

US EPA ARCHIVE DOCUMENT

Section 17 Projects: Old Church Rock Mine and Downwind Structures

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Navajo Superfund Program - Site Assessment

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Waste Regulatory Compliance Dept.

Navajo Nation

Environmental Protection Agency

Day After Heavy Rain



August 2, 2006



Waste Material:
Height: 8-12 feet
Length: 370 feet

Flood mark
↓

Exposure Measurements:
65-110 $\mu\text{R/hr}$ (bank)
30-65 $\mu\text{R/hr}$ (sediment)

Background=12-15 microRoentgens per hour ($\mu\text{R/hr}$)

**Dry Ponds On-site
(unreclaimed)**



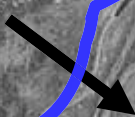
320 μ R/hr



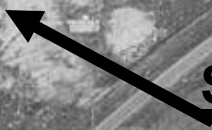
**White Waste Material in Bank
(Stratum: 3' thick & 30' length)**

Old Church Rock Mine

Settling (dry) Ponds



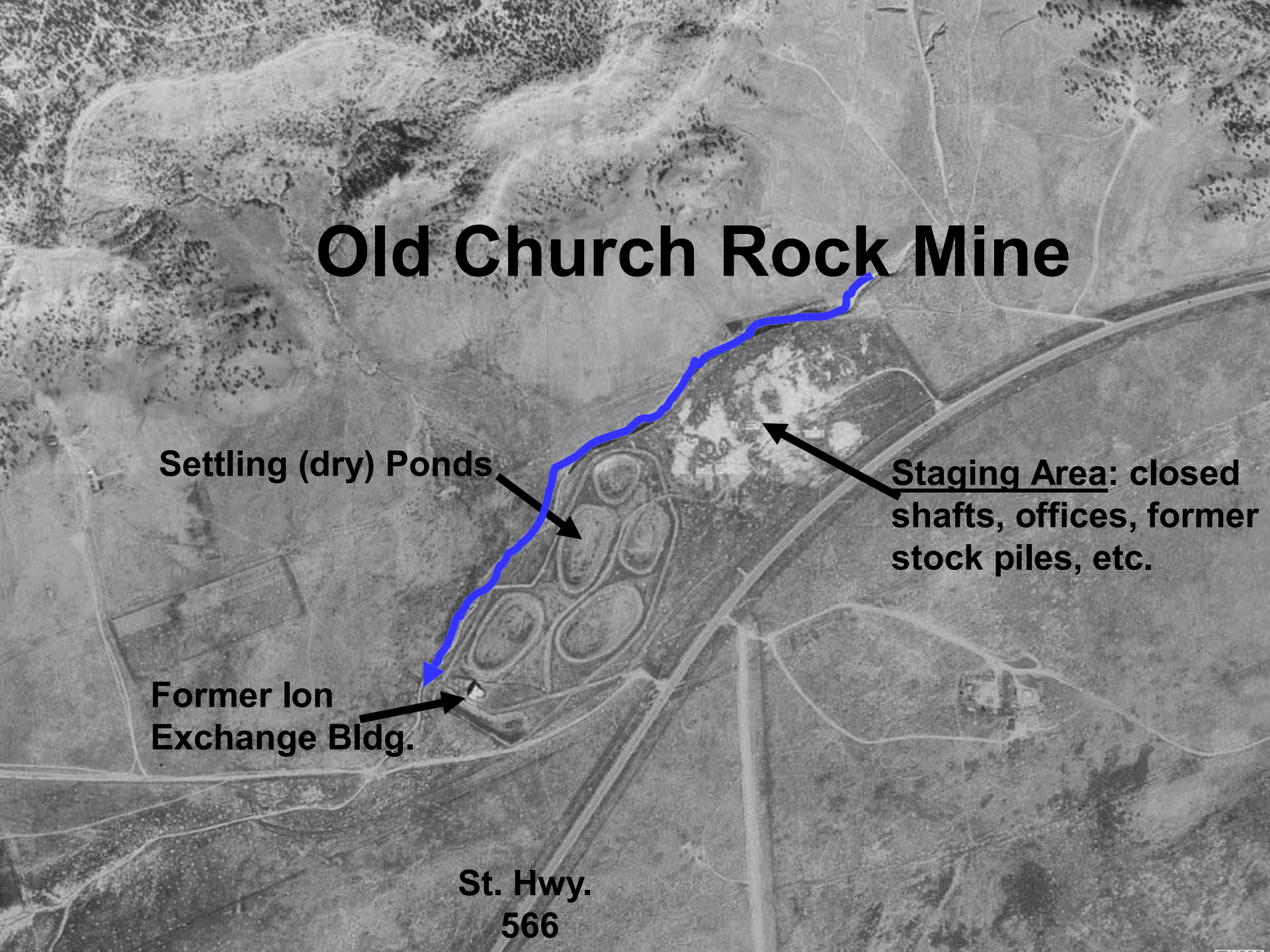
Staging Area: closed shafts, offices, former stock piles, etc.



