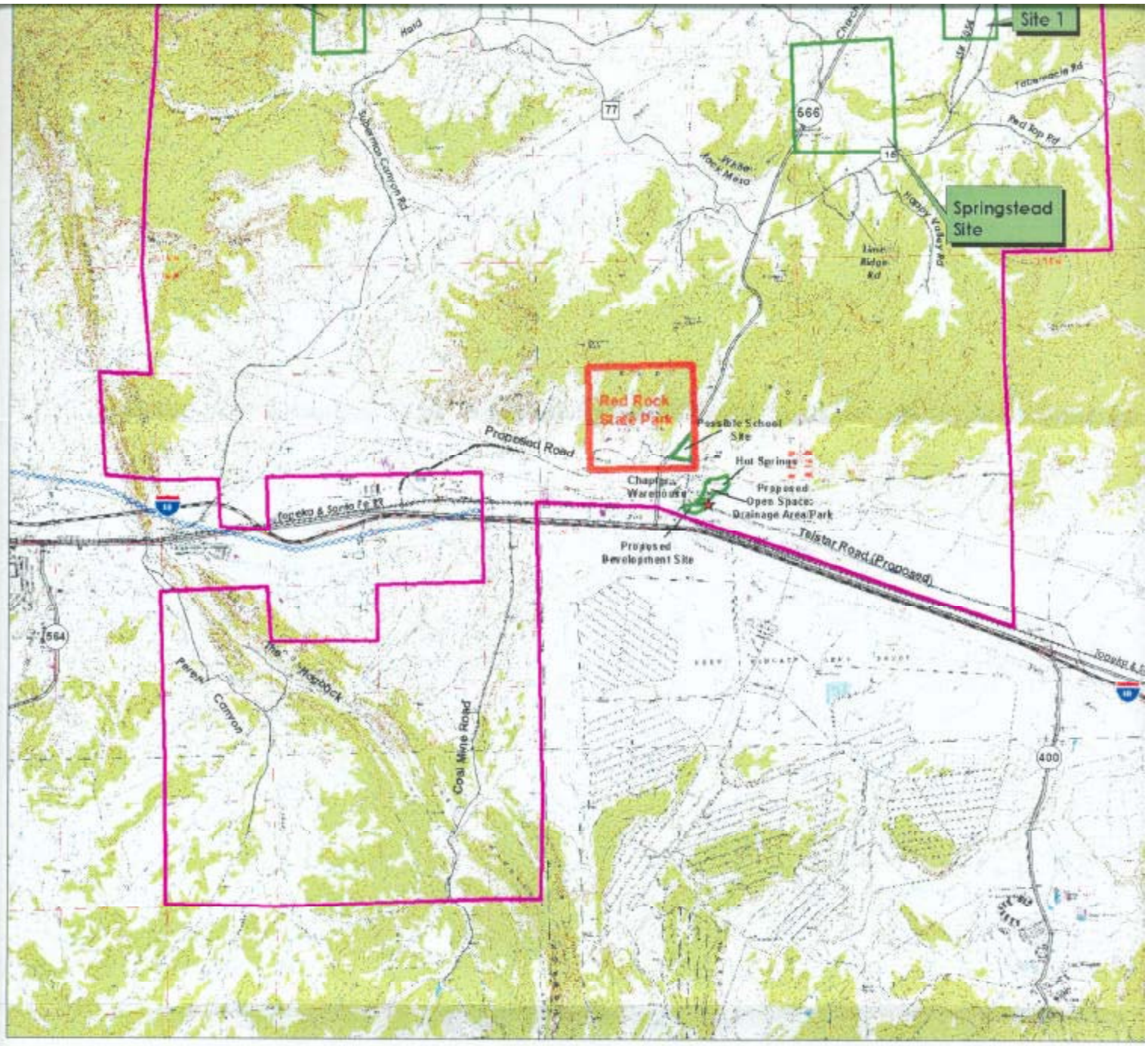


Chapter Boundary

Chapter House

Proposed Development

Utilities

Navajo/Gallup Water Supply Pipeline (Proposed)

Churchrock Chapter Proposed Land Use

NORTH

1 0 1 Miles

C. *Infrastructure Analysis*

1.0 Infrastructure

This section describes the existing and needed infrastructure in the Churchrock Community. Infrastructure is shown in Exhibit 24.

1.1 Transportation

Eighty percent of those who responded to this question on the ARC survey said they had their own vehicles, on which they relied for transportation. One percent carpooled. Nineteen percent used some alternative means of transportation.

Roads

- Existing
  An inventory of existing roads is as follows:

  State Roads:
  - 566 - paved

  County Roads:
  - 30 - graveled
  - 43 - part dirt and part graveled
  - 77 - graveled
    Churchrock Elementary School West Access
    chip-sealed
  - Topeka-Telstar Road - part chip-sealed, part dirt
  - Sundance Road - .5 miles has been chip-sealed. The remaining road is dirt or graveled
  - Santa Fe Trail Road - closed pending acquisition of a bypass at Sundance
  - White Cliff Access Road to Red Rock State Park - dirt
  - 15 - dirt.

  B.I.A. Roads
  - none

- Proposed
  The following are projects needed to improve the roads in the Churchrock Chapter. The projects are prioritized by importance, beginning with the first one within each listing.

County Roads - Chip Seal Projects
- 30 - Zuni Drive-In road south to turn-around (funded)
- 77 and Becenti Trail Road from SR 566 to turn- around in Hard Ground Flats (funded)
- Sundance Road from end of pavement to turn-around.

County Roads - Grade and Drain Projects
- 30 - Hassler Road Junction northeast to junction with 77
- Sundance Road turn-around to Amcoal Mine fence
- Telestar Road from end of pavement to Fort Wingate-Overpass (Wingate bus loop/Head Start bus route). Formerly had county approval, but was blocked by someone who built a house in the right-of-way. Need to go back to county for approval and survey what was done.

Surveys Needed
- Telstar Road
- White Cliffs Access Road to Red Rock State Park (Tse Yani Chee Drive)

Gravel
- Churchrock Road - Indian Hills to Sundance (change name to Santa Fe Trail to get tourism/scenic trails funding)
- 15 from junction with SR 566 to Pinedale Junction (There has been discussion that this road may be paved.)

Bridge Stabilization (erosion is wearing away embankment around bridge piers). Requires archaeological and environmental clearances; County would do work afterwards.
- SR 566
- County Road 77
- County Road 43

Transit

- Existing
  There is a Navajo Nation Transit Bus Route, Bus Route #5, which runs between Fort Defiance and Gallup. Greyhound Bus Lines also service Gallup. There is no direct bus service in the Chapter.

- Proposed
  Nothing is proposed for Churchrock at this time.

Airport

- Existing
  The nearest airport to Churchrock is the Gallup Municipal Airport, owned and operated by the City of Gallup. The airport is located three miles west of downtown Gallup. Airline service at the airport is provided by America West Express, a division of Mesa Airlines. There are four flights daily with direct service to Phoenix. Connecting flights allow a Gallup customer to reach any destination in the world. Federal Express provides daily overnight express package service. Other air freight transportation is available. Trained weather observers provide weather information 24 hours a day. The paved 7300' runway has medium intensity lighting, and is able to accommodate corporate jets, turbo prop and commuter aircraft. There are approximately 50 aircraft based at the Gallup Municipal Airport, most of which are hangared. Gallup Flying Service provides air taxi, air ambulance, flight training, and sight-seeing tours. There is a car rental agency located at the airport. The airport covers 359 acres and land is available for commercial development.

- Proposed
  Nothing is proposed for Churchrock at this time.

Railroad

- Existing
  The following rail services are available in Gallup:
  Amtrak: (2) passenger trains going east and west daily.
  (2) Package Express shipments daily.
  Santa Fe: Daily freight shipments to and from Gallup as requested.

- Proposed
  Nothing is proposed for Churchrock at this time.

