Figures

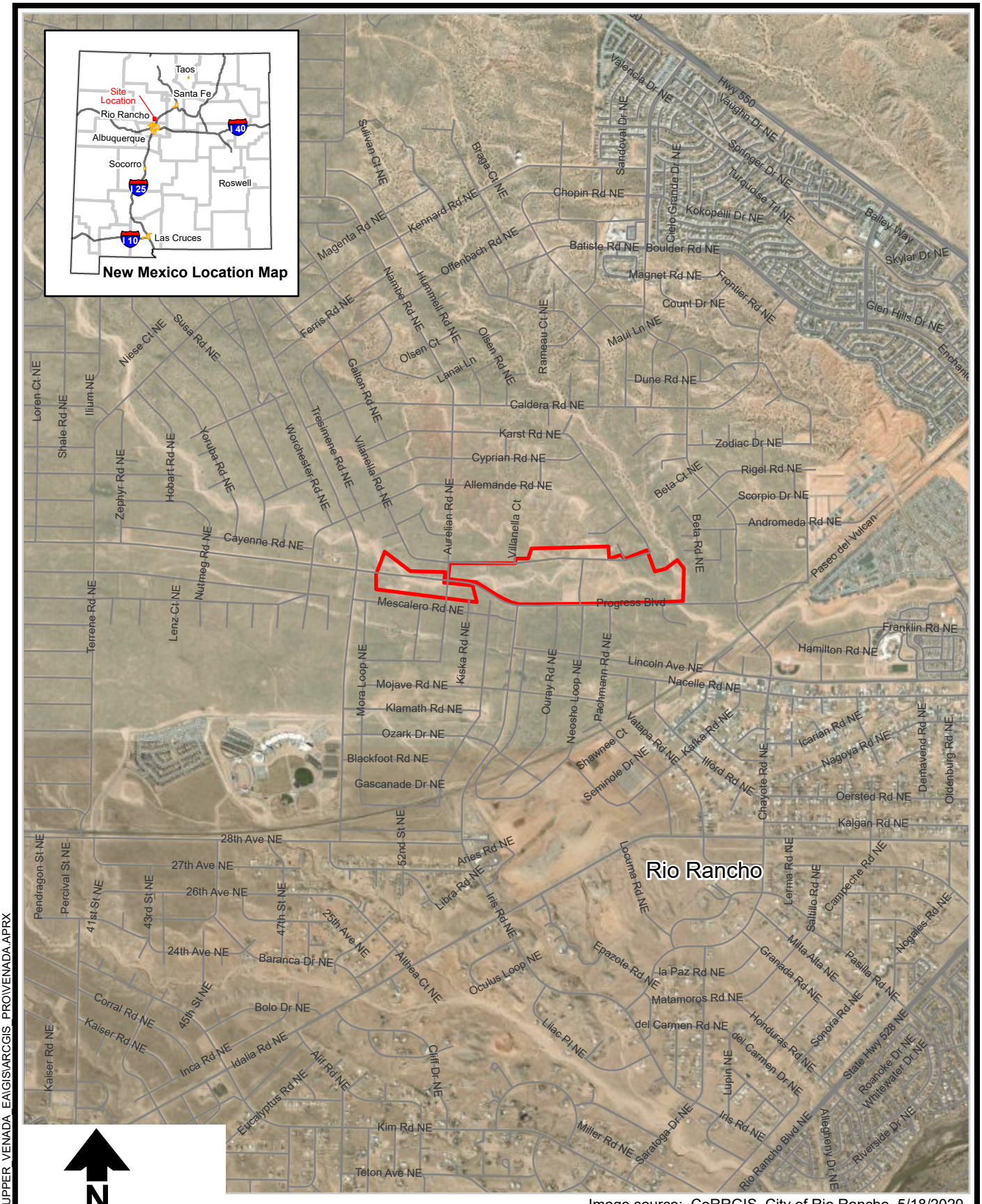

Image source: CoRRGIS, City of Rio Rancho, 5/18/2020

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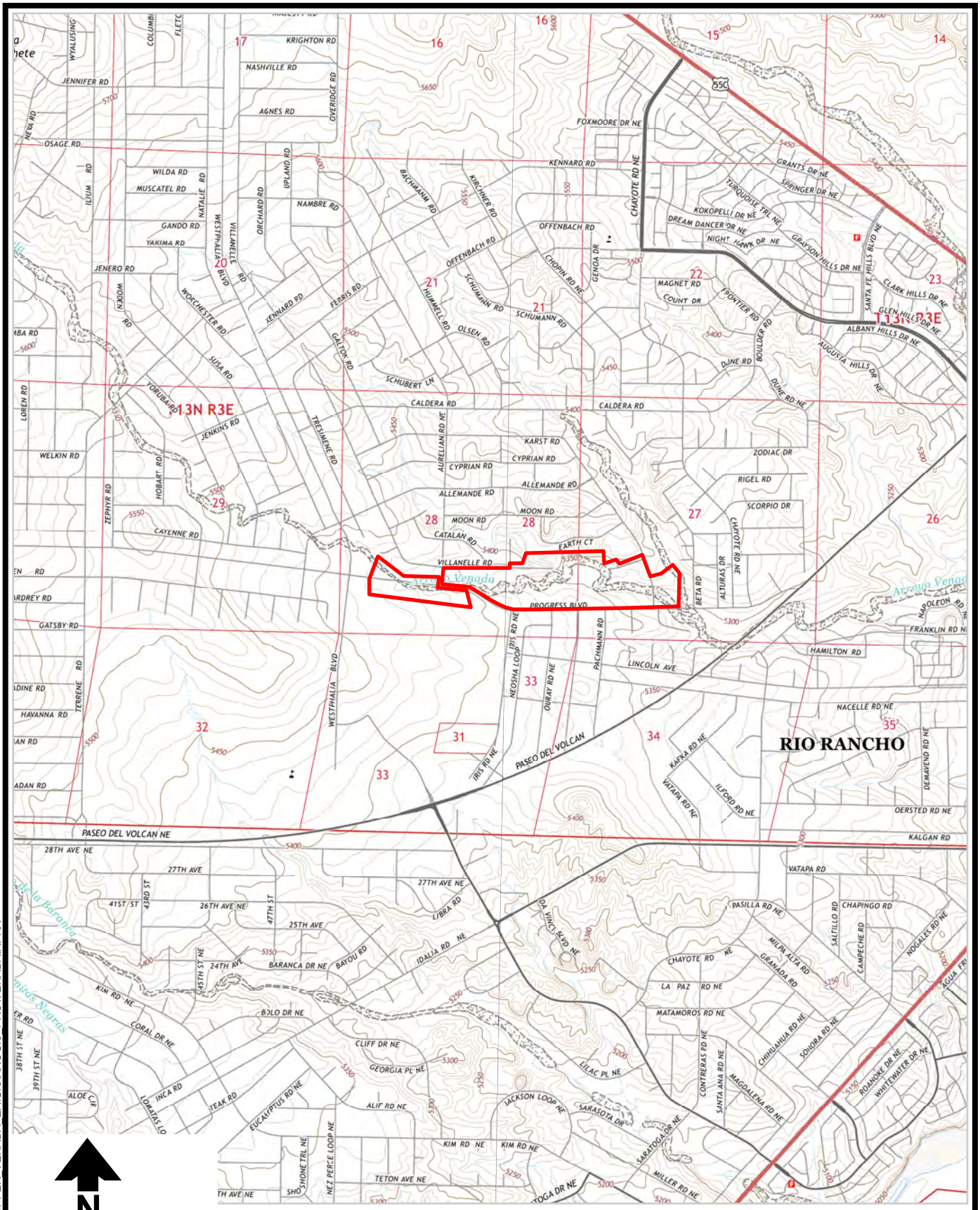
UPPER VENADA ENVIRONMENTAL ASSESSMENT

Area Map

DBS&A a Geo-Logic Company

3/7/2025 DB24.1253

Figure 1



N

0 1500 3000 ft