Former Ion Exchange Bldg.



St. Hwy.
566



Scoping Survey done by Navajo Superfund Program March 2007

Bureau of Land Management

Navajo Trust Land

Residence


Navajo
Trust

Sec. 9

Sec. 16

State
Land

Sec. 8

Sec. 17

Residences


Former Ion
Exchange
Building


SITE

Hwy.
566

Residences


Township 16 North, Range 16 West

Establishing Survey Grid Points Inside OCRM Site



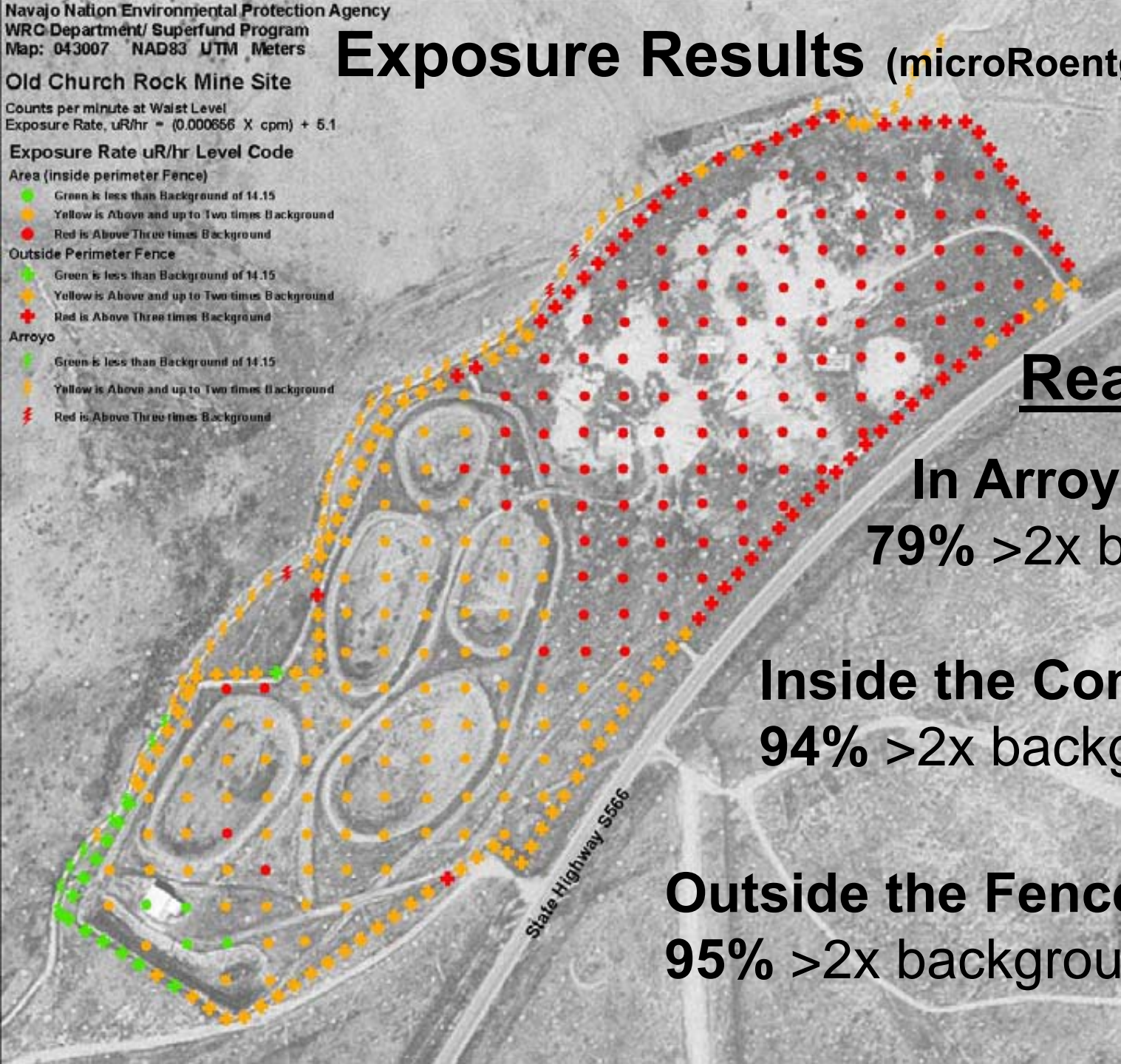
Old Church Rock Mine Site History

- Mined 1960-'62 by Phillips Petroleum Co.; Reopened 1976-'77 and 1979-'81 by United Nuclear Corporation (UNC)
- Underground mining (800 ft.- 900 ft. shafts) with on-site processing
- Ore production was 77,965 tons
- Uranium Resources Inc. (URI) now owns the subsurface mineral rights