1.2 Utilities

Gas

- Existing
  Liquid propane (LP) gas is the only form of gas service available to Chapter members at this time. The Chapter is interested in tapping into the gas lines running through Chapter lands.

- Proposed
  Gas lines are not proposed for Churchrock at this time.

Electric

- Existing
  Continental Divide Electric Cooperative in Grants, New Mexico currently serves the Churchrock Chapter under a contract with the Navajo Nation.

- Proposed
  A contract between the Navajo Nation and Continental Divide Electric Cooperative allows Continental Divide to provide electricity to 94 unserved homes in the Chapter. An archeological survey has been completed by the Navajo Historic Preservation Office and submitted for approval to the B.I.A. An environmental survey contract has been granted to Jim Analla. Continental Divide and Analla are requesting a contract modification for a breakdown of the contract into smaller components, so that construction can begin where surveys have been completed. The Navajo Nation has not yet responded to the request.

  Some of the families on the project list are asking the City of Gallup to provide electricity to the Coyote Canyon (north side of Gallup), Sundance, and Hogback areas. The City of Gallup is conducting surveys to obtain easements in the Continental Divide Service Project Area.

  The following electric line projects are prioritized in order of their present status and importance:
  - Hassler Valley to Churchrock - Archaeological and environmental clearances have been completed.
  - Sundance to the Aamco Coal Mine area -

Archaeological survey has been completed. An environmental survey is needed for BLM lands surrounding the mine.

- Hogback and Peretti Canyon - no firm proposals or contracts have been completed as of this writing.

Water

- Existing

The Navajo Tribal Utility Authority provides domestic water through pipelines from a well in Pinedale. According to NTUA, there is sufficient water to meet current and future domestic use needs. Additional water needs for commercial and industrial development must be evaluated on a case-by-case basis.

Churchrock has a critical need for water for agricultural use due to the area's semi-arid climate with its lack of rainfall and periodic droughts. There are additional needs for water for domestic use, commercial and industrial use, and agricultural purposes. Another potentially serious situation is the lack of water available for fire protection.

An inventory of windmills, dams, and artesian water in the Chapter should be conducted to determine other existing water sources.

- Proposed

Navajo-Gallup Water Supply Project:

The Chapter passed a resolution supporting the Navajo-Gallup Water Supply Project from the San Juan River. According to the draft *Technical Memorandum: The Navajo-Gallup Water Supply Project*, "A long-term, high quality municipal and industrial water supply is needed to improve the standard of living for current and future populations and to support economic growth of the Navajo Nation, the Navajo Agricultural Products Industry (NAPI), and the City of Gallup. The Navajo-Gallup Water Supply Project has evolved over four decades as a major infrastructure initiative to supply approximately 36,000 acre-feet of water annually from the San Juan River to meet these needs."

In addition, a March 2000 draft report on the Navajo-Gallup Water Supply Project describes the short term and long term objectives of the Project for the Churchrock Chapter. According to the report, it is predicted that the Churchrock, Bread Spring, Chichiltah, Iyanbito, Pinedale and Red Rock Chapters will require 4,822 acre-feet of water annually by 2020.

The Navajo-Gallup Water Supply Project has proposed a routing for a lateral line from the main trunkline at Yah-ta-hey to the Churchrock and Iyanbito Chapters. Approximately 6,150 acre-feet per year could be piped easterly. Construction on the project is set to begin in late 2002, with final buildout by 2006.

In order to meet the short-term needs of the Churchrock and Iyanbito Chapters, the report proposes conveying groundwater from the east.

Another project within the Chapter involves planning for water harvesting from rooftops for landscaping in the Chapter. Volunteers from Vista and Americorp are working on the project.

The Chapter is also involved in developing a water conservation plan as part of their involvement in the statewide New Mexico Water Plan.

Sewer

- Existing

There are three sewer lagoons located within the Churchrock Industrial Park that serve the housing in the Chapter compound area and the Sundance subdivision.

Other housing units within the Chapter that are not served by water and sewer systems are on septic systems.

- Proposed

There are no new proposals for sewer lines; however, the new housing replacing Indian Village will have an impact on the existing infrastructure. This new housing will be hooked into the existing line serving the NHA subdivisions and Chapter compound area.

Because the existing sewer lagoon near Red Rock State Park is near capacity, Churchrock and the Rehoboth-Red Mesa Foundation are working together on developing a new sewer treatment plant.

Telephone

- Existing

Currently, Qwest is providing telephone service within the Chapter. According to Qwest, 85 to 90 percent of households in the United States, including Pueblos in New Mexico, have telephones. By contrast, only 12 to 15 percent of people in the Navajo Nation have telephones.

- Proposed

Qwest is offering discounted phone rates through its Tribal Lifeline/Tribal Link-up program. Under the plan, the Navajo Nation has approved a blanket right-of-way for Qwest to run phone lines across tribal lands. Churchrock Chapter passed a resolution approving the plan on August 01, 2001.

The Tribal Lifeline provides reduced monthly charges to telephone customers who qualify under low income guidelines (service is being offered at $1.00, $4.00 or $7.00 per month).

Tribal Link-Up provides reduced connection charges to telephone customers who qualify. Up to $5,000 per house is available to get lines close enough to provide service. Beyond that distance, the customer is required to pay any additional costs. There is additional money available in the Rural Extension Fund (under the State of New Mexico Public Regulatory Commission), which can raise the $5,000 up to $10,000 to $15,000.

With copper service lines to homes, additional technology is available to the customer, including voice dial-up, 56K data transmission, and T-1 lines to commercial or government facilities. Fiber optic cables are being laid within the Eastern Agency chapters as the backbone to the copper service lines.

Qwest expects the project to take eighteen months to complete.

Solid Waste

- Existing

There is substantial air and water pollution from illegal dumping, toxic and hazardous waste, wind and water erosion due to overgrazing.

- Proposed

The Chapter would like to implement a community education program, to provide a community solid waste transfer program for the Chapter, and to assist in cleaning up open dumps.

Churchrock members in the Sundance area who pay water bills to the City of Gallup receive vouchers to use the city transfer station; however, at the time of this writing these residents are denied access at the transfer stations when they have tried to redeem the vouchers. Community members would like to see this issue resolved.

There may be opportunities for development of trash pickup at scattered housing sites at a reasonable cost as a local business venture.

2.0 Analysis of Individual Sites

This section assesses the three proposed housing sites in terms of their need for additional infrastructure (Exhibit 25).

Several sites for potential housing were chosen for initial review in the Churchrock Chapter. Through research and community involvement, some sites were eliminated from consideration due to conflicts or problems such as potential for flooding, grazing issues, terrain issues, potential hazards such as nearby gaslines, and potential other uses.

2.1 Site One (1): T16N, R16W, Section 20

Site One consists of 158 acres located approximately five miles northeast of the Chapter House. The site is square-shaped.

Site Accessibility

McKinley County Road 15, a graded dirt road, runs through the eastern half of the site

Site Related Aspects

There are no existing buildings or structures noted on the site.

Site Utilities

- Water
  A water line enters from the west side of the property and intersects with a north-south running line within the site.

- Sewer
  No sewer service is available on the site. A subdivision-type housing development will require the construction of a sewer lagoon. A four- to six-acre cell will serve between 20 and 160 homes. A 1,000 foot setback from the lagoon is required.

- Gas:
  The closest gas lines are located south of the site. There is the possibility of extending gas lines to the site, especially if gas lines are extended to the Springstead site which is nearby. If not, homes built here would most likely be serviced by individual propane tanks.

- Electrical:
  An electric line ends just inside the western border of the site. Other electric lines run relatively close to the northern (~600') and southern (~2,600') borders.

- Telephone:
  There is a telephone line approximately 2,250' northwest of the site.

