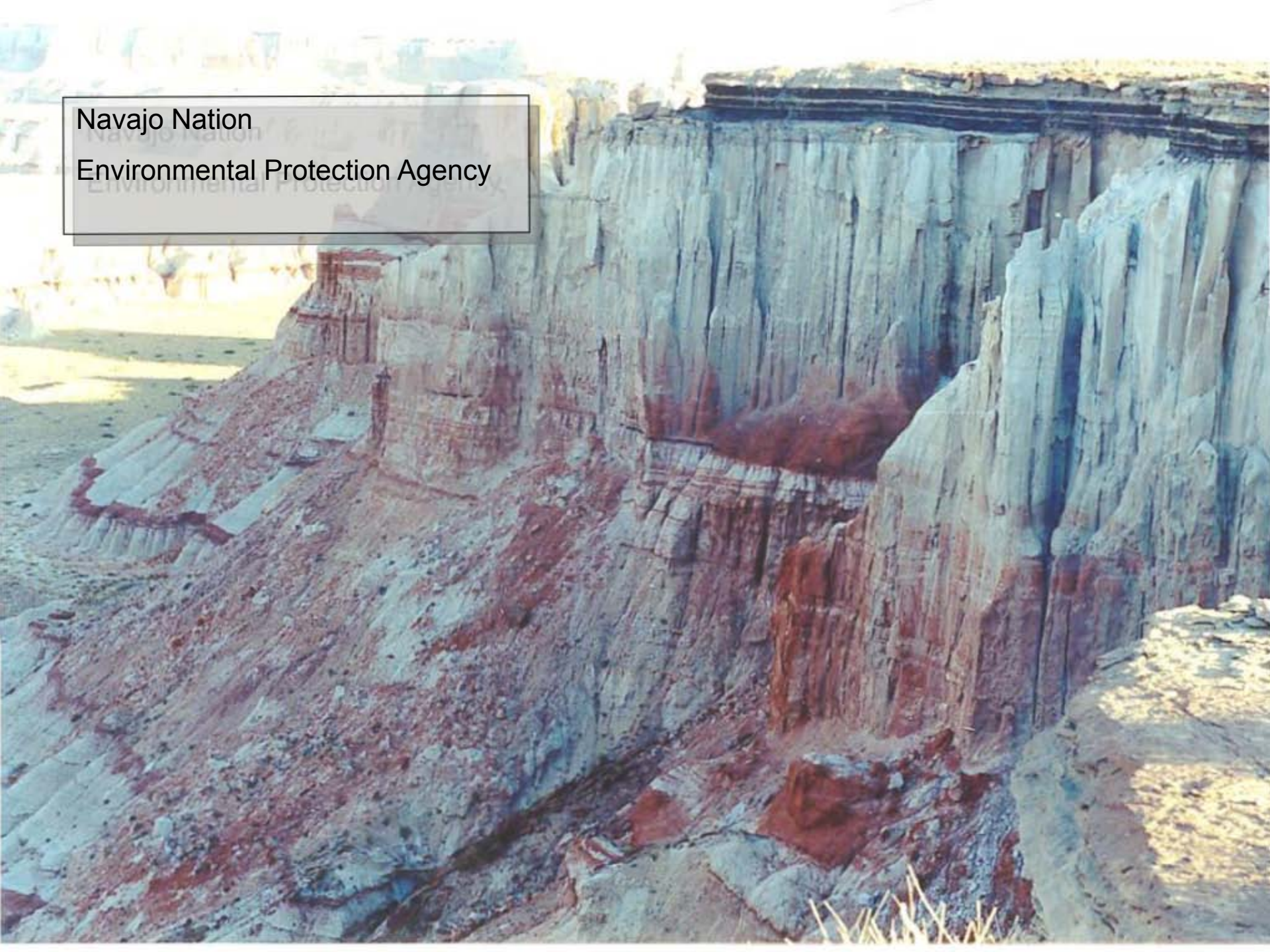


US EPA ARCHIVE DOCUMENT

Navajo Nation

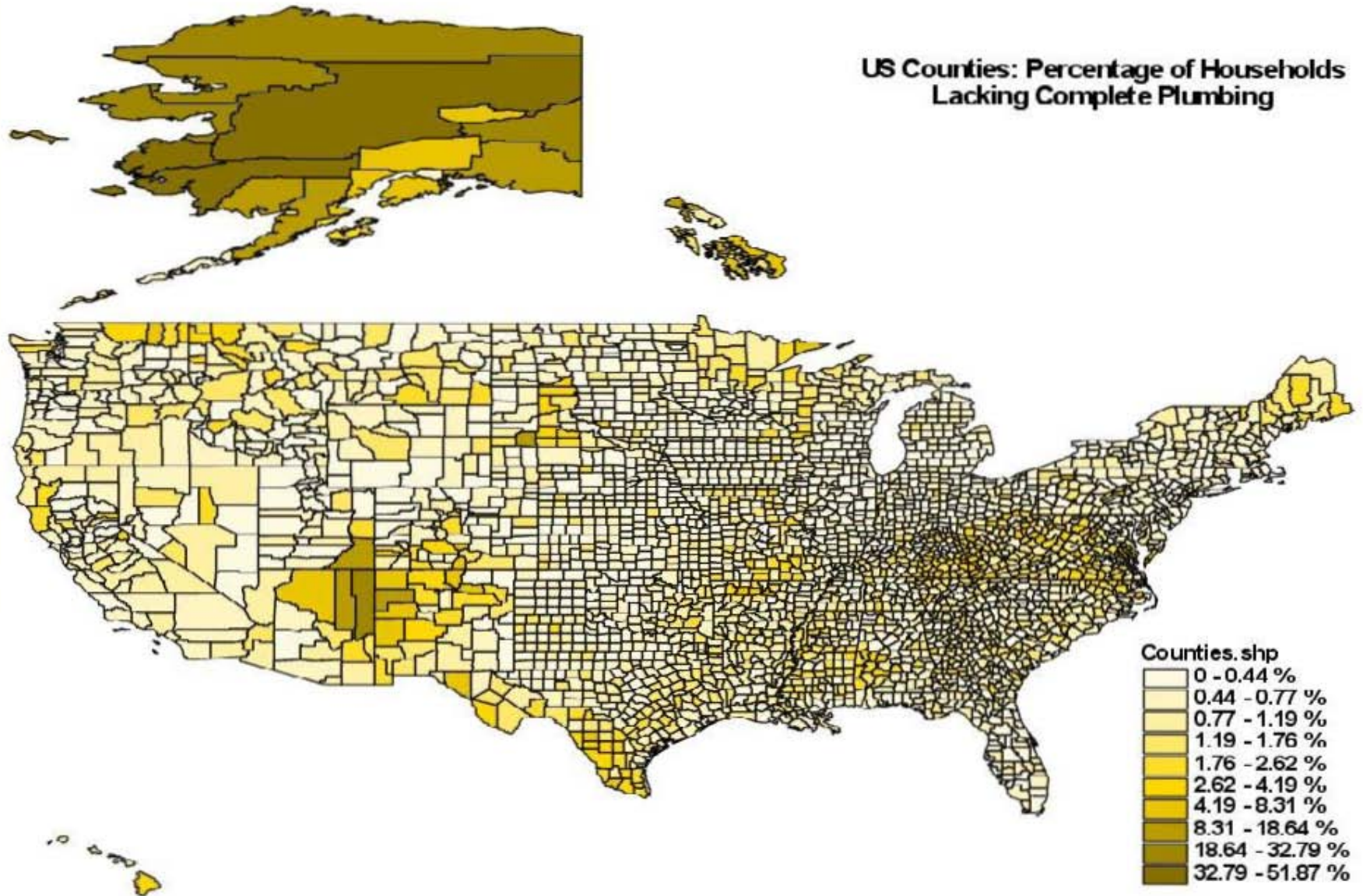
Environmental Protection Agency



Navajo Nation Environmental Protection Agency

- ◆ Public Water Systems Supervision Program within the:
 - ◆ Surface and Ground Water Protection Department
- ◆ (928) 871-7755
- ◆ Email: ybarney@navajopublicwater.org
- ◆ www.navajopublicwater.org

US Hot Spots Lacking Plumbing Facilities



Water Hauling on Navajo Nation

- 91% public water systems (PWS) are compliant with SDWA
- 30% households are not connected to a PWS
 - ~ 14,347 households and 54,000 people without potable water
- Many connected households haul water
 - Cost or taste of treated