Exposure Results (microRoentgens per hour)

Old Church Rock Mine Site
Counts per minute at Waist Level
Exposure Rate, uR/hr = (0.000856 X cpm) + 5.1

- Exposure Rate uR/hr Level Code**
- Area (inside perimeter Fence)**
- Green is less than Background of 14.15
 - Yellow is Above and up to Two times Background
 - Red is Above Three times Background
- Outside Perimeter Fence**
- Green is less than Background of 14.15
 - Yellow is Above and up to Two times Background
 - Red is Above Three times Background
- Arroyo**
- Green is less than Background of 14.15
 - Yellow is Above and up to Two times Background
 - Red is Above Three times Background



Readings:

In Arroyo

79% >2x background

Inside the Compound

94% >2x background

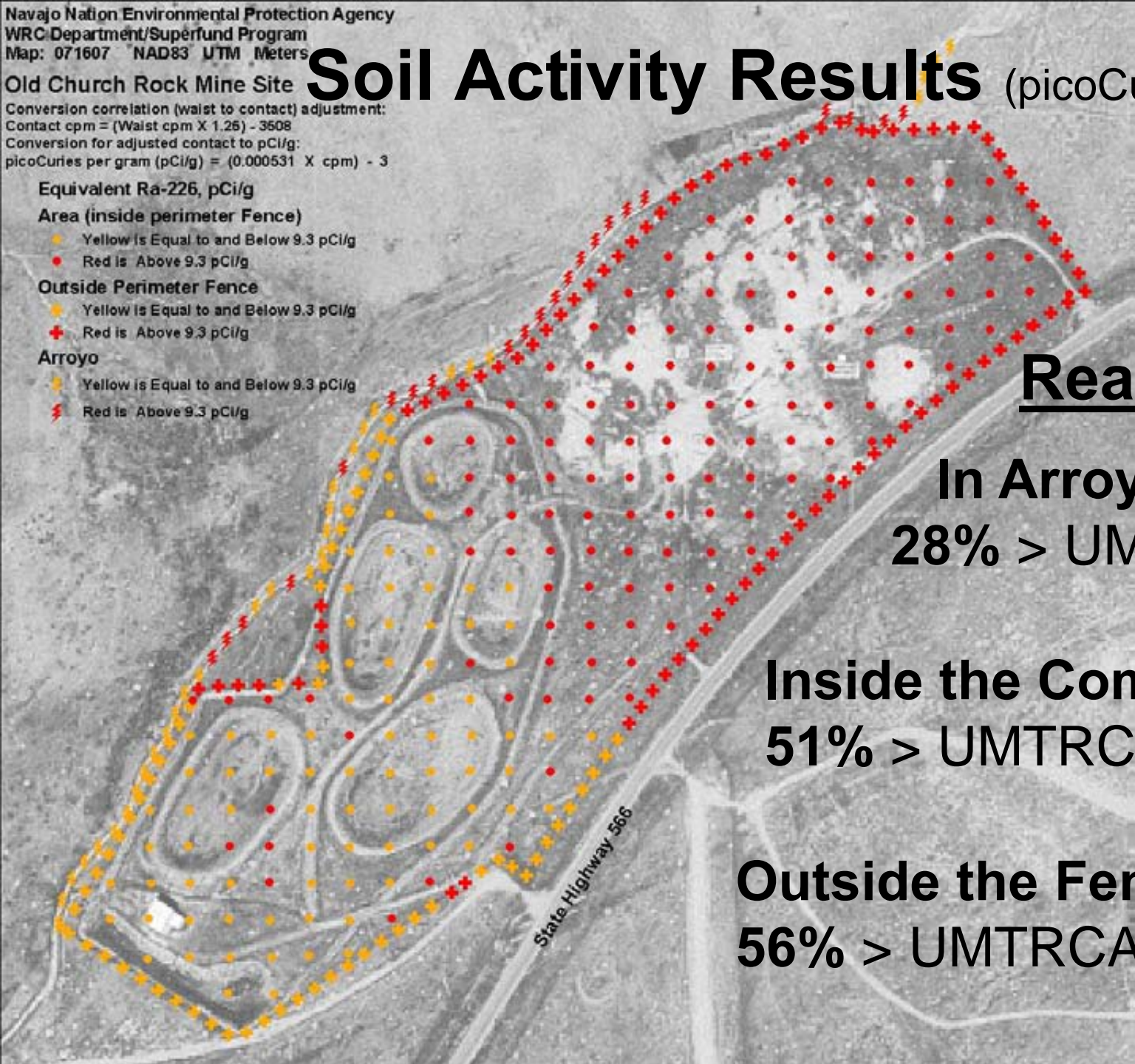
Outside the Fence Line

95% >2x background

Soil Activity Results (picoCurie per gram)