Explanation

Project area

Source: U.S. Geological Survey 7.5 Minute Quadrangle Map
US Topos NM Bernalillo 2013 and NM Loma Machete 2013
http://rgis.unm.edu/
Accessed 8 September 2022

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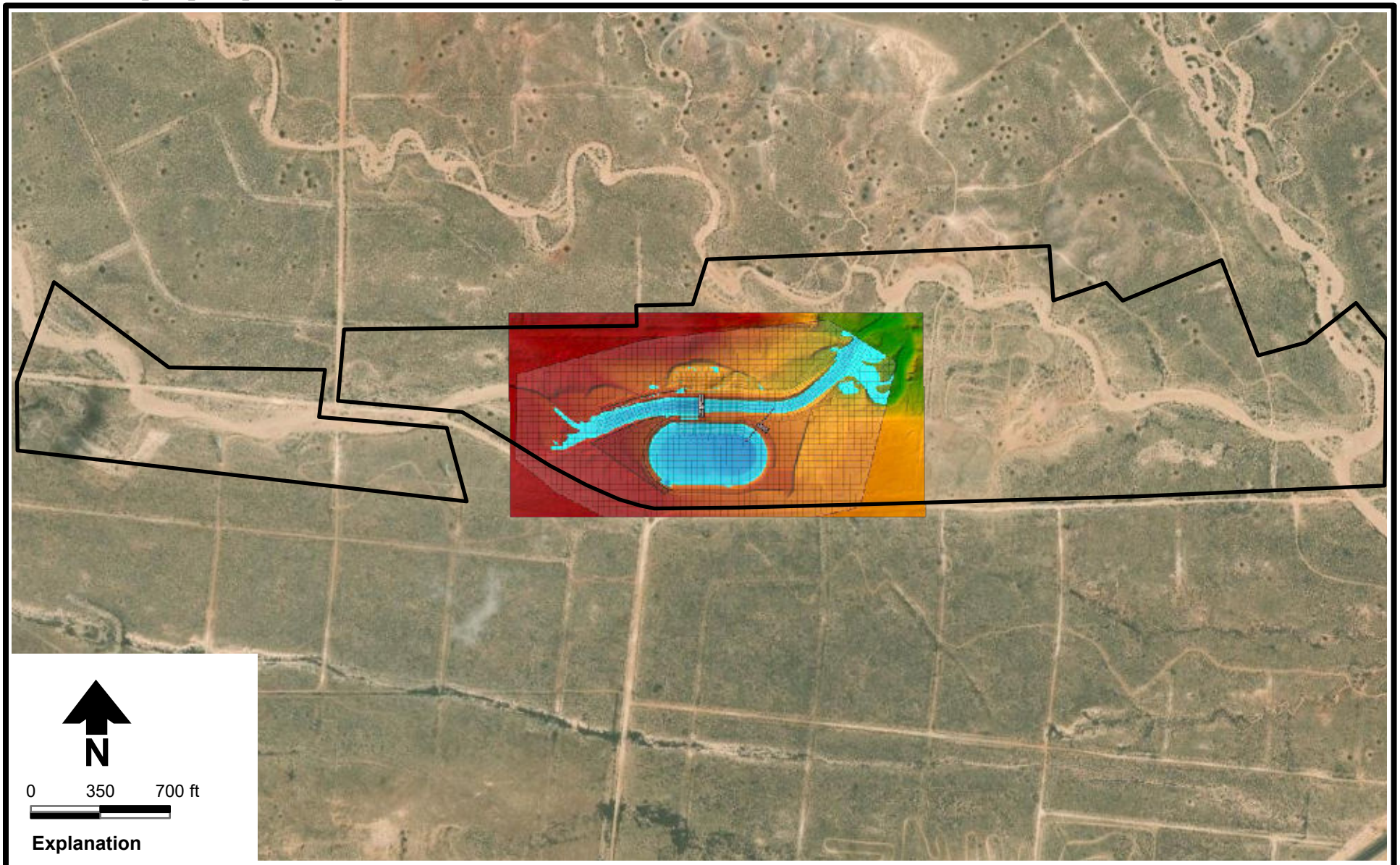
UPPER VENADA ENVIRONMENTAL ASSESSMENT