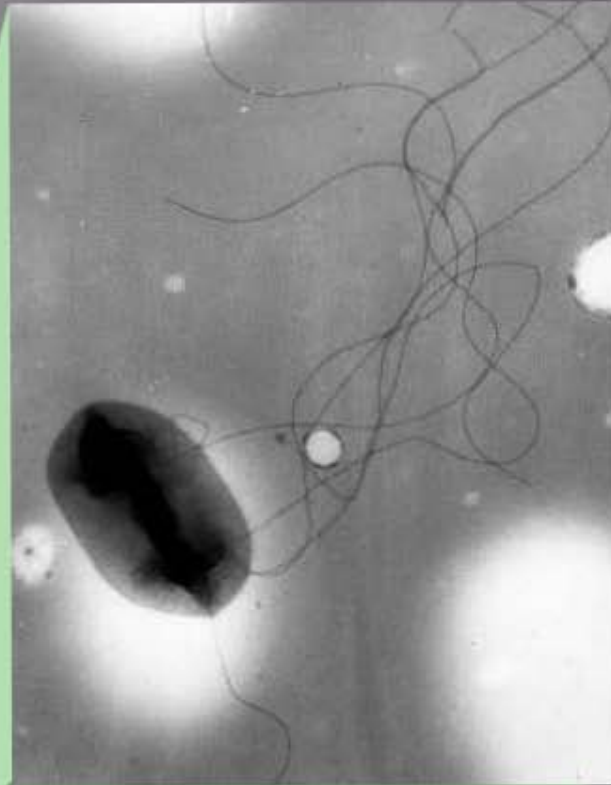
Public Health Concerns Related to Water Hauling

- Use of unregulated, untreated source water
 - Mainly livestock wells and natural springs
 - Not approved for human consumption
 - May contain bacteria and chemicals (natural arsenic and uranium)
- Unsafe storage and handling

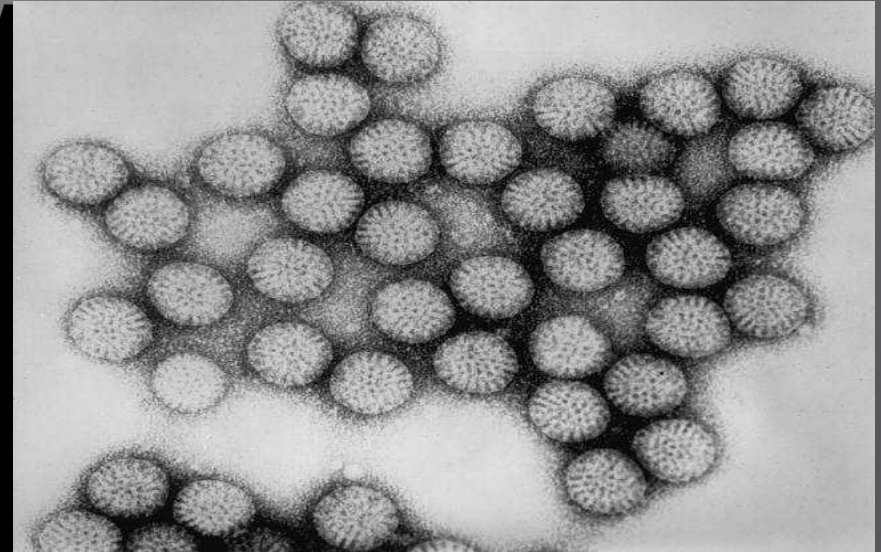


What contaminants are people exposed to when drinking unregulated water on Navajo Nation?

