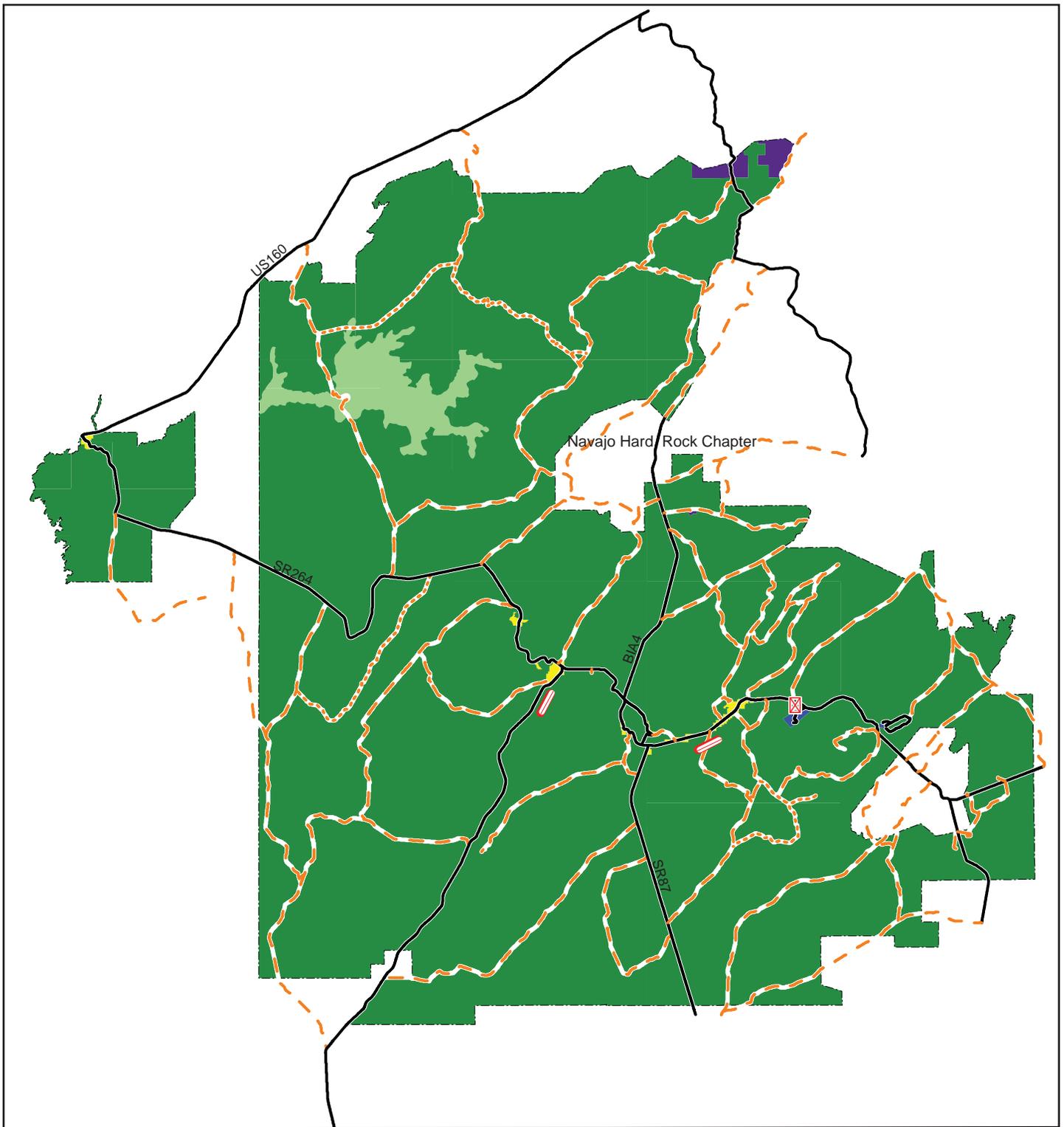


Figure 6-9
 Transportation on and to the
 Hopi Indian Reservation
 Preliminary Hopi HSR
 December 2008

IRR Surface Type

- Bituminous
- - - Grade & Drain
- · · Unimproved

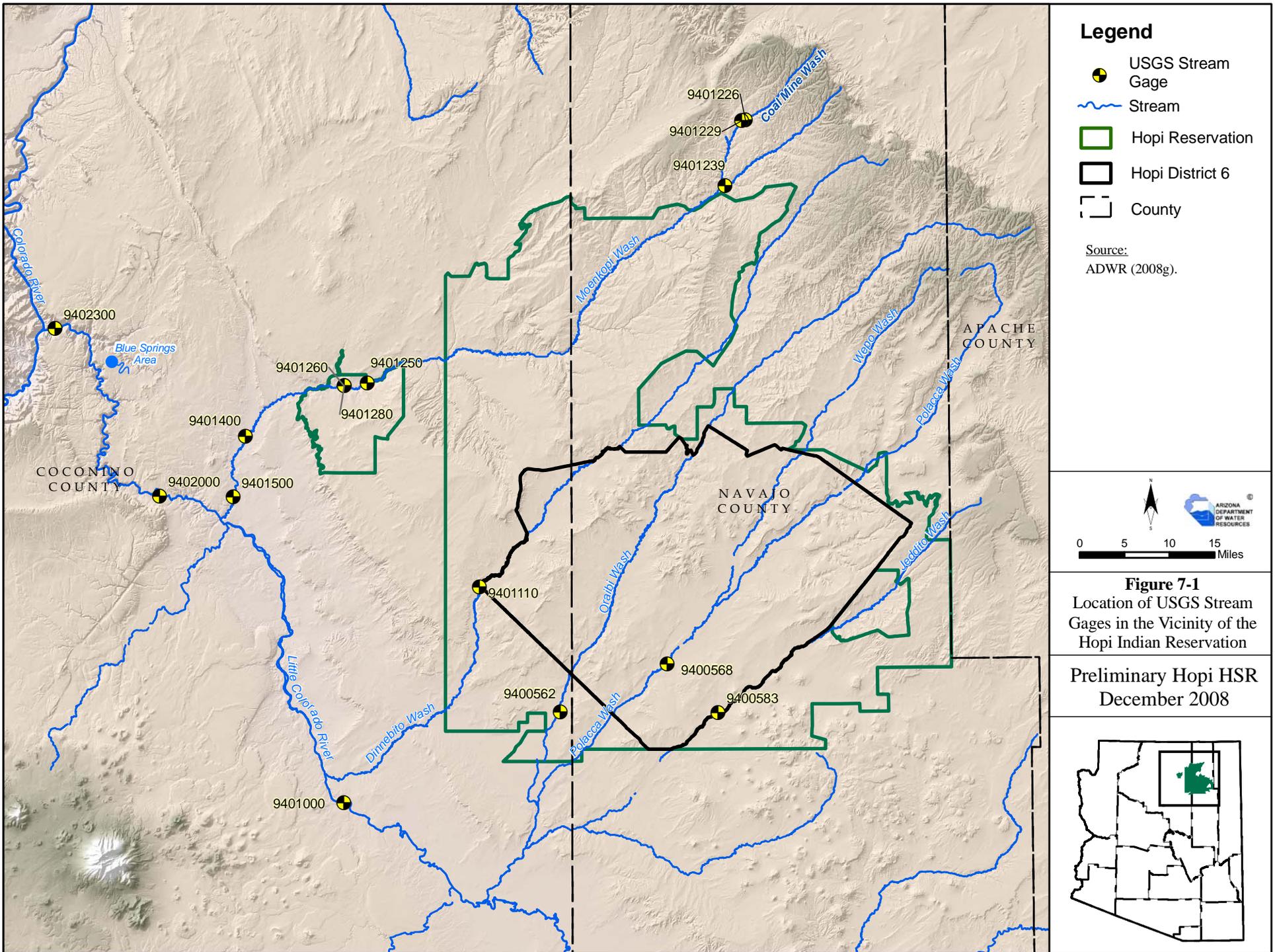
Air Transportation

- ▭ Runways
- ⊠ Helipads

Land Uses

- Recreation
- Industrial
- Community Residential
- Agriculture & Range
- Institutional

Source: Hopi (2001)



- Legend**
- USGS Stream Gage
 - Stream
 - Hopi Reservation
 - Hopi District 6
 - County

Source:
ADWR (2008g).

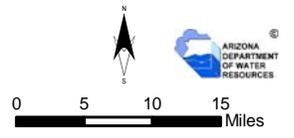
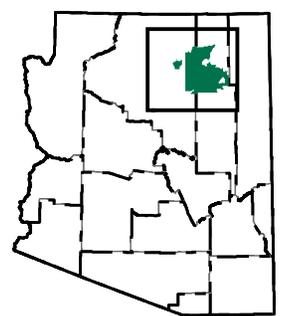


Figure 7-1
Location of USGS Stream Gages in the Vicinity of the Hopi Indian Reservation
Preliminary Hopi HSR
December 2008



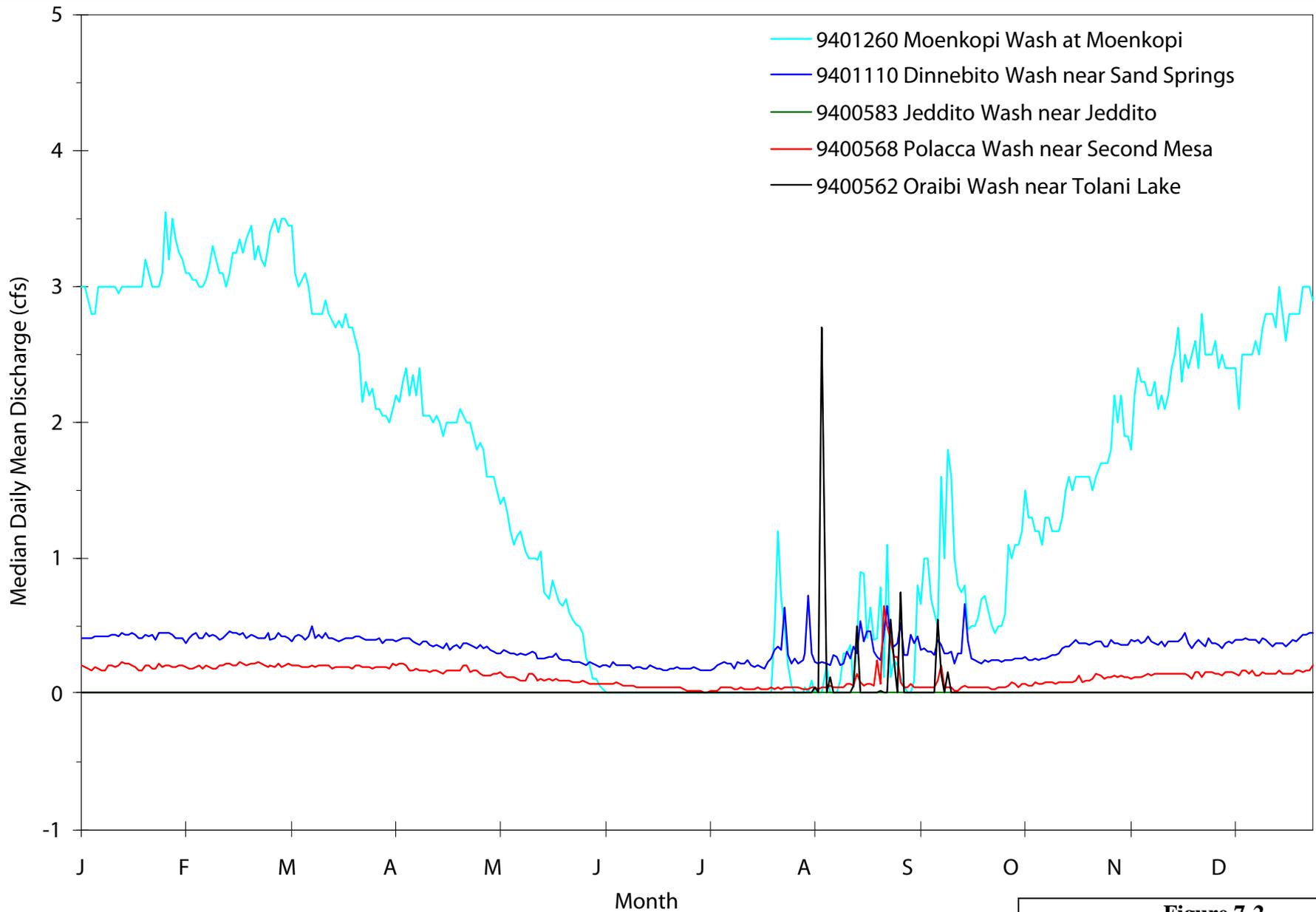


Figure 7-2
 Annual Hydrographs for the
 Middle Sections of the Hopi Washes
 Preliminary Hopi HSR, December 2008



Source: ADWR (2008g).

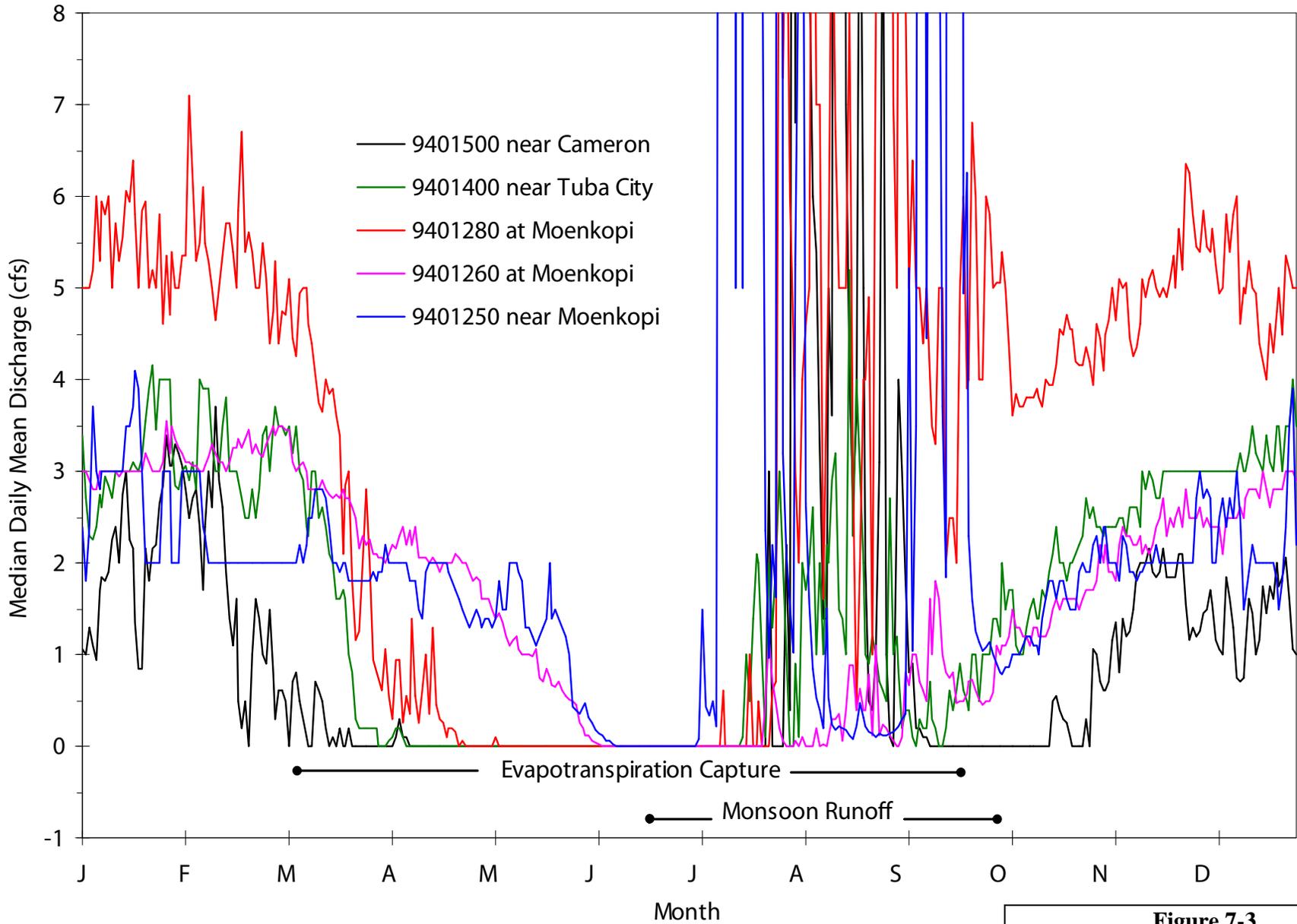


Figure 7-3
Annual Hydrographs for Middle and Lower Moenkopi Wash

Preliminary Hopi HSR, December 2008

Source: ADWR (2008g).



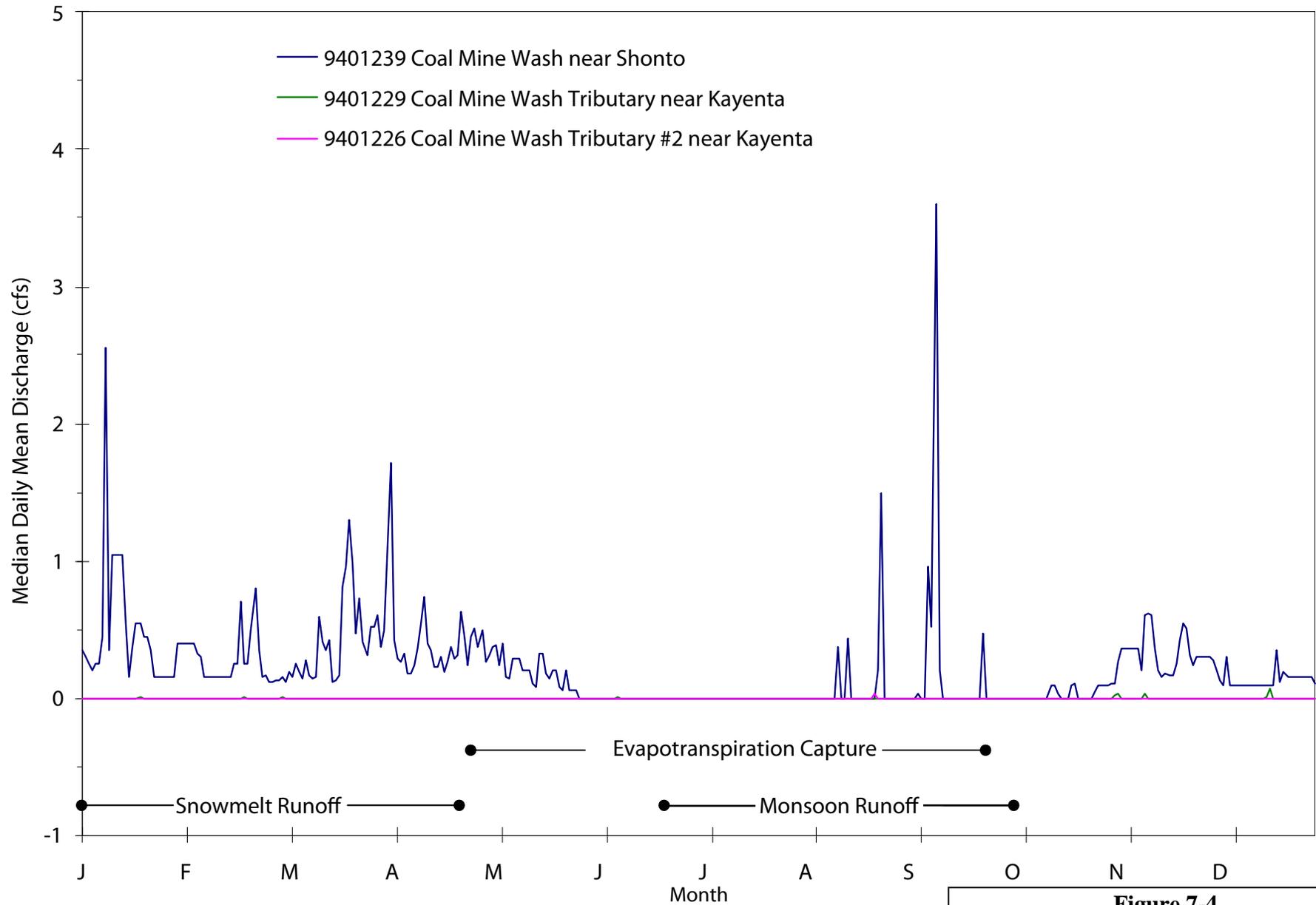
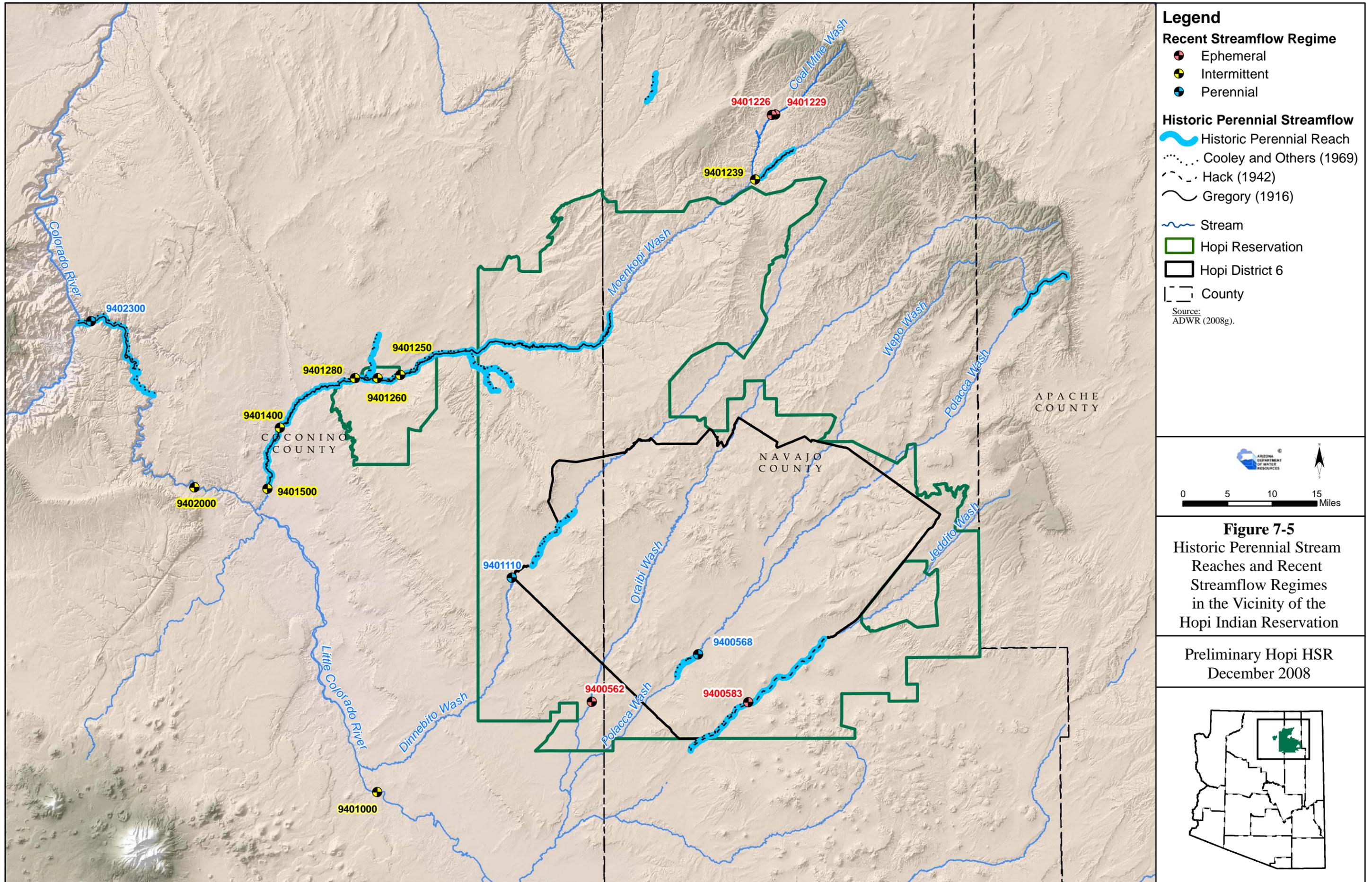


Figure 7-4
Annual Hydrographs for the Coal Mine Wash Watershed, Along Upper Moenkopi Wash

Preliminary Hopi HSR, December 2008

Source: ADWR (2008g).



