

**RESOLUTION OF THE
RESOURCES AND DEVELOPMENT COMMITTEE
Of the 23rd Navajo Nation Council---Second Year 2016**

**AN ACTION
RELATING TO RESOURCES AND DEVELOPMENT COMMITTEE, CERTIFYING
ROUND ROCK CHAPTER'S COMMUNITY-BASED LAND USE PLAN**

BE IT ENACTED:

SECTION 1. FINDINGS

A. The Resources and Development Committee, pursuant to 26 N.N.C. §2004(D)(2) shall certify community-based land use plans.

B. The Transportation and Community Development Committee (predecessor to the Resources and Development Committee; CO-45-12) approved the Round Rock Chapter's Community-Based Land Use Plan in 2006.

C. Pursuant to 26 N.N.C. §2004(D)(2), the Chapter shall amend the Community-Based Land Use Plan every five years, and such amendment is subject to the certification of the Resources and Development Committee of the Navajo Nation Council.

D. Pursuant to Round Rock Chapter Resolution No. ROUN1412-02, the Round Rock Chapter approved the revision of its Community-Based Land Use Plan and requested the Resources and Development Committee certify the revised Community-Based Land Use Plan.

E. The Resources and Development Committee of the Navajo Nation Council finds it in the best interest of the Navajo Nation to certify the Round Rock Chapter's Community-Based Land Use Plan.

SECTION 2. Certification

A. The Resources and Development Committee of the Navajo Nation Council hereby certifies Round Rock Chapter's Community-Based Land Use Plan, attached hereto as Exhibit A.

B. Certification of this Community-Based Land Use Plan shall not delineate adjacent chapter boundaries. Any chapter disputes rest solely with the Courts of the Navajo Nation.

CERTIFICATION

I, hereby, certify that the foregoing resolution was duly considered by the Resources and Development Committee of the 23rd Navajo Nation Council at a duly called meeting at Navajo Nation Council Chambers, Window Rock, Navajo Nation (Arizona), at which quorum was present and that same was passed by a vote of 3 in favor, 0 opposed, 1 abstained this 19th day of February, 2016.



Alton Joe Shepherd, Chairperson
Resources and Development Committee
Of the 23rd Navajo Nation Council

Motion: Honorable Walter Phelps
Second: Honorable Davis Filfred

Tsé Nikání

B i s D o o t ł ' i z h D e e z ' á h í

LAND USE PLAN

ROUND ROCK CHAPTER
DECEMBER 2014



ACKNOWLEDGEMENTS

Round Rock Chapter
P.O. Box 10
Round Rock, Arizona 86547
Phone (928) 787-2510

ROUND ROCK CHAPTER COMMUNITY MEMBERS

CHAPTER OFFICIALS

Kellywood Harvey, Sr., President
Robert Wagner, Vice-President
Harrison Roy, Secretary/Treasurer
Roland Tso, Grazing Official
Mary L. John, Acting CSC

NAVAJO NATION COUNCIL DELEGATE

Nelson S. BeGaye

COMMUNITY LAND USE PLANNING COMMITTEE

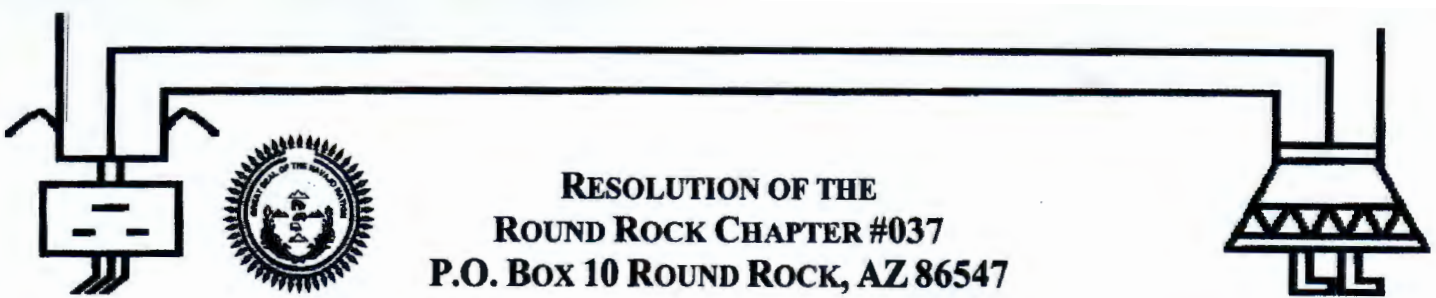
Laverne Jones, CLUPC President
Christina Jones, CLUPC Secretary
Reid Mckinley, Jr., Member

CONSULTANT

JJ Clacs & Company
P.O. Box 479
Fort Wingate, New Mexico 87316
wynette@jjclacs.com

CONTRIBUTORS:

Navajo Nation Department of Transportation, Navajo Tribal Utility Authority (NTUA), Navajo Nation Land Department, Navajo Nation Historic Preservation (NNHPD), Navajo Nation Department of Fish & Wildlife (NNDFWL), San Juan County, U.S. Soil and Water Conservation, BIA Natural Resources, Navajo Nation Department of Agriculture, Navajo Division of Natural Resources, and Navajo Nation Department of Water Resource.



ROUN1412-02

APPROVING THE REVISED AND UPDATED ROUND ROCK CHAPTER LAND USE PLAN AND REQUESTING THE RESOURCE AND DEVELOPMENT COMMITTEE TO CERTIFY, IN ACCORDANCE WITH THE 5-YEAR REVIEW RECOMMENDATION STATED IN NAVAJO NATION CODE TITLE 26 LOCAL GOVERNANCE ACT; THIS UPDATED AND REVISED PLAN SUPERSEDES THE 2003 VERSION.

WHEREAS:

1. The Round Rock Chapter is officially recognized and certified as a political unit of the Navajo Nation Government pursuant to Navajo Nation Council Resolution No. CJ-20-55 and as listed at Part 1, Section 10 of the Navajo Nation Election Code (11 N.N.C.), **AND**
2. Pursuant to Resolution No. CAP-34-98, the Navajo Nation Council adopted the Navajo Nation Local Governance Act (LGA) under Navajo Nation Code Title 26; **AND**
3. Pursuant to the LGA, all chapters shall develop and implement a Land Plan and every five years the plan shall be reevaluated and readjusted to meet the needs of the changing community; **AND**
4. Pursuant to the LGA, the Round Rock Chapter established a Community Land Use Planning Committee (CLUPC) to oversee all land use planning activities under Resolution No. 1206-03; **AND**
5. Pursuant to the LGA, the CLUPC led the development of the first Community-Based Land Use Plan in 2003; the Chapter subsequently approved this plan and the Navajo Nation Council - Transportation and Community Development Committee of the Navajo Nation Council, by committee resolution (TCDC- 13-02) certified the Community-Based Land Use Plan on Feb.21, 2006; **AND**
6. In Spring 2014, Round Rock Chapter chose to revise and update its 2003 LGA certified Community Land Use Plan to meet the needs of the changing community; **AND**
7. Pursuant to the LGA, the CLUPC approved a Community Participation Plan on August 7, 2014 to ensure local community members were given the opportunity to participate in the planning process for updating and revising the community land use plan; **AND**

Table of Contents

1	Introduction.....	7
1.1	Authorization.....	7
1.2	Purpose	8
1.3	Prior Land Use Plan – Certified February 21, 2006	8
1.4	Community Land Use Planning Committee	9
1.5	Community Involvement and Public Participation	10
1.6	Plan Amendment and Update Process	11
2	Community Background.....	13
2.1	Location	13
2.2	Chapter Area	13
2.3	Grazing District.....	14
3	Inventories and Assessment.....	18
3.1	Demographics and Community Profile.....	18
3.2	Housing Units	23
3.4	Economic Characteristics.....	27
3.5	Community Facilities	30
3.6	Utilities & Solid Waste	32
3.7	Technology and Communications	34
3.9	Transportation, Roads and Accessibility	35
3.10	Natural Conditions.....	38
4	Community Vision and Goals.....	69
4.1	Introduction.....	69
4.2	Vision, Mission and Values	69
4.3	Goals and Objectives	70
5	Land Use.....	71
5.1	Introduction.....	71
5.2	Land Use Designation	71
6	Infrastructure and Capital Improvement Plan (ICIP).....	78
	References	81
Appendix A	CLUPC Plan of Operation	
Appendix B	Chapter History	
Appendix C	Selected Housing Characteristics & Selected Economic Characteristics	
Appendix D	Soils Reports	

List of Figures

Figure 1	Population Trends	19
Figure 2	Age Distribution	20
Figure 3	Large Households	22
Figure 4	Number of Rooms	24
Figure 5	Year Housing Built	25

List of Tables

Table 1	Community Participation Meetings	12
Table 2	Age Characteristics	19
Table 3	Veterans	21
Table 4	Households	22
Table 5	Housing Units	23
Table 6	Type of Housing Unit ⁽¹⁾ and Median Home Value	24
Table 7	Plumbing and Kitchen Facilities and Telephone Services	26
Table 8	House Heating Fuel	26
Table 9	Employment Status	27
Table 10	Income and Poverty	29
Table 11	Soil Discriptions	42

List of Maps

Map 1	Location.....	15
Map 2	Chapter Area.....	16
Map 3	Grazing District.....	17
Map 4	Utilities.....	61
Map 5	Roads.....	62
Map 6	Topography.....	63
Map 7	Soils.....	64
Map 8	Water Wells.....	65
Map 9	Surface Water.....	66
Map 10	Vegetation Analysis.....	67
Map 11	Environmental Zones.....	68
Map 12	Land Use.....	76
Map 13	Chapter House Area Land Use.....	77



1 INTRODUCTION

This Community-Based Land Use Plan (Land Use Plan) is an official public document approved by the Round Rock Chapter (hereafter interchangeably referred to as the Chapter) membership through Chapter Resolution ROUN1412-02 (A copy of the resolution is inserted at the beginning of this document).

The Land Use Plan serves as a guide for land use and future development as well as provides a foundation for zoning ordinances. It allows the Chapter to evaluate potential development projects while balancing the diverse needs of the community with concerns, cultural traditions and natural resources. The Chapter recognizes that to build a self-sustaining community, perseverance and a solid land development plan are needed. Equally important to the success of the Land Use Plan is the community's commitment and their participation throughout the process. This Land Use Plan herein directly reflects the effort of the Round Rock Chapter and its members who came together and voiced their wants, needs, and desires for a better future.

1.1 AUTHORIZATION

Title 26 Navajo Nation Local Governance Act (LGA) provides authorization to the chapters to develop a community-based land use plan. Land use planning has been an option for Navajo Nation chapters since the LGA passed into law in 1998. If Chapters choose to

administer land within their community, a Land Use Plan must be developed and implemented, pursuant to the law, and updated every five years.

The purpose of the LGA is to recognize governance at the local level. Through adoption of this Act, the Navajo Nation Council delegates its authority, with respect to local matters consistent with Navajo law including custom and tradition, to the individual Chapters. This authority will improve community decision making, allow communities to excel and flourish, enable Navajo leaders to move towards a more prosperous future, and improve the strength and sovereignty of the Navajo Nation in the long run. The LGA compels Chapters to govern with responsibility and accountability to the local citizens.

Chapters wanting to administer land, pursuant to LGA, are required to develop a Land Use Plan based upon results of a community assessment. Chapters who complete a Land Use Plan must then receive certification from the Navajo Nation Council Resources Committee. Once certified, Chapter can then administer land pursuant to the LGA. The Round Rock Chapter has exercised this option and developed a Land Use Plan.

1.2 PURPOSE

The purpose of the Land Use Plan is to develop a plan as part of the LGA in which Round Rock Chapter can plan for its future. The Land Use Plan satisfies the land use certification process under the LGA, as amended, and moves the Chapter closer to managing and making decisions regarding local matters pertaining to land use and thereafter administering the land use process.

The immediate goal is to update the 2003 Land Use Plan (LGA certified in 2006) for the Chapter. Much of the Land Use Plan flows from the voices of the community's members and its chapter leadership including the elected officials and the members of the land use planning committee.

With a unique cultural perspective, the plan incorporates the traditions and customs of the past and articulates the community's overarching goals, objectives, and strategies to guide and coordinate land uses.

1.3 PRIOR LAND USE PLAN – CERTIFIED FEBRUARY 21, 2006

Round Rock Chapter prepared a land use plan in 2006 which was approved by the chapter and certified by the then Navajo Nation Council Transportation and Community Development Committee. The 2006 certified land use plan was prepared with a focus on housing due the funding source. The purpose of that plan was to identify land available for

the development of affordable housing. A Native American Housing Assistance and Self-Determination (NAHASDA) grant funded the plan under the Office of Navajo Government Development. Certain parts of the previous land use plans are integrated into this land use plan including the history section which is included in the appendix.

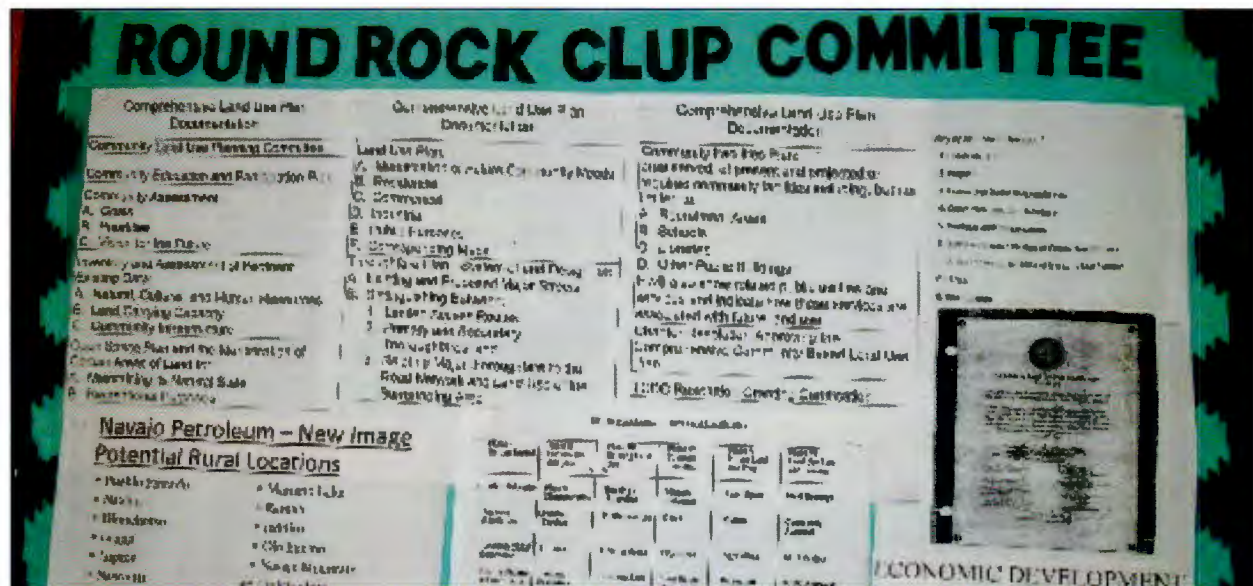
1.4 COMMUNITY LAND USE PLANNING COMMITTEE

In conformance with the LGA, Round Rock Chapter established a Community Based Land Use Committee (CLUPC) comprised of community members that operate according to an approved plan of operation (**APPENDIX A**).

The CLUPC was established to approve the community-based land use planning processes and oversee community-based land use planning activities. The responsibilities of the CLUPC include attending periodic meetings to discuss the development and implementation of the Land Use Plan. Members advise, review, and make recommendations related to land use to the Round Rock Chapter's membership at duly called chapter meetings.

The CLUPC developed the following mission statement to further define the CLUPC's purpose and underlying philosophies:

WE THE PEOPLE OF ROUND ROCK CHAPTER WILL PROTECT THE IMPORTANT SPIRITUAL FAITH FOR ALL AND SACRED SITES. PURSUE TO PROMOTE HEALTH, SAFETY, AND ENCOURAGE EDUCATIONAL DEVELOPMENT FOR ALL.



1.5 COMMUNITY INVOLVEMENT AND PUBLIC PARTICIPATION

In accordance with the LGA, the CLUPC initially developed, approved, and adhered to a *Community Involvement and Participation Plan* (August 17, 2014) to guide community members through the land use planning process by giving all interested parties the greatest possible opportunity to learn and actively participate in reviewing and updating the Land Use Plan. Community members were strongly encouraged to participate in every step of the planning process to review and update the Land Use Plan.

The *Community Involvement and Participation Plan* offered community members to meet with their community leaders and discuss land uses. The participation plan also fostered community education and active participation that ultimately allow the membership to substantially contribute to the back-bone of Land Use Plan.

The educational component of the land use planning process relied on public meetings, work sessions, and public hearings. The approach of each session type is defined below:

- **Public meetings** informed, updated and recommended the land use planning activities of the Chapter community.
- **Work sessions** offered the community a more informal and hands-on approach to participating in the planning process.
- **Public hearing** was a meeting that was held in a more formal setting to obtain views and comments of community members regarding the project.



These sessions were used to educate, inform, and involve the community in the project at various stages along the way. During these times, community members received feedback about assessments, helped prioritize land use plan objectives, and further defined goals. Local community members were encouraged and urged to attend and participate in any and all of the education and communication sessions. Information pertaining to the land use plan was available to the public. The meetings conducted were are shown in **TABLE 1**.

Table 1. Community Participation Meetings

Activity	Purpose	Date
Public Meeting	Regular CLUPC Meeting – Introduction, review planning process and timeline to approve Community Participation Plan	August 12, 2014
Public Meeting	Regular Chapter Meeting – Approval of Community Participation Plan	August 17, 2014
Work Session	Review and update Chapter, vision, community assessments, existing and future land uses, and mapping	September 3, 2014
Public Hearing	Present Draft LUP (start of 60-day comment Period)	September 14, 2014
Public Meeting	Regular CLUPC Meeting – Review Land Use Plan Comments	October 27, 2014
Public Meeting	Review of Land Use Plan - Editing	November 25, 2014
Public Meeting	Regular CLUPC Meeting – Review LUP Comments (close of 60-day comment Period)	November 28, 2014
Chapter Planning Meeting	Recommend to the Chapter for approval and adoption via Chapter Resolution	December 03, 2014
Chapter Meeting	Approval and Adoption of Land Use Plan	December 14, 2014

1.6 PLAN AMENDMENT AND UPDATE PROCESS

The amendment process provides an opportunity for community members, groups, organizations, departments, entities, businesses and the general public to propose changes to the Land Use Plan. Proposed amendments included changes that addressed changing social, economic and environmental conditions.

Changes also reflect on-going work or new information. Proposed amendments may include changes to policies, maps, appendices or other components of the Land Use Plan.

1.6.1 Five-Year Update

Round Rock Chapter anticipates that the Land Use Plan will function well for some time to come; however, to assure that the plan is meeting the needs of the community, the Land Use Plan will be completely reviewed, revised and updated by the CLUPC, as appropriate, every five years pursuant to LGA regulations.

1.6.2 As Needed Amendment

In between the five-year updates, amendments can be made on an as needed basis. Community members, groups, organizations, departments, entities, businesses and/or the general public can propose an amendment(s) in accordance with the process described herein. When the CLUPC approves an amendment, it shall become part of this Land Use Plan as an addendum. All addendums will be reviewed and incorporated, as appropriate, into the Land Use Plan during the Five-Year Update.

1.6.3 Process for Proposing an Amendment

Request for amendments should be in writing to the attention of the CLUPC. Appropriate support material, if any, should be included along with the request for the amendment.

1.6.4 Criteria for Considering an Amendment

If an amendment was proposed to the Land Use Plan, specific questions were asked as part of the evaluation process. Such questions included but were not limited to the following:

- Is the proposed amendment appropriate for the Land Use Plan?
- Consider whether proposed changes pertain to the Land Use Plan. For example, some proposed amendments suggest changes to regulations or budgets while others request specific assistance, which are more appropriately addressed at Chapter planning meetings and Chapter meetings.
- Is the proposed amendment legal? Consider whether the proposed amendment meets existing relevant laws.

1.6.5 Approval/Disapproval of an Amendment

The CLUPC shall conduct a public hearing for all proposed amendments determined to be appropriate to the Land Use Plan. At the end of the public hearing, the CLUPC shall vote to accept or reject the proposed amendment. If the proposed amendment is accepted, the CLUPC shall recommend adoption, via a resolution, of the proposed amendment to the Round Rock Chapter. Round Rock Chapter membership then shall vote on the resolution at a duly called chapter meeting. Pursuant to the LGA, Chapter approved amendments or modifications shall be approved by the appropriate committee of the Navajo Nation Council. The approval by the committee is the formal acknowledgement of Round Rock Chapter amending its Land Use Plan.



2 COMMUNITY BACKGROUND

2.1 LOCATION

The Round Rock Chapter is located in the north central part of the Navajo Nation within Arizona (**MAP 1**). Situated in Apache County, Arizona, the Chapter house is located along Navajo Route 12 (N12) approximately 32 miles north of Chinle and 22 miles from Tsaille.

2.2 CHAPTER AREA

The Chapter area is approximately 171,520 acres or 268 square miles (**MAP 2**). The Chapter area extends into and along the western edge of the Lukachukai Mountains along the Lukachukai Wash. Six chapters are adjacent to Round Rock; Cove, Lukachukai, Many Farms, Red Valley, Rock Point, Rough Rock and Sweetwater.

The Chapter area lies between two sacred land forms which have special significance in the traditional Diné view of the world. To the east of the Chapter area is a male figure that lies along the Chuska and Carrizo mountains. *His head is Chuska Peak or Tohatchi Mountain, his body is the Chuska-Tunicha range, while his lower extremities are the Carrizo Mountains, with his feet located at Beautiful Mountain, New Mexico. He holds in one hand a bow or a sacred medicine pouch, which is Shiprock.*¹ It is also said that, *his legs lie at the Carrizos, his neck at*

¹ Ibid.

Béesh Łichíí' ii Bigiizh (Red Flint or Narbono Pass), and his head at Chuska Peak. He is in charge of all plants and wildlife.²

This figure is matched by a female counterpart that lies to the west of the Chapter area along the mesas. These mesas make up part of the figure of Pollen Woman: she rests her head at Navajo Mountain, her body at Black Mesa, and her feet at Balakai Mesa. Her arms lie in Shonto Wash. Her cane [or spinning tool] is Aghaałá, a tall black rock near Kayenta. She rules all water and water creations.³ It is said that Whippoorwill Springs Mesa and Low Mountain are the kidneys of Pollen Woman. Some Navajos also suggest that Comb Ridge is one arm, a monocline near Marsh Pass the other, and Tuba Butte and El Capitán are her breasts.⁴ Detailed Chapter history obtained from the previous land use plan is included in APPENDIX B.

2.3 GRAZING DISTRICT

Round Rock Chapter Area is within Grazing District 11 (MAP 3). Generations of herding and grazing on the Navajo Nation led the federal government to form grazing districts over 70 years ago. The Bureau of Land Management (BLM) and the Bureau of Indian Affairs (BIA) developed Navajo Nation grazing districts in 1935. They based the districts on soil and range inventories, which they used to determine animal unit capacities. As these agencies performed their studies, they also kept track of their research areas with what they called grazing district lines that were based on natural topography such as mountain ranges and washes. Between 1937 and 1938, the BIA issued grazing permits based on the units' capacities, and although the district boundaries have never been legally surveyed, they have had many uses over the years.