Special Site Development Requirements

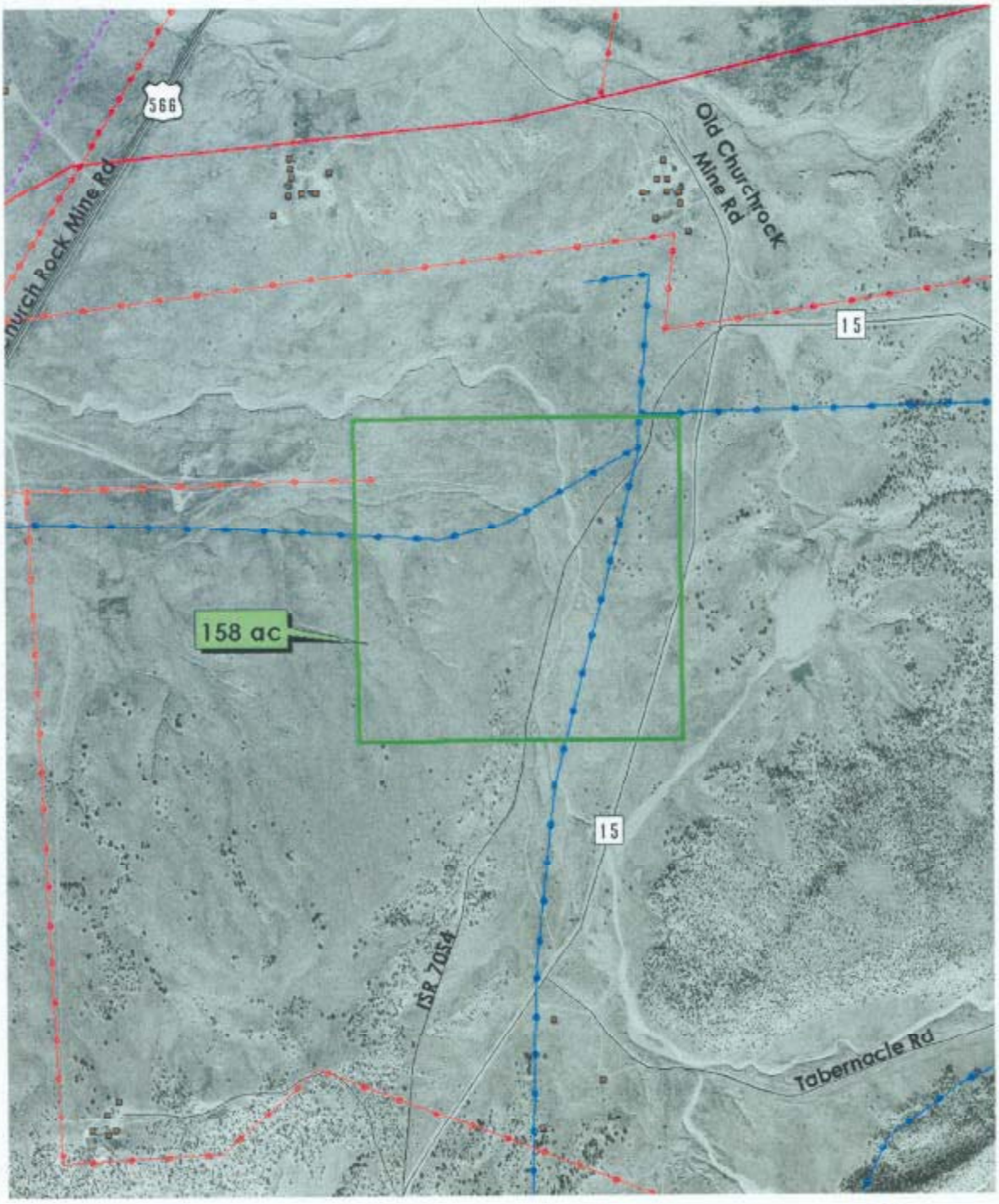
This site appears to be well suited for development as there are utilities available and the site has good accessibility. A sewer lagoon will need to be built as mentioned.

Legal Considerations:

The site is located on BLM land which is marked for disposal. An agreement such as a trade, purchase, or otherwise will need to be worked out between the Navajo Nation and the BLM. Once the land is acquired, the Chapter will be required to proceed with the proper land withdrawal process and obtain utility right-of-ways from chapter members.

Site 1

Exhibit 26: *Housing Site 1*



Proposed Sites
Homes

Utility Lines
Electric
Water
Telephone

Churchrock Site 1

500 0 500 Feet

NORTH

2.2 Site Two (2): T16N, R17W, Section 20

Site Two consists of 150 acres located approximately five and one-quarter miles northwest of the Chapter House. The site is square-shaped.

Site Accessibility

There are several unmarked dirt roads within the site. Superman Canyon Road lies approximately 1,200' to the southeast of the site.

Site Related Aspects

There are no existing buildings or structures noted on the site.

Site Utilities

- Water:
  The closest water lines are approximately 1150' southeast from the site border.

- Sewer:
  No sewer service is available on the site. A subdivision-type housing development will require the construction of a sewer lagoon. A four- to six-acre cell will serve between 20 and 160 homes. A 1,000 foot setback from the lagoon is required.

- Gas:
  The closest gas lines are located south of the site and a line extension might be a possibility. Otherwise, homes built here would most likely be serviced by individual propane tanks.

- Electrical:
  The closest electric lines are approximately 300' southeast from the site border.

- Telephone:
  The nearest telephone lines are approximately 1.5 miles south of the site.