Legend

Recent Streamflow Regime

- Ephemeral
- Intermittent
- Perennial

Historic Perennial Streamflow

- Historic Perennial Reach
- ⋯ Cooley and Others (1969)
- - - Hack (1942)
- ~ Gregory (1916)

— Stream

▭ Hopi Reservation

▭ Hopi District 6

▭ County

Source:
ADWR (2008g).

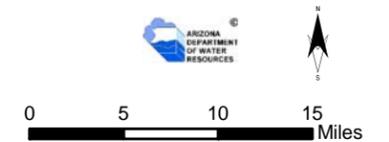
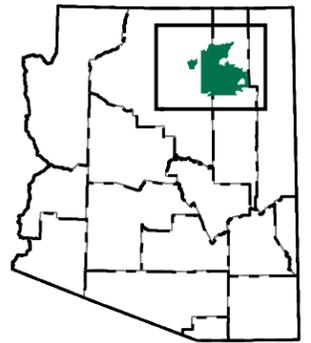
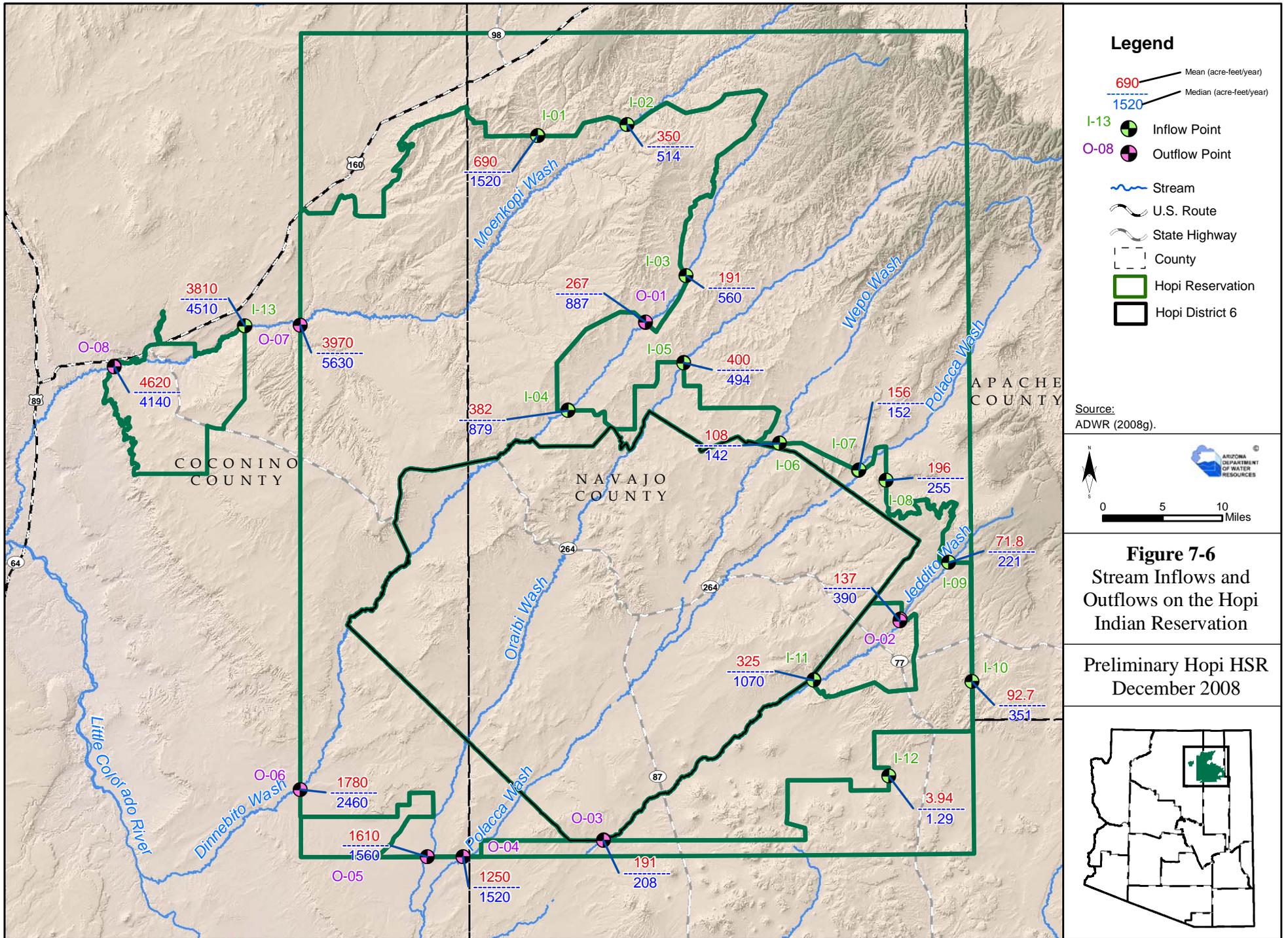
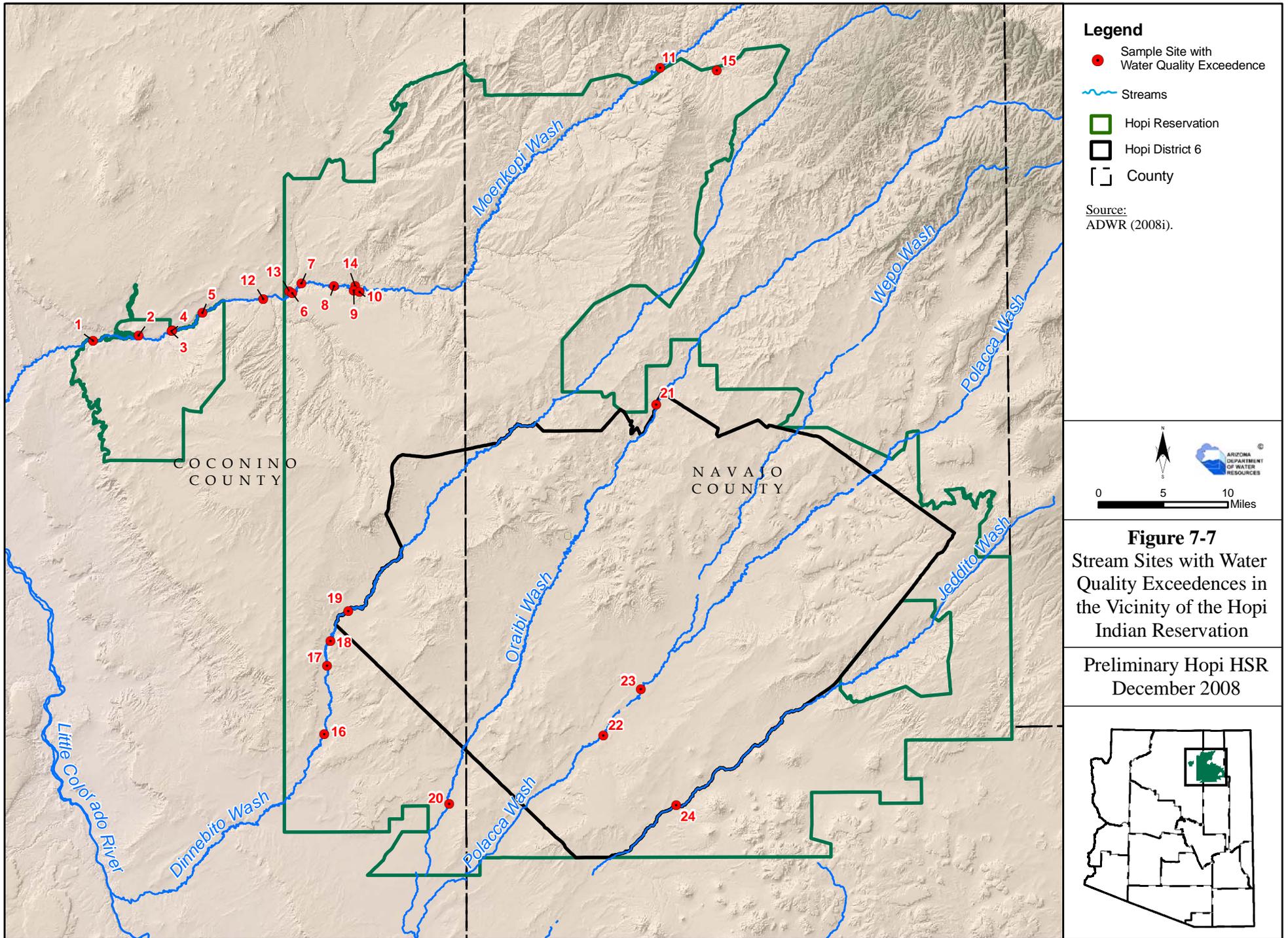


Figure 7-5
 Historic Perennial Stream Reaches and Recent Streamflow Regimes in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008







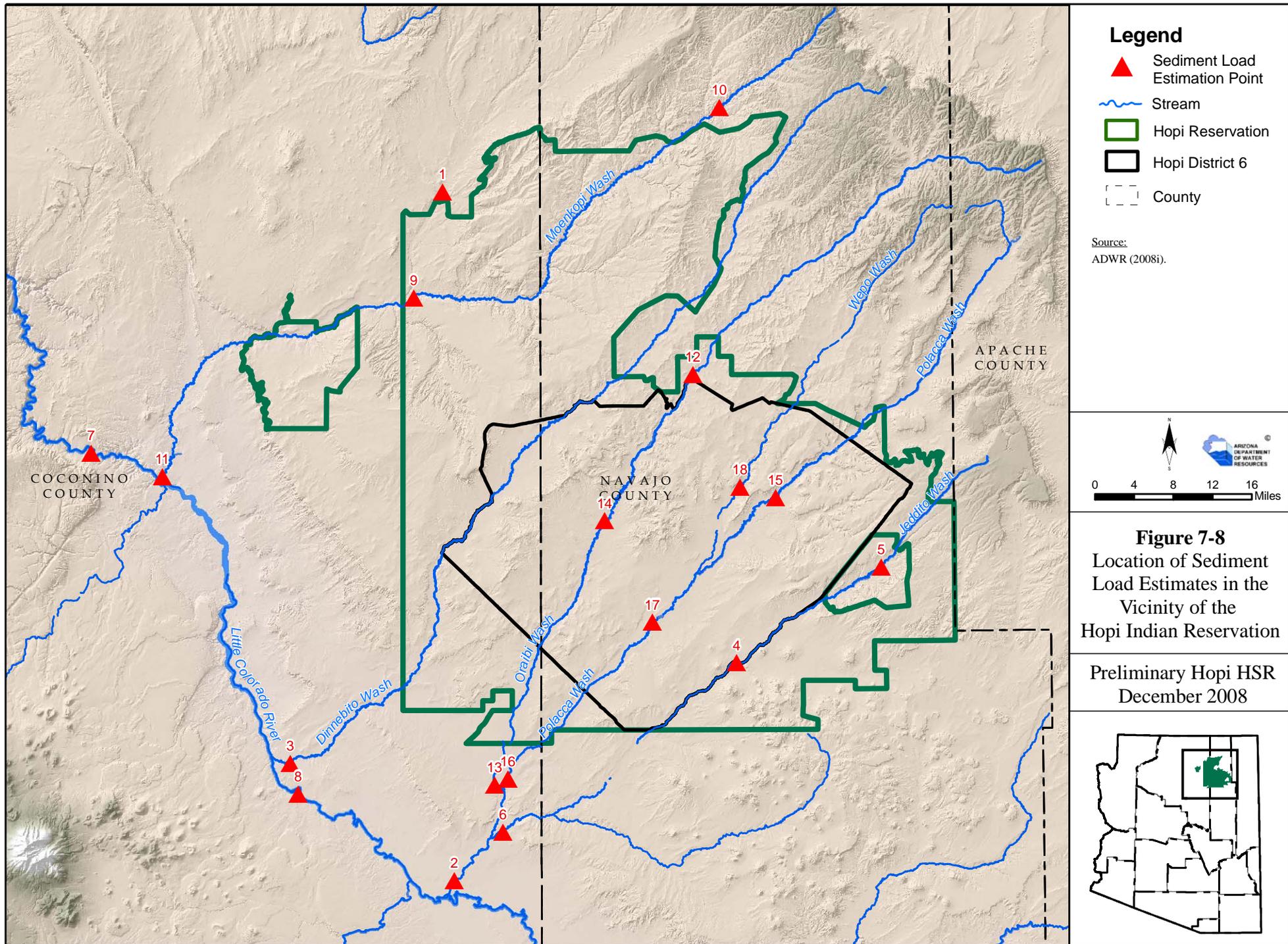




Figure 7-9

Bank Erosion and Salt Deposits Along a
Perennial Reach of Polacca Wash in April 2007

Preliminary Hopi HSR, December 2008

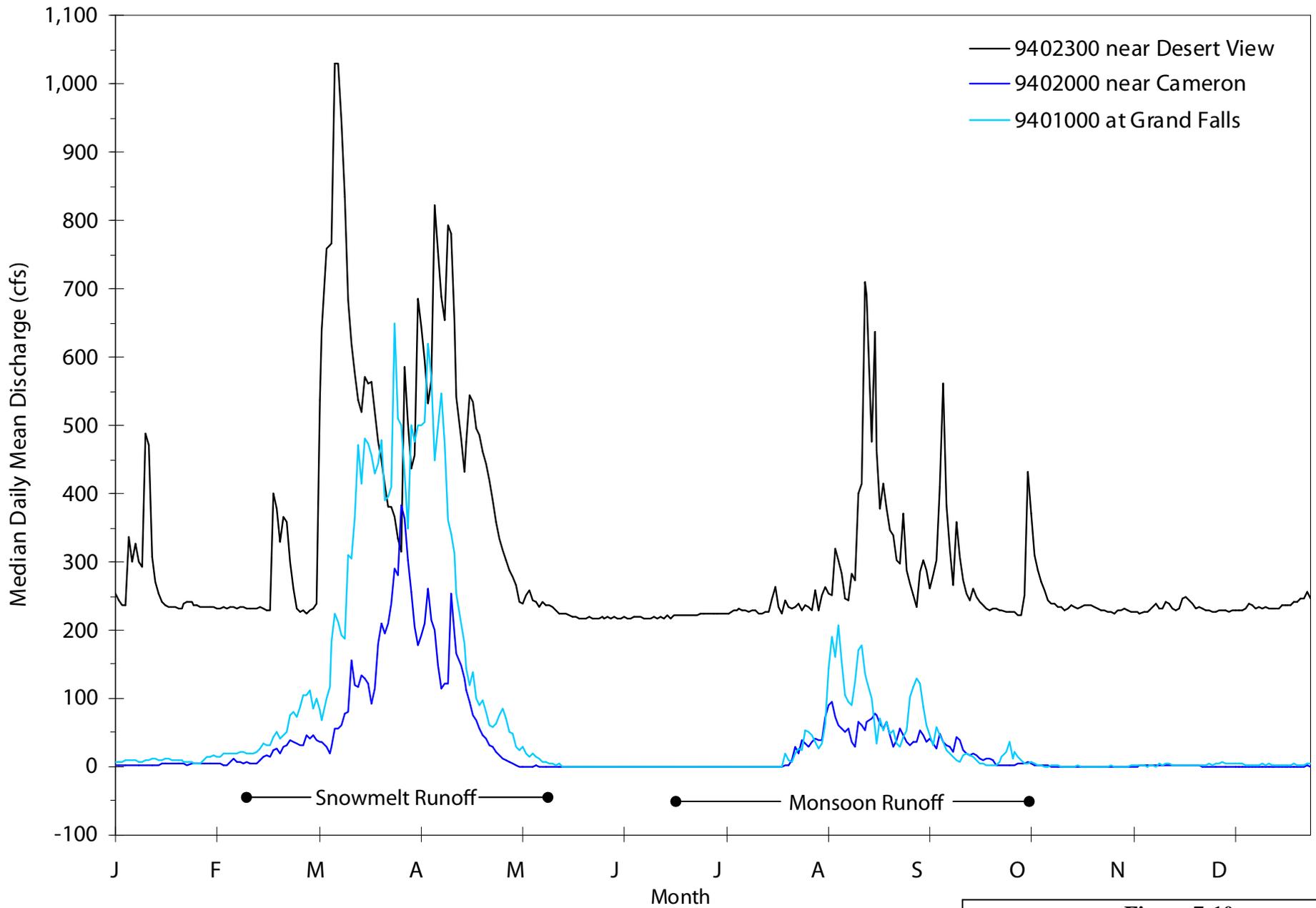


Figure 7-10
 Annual Hydrographs for the
 Lower Little Colorado River
 Preliminary Hopi HSR, December 2008



Source: ADWR (2008g).