Old Church Rock Mine Site
Conversion correlation (waist to contact) adjustment:
Contact cpm = (Waist cpm X 1.26) - 3508
Conversion for adjusted contact to pCi/g:
picoCuries per gram (pCi/g) = (0.000531 X cpm) - 3

- Equivalent Ra-226, pCi/g**
- Area (inside perimeter Fence)**
 - Yellow is Equal to and Below 9.3 pCi/g
 - Red is Above 9.3 pCi/g
- Outside Perimeter Fence**
 - Yellow is Equal to and Below 9.3 pCi/g
 - Red is Above 9.3 pCi/g
- Arroyo**
 - Yellow is Equal to and Below 9.3 pCi/g
 - Red is Above 9.3 pCi/g



Readings:

In Arroyo
28% > UMTRCA std.

Inside the Compound
51% > UMTRCA standard

Outside the Fence Line
56% > UMTRCA standard

Community Concerns

- Radioactive contaminants being transported off-site by way of surface water and air
- Heavy metals in on-site dry ponds
- Still have mined ore rocks scattered in areas
- Residences are nearby and near a regional drainage (\approx mile downstream of site)
- Adjacent land used for agricultural purposes

**Phase I Site Characterization Work Plan
Old Church Rock Mine
McKinley County, New Mexico**



Prepared for:

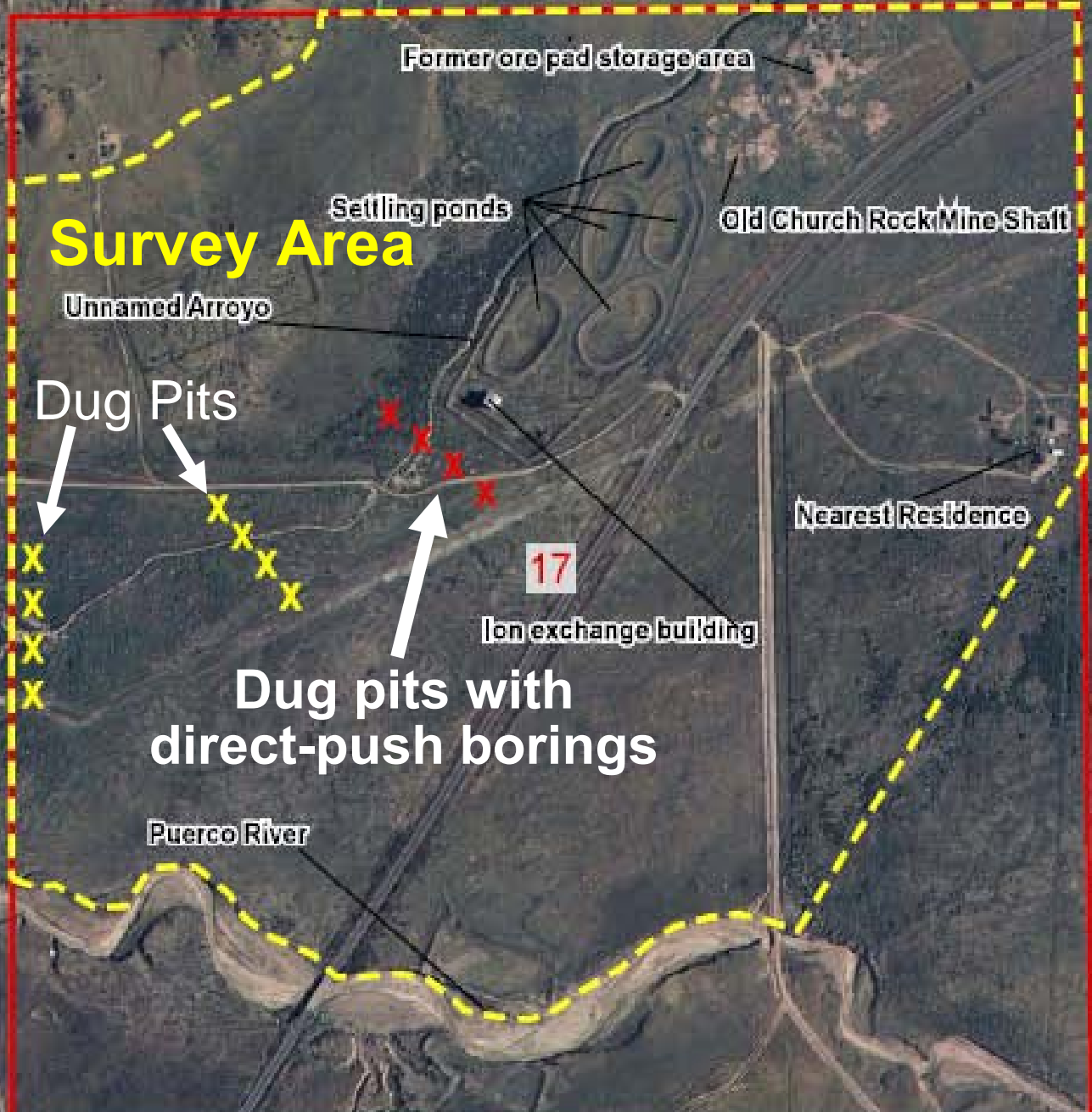
Uranium Resources Inc.
5041 Indian School Rd. NE
Albuquerque, NM 87110