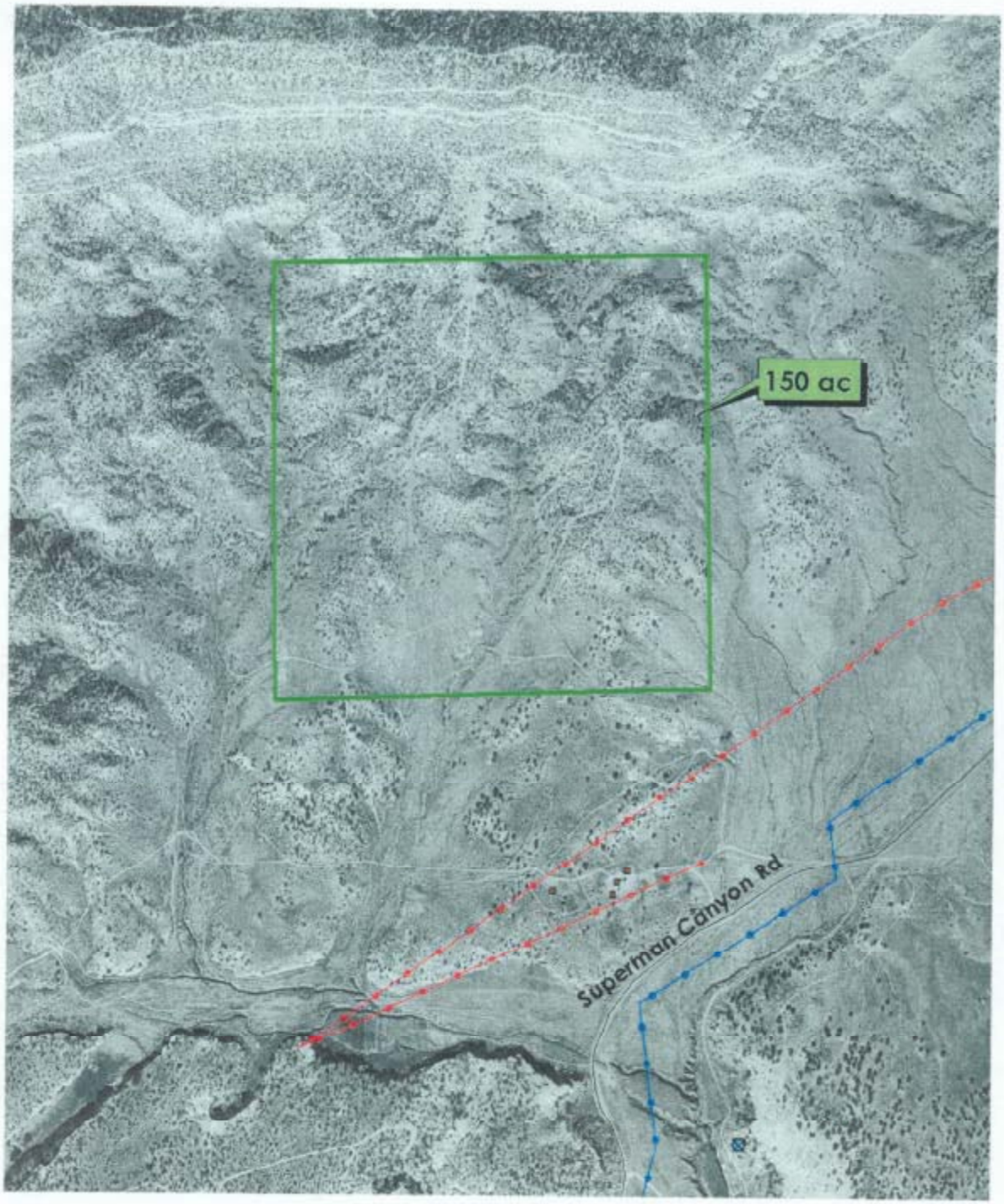
Special Site Development Requirements

Due to the nature of the terrain, only a portion of the site may be suitable for housing.

Legal Considerations

The site is located on BLM land which is marked for disposal. An agreement such as a trade, purchase, or otherwise will need to be worked out between the Navajo Nation and the BLM. Once the land is acquired, the Chapter will be required to proceed with the proper land withdrawal process and obtain utility right-of-ways from chapter members.

Exhibit 27: Housing Site 2



Proposed Sites
Homes

Utility Lines
Electric
Water

Well - Not Operational

Churchrock Site 2

300 0 300 Feet

NORTH

2.3 Site Three (3) Springstead: T16N, R16W, Section 30

Site Three, the Springstead Subdivision, consists of 626 acres located approximately three and one-half miles northeast of the Chapter House. The site is square-shaped.

Site Accessibility

NM 566 passes through the western portion of the site.

Site Related Aspects

There are signs of possible hazardous materials contamination (a building complex with unidentified materials lying around), and illegal dumping on the site.

Site Utilities

- Water:
  There is a water line running across the southeastern corner of the site. Another water line is located approximately 375' from the northeast corner of the site.

- Sewer:
  No sewer service is available on the site. A subdivision-type housing development will require the construction of a sewer lagoon. A four- to six-acre cell will serve between 20 and 160 homes. A 1,000 foot setback from the lagoon is required.

- Gas:
  The closest gas lines are located south of the site and a line extension might be a possibility. Otherwise, homes built here would most likely be serviced by individual propane tanks.

- Electrical:
  There are electric powerlines located in the western half of the site, as well as a powerline that runs along the eastern border of the site.

- Telephone:
  There is a telephone line running across the northwest corner of the site.

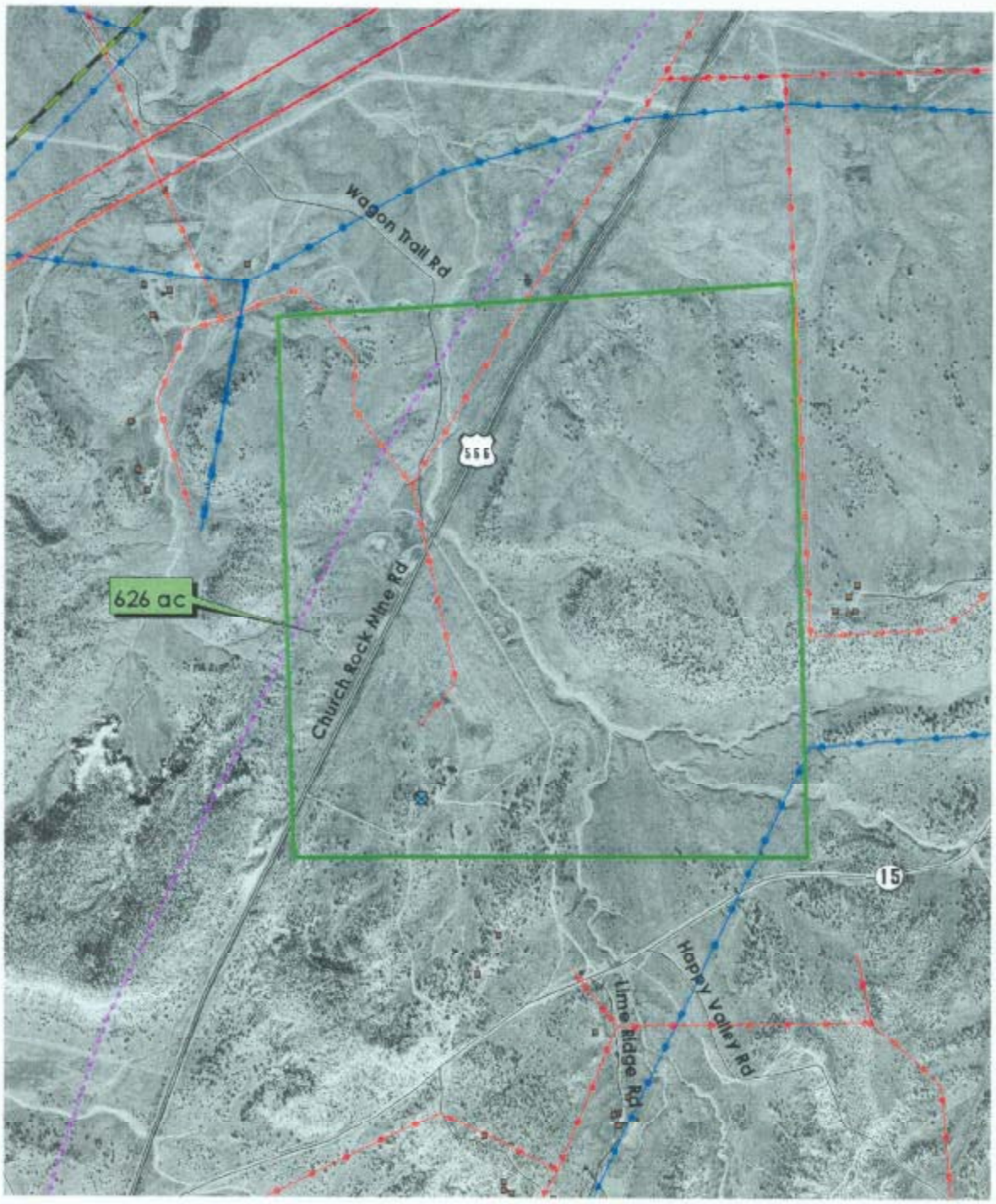
Special Site Development Requirements

The relatively level area of the site makes it one of the more suitable areas for housing development in the Chapter.

Legal Considerations

The site is located on private land, which is being developed by the Fort Defiance Housing Corporation. As such it will be subject to the subdivision laws and regulations of the State of New Mexico. Affordable housing will be made available to Churchrock Chapter members. This will depend, however, on the results of tests being conducted on possible uranium contamination of groundwater in the area.

Exhibit 28: Springstead Site



Proposed Sites
Homes
Well
Well - Not Operational

Utility Lines
Electric
Water
Telephone
Gas

Churchrock Springstead Site

500 0 500 Feet

NORTH

arc

2.4 Site Development Costs

A soils test is recommended to determine the extent of expansive soil under a site, the bearing capacity of the soil, and the best engineering means for overcoming limitations.

Clay Soils

The presence of expansive soils, those with a high clay content, can increase the cost of development significantly. These types of soils are unstable when saturated. The cost of preparing the soils for development can be extreme.

A drainage study and site development plan are also recommended. These documents are necessary to ensure proper site drainage. Proper drainage from the site will help prevent future saturation of the soils.