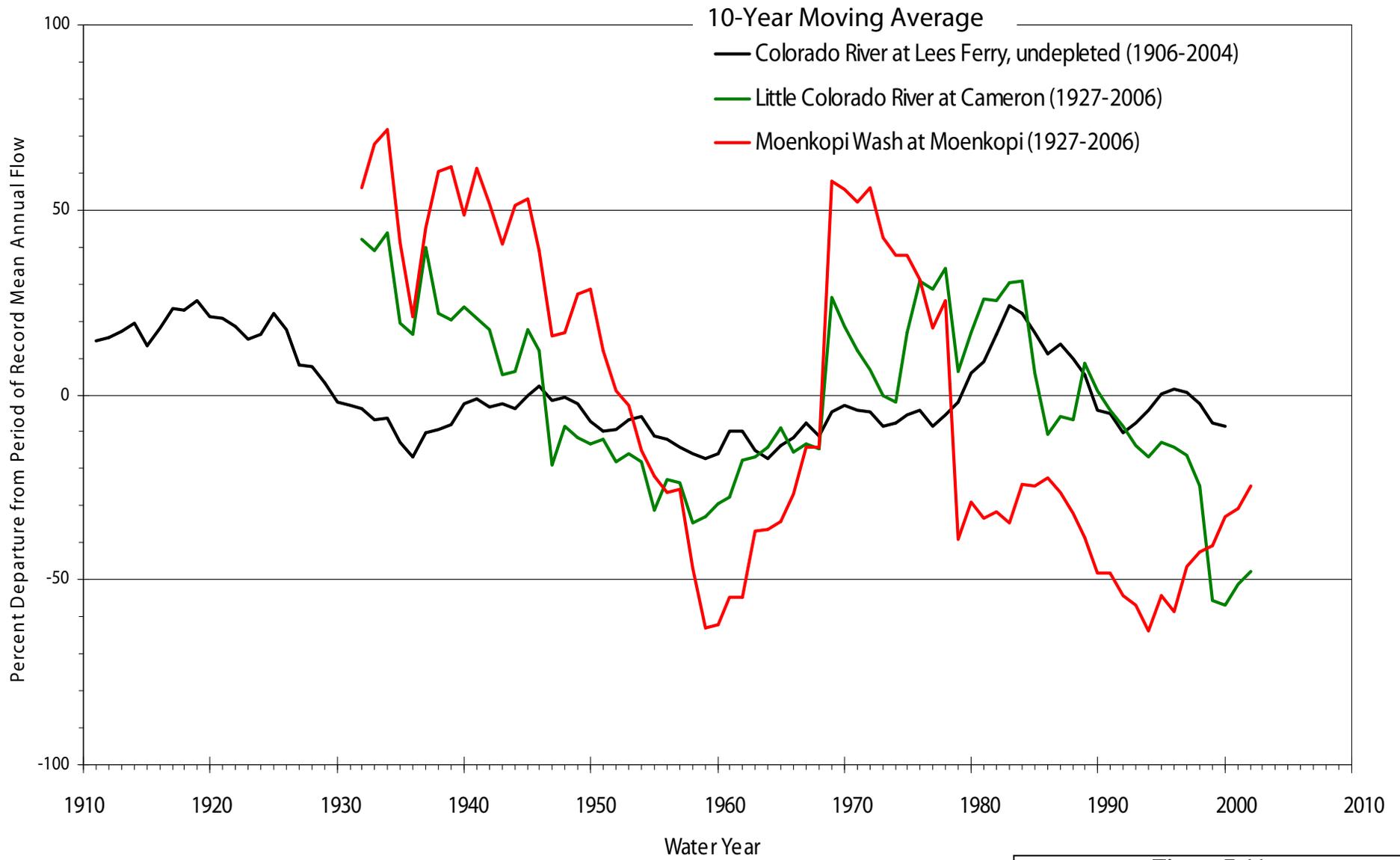


Figure 7-11

Short-term Trends in the Annual Streamflow Along Moenkopi Wash, Lower Little Colorado River and Colorado River at Lees Ferry

Preliminary Hopi HSR, December 2008



Source: ADWR (2008g)

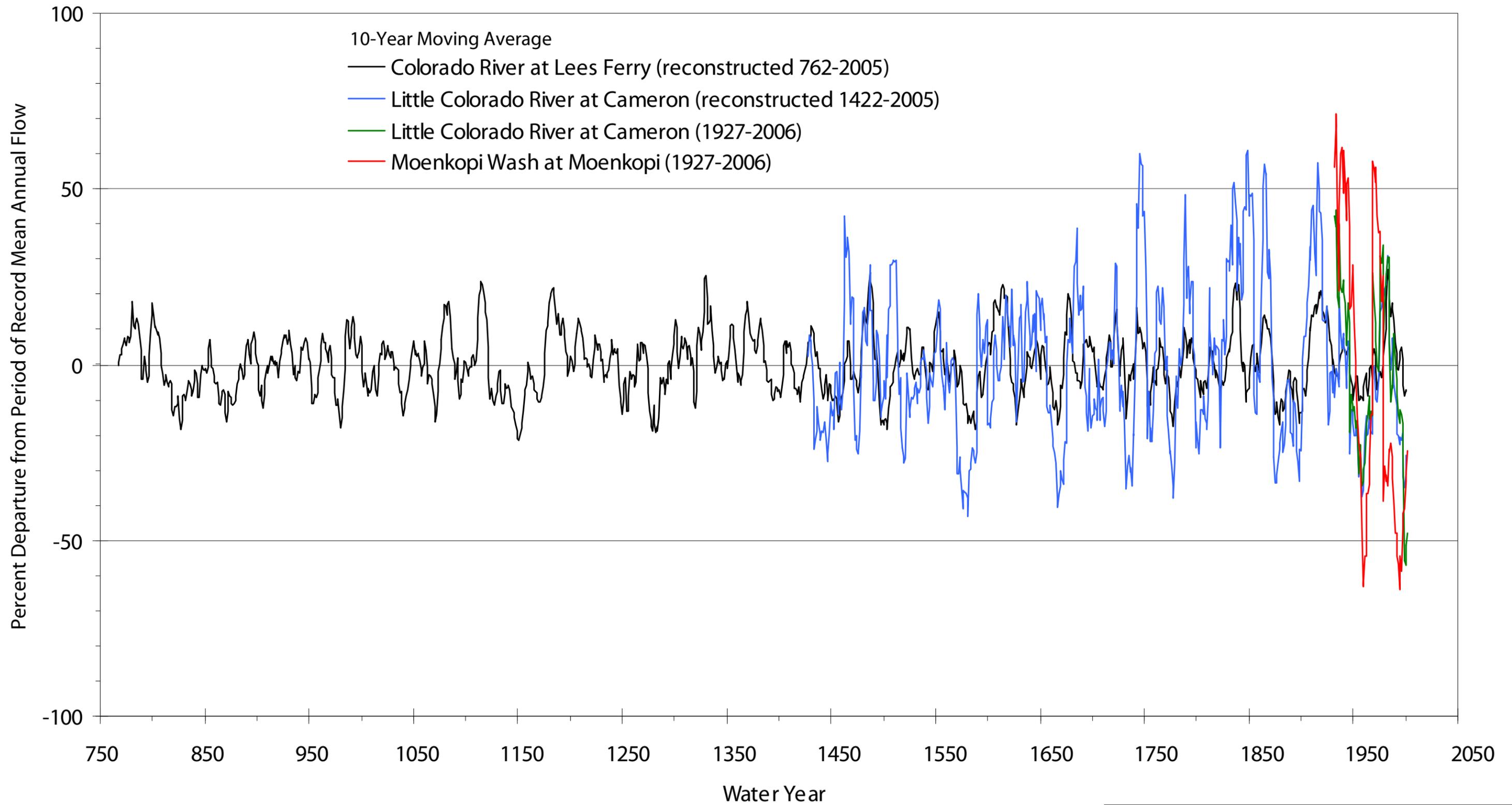
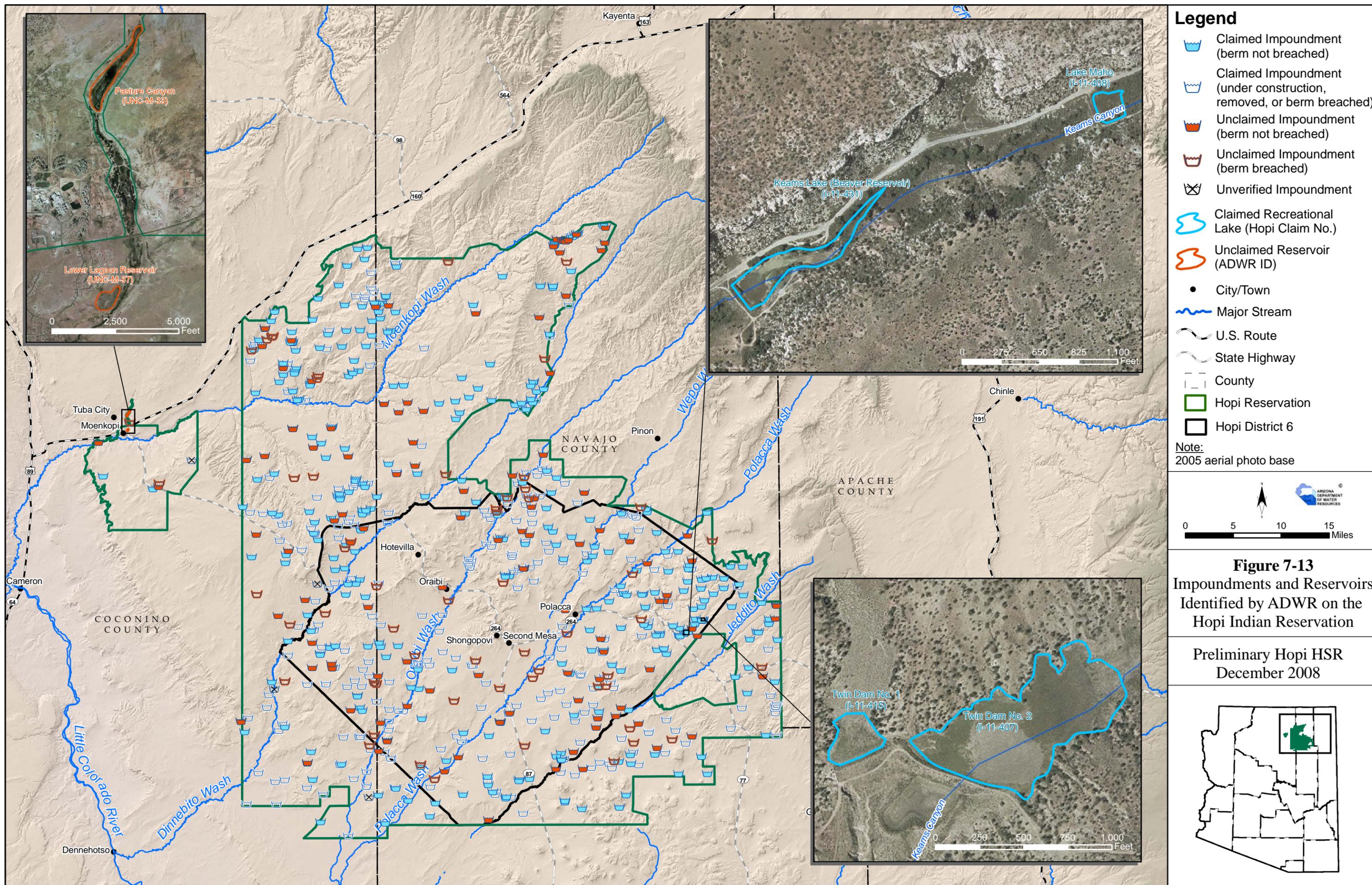


Figure 7-12
 Long-Term Trends in the Annual Streamflow
 Along Moenkopi Wash, Lower Little Colorado
 River and Colorado River at Lees Ferry

Preliminary Hopi HSR, December 2008



- Legend**
- Claimed Impoundment (berm not breached)
 - Claimed Impoundment (under construction, removed, or berm breached)
 - Unclaimed Impoundment (berm not breached)
 - Unclaimed Impoundment (berm breached)
 - Unverified Impoundment
 - Claimed Recreational Lake (Hopi Claim No.)
 - Unclaimed Reservoir (ADWR ID)
 - City/Town
 - Major Stream
 - U.S. Route
 - State Highway
 - County
 - Hopi Reservation
 - Hopi District 6
- Note:**
2005 aerial photo base

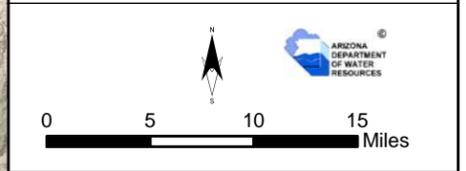
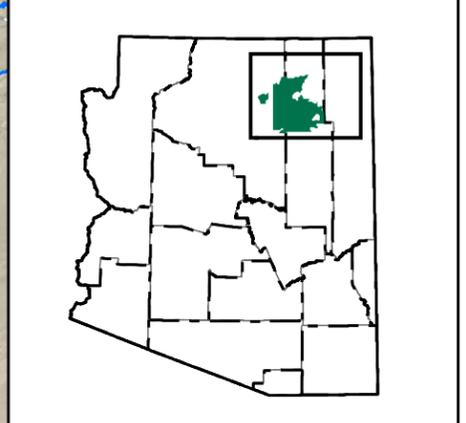
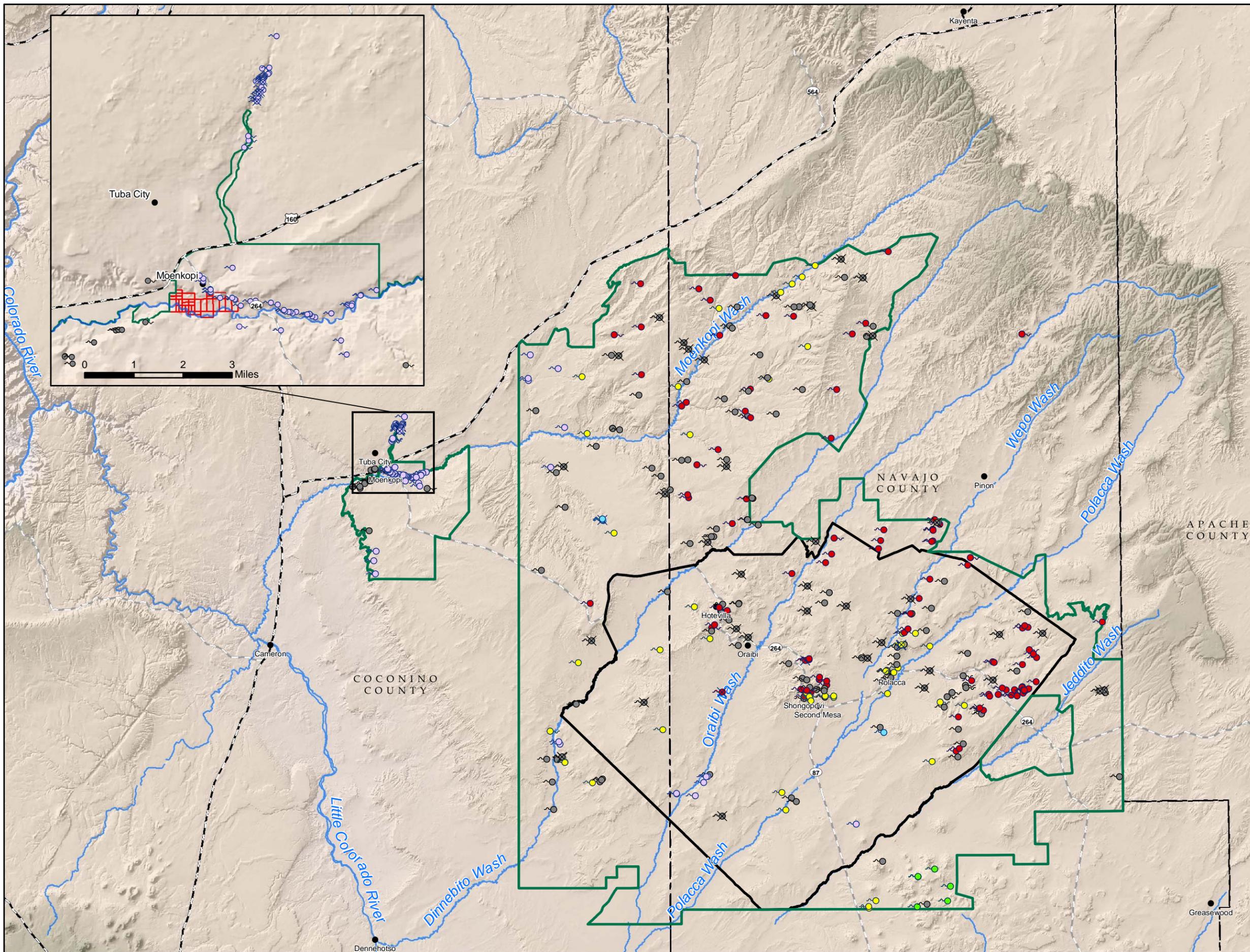


Figure 7-13
Impoundments and Reservoirs
Identified by ADWR on the
Hopi Indian Reservation

Preliminary Hopi HSR
December 2008





Legend

Type

- Claimed Spring
- Unclaimed Spring
- ⊗ Unverified Spring

Water Source

- Alluvial/Colluvial Aquifer
- Spring Deposits
- T Aquifer
- D Aquifer
- N Aquifer
- Currently Undetermined