Prepared by:



INTERA Incorporated
6000 Uptown Boulevard, NE
Suite 100
Albuquerque, New Mexico 87110

July 11, 2008



Former ore pad storage area

Survey Area

Settling ponds

Old Church Rock Mine Shaft

Unnamed Arroyo

Dug Pits

Nearest Residence

17

Ion exchange building

Dug pits with direct-push borings

Puerco River



Soil bores carried out with a direct-push equipment (GeoProbe)

Twelve Pits Were Dug



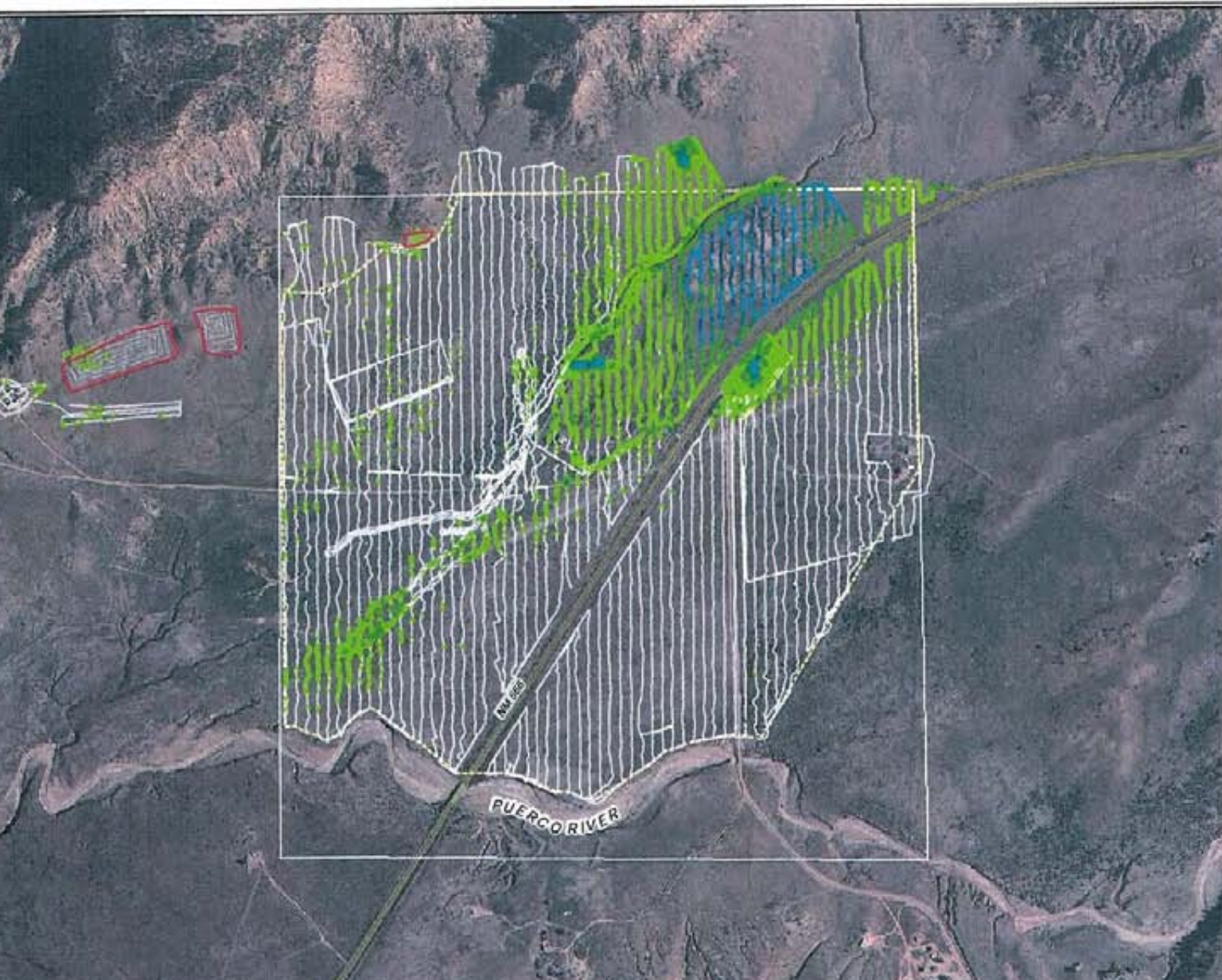


Data Collected w/Ratometer Connected to GPS Equipment

A black and white aerial photograph of a rugged, mountainous landscape. The terrain is characterized by steep, rocky slopes