Development costs will need to include the possibility of excavation of the expansive soils from a building site and replacement with engineered fill. On average, the cost for excavation is $3 to $4 a cubic yard. Replacement with an engineered fill costs $17 to $18 a cubic yard. For a house that is approximately 1500 square feet, with four feet of expansive soil below the surface, it would cost between $5,500-$6,500 to prepare the earth for the pouring of the concrete foundation. If the expansive soil extends beyond four feet, excavation becomes an issue and costs increase.

Another option would be to use a pier and beam foundation. In this type of foundation, rather than a slab of concrete as the foundation, structural columns are sunk into the ground until they reach solid bedrock. The columns are then filled with a steel cage and concrete. The columns are level across the top, usually two to three feet above the ground. Beams of wood are placed over the columns. The pier and beam foundation is then covered with a sheet of plywood and the framework for the first floor is ready to be built. Pier and beam foundations can at times be more cost-effective than excavation, depending upon the amount of expansive soil that needs to be excavated or over-excavated, the type of clay that is present, the cost locally of engineered fill, and many other factors, some of which are addressed in soils tests.

Rocky Soils

Rocky soils can easily be dealt with when building a foundation. If the soil is made up of loose rock, removal of the rock and then placement of the foundation on solid ground is the easiest approach. If the site is solid rock, it is best to build up the ground with a engineered fill so that the anchors can be stable, usually about two feet deep. Once the concrete slab is poured, it can then be sloped to ensure proper drainage. If the condition of the land is extremely rocky, costs of infrastructure increase by approximately 10%.

Site Development

When developing a subdivision, it is more cost-effective to complete all of the earthwork at one time. This allows larger equipment to be used, and is a more effective use of time. When constructing a single unit or scattered units, smaller machines must be used and work is done more slowly.

The suitability analysis begins with a discussion of the natural resources of the Chapter, including its geology and soils, water resources, vegetation, and threatened and endangered species.

Following this overview is a more detailed analysis of each potential housing site's cultural and environmental suitability.

1.0 OVERVIEW OF RESOURCES

1.1 Natural Resources

- **General**

The Churchrock Chapter lies within Navajo Reservation land in McKinley County, in northwestern New Mexico. The elevation ranges from 6650 to 7500 feet above sea level. The dominant landform to the west is the Hogback, a ridge of steeply dipping sedimentary rocks. The area to the south is Fort Wingate and Cibola National Forest land. Six Mile Canyon lies to the southeast and east of the Chapter. The low alluvial floodplain of the south fork of the Rio Puerco lies both north and south of I-40.

Soils

Two major soil associations occur within the Chapter: Moriarty-Prewitt and Thurloni-Savoia-Conchos. The Moriarty-Prewitt association occurs mainly in valley bottoms and on flood plains and terraces along intermittent drainages and is dominated by soils that are slightly to moderately saline and alkali-affected. These soils occupy nearly level to gently sloping landscapes and are formed in fine-textured alluvium weathered principally from shale and other sedimentary materials. Although occurring on gentle slopes, they are susceptible to erosion. The soils in this association have very slow permeability and fine textures.

Cliffs in the Churchrock Chapter

The Thurloni-Savoia-Conchos association occurs in a variety of topographical settings ranging from nearly level to strongly sloping. The soils in this association are developed residually in parent materials weathered from sedimentary rocks, including shale, sandstone, and limestone or in alluvial and eolian sediments. The major soils are moderately deep, but shallow soils and shale and rock outcrops are also included in this association. The soils in this association are susceptible to erosion.

Due to the possibility of erosion with the soils in the Churchrock Chapter, special attention when building should be given to drainage to avoid potential problems.

Vegetation

The project area consists of piñon-juniper woodland with a big sagebrush understory. A few ponderosa pine also grow on the north and east slopes at the higher elevations. Additional vegetation includes fringed sage, fourwing saltbush, rose heath, snakeweed, summer cypress, winterfat, pale wolfberry, prickly-pear cactus, banana yucca, various wildflowers, and mixed grasses. The vegetative biome is classified as Great Basin Desert Scrub, located on the edge of the Great Basin Conifer Woodlands.

Mariposa lilies in bloom in Churchrock

Climate
Annual rainfall ranges from 10 to 20 inches, and the annual frost-free days range from 140 to 170 days.

- **Water Resources**

Floodplain/Flood Hazard/Drainage
Executive Order 11988, Floodplain Management, requires that any potential impacts to floodplain areas be studied, assessed, and identified to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains. Therefore, project planning must ensure that the proposed construction will be compatible with the floodplain areas by identifying potential impacts and ways to mitigate them.

Unincorporated areas of McKinley County have been mapped by the U.S. Department of Housing and Urban Development (HUD) on Flood Hazard Boundary Maps. Community Panel Numbers 350039 0020 A, 350039 0021 A, 350039 0022 A, 350039 0029 A, 350039 0030 A and 350039 0031 A show existing flood areas and their associated drainage in portion of the Chapter. The Zone A floodplain boundary, comprising special flood hazard areas inundated by the 100-year flood, where no base elevations have been determined, encompasses a majority of the Chapter's area around 6650 feet, north and south of I-40.

Surface runoff within the project area is primarily ephemeral and comes as runoff from storm water, most of which is provided by summer thunderstorms. Three main drainage channels traverse the Chapter and convey substantial storm water flows. These drainage areas and arroyos are tributary to a main drainage basin, the south fork of the Rio Puerco. These arroyos and others located north and south of I-40 are considered Waters of the United States and if any type of construction or alteration of the drainage area will require a clearance and type of Clean Water Act (CWA) Section 404 permit issued by the U.S. Army Corps of Engineers (COE).

Water Quality
Wells serve the Chapter House and residents in the general area. Glorieta sandstone/San Andres limestone forms the

major aquifer of the region. There is no evidence that the water from wells in this aquifer does not meet current water quality standards. The flow of water in the aquifer is from the southeast to the northwest. Groundwater in the vicinity of the Chapter house can be expected to be encountered at approximately 100 to 150 feet.

Wetlands
Wetland systems and classes are based on criteria set forth in the Clean Water Act (CWA) of 1977, Executive Order 11990, and other regulatory materials. There are known wetlands within the Chapter area, but they have not been delineated.

- **Air Quality**

Churchrock Chapter is located in western McKinley County, which has been designated by the Environmental Protection Agency (EPA) as a rural attainment area, indicating that ambient air quality meets or exceeds the National Ambient Air Quality Standards (NAAQS). Western McKinley County is located within New Mexico state designated Air Quality Control Region (AQCR) Number 1, which corresponds to EPA Region 14, the Four Corners Interstate Region.

- **Living Resources**

Threatened and Endangered Species/Species of Concern
Federal and Navajo threatened or endangered species are protected by law. Species currently listed as proposed, threatened, and endangered by the U.S. Fish and Wildlife Service (USFWS) and listed as endangered and under consideration by the Navajo Fish and Wildlife Department (NF&WD) were reviewed during this planning study.