Bacteria



Viruses



Protozoa



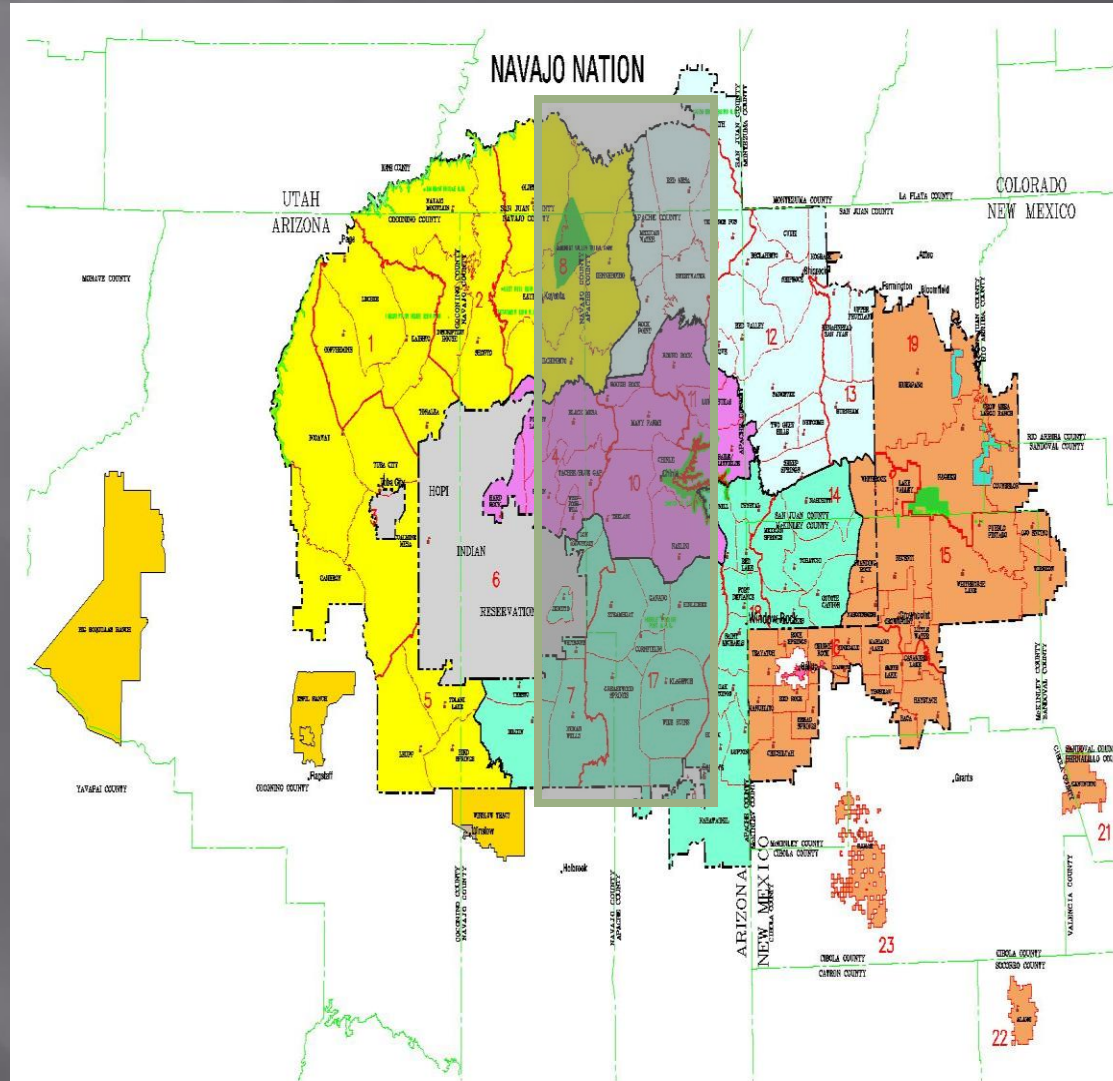
Giardia



Cryptosporidium

Survey of Unregulated Drinking Water 2006-2007

- Targeted risk area for natural contaminants
- Surveyed 229 water sources
- Tested water from 199 sources
- All water samples tested for chemicals
- 188 (94%) samples tested for bacteria



Bacterial Analysis

Total # of samples tested for bacteria	Samples positive for <i>E. coli</i>	Samples positive for total coliforms
188	40 (21%)	144 (77%)

- ▣ Results high compared to bacterial contamination seen in non-Navajo domestic wells
 - 11% *E. coli* and 41% total coliforms
- ▣ No relationship between bacterial contamination and well characteristics

Arsenic and Uranium Analysis

TOTAL # SAMPLES = 199

EPA drinking water standards	N (%) sources exceeding standard	Maximum level
Arsenic \geq 10ug/L	24 (12%)	Max = 190 ug/L
Uranium \geq 30ug/L	9 (5%)	Max = 260 ug/L

Survey of Unregulated Drinking Water

- Widespread bacteria found
- 24 wells (12%) exceeded the arsenic standard
- 9 (5%) exceeded the uranium standard
- High contamination in Red Mesa, Dennehotso, Ganado, Steamboat, Greasewood

To what extent does
contamination of unregulated
water sources impact human
health?