and a network of dry, winding gullies. A prominent road, shown as a dashed black line, curves from the bottom left towards the top right. In the upper right quadrant, a small cluster of buildings is visible, situated on a relatively flat area. The overall scene depicts a remote, high-altitude environment.

**1962 Aerial Photo
of OCRM Site and
its vicinity**

Results From Gamma Radiation Survey During May 2009



Source(s):
Aerial - EDAC, dated 2005.

Legend

0.5 Meter, Gross Gamma Survey

Gamma

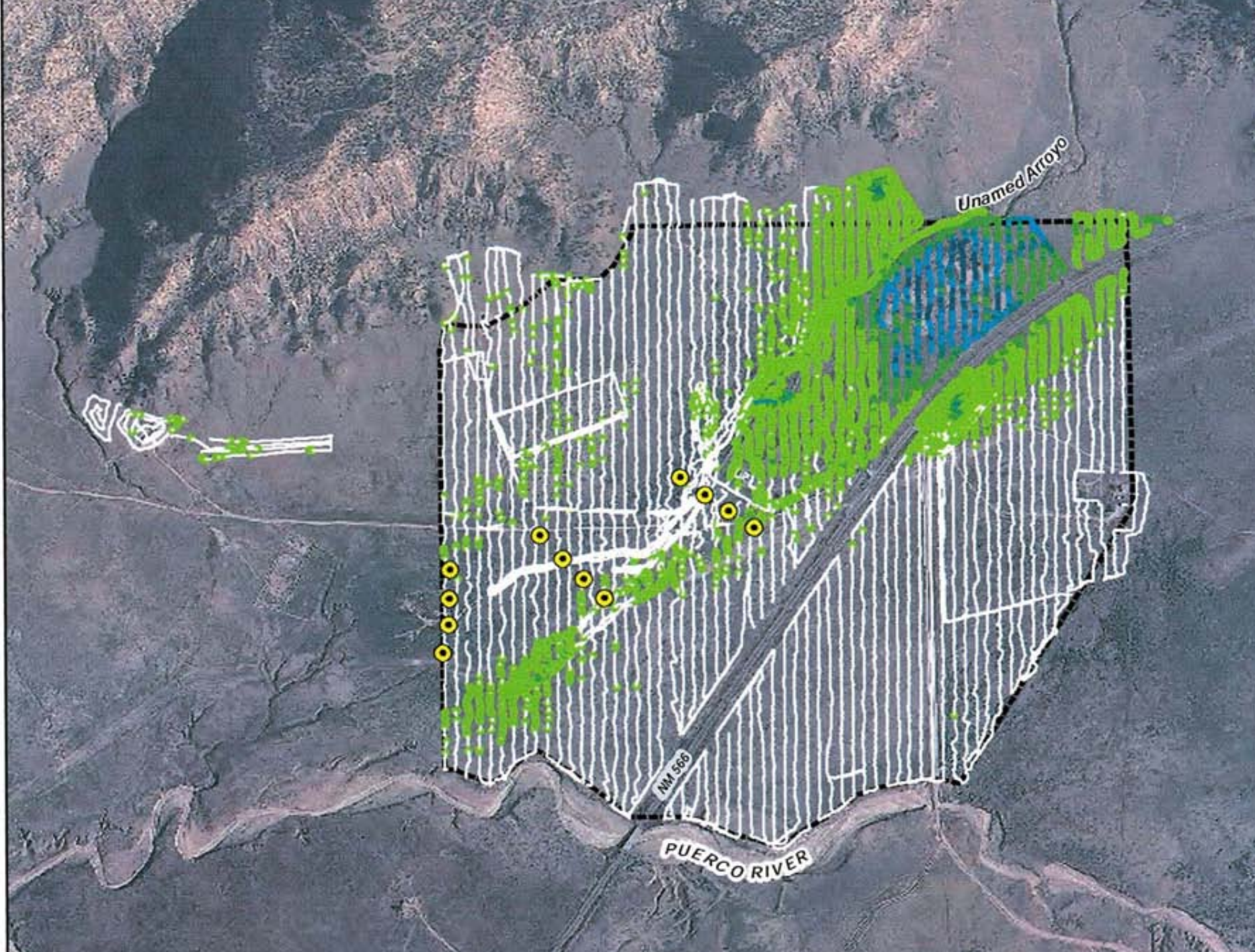
- <17,429
- 17,429 - 30,000
- 30,000 - 75,000
- 75,000 - 100,000
- 100,000 - 200,000
- >200,000