No federal or Navajo listed plant or animal species was seen during a general reconnaissance of the potential housing sites, and few are likely to occur within the project limits. However, there is suitable habitat and/or foraging area within the general area, and some species of concern could potentially occur. A chart showing these rare animals and plants is found on the following page:

*An **endangered species** is one that is in danger of extinction throughout all or a significant portion of its range.*

*A **threatened species** is one that is likely to become endangered in the foreseeable future.*

*A **proposed or candidate species** is one being considered for listing as threatened or endangered.*

*An **extirpated species** is one that has been eliminated from its range, usually in a specific geographic area.*

CHURCH ROCK CHAPTER
McKinley County
Federal and Navajo Listed Species

		STATUS	
Common Name	**Scientific Name**	**Federal**	**Navajo**
Amphibians			
Western Chorus Frog	*Pseudacris triseriata*		
Northern Leopard Frog	*Rana pipiens*		Endangered
Birds			
Northern Goshawk	*Accipiter gentilis*		Consideration
Golden Eagle	*Aquila chrysaetos canadensis*		Endangered
Ferruginous Hawk	*Buteo regalis*		Endangered
Belted Kingfisher	*Ceryle alcyon*		Consideration
Mountain Plover	*Charadrius montanus*	Threatened	Consideration
Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*		Endangered
Band-tailed Pigeon	*Columba fasciata fasciata*		Consideration
Yellow Warbler	*Dendroica petechia*		Consideration
Southwestern Flycatcher Willow	*Empidonax traillii extimus*	Endangered	Endangered
American Peregrine Falcon	*Falco peregrinus anatum*		Consideration
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	
Sora	*Porzana carolina*		Consideration
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	Endangered
Tree Swallow	*Tachycineta bicolor*		Consideration
Fish			
Zuni Bluehead Sucker	*Catostomus discobolus yarrowi*	Species of Concern	Consideration
Mammals			
Pronghorn	*Anilocapra americana americana*		Endangered
Navajo Mogollon Vole	*Microtus mogollonensis navaho*	Species of Concern	Consideration
Western Small-footed Myotis Bat	*Myotis ciliolabrum melanorhinus*	Species of Concern	
Long-eared Myotis Bat	*Myotis evotis evotis*	Species of Concern	
Occult Little Brown Myotis Bat	*Myotis lucifugus occultus*	Species of Concern	
Fringed Myotis Bat	*Myotis thysanodes thsanodes*	Species of Concern	
Long-legged Myotis Bat	*Myotis volans interior*	Species of Concern	
Reptiles			
Northern Sagebrush Lizard	*Sceloporus graciosus graciosus*	Species of Concern	
Plants			
Naturita Milkvetch	*Astragalus naturitensis*		Consideration
Acoma Fleabane	*Erigeron acomanus*	Species of Concern	Endangered
Zuni Fleabane	*Erigeron rhizomatus*	Threatened	
Sivinski's Fleabane	*Erigeron sivinskii*	Species of Concern	Consideration
Parish' s Alkili Grass	*Puccinellia parishii*	Species of Concern	Consideration

1.2 Historic and Cultural Resources

A cultural resources inventory, including a review of previous research and a site files check, was completed for the potential housing areas. No archaeological, architectural, or ethnographic resources were identified for these areas. However, when a particular site is chosen, a Class III intensive pedestrian survey and ethnographic research must be completed.

1.3 Visual Resources

Visual resources are those physical features that make up the visible landscape, including land, water, vegetation, and human-made elements. No adverse impacts to visual resources are anticipated from the construction of any housing units to be built on the proposed sites.

2. 0 ANALYSIS OF INDIVIDUAL SITES

While several sites were looked at within the Churchrock Chapter, including tribal trust land, they were not selected due to a number of problems. Potential flooding and the presence of natural gas lines are the main obstacles to development on these sites. A total of seven sites were reviewed. Four sites were rejected and the following are recommended for housing within Churchrock Chapter.

2.1 Site One (1): 160 acres

Geology/Soils

Five different soil types are present on this site:

- 230: Sprank-San Mateo-Zia Association - This association consists of well-drained to somewhat excessively drained soils with low to high shrink-swell potential.
- 241: Mentmore - This soil type is well-drained with a moderate shrink-swell potential.
- 245: Buckle-Gapmesa-Barboncito Association - This association consists of well-drained soils with low to moderate shrink-swell potential.
- 255: Fairview - This soil type is well-drained.
- 352: Zia Sandy Loam - This soil type consists of somewhat excessively drained soil with low shrink-swell potential. This soil type appears to be the most suitable for building on in this site.

Surface Water/Drainage

There is a large arroyo bisecting the northeast portion of the site. There are other drainage problems and the potential for sheet flooding in the northern area. There is good drainage on the southeastern half of the site, where the land slopes to the eastern and northern portions.

Vegetation

Vegetation appears to be typical for the Churchrock Chapter as described earlier in this section.

Wildlife

While endangered species may be present on site as previously described in this section, none were noted on a site visit. Bluebirds were observed flitting about the brush and grasses.

Environmentally Sensitive Areas
This site is located in a Navajo Nation Department of Fish and Wildlife Zone 3: Low Sensitivity/Unrestricted Development. This zone has a low, fragmented or unknown concentration of species of concern.

Culturally Significant Areas/Traditionally Sensitive Areas
In the northeast portion of the site there appears to be a traditional ceremonial area that should be avoided.

Recommendations
This property is currently managed by the BLM, which has slated it for disposal. The property would have to be acquired from the BLM for use by the Chapter. Due to the land status, it is recommended that acquisition of this site be actively pursued by the Navajo Nation. The site should be reserved for future housing for the Churchrock Chapter.

Site 1

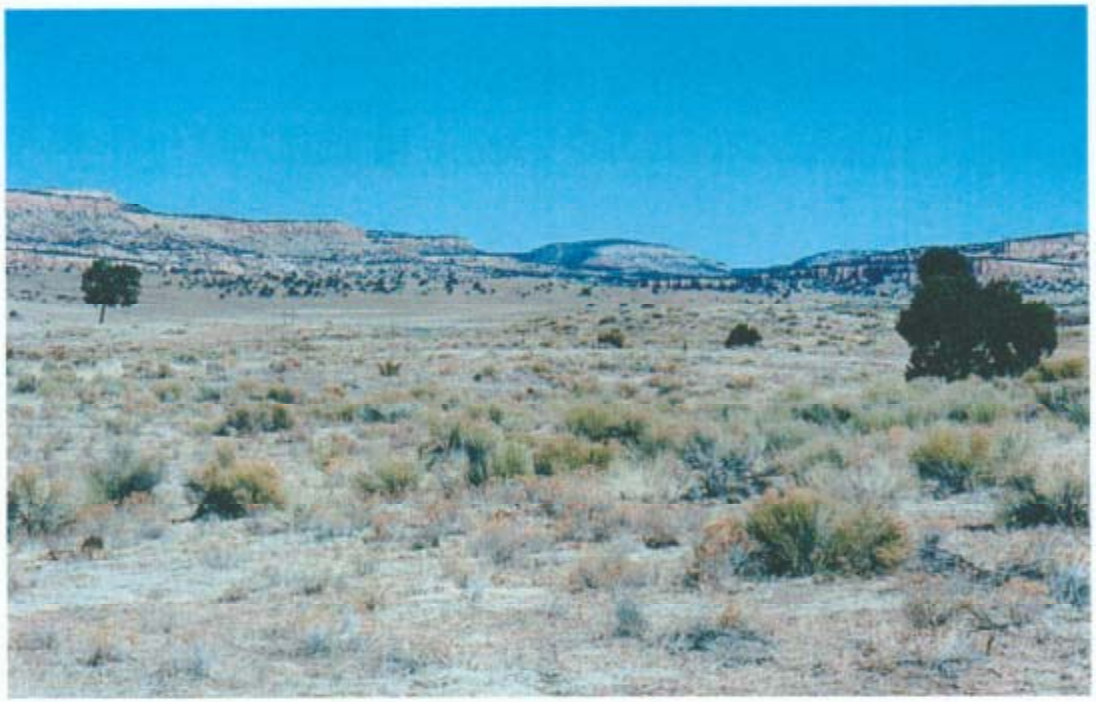
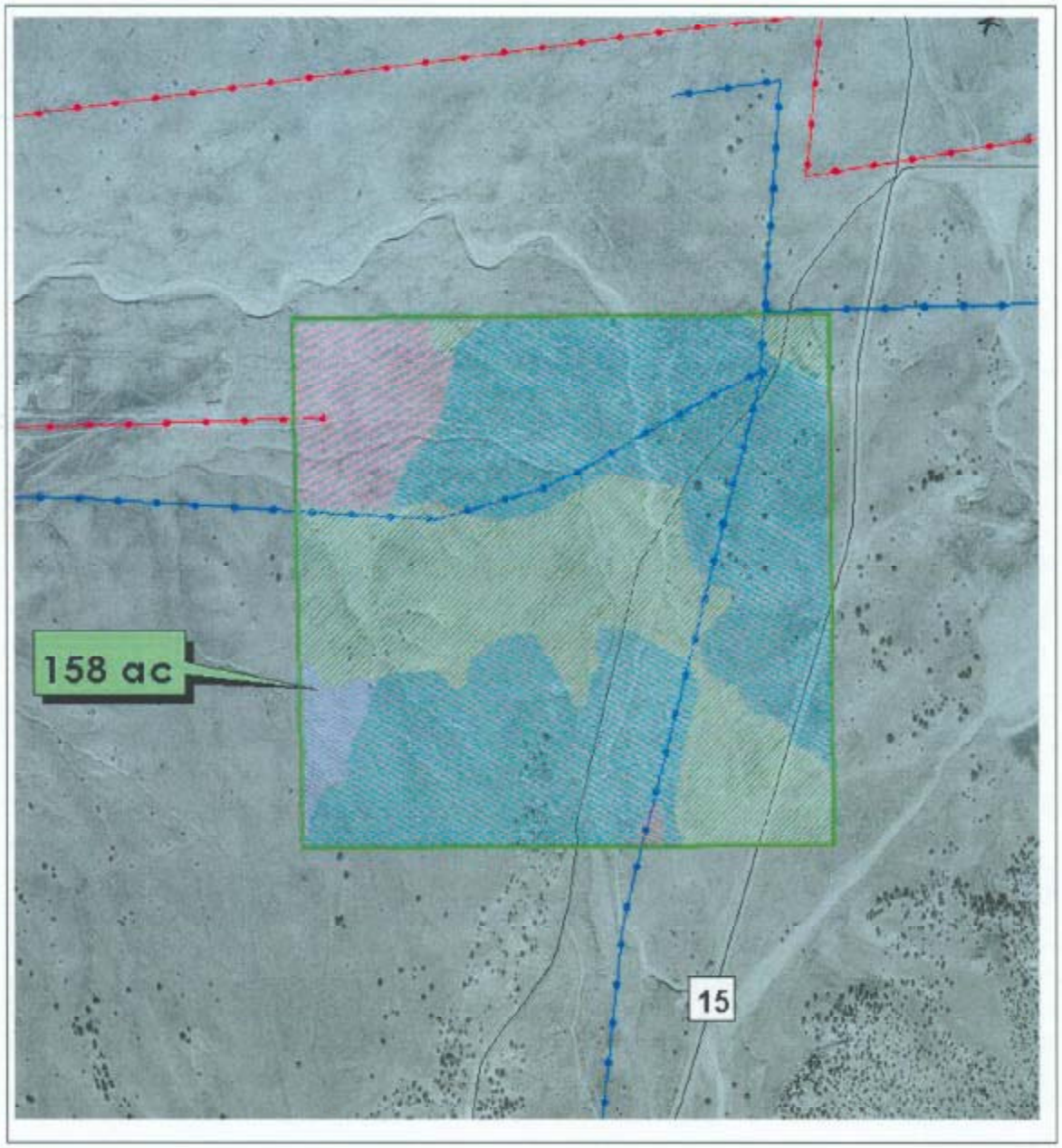