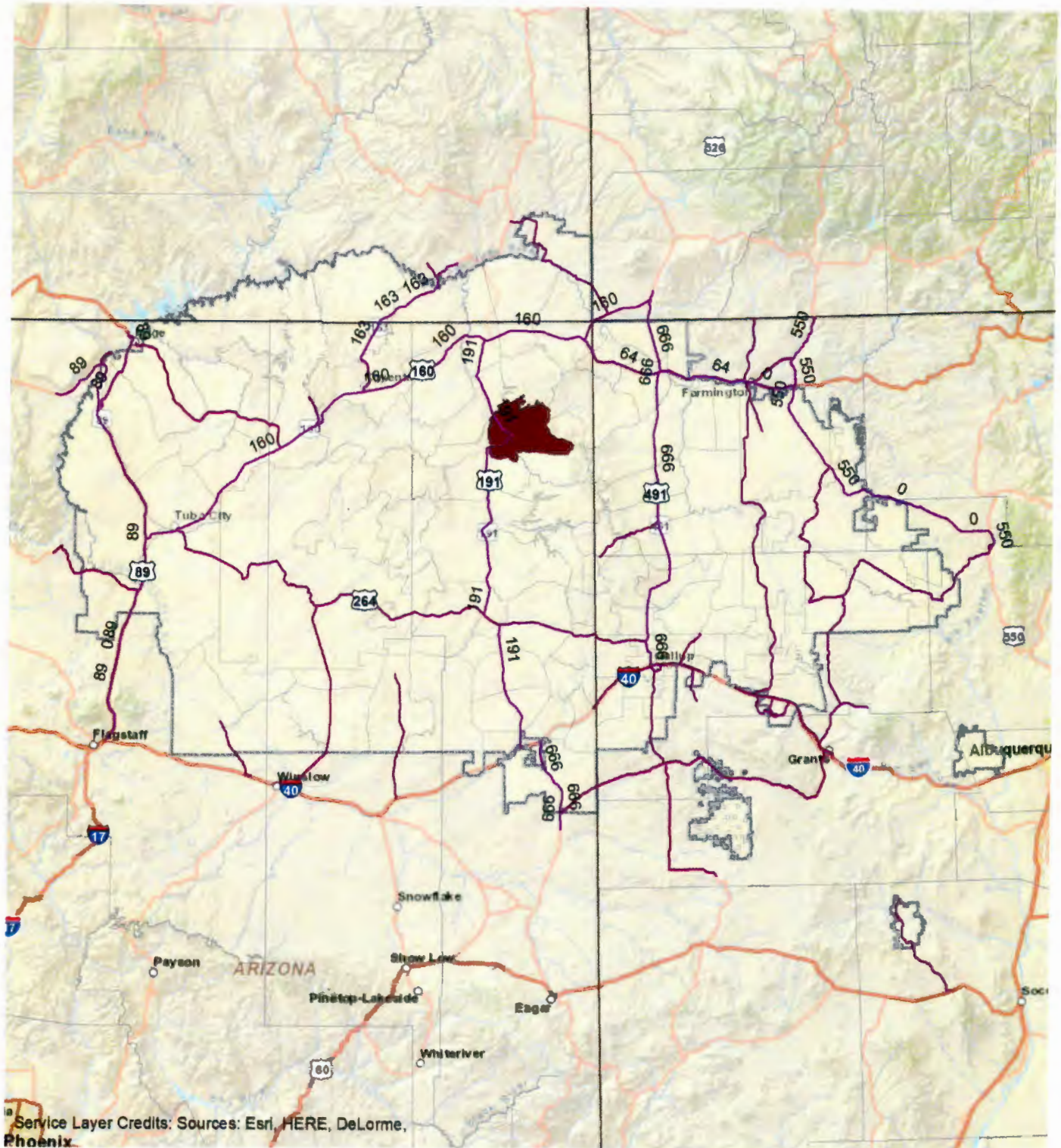


² Ibid, pp. 6

³ Ibid, pp. 6

⁴ *Sacred Land Sacred View*, Robert S. McPherson, Brigham Young University/Charles Redd Center for Western Studies, Salt Lake City, Utah; 1992. pp 21.

MAP 1 - LOCATION



Service Layer Credits: Sources: Esri, HERE, DeLorme, Phoenix

Legend

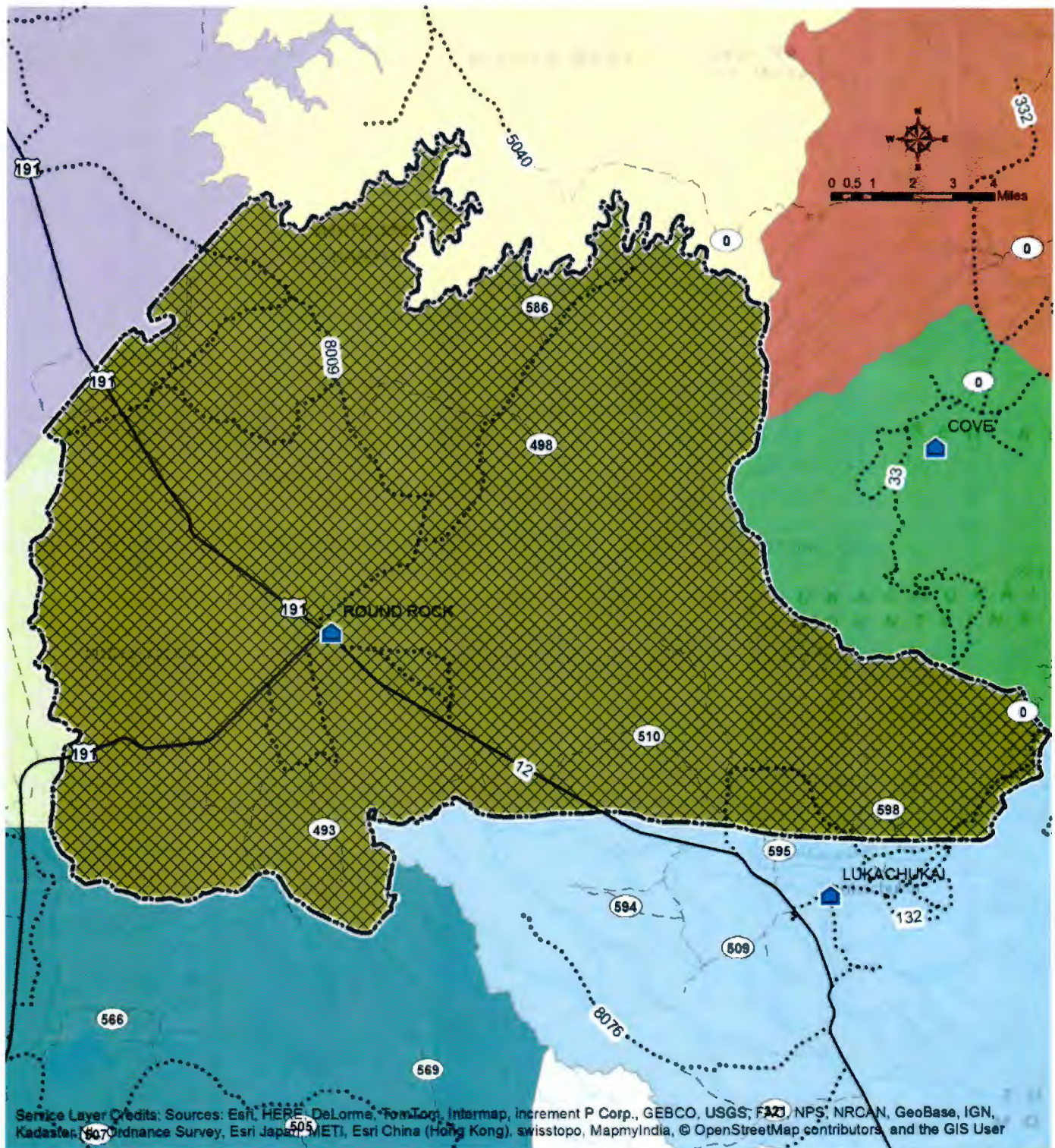
- Chapter Area
- Navajo Nation
- Counties
- States
- Chapters
- State Highway
- U.S. Highway

Tse Tsé Níkání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department

DISCLAIMER: Round Rock Chapter and/or JJ Clacs & Company shall assume no liability for any errors, omissions, or inaccuracies in the information.

MAP 2 - CHAPTER AREA



Legend

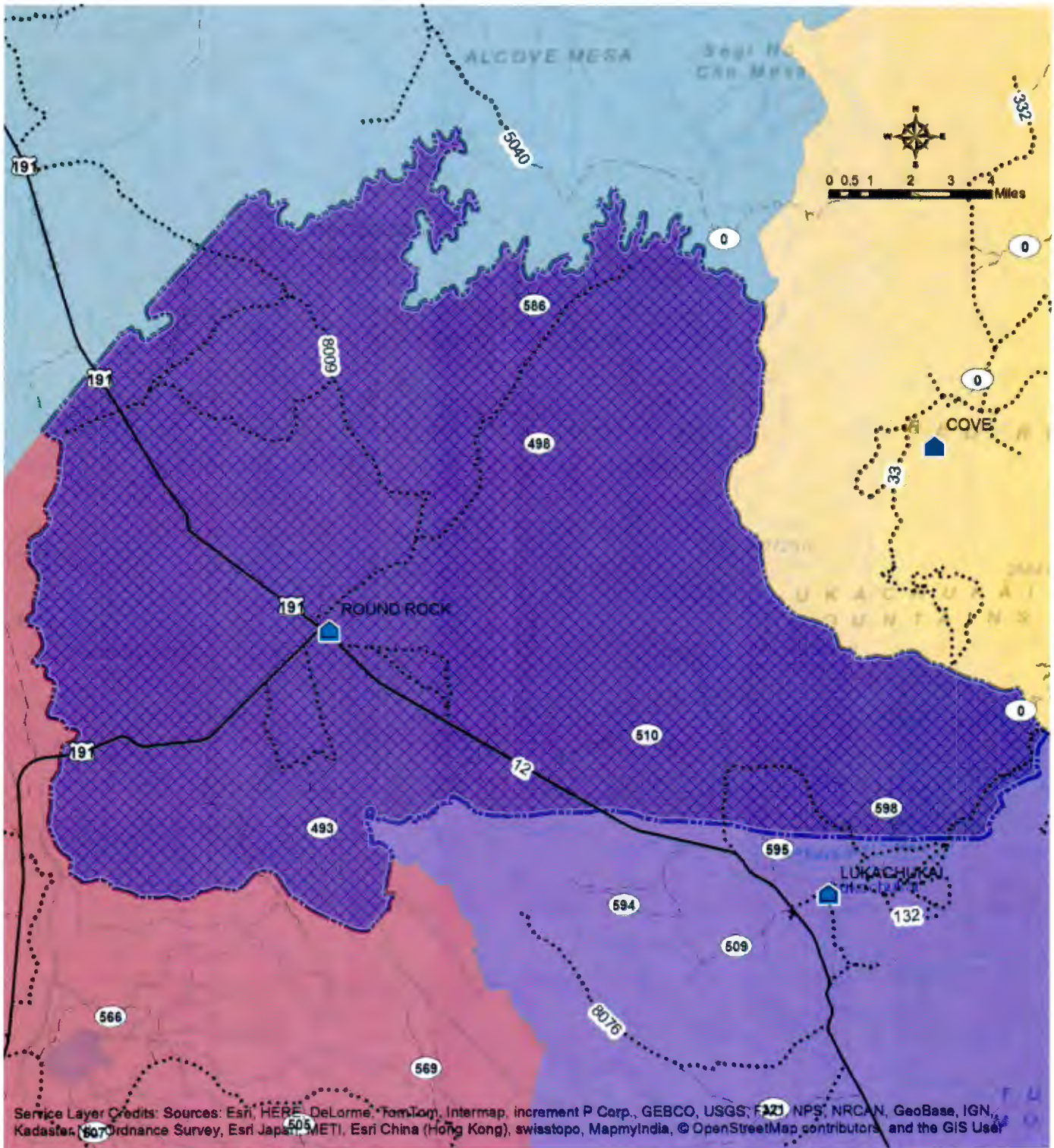
Chapter House	(Navajo Route Unpaved)	Cove	Rock Point
Chapter Area	Navajo Route (Paved)	Lukachukai	Rough Rock
County	U.S. Highway	Many Farms	Sweetwater
		Red Valley	

Tse Tsé Níkání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department

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MAP 3 - GRAZING DISTRICT



Legend

	Chapter House (Navajo Route Unpaved)		Grazing District 9
	Chapter Area	— Navajo Route (Paved)		Grazing District 10
		— County		Grazing District 11
		— U.S. Highway		Grazing District 12

Tse Tsé Níkání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department

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3 INVENTORIES AND ASSESSMENT

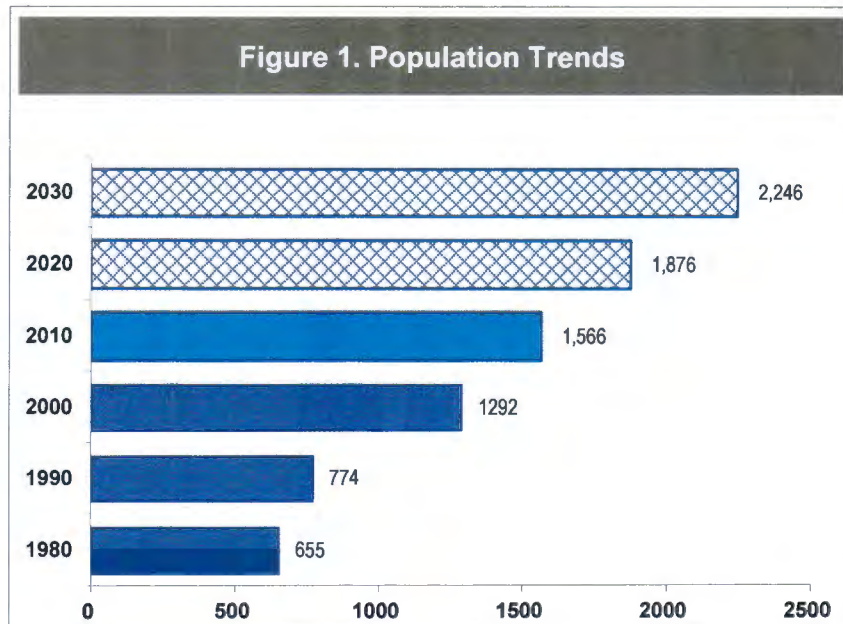
3.1 DEMOGRAPHICS AND COMMUNITY PROFILE

Population growth brings demand for an expanded job base, retail and services business, residential development and essential community services. Changes in the Chapter's population, households, housing and economic data are described below. Data was obtained from the U.S. Census Bureau. Population and household data were available from SF1 tables in 2010 and 2000 Census. Certain economic and housing data were available from 2008-2012 5-year American Community Survey.

3.1.1 Population Trend and Forecast

The Chapter's population has increased since 1980 (**FIGURE 1**). The greatest increase, 67 percent, occurred from 1990 to 2000; most likely due to the Navajo Nation's efforts on obtaining a more accurate census count. The following decade, 2000 to 2010, continued to grow substantially (21 percent), bring the 2010 population to 1,566. The population is expected to steadily increase through 2030.

Population projections for 2020 increased to 1,876 based on a 1.82 percent growth rate recorded by the Navajo Nation Division of Economic Development (2006). At this growth rate projections continue to increase to 2,246 for 2030.



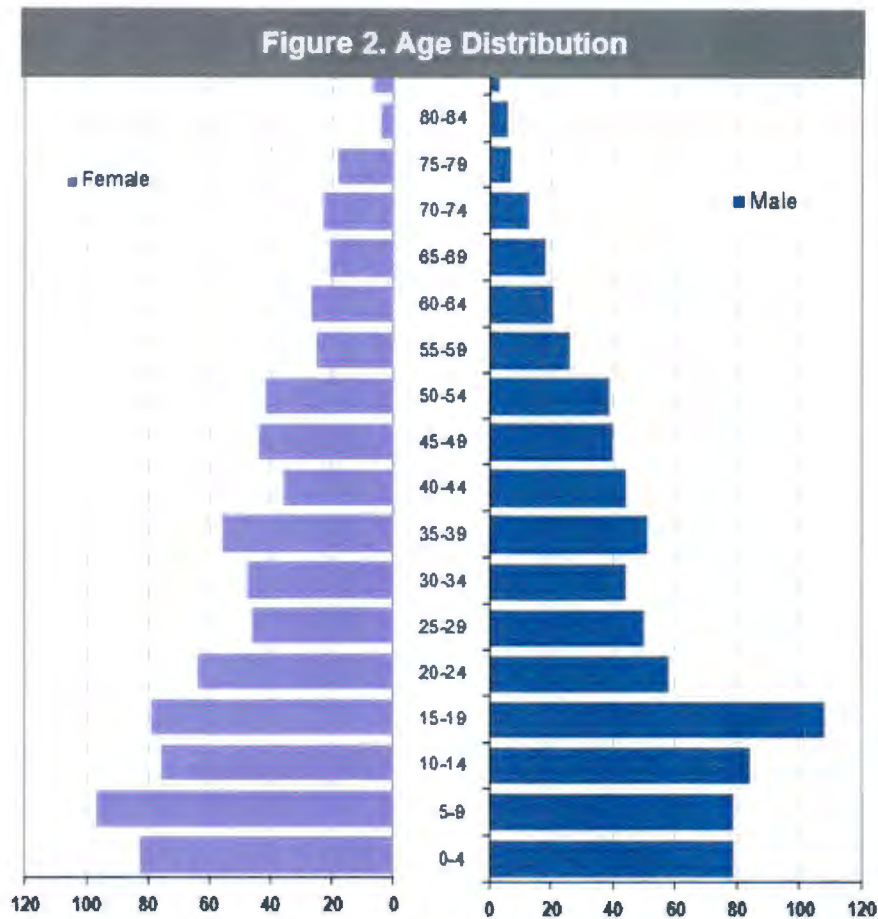
3.1.2 Age Distribution

Including the male and female populations, the Chapter's median age is 23.8, which is much lower than the regions listed in (TABLE 2). Round Rock Chapter's median age is 5.3 years younger than the Navajo Nation, over 8 years lower than Coconino County and much lower than the State of Arizona and the United States.

In Round Rock Chapter, people less than 19 years of age are one-third of the population (33.4 percent) while 7.7 percent are age 65 or older.

Table 2. Age Characteristics			
	2010 School Aged 5-19 (%)	2010 Age 65 or older (%)	2010 Median Age (Years)
United States	20.4	13	37.2
Arizona	21.3	13.8	35.9
Navajo Nation	28.6	9.5	29.1
Round Rock Chapter	33.4	7.7	23.8
Apache County, AZ	26.8	11.6	32.4
Source: U.S. Census Bureau, 2010 Census, SF1			

Males between the ages of 15 and 19 years and females between the ages of 5 and 9 years are the largest sub-populations in Round Rock Chapter (**FIGURE 2**). The age distribution of females and males follow similar trends. Each exhibit decreases with age and with fairly equal numbers.



3.1.3 Veterans

According to local Veterans organization, there are 69 veterans in the community. Over one half of the veterans served in the Gulf War, 13 served in Vietnam and 2 in the Korean War (**TABLE 3**). No information, except names are available for the remaining 15 veterans.

Table 3. Veterans

Conflict	Number
Gulf War (9/2001 or later) veterans	32
Gulf War (8/1990 to 8/2001) veterans	2
Vietnam era veterans	13
Korean War veterans	2
World War II veterans	0
Source: Round Rock Chapter Veterans Organization	



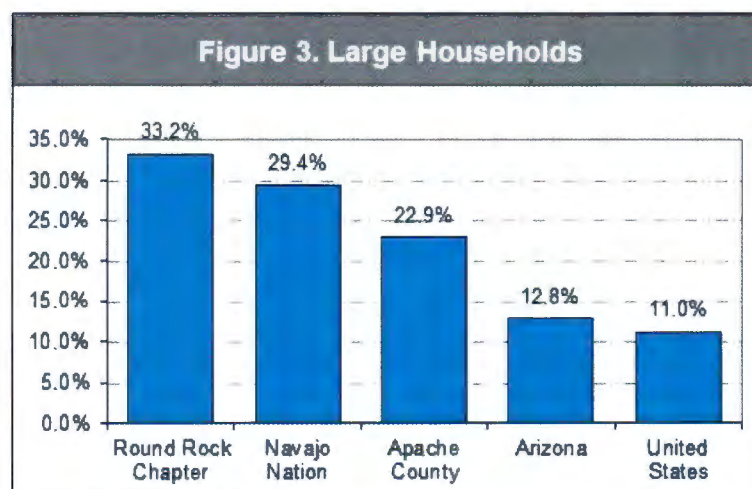
3.1.4 Household Size

TABLE 4 presents average household size throughout various geographical regions according to Census 2010 data. The average household size is the highest for the Chapter is 3.59 while the Apache County is lower at 3.10 and the Navajo Nation at 3.46. Even lower is 2.63 and 2.58, respectively, for Arizona and the United States.

Table 4. Households		
	Households	Average Households Size
United States	116,716,292	2.58
Arizona	2,380,990	2.63
Navajo Nation	49,946	3.46
Apache County	22,771	3.10
Round Rock Chapter	428	3.59
Source: U.S. Census Bureau, 2010 Census, SF1		

3.1.5 LARGE FAMILIES

Large family households have special housing needs due to the lack of adequately sized and affordably priced homes in the community, which results in overcrowding. Large family households are defined as households with five or more persons. A five-person household would typically need a three-bedroom unit while a seven-person household would need a five to six-bedroom unit. Within the Chapter, Census 2010 reports large families comprise 33.2 percent of the households (**FIGURE 3**). The Chapter's has the highest number of large families with the Navajo Nation slightly lower at 29.4 percent. Other geographic areas are much lower, ranging from 11 to 22.9 percent.



3.2 HOUSING UNITS

Selected housing characteristics based on the 2008-2012 American Community Survey 5-year Estimates are included in **APPENDIX C**. Other data reported by the U.S. Census Bureau are presented below.

The number of total housing units within the Chapter has slightly decreased from 591 to 538 (-9.0 percent change) over a ten year period (2000-2010) according the U.S. Census Bureau (**TABLE 5**). However, the percent change from 1990 to 2010 is significant at a 47 percent increase. Apache County had the smallest percent change while the State of Arizona had the greatest increase at 29.9 percent change from 2000 to 2010.

Table 5. Total Housing Units				
	1990	2000	2010	Percent Change
United States	102,263,678	115,904,641	131,704,730	13.6%
Arizona	1,659,430	2,189,189	2,844,526	29.9%
Navajo Nation	48,385	59,498	63,998	7.6%
Round Rock	366	591	538	-9.0%
Apache County	26,731	31,621	32,514	2.8%



3.2.1 Housing Type and Median Home Price

The median home values, according to the American Community Survey, for the Chapter is far below all other jurisdictions examined in **TABLE 6**. One quarter (25.3 percent) of the housing units are mobile home units in the Chapter. According the areas listed in the

table, Apache County has the next highest percentage of mobile homes at 20.5 percent followed by the Navajo Nation with 18.8 percent.

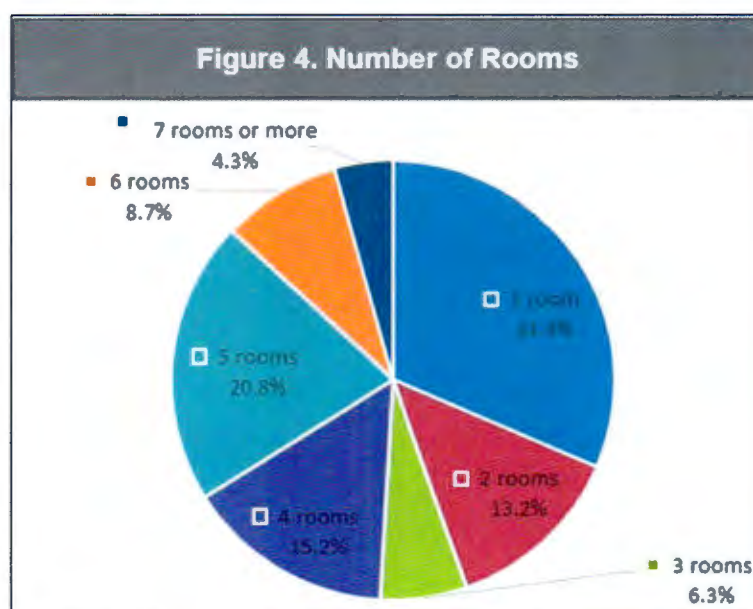
The trend for the state of Arizona and the U.S. have few mobile homes and considerable higher home values. The median home value is significantly lower for Apache County (\$85,200) and the Navajo Nation (\$67,900). The Chapter showed the lowest in home value (\$57,000).