● City/Town

— Major Stream

— U.S. Route

— State Highway

— County

▭ Hopi Reservation

▭ Hopi District 6

▭ Hopi Allotments

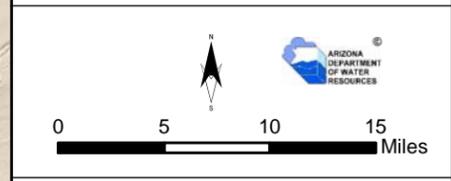
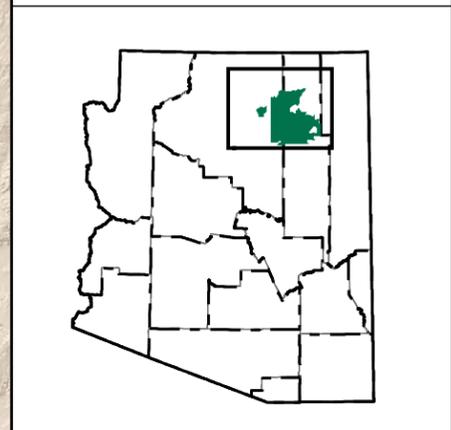
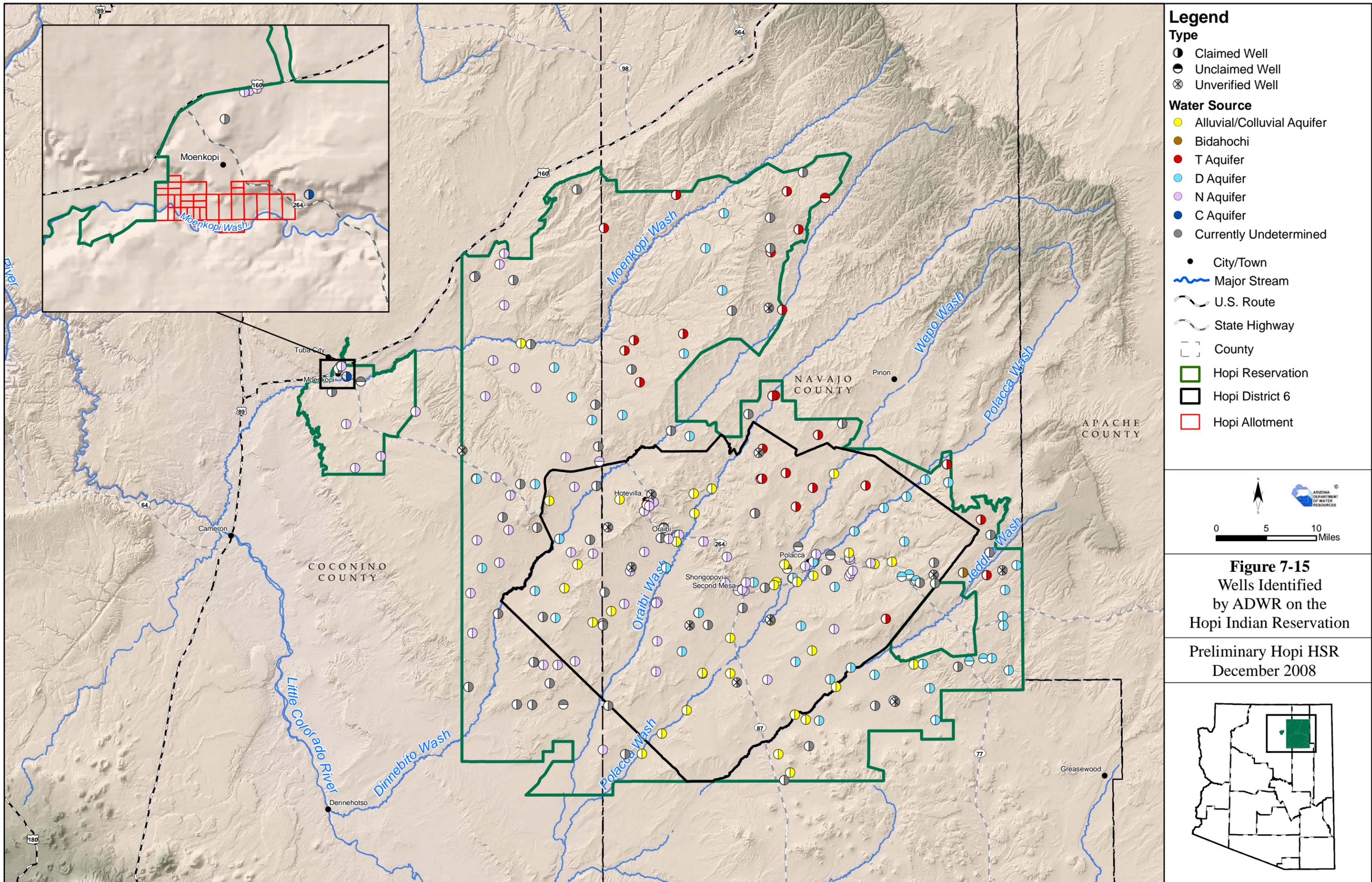
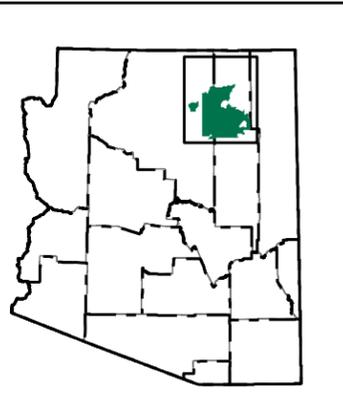
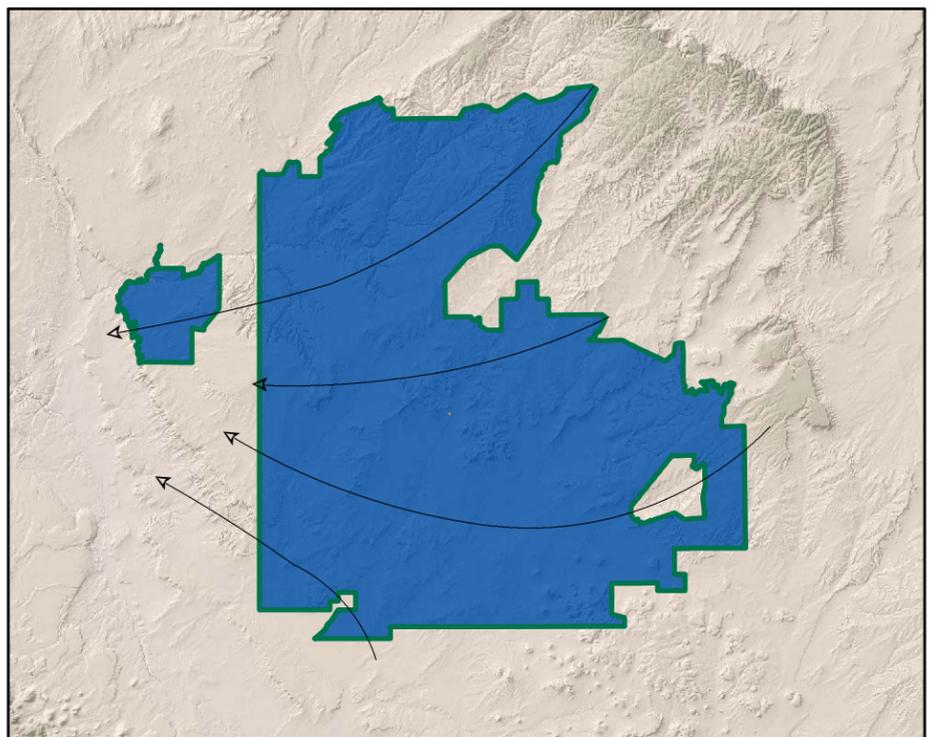
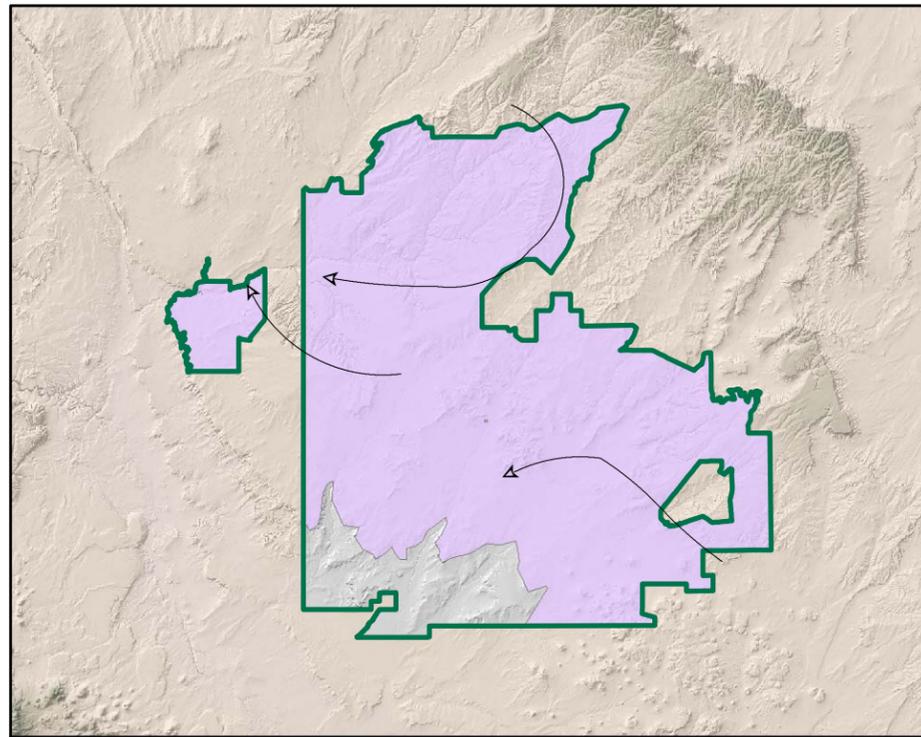
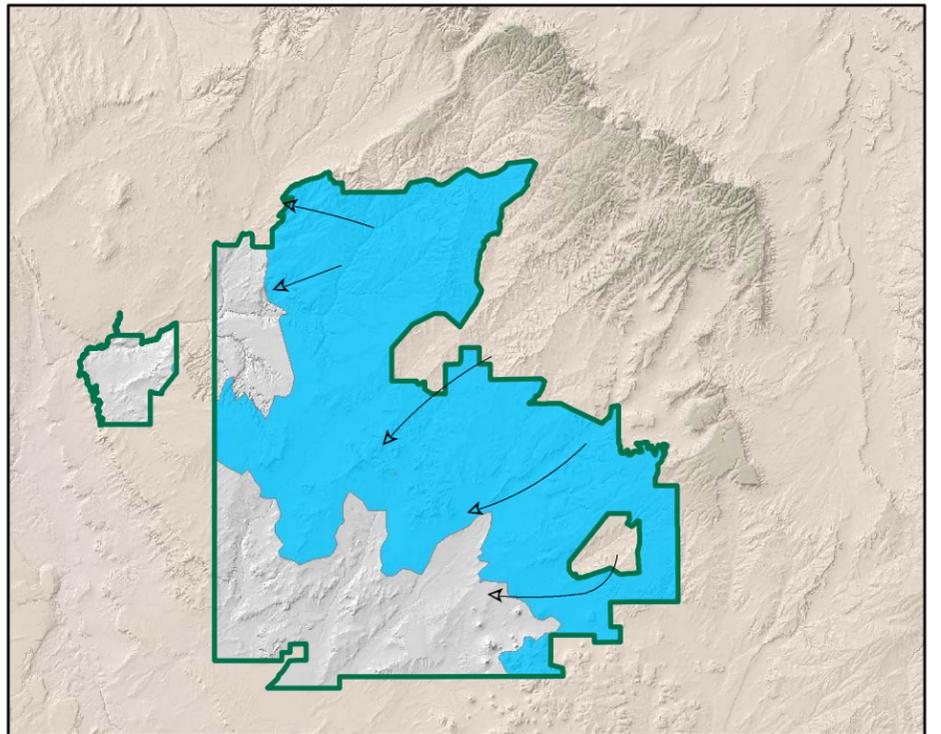
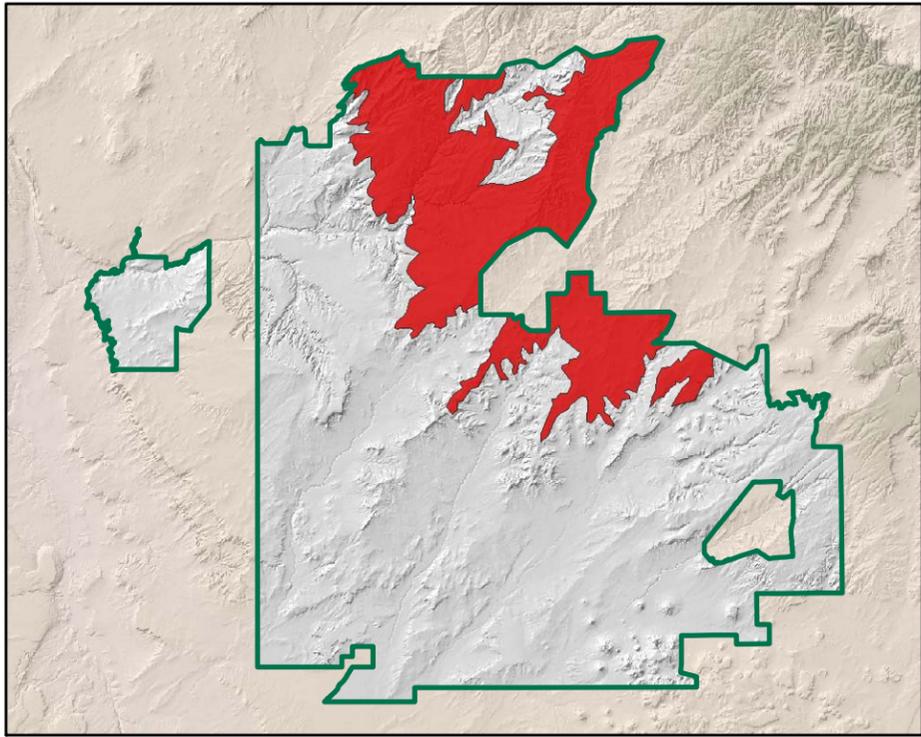
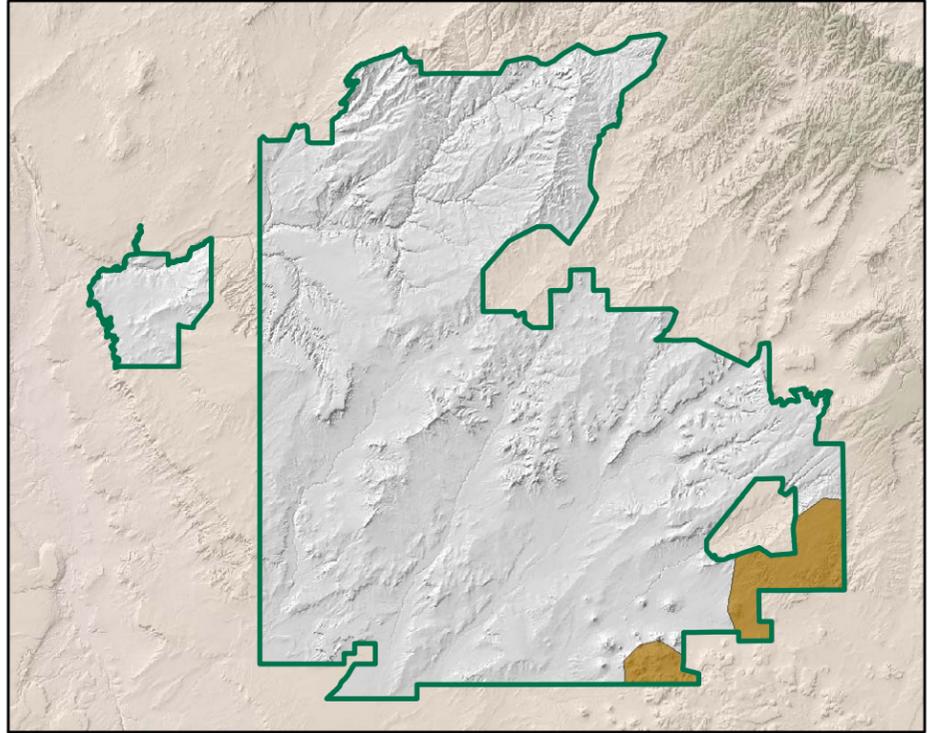
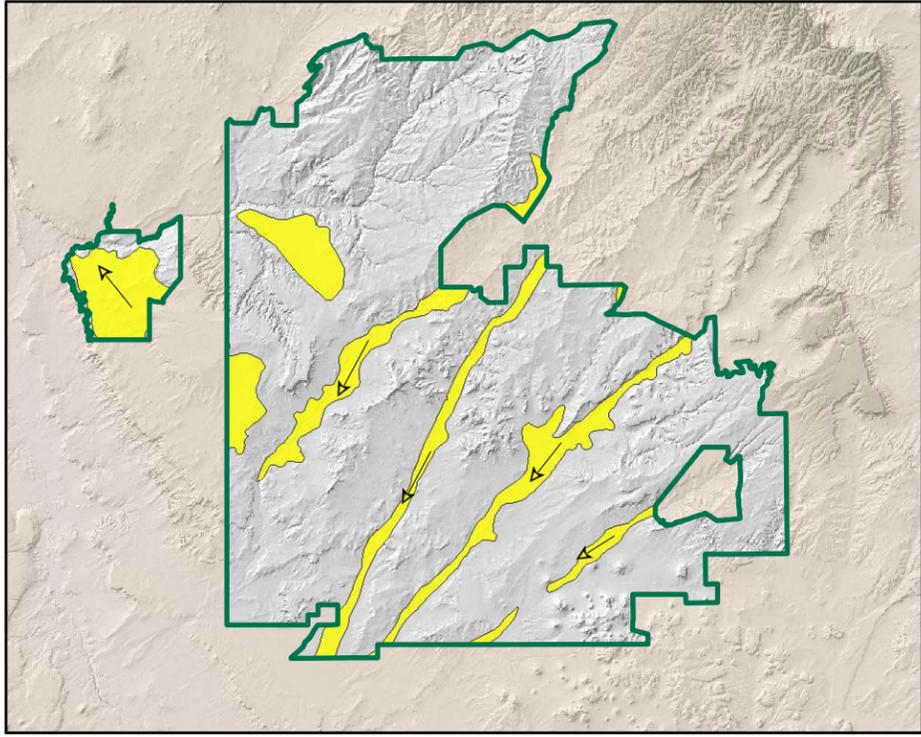


Figure 7-14
Springs Identified
by ADWR on the
Hopi Indian Reservation

Preliminary Hopi HSR
December 2008







- Legend**
- Alluvial/Colluvial Aquifer
 - Bidahochi Aquifer
 - T Aquifer
 - D Aquifer
 - N Aquifer
 - C Aquifer
 - General Flow Direction
 - Hopi Reservation

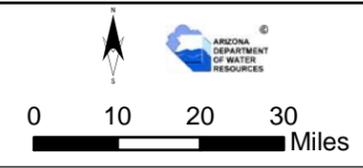
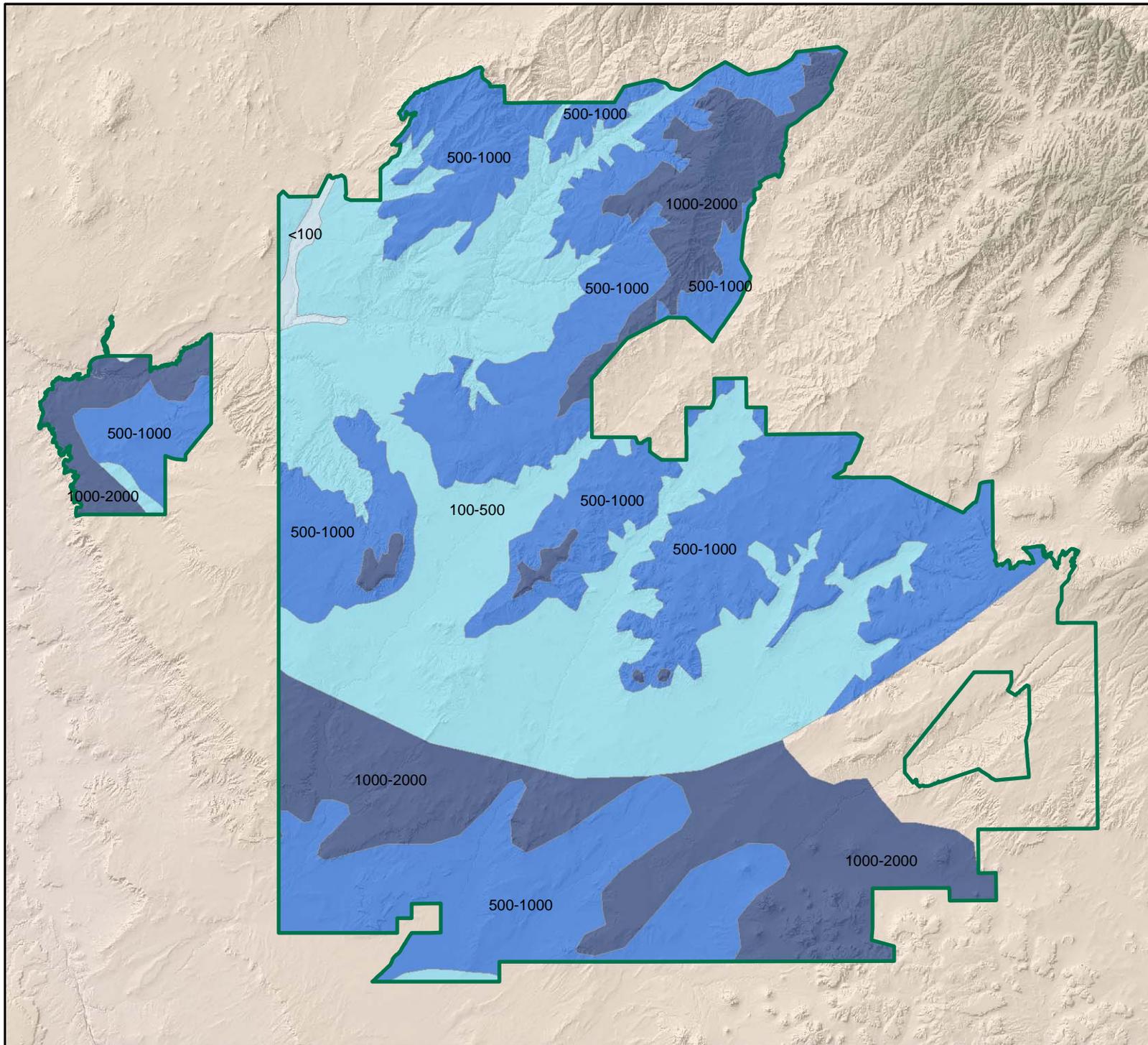


Figure 7-16
Lateral Extent of Aquifers
Beneath the Hopi
Indian Reservation
 Preliminary Hopi HSR, December 2008

- Sources:**
1. ADWR (1989)
 2. Hopi (2001)
 3. Richards and others (2000)
 4. Truini and Longworth (2003)



LEGEND

Water Level in Well

- <100 feet
- 100-500 feet
- 500-1,000 feet
- 1,000-2,000 feet
- Hopi Reservation

Source:

McGavock and Edmunds (1974)
Original scale 1:375,000

Notes:

- (1) Numbers indicate approximate range of water level, in feet below land surface, after 100 days of continuous pumping at 25 gallons per minute.
- (2) Levels reflect the first aquifer encountered that would yield the specified amount.

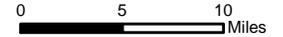
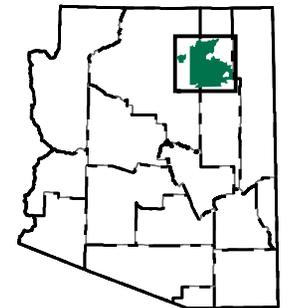
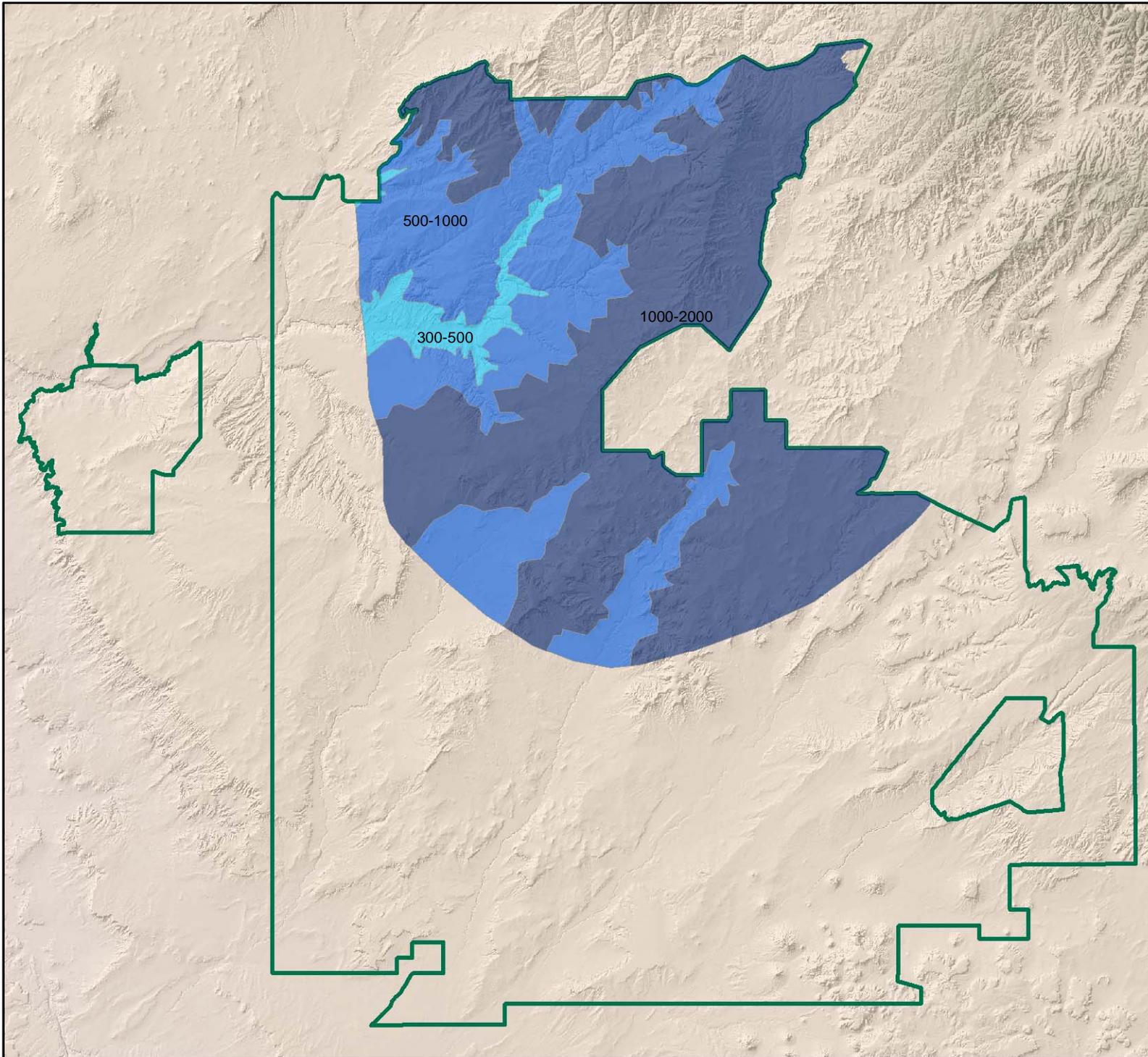


Figure 7-17
Estimated Water Level
in Wells Yielding at
Least 25 gpm on
the Hopi Indian
Reservation

Preliminary Hopi HSR
December 2008





LEGEND

Water Level in Well

- 300-500 feet
- 500-1,000 feet
- 1,000-2,000 feet
- Hopi Reservation

Source:
 McGavock and Edmunds (1974).
 Original scale 1:375,000

Notes:
 (1) Numbers indicate approximate range of water level, in feet below land surface, after 100 days of continuous pumping at 500 gallons per minute.
 (2) Levels reflect the first aquifer encountered that would yield the specified amount.