Topographic Map

Figure 2

S:\PROJECTS\DB22.1256_UPPER_VENADA_EA\GIS\ARCGIS_PRO\VENADA.APRX ● FIG 3 PREFERRED ALTERNATIVE



N

0 350 700 ft

Explanation

Project area

Aerial image: Maxar Vivid, 2/5/2024

Figure 3

UPPER VENADA ENVIRONMENTAL ASSESSMENT

Preferred Alternative Conceptual Design

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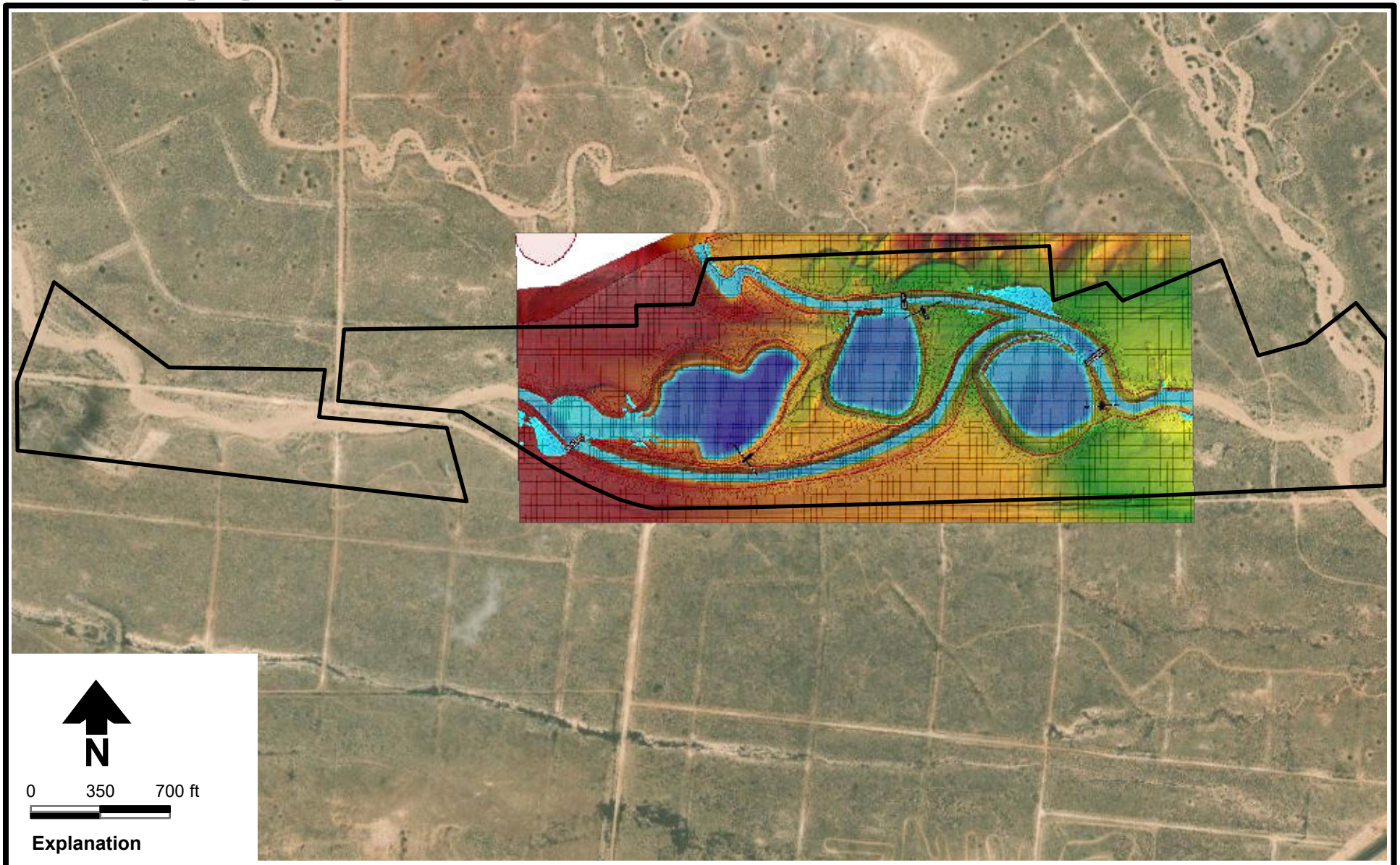
S:\PROJECTS\DB22.1256_UPPER_VENADA_EA\GIS\ARCGIS_PRO\VENADA.APRX ● FIG 4 THREE STORAGE POND ALTERNATIVE



N

0 350 700 ft

Explanation

Project area

Base image source: ESRI et al.