Table 6. Type of Housing Unit ⁽¹⁾ and Median Home Value			
	1-Unit, Detached	Mobile Home Unit	Median Home Value
United States	131,704,730	8,684,414 (6.7%)	\$181,400
Arizona	1,794,080 (63.1%)	304,585 (10.7%)	\$175,900
Navajo Nation	52,091 (69.6%)	13,096 (18.8%)	\$67,900
Round Rock	395 (73.4%)	136 (25.3%)	\$57,000
Apache County	23,499 (72.2%)	6,664 (20.5%)	\$85,200

Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

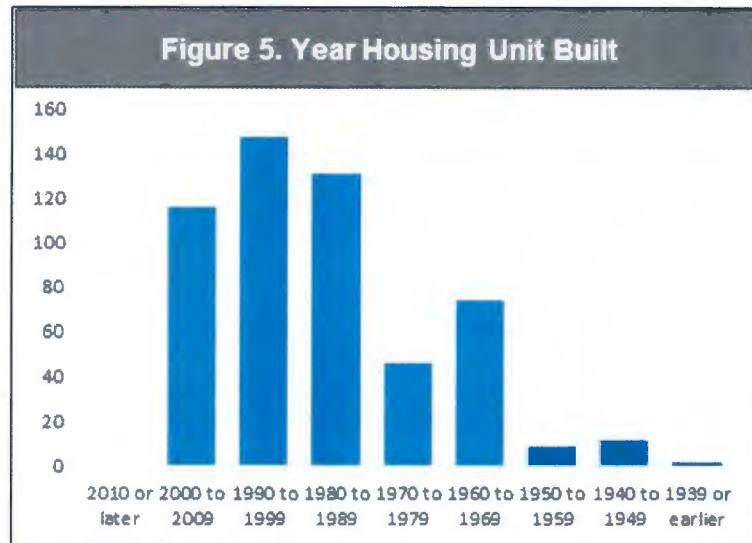
(1) A housing unit is a house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters.

FIGURE 4 shows the distribution of the housing units based on number of rooms for Round Rock Chapter. The majority of the houses within are one-room units (31.4 percent) followed by homes with five rooms (20.8 percent), four rooms (15.2 percent) and two rooms (13.2 percent). The homes with six rooms make 8.7 percent of the housing units. The units with seven or more rooms drops to 4.3 percent.



3.2.2 Housing Condition

The condition of housing is generally characterized by the age of the homes and the availability of basic facilities, such as plumbing and heating. The majority of houses in the Chapter were built between 1990 to 1999 and some much earlier than that (**FIGURE 5**). No houses have been built since 2009.



Complete plumbing facilities are defined as hot and cold piped water, a bathtub or shower, and a flush toilet. Over one-third (35.0 percent) of the Chapter's homes lack complete plumbing facilities; much higher than all other jurisdictions shown in **TABLE 7**. Similarly, one-quarter (24.5 percent) of the Chapter's homes lack complete kitchen facilities, which is much higher than the other areas listed in the table. Over one-third (35.9 percent) percent of the housing units in the Chapter have no land line telephone service. The Navajo Nation shows a slightly lower percentage (26.9 percent) while the counties, state and national rates are significantly lower.

Table 7. Plumbing and Kitchen Facilities and Telephone Service				
	Occupied housing units	Lacking complete plumbing facilities	Lacking complete kitchen facilities	No telephone service available
United States	115,226,802	628,104 (0.5%)	1,048,399 (0.9%)	2,879,289 (2.5%)
Arizona	2,357,158	18,258 (0.8%)	22,461 (1.0%)	75,271 (3.2%)
Round Rock Chapter	326	114 (35.0%)	80 (24.5%)	117 (35.9%)
Navajo Nation	43,425	9,462 (21.8%)	7,767 (17.9%)	11,697 (26.9%)
Apache County	19,035	3,296 (17.3%)	2,578 (13.5%)	2,877 (15.1%)
Source: U.S. Census Bureau (2008-2012 American Community Survey 5-Year Estimates)				

According to the 2008-2012 American Community Survey 5-Year Estimates, for the Chapter, almost all homes (78.8 percent) rely on wood for heating. Approximately 7.9 percent of the units are heated by propane (**TABLE 8**).

Table 8. House Heating Fuel			
	Propane	Electric	Wood
Round Rock Chapter	7.9%	5.2%	78.8%
Source: U.S. Census Bureau (2008-2012 American Community Survey 5-Year Estimates)			

3.4 ECONOMIC CHARACTERISTICS

Selected economic characteristics based on the 2008-2012 American Community Survey 5-year Estimates are included in **APPENDIX C**.

3.4.1 Labor Force and Employers

Labor force estimates provided by the 2008-2012 American Community Survey are shown in **TABLE 9**. Among the population 16 years and over, 351 are in the labor force. Of those in the labor force, 249 (29.1 percent) are employed. Employment is dominated by jobs (68.3 percent) in educational services, and health care and social assistance as compared to 11.6 percent in public administration or construction. Retail trade and finance industry show about 4 percent each. Based on class of work, 82.3 percent are government workers and remaining 17.7 percent are private wage and salary workers. No self-employed workers were reported.

Table 9. Employment Status		
	Estimate	Percent
Population 16 years and over	857	
In labor force	351	41.0%
Employed	249	29.1%
Unemployed	102	11.9%
Industry		
Agriculture	0	0.0%
Construction	29	11.6%
Manufacturing	0	0.0%
Wholesale Trade	0	0.0%
Retail Trade	11	4.4%
Transportation and Warehousing, and Utilities	0	0.0%
Information	0	0.0%
Finance and Insurance, and real estate and rental and leasing	10	4.0%
Professional Scientific, Mngt, Administrative and Waste Mngt Services	0	0.0%
Educational Services, and Health Care and Social Assistance	170	68.3%
Arts, Entertainment, Recreation, Accommodation and Food Services	0	0.0%
Other services, except public administration	0	0.0%
Public Administration	29	11.6%
Class of Worker		
Private Wage and Salary Workers	44	17.7%
Government Workers	205	82.3%
Self-Employed in own not incorporated business workers	0	0.0%
Unpaid Family Workers	0	0.0%
Source: U.S. Census Bureau (2008-2012 American Community Survey 5-Year Estimates)		

Red Mesa Unified School District is the major employer within the Chapter employing both community and non-community members at the Round Rock Elementary and Junior High School. The Chapter House employ 10 to 46 people and the Head Start program has three employees. Most residents work outside of the community. Chinle is the nearest large community providing employment opportunities. Nearby communities including Tsaile, Rock Point, and Rough Rock and Kayenta also provide employment to some community members.

Most residents work outside of the community with a mean travel time to work of 42.6 minutes. Major employers throughout these areas include the BIA, Navajo Nation, Indian Health Service (IHS), Navajo Tribal Utility Authority (NTUA), Navajo Engineering and Construction Authority (NECA), Abandoned Mine Land (AML) Reclamation Project and Apache County. Nearby power plants also serve as major regional employers.

3.4.2 Self-Employment

Although U.S. Census reported there were no self-employed workers, there are an unknown number of community members self-employed or combine work to make a living. Entrepreneurs typically are people operating art and crafts businesses where they make their products in their homes. They sell their product through direct sales. Other entrepreneurs supplement their living via a cattle and/or sheep operation, farming, businesses or other home-based businesses.

3.4.3 Local Businesses

There are two business site leases within Round Rock. The first located adjacent to Navajo Route 12 near the chapter house compound. Currently a vacant building sites on the property. The former Round Rock Trading Post is locate northwest of the chapter house adjacent to the school property. The Trading Post closed this past year. A community entrepreneur also has a tire shop as indicated by local signage.



3.4.4 Income

The per capita income and median family income are show in **TABLE 10**. The per capita income for the Chapter is \$8,107, which is the lowest among all jurisdictions listed in the table. Similarly, the Chapter's median family income of \$30,724 is lowest. The median family income for the Navajo Nation is slightly higher than the chapter.

The percent of persons below poverty level is 47.3 percent for the Chapter, which is highest followed by the Navajo Nation and Apache County. The margins continue to increase for the state and national poverty levels.

Table 10. Income and Poverty

	Per Capita Income	Median Family Income	Persons Below Poverty Level	% Below Poverty Level
United States	\$27,915	\$64,293	42,739,924	14.3%
Arizona	\$25,784	\$60,237	1,003,575	16.2 %
Navajo Nation	\$10,864	\$32,182	64,317	38.1 %
Round Rock Chapter	\$8,107	\$30,724	(x)*	47.3%
Apache County, AZ	\$12,626	\$38,290	24,120	34.7%

Source: U.S. Census Bureau (2008-2012 American Community Survey 5-Year Estimates)

* An (x) means that the estimate is not applicable or not available.



3.5 COMMUNITY FACILITIES

- Chapter House – The Chapter house is located along Navajo Route 12.



- Senior Center – The Senior Center provides service to the elderly and serves approximately 25 people on a daily basis.



- Law Enforcement and Fire Protection – The Navajo Nation provides law enforcement from Chinle. There is no fire protection within Round Rock. The nearest fire stations are located in Lukachukai and Rock Point.
- Hospital and Health Services – The Chinle Comprehensive Health Care Center, Tsaille Clinic and the Red Mesa Four Corners Regional Health Care Center are the surrounding health care facilities from which the community members seek medical service.
- Parks and Recreation – There are no public parks and recreational areas within the Chapter. Canyon De Chelly is nearby some 30 miles driving distance to the south of the chapter house. Four Corners Monument is 90 miles to the northeast and Monument Valley is approximately 100 miles to northwest.

- Preschool and Head-start - Concordia Charter School provides Pre-K to 4th grade and serves approximately 43 students.



- Elementary Education –The Round Rock and Red Mesa Public School consists of Kindergarten through 8th grade with approximately 153 students. Students also attend elementary schools in Rock Point, Many Farms, Red Mesa and Chinle.



- Middle and High School Education – Students attend middle schools in Rock Point and Many Farms.
- Colleges – Dine College is the nearest college in Tsaile, Arizona. Arizona State University has branches in Tsaile and Chinle. Fort Lewis College also has a branch in Tsaile. Navajo Technical University and Northern Arizona University have branches in Chinle.
- Churches – Round Rock provides a variety of opportunities to worship, which include the following: Lady of Guadalupe Catholic Church and a Baptist Church. Several community members also practice the traditional Navajo religion and the Native American Church. These worship sites are located within or near existing developed homesteads.



3.6 UTILITIES & SOLID WASTE

The Navajo Tribal Utility Authority (NTUA) is an enterprise of the Navajo Nation, providing electric, natural gas, water, wastewater treatment and solar energy to residents and businesses of the Navajo Nation. Within Round Rock, NTUA provides only electric and water services. **Map 4** shows existing utilities including electric and water lines within Round Rock Chapter.

3.6.1 Electric

A 69KV NTUA electrical power line runs through Round Rock along the paved roads with a substation located at the junction of N-12 and Highway 191. This is a major north-south transmission line for the central area of the Navajo Nation.

3.6.2 Water and Wastewater

The existing domestic water system was constructed by the Indian Health Service (IHS) in the 1970's and is maintained and administered by NTUA. The original system served about 29 homes, the Baptist Mission School and the Chapter House complex. It consists of a 75,000 gallon steel water storage tank, a deep well #11T-501, an artesian well and about 7 miles of distribution lines. The well was reduced in capacity in the early 1980's and is now about 600 feet deep. IHS also drilled an alluvial well which produces about 35 gpm and connected it to the pump-house along with chlorination and fluoridation equipment.

Currently, residents living within a one mile radius of the Chapter House are served by the NTUA domestic water and septic systems.

The Round Rock Elementary School is served by a separate water system and is responsible for its own system. The school also has its own sewage collection system and

lagoon. The Navajo Housing Authority (NHA) also has its own lagoon. The chapter also has its own lagoon.

Other residents depend on local wells and water hauling for their domestic water and most do not have septic systems.

The Navajo Department of Water Resources reported the following deficiencies to the water supply system in the previous land use plan (2006):

- The public water supply in rural areas does not meet the demand. Approximately 40% (or 4 out of every 10) of the families living on the reservation depend on water hauling for their residential and livestock water supply.
- In 1999, IHS estimated that the cost of deficiencies was \$297 million for water systems, \$73 million for sewer and \$12 million in solid waste systems. The annual IHS budget is \$25 million a year, resulting in a 20 year backlog on water and wastewater projects.
- The NTUA water systems face critical economic problems. For many NTUA systems there are many miles of pipelines, but few connections per mile. On some of these water systems the operating costs exceeds the system revenue and it generally costs NTUA more to deliver water than similar non-Indian water companies spend. These higher costs do not allow NTUA to set aside funds for the future, so funding may not be available in the future when the existing systems need to be replaced.
- The population has very limited economic resources and therefore it is not possible to depend on the population to fund capital investments in the water and wastewater systems through user repayment programs.
- The population on the reservation is very widely dispersed. This means that there are long distances between water sources and water users and this adds to the cost of providing services.

3.6.3 Solid Waste Disposal

The Chapter has a trash bin within the Chapter House compound. Waste is collected every Friday by Navajo Nation Waste Management.

3.7 TECHNOLOGY AND COMMUNICATIONS

While the Chapter's communications do include telephone, radio, television, internet and newspaper, some of these services are extremely limited. Growing coverage of cellular telephone service across the Navajo Nation has begun to replace the need for landline service in some cases; however, there is no cell-phone service in some parts of Round Rock.

Clearly transmitted AM radio stations include KNDN and KTNN from Farmington, NM and Window Rock, AZ, respectively. Television channels can be received from Flagstaff, Phoenix and Window Rock. Some residents access satellite television. Dish and Direct TV are common satellite providers.

The chapter area has access to two newspapers: *The Gallup Independent* in Gallup, New Mexico and the *Navajo Times* in Window Rock, Arizona.

Internet service is available via modem and satellite connections. Frontier provides wireless internet service the Chapter house.

The Navajo Communications Company is the telephone utility for the Navajo Nation. Telephone lines run along the same corridors as the electrical lines.

Other residents are using cellular phone service, however the service is not always reliable and coverage is not good in some parts of the Chapter. The Cellular One Corporation has an exclusive contract with the Navajo Nation to provide cell tower service within the reservation. It is hoped that within a few years cellular phone service will improve throughout the reservation.



3.9 TRANSPORTATION, ROADS AND ACCESSIBILITY

Round Rock's transportation network is vital as it provides the much needed safe convenient circulation within the community and links to nearby and adjacent communities. **Map 5** shows the existing roads.

Accessibility by automobile and buses is not always available due to flash-flooding in the area and snow storms. Mud makes local roads impassable and contributes to the creation of new roads.

3.9.1 Roads

Two major highways, Navajo Route 12 and US Highway 191 provide access to Round Rock Chapter. These highways intersect near the Chapter house compound. Both of these highways are main transportation corridors through the central part of the Navajo Nation.

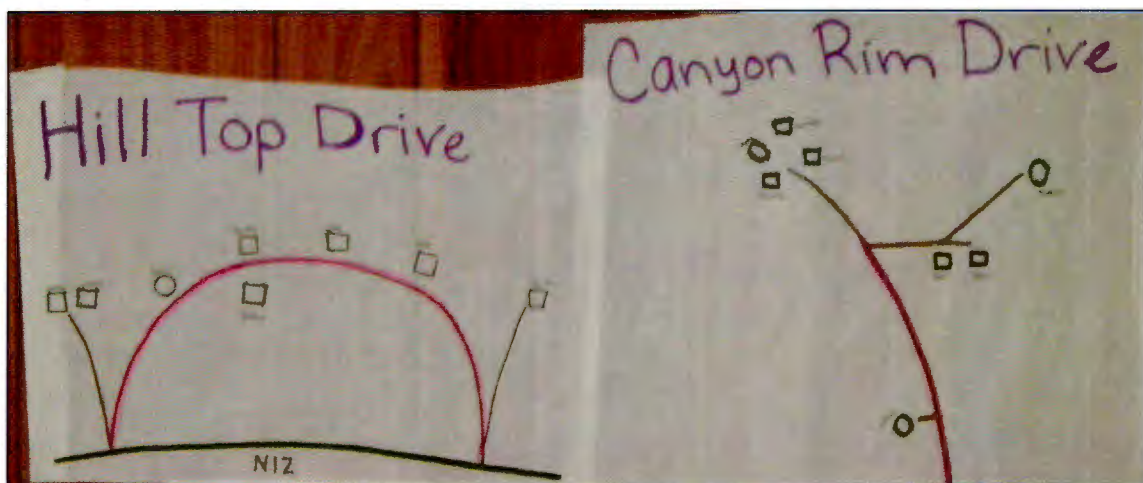
- Navajo Route 12 - Is a primary north-south Navajo Nation highway that runs between US Interstate 40 (near Lupton at the south) and ends at the junction with US Highway 191 at Round Rock. Regionally, it runs along the west side of the Chuska Mountains and connects to Rock Point to the north, Lukachukai, Navajo, Ft. Defiance, and Window Rock.
- US Highway 191 - is a major north-south highway passing through Arizona from St. John's in the south to Mexican Water on the north border. Regionally it connects Round Rock with US Interstate 40 at Chambers, Chinle and US Highway 160 (between Kayenta and Flagstaff).



The rest of the chapter area is served by a combination of gravel and unimproved roads. Other main graded roads in the Chapter area are:

- N-172 (also called 17B) which provides access to the central and eastern section of the Chapter along Red Wash and ending in the Hasbidito Wash area;
- N-8067 (also referred to as the East Road) which provides access to the residential areas east of N12 and south of the Chapter House along Lukachukai Wash;
- N-171 (also called 17A) which provides access from US 191 south along the west side of Agua Sal Wash; and
- County Road - 490 which provides access from US 191 west on the north side of Round Rock and Little Round Rock Buttes; and
- N - 8009 which provides access to the northern section of the Chapter area to the east of US 191 in the upper mesa to the east of Lukachukai Wash and north to Standing Rock.

Rural addressing system is currently in progress for the Chapter and scheduled to be completed by the end of 2014.



3.9.2 Public Transportation

Today, there are no general local public transit systems available within Round Rock. However, a stop is proposed by Navajo Transit in 2015. The regional transit system, Navajo Transit, has stops in Chinle and Tsaile.

Similarly, there is no rail transit service available. Rail service is only available along US Interstate 40 with the closest major hubs at Gallup, New Mexico or Winslow, Arizona.

Other tribal and private services that provide public transportation to Navajos are: Navajo Aging Services Department and Safe-Ride Services. These services have eligibility requirements.

Bus service is available for school children. About seven different school buses serve Round Rock.

3.9.3 Air Transportation

The nearest public airport is located in Farmington approximately 150 miles east from the Chapter house. Otherwise, the closest air transit hubs are in Flagstaff, Arizona and Albuquerque, New Mexico.

Gallup and Winslow also have small airstrips for commuter planes. There is an airstrip in Chinle, but this is used for medical transport only.



3.10 NATURAL CONDITIONS

The section includes information on topography, slope, ground and surface water, soils, vegetation, culturally significant areas, traditional sensitive areas, and environmentally sensitive areas.



3.10.1 Topography

Major features of the Chapter area are the Lukachukai section of the Chuska Mountains on the east side which drops down via steep sandstone cliffs to a series of mesas to the relatively flat, gently sloping western side which is part of the Defiance Plateau. There are several wide and shallow ephemeral washes flowing generally southeast to northwest across the plateau areas.

The Chapter area is also noted for a number of outstanding and monumental sandstone outcroppings. The most notable are Round Rock and Little Round Rock which give the Chapter its name. But there is also Standing Rock along the northern boundary, the Los Gigantes Buttes further east and a number of less visible outcroppings in the deep canyons at the base of the Lukachukai Mountains.

The Chapter is also known as Bis Doot' izhí Deez'áhí for the Blue Clay Ridge which can be seen to the northeast from the former Round Rock Trading Post. The chapter has a number of other smaller outcroppings, eroded hills, ancient lava flows and springs in the lower plateau areas. These serve as local landmarks and in many cases are significant to traditional Diné religious practices.

Elevations range from 5248 feet above sea level in Lukachukai Wash near the northern Chapter boundary to around 8490 feet in the Lukachukai Mountains. The elevation near the Chapter House is 5382. Round Rock butte rises about 700 feet above the adjacent valley floor and Los Gigantes Buttes are about 600 feet high.

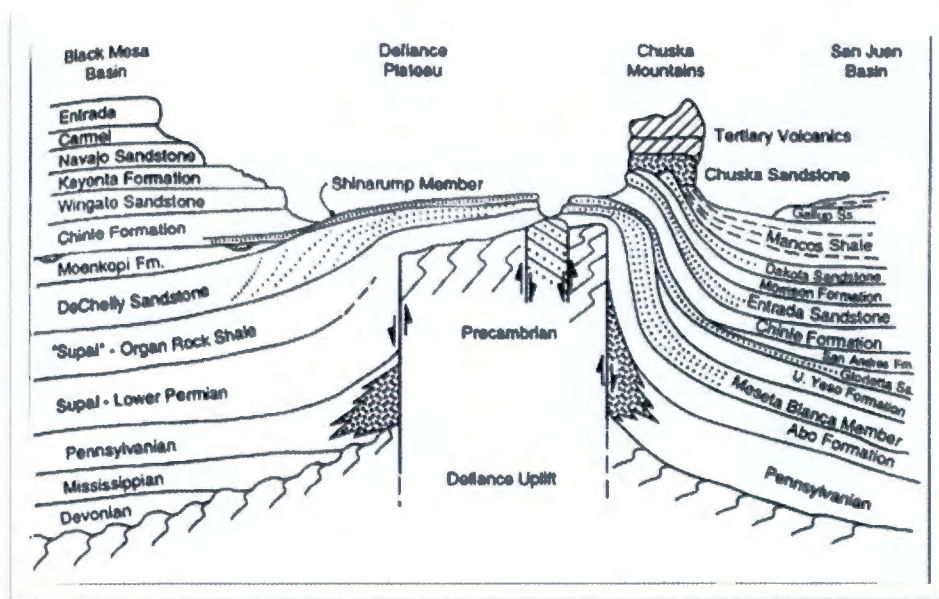
The Chapter is situated in portions of the following U.S. Geological Survey (USGS) 7.5' quadrangles: Dancing Rocks; White Area Canyon; Kinusta Mesa; Little Round Rock; Round Rock, Mexican Cry Mesa; Many Farms NE; Fire Dance Mesa; Bad Bug Butte; and Lukachukai (MAP 6).

3.10.2 Geology

The Chapter area is located in the central portion of the Colorado Plateau physiographic province and the upper portion of the Defiance Uplift a combination of the Defiance Plateau and the Chuska/Lukachukai Mountains.

The geologic formations of the Round Rock area date from the Permian period of the late Paleozoic era. Repeated shallow seas covered the region depositing successive layers of sediment material. With the gradual uplifting of the whole region during the Cretaceous period, the shallow seas retreated and the region became part of the permanent continental land mass. Erosion, volcanic eruption and movement of the earth's crust prevailed during the intervening millions of years, creating the land forms seen today.

The diagrams below show typical cross-sections of the geologic layers in the Round Rock area.



Cross Section showing geologic relationships across the Southern Defiance Uplift and the Chuska Mountains.⁵

The main geologic formations outcropping in the Chapter are briefly discussed below.

- Alluvium – Chiefly composed of sand, silt and gravel eroded off the surrounding mountains and mesas and deposited in the flat stream bottoms over 200 feet thick in places. Where saturated, the alluvium along Chinle Wash and Lukachukai Wash yield fairly large amounts of good quality water on a sustained basis.

- Permian – Sand and Mudstones

DeChelly Formation is a light to dark salmon colored, fine grained sandstone. It forms the canyon walls in Canyon DeChelly and also the massive buttes of Monument Valley. In Round Rock it is seen as the red sandstones of the free standing Buttes of Round Rock and Los Gigantes as well as the cliffs along the base of the Lukachukai Mountains. In the Chapter area this formation is around 800 – 750 feet thick. It is a secondary source of artesian well water for the Chapter area.