Exhibit 31: Site 1 Soils



Proposed Development
Houses

Utilities
Electric Line
Water Line

Soil Types
Buckle-Gapmesa-Barboncito
Zia Sandy Loam
Mentmore
Sprank-San Mateo-Zia
Fairview

Churchrock Site 1

NORTH

400 0 400 Feet

2.2 Site Two (2): 160 Acres

Geology/Soils

Two different soil associations are present on this site:

- 245 - Buckle-Capmesa-Barboncito Association - This association consists of well-drained soils with a low to moderate shrink-swell potential. If the topography is not too rugged, this soil type appears to be well-suited for building.
- 250 - Eagleye-Atchee Association - This association consists of well-drained soils with a moderate to high shrink-swell potential making it less suitable for building.

Surface Water/Drainage

There are two large arroyos draining the site. Due to these features and the rugged terrain on the northern portion of the site, drainage issues must be carefully addressed before building.

Vegetation

Vegetation appears to be typical for the Churchrock Chapter as described earlier in this section.

Wildlife

There may be endangered or threatened species on this site as the following information on sensitive area indicates.

Environmentally Sensitive Areas

The majority of the land in this site is located in a Navajo Nation Department of Fish and Wildlife (NNF&WD) Zone 1: Highly Sensitive/No Development. This zone has the highest concentration of endangered, rare and sensitive plant, animal and game species, and therefore the best habitat for species on the Navajo Nation. To protect the Navajo Nation's most sensitive species and habitats for plants and animals, the NNF&WD recommends no further business or residential development, permanent, temporary, or seasonal. A Biological Evaluation (BE) would have to be conducted by NNF&WD before any development could proceed.

The southeast portion of the site is located in Zone 3, which is an area that has a low, fragmented or unknown concentration of species of concern. Species in this area

may be locally abundant on 'islands' of habitat, but islands are relatively small, limited in number and well spaced across the landscape. Small-scale development to serve the private needs of individuals, such as homesites and service lines for utilities, can proceed without the development of a BE. However, documentation of the development shall be submitted to NNF&WD for its files. All other development requires preparation of a BE.

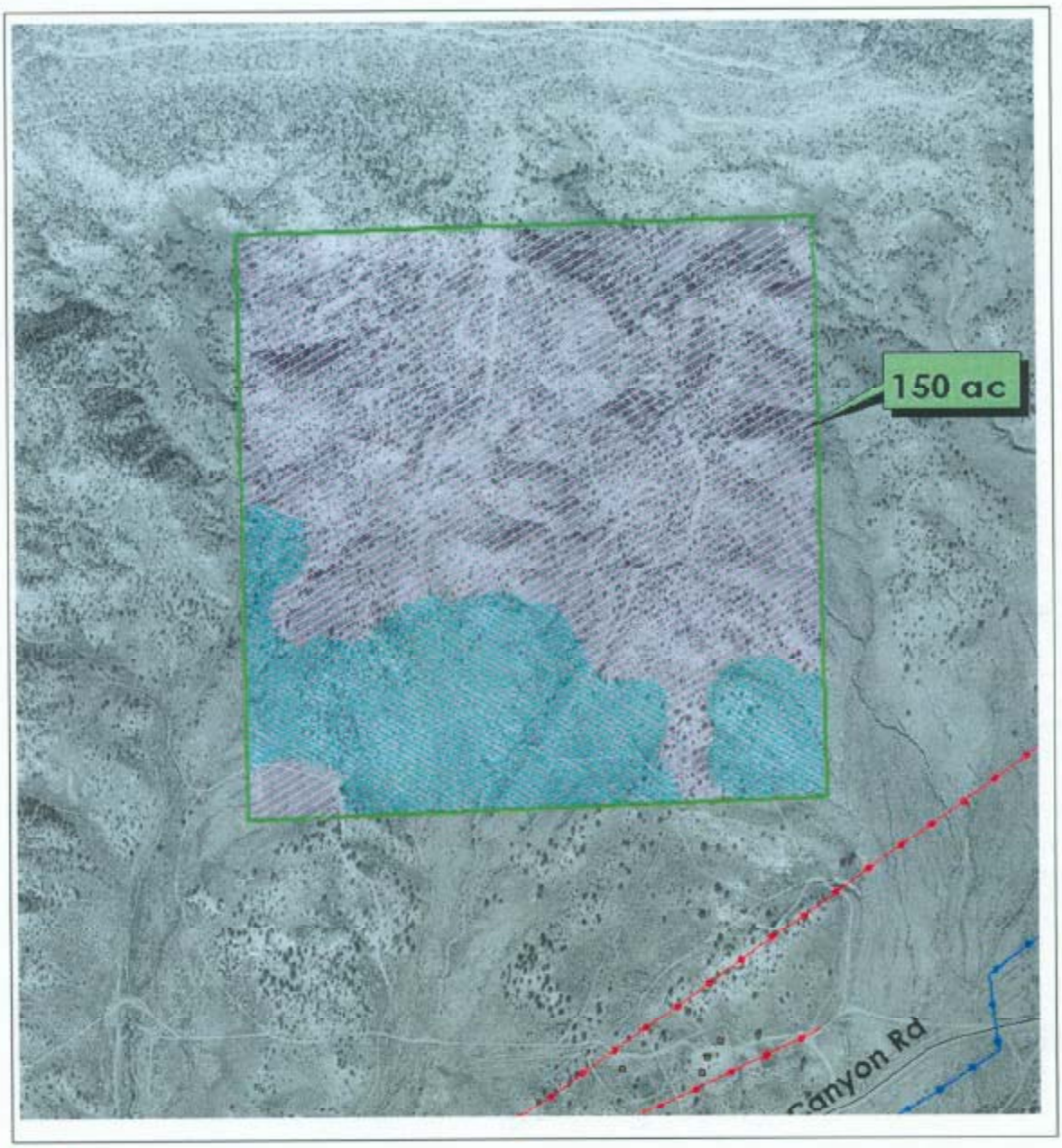
Culturally Significant Areas/Traditionally Sensitive Areas
A record search indicates no culturally significant or traditionally sensitive areas.