Figure 4

UPPER VENADA ENVIRONMENTAL ASSESSMENT

Three Storage Pond Alternative Conceptual Design

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3/6/2025 DB24.1253

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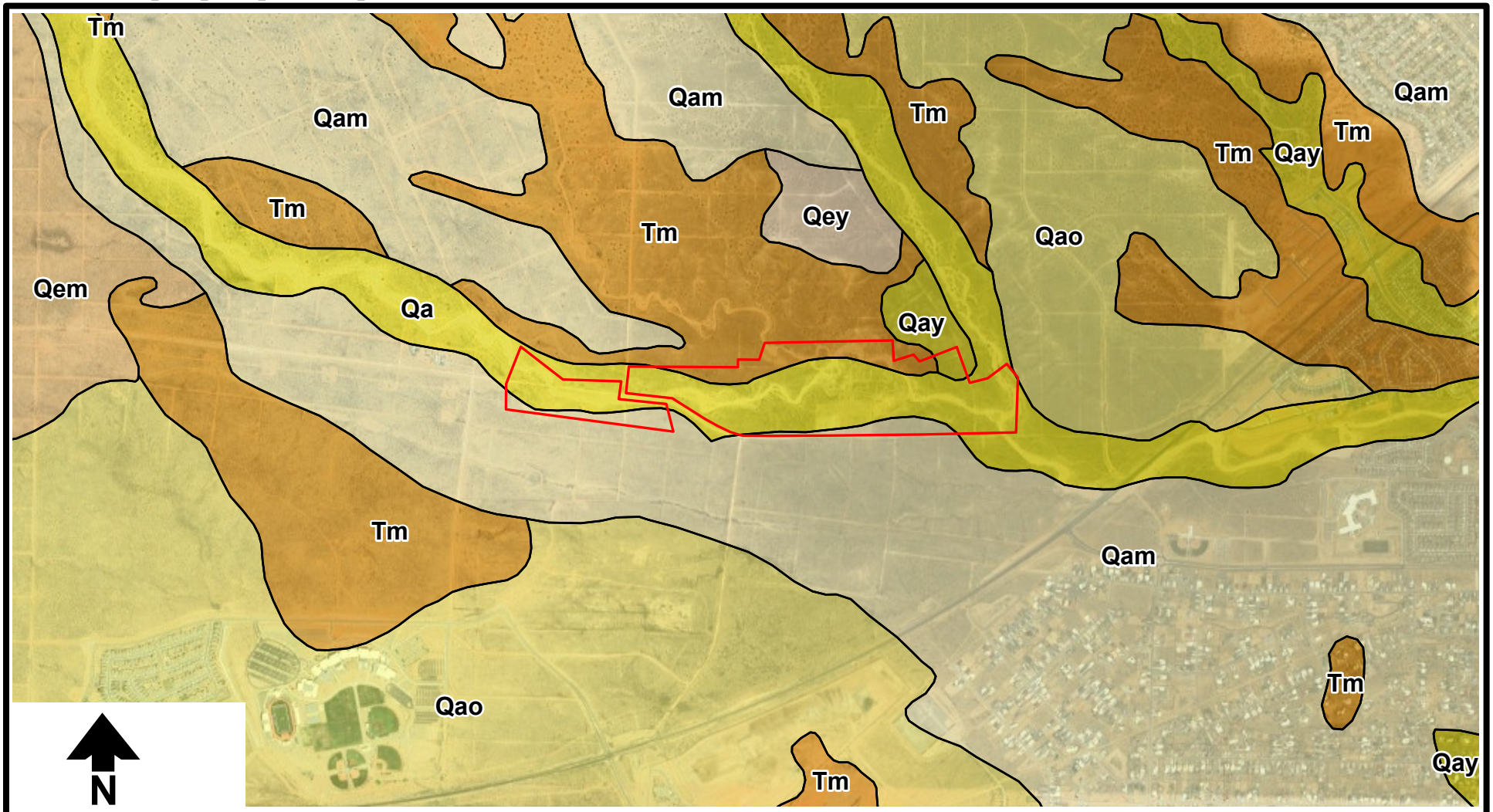

N

0 1000 2000 ft

Explanation

Project area

Tributary-stream alluvium (Holocene)	Qa
Medial-age slope alluvium (middle Pleistocene)	Qam
Old slope alluvium (middle to lower Pleistocene)	Qao
Young slope alluvium (upper Pleistocene)	Qay
Older eolian sand (middle Pleistocene)	Qem
Younger eolian sand (Holocene to upper Pleistocene)	Qey
"Middle red" formation (upper Miocene)	Tm

Image source: Google Earth Pro, 10/4/2020
Geology source: USGS
Geologic map of the Albuquerque 1:100,000-scale quadrangle, Bernalillo, Sandoval, Santa Fe, and Torrence Counties, New Mexico
Williams et al., 2005
http://pubs.usgs.gov/of/2005/1418/,
Accessed December 15, 2022