□ Background Gamma Survey Areas

□ Study Area Boundary

□ Section 17 Boundary

□ Roads

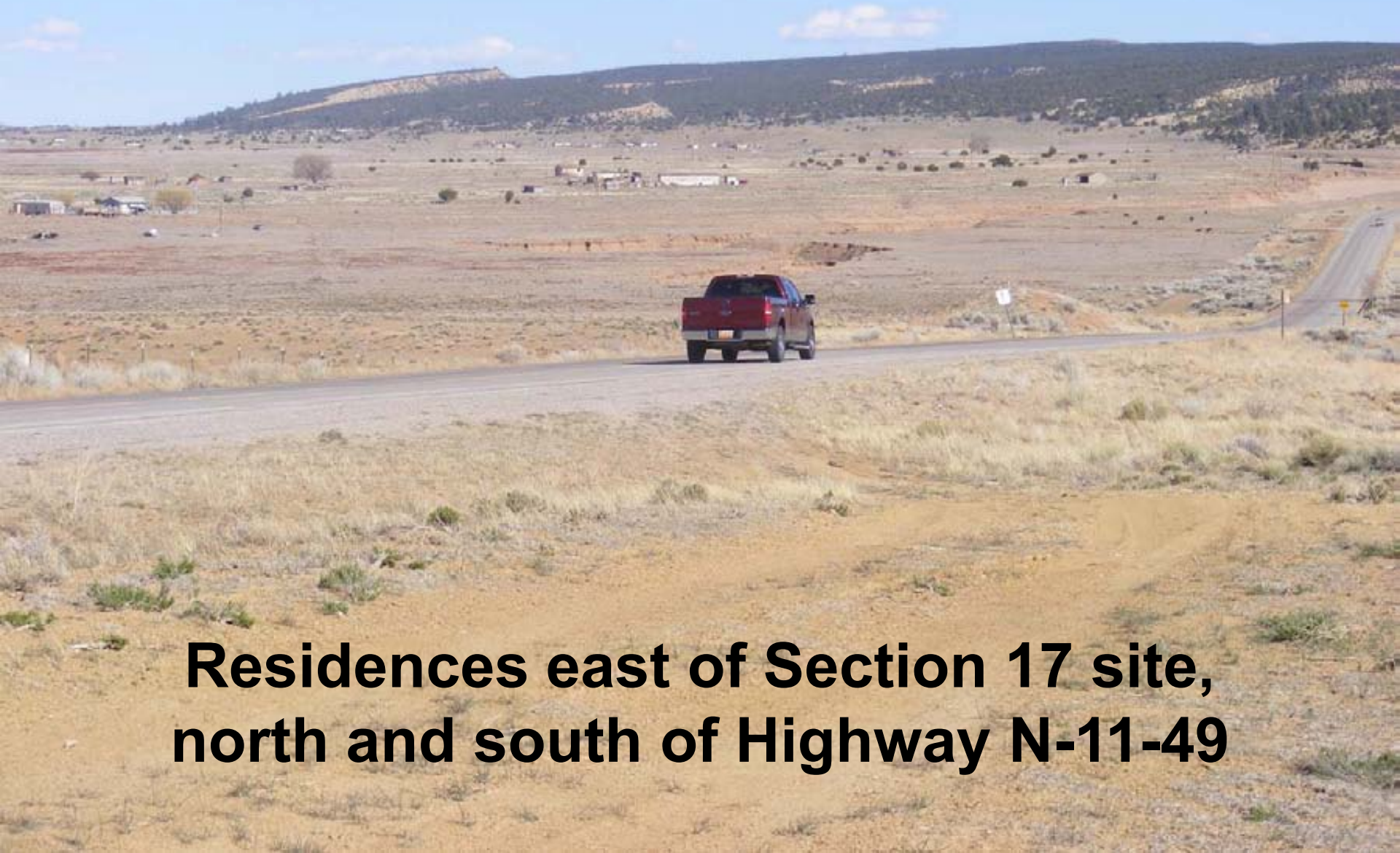


Unnamed Arroyo

NM 598

PUERCO RIVER

Associated Project: Radiological Survey Around Structures Downwind of Section 17



**Residences east of Section 17 site,
north and south of Highway N-11-49**



July 6, 2006 – Visit to Section 17 by the New Mexico Environment Department