Household Investigation of Drinking Water Exposures

- ▣ Target highest risk chapters
 - Red Mesa, Dennehotso, Steamboat, Greasewood, Ganado

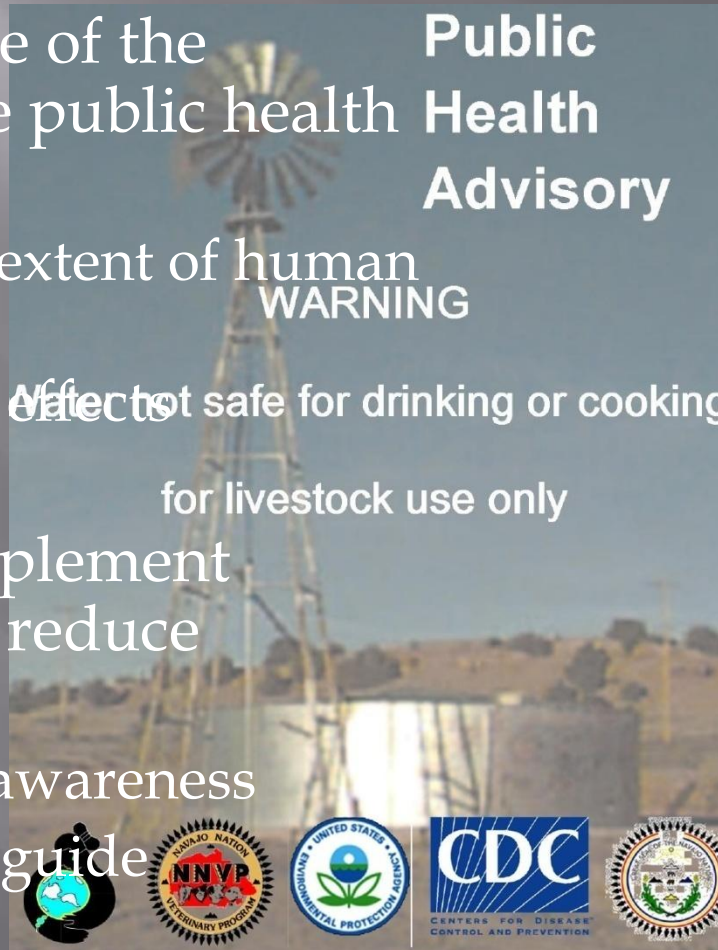
- ▣ Assess human exposure to arsenic, uranium and bacteria in drinking water

- ▣ Collaboration Navajo EPA, Navajo Division of Health, Navajo Epidemiology Center, IHS, CDC



Goals and Objectives

- ▣ Asses magnitude of the problem and the public health impact
 - Determine the extent of human exposure
 - Identify health effects
- ▣ Develop and implement interventions to reduce exposure
 - Initiate public awareness
 - Collect data to guide interventions
 - Collect data to justify resources



Benefits to Communities

- ▣ Identify additional contaminated wells in the community
 - Public Awareness
 - Interventions to limit exposure
- ▣ Characterize barriers to safe water in community
 - Address those barriers and improve access to safe water



US Standards (EPA)

Water

Uranium – 30 ug/L, as of 2003

Gross alpha radioactivity – 15 pCi/L

Radium 226/228 – 5 pCi/L

Air

Uranium 10 mrem/year

Total Radionuclides – 10 mrem/year

Radon (indoor) – 4 pCi/L



**WATER FROM
THIS WELL
IS NOT SAFE
TO DRINK**

This water has been tested and found to exceed Navajo EPA and U.S.EPA human drinking water standards for uranium or other contaminants.

Navajo Nation policy is that livestock-use-only wells are not to be used for human drinking water.