Figure 5

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3/6/2025 DB24.1253

UPPER VENADA ENVIRONMENTAL ASSESSMENT

Geology Map

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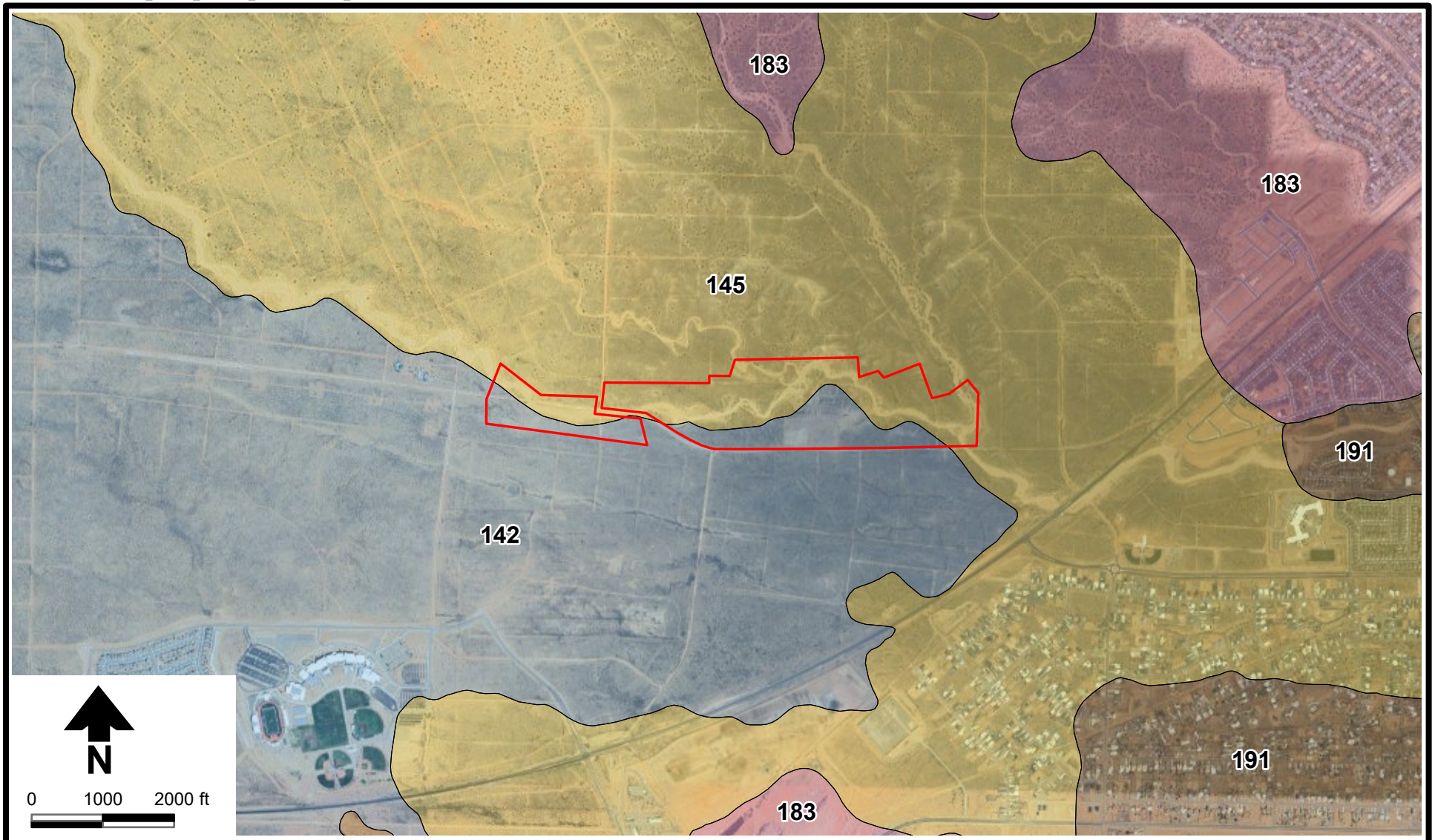

Explanation

Project area

145	Grieta-Sheppard loamy fine sands, 2 to 9 percent slopes
142	Grieta fine sandy loam, 1 to 4 percent slopes
183	Sheppard loamy fine sand, 8 to 15 percent slopes
191	Sheppard loamy fine sand, 3 to 8 percent slopes

Image source: Google Earth Pro, 10/4/2020
Soil Data Source: USDA,
SSurgo SSA version est.: 09/08/2022
https://websoilsurvey.sc.egov.usda.gov/
Accessed December 14, 2022

Figure 6

DBS&A
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3/6/2025 DB24.1253

UPPER VENADA ENVIRONMENTAL ASSESSMENT

Soils Map

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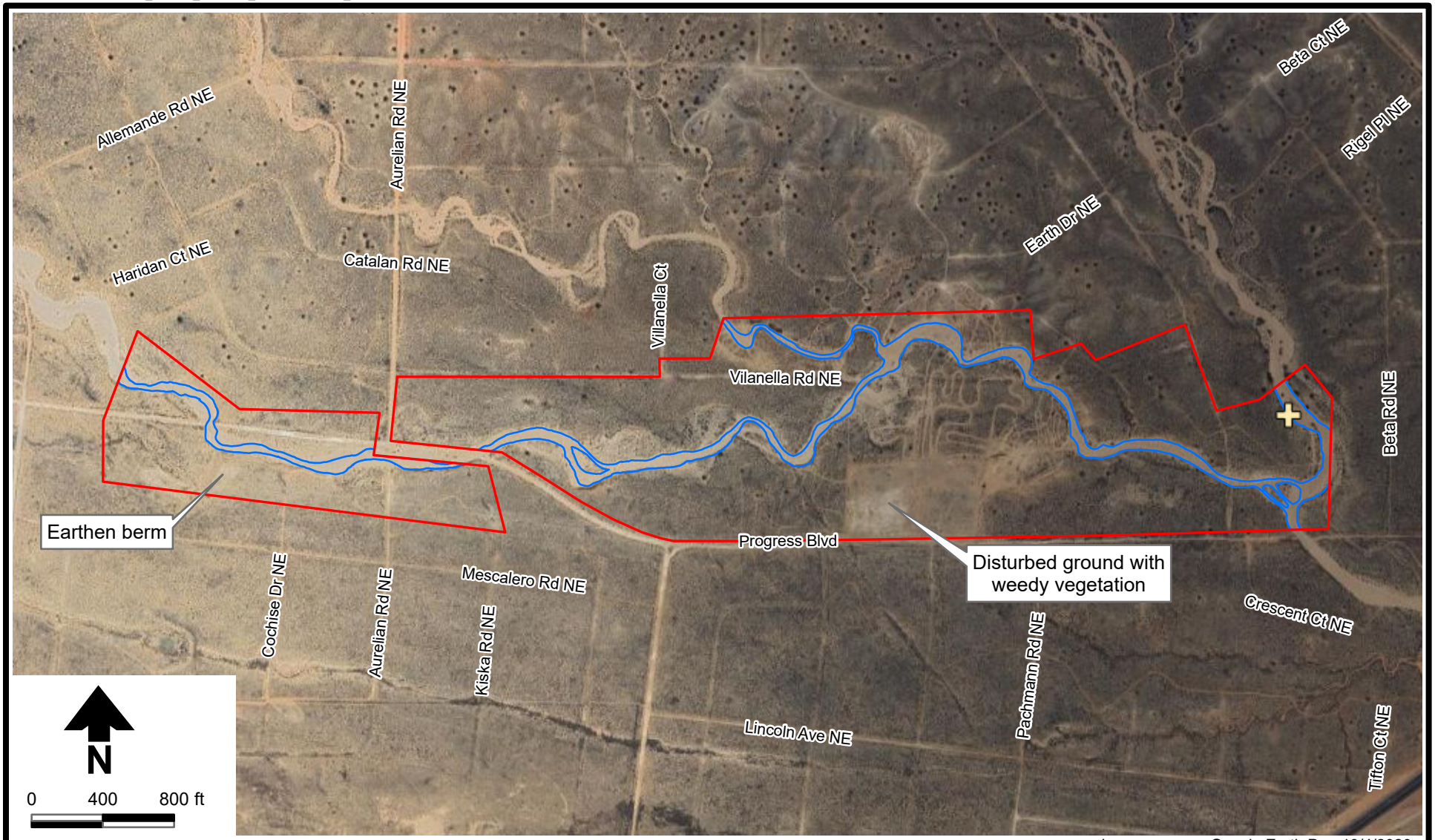