- Triassic - Red Sandstones

Shinarump Conglomerate is a yellowish-gray, poorly sorted and moderately to firmly cemented sandstone. It usually contains abundant pockets of gravel. The Shinarump conglomerate offers a reliable source of good quality water but wells can be over 1000 feet deep.

Chinle Formation, which overlies the Shinarump conglomerate, is predominantly an impervious claystone composed of three general layers or members. The lower layer is sandier, while the middle layer consists of variegated, gray, purple, and red claystones that contain considerable amount of bentonite clay. This member forms the painted desert type landscape and contains remnants of petrified forests. The upper layer of the Chinle formation contains thin, siliceous conglomeratic limestones interbedded with mudstones and forms a prominent erosion resistant ledge on top of the lower slopes of the painted desert type formation. Because of its restricted permeability the Chinle formation is not considered a good water source from the standpoint of quantity or quality. Some artesian wells produce small quantities of water.

- Jurassic – Glen Canyon Group Sandstones

Wingate Sandstone, which overlies the Chinle formation, is characterized by the massive reddish-orange vertical cliffs of the region which compose Round Rock and Los Gigantes Buttes. The lower portion of the formation

⁵ *Navajo Country*, Ronald L. Baars, University of New Mexico Press, Albuquerque; 1995. p. 87

is very fine-grained sandstone with siltstone while the thick upper member is fine grained, well-sorted sandstone. Wingate Sandstone formation is about 750 feet thick. It is not a source of water.

Morrison Formation and associated formations form the high picturesque cliffs of the Lukachukai Mountains. Members of the formation are mostly weakly cemented sandstones or siltstones eroding into weak blocky escarpments or gentle slopes. Some uranium deposits are found in this formation and have been mined in the past. It is not a source of water.⁶

3.10.3 Soils

The soils in the Chapter are at low elevations and mostly gently to moderately sloping, but the arid and semiarid climates limit forage production for livestock grazing. The soil distribution is shown in (MAP 7). Soil reports for Dwellings and Small Commercial Buildings and Soil Features are included in APPENDIX D. Soil blowing and accelerated soil erosion resulting from deteriorated plant communities are a major problem in many parts of the Chapter. The soils in the higher elevations are in the southwestern portion of the Chapter and are generally steeply sloping, high in rock fragments, and/or shallow to bedrock. If these soils are well managed, they can produce forage for domestic livestock and wildlife, as well as food products for local use for well into the future. Major limitations to development also exist within the various soil units but are manageable with the appropriate responses.

General soil descriptions for the Chapter are based on a recent survey conducted by the United States Department of Agriculture (USDA), Soil Conservation Service and are only provided for the units contained within the Chapter (TABLE 11). Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor associations or inclusions but is named for its major components.



⁶ Most of this material is quoted from the *Round Rock Comprehensive Plan 1983*, David Hanna Associates, Santa Fe, New Mexico; September 1983 – italicized sections were added to fill in geologic information important to understanding the local hydrology.

Table 11. Soil Descriptions

Map Symbol	Soil Description
1	Akhoni-Typic Argiustolls-Tuntsa complex, 15 to 75 percent slopes
2	Aneth-Naha-Sheppard family complex, 0 to 2 percent slopes
3	Aquima-Rizno-Begay complex, 1 to 15 percent slopes
4	Aquima-Ustic Haplocambids complex, moist, 1 to 6 percent slopes
6	Arches-Begay-Mido complex, 1 to 25 percent slopes
8	Begay loam, 1 to 5 percent slopes
9	Begay-Gullied land complex, sodic, 1 to 3 percent slopes
10	Begay-Mido complex, 1 to 15 percent slopes
13	Claysprings-Lithic Torriorthents-Typic Torriorthents complex, badlands, 1 to 60 percent slopes
17	Denazar-Sheppard-Lithic Torriorthents complex, 1 to 20 percent slopes
24	Jocity-Tezinie-Nazlini complex, sodic, 0 to 5 percent slopes
25	Kachina-Evpark family-Gladel family complex, 2 to 35 percent slopes
26	Lithic Haplustepts-Jacks family-Pachic Haplustolls complex, 4 to 40 percent slopes
27	Lithic Ustic Torriorthents-Begay complex, rocky 1 to 30 percent slopes
28	Marcou-Claysprings complex, 0 to 8 percent slopes
29	Moenkopie-Rock outcrop complex, severely eroded, 1 to 45 percent slopes
30	Monue sandy clay loam, moderately deep, 0 to 3 percent slopes
32	Monue-Sheppard-Nakai complex, 1 to 6 percent slopes
33	Nakai very fine sandy loam, 0 to 6 percent slopes
34	Nakai-Somorent family complex, 1 to 15 percent slopes
40	Plumasano-Lithic Ustipsamments-Royosa complex, 1 to 6 percent slopes
43	Rock outcrop-Arches-Shedado complex, 2 to 20 percent slopes
45	Rock outcrop-Shinume complex, 15 to 65 percent slopes
46	Sheppard-Aneth-Marcou complex, 0 to 4 percent slopes
50	Tekapo and Lithic Ustic Torriorthents soils and Rock outcrop, 5 to 65 percent slopes
51	Trail-Ives-Riverwash complex, 0 to 2 percent slopes
56	Tuntsa, moderately deep-Akhoni family-Cumulic Endoaquolls complex, 0 to 25 percent
58	Typic Haplustolls, moderately deep-Rock outcrop-Typic Ustipsamments complex, 15 to 70 percent slopes
61	Ustic Torriorthents-Eslendo-Rock outcrop complex, 15 to 65 percent slopes
64	Ustifluventic Haplocambids-Ustic Haplocambids, rocky-Riverwash association, 1 to 70 percent slopes
65	Water

3.10.5 Groundwater

The 1983 Round Rock Comprehensive Plan states:

Good quality water capable of supporting a limited amount of community development can be found at shallow depths along Chinle and Lukachukai Washes in the alluvium. The new Round Rock community well (11T-523) was drilled in this alluvium to a depth of 43 feet. Additional wells in the alluvium will be needed as the community grows beyond the capacity of the new well. Alluvium aquifers are recharged seasonally by the washes from precipitation in the Lukachukai Mountains principally in the winter and spring.

The Shinarump conglomerate formation, which is connected hydrologically with the De Chelly sandstone aquifer, offers a reliable source of good quality water but well depths can be fairly deep and quite expensive. The Chinle formation yields small amounts of water to wells but it is not thick enough, nor permeable enough to yield large amounts of water. Confining layers of claystone prevent water in intervening aquifers from moving vertically and thus creates artesian pressure. Flowing wells in the Chapter occur where sufficient artesian pressure is developed to raise the water above the land surface.

The Wingate sandstone yields small amounts of water to springs and wells, but because it generally is exposed on the sides, it does not yield sufficient water for drilled wells. The Morrison formation is not considered a source of water because of its unconfined sides and steep slopes in this Chapter area.

The Navajo Nation's Water Resources Development Strategy report indicates that the C-Aquifer is the primary source of well water for the chapter area. Aquifers are layers of porous rock and rock materials that hold water. The aquifers are named by the layer of rock where the water is found. The water in different aquifers is usually of different geologic age, and of different qualities.

The report gives the following description of the aquifers used in Round Rock. The Aquifers are listed from the deepest to the shallowest.

C or Coconino Aquifer

The C-Aquifer underlies most of the reservation in the Little Colorado River Basin. It is recharged from outcrops on the Defiance Plateau, the Mongollon Rim and the San Francisco Mountains. The communities of Cameron, Leupp, Ganado and Chinle, among others, depend on the C Aquifer for much of their municipal water supply. It is also a major source of industrial water for non-Indian communities in the Little Colorado River Basin.

Note that the Shinarump Member of the Chinle Formation is a Triassic sandstone where the Coconino Sandstone is older and from the Permian

period. The two layers are separated by the Moenkopi siltstones and the Kaibab Limestone in some places. However, it is assumed that the Shinarump formation is considered to be part of the C-Aquifer.

N or Navajo Aquifer

The N Aquifer has less storage than the C Aquifer, but overall it has better water quality. The communities of Kaibeto, Kayenta, Piñon, Tuba City, and the Peabody Coal Mine, among others, depend on the N Aquifer. The Navajo Aquifer has a total storage of 290 million acre-feet.

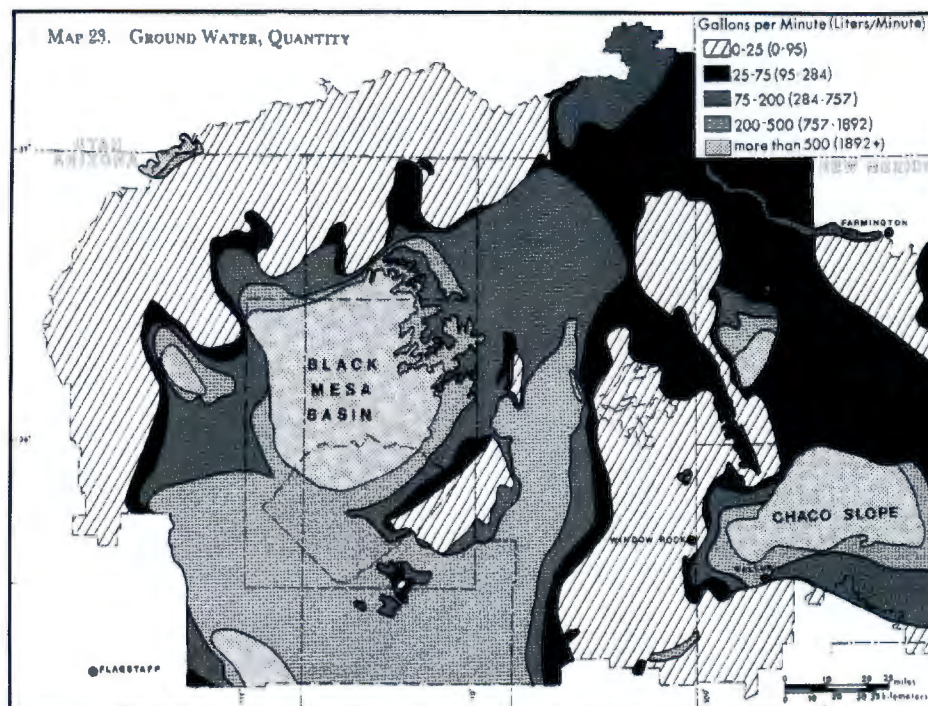
Mesa Verde and M or Morrison Aquifers

The San Juan Structural Unit includes several formations that are primarily located within the State of New Mexico. The major water bearing formations that provide water to Navajo public water systems are the Morrison and Mesa Verde.

The chart and map on the following pages shows the location of wells used for domestic water supply in the chapter area and provides some information about these wells.

Groundwater quantity in the western part of Navajo Country⁷

The major water supply for the piped domestic water system in the chapter area



comes from the NTUA wells and the NTUA system.

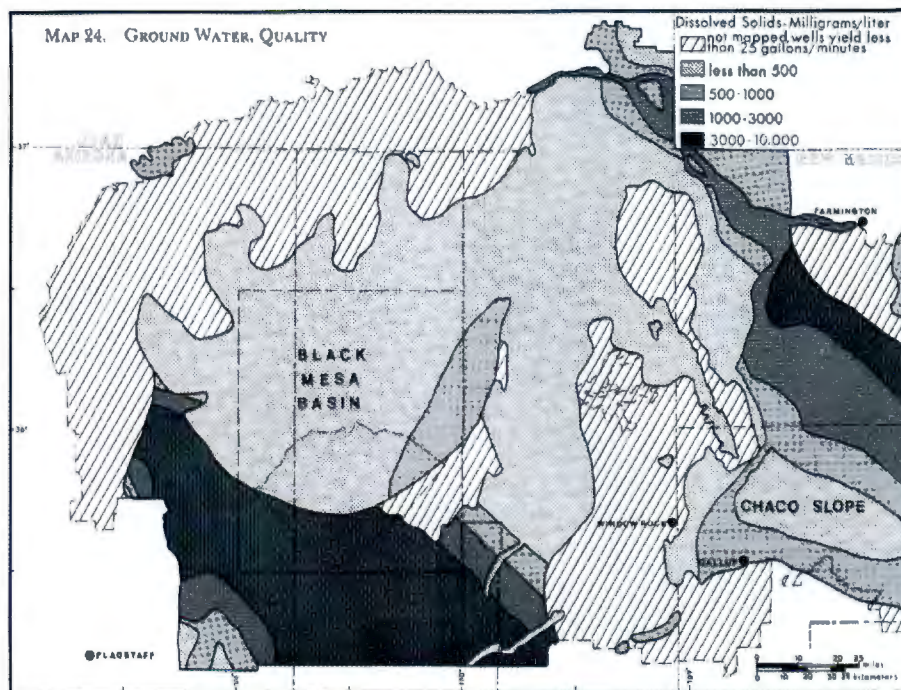
⁷ *The Navajo Atlas*, James M. Goodman, University of Oklahoma Press, Norman; 1971. p. 48.

MAP 8 depicts water wells (some may have been capped) within the Chapter. The well names and their corresponding aquifers are shown. The chapter area also has numerous springs located along the base of the mountains. Most of these springs are in a natural state and are important both as a source of water for the customary use area families and for traditional practices.

3.10.6 Water Quality

Water quality from the NTUA well is the best quality of water as it comes from the C-Aquifer which has good quality water. Water from the Morrison Aquifer is not as good. The Ground Water Quality map shown below indicates that the groundwater in the chapter area has dissolved solids (salts) varying from very low at less than 500 milligrams per liter.

Groundwater quality in western Navajo Country⁸



There are not any known major point sources of groundwater pollution in the general region. However, individual well sites can be contaminated through septic systems which are located too close to the well or through contamination found in the piping system connected to the well. In addition there may be some point source pollution from abandoned uranium mines in the Lukachukai Mountains. Since the drainage from these areas is limited, we can also assume that the potential pollution is also limited.

⁸ *The Navajo Atlas*, James M. Goodman, University of Oklahoma Press, Norman; 1971. p. 49.

3.10.7 Surface Water

The Chapter area is located in the San Juan River Basin on the Colorado Plateau in the Northwestern part of New Mexico within Apache County. It is also within the Chinle Valley hydro-geologic subdivision.

There are no permanent rivers or streams in the Chapter area. There are no wetland areas. The area has four major washes and numerous smaller washes originating at the tops of the mesa and feeding into the main washes. Water experts call the washes ephemeral, which means that water only runs in them for a day or a very short period of time. Most of the available surface water flows during the months of December and January with the source being snow melt from the Lukachukai/Chuska Mountains. There is also run-off during the summer monsoon months between July and August, but this run-off has a higher level of sediment and suspended particles.



The overall drainage is southeast to northwest into the Chinle Wash (**MAP 9**). The major washes are:

- Chinle Wash running more or less south to north in this area;
- the Lukachukai Wash which flows into the Chinle Wash south of Rock Point,
- Hasbitito Wash which originates in Wolf Canyon and flows into Lukachukai Wash north of the Chapter boundary,
- Black Greasewood Wash which runs from Dry Mesa into the Lukachukai Wash north of the Round Rock Chapter, and
- Red Wash which is fed by a system of smaller washes flowing out of the Red Mesa and Female Canyons.

The Chinle Wash eventually flows into the San Juan River west of Mexican Hat.

Surface water drainage stays mainly in the stream channels. Flooding occurs as flash floods and due to the speed and depth of the stream channels moves fairly quickly downstream. It does not appear that FEMA or the Army Corps of Engineers have conducted flood plain studies for this area of the country. Flooding areas occur along both the Chinle Wash and the Lukachukai Wash. There is not very much current development along the Chinle Wash. Along the Lukachukai Wash, flooding has historically occurred in the area along the west side of the wash around the Round Rock Trading Post, along the north end of

the Round Rock School property and in areas along the wash up to 3.5 miles north of the trading post bridge.

There are a few earthen dams which were created to capture some of the runoff for livestock ponds, but do little to retain the majority of the flow or mitigate the erosion.

The combination of fast water runoff and the overgrazed condition of the land surface in the valley areas is part of an environmental cycle which is preventing the land area from regenerating as grazing land. This means that not only is the water not being trapped and retained on the flatter areas by vegetation, it is also running down the washes without having time to soak into the ground and help recharge the groundwater.

In places the washes have carved out deep canyons such as Yellowstone Canyon along the Chinle Wash and Bihilinie Canyon at the northern end of Agua Sal Creek. Dams and canals were constructed to divert water from the Lukachukai Wash to create Round Rock Lake along the east side of Highway 12. The lake maintains water throughout the year and is used for agricultural irrigation.



3.10.8 Round Rock Dam

The Lukachukai Wash also has a diversion dam in the Sitting Coyote Mesa area of the Chapter. The diversion dam directs water into an approximately 3 mile long ditch which delivers water into the Round Rock Reservoir. The Round Rock irrigation system was built in the early 1900's. It starts with a diversion dam on the Lukachukai Wash which directs water into a ditch. A water gate controls the flow of water into the ditch. The ditch runs several miles and feeds into the man-made Round Rock Lake. The lake filled in a natural bowl in the land and the water is held back by a dam. An irrigation system of ditches and pipes feeds out to farm plots below and to the north and east of the lake.



Louise Yazzie walking along top of the diversion dam on Lukachukai Wash

The Round Rock reservoir and dam is described as follows in the Navajo Nation Safety of Dams Program, *Emergency Action Plan for Round Rock Dam*:

The primary purpose of the dam is to provide water for livestock, irrigation and recreational use. The dam is a homogeneous earth-fill embankment with a structural height of approximately 40 feet, a crest length of 1675 feet, and a crest width of 20 feet. At the spillway crest (elevation 519), Round Rock reservoir has a storage capacity of approximately 1624 acre-feet and a surface area of approximately 84 acres...

The uncontrolled spillway consists of a 71" x 47" arch corrugated metal pipe (CMP) conduit with an invert elevation of 5519 feet, located near the left dam abutment (looking downstream). The spillway has a discharge capacity of approximately 90 cfs at the maximum water surface elevation of 5522.6 feet. The outlet works is located within the base of the encased in grout inside of an old CMP. The outlet works includes a gate tower which houses and 18 inch slide gate and a 12 inch slide gate to control the flows. The discharge capacity of the outlet works is estimated



Diversion ditch to Round Rock Lake

at 23 cfs at the water surface elevation of 5522.6 feet. The irrigation releases are made through the outlet works.⁹

The report goes on to discuss safety issues and recommendations:

The downstream hazard classification for Round Rock is **HIGH**. This is due to the potential for loss of life and property damage to the town of Round Rock during failure of the dam. A threat to life would also occur to vehicular travelers on Highway N12, which is located about ½ mile downstream from the dam. An Early Warning System (EWS) is planned for Round Rock Dam in the near future which will give responsible parties increased flexibility in responding to emergencies at the dam.

Responsible parties include:

- The Bureau of Indian Affairs, Department of Interior are the land trustees;
- The dam is operated by the Round Rock Chapter and the Round Rock Farm Board (note: as of January 2003 this board was not officially constituted);
- The Round Rock Chapter President serves as the temporary Emergency Management Coordinator and during a Level II or Level III response situation the Chapter House will become the Emergency Operation Center;
- The Water Master, as designated by the Round Rock Chapter, is responsible for monitoring conditions at the dam; and
- The Round Rock Primary Response Team (RRPRT) is responsible for providing appropriate emergency information.

Annual average precipitation is around 9.60 inches per year. More data is provided in the Climate section of this report. Average evaporation is 28.9.¹⁰

Lukachukai Wash drains a watershed of about 115,000 acres with peak flows of about 220 cubic feet per second.¹¹

⁹ *Emergency Action Plan for Round Rock Dam*, Navajo Nation Safety of Dams Program, Ft. Defiance, Arizona; July 2002. pp 2.

¹⁰ *Draft Round Rock Chapter Water Plan, San Juan River Basin*, Water Management Branch, Department of Water Resources, The Navajo Nation, September 17, 2002. pp.17.

¹¹ *Round Rock Comprehensive Plan 1983*, David Hanna Associates, Santa Fe, New Mexico; September 1983. pp.

The prominent vegetation zone within the chapter area is the upper Sonoran. This zone is defined by semi-arid grass and shrub ecosystem at the lower elevations and piñons-juniper, mixed conifer and ponderosa pine forests at high elevations. Small patches of riparian systems along the major washes and these lower elevation stream bed areas are increasingly being defined by salt cedar (tamarisk) stands, which are a highly invasive non-native species. Un-affected areas will have willows and cottonwood ecosystems. Some sheltered valley areas such as the Yellowstone Canyon were used for cultivation of food crops and fruit trees. There are also some isolated stands of higher elevation mixed conifer ecosystems canyons of the Lukachukai, Bihilinie, and Ts



higher elevation mixed conifer ecosystems in a few of the more isolated and sheltered canyons of the Lukachukai, Bihilinie, and Tsedatoh Wash systems.

[illegible]General Vegetation Chart for western Navajo Country¹²

¹² *The Navajo Atlas*, James M. Goodman, University of Oklahoma Press, Norman; 1971., p. 40.

The following list of plant species is typical for the lower elevations:

General Vegetation Chart for western Navajo Country

The following list of plant species is typical for the lower elevations:

- Cheatgrass, *bromus tectorum*
- Blue Gamma grass, *bouteloua* sp.
- Prickly Pear, *opuntia* sp.
- Narrowleaf Yucca, *yucca angustissima*
- Salt Bush, *atriplex canescens*
- Shadscale, *atriplex confertifolia*
- Sage, *artemisa* sp.
- Cholla Cactus, *opuntia* sp.
- Wolfberry, *lyceum pallidum*
- Bunchgrass, *sorobolus* sp.
- Russian Thistle, *salsola kali*
- Indian Ricegrass, *oryzopsis humenoides*
- Snake Weed, *gutierrezia sarothrae*
- Wild Onion, *allium* sp.
- Vetch, *astragalus* sp.
- Paintbrush (Rabbitbrush), *castilleja* sp.
- Spiny Cactus, *opuntia macrorrhiza*
- Treadleaf Groundsel, *senecio douglasii*

No threatened or endangered vegetative species were identified.

MAP 10 contains global Landsat imagery from 1990-2010 at 30 meter resolution. The Landsat 4 5 1 band combination creates an image where vigorous vegetation appears in shades of bright orange trending towards reddish, with less vigorous and natural vegetation darker oranges and browns. Bare soils appear as greens and browns. Urban features vary from dark purple and grey to white (ESRI Landsat image services). An analysis of the map indicates a lot of green for bare soils and very oranges and brown. Only the Lucachukai mountains show some brown.

3.10.10 Forestry

The Round Rock Chapter contains some small sections of the northern end of the Navajo Forest. However, Round Rock Chapter residents use much more of the Navajo Forest in the areas of the Lukachukai Mountains where their summer sheep camps are located. The areas used by Chapter residents include parts timber compartments #33 – 34, 37 and 38.

The Final Programmatic Environmental Impact Statement for the Navajo Nation 10 year Forest Management Plan Alternatives Report provides the following assessment of the vegetation present in the forest:

The major forest types found in the Navajo Forest are mixed conifer (i.e., Douglas-fir, spruce, and aspen), ponderosa pine, and pinyon-juniper forests. Relatively pure stands of ponderosa pine are most common between 7,000 feet and 8,000 feet in elevation. Above 8,000 feet, the ponderosa pine forest is interspersed with the mixed-conifer forest type, and below 7,000 feet, pinyon-juniper and big sagebrush are mixed with ponderosa pines. Gambel oak is the most common tree associated with ponderosa pine.

Numerous grass species are found in the Navajo Forest. Predominant species include (common names given) blue grama, Arizona fescue, Indian ricegrass, needlegrass, sand dropseed, Squirreltail, ring muhly, and mutton grass. Typical form perennials include globe mallow, beard tongue, paintbrush, mountain muhly, spike muhly, bluestem, deer vetch, lupine, iris, and strawberry. Common understory shrubs include cliffrose, big sagebrush, serviceberry, rabbitbrush, black sagebrush, banana yucca, narrow leaf yucca, Whipple cholla, prickly pear, red hedgehog cactus, mountain mahogany, ceanothus, snowberry, wildrose, common juniper, squaw bush and barberry.