Just So Happened ... 60+ MPH Winds That Day



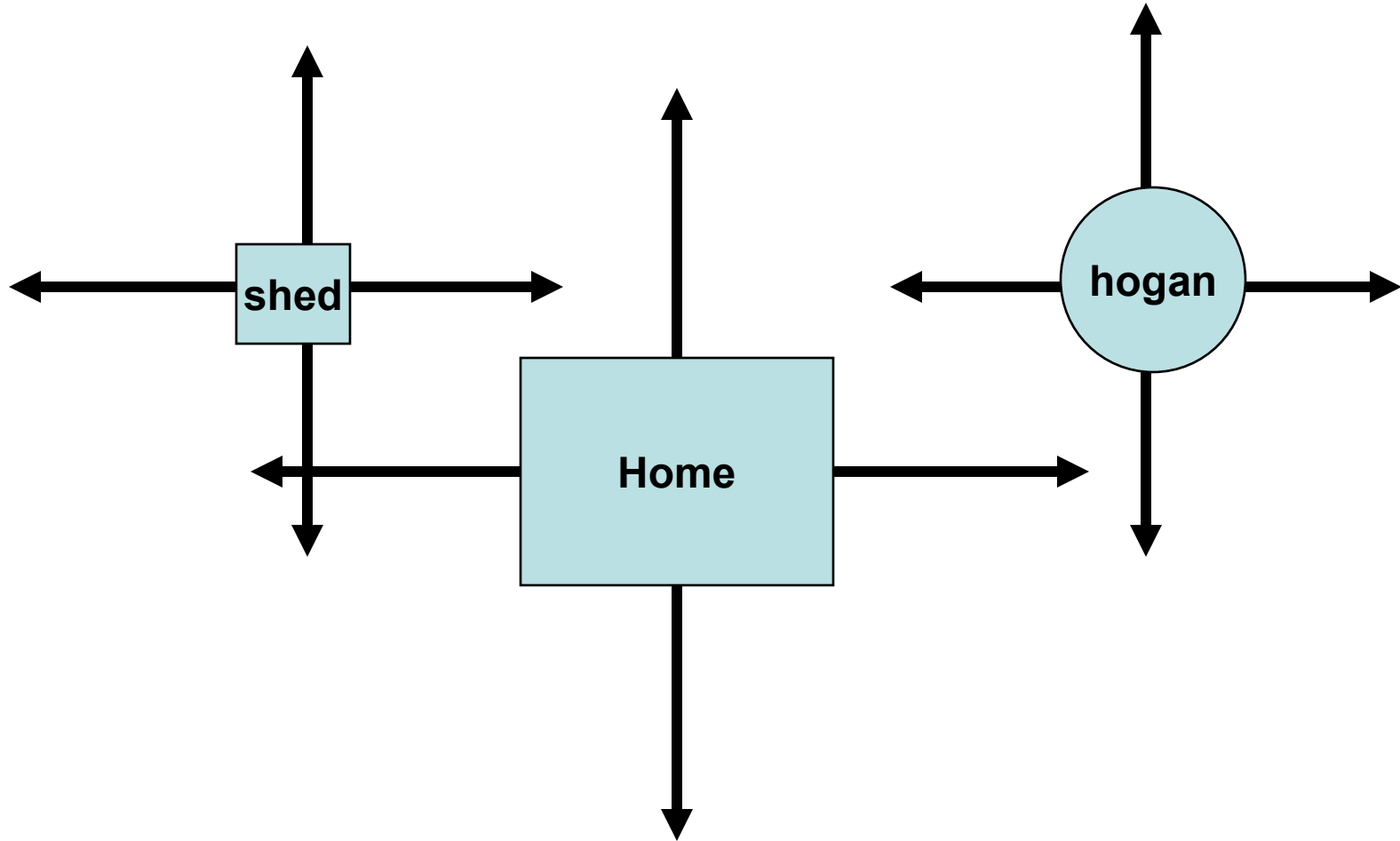


This event brought out the concern of windblown sand from Section 17 depositing at residences downwind



Radiological Survey to check on soils around structures, primarily main residences, hogans, storage buildings, and sheds.

Survey Method at Primary Structures



Reading collected every 10 feet over a 50-ft. length.