Image source: Google Earth Pro, 10/4/2020

Explanation

- Ordinary high water mark
- Project area
- Vacant nest

Figure 7

DBS&A
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3/6/2025 DB24.1253

UPPER VENADA ENVIRONMENTAL ASSESSMENT

Biological Survey

Tables

Table 1. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area
Page 1 of 4

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Birds	Southwestern willow flycatcher (*Empidonax trailii extimus*)	FE	Habitat for the southwestern willow flycatcher consists of dense riparian vegetation along rivers, streams, or other wetlands, where its diet consists primarily of insects. Suitable vegetation includes dense growth of willows (*Salix* spp.), arrow weed (*Pluchea sericea*), alder (*Alnus* spp.), and saltcedar (*Tamarix ramosissima*).	Unlikely to occur. The Project Area does not contain riparian vegetation or surface water.
	Yellow-billed cuckoo (*Coccyzus americanus*)	FT	The yellow-billed cuckoo is found in riparian habitat with multi-level canopy forest and dense understory.	Unlikely to occur. No riparian forest is present in the Project Area and Action Area.
	Mexican spotted owl (*Strix occidentalis*)	FT	Primarily within shaded, mesic, and cool canyons with steep sides that have mixed conifer, pine-oak, and riparian forest types. Forests used for roosting or nesting often contain moderate to high canopy closure, a wide range of tree sizes suggestive of uneven-age stands, large overstory trees of various species, and high plant species richness with adequate levels of residual plant cover to maintain fruits, seeds, and regeneration to provide for the needs of prey species for the owl.	Unlikely to occur. The Project Area does not harbor any shaded, mesic, and cool steep-sided canyon of forest patches with moderate to dense canopy cover.
Mammals	New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	FE	Habitat specialist using persistent emergent herbaceous wetlands and scrub-shrub wetlands on wet soil along perennial streams. Also uses patches of herbaceous vegetation dominated by sedges along water edges within willow and alder dominated habitats.	Unlikely to occur. The Project Area and Action Area do not contain emergent herbaceous wetlands, scrub-shrub wetlands, or willow and alder habitat containing sedges.
Reptiles	None			

Table 1. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area
Page 2 of 4

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Amphibians	Jemez Mountains salamander (*Plethodon neomexicanus*)	FE	The species is endemic to the Jemez Mountains, where it occurs in mixed conifer and spruce-fir forests above 7,200 feet in specific microhabitat conditions. Preferred microhabitat is generally characterized by relatively high humidity and soils with a specific rock structure.	Unlikely to occur. The Project Area and Action Area are not within the Jemez Mountains.
Fish	Rio Grande silvery minnow (*Hybognathus amarus*)	FE	The Rio Grande silvery minnow is found in the Middle Rio Grande.	Unlikely to occur. Upper Venada Arroyo is a tributary of the Rio Grande, but the Project Area is not near the confluence with the Rio Grande. It is an ephemeral drainage, and no aquatic habitat was observed during the survey.
	Rio Grande cutthroat trout *Oncorhynchus clarkii virginalis*	FC	The Rio Grande cutthroat trout is a subspecies of cutthroat trout, endemic to the Rio Grande, Pecos, and possibly the Canadian River Basins in New Mexico and Colorado.	Unlikely to occur. Upper Venada Arroyo is a tributary of the Rio Grande, but the Project Area is not near the confluence with the Rio Grande. It is an ephemeral drainage, and no aquatic habitat was observed during the survey.

Table 1. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area
Page 3 of 4

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Insects	Monarch (*Danaus plexippus*)	FP	Adult monarch butterflies during breeding and migration require a diversity of blooming nectar resources, which they feed on throughout their migration routes and breeding grounds (spring through fall). Monarchs also need milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat. The correct phenology, or timing, in the life cycle of monarchs and blooming of nectar plants and milkweed is important for monarch survival. New Mexico does not overlap any migration routes but contains summer breeding areas primarily in the eastern third of the state (USFWS, 2020). The US Fish and Wildlife Service has proposed to list the monarch butterfly as a threatened species with designated critical habitat	Unlikely to occur. New Mexico does not harbor any known migration routes, and there is no known breeding population in central New Mexico.. In addition the potential for milkweed plant species to be present is low. No milkweed was observed during the site survey.
	Suckley's cuckoo bumble bee (Bombus suckleyi)	FP	Suckley's cuckoo bumble bee (proposed for listing as endangered under the Endangered Species Act) is a semi-specialist obligate parasite known to usurp nests of Western bumble bees (*Bombus occidentalis*) and Nevada bumble bees (*Bombus nevadensis*). It requires a diversity of native floral resources (pollen and nectar) for nutrition. It is found in a wide variety of habitats, including montane meadows and prairies, farms, woodlands, boreal forests, active and fallow agricultural fields, and urban areas. The species has a broad distribution across North America, stretching from the Yukon down to Arizona and as far east as Newfoundland. The species has experienced an approximately 85 percent decline in occupancy range wide between 1900 and 2020 and has not been observed in the contiguous United States since 2016, despite an expanding survey effort throughout the range (USFWS, 2024).	Unlikely to occur. The Suckley's cuckoo bumble bee has not been observed in the contiguous United States since 2016. There are no historical occurrence records from New Mexico (The Xerces Society et al., 2017; Center for Biological Diversity, 2020).