When viewed as a wildlife habitat, the forest becomes a mosaic of structural elements that reflect availability of critical habitat resources. Structural diversity refers to the vertical layering of the forest canopy. Forests with single canopy layer are structurally less diverse and usually support fewer species of animals than forests with many canopy layers...

...the structural diversity of the Navajo Forest has changed dramatically over the past 50 years. Not only has the vegetative structure of the commercial species changed, the horizontal and vertical profiles have also changed. The forest has generally evolved from one with large open spaces and older trees to a dense forest with numerous smaller, younger trees. Like other forests in the Southwest, the change is primarily due to timber management practices and suppression of natural fires.

The reduction in old growth has increased fragmentation of habitat for species that depend upon this type of habitat component. The change in vegetative structure has also

decreased the amount of edge or boundary between two or more elements of the environment (e.g., grassland and woodland areas). In other cases, past management practices have reduced the corridors between similar habitat, resulting in increased fragmentation of habitat and reduced ability of the remaining undisturbed patches to function as interior habitat.

Past forest management practices, including fire suppression, have also affected the processes of natural forest succession. Forest succession occurs when one plant community becomes established and slowly creates conditions that allow new species from other communities to invade, grow and reproduce.

The Navajo Nation adopted a new Forest Management Plan in the summer of 2001.

3.10.11 Wildlife

The following species are typical and indigenous to the general area, the Diné word is given first, followed by the English name and the Latin name:

- Gáagii (crow), Raven, *Corvus corax*
- Gwëęg, Prairie Dog, *Cynomys gunnisonii*
- Gahtsoh, Blacktail Jackrabbit, *Lepus californicus*
- Gałbáhi, Desert Cottontail, *Sylvilagus auduboni*
- Tsin dit'inii, Spotted Ground Squirrel, *Suylvilagus pilosoma*
- Mą'ii, Coyote, *Canis latrans*
- Tsídiilbáhi, Sparrow, *Passer domesticus*
- Finch, *Carpodacus Mexicanus*
- Turkey Vulture, *Cathartes aura*
- Redtail Hawk, *Buteo jamaicensis*
- Horned Lark, *Cremophila alpestris*
- Dló, ' átah né' éshjaa', Burrowing Owl, *Athene cunicularia*
- Long-billed Curlew, *Numenius americanus*
- Mountain Plover, *Charadrius montanus*

Other species which have been sighted in the area include: American Kestrel, great horned owl, loggerhead shrike, western kingbird, lark sparrow, rock wrens, golden mantled squirrels, antelope ground squirrels, deer and porcupine.

The Navajo Nation Department of Fish and Wildlife is in the process of collating list of species found in different areas of the reservation. In the Round Rock area, the Department is most interested in protecting eagle and hawk habitat. A list of endangered and threatened species present in the Navajo Forest is included in the addenda section of this report.

The Navajo Nation Department of Fish and Wildlife have also prepared a zoning map for the protection of endangered and threatened species (**Map 11**). The draft habitat protection zones created by the Department of Fish and Wildlife are as follows:

Zone 1: Highly Sensitive/Restrictive Development

This zone contains the best habitat for endangered, rare and sensitive plant, animal, and game species, and the highest concentration of these species on the Navajo Nation. To protect the Navajo Nation's most sensitive habitats for plants and animals the NNDFWL advises no further business or residential development, permanent, temporary or seasonal.

Exceptions are not of concern if a biological evaluation determines the proposed development is within or adjacent to an area already developed and not close enough to habitat to cause long-term impacts.

"Adjacency" will depend on the species and situation, but generally means within 1/8th of a mile (to existing development)

Any proposed development within Zone 1 shall be submitted to the NNDFWL for review and comment. The NNDFWL 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.

Zone 2: Medium Sensitive/Development with Careful Planning

This zone has a concentration of rare, endangered, sensitive and game species occurrences or has a high potential for these species to occur throughout the landscape. To minimize impacts on these species and their habitats and to ensure the habitats in Zone 1 do not become fragmented, the NNDFWL recommends that no development be placed in Zone 2 to avoid species and their habitat.

Avoidance needs to include an adequate buffer to address long-term impacts. The buffer distance will depend on the species and the situation, and may be up to 1 mile.

As with Zone 1, any proposed development in Zone 2 shall be submitted to the NNDFWL for review and comment. The NNDFWL 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.

Zone 3: Low Sensitivity

This zone has a low, fragmented or unknown concentration of species of concern. Species in this zone may be locally abundant of "islands" of habitat; but islands are few and far between.

Small scale development to serve the needs of individuals, such as Home sites and utilities can proceed without concern for significant impacts to biological resources. [Documentation of] Any development in this zone shall be provided to the NNDFWL for its files. No approval is required.

Community Zone - The NNDFWL has determined that the areas around certain communities do not support the habitat for species of concern and therefore development can proceed without further biological evaluation.

For certain communities, there are exceptions where one or two species have the potential to occur. For these exceptions, the biological evaluation need only address the one or two species.

Habitat Enhancement/Refuge/Preserve Zones: These areas contain excellent, or potentially excellent, wildlife and/or plant habitat and are recommended by the NNDFWL for protection from most human-related activities.

They will be identified for each chapter on a case-by-case basis. A variety of protection techniques are available, and the NNDFWL is interested in working with the chapter and land-user to protect/enhance these habitats by providing technical assistance and possibly materials and labor. The NNDFWL is also interested in receiving proposals from chapters and land-users for these types of zones.

3.10.12 Minerals

Some small uranium mines were developed in the Lukachukai Mountains about 2 miles southwest of Cove Day School as the crow flies. These mines were operated during the 1950's and 1960's and were closed once small scale uranium mining was no longer commercially viable around 1968. Around 725,000 tons of ore was produced in 50 mines. Most of the mines were dug into the cliffs of the exposed Morrison Formation, Salt Wash member. The USGS quad maps note a number of old mine sites within the Chapter area starting east of the top end of Wolf Canyon and moving south along the edge of the Lukachukai Mountains the mines located are: East Mesa, Mexican Cry, Nakai Chee Begay,

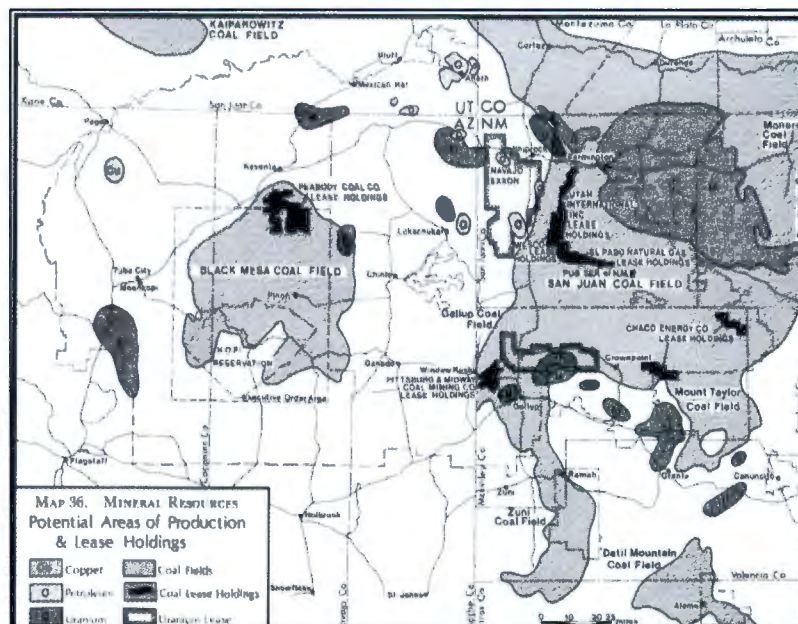
Hall, Jimmie King No. 9, Knife Edge, Joleo, Cisco, and Camp Mines. Uranium is also present in the Shinarump Conglomerate Foundation, Petrified Forest member.

The Roof Butte quad map also shows the Dineh Bi Keyah oil field located about 1 – 2 miles north east of Buffalo Pass. The area shows a number of natural gas wells. There have been other gas and oil explorations in the Round Rock area but no commercial development has come out of this.

The Minerals Resource Map produced by the Navajo Nation Division of Natural Resources, Minerals Department indicates both uranium and heavy metal deposits in the Buffalo Pass area.

Mineral resources in Navajo Country¹³

The Division's Sand, Gravel and Rock Quarry Resources also shows sand and gravel beds south of Rock Point along the Chinle and Lukachukai Washes. Dimensioned stone and crushed aggregate may also be potential commercial construction materials present in the Chapter area. Dimensioned stone is most likely to come out of the Chinle and DeChelly sandstones. The David Hanna Associates comprehensive plan noted that a rough quarry site was operated in the Round Rock area sometime in the past. A specific location was not provided.



¹³ *The Navajo Atlas*, James M. Goodman, University of Oklahoma Press, Norman; 1971. p. 74.

Other non-metallic resources which may be present in the Chapter area include: Bentonite clays, structured clay, semi-precious stones – particularly agatized (petrified) wood and special sands.

The abandoned uranium mines within and near the Chapter area in the Lukachukai Mountains have not been remediated and some are still accessible. It is very possible that these sites represent a point source for surface water pollution.

Findings for sites in the area of Round Rock that were included in the Environmental Protection Agencies Abandoned Uranium Mine study include:

Cove – Radiation and Metals Exposure Hazard, Water Sources

Alco Canyon Springs

Uranium 125 pCi/L¹⁴, Alpha 100 pCi/L

Lukachukai Canyons – south of Cove Community

Streams and Mines

Arsenic 83-105 mg/L, Uranium 35 – 879 pCi/L, Alpha 48 – 1020 pCi/L

The cancer risk posed by the radioactive material in the water of the streams would be at least 1×10^{-3} .

There is a complex of mines on the mesas above the community of Cove. Water flows from springs through creeks and into the recharge area at the base of the mountains. The flowing water in the creeks is used by the community. The children play in the creeks and drink the water. One well that was closed due to elevated levels of radionuclides is used only during drought conditions. It is mixed or used directly. The documented elevated levels of contaminants may pose an imminent and substantial endangerment to public health, welfare or the environment.

Based on the analysis conducted thus far, the water quality could be greatly improved by keeping the water from standing in the mine structures near the tops of the mesas. Water collects in these mine structures and slowly drains from pipes lower down. During the time the water is sitting in the mines the metals dissolve into the water. The biggest engineering challenge is how to keep the water from sitting, either by having no structure to hold the

¹⁴ pCi/L stands for pico Curies per liter and is a measurement of the amount of radioactivity. The maximum contamination level uses for regulatory compliance monitoring is 30pCi/L for uranium, 15 pCi/L for alpha particle activity and 50 ug/L for arsenic although this level may be lowered to 15 ug/L.

water, or having the water flow quickly through. Reinstallation of the access roads to the mines would be a major reclamation expense.

The Navajo AML is constructing roads to do reclamation this field season 2000. Working with the AML to integrate the objectives, funding and engineering expertise, is the only way to take care of the situation. Costs unknown without further information.¹⁵

The study was conducted in 2000 using aerial surveys of gamma radiation over parts of the Navajo Nation. Not all known abandoned uranium mines within the Reservation area were surveyed and test mines may not have been included. The memo states that the measurements are very accurate as to location of the radiation source area. Ground level investigations were then made to determine the specific nature of the source of radiation. However this second step was not completed or documented as the field activities ended before the specific proximity to people and land use had been determined.

The primary concern of the study was internal exposure to radiation, metals and other hazards related to abandoned uranium mines. Internal exposure is created through water used for human consumption.

Work to address these issues is being done through projects run by the Shiprock and Tuba City field offices for the Navajo Abandoned Mine Lands Reclamation or AML. AML is part of the Department of Interior, Office of Surface Mines. Other Agencies involved in this effort include: Navajo Water Resources and NTUA.

Round Rock was one of the Chapters which had helicopters but no ground surveys. The memo makes the following statement:

South-draining side of the Lukachukai

This is the area south of the Cove area. The mines occur along the Lukachukai ridges that drain water either to the north into Cove or to the south into the Round Rock Chapter. The Lukachukai flight survey covers this area. No water sampling was conducted prior to demobilization.¹⁶

¹⁵ Navajo Abandoned Uranium Mines Project – Summary Memo to Michael Freeley, Deputy Director, Superfund Program, United States Environmental Protection Agency Region IX, February 20, 2000 (Rev. December 2000). Pp 7 – 8.

¹⁶ Navajo Abandoned Uranium Mines Project – Summary Memo to Michael Freeley, Deputy Director, Superfund Program, United States Environmental Protection Agency Region IX, February 20, 2000 (Rev. December 2000). Pp 16.

3.10.13 Atmosphere

The climate in the project area may be characterized as "Arid Continental" with low humidity and high aridity. The 1983 Comprehensive Report states that:

The climate in the Round Rock Chapter is directly related to elevation. Precipitation at the lower elevations near the Chapter House ranges around 9 inches per year while the higher mountain areas may receive 12 inches precipitation or more per year. Most of the precipitation falls between July-October during heavy thunderstorms which can cause flash flooding in the usually dry washes.

During the remaining months of the year the Chapter receives minimal amounts of precipitation. Almost all of the precipitation that falls during the cold months is in the form of snow which usually melts within a few days, except at the highest altitudes.

Round Rock has mild summers. Temperatures in July and August typically range from the middle eighties in the afternoon to the middle fifties at night. Winter temperatures can be cold with nighttime lows in the middle teens and daytime highs usually in the middle forties. A record low of -25 degrees was recorded in 1968. Some winter days can be as warm as 65 degrees as well.

Most winter storms are not accompanied by excessive winds and blizzard conditions rarely occur.

The frost free period ranges around 140 days at Round Rock with the latest frost usually occurring in May and the earliest frost usually occurs in September.

Wind direction is usually from the southerly direction or southwest or southeast. Strong winds occur during the late spring and early summer with gusts exceeding 40 to 50 miles per hour. During the winter the prevailing wind is from the northwest.

Sunshine averages about 70% of the available hours throughout the year.

An air monitoring station at Nazlini, Arizona indicates that most concentrations recorded were below the threshold of detection of the monitoring instruments and all levels of pollutants were at or below applicable Arizona and Federal ambient air quality standards. Total suspended particulates are high during the months of May, June, and July when dust storms are most prevalent. These high particulate values were probably caused by windblown dust.

During seasonal changes, the area has several emission factors contributing to inversions and haze in the valleys and mountains. The contributing sources are the wood

and coal burning slash burning, fugitive dust emissions from vehicular travel on unimproved roadways and some open burning within the community.

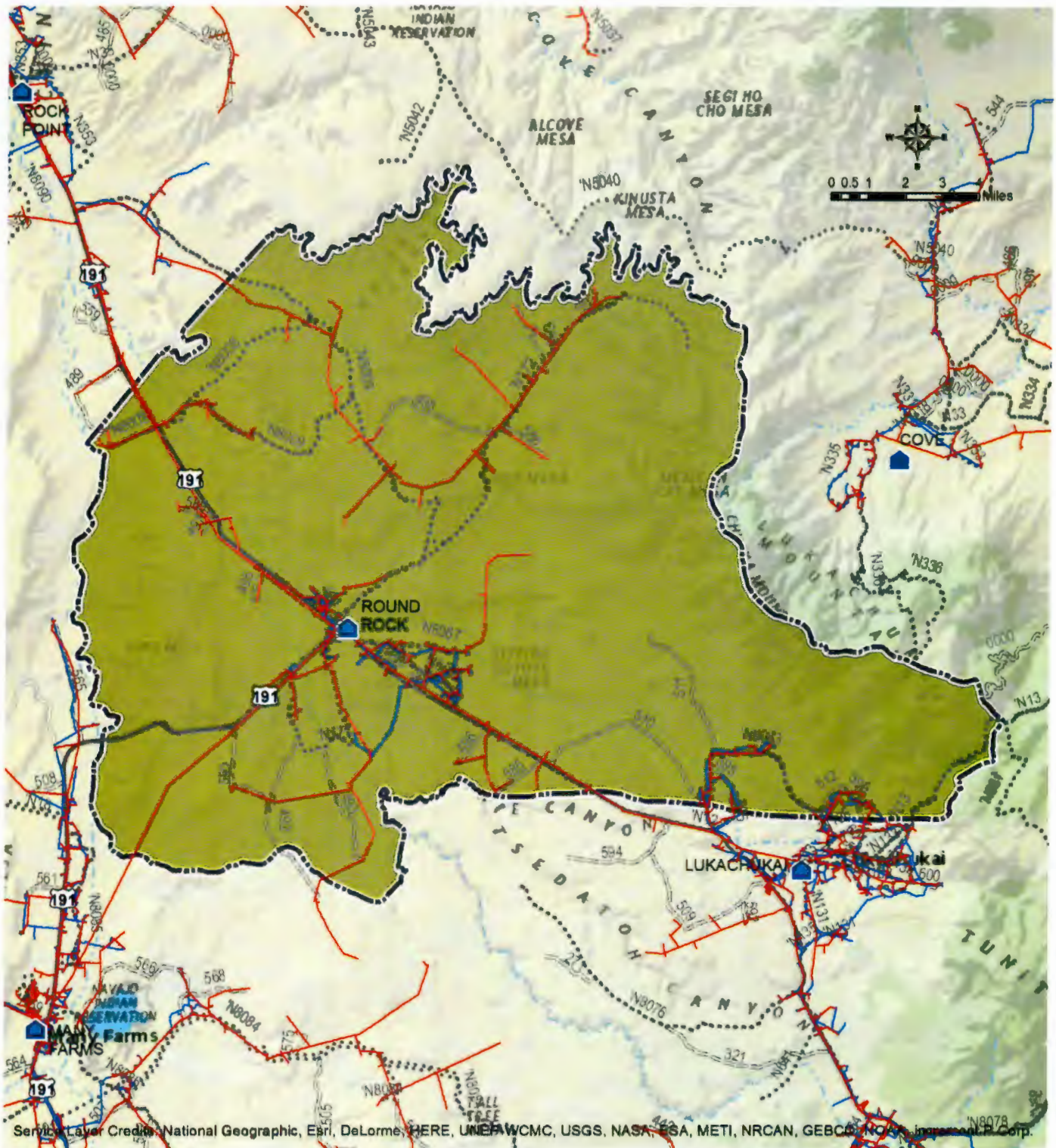
Nazlini Station also conducts visibility monitoring. Processed data collections, including capture percentage by seasons, are as follows:

- Winter 90%
- Spring 87%
- Summer 87%
- Fall 98%

Visibility and TSP (total suspended particulate) are affected by blowing dust and sand during the spring months. Minor sources of air pollution arise from wood and coal burning.

There are no major noise pollution sources within or near the Chapter area. Traffic along Highway 12 and Highway 191 do contribute to an increase in the overall ambient noise level. However, traffic along the highway is sporadic rather than constant and this is not be considered to be a source of continual noise pollution.

MAP 4 - UTILITIES



Legend

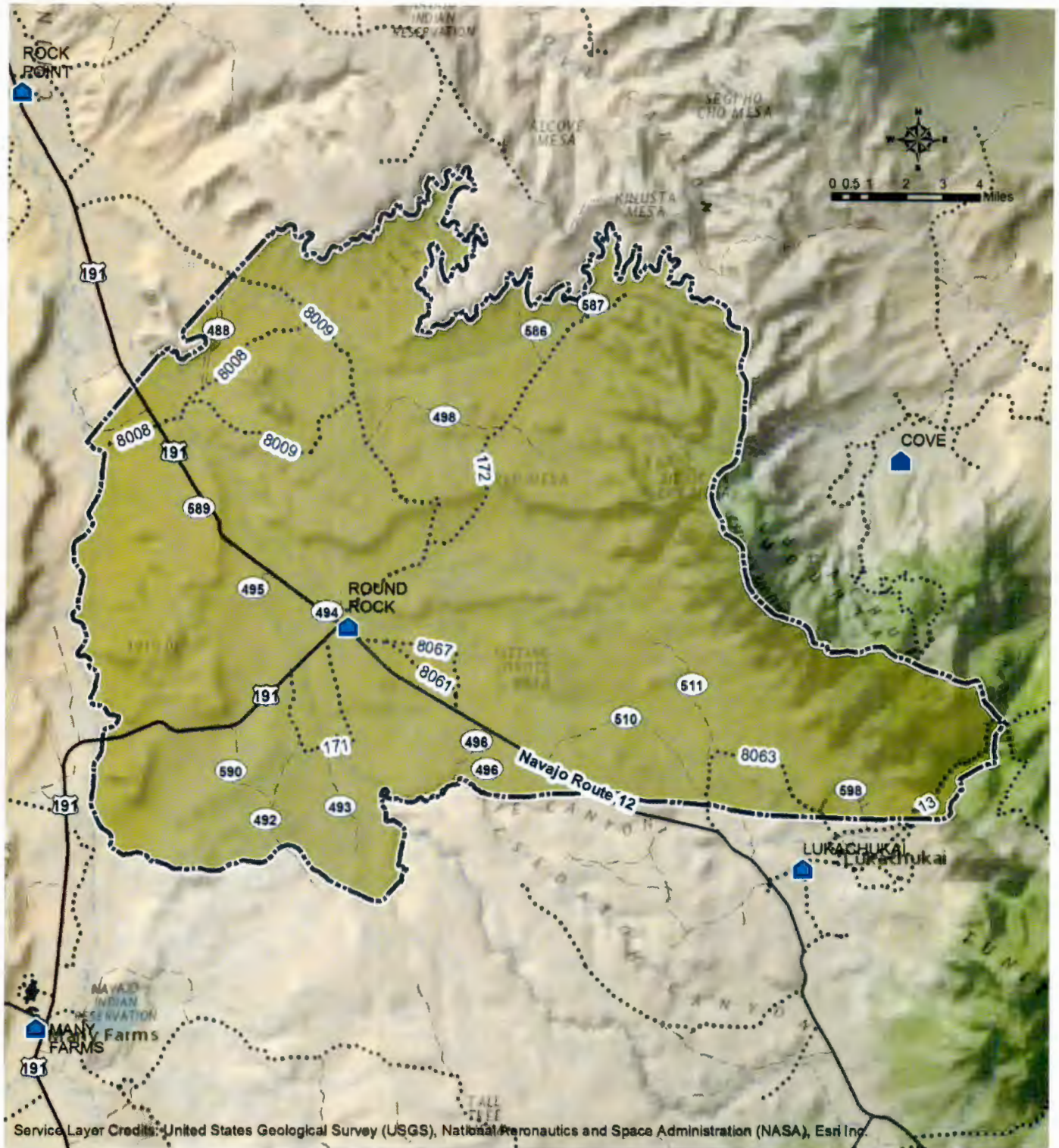
- Chapter House
- Chapter Area
- Electric Line
- Water line
- Navajo Route (Unpaved)
- Navajo Route (Paved)
- County Road
- U.S. Highway

Tse Tse Nikání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS

DISCLAIMER: Round Rock Chapter and/or JJ Clacs & Company shall assume no liability for any errors, omissions, or inaccuracies in the information.