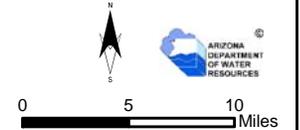
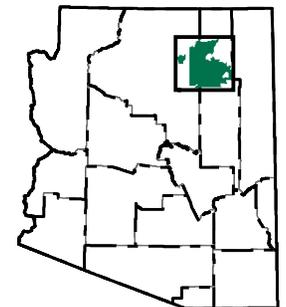
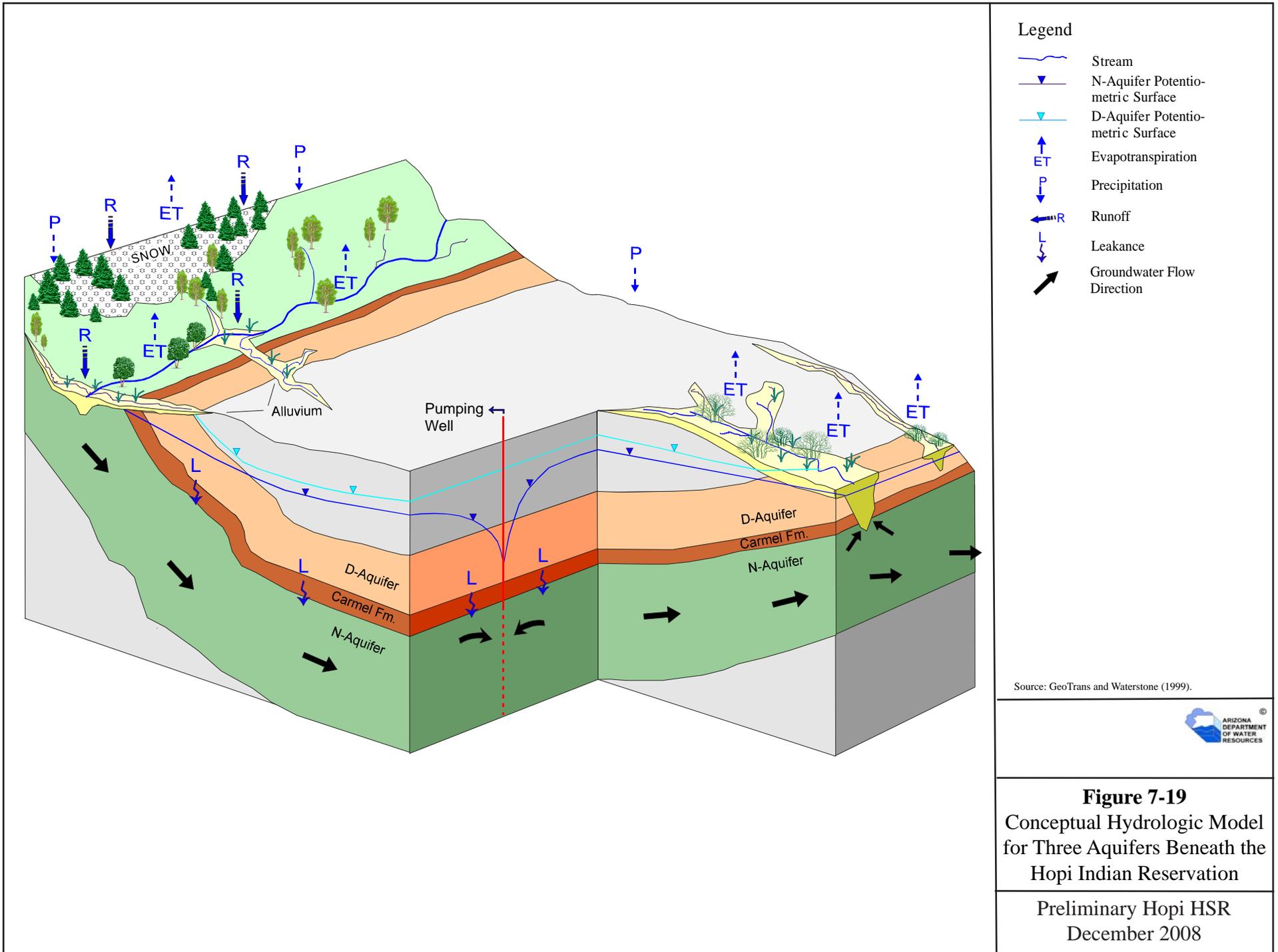
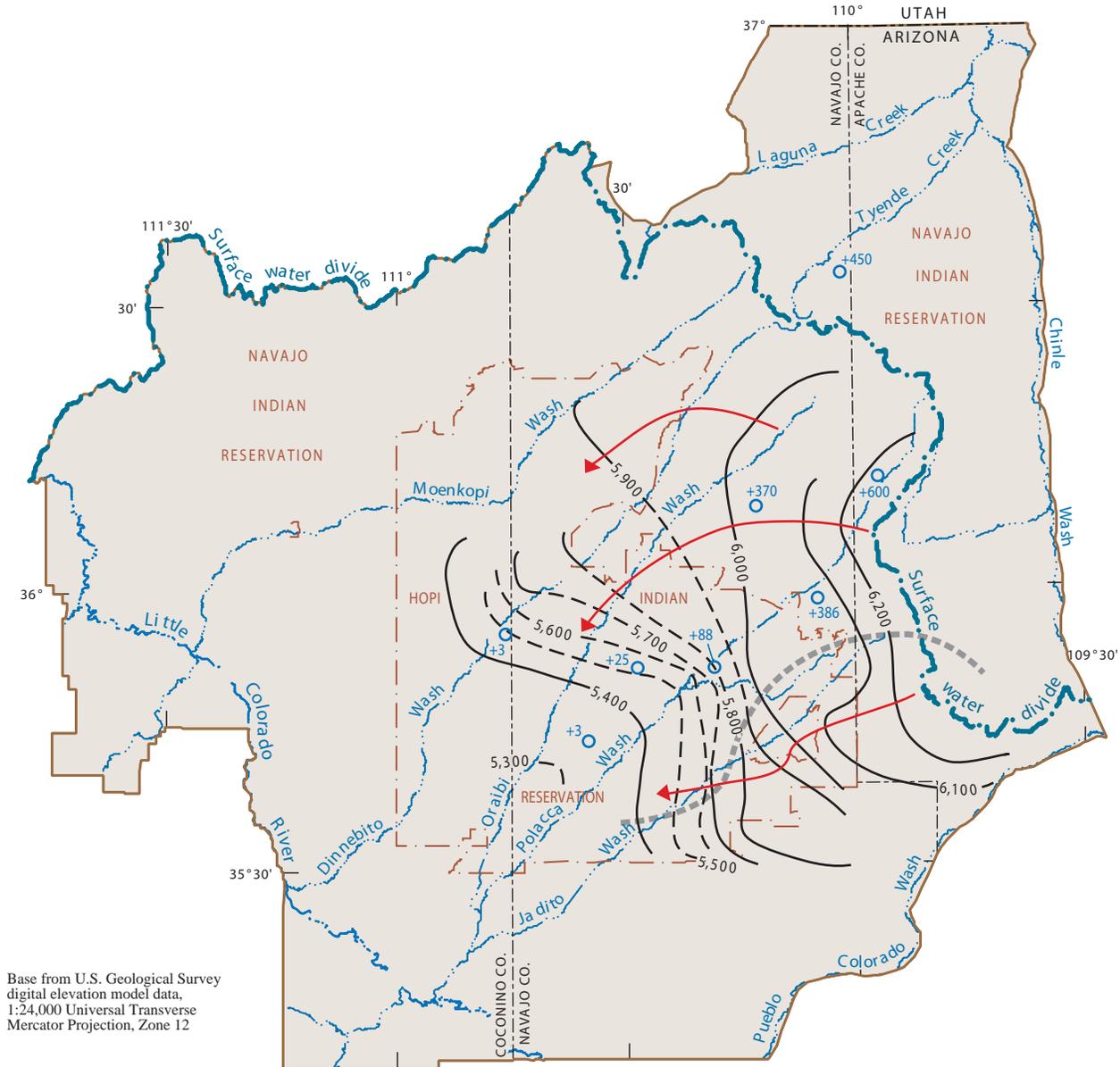


Figure 7-18
 Estimated Water Level
 in Wells Yielding at
 Least 500 gpm on
 the Hopi Indian
 Reservation

Preliminary Hopi HSR
 December 2008







Base from U.S. Geological Survey digital elevation model data, 1:24,000 Universal Transverse Mercator Projection, Zone 12

Legend

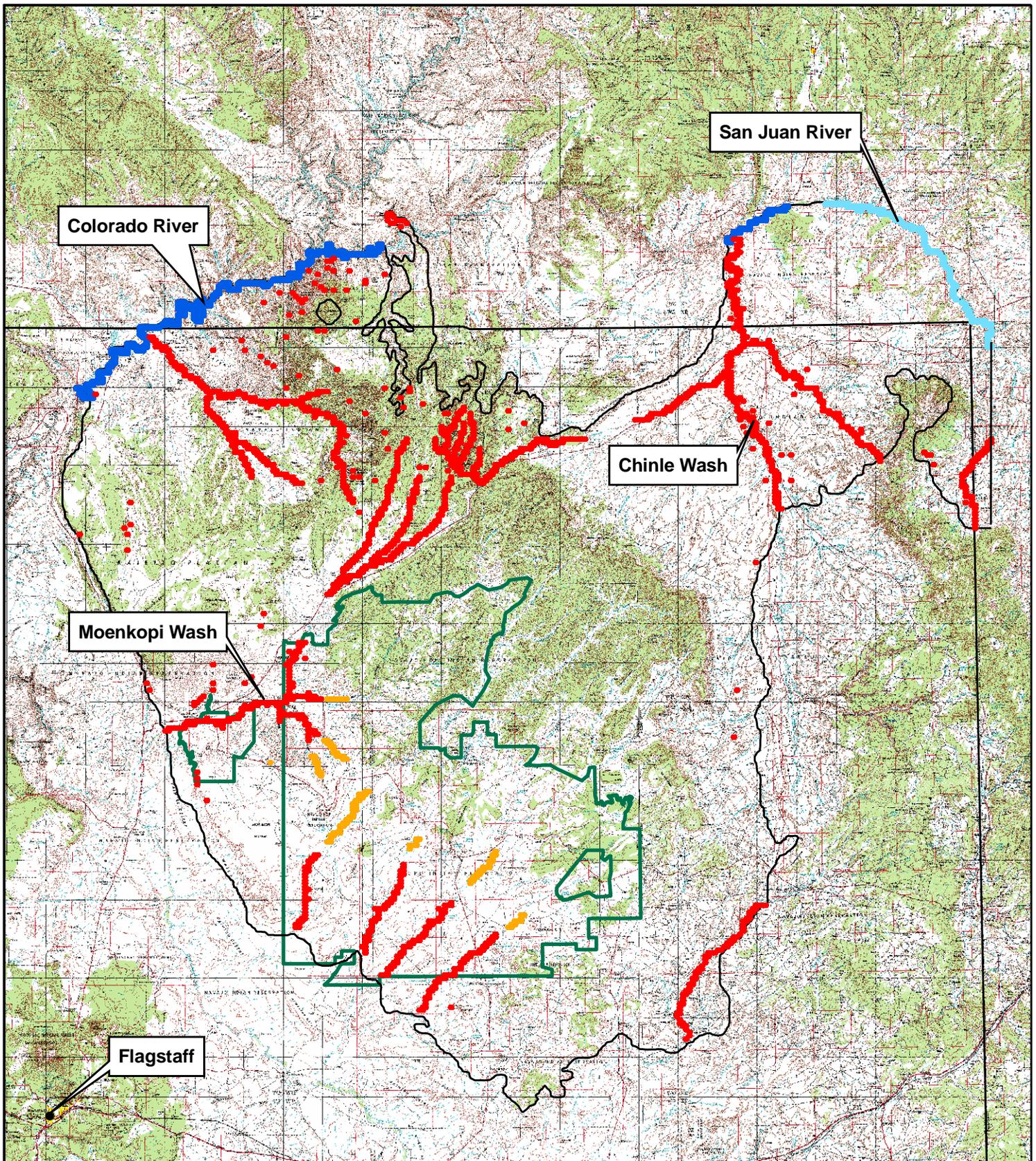
- 6,000 — POTENTIOMETRIC CONTOUR—Shows the altitude at which the water level would have stood in a tightly cased well, 1951–61, in feet above mean sea level. Dashed where approximately located. Contour interval 100 feet
- APPROXIMATE SOUTHEAST LIMIT OF THE NAVAJO SANDSTONE
- +370
○ DIFFERENCE BETWEEN POTENTIOMETRIC SURFACE OF THE D AQUIFER AND PRESTRESS WATER LEVEL IN THE N AQUIFER—in feet. Data for N aquifer from Thomas (2002).
- ↖ General Direction of Flow



Figure 7-20
D Aquifer Water Levels and Flow Directions in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
December 2008

Source: Truini and Longworth (2003).



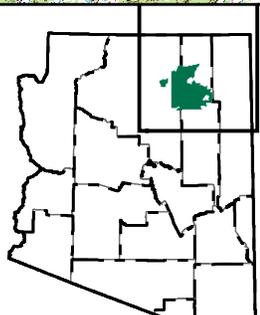
Colorado River

San Juan River

Chinle Wash

Moenkopi Wash

Flagstaff



Drain and River Cells

- Underflow from D Aquifer
- Underflow from N Aquifer
- Baseflow from D Aquifer
- Baseflow from N Aquifer
- ~ WNHN Model Boundary
- Hopi Reservation
- State Boundary

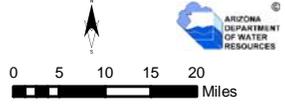
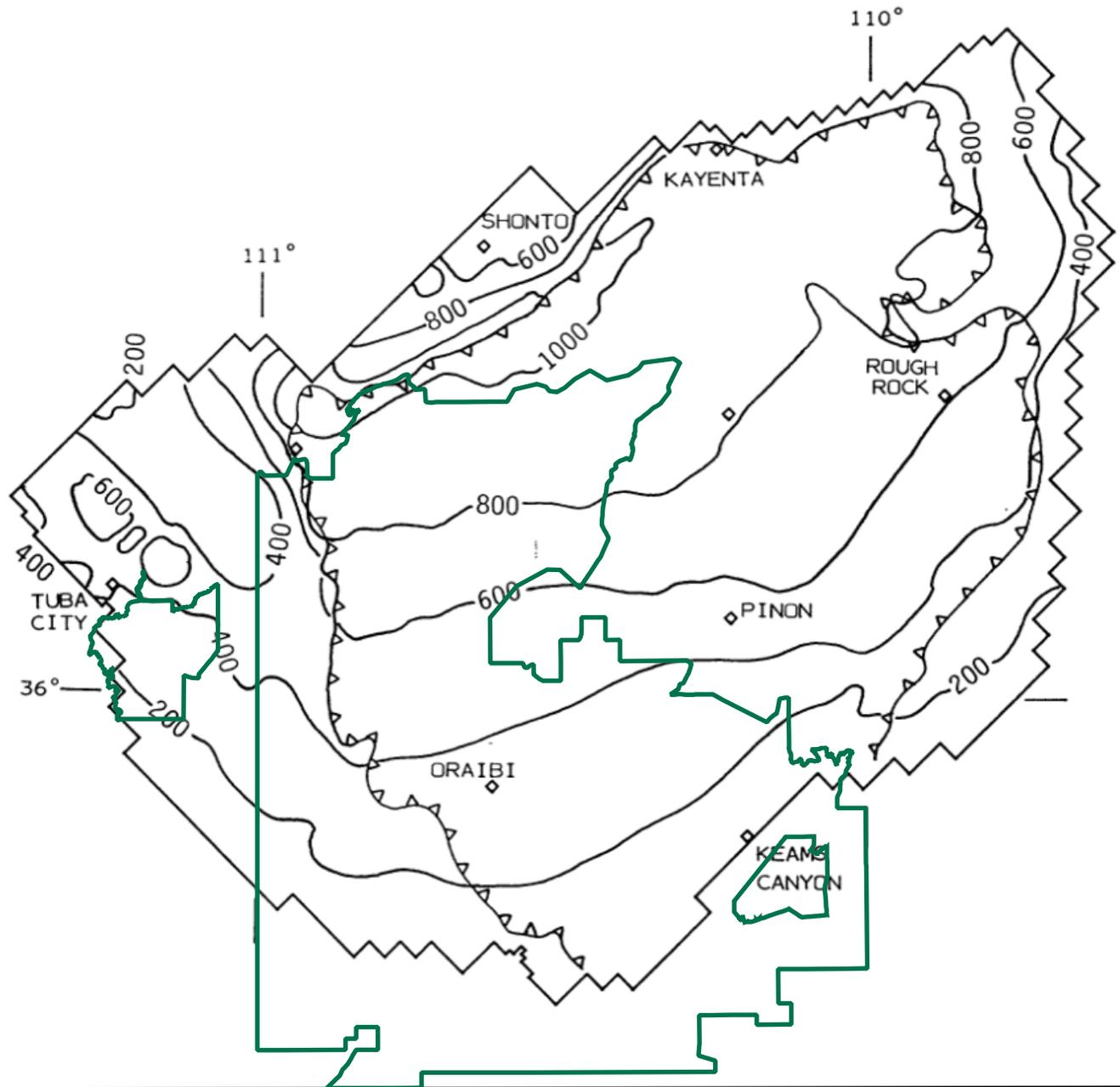


Figure 7-21
 Simulated D and N
 Aquifer Discharge Points

Preliminary Hopi HSR
 December 2008

Source: HDR (2003).



-  200

LINE OF EQUAL SATURATED THICKNESS - Shows approximate generalized saturated thickness. Interval 200 feet
- 

APPROXIMATE BOUNDARY BETWEEN CONFINED AND UNCONFINED CONDITIONS
- 

BOUNDARY OF USGS GROUNDWATER MODEL
- 

HOPHI INDIAN RESERVATION

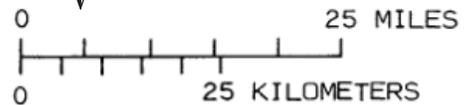


Figure 7-22
 'Predevelopment' N Aquifer Saturated Thickness in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008

Source: Brown and Eychaner (1988).