Recommendations
Any proposed development within Zone 1 shall be submitted to the NNF&WD for review and comment. The NNF&WD will evaluate each proposed project for appropriate environmental impact. The NNDFWL has the authority to reject any project in its entirety or approve with conditions. As such, any proposed housing plan for this area would need their approval.

This property is currently managed by the BLM, which has it slated for disposal. The property would have to be acquired from the BLM for use by the Chapter. Due to the land status and restrictions mentioned above, it is recommended that this site be removed from consideration as a housing area at this time; however, it should be reserved for possible future use by the Chapter.

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report is not intended to represent an intensive survey of threatened or endangered species within the study area.

Exhibit 32: Site 2 Soils



Proposed Development
Houses

Soil Types
Buckle-Gapmesa-Barboncito
Eagleye-Atchee

Utilities
Electric Line
Water Line

Churchrock Site 2

400 0 400 Feet

2.3 Site Three (3) Springstead: (626 acres).

Geology/Soils

Two different soil associations are present on this site:

- Camborthids-Torriorthents - Shallow to moderately deep soils of canyons, cliffs and mesas. Runoff is slow and the hazard of erosion is moderate
- Rockland-Torriorthents-Haplargids - Well-drained, shallow soils and rock outcrop on hills and low mountains in hot, arid areas. Haplargids have a high shrink-swell potential.

Surface Water/Drainage

There is a large arroyo bisecting the northeast portion of the site.

Vegetation

Vegetation appears to be typical for the Churchrock Chapter as described earlier in this section.

Wildlife

While endangered species may be present on site as previously described in this section, none were noted on a site visit. Two coyotes, a piñon jay, and a crow were observed; however, none of these is an endangered or threatened species.

Environmentally Sensitive Areas

This site is located in a Navajo Nation Department of Fish and Wildlife Zone 3: Low Sensitivity/Unrestricted Development. This zone has a low, fragmented or unknown concentration of species of concern.

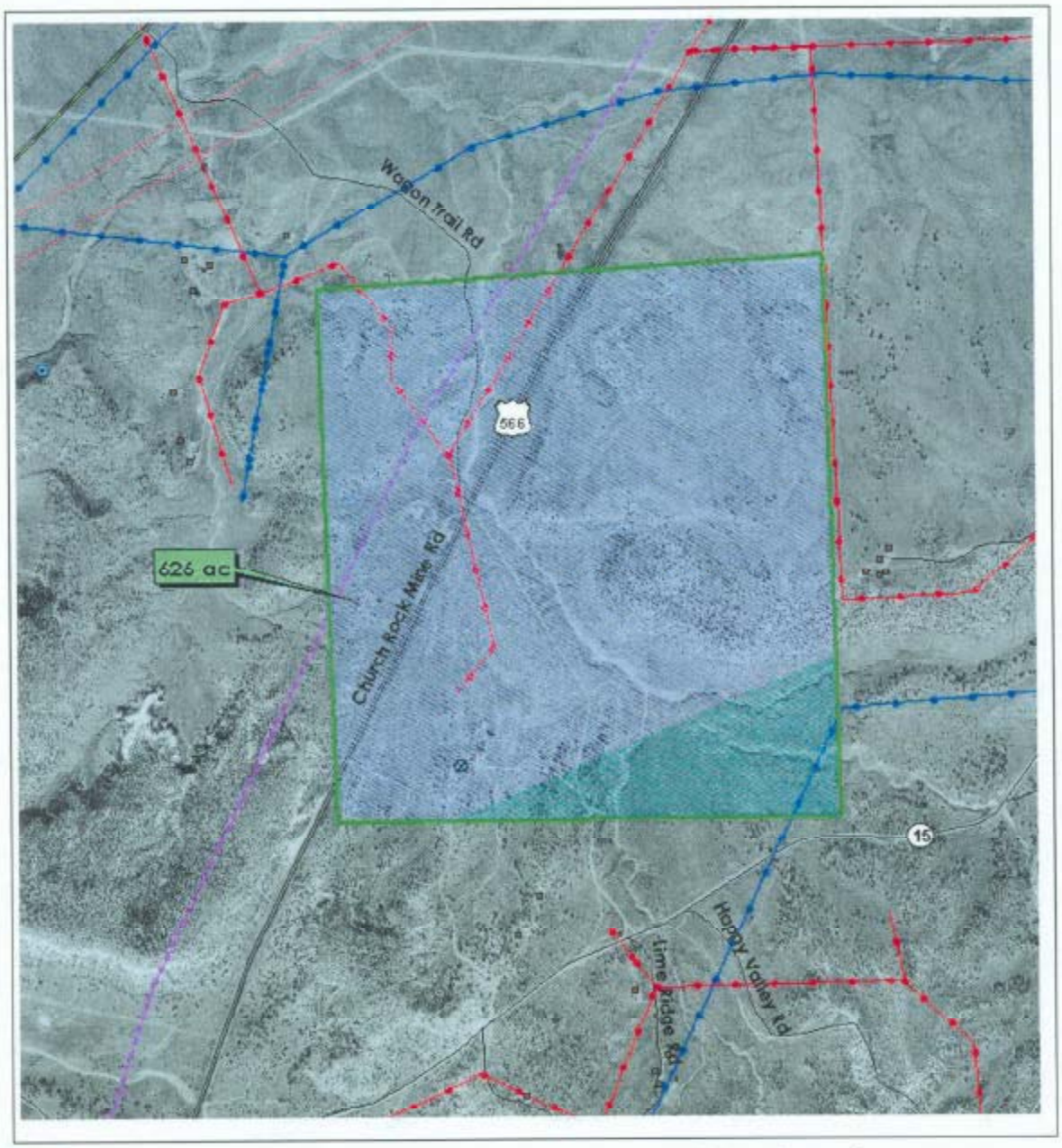
Culturally Significant Areas/Traditionally Sensitive Areas

No archaeological, architectural, or ethnographic resources of significance were identified on a site visit.

Recommendations

The relatively level area of the site makes it one of the most suitable areas for housing development in the Chapter. This will depend, however, on the results of tests being conducted on possible uranium contamination of groundwater in the area. If the results are favorable and development proceeds, the Chapter should work with Fort

Exhibit 33: Site 3 Soils



Proposed Development
Houses

Churchrock Springstead Site

Utilities
Electric Line
Water Line
Telephone Line
Gas Pipeline

Soil Types
Camborthids--Torriorthents
Rockland-Torriorthents-Haplargids

Defiance Housing Corporation to ensure that a wide variety of housing opportunities are available on this site to Chapter members

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report is not intended to represent an intensive survey of threatened or endangered species within the study area.

E. Land Use Plan

The Land Use Plan for Churchrock Chapter is comprised of three sections:

- E.1 Recommendations
- E.2 Implementation
- E.3 Future Land Use Map