MAP 5 - ROADS



Legend

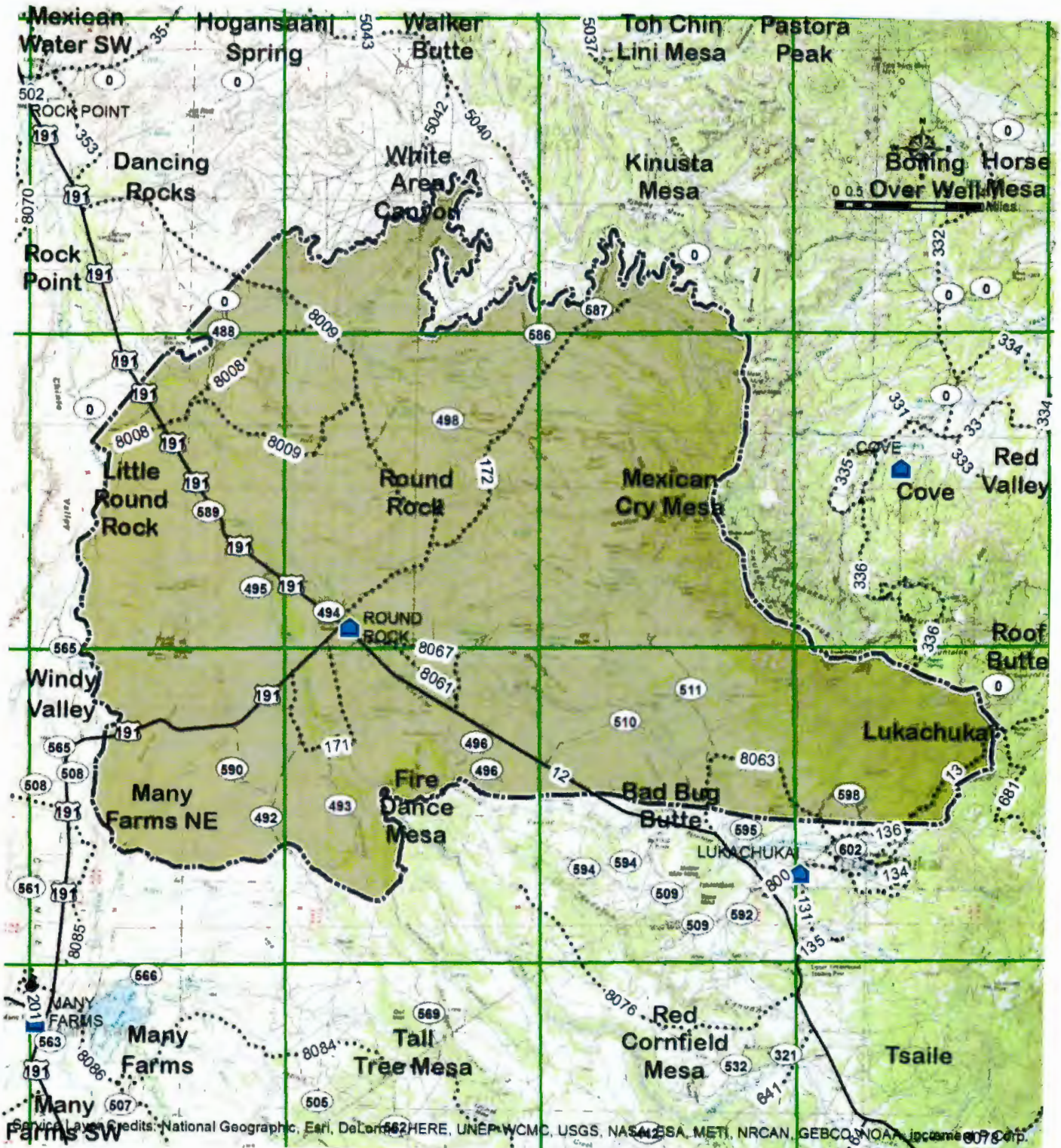
- Chapter House
- Chapter Area
- (Navajo Route Unpaved)
- Navajo Route (Paved)
- U.S. Highway

Tse Tse Nikání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS

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MAP 6 - TOPOGRAPHY



Source: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iocameo Corp.

Legend

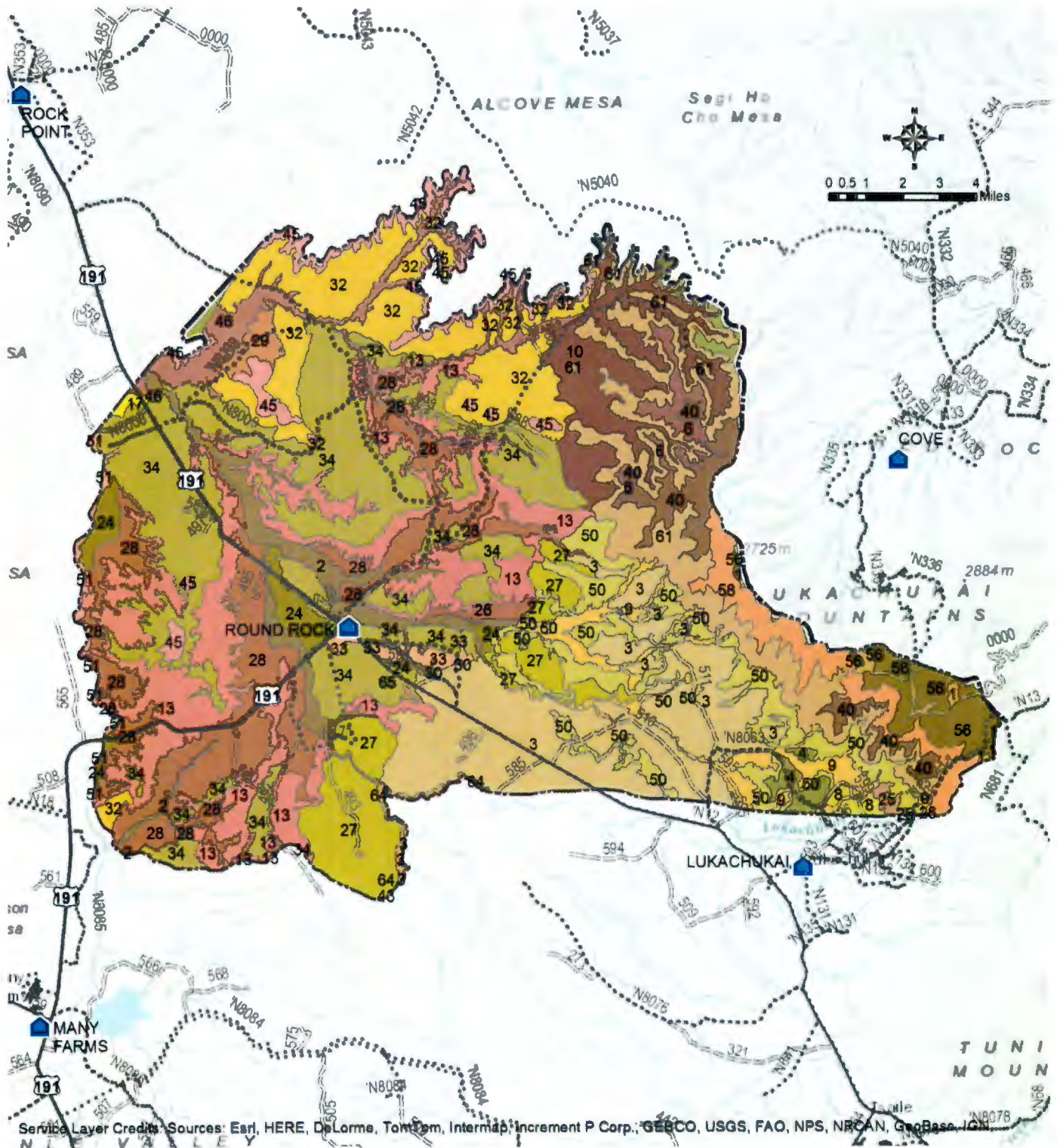
- Chapter House
- Chapter Area
- (Navajo Route Unpaved)
- Navajo Route (Paved)
- County
- U.S. Highway
- USGS Quadrangle (1:24,000)

Tse Tse Nikani Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS

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MAP 7 - SOILS



Service Layer Credits: Sources: Earl, HERE, DeLorme, TomTom, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN

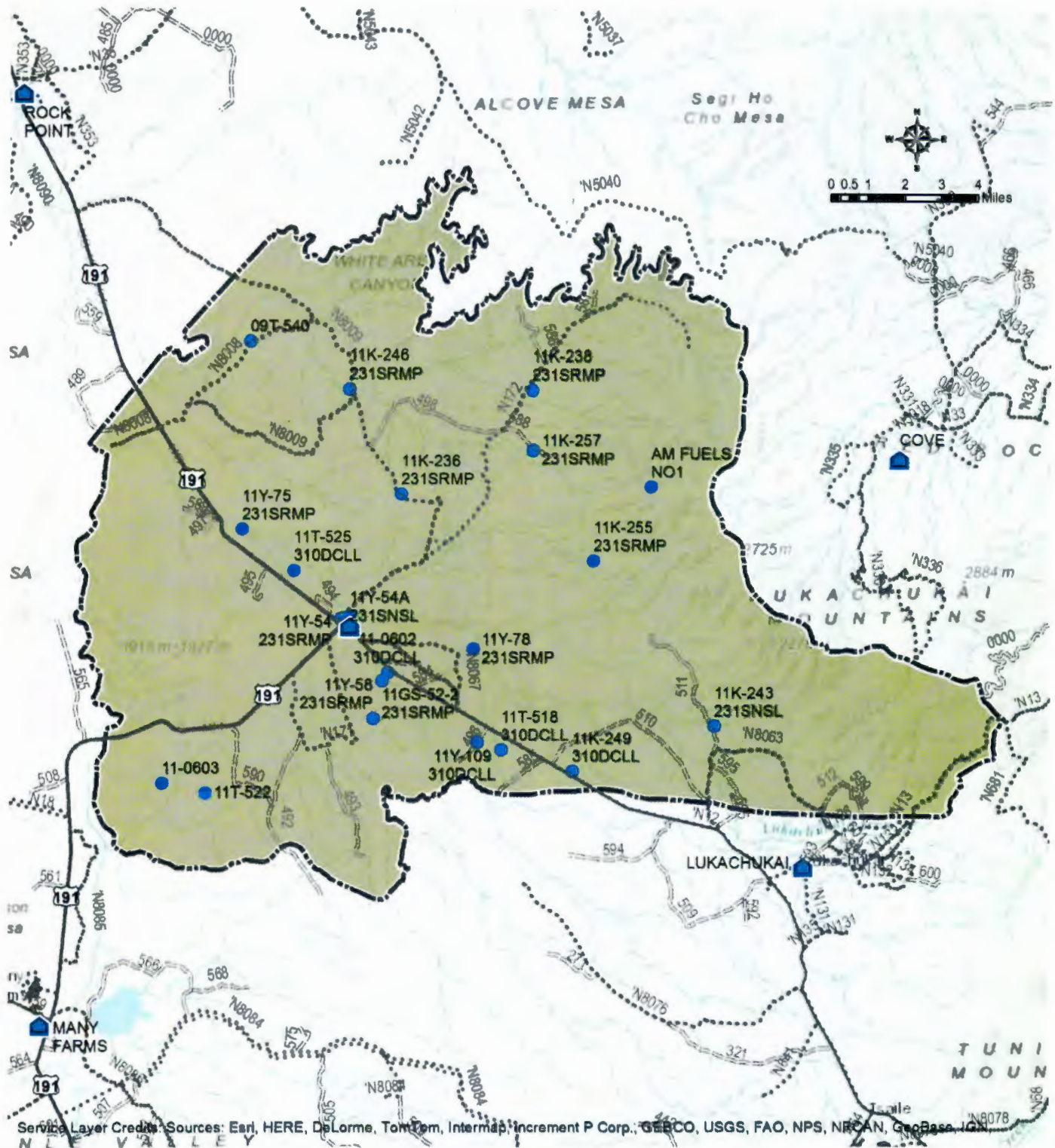
Legend

	Chapter House	1	2	27	30	4	48	58	65
	Chapter Area	10	24	28	32	40	50	6	8
	U.S. Highway	13	25	29	33	43	51	61	9
		17	26	3	34	45	56	64	

Tse Tse Nikání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS
DISCLAIMER: Round Rock Chapter and/or JJ Clacs & Company shall assume no liability for any errors, omissions, or inaccuracies in the information.

MAP 8 - WATER WELLS

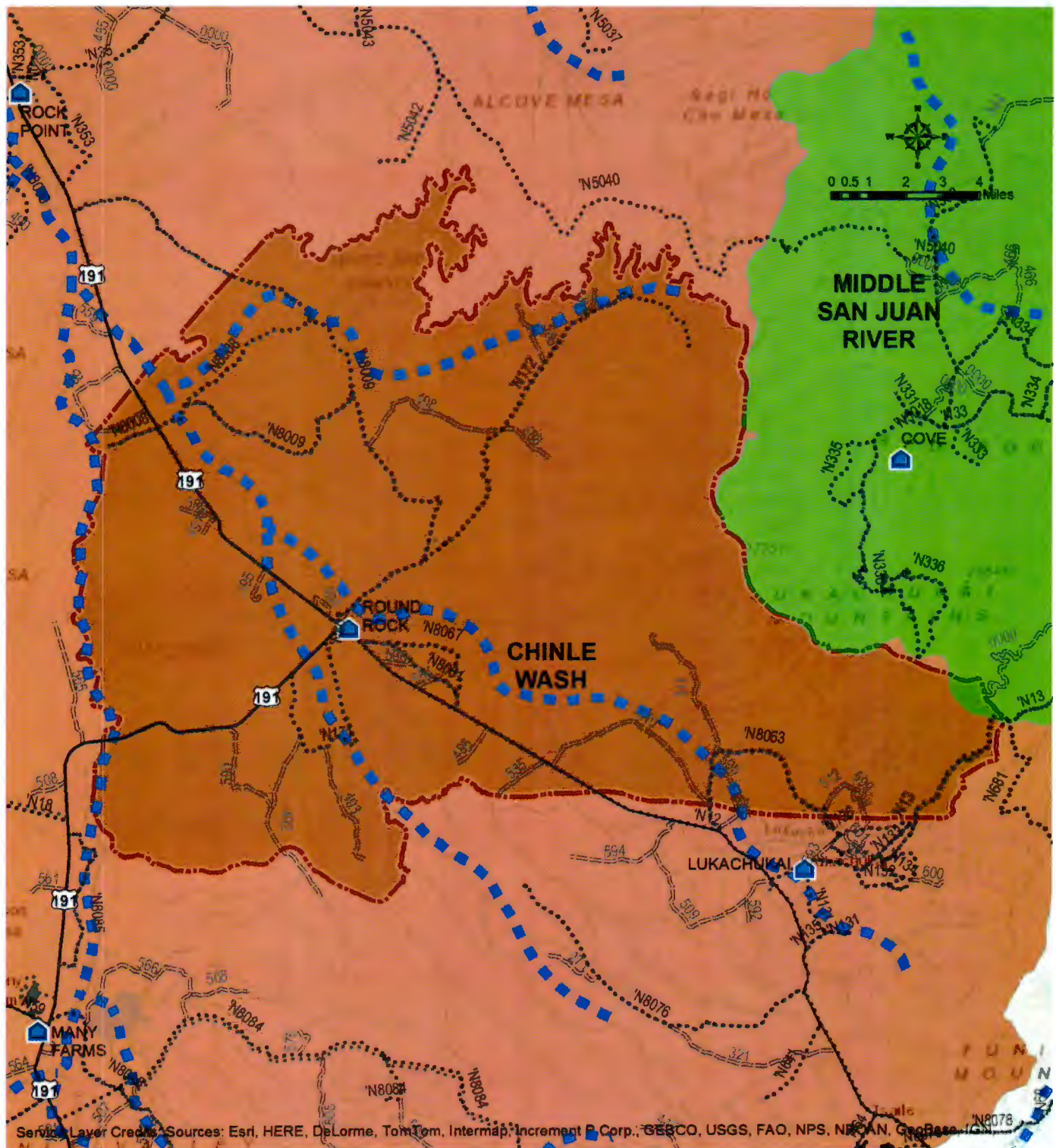


Tse Tse Nikani Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS

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MAP 9 - SURFACE WATER



Legend

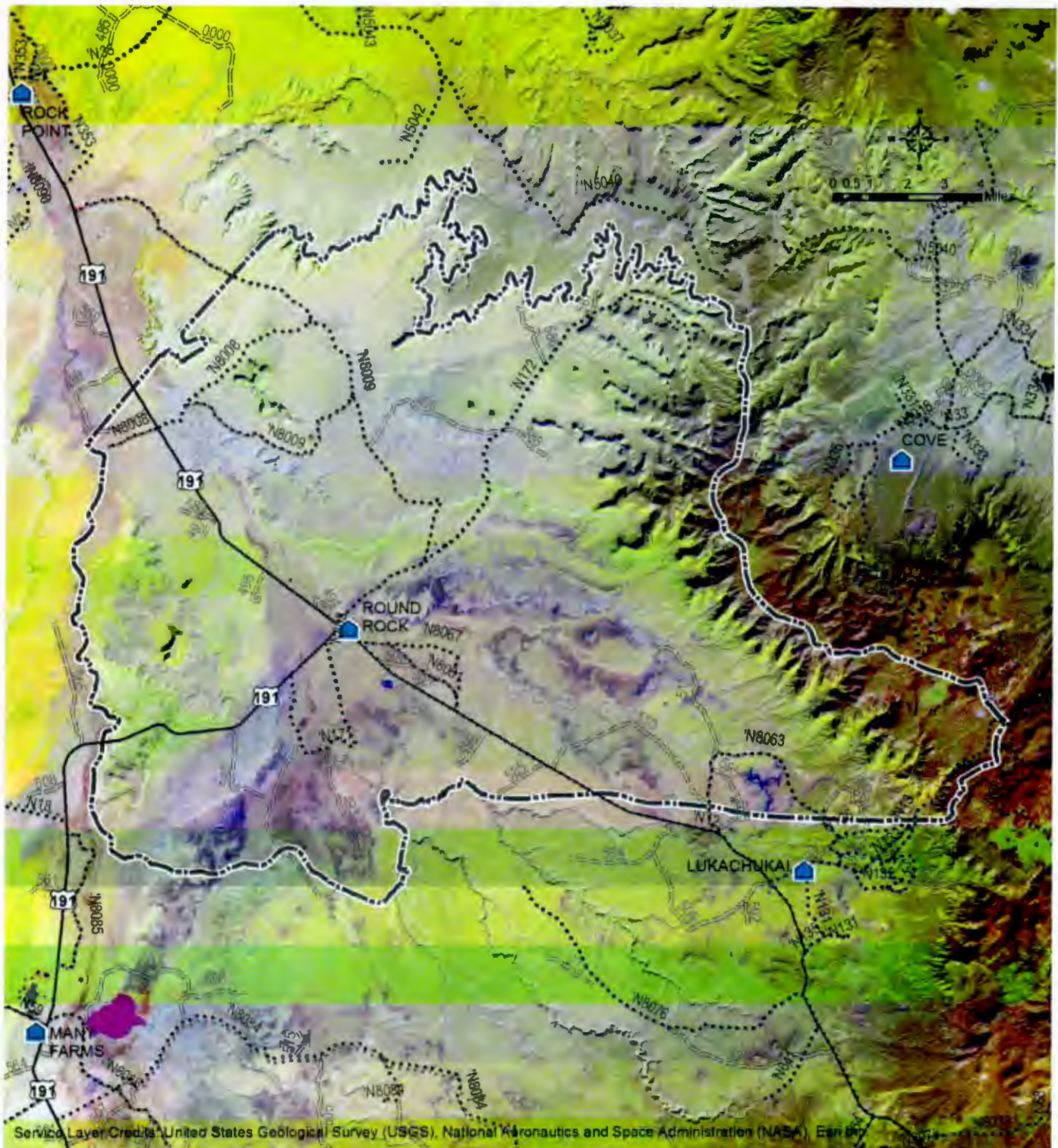
- | | | |
|---------------|-----------------------|--------------|
| Chapter House | Watershed | Major Washes |
| Chapter Area | CHINLE WASH | |
| U.S. Highway | MIDDLE SAN JUAN RIVER | |

Tse Tse Nikání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS

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MAP 10 - VEGETATION



Legend

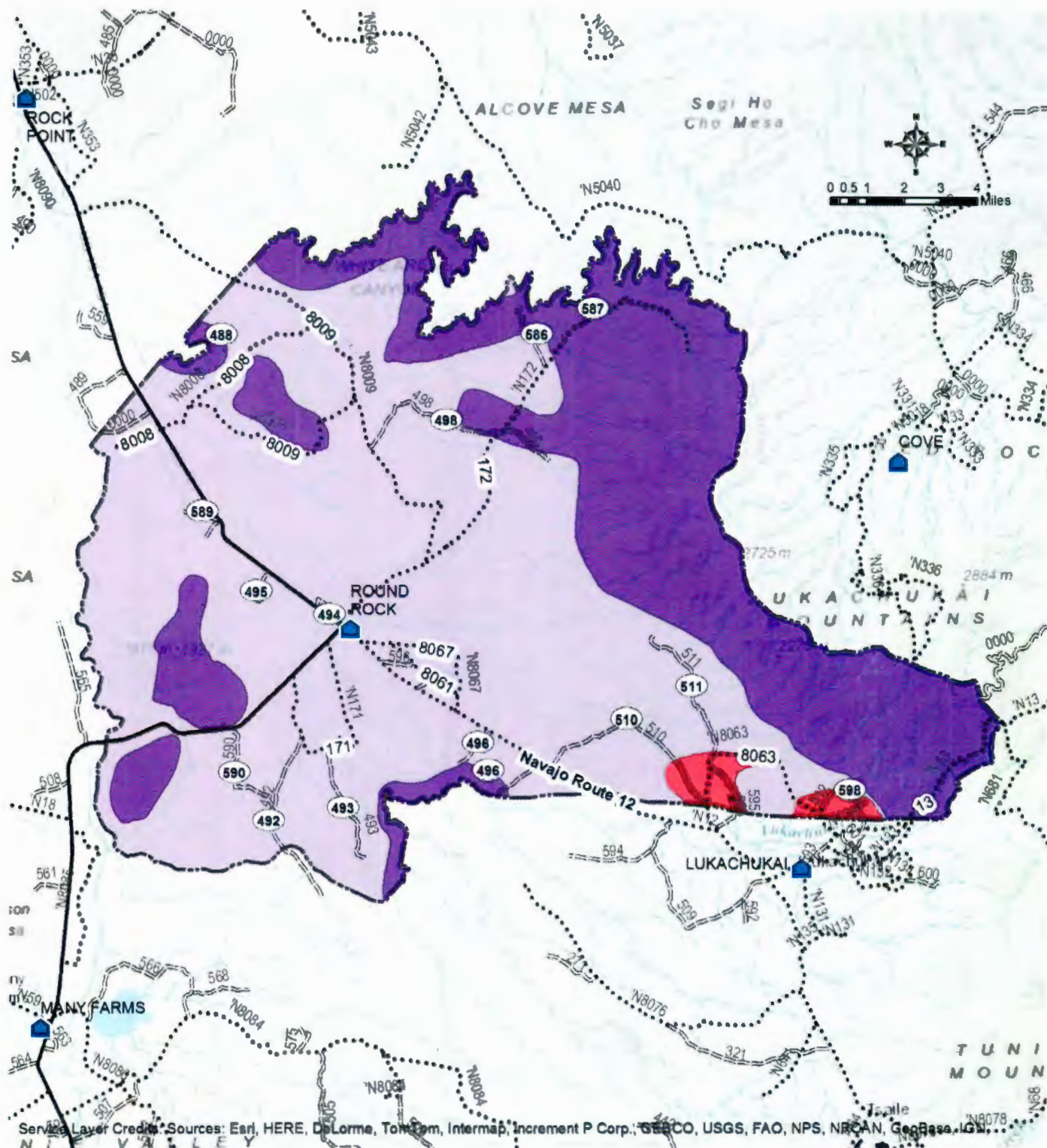
-  Chapter House
-  U.S. Highway
-  Chapter Area

Tse Tse Nikání Land Use Plan
Round Rock Chapter
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December 2014

Sources: NDOT, Navajo Land Department; USGS

DISCLAIMER: Round Rock Chapter and/or JJ Clacs & Company shall assume no liability for any errors, omissions, or inaccuracies in the information.

MAP 11 - ENVIRONMENTAL_ZONES



Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeBCO, IGN, etc.