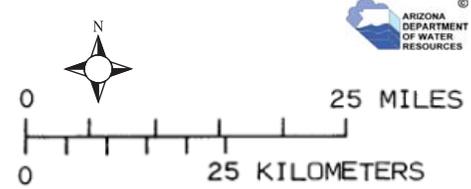
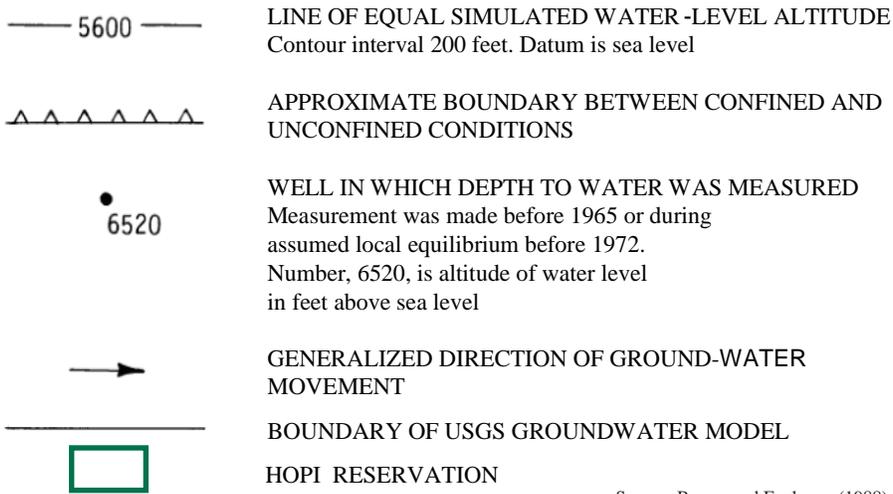
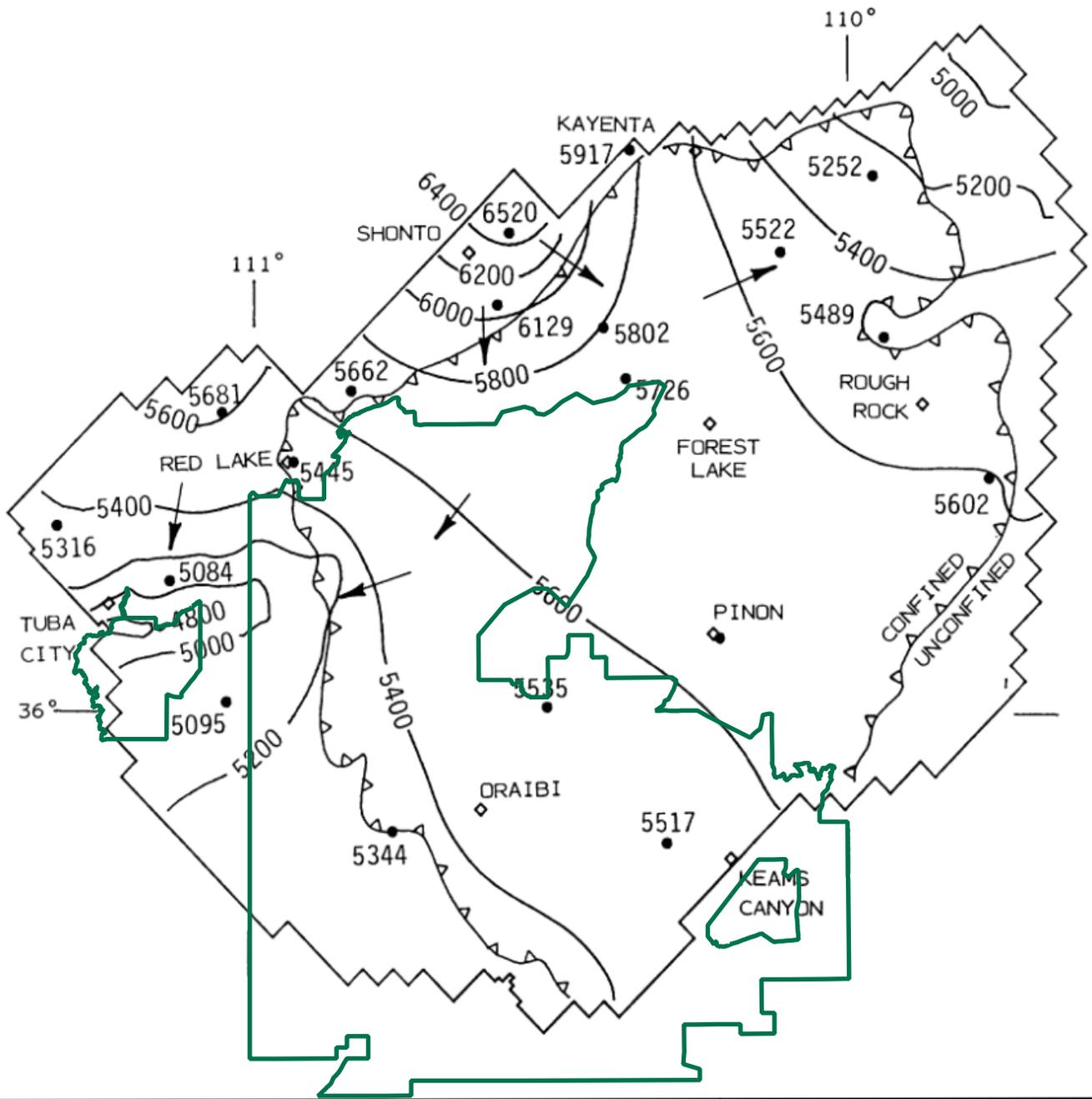
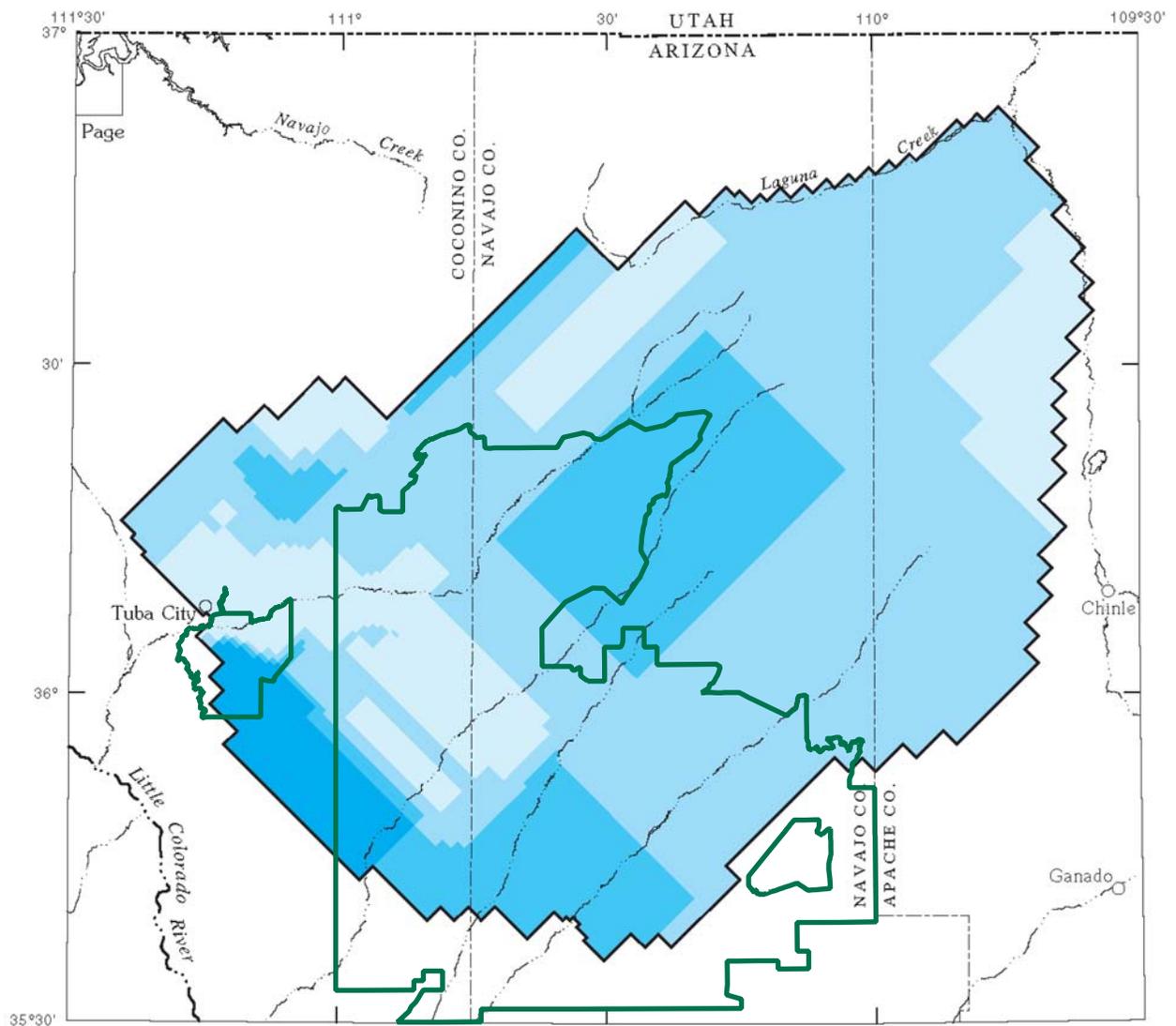


Figure 7-23
‘Predevelopment’ N Aquifer Water Levels and Flow Directions in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
December 2008

Source: Brown and Eychaner (1988).



EXPLANATION

HYDRAULIC CONDUCTIVITY,
IN FEET PER DAY:

- | | |
|--|--|
|  0.1 to 0.4 |  0.4 to 0.8 |
|  0.8 to 1.2 |  1.2 to 1.8 |

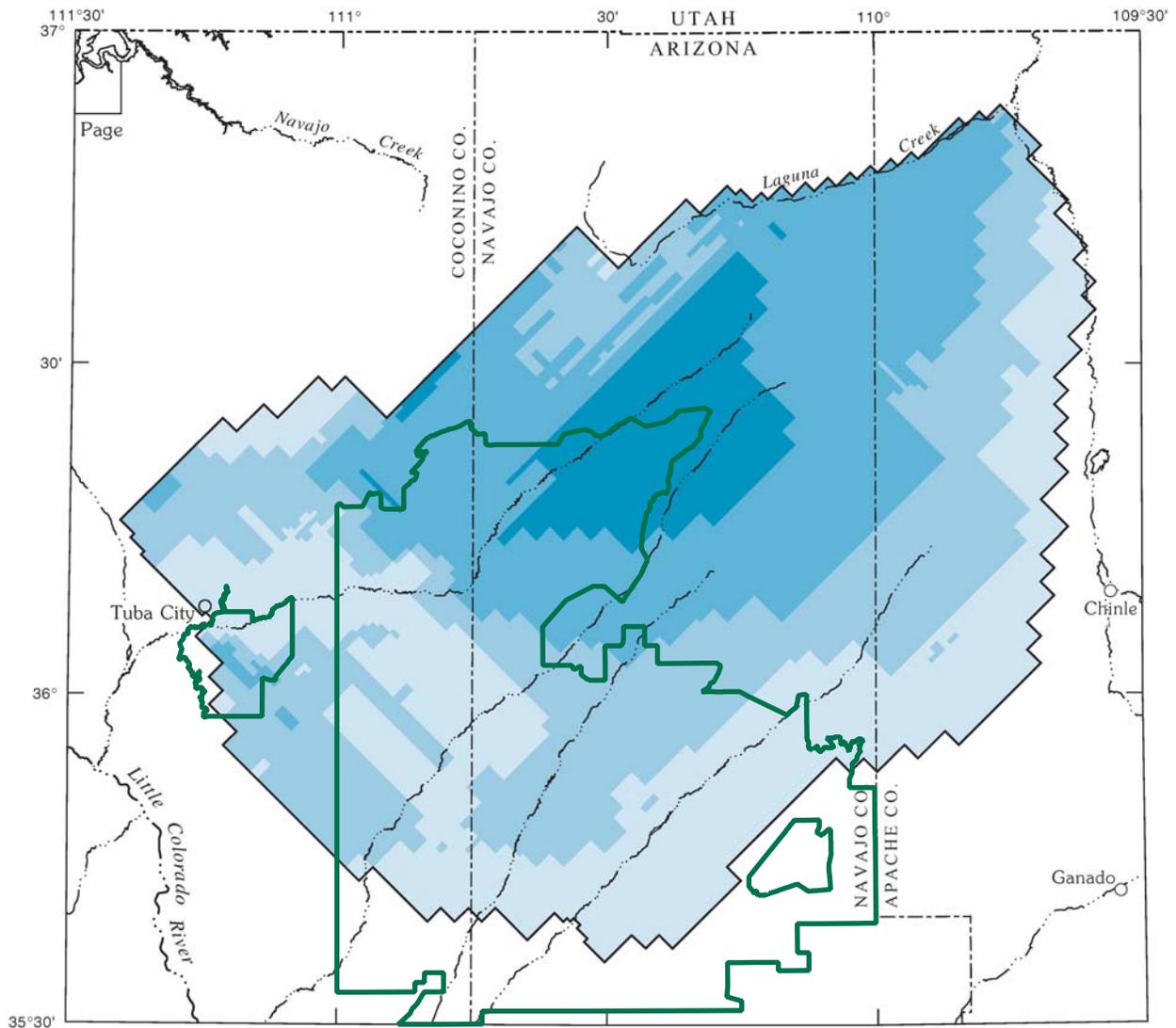
-  MODEL BOUNDARY
-  HOPI RESERVATION



Figure 7-24
USGS Simulation of N Aquifer
Hydraulic Conductivity in the Vicinity
of the Hopi Indian Reservation

Preliminary Hopi HSR
December 2008

Source: Thomaas (2002).



EXPLANATION

TRANSMISSIVITY, IN FEET SQUARED PER DAY:

- 20 to 200
- 200 to 400
- 400 to 700
- 700 to 1,040

— MODEL BOUNDARY

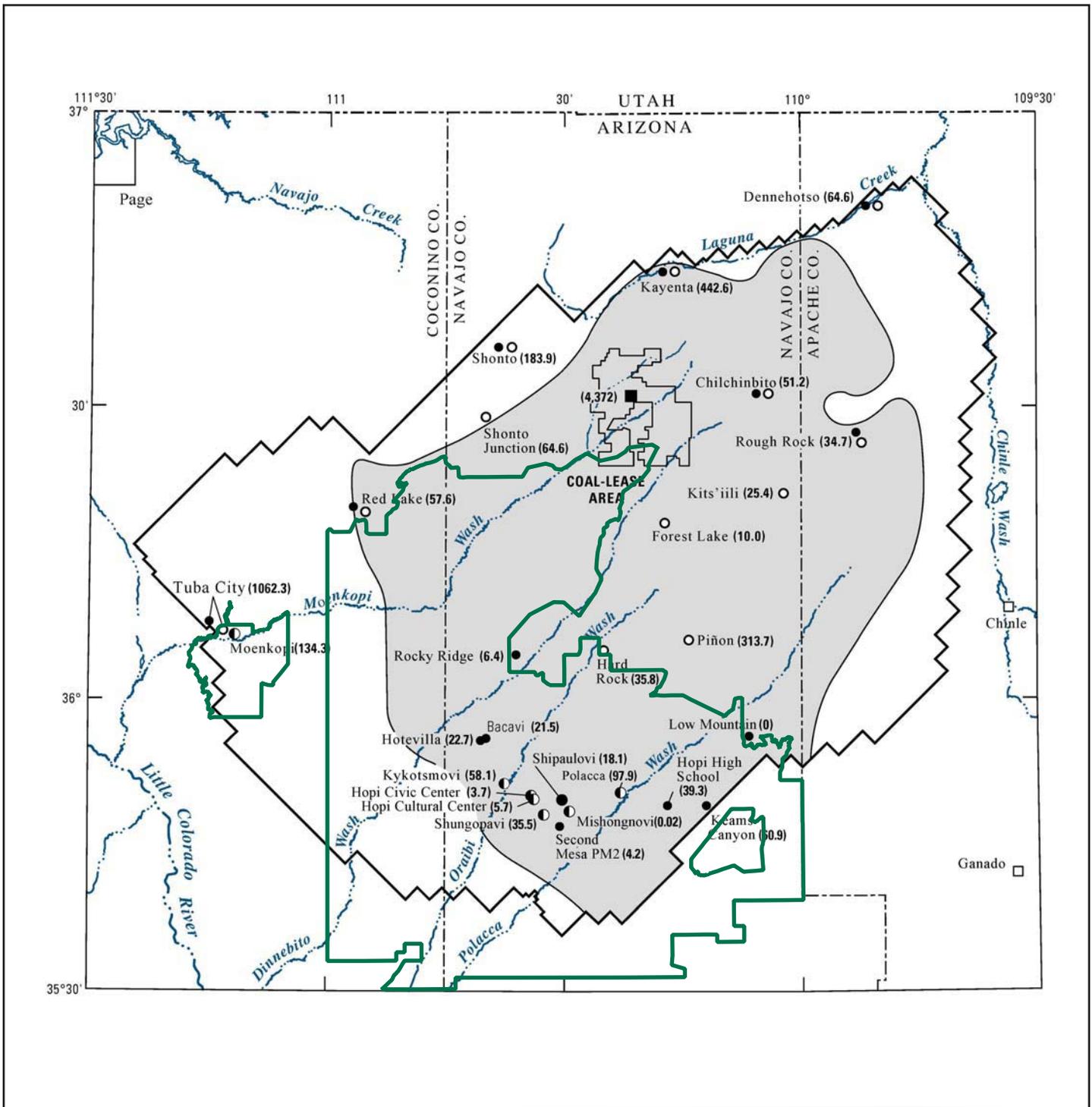
▭ HOPI RESERVATION



Figure 7-25
 USGS Simulation of N Aquifer Transmissivity in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008

Source: Thomas (2002).



<p>CONFINED AND UNCONFINED CONDITIONS IN THE N AQUIFER WITHIN MODEL BOUNDARY</p> <p> Confined Unconfined </p> <p> APPROXIMATE BOUNDARY BETWEEN CONFINED AND UNCONFINED CONDITIONS — From Brown and Eychaner (1988) </p> <p> BOUNDARY OF MATHEMATICAL MODEL—From Brown and Eychaner (1988) </p> <p> HOPI RESERVATION </p>	<p>WELL-SYSTEM OWNER</p> <p> Bureau of Indian Affairs Navajo Tribal Utility Authority Hopi Tribe Peabody Western Coal Company </p> <p> Piñon (313.7) WITHDRAWALS FROM THE N AQUIFER —Piñon, is the well-system name; 313.7, is the total withdrawal in acre-feet for 2005. The total is cumulative at locations served by multiple wells </p>
---	--

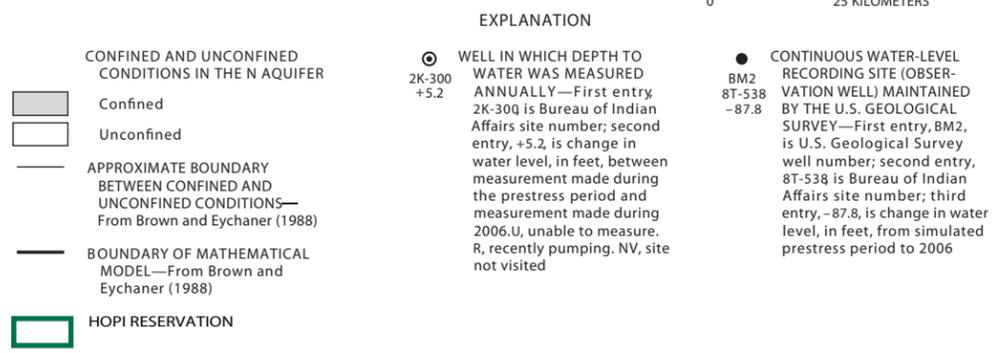
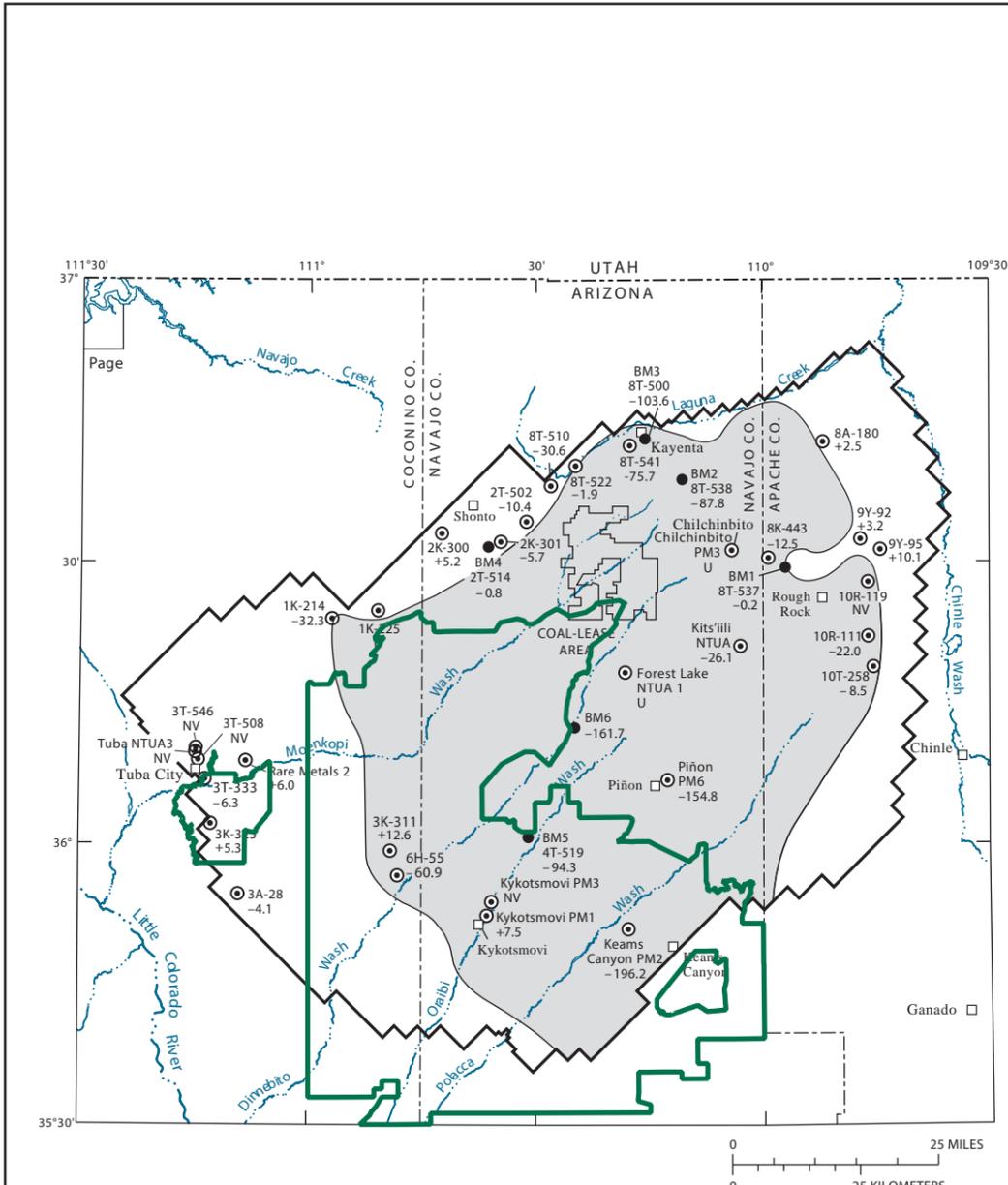
0 25 MILES

0 25 KILOMETERS

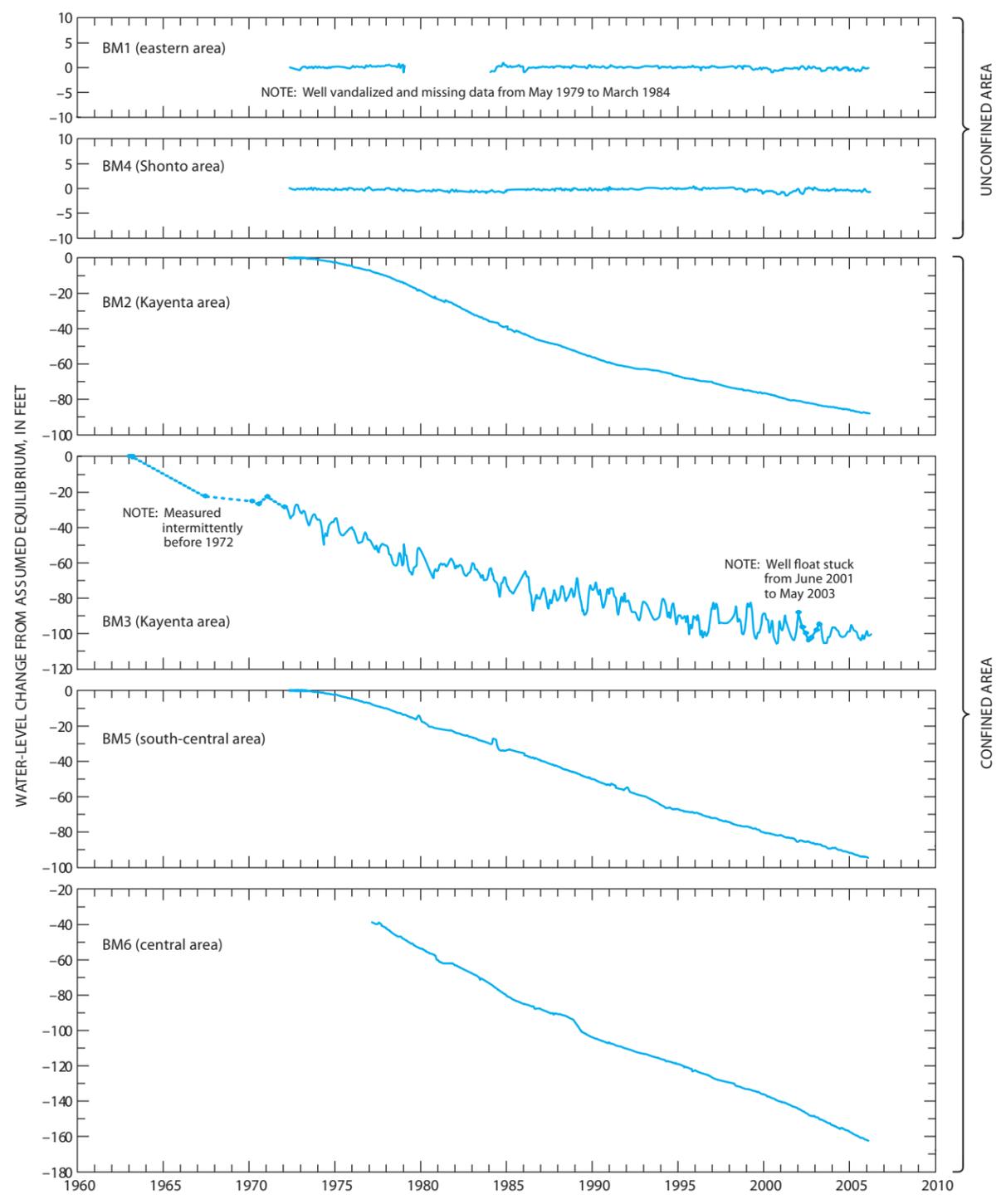
Figure 7-26
 2005 N Aquifer Well Withdrawals in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008

Source: Tuini & Macy (2007).