Table 1. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area
Page 4 of 4

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Plants	None			

Federal designations: Federal Endangered Species Act, USFWS

FC = Federal candidate
FE = Federal endangered
FP = Federal proposed
FT = Federal threatened

Table 2. State Listed and Rare Plant Species Identified for Project Area and/or Action Area
Page 1 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Plants [a,b]	Wood lily (*Lilium philadelphicum*)	SE	The wood lily occurs in a wide variety of habitats from the Appalachian Mountains to the Rocky Mountains, in tallgrass prairies, open woods, thickets, and high mountain meadows. In New Mexico, the species is found in wetter habitat typical of the Rocky Mountains.	Unlikely to occur. The Project Area and Action Area do not have tallgrass prairies, open woods, thickets, and high mountain meadows, or any wetter habitat typical of the Rocky Mountains.
	Parish's alkali grass (*Puccinellia parishii*)	SE	The Parish's alkali grass requires alkaline springs, seeps, and seasonally wet areas that occur at the heads of drainages or on gentle slopes at 2,600 to 7,200 feet (800 to 2,200 meters) range-wide.	Unlikely to occur. The Project Area and Action Area do not have habitat containing alkaline springs or seeps or wet headwater areas.
	Brack's cactus (*Sclerocactus cloveriae subsp. brackii*)	SE	Sandy clay strata of the Nacimiento Formation in sparse shadscale scrub at 5,000 to 6,400 feet (1,500 to 1,950 meters).	Unlikely to occur. The Project Area and Action Area do not contain strata from the Nacimiento Formation.
	Gypsum Townsend's aster (Townsendia gypsophila)	SE	Weathered gypsum outcrops of the Jurassic-age Todilto and overlying Morrison formations. The largest populations occur on highly gypsiferous soils rather than pure gypsum. Smaller populations grow on Todilto gypsite, a highly pure, crustose form of gypsum.	Unlikely to occur. The Project Area and Action Area do not contain gypsum outcrops.
Invertebrates	None			
Fish	Rio Grande silvery minnow (*Hybognathus amarus*)	FE/SE	Rio Grande, beyond project limits and Action Area. The confluence with the Rio Grande is approximately 3.5 miles from the downstream end of project.	Unlikely to occur. The Venada Arroyo is a tributary of the Rio Grande, but the Project Area is not near the confluence with the Rio Grande, and it is an ephemeral drainage.

Table 2. State Listed and Rare Plant Species Identified for Project Area and/or Action Area
Page 2 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Amphibians	Jemez Mountains salamander (*Plethodon neomexicanus*)	FE/SE	The species is endemic to the Jemez Mountains, where it occurs in mixed conifer and spruce-fir forests above 7,200 feet in specific microhabitat conditions. Preferred microhabitat is generally characterized by relatively high humidity and soils with a specific rock structure.	Unlikely to occur. The Project Area and Action Area are not within the Jemez Mountains.
Mollusks	Wrinkled marshsnail (*Stagnicola caperata*)	SE	The species is known to occur only in the Cerro la Jara area of the Jemez Mountains, which is the key habitat area in the state.	Unlikely to occur. The Project Area and Action Area are not within the Jemez Mountains.
Mollusks (cont.)	Paper pondshell (*Utterbackia imbecillis*)	SE	The paper pondshell is strictly an aquatic species that inhabits mud, sand, and gravel substrates of lakes and rivers. The animals imbed themselves in softer substrates, with only the tip of the shell and the siphonal openings visible. Reproduction in freshwater mussels occurs with the release of larvae from the adult that disperse over the available environment. In New Mexico, it is known from the lower Canadian River at Conchas Reservoir (San Miguel County), the key habitat area of the state for the species. A population, likely introduced, was documented in the Middle Rio Grande near Rio Rancho, Sandoval County.	Unlikely to occur. The Project Area and Action Area have no consistently wetted softer substrates, mud, and gravel.
Reptiles	None			

Table 2. State Listed and Rare Plant Species Identified for Project Area and/or Action Area
Page 3 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Birds	Brown pelican (*Pelecanus occidentalis*)	SE	The brown pelican is found along seacoasts, lakes, and rivers. This species is a vagrant to New Mexico, having been verified at Bloomfield (San Juan Co.), Snow Lake (Catron Co.), and Bitter Lake National Wildlife Refuge; there are also records of the species near Cliff (Grant Co.), but is mostly found at large lakes or along major rivers, including in the San Juan, Gila, Rio Grande, and Pecos drainages.	Unlikely to occur. The Project Area does not contain surface water.
	Common black hawk (*Buteogallus anthracinus anthracinus)*	ST	The black hawk is found within wooded habitat along permanent streams. The species summers primarily at lower elevations in the Gila, San Francisco, and Mimbres drainages, which are key habitat areas.	Unlikely to occur. The Project Area does not contain surface water.
	Bald eagle (*Haliaeetus leucocephalus*)	ST	The bald eagle is usually found along seacoasts, lakes, and rivers. Nesting sites are usually isolated high in trees, on cliffs, or on pinnacles. The species is also associated with prairie dog colonies in New Mexico.	Unlikely to occur. The Project Area does not contain surface water or prairie dog colonies.
	Gray vireo (*Vireo vicinior*)	ST	In New Mexico, the gray vireo prefers open pinyon-juniper woodland or juniper savannah with a shrub component. In northwest New Mexico, gray vireos are found in broad-bottomed, flat or gently sloped canyons, in areas with rock outcroppings, or near ridgetops. In these areas, bitterbrush (*Purshia tridentate*), mountain mahogany (*Cercocarpus breviflorus*), Utah serviceberry (*Amelanchier utahensis*) and big sagebrush (*Artemisia tridentata*) are often present. Gray vireos are often found in areas of moderate shrub cover (35-45%) with large amounts of bare ground between herbaceous plants.	Unlikely to occur except as a rare transient. The Project Area is not within well-developed woodland or gently sloped canyons, or areas with rock outcroppings near ridgetops. Habitat of the project area has scattered junipers but does not contain well-developed pinyon-juniper woodlands or juniper savannah.