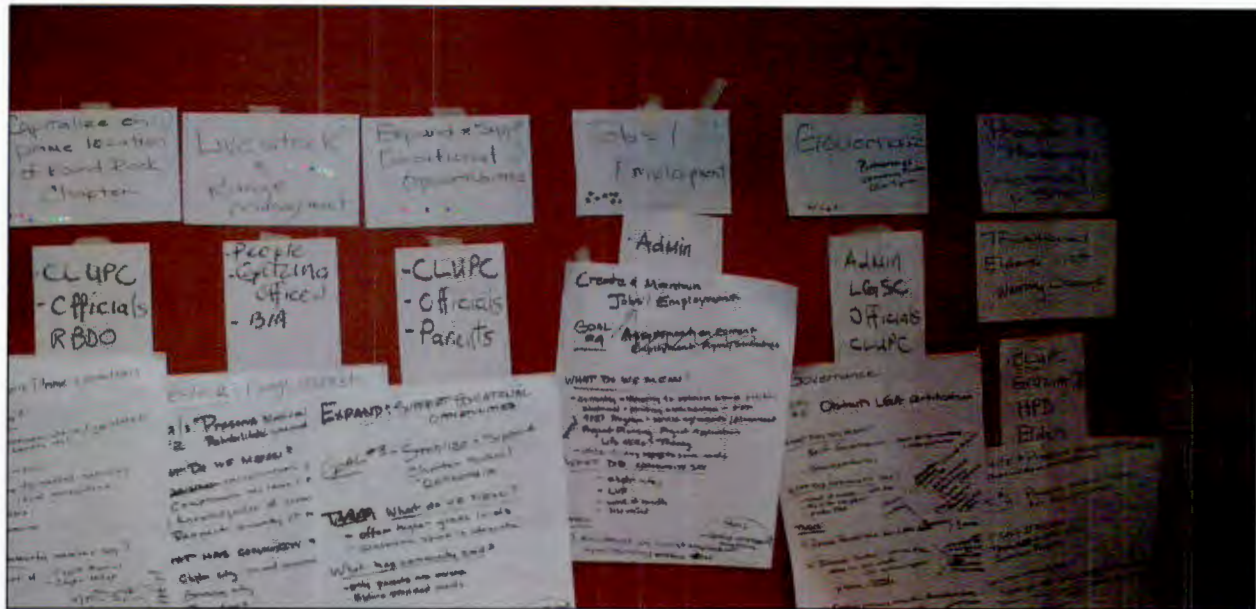
Legend

-  Chapter House
-  County Road
- Environmental Level**
 -  Zone 1
 -  Zone 3
 -  Zone 4

Tse Tse Nikání Land Use Plan
Round Rock Chapter
JJ Clacs & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS

DISCLAIMER: Round Rock Chapter and/or JJ Clacs & Company shall assume no liability for any errors, omissions, or inaccuracies in the information.



4 COMMUNITY VISION AND GOALS

4.1 INTRODUCTION

This step was to identify the values of the community members, what is important to them. Such visioning and planning are important particularly considering the potential for future growth and development. To this end, community members within the Chapter gave their input through public meetings and work sessions.

4.2 VISION, MISSION AND VALUES

VISION - To be a healthy, safe, clean, friendly, self-sufficient community that values culture and natural resources.

MISSION - To protect, promote, and preserve our valuable resources for prosperity, self-sufficiency and in the best interest of our community

VALUES – Ke'

Respect

Pride

Honor

Dignity

Responsible

Teamwork

Individuality

Cultural

Competency

Honesty

Accountability

Quality

4.3 GOALS AND OBJECTIVES

The goals and objectives reflect the specific desires of the Round Rock Chapter community- guiding how and where the community will grow.

ONE - Economic & Community Development

- Capitalize on prime locations
- Attract Tourism
- Develop Master Plan for Community Facilities

TWO - Livestock & Range Management

- Preserve, Respect & Rehabilitate
- Implement Conservation Planning & Practices

THREE - Educational Opportunities

- Stabilize & Support Local Charter School
- Provide a variety of educational opportunities

FOUR - Jobs/Employment

- Understand Workforce
- Create & Maintain Jobs/Employment

FIVE - Governance

- Enhance Local Governance
- Obtain LGA Certification

SIX - Cultural & Historical Site Preservation

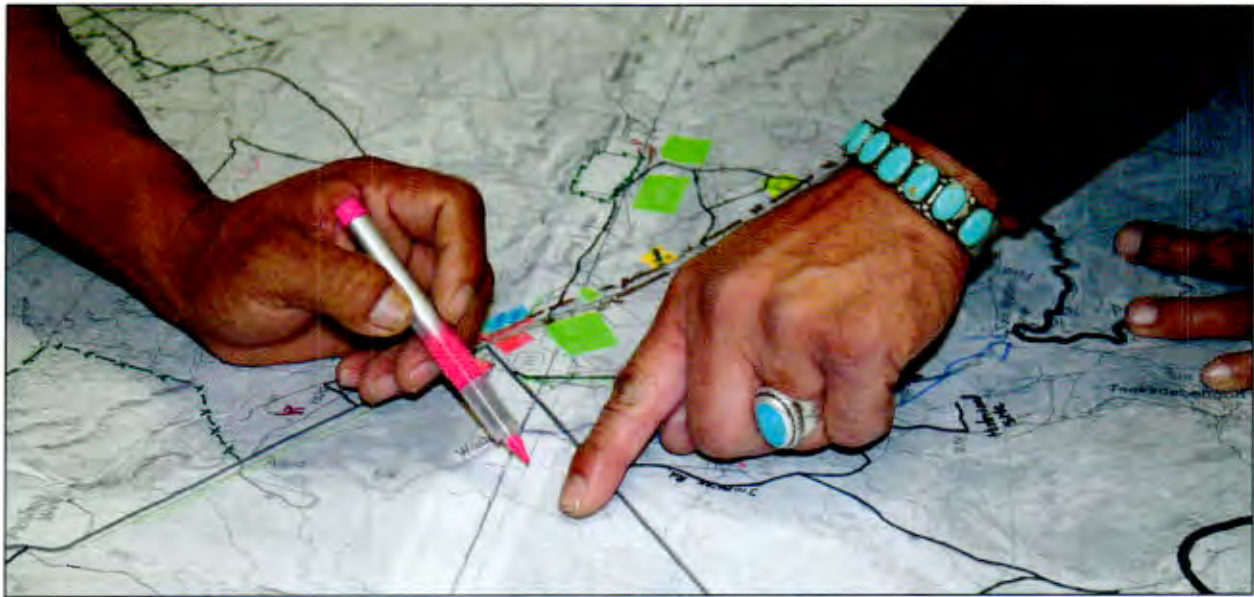
- Identify, Protect and Preserve Historic Sites
- Explore Feasibility of Cultural Center

SEVEN - Wellness & Recreational Activities

- Promote a Healthy Community
- Attract Tourism

EIGHT - Residential Housing

- Identify & Develop Residential Home Sites
- Update Housing Plan



5 LAND USE

5.1 INTRODUCTION

The designations of future land uses for development are important to any community, especially for the Chapter as it moves towards local governance and sustainability. Decisions regarding how to design the landscape affect the way the community lives, works and spends its leisure time. Land-use decisions can also affect the way the community spends its money, potentially providing convenient locations for purchasing certain goods and services without the need for long-distance drives. Further, the way communities are planned has a direct impact on the community members' health, safety, general welfare, and emotional stability. Solid planning can lead to a stronger economic base, an efficient system of roads and utilities, and the protection of natural, cultural and traditional resources.

5.2 LAND USE DESIGNATION

Round Rock's future land use plan (**Map 12**) is a set of generalized plans designed to inspire ideas that provide a broad, yet clear picture of the community as its members, leaders, and the general public envision it to be. The Land Use Plan is the community's general guide for managing growth in the location, type, scale and density of future land development. **Map 13** shows the Chapter House area in more detailed.

The maps used in this plan indicate the intended predominate future function and characteristic use of the land. They do not reflect the intended zoning of individual areas but

rather generalizes desired future land uses. To achieve appropriate balance among the goals promoted by the land use plan, flexibility in specific decisions is required.

5.2.1 Residential Housing

Residential land use includes scattered housing and subdivisions. Scattered housing generally comprise of clusters of one-acre home sites. Within these clusters, homes may or may not be close together. Subdivisions on the other hand, provide a tighter, more organized housing arrangement with more houses per acre. Typically subdivisions on the Navajo Nation include housing built by the BIA, NHA, schools or other entities.

The Chapter supports scattered housing, clusters, and subdivisions for residential land use. Individual homesites not shown within this land use plan can be added on a case by case basis. Homesite request shall be reviewed by the CLUPC.

5.2.2 Community facilities

This category designates public land uses, including schools, colleges, libraries, fire stations, police stations, convention centers, museums, governmental offices, utility stations, and hospitals. Community facilities provide a valuable service to the community, offering services to benefit and serve the entire community. Typically, these facilities on the Navajo Nation provide public amenities and include places like the Chapter house. The Chapter house provides a central location for meetings, meals and community gatherings. Other community facilities may include group-housing areas, health services facilities, police stations and fire departments. In addition, local schools are an important community facility that can provide children of the community with a suitable, conveniently located educational facility.

The chapter proposed a community facilities site along Highway 191 towards Many Farms. A site is proposed on the west side for community facilities while the east side is proposed for a veterans cemetery.

5.2.3 Commercial

The commercial categories are established to provide areas in which business may be conducted, goods sold and distributed, and services rendered. In addition, they are set up to provide for public activities and other activities which support retail and business functions. Such uses may include grocery stores, trading posts, or even areas for local vendors and artists to sell their wares to tourists and others.

This commercial land use is important to the economic development of the Chapter as it provides places for businesses to be developed and grow. Businesses can provide jobs and create an economic base, and potentially revenue for the Chapter through sales tax or

business leases. Local businesses can provide opportunities for local residents to shop locally versus commuting far away to shop; such activities bring money into “locally” owned business that can help spur other growth within the community.

Commercial area are proposed near and around the Chapter House proper. Two business site leases are designated along Navajo Route 12 southeast of the chapter house. Additional sites are designated where the old Trading Post is located. The Trading Post closed in 2013. Another site designated by the school entrance.

5.2.4 Industrial

Industrial development is another way to enhance economic development. Industrial development typically facilitates businesses connected with the production, manufacture, or construction of a product or a range of products. Typical industrial development may include mining, manufacturing or warehousing. Industrial development can provide jobs for the community and potentially bring revenue from user fees, sales tax, or other mechanisms.

Potential gravel sites may exist however none were specifically identified.

5.2.5 Recreation

Recreation facilities provide places for play and relaxation; activities at such facilities can encourage physical fitness among community members. The areas designated for recreation on this plan are intended to be more structural recreation facilities rather than those provided by trails in the open space. Such structural facilities may include both indoor and outdoor structures. Outdoor facilities may include parks, playgrounds, hiking and biking trails, ball fields, rodeo or equestrian facilities, or golf courses. Indoor facilities may include gymnasiums, fitness centers, or a multi-use recreation center.

5.2.6 Open Space

Areas designated as open space are those areas that the community has identified as having special significance, and are areas that should be preserved in their natural state without development. The designation as open space does not mean that people cannot use the space for limited grazing, hiking, or other low impact activities, but it does protect the area from mining, building or other forms of development. Grazing in open space areas should not be intensive and should be carefully monitored to ensure that overgrazing does not occur in these areas. The intent of open space is to preserve areas of particular beauty, or natural or cultural significance for future generations to enjoy and respect.

Open space correspond with the environmentally designated areas. Additionally, several historical and sacred sites exist; not all are shown on the map.

5.2.7 Grazing

As open space areas, grazing lands possess scenic values except when overgrazed. Areas designated for grazing should remain primarily undeveloped to ensure that grazing rights in these areas are protected. The grazing areas will likely be managed by the grazing committee and should be regulated by the grazing management plan. Areas designated for grazing should not limit the use of these areas for other non-development related activities such as recreation or hunting with the understanding that the primary managed land use on this land is grazing. Traditionally, home sites and family clusters of homes are located within a grazing area. This type of home site development is compatible with areas designated for grazing.

Several range units exist and/or are proposed. These are shown on the map. Additionally, grazing permittees are working on individual grazing management plan of operations.

5.2.8 Farming

Farming is another important way of life for some community members, though on a smaller scale than grazing. Land that has been designated for farming should be used for raising crops, either for subsistence or for market. Soils and location are prime factors in determining the suitability of land for farming. Further, availability of adequate water is also a serious consideration and limits the amount of land capable of being brought into cultivation. Farming land is typically relatively flat with healthy, rich soils, and near a natural or irrigated water source.

The Chapter has several existing farming areas although they may not be active. These farms are intended to be restored over time. Several are shown on the map while others will be identified in the future.

5.2.9 Traditionally and Culturally Sensitive Sites

Traditionally and culturally sensitive sites are defined as those areas that have been designated by community members as areas that are either used for ceremonies, or have some cultural significance. These areas may be areas where herbs are gathered, areas of archeological importance, or they may be areas that hold other historic or cultural significance for members of the community. These areas should be treated with the greatest of respect and should not be subject to any sort of development (with the exception of building ceremonial structures, etc.). The purpose of designating these areas is to protect them for the use and respect of community members and future generations.

As stated on open space, several sites exist and are protected by law.

5.2.10 Infrastructure

The extent and quality of the roads are an important determinant for local community development and economic development and growth. Future development in the Chapter will be possible if the community is prepared to identify the existing infrastructure needs and plan for providing the infrastructure that will be needed to attract potential developments.

Utilities also plays an important role in future development. The maps shows existing utilities care planning is necessary to ensure proposed developments are provided appropriated services.

Technology is also important to future development. Cell service is provided and internet service is limited. These need to be planned for.

MAP 12 - LAND USE

Legend

- Navajo Route
- County Road
- U.S. Highway

Land Use

- Proposed, Community Facilities
- Existing, Residential
- Proposed, Residential
- Existing, Community Facilities
- Existing, Commercial
- Proposed, Commercial
- Existing, Farming
- Existing, Range Unit
- Existing, Open Space
- Existing, Embankment
- Proposed, Cemetery
- Zone 1
- Zone 4
- Grazing



0 3,650 7,300 14,600 21,900 29,200 Feet

Tse Tse Nihéí Land Use Plan
Round Rock Chapter
JJ Clace & Company
December 2014

Sources: NDOT, Navajo Land Department; USGS
DISCLAIMER: Round Rock Chapter and/or JJ Clace & Company shall assume no liability for any errors, omissions, or inaccuracies in the information.

Service Layer Credits: Esri, USDA Farm Service Agency

MAP 13 - CHAPTER HOUSE AREA LAND USE

Legend

- Navajo Road
- County Road
- U.S. Highway

Land Use

- Blank: Residential
- Blank: Community Facilities
- Blank: Commercial
- Blank: Industrial
- Blank: Farming

USA NAIP Imagery: Natural Color

RGB

- Red: Band 1
- Green: Band 2
- Blue: Band 3

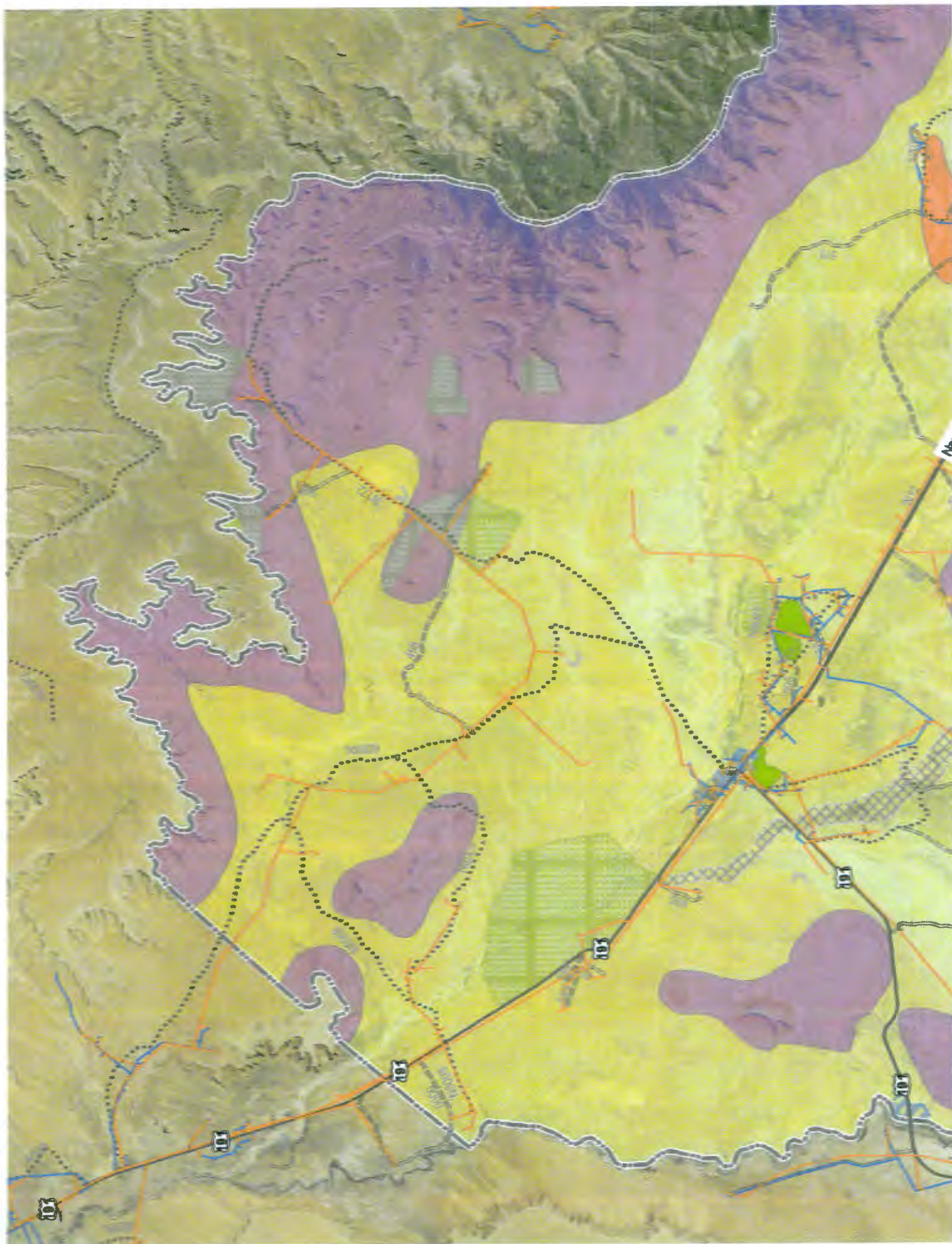


The T&E Nikieli Land Use Plan
Round Rock Chapter
JJ Class & Company
December 2014

Sources: NDOT, Navajo Land Department, USGS
DISCLAIMER: Round Rock Chapter and/or JJ Class &
Company shall assume no liability for any errors, omissions,
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Circle Layer Credit: USDA Farm Service Agency





6 INFRASTRUCTURE AND CAPITAL IMPROVEMENT PLAN (ICIP)

Capital projects are planned for and built over a period of several years. They are important to the implementation of the land use plan.

6.1.1 Navajo ICIP

Under the Navajo Nation, the Infrastructure and Capital Improvement Plan (ICIP) is a list of priority projects showing the estimated costs and source of revenue and funding for selected projects over a six year period. Eligible projects pursuant to the Navajo Nation Infrastructure and Capital Improvement Guidelines and Procedures include:

- The construction, renovation(s) repair or expansion of public facilities. i.e., Chapter House, Senior Citizens Centers, Headstart/Preschool buildings, Recreation facilities, Cemeteries, Fire Stations, Solid Waste facilities, Airports, Streets & Lights, Bridges, Warehouses and Storage buildings.

- Major equipment purchases such as road maintenance equipment, farm equipment, fire-fighting equipment, vehicles, school playground equipment, office equipment and furnishings that support new buildings.
- Acquisitions of manufactured buildings, aircraft, land and/or lease of thereof.
- The cost for the development of infrastructure such as electric power line, water line, sewer lagoons, waste water treatment facilities, communication and transportation systems, roads and parking lots, Erosion Control Systems, and Irrigation Systems.
- The installation of bathroom additions and electrical house wiring required as a precedent to planned or current waterline extensions or electrical power line extensions for the same project.

6.1.2 Round Rock ICIP

Round Rock's ICIP Plan 2016-2021 covers projects for Fiscal Year 2015 thru 2019. A project summary is presented in Table 11.

CAPITAL IMPROVEMENT PLAN FY2014-2020

PROJECT TITLE	RAN K	CATEGORY	FUNDING SOURCES	2014	2015	2016	2017	2018	2019	2020	TOTAL
Chapter parking lot	2014 (1)	Building Community	A.M.L Chapter	\$200,000							\$200,000
Bathroom Sewage	2015 (2)	Building Community	Chapter PEP & CIP		\$300,000						\$300,000
Power line Extensions	2015 (3)	Building Community	Chapter/ Homeowner		\$200,000						\$200,000
Chapter Lagoon/ Regional Land Fill	2015 (4)	Building Community	Chapter			\$2,000,000					\$4,000,000
Irrigation/Lake Canal	2016 (5)	Building Community	Chapter/ Farm Com.			\$1,500,000					\$1,500,000
Community Cemetery	2017 (6)	Building Community	Chapter				\$500,000				\$500,000
Windmill/ Artesian well/ Earthen Dams	2018 (7)	Building Community	Water Resource/ Chapter					\$1,100,000			\$1,100,000
Headstart Renovation and Additions	2018 (8)	Building Community	Chapter 1 Headstart					\$200,000			\$200,000
Roads Improvements	2019 (9)	Building Community							\$1,000,000		\$1,000,000
Senior Citizens Center	2020 (10)	Building Community	Aging Serv. State, Chapt.							\$1,000,000	\$1,000,000
											\$10,000,000.00

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Young and Morgan 1987; Linford, 2000.

Appendix A

CLUPC Plan of Operations

The Round Rock Chapter

Community Land Use Planning Committee Plan of Operation

Section 1. Establishment

There is hereby established the Round Rock Chapter Community Land Use Planning Committee (CLUPC).

Section 2. Purpose

The purpose of the CLUPC is to develop and approve the processes for local land use planning, oversee land use planning activities, and after thorough review and analysis, present a community land use plan to the Round Rock Chapter membership for consideration.

Section 3. Committee Duties and Responsibilities

The CLUPC shall exercise the following duties and responsibilities consistent with the Navajo Nation Local Governance Act, 26 N.N.C. Section 2004:

- A. Educate the community on the concepts, needs, and process for planning and implementing a land use plan.
- B. May hire, subject to availability of funds, a land use planner, to assist in the preparation of the community land use plan. The hiring and supervision of a land use planner shall be consistent with 26 N.N.C. Section 2004 ©(2). The hiring of the planner shall be on a consultant basis consistent with general procurement and preference requirements.
- C. Attempt to ensure that the development of the community land use plan is based upon the guiding principles, priorities, goals, and vision as articulated by the community, and approve a public participation plan.
- D. Shall work closely with the membership consultant and the designated coordinator/planner as planning progresses.
- E. Upon approval of the community land use plan by the chapter membership, the CLUPC shall seek approval of the plan from the Transportation and Community Development Committee, pursuant to 26 N.N.C. Section 102 ©.
- F. Upon approval of the community land use plan by the Chapter membership and by the Transportation and Community Development Committee, the CLUPC shall develop recommendations for the implementation of the land use plan.

Section 4. Committee Selection; Membership

- A. The selection of members to the CLUPC shall be by the Chapter membership at a duly called Chapter meeting at which a quorum is present. The selection of the members shall be set forth in a certified written resolution.
- B. The members of the CLUPC shall be comprised of 05 voting members of the Chapter that has expertise to provide valuable contributions to the overall land use planning process. Subcommittees such as technical, and public advisory committees, comprising of voting and non-voting members of the Chapter may be established to assist the CLUPC.

Section 8. Ethics

Conduct & Conflict of Interest

Members of the CLUPC are required to comply with the Navajo Nation Ethics and Government Law.

Section 9. Amendments

The CLUPC Plan of Operation may be amended from time, as needed, by the Chapter membership.

Appendix B

Chapter History

ROUND ROCK CHAPTER BACKGROUND & HISTORY

The following section provides a brief summary of historic events, which are directly related to the Round Rock area. The narrative does not attempt to provide a full history of the Diné and it closes in the late 1880's. This is not to say that historic events of the past century have not had a significant impact on the people and the land of Round Rock.

For 1200 years, or perhaps even 6 – 10,000 years¹, people have been living in the Round Rock area. The early archeological evidence of human communities is found in the Anasazi remains and structures that can be found in Canyon de Chelly, Navajo Monument and scattered along the mesas in the Round Rock area.