Well Location and Water-level Change Map



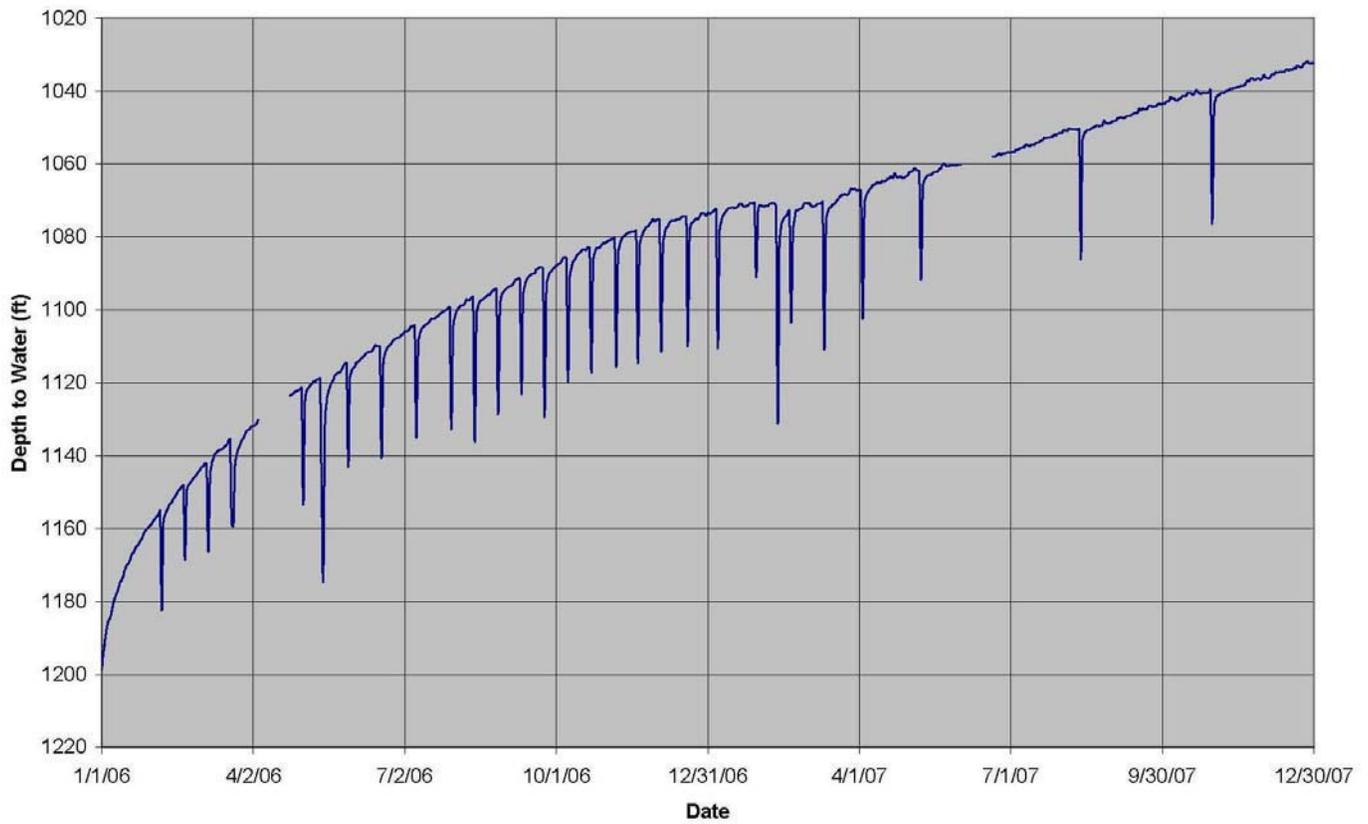
Hydrographs for Wells with Continuous USGS Water-level Recorders

Source:
Truini & Macy (2007).

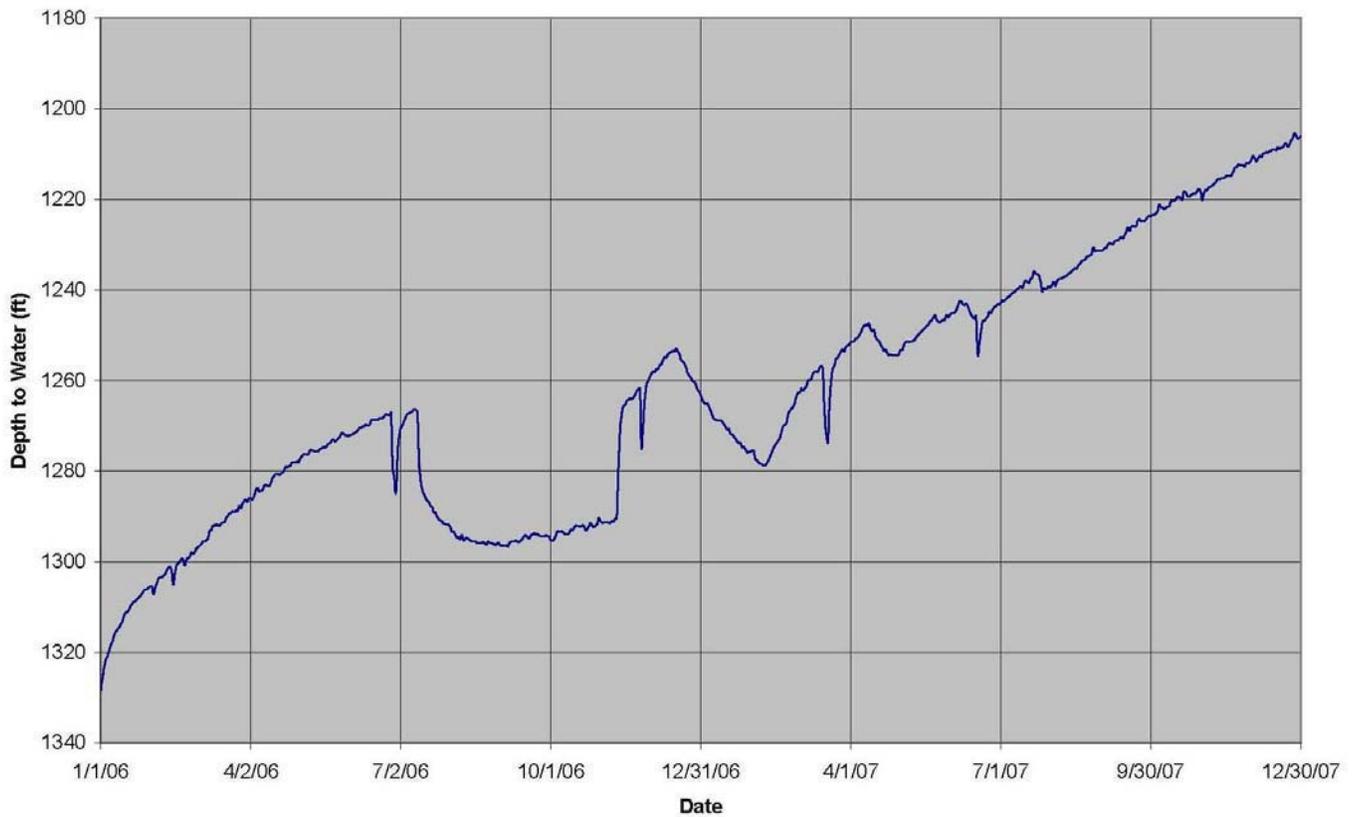


Figure 7-27
Measured Water-level Changes Since Predevelopment for N Aquifer Wells in the Vicinity of the Hopi Indian Reservation

Preliminary Hopi HSR
December 2008



Hydrograph for PWCC Observation Well NAVOBS3



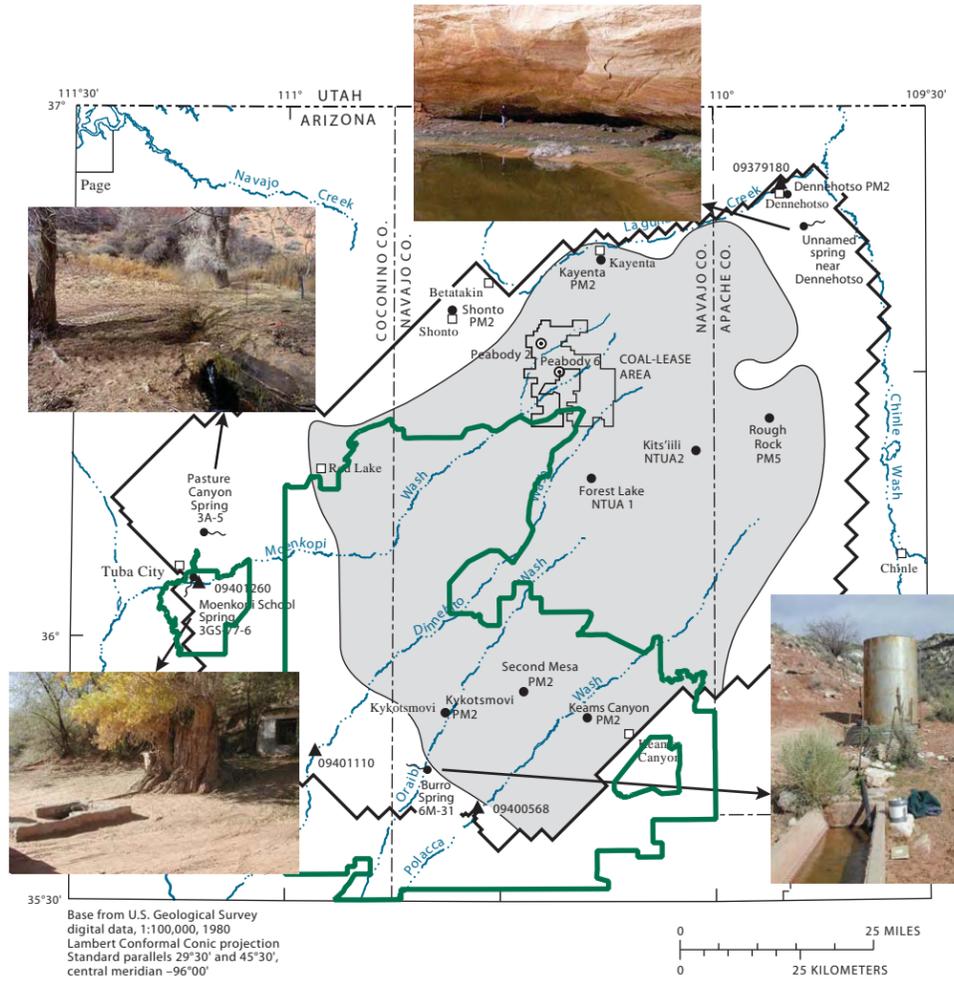
Hydrograph for PWCC Observation Well NAVOBS6

Figure 7-28
 Water Level Rise Measured in
 Two PWCC N Aquifer Wells
 Since January 2006

Preliminary Hopi HSR
 December 2008

Source: Cochran (2008).



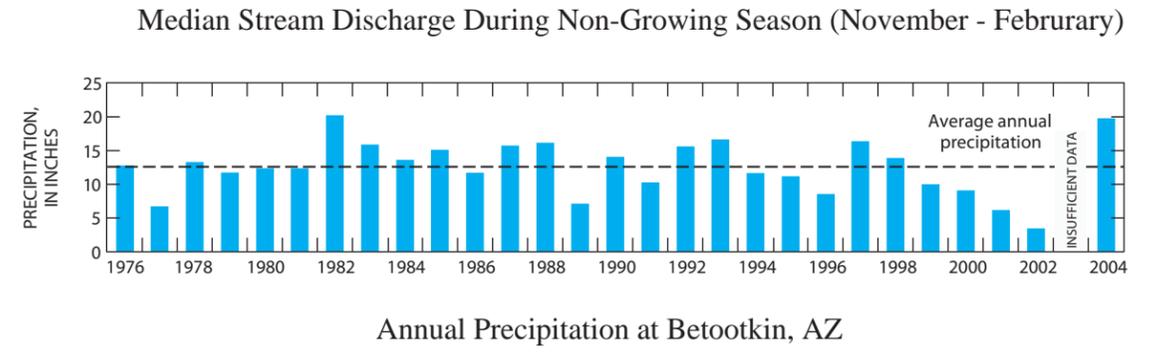
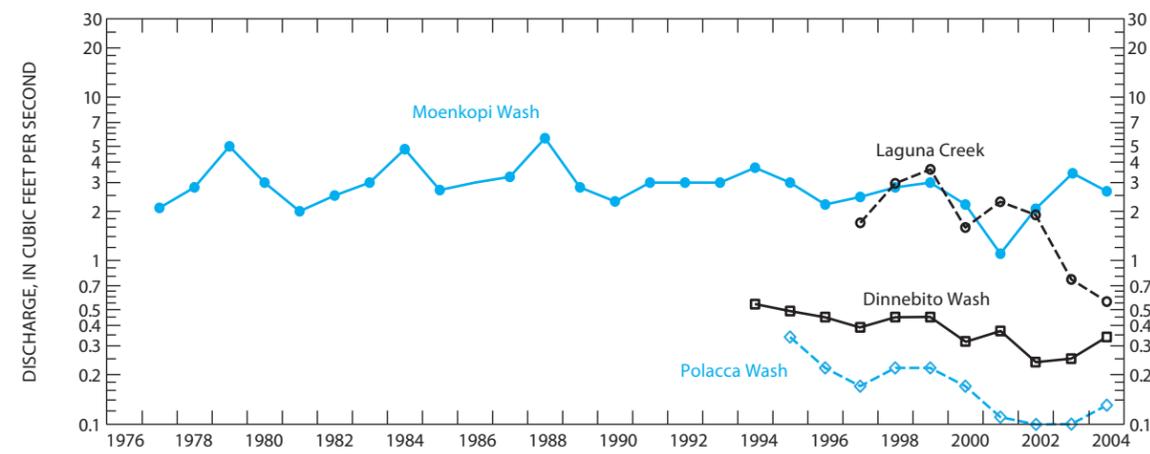
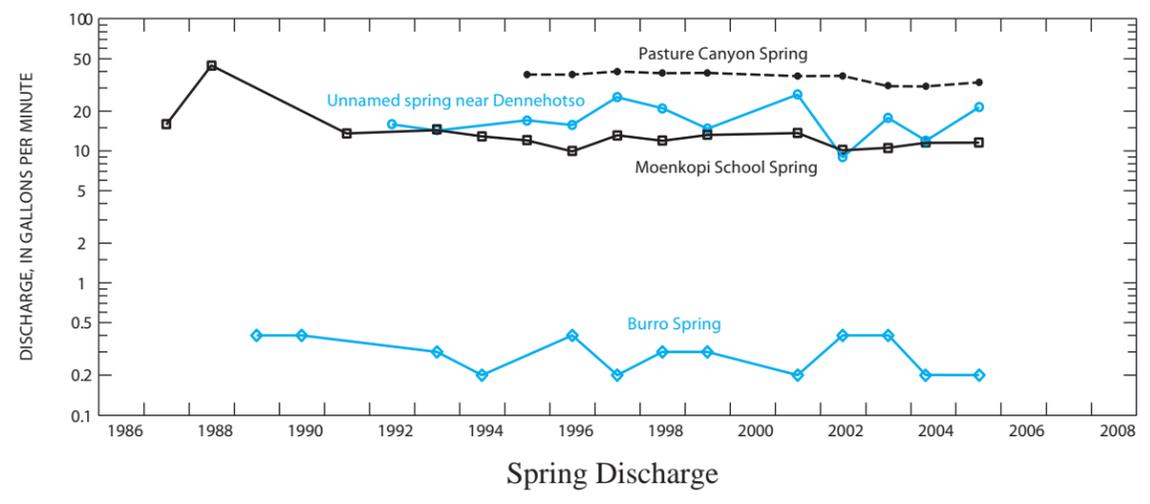


Base from U.S. Geological Survey digital data, 1:100,000, 1980
 Lambert Conformal Conic projection
 Standard parallels 29°30' and 45°30',
 central meridian -96°00'



- EXPLANATION**
- CONFINED AND UNCONFINED CONDITIONS IN THE N AQUIFER WITHIN MODEL BOUNDARY
 - Confined
 - Unconfined
 - APPROXIMATE BOUNDARY BETWEEN CONFINED AND UNCONFINED CONDITIONS—From Brown and Eychaner (1988)
 - BOUNDARY OF MATHEMATICAL MODEL—From Brown and Eychaner (1988)
 - HOPKI RESERVATION
 - MUNICIPAL WELL FROM WHICH WATER-CHEMISTRY SAMPLE WAS COLLECTED—Rough Rock PMS is well name
 - INDUSTRIAL WELL FROM WHICH WATER-CHEMISTRY SAMPLE WAS COLLECTED—Peabody 6 is a well number
 - SPRING AT WHICH DISCHARGE WAS MEASURED AND WATER-CHEMISTRY SAMPLE WAS COLLECTED—Number is spring identification
 - STREAMFLOW-GAGING STATION OPERATED BY THE U.S. GEOLOGICAL SURVEY—Number is station identification

USGS Data Collection Sites

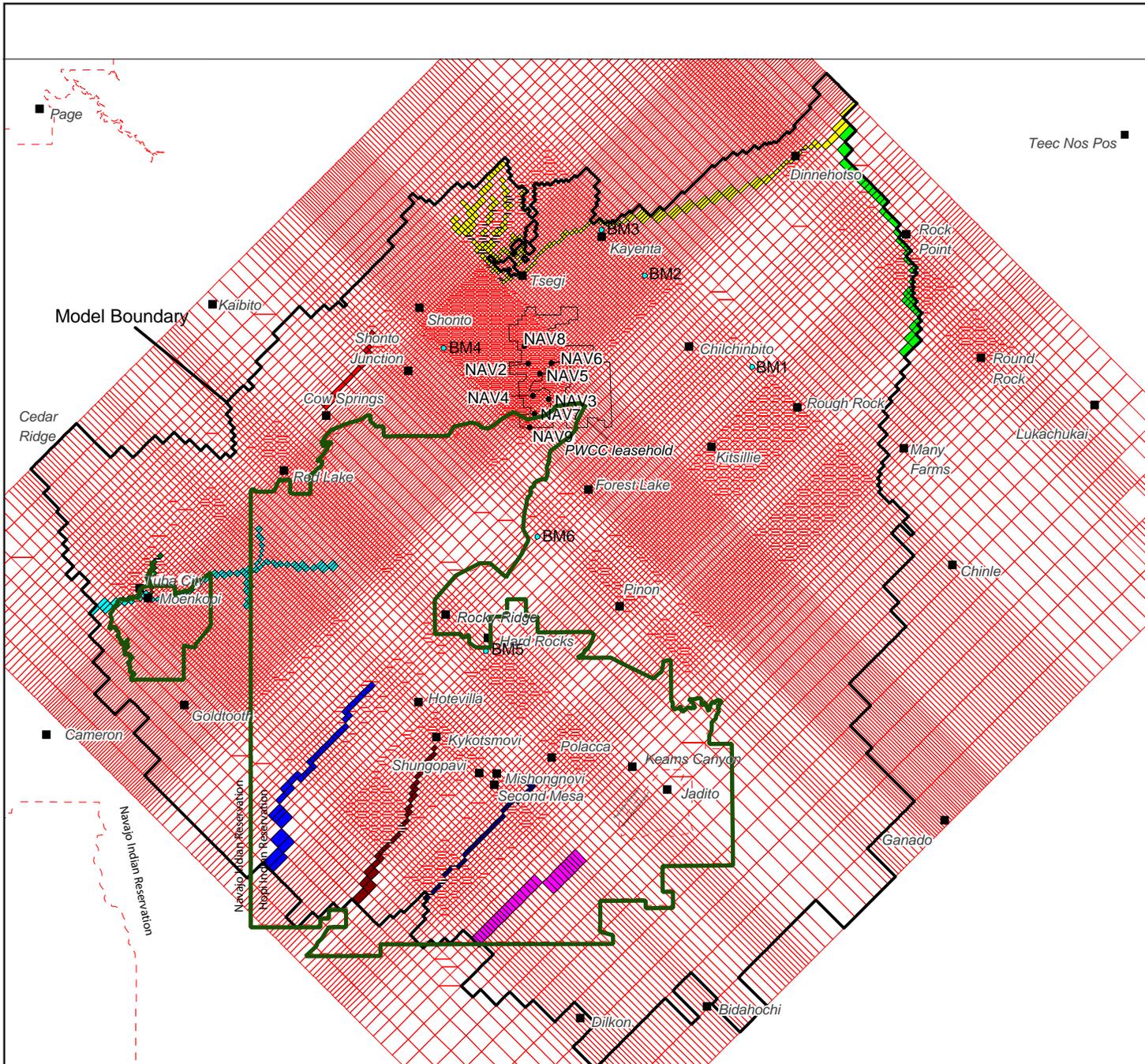


Source:
 Truini & Macy (2006).