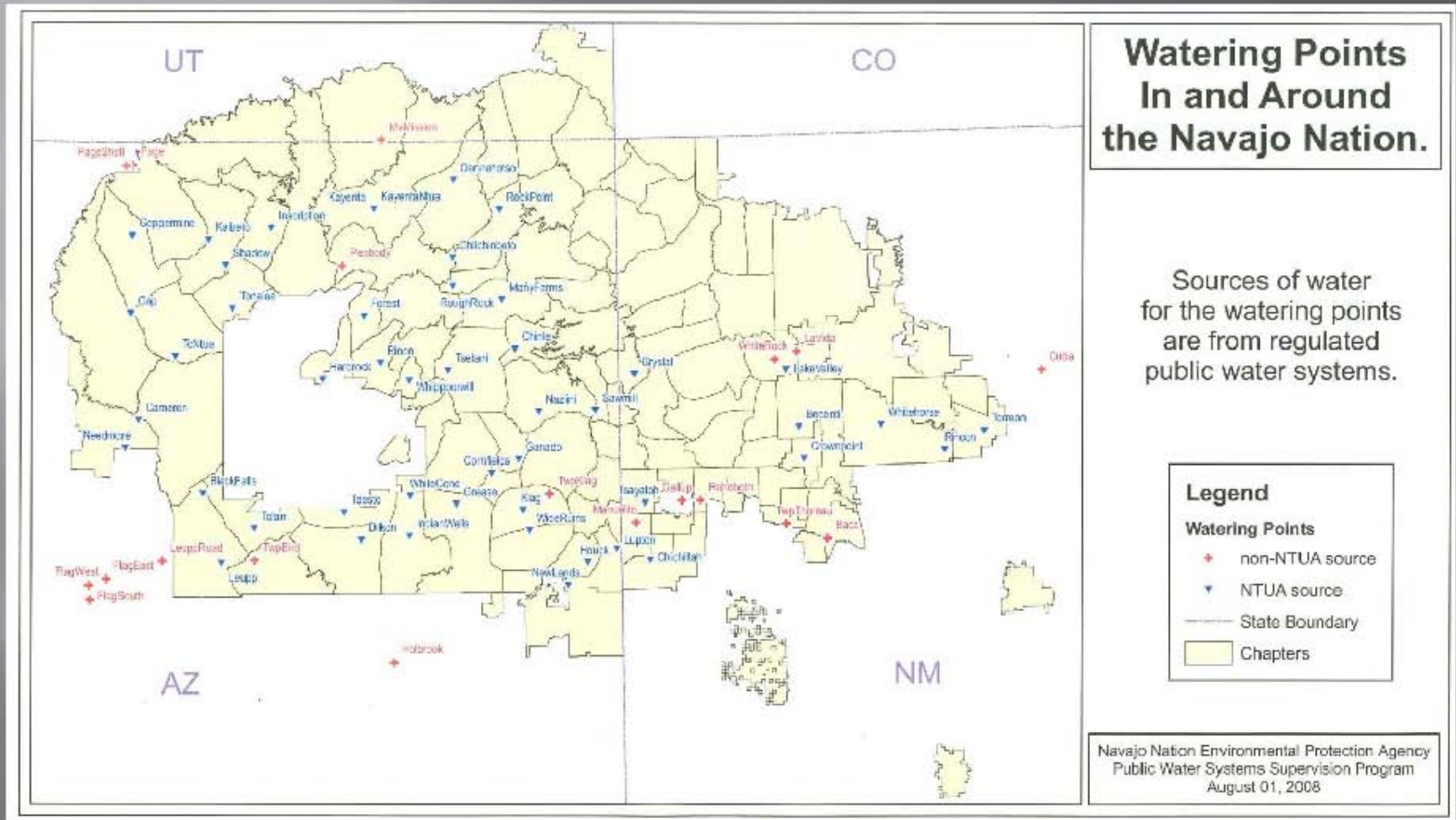
Public Health Advisory

WARNING

Water not safe for drinking or cooking
for livestock use only



Recommended Watering Points



Watering Points In and Around the Navajo Nation.

Sources of water for the watering points are from regulated public water systems.

Legend

- ♦ non-NTUA source
- ▼ NTUA source
- State Boundary
- Chapters

Navajo Nation Environmental Protection Agency
Public Water Systems Supervision Program
August 01, 2008