Table 2. State Listed and Rare Plant Species Identified for Project Area and/or Action Area
Page 4 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Birds (cont.)	Peregrine falcon (*Falco pergrinus*)	ST	Habitat of the peregrine falcon is primarily located in open wetlands near cliffs. In New Mexico, the breeding territories center on cliffs that are in wooded/forested habitats with large "gulfs" of air nearby in which these predators can forage.	Unlikely to occur. The Project Area does not contain wetlands near cliffs.
	Neotropic cormorant (*Phalacrocorax brasilianus*)	ST	In New Mexico, neotropic cormorants are generally found on larger bodies of water such as reservoirs, where they prey on fish.	Unlikely to occur. The Project Area does not contain surface water.
	Broad-billed hummingbird (*Cynanthus latirostris*)	ST	In New Mexico, the broad-billed hummingbird is local and uncommon. It is a regular summer resident only in the southwest corner of the state within Guadalupe Canyon; otherwise, vagrant occurrences have been documented at a select few locations around the state including Bandelier National Monument (Sandoval Co.) and as an accidental transient in residential/developed areas. It prefers riparian woodlands at low to moderate elevations.	Unlikely to occur as anything more than a vagrant occurrence. The nearest known location to the project area and Action Area is Bandelier National Monument, far outside of the Project Area.
	Costa's hummingbird (*Calypte costae*)	ST	Costa's hummingbird is a desert scrub species of the southwestern United States and northern Mexico. In New Mexico it is an uncommon and sporadic breeder in the southwest and south-central mountains. It occurs most regularly in Guadalupe Canyon and in side canyons along the lower Gila River from Cliff south.	Unlikely to occur. The Project Area is far outside of the species' regular distribution in New Mexico.

Table 2. State Listed and Rare Plant Species Identified for Project Area and/or Action Area
Page 5 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Birds (cont.)	Southwestern willow flycatcher (*Empidonax trailii extimus*)	SE/FE	Habitat for the southwestern willow flycatcher consists of dense riparian habitats along rivers, streams, or other wetlands where its diet consists primarily of insects. Suitable vegetation includes dense growth of willows (*Salix* spp.), arrow weed (*Pluchea sericea*), alder (*Alnus* spp.) saltcedar (*Tamarix ramosissima*), and other riparian vegetation.	Unlikely to occur. The Project Area does not contain riparian habitat or surface water.
	Baird's sparrow (*Ammodramus bairdii*)	ST	Baird's sparrow breeds in a fairly small geographic area of south-central Canada, Montana, and North and South Dakota. It winters on grasslands of the northern Mexican plateau, primarily in Chihuahua and Durango but including portions of bordering states. The winter range extends into small portions of southeast Arizona, southern New Mexico, and southwest Texas. In New Mexico, Baird's Sparrow has been found on Otero Mesa and in the Animas Valley, and may occur in other areas of suitable winter habitat, particularly in the southeast portion of state (NMPF, 2007).	Unlikely to occur. The Project Area is west and north of the species' known winter range in New Mexico and far outside the breeding distribution.
Mammals	New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	FE/SE	Habitat specialist using persistent emergent herbaceous wetlands and scrub-shrub wetlands on wet soil along perennial streams. Also uses patches of herbaceous vegetation dominated by sedges along water edges within willow and alder dominated habitats.	Unlikely to occur. The Project Area and Action Area do not contain emergent herbaceous wetlands, scrub-shrub wetlands, or willow and alder habitat containing sedges.
	Pacific marten (*Martes caurina*)	ST	The Pacific marten occupies primarily mature coniferous forests.	Unlikely to occur. The Project Area and Action Area do not contain mature coniferous forests.

Table 2. State Listed and Rare Plant Species Identified for Project Area and/or Action Area
Page 6 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Mammals (cont.)	Spotted bat (*Euderma maculatum*)	ST	Known in New Mexico from the Rio Grande, Rio Chama, and Animas River Valleys, the Mogollon Plateau, and the Jemez, San Mateo, and Sacramento Mountains. However, it is undoubtedly more widespread in the state than records indicate. Occupies a wide range of vegetation types, moving downslope after the reproductive season. Preferred habitat consists of meadows in subalpine coniferous forests. In the Mogollon, San Mateo, and Jemez Mountains, spotted bats were netted over streams or water holes in ponderosa or mixed coniferous forest. Bats are cliff dwellers whose diurnal roosts are the cracks and crevices of canyons and cliffs. Also recorded in pinyon-juniper woodlands and open semidesert shrublands. Rocky cliffs are necessary to provide suitable cracks and crevices for roosting, as is access to water.	Unlikely to occur. There are no coniferous forests, pinyon-juniper woodlands, streams or water holes in the Project Area or Action Area.

ST = State threatened
SE = State endangered
FT = Federal threatened
FE = Federal endangered

Table 3. Demographics Summary for New Mexico and Sandoval County

	New Mexico	Sandoval County
Population	2,117,527	148,834
American Indian and Alaska Native alone	11.2%	14.1%
Black or African American alone	2.7%	2.8%
Asian	1.9%	1.9%
Hawaiian/Pacific Islander	0.2%	0.2%
White alone	81.3%	77.7%
Hispanic or Latino	50.1%	41.2%
Economic Data		
Median household income (2017-2021)	$54,020	$68,947
Unemployment rate [a]	3.4%	3.1%
Persons in poverty	18.4%	9.4%

Source: U.S. Census Bureau, 2023, unless otherwise noted

[a] New Mexico Department of Labor, 2022