Figure 7-29
 Recent Change in Discharge
 of Some Streams and Springs
 in the Vicinity of the
 Hopi Indian Reservation

Preliminary Hopi HSR
 December 2008



Legend

- Kitsillie Community
- BM3 BM observation well
- NAV4 PWCC production well
- Hopi Reservation

Model Drain Cells

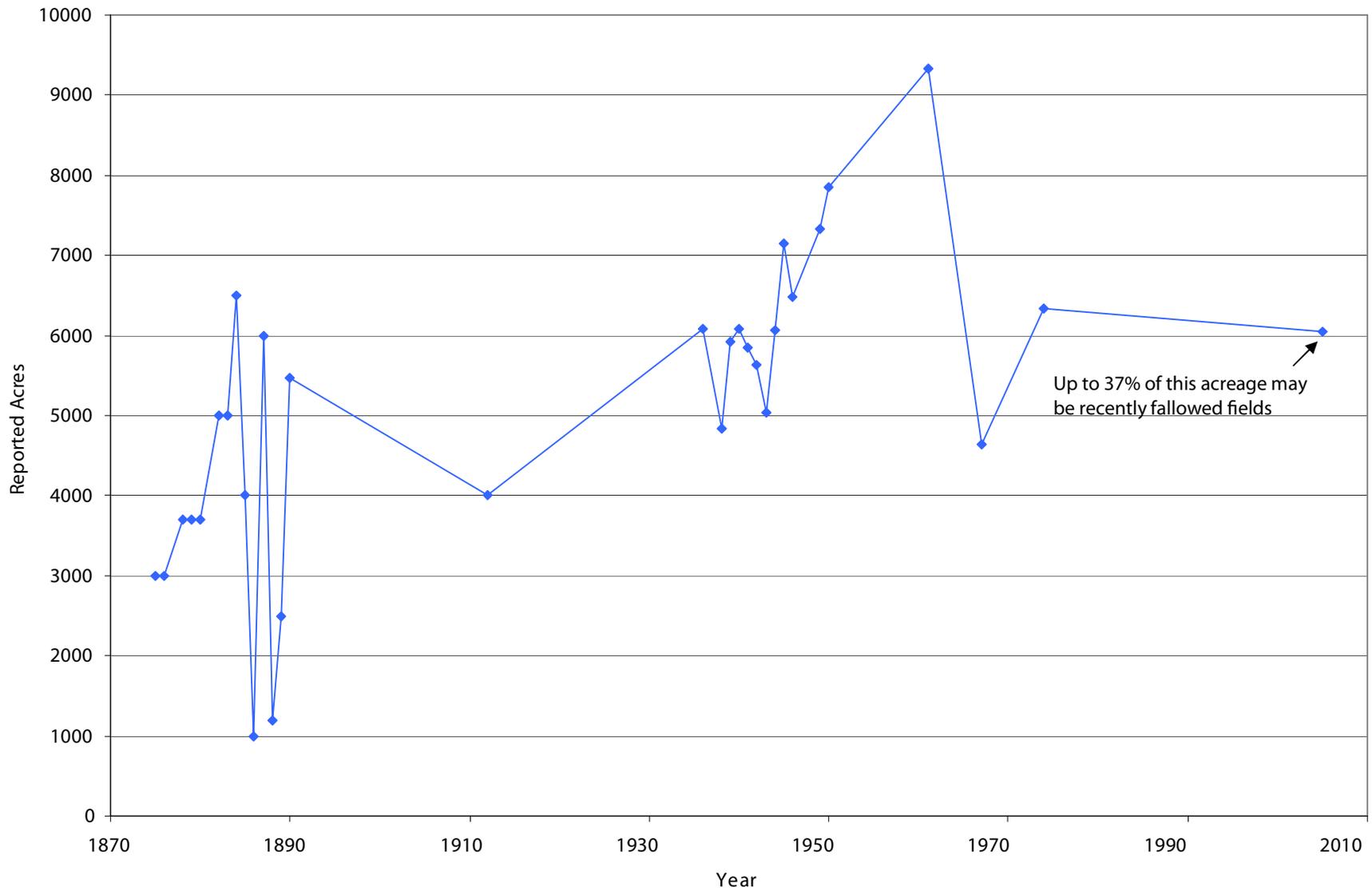
- Begashibito
- Chinle
- Dinnebito
- Jaidito
- Laguna
- Moenkopi
- Oraibi
- Pasture
- Polacca

Source: GeoTrans and Waterstone (1999).



Figure 7-30
Grid for the PWCC Numerical
Groundwater Flow Model
of the N Aquifer

Preliminary Hopi HSR
December 2008



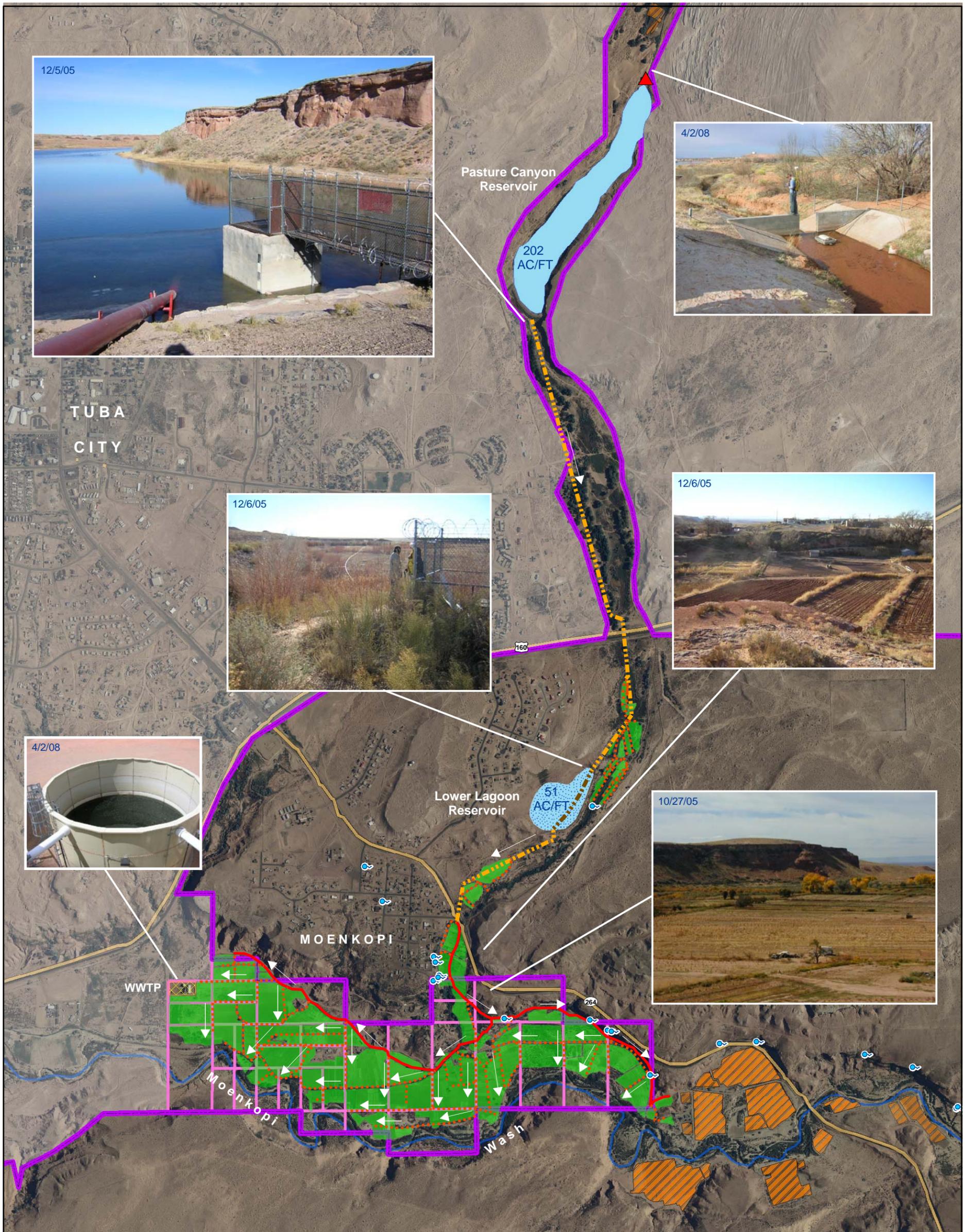
Up to 37% of this acreage may be recently fallowed fields

- Notes:
1. If 2 or more acreages were reported for the same year, the average value is shown.
 2. Years when the cropped acreage was only reported for part of the Reservation are not shown.

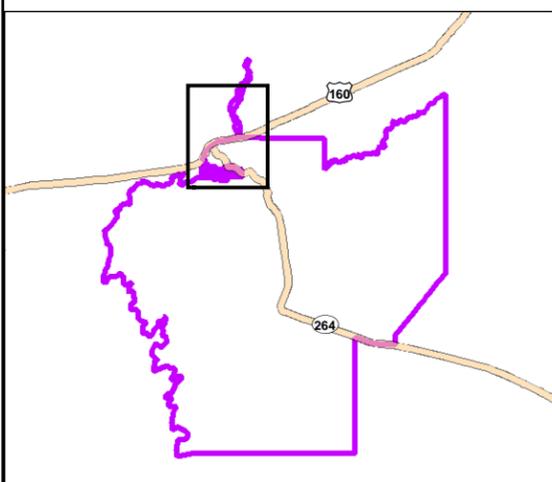
Figure 8-1
 Historic and Recent Cropped Acreage
 on the Hopi Indian Reservation
 Preliminary Hopi HSR, December 2008

Source: Andersen (2008) and ADWR (2008c).





Base map: 2007, 1m resolution
National Agriculture Imagery Program (NAIP)



Legend

Irrigation System

- BIA (?) Stream gage
- Primary Storage Reservoir
- Below Ground Main Pipe
- Above Ground Main Pipe
- Stormwater Reservoir
- Unlined and Lined Main Canal
- Unlined Lateral Ditch
- Springs
- Stream

Agricultural Fields

- (Surveyed by ADWR in 2005, 2006 and 2008)
- Hopi fields served by Moenkopi irrigation system (179 acres; between 151 and 158 acres of these were cropped in 2005)
 - Hopi fields in figure not served by Moenkopi irrigation system (55 acres; between 26 and 42 acres of these were cropped in 2005)
 - Observed Flow Direction
 - Moenkopi WWTP
 - Road
 - Hopi Reservation
 - Hopi Allotment

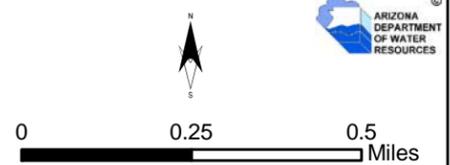
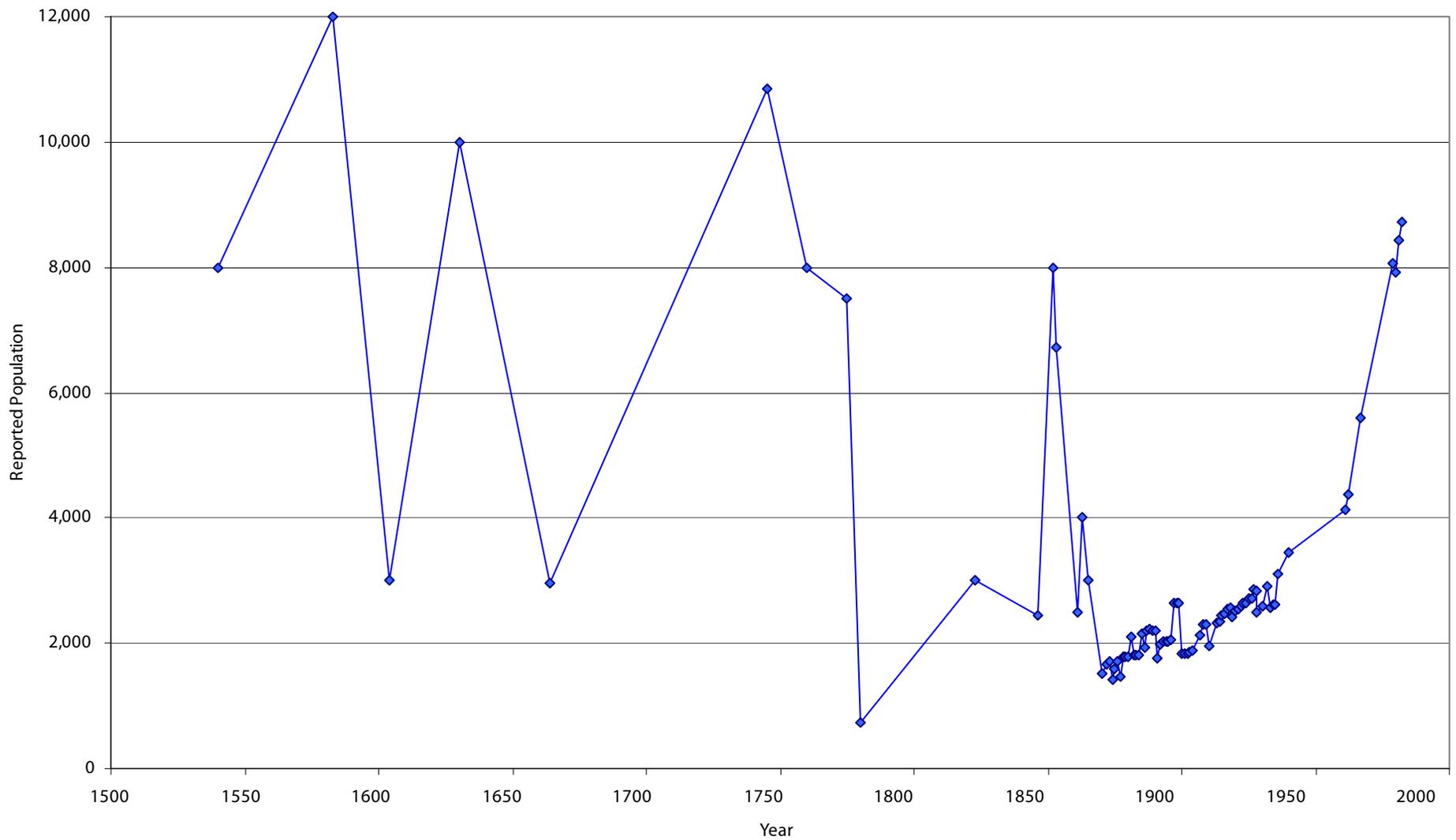


Figure 8-3
Moenkopi (Pasture Canyon)
Irrigation System

Preliminary Hopi HSR
December 2008



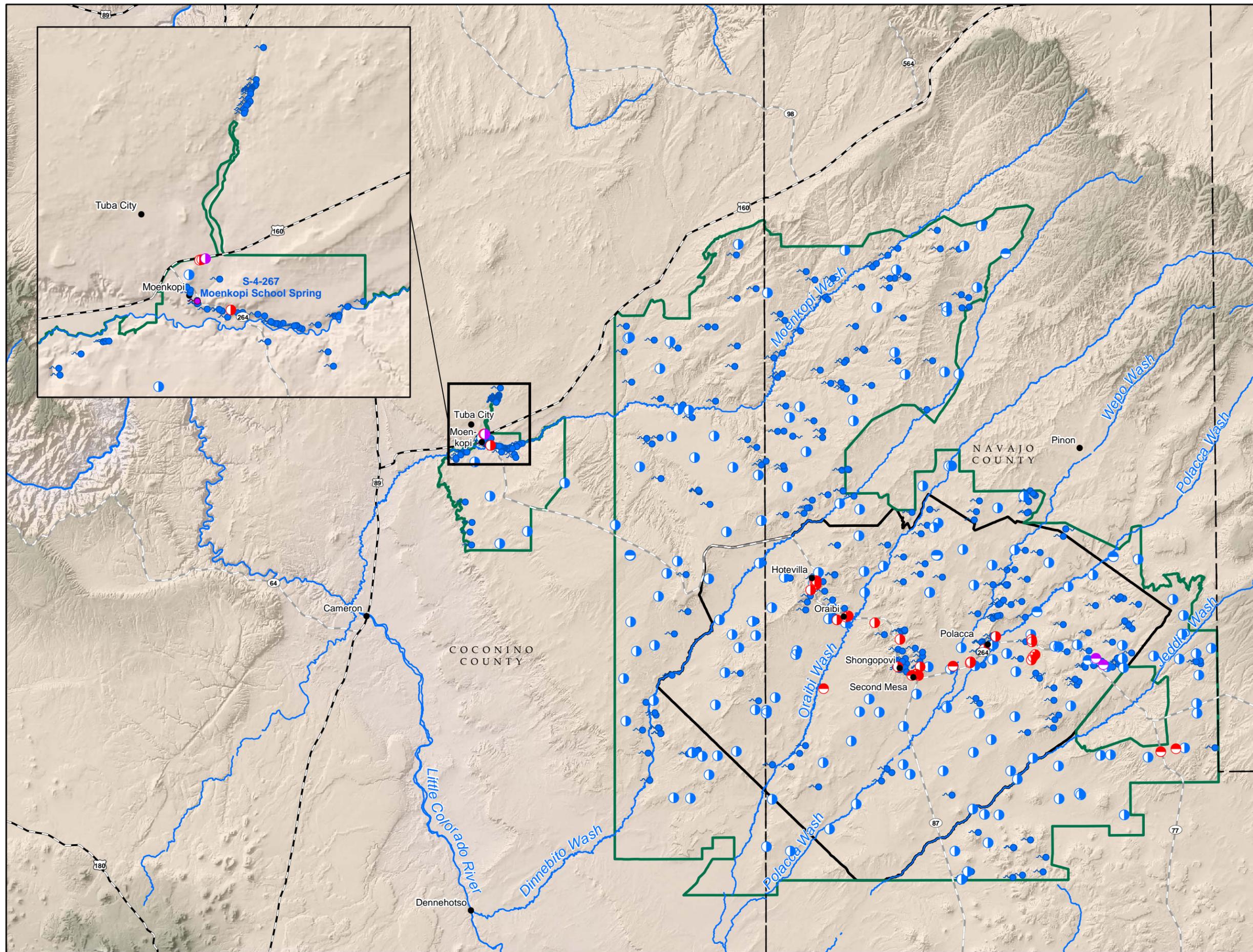
Notes:

1. Reported populations before 1870 are based on accounts of missionaries, explorers and soldiers.
2. If 2 or more populations were reported for the same year, the average value is shown.
3. Moenkopi Area population was not always known.
4. Some reported populations may include Hopi not living on the Reservation.

Figure 8-4
 Historic Populations of the Hopi
 Indian Reservation
 Preliminary Hopi HSR, December 2008



Source: Andersen (2008).



Legend

Type

- Claimed Well
- Unclaimed Well
- Claimed Spring
- Unclaimed Spring

Use

- Domestic
- Municipal
- Both

● City/Town

Stream

U.S. Route

State Highway

County

Hopi Reservation

Hopi District 6

Note:
 Moenkopi School Spring (S-4-267) was only claimed for domestic use, but is a known municipal supply.

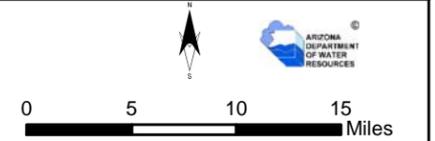
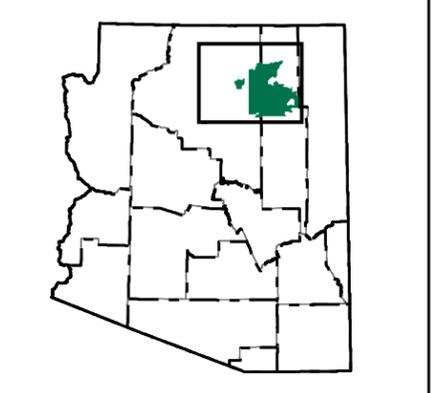


Figure 8-5
 Wells and Springs on and Near
 the Hopi Indian Reservation
 Used for Municipal and
 Domestic Purposes

Preliminary Hopi HSR
 December 2008





August 1932



November 2001

Moenkopi Wash, near Tuba City



September 1914



July 2000

Little Colorado River, at Cameron



Figure 8-6
Changes to Riparian Vegetation near
the Hopi Indian Reservation
Preliminary Hopi HSR, December 2008

Source: Webb and others (2007).