"Black Shattered House" Anasazi ruin in Round Rock

There has not been enough research conducted to adequately determine exactly when the Diné first moved into the Round Rock area. Diné stories say that they emerged into the fifth world in the vicinity of Gobernador and Largo Canyons; and indeed the earliest excavations of Navajo habitations have been found in this headwater area of the San Juan River. Encircled by the four sacred mountains: Sis Naajini (Blanca Peak), Tsoodzit (Mount Taylor), Dook'o'oosłíid (San Francisco Peaks), and Dibé Nitsaa (Mount Hesperus) this emerging place is known as Dinétah.

The scientific community has dated early Navajo sites in the Gobernador area around the 1300 – 1450's. The Navajo language belongs to the Athabaskan family and it is generally believed that Navajo's are part of a Southern Athabaskan group that moved south from north central Canada in the 11th century and arrived in the southwest in the late 1200's. Many traditional Diné believe that this is their place of origin and their stories have people splintering off and moving north.

The Diné have a strong tradition of oneness with the land, and fully believe they have been in the Southwest as long or longer than anyone else. ...

Furthermore, many Diné clans identify different locations of origin...Some clans are also thought to have incorporated people from other cultures through the years, including Mohaves, Utes, Apaches, Zunis, and Mexicans. Some clans are known to have metamorphosed from pueblo ...groups migrating into Navajo territory in historic times. It seems entirely logical, if not likely, that similar groups were assimilated in earlier times, and that at least a portion of the Navajo culture evolved in place.²

By the mid-1500's, the Diné had spread out as far as Black Mesa and we can assume that clan groups were well established in Round Rock by that time.

¹ In the summer of 1971, archeologists with the University of New Mexico conducted a systematic visual survey of a 16 x 8 mile wide area centered within the boundaries of the Chaco Canyon National Monument. The survey uncovered evidence of human artifacts ranging in cultural age from the archaic to Basketmaker II. The archaic period ranges from the time of ancient hunters in 5,000 BC to shortly before the time of Christ. The Basketmaker II period spans from around 0 – 500 AD. – *People of Chaco, A Canyon and Its Culture*, Kendrick Frazier, W.W. Norton & Company, New York; 1999.

² *Navajo Places – History, Legend, Landscape*, Laurance D. Linford, University of Utah Press, Salt Lake City; 2000.

Around 1582, a Spaniard, Antonio de Espejo led a small party from the Rio Grande and then west towards the Hopi mesas. In Cebolletta, just north of the current Laguna Indian Reservation, the group encountered "Querechos" (later translated as Navajos) and did battle with Querchos and Acoma at the foot of Mount Taylor. During this time, Navajo territory extended east to the Rio Grande valley and the late 1500's and early 1600's were marked by Navajo raids and harassment of the Spanish and Spanish slave raids on the Navajo. In 1675, the Spanish along with Pueblo allies launched a second raid on the Navajo "Casafuerte"³ and defeated the Navajos. This victory was short lived. Five years later the Pueblo Revolt pushed the Spanish out of the Southwest. An un-anticipated consequence of the Pueblo Revolt and the return of the Spanish twelve years later was a large exodus of Pueblo peoples into Diné Bikéyah where they sought refuge. It is possible that there was a transfer of art and technology between the groups during this time, and many say that this is when the Navajo learned masonry construction, pottery, weaving and farming.

Periods of intense fighting and then relative peace characterize the first part of the 1700's, and the Diné concentrated more of their efforts in fighting the encroachment of Ute and Comanche. In 1786, the Spanish made a tactical mistake and tried to consolidate negotiations with the Navajo under a single Navajo leader. They appointed two Navajo brothers, Don Carlos and Don Joseph Antonio, thereby ignoring the political structure of Diné society. Commitments made by the Antonio's were largely ignored by most clans.

By the end of the 1700's, the Diné had strengthened their alliances with the Apaches and together they began a nearly continuous 65-year war with the Spanish. The ending of the Mexican revolution in 1821, did not stop the raiding and warring. However, trade agreements between Anglo-American traders and the Mexican government increased their access to firearms and equipment, much to the disadvantage of the Diné.

During this almost two hundred years of wars and raiding, it is very likely that many of the Spanish raids passed through Round Rock as the moved between the Rio Grande valley and into the Chaco River Valley and the Chuska Mountains. Historic records indicate the following activities, which may have involved the Round Rock clans:

- 1805: Lt. Col. Antonio de Narbona moved through the Chuska Valley on his way to Canyon de Chelly where there was a bloodbath at Massacre Cave.
- 1823: Jose Antonio Vizcarra lead an expedition up the Rio Puerco, Chaco Canyon, Chuska Valley, Canyon de Chelly, Black Mesa, Blue Canyon, Marsh Pass, Dinnehotso, the San Juan River and the Valle Grande – killing Navajos and capturing livestock.
- 1839-40: Two more raiding trips through the Chuska Valley into Canyon de Chelly and Black Mesa.

The situation for the Diné did not improve much with the appointment of Stephen Kearney to govern the New Mexico Territory. However, on November 21, 1846 the first Navajo-American treaty was signed at Ojo del Oso. Among the leaders representing the Diné was Narbono. The treaty failed five days later and began sixteen years of campaigns, battles, slave raids, broken treaties and an increasing distrust by the Diné of Americans. The hostilities culminated in the Ndahonidzood⁴, which began in the summer of 1860 and did not end until the return of the Diné from Bosque Redondo in 1868. A few of the key events during this period include:

³ Stronghold.

⁴ Fleeing from Danger Time or Being Chased Time.

- The establishment of Fort Wingate at Ojo del Oso in August 1860.
- The death of the great Diné leader, Zarcillos Largos, in a battle with slave traders near what is now called Ganado.
- The massacre at Fort Fauntleroy in 1861.
- The beginning of the Civil War.



Ben Wittick , Courtesy Museum of New Mexico, Negative #15936: Navajo Scout from the 1880's

In the summer of 1883, Colonel Christopher “Kit” Carson was ordered to totally subjugate or exterminate the Navajo. Employing a “scorched earth” policy, he and his troops moved through Navajo communities destroying crops, livestock, and homes. He then returned to Ft. Canby (Ft. Defiance) to wait for the impending winter. As people began to surrender, due to the suffering, famine and cold weather, they were impounded at Ft. Canby and the Old Fort Wingate and then forced to walk to the Bosque Redondo at Ft. Sumner near the eastern border of New Mexico.

There were four routes to Ft. Sumner including one extra long route that went north to Santa Fe. It took around 4 to 6 weeks to make the journey on foot. Many people did not survive the “scorched earth” campaign and many more were lost during the long walk. At least 11,000⁵ men, women and children were forced on the long walk. Only 9,000 Diné returned home.

Not all Diné were captured. Especially in the northern canyon lands and in areas with inaccessible canyons and mountains, some people were able to evade Kit Carson’s troops and hide. Life for the people in hiding was difficult and dangerous. Still, they managed to stay and maintain a connection to the land. Many families have stories about these times and about finding weaving tools and other goods stuck away in the cracks of rocks for safekeeping.

Bosque Redondo was a horrifying experience for the Diné. People suffered from starvation, disease, executions and fights between their own people and the outlying Ute and Comanche. Attempts to grow crops during the first three years resulted in failed harvests and by the fourth year the people refused to continue farming. The federal government was forced to provide for troops and food provisions at a cost of around \$1.5 million dollars a year. This along with the protests of some conscientious Whites resulted in an investigation of the conditions at Bosque Redondo and the decision that the Bosque Redondo “experiment” had been a very bad idea. Brigadier General George Carlton was removed as the commander of the Department of New Mexico in the fall of 1866 and control over the Navajos was transferred from the Army to the Indian Service of the Department of Interior.

A small group of remaining Diné leaders at Bosque Redondo were able to persuade the Indian Service that it was best to let the people return to their homeland. A new treaty was negotiated and signed on June 1, 1868. The signers included: Bidághaa’í, Gish Díílidíni, Delgado, Manuelito, Bigod Bijaa’, Herrero, Ch’ah Lá’ ní, Dichin Biiłhéhé, Hombre, Narbono, Hastiin Totsohnii, and

⁵ Population estimates from the Bosque Redondo State Monument. Counts were not kept of the numbers of people who left from Fort Defiance or Fort Wingate. Census counts were taken after the second year of captivity at Fort Sumner, but the accuracy of these counts is not known.

Narbono Segundo⁶. The treaty signers formed the core of what became known as the Chief's Council and the beginning of a representative form of governance.

The people were finally allowed to return to Diné Bikéyah. Three weeks after the signing of the treaty seven thousand or so began the long walk back – it took about a month to reach Ft. Wingate.

The Chief's Council challenged the authority of the Indian Agent, William F. M. Arney. Arney had attempted to conduct a census of the tribe in opposition to the Chief's Council and had tried to get the Council to give up the San Juan portion of the reservation. The Naat'anii filed a petition requesting Arney's removal. Arney resigned shortly afterwards and he and other White government employees were asked to leave the reservation.



Unknown Photographer, Courtesy of Museum of New Mexico, Negative #18349: Navajo Group

Even as the power of the Chief's Council began to grow, this system of centralized management began to break down. By the late 1880's many of the Naat'anii had become elderly and their influence had waned.

The first Navajo Tribal Council was established in 1923 and Window Rock was selected as the capital in the early 1930's. The first general election of tribal officials was in 1938. From that time until 1989, the Navajo Nation government consisted of the Tribal Council headed by the Chairman of the Council. The Title 2 Amendment was passed in 1989. This amendment created the existing three branches of government – executive, judicial and the Tribal Council.

Laurance Linford makes the following comments in his book, *Navajo Places History, Legend, Landscape*, about the Round Rock area:



Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NN11-102.B): Marie Lee Yazzie riding horse with her umbrella, herding sheep in Round Rock, AZ, no date given

...Round Rock is likely the "Piedra Rodilla," possibly "Knee Rock" explored by Captain John G. Walkers 1858 expedition.

Traditional Navajos will not climb the precipitous sides of the sacred rock for fear of punishment by lightning, snakes, whirlwinds, or bears. They tell the following tradition of the rock:

It was during the time when the Navajos were at war with they were going down the Chinle Valley, the Navajos saw the Utes coming from the north. As soon as the Utes got behind Round Rock, the Navajos shot one of the arrows and clipped off the top of the mesa. The sliding rock killed most of the Utes and the rest ran off because they were outnumbered.⁷

⁶ Also known as: Barboncito, Armijo, Delgado, Manuelito, Largo, Herrero, Chiquito, Muerto de Hombre, Narbono, Ganado Mucho and Narbono Segundo.

⁷ *Navajo Places – History, Legend, Landscape*, Laurance D. Linford, University of Utah Press, Salt Lake City; 2000. pp. 125.

Round Rock Trading Post. A note on the Round Rock Trading Post: The trading post was established in 1887.

The following story was told by Adeline Aldrich Linn in the fall of 1993:

My grandfather, Stephen E. Aldrich, served with the United States Cavalry from 1870 to 1880 in the Montana, Wyoming, Arizona and New Mexico territories so he knew the area well. He was a veteran of the Apache Campaigns. After an honorable discharge he became engaged in the Indian trading business.

In 1882 he bought the trading post at Manuelito, New Mexico which is about 18 miles west of Gallup, from a Mr. Brown who had established the store in 1881. While owning Manuelito, Stephen Aldrich established a licensed trading post at Washington Pass. He learned that with the onset of winter the Navajo's moved to a lower elevation so he soon abandoned the Washington Pass post.



Round Rock Trading Post 2002

In 1885, Mr. Aldrich established a trading post at Tséihíł (Tsaile) with Elias S. Clark, later to become the Attorney General for Arizona. Charles Hubbell, brother of J. Lorenzo Hubbell, was an employee. This store staples in order to resist the winds. The tent served as a store, kitchen and sleeping room. A counter was erected at the front part of the tent. Archibald Sweetland purchased Mr. Clark's interest about 1886 and remained Mr. Aldrich's partner until 1889 when he became sole owner of the Tsaile trading post. He ran the post until 1890 when he finally abandoned it.



Unknown photographer, Courtesy Museum of New Mexico, Negative #183438: Round Rock Trading Post, Rita Wheeler at center right, no date given.

In 1887 (some accounts say 1890), Stephen Aldrich established the Round Rock trading post which was the first trading post established in the Territory of Arizona. It is still in operation. 1887 was the year when many Navajos died of a throat infection.

Henry (Chee) Dodge was Mr. Aldrich's partner at Round Rock. In September of 1912, Mr. Aldrich sold his half interest to C. N. Cotton of Gallup. (I have the original bill of sale.)

Grandpa and Grandma Aldrich no longer live in their beautiful residence in Gallup which they built in 1896. The Manuelito trading post was managed by a Mr. Welsh until my dad, Ray Aldrich, and mother were married in 1908 and took over the management.⁸

The Trouble at Round Rock⁹ This is the story of how the leader, Black Horse, stood up to the Indian Agent Henry Shipley as told by Left-Handed Mexican Clansman in 1952.

At the time I was about 18 years old the person who started the present trading post at Blue Clay Point move there – I used to know just when it was. They used to call the former old interpreter (Chee Dodge) Chee (Red) when I first heard of him. Chee was a good friend of white man from Ugly House (Manuelito, N.M.), known as Big Lump Setting Up (S. E. Aldrich). The two of them built the trading post of the place called Blue Clay Point. It

⁸ From a letter dated October 24, 1993 to Ms. Doreen Bowman, Round Rock Trading Post, Round Rock, Arizona from Adeline Aldrich Linn, Whittier, California.

⁹ Excerpts from *The Trouble at Round Rock*, Historical Series 2, United States Indian Service, Phoenix Indian School, Phoenix, AZ; January 1942. pp 23 -31.

was in the spring when they moved there. There was an epidemic in progress, and we now refer to it as "the time of the throat kills many."

They built the trading post in four years later perhaps, I do not recall exactly when, the one I called my uncle told us to haul wood there. They (the traders) probably called for the wood.

There was a boy of the Big Water Clan with whom I always chummed around. We started doing that kind of work. We went about calling each other "younger brother," and we hauled wood to the trading post. We heard reports that there were people going about to get children put into school. It was said that they were then over at Chinle, and we heard that they were coming here sometime soon. We would discuss it when we took the wagon after wood.

"Say, let's go to school," I said to my companion.

"All right," he said.

And then we went about, talking enthusiastically about it. In the evening after we had unloaded another load of wood we started back home in the wagon. When we got back to the home on we found that my uncle was there. And it turned out that my grandfather, who was called Big Mexican Clansmen, was there to so we told him of our plan.

"It's probably all right. It's fine indeed, my children. The party is on its way coming to us. You cannot escape them anyway," my uncle and my grandfather said to us.

On the next day we went to the trading post, and my grandfather put his thumbprint on a paper for us.

It was reported that the children from Chinle who were being taken to school would get there in two days, and we heard the grown-ups talking to one another about it.

Since it was reported that it would be another day before the wagon load of children would arrive, we went back home. We spent the night there, and then return on foot.

And we found the children had arrived. There was some man of the Bitter Water Clan whom people called Pug Nose. He was going around with the party, taking care of the children. He knew a little English, and that was probably why he was told to take care of the children. He was busily running around the children who had been hauled in, chattering in English. He was keeping them together. The children from Blue Clay Point who were to be put in school had not all been brought in as yet. It was said that the wagon with the children with start off in two days time. They were to go by way of Lukachukai, Tsaile, and Crystal, and on over to Fort Defiance. That was probably the plan.

But the people who live over beyond yonder mountain in the area of Cove and Red Rock were thinking ugly thoughts about the plan in connection with education. They said that if this business of taking children to school got to them they would really do something about it. As we came to find out, they were saying that (the school) would not get a one of their children. A man by the name of Black Horse was a leader of that faction. They had no doubt heard that in a certain number of days a party would come to Blue Clay Point for the purpose of putting children in school. So they began to think of the matter with the bitterness.

They probably said, "Boys, let's go there. Come on!"



Blue Clay Ridge in the background

So they probably set out from there for this purpose (of opposing the placing children in school). We had not heard of this, and knew nothing about it. They met (the school party) at Blue Clay Point.

Near the trading post there was a house which, at that time, we call the Ugly House. The house served the purpose of providing a place to sleep for the people who came to the trading post. Black Horse's party went over there, and they no doubt came with evil thoughts. The people who live to hereabouts had heard nothing of their plans, but at night they spoke about themselves, revealing their intentions.

The one I referred to as my grandfather, and another uncle of mine

called Little Boy, apparently went there at night and heard them telling about it.

The probably planned to go in and see the Agent on the next day. They no doubt told what they thought – what their opinions were regarding the school business that had started in connection with us. They told these things to the people from here who had gathered. So people began to think along lines of their planning.



Simeon Schwemberger, Courtesy Museum of New Mexico, Negative #48714:
Left - Billi Ł izhin (Black Horse), right – Taiyori (Squeezer), 1905

"Now men, is there anyone here who can do it (a chant)? Long ago, people of old had a story of some kind of chant called "Talk One into the Grave." Who knows it?" said Black Horse asking that it be performed.

These people from the other side of the mountain were saying this. That is what I heard. I wasn't at the meeting myself. And I don't know just how this chant goes.

"I do," said the one I referred to as Little Boy.

So then my grandfather, the man I spoke of its Big Mexican Clansman, volunteered to join him to carry on the ceremony. South from the trading post there is a ruin which we call in Navajo Shattered House. Someone burned at long ago. It is said they were Anasazi. It is black there like ashes. It was there that they carried on the ceremony. I don't know how it was done. That is what took place that night.

As for us, we spent another night at my uncle's hogan. Today we had been placed among the children who were to be taken off to school. On the morrow we would start off with them. So for that purpose, in the morning we again started off from the hogan afoot. We left with men folk, with the one who would thumbprint the papers for us, and who would vouch for us. It was my grandfather, Big Mexican Clansman. He stood up for the two of us.

When we got to the store we found that many people have assembled. Many horses were standing about. At that time horses were only means people have for transportation. Some of us did not know what had been done the night before. All we had found out was that someone by the name of Black Horse that brought a party from the other side of the mountain.

We had volunteered for school. We were going to get an education. We considered school as good news. That was what I thought. I always told my friends about what I myself was thinking. "You see, it's something to strive for and covet. Look at Chee's trading post here. Quite sometime ago when they moved back from Fort Sumner he had a hard time. He started his life by poking around in the hold horse manure in a stable. He used to be out there early in the morning with a stick especially made for that purpose. He could be sitting out there is silhouetted against the sun, with a light shining red through his hair. That is how he came to be called Chee. Then some white people took him in. That is how he's got a start in life. That is how his mind began to develop. He got ahead and now he here he is hid enviable position. He knows English, "I said.

That is what I had an ambition to do at that time. It was for that reason that I volunteered myself for school. And the person who had joined me thought likewise. With this in mind I wanted an education badly then. But it was destined to turn out differently.

The people went in into the trading post. It was packed full. Over here on one side the counter ran. Further back in the room was a swinging gate. It was out through there that Chee came. The brother of the One Who Has Eyeglasses (John Lorenzo Hubbell) from Ganado, a man called the Bat, was a clerk there. He was over to one side behind the counter. The Bat was a man who could understand Navajo very well. A little later the one

called Little Chief (Shipley) came out, and stopped beside Chee. Chee was his interpreter as he began to make a speech to the people. Black Horse was standing against the counter over to one side. The people of his band were standing with them. The people who had promised their children for school were named, and we were told many things about the school.

Then Black Horse spoke up and said, "This business of taking children away from people to put them in school – when it is going to affect the people from over beyond the mountain?"

"It will reach you sometime. Tomorrow these will start out, and will be routed right along the mountainside," said Little Chief.

"We'll not give you one of our children. And we just as soon fight over the matter is not," said Black Horse balking stubbornly.

Speaking this way to each other the Agent and Black Horse exchange many words.

The one I referred to as Limper was standing near Black Horse, with a blanket wrapped around his middle. And those of his band were lined up, one behind the other.

"Come on, you boys. Remember what you said," said Black Horse.

The one called Limper was the first to hop in there, and he grabbed the Agent by the collar. And they all rushed in. Chee jumped over the gate of the back of the room and, and chaos followed.



View of Round Rock Trading Post showing the cliff Agent Shipley was threatened to be thrown from.

"Outside with him!" voices were saying.

The started out with him. As they were talking taking him outside I crawled and squeeze myself out among them. Just then they lock the door from inside. Two of the boys were going to school were locked in. The one I referred to as River Man, now known as Short Hair, and another boy with him. These were the ones who were locked inside. On account of this fact a man I spoke as Wheela took the Agent's side – it was because one of the boys locked in there was his son.

The mob was carrying the agent away. Not far from them not far from there, there was a drop. There was a wash in the blue clay with a point of land on either side. That is how the trading post got its name. It was a long drop.

"Throw him down there!" voices were heard saying.

A lot of people were standing alongside the trading post, and I among them. My uncle was standing beside me, and I don't remember who else was standing there. As the people carried the Agent along they beat him with their fists. They were beating him up. But as they carried him further away the one called Bead Clan Gambler went

"What the devil are you trying to do, boys?" he said as he went running into the mob, shoving people backwards.

The man who son had been locked in the trading post ran in there with him. The number of his friends and turn followed him into the mob. They rescued the Agent.

The one called Little Boy – they're very one who had performed the ceremony of Talking a Person into the Grave on the night before – was among those who were carrying the Agent back. He was holding up the Agent's head. He took part in the rescue of the Agent. He was my uncle.

The really gave the Agent of beating. His face was all bruised up, and he was covered with blood. They probably almost killed him. If one of the mob had beat him with the club they would no doubt have killed him. They took him back into the trading post, and the door was immediately closed then they piled flour and other things of that type against the door. Those from whom the Agent had been rescued ran around the corner of the trading post yelling wildly.

As they brought the agent back inside, one of the Navajo policeman whet dashing out. He

ran over to the other side of the hill where the horses were hobbled, carrying a bridal. This man was a brother-in-law of Chee.

Someone said, "There goes one of the policeman!"

He was far away, about to disappear over the crest of the hill, before they spied him.

Then it started to rain, just a bit, and we went to stand alongside the trading post again.

The set off on horseback after the policeman. There about three who pursued him, as I recall. They were some whose horses happen to be standing right there, no doubt. But the policeman got to his horse, and got off to a head start. They began chasing him up to Lukachukai. They gave up the chase a long way up a place called a Cone Shaped Rock on the Canyon's Edge. He ran so fast that there was no chance for them to catch them. They merely turned back.

The policeman who had escaped on the horse made his way to the place called Water Flows into the Rock (Tsaile) where, at that time, there was a trading post. In those days a white name by the name of Gray Man (Archibald Sweetland) was the trader there. At the time some white soldiers from Fort Wingate were nearby hunting bear. They had their camp at the place called Meadows, Come Together, and they had just returned when the man on horseback arrived. There was one Navajo in the army at that time, and man called Son of Rubbish Man. He was a Navajo from the place called Mountain Set on Top of Each Other (Hosta Butte). And at the time of this happening he was among those were hunting bear. The man who arrived on horseback toll about what had taken place the Blue Clay Point, and then rode on in to Fort Defiance.

After these things took place all the plans were canceled. Some of the children who had been gathered for school probably went back home afoot – I'm referring to those from Chinle. At least that's what I heard. We who lived in the area hereabout stayed. We lived here anyway. That's what took place. That's what Black Horses and his band did. Back in the room where they piled flour sacks in a circle like a hogan. The Agent was behind the barricade, and Chee Dodge too, it is said.



Meadows Comes Together camp site near Tsaile

They made a hole in the roof. Then they made a ladder and put up there. They kept watch at night from up there. This is a story told by those who were sentinels. Some were stationed up there at the top. They kept watch at night because they said Black Horse or his men might set fire to the building with them in it. This part is just hearsay as far as I'm concerned. That's what happened at night

Those of opposing camp were on the other side of the wash, at a considerable distance, over where our home was. It was a big hogan, and the then was the home of Old Interpreter, who was a Red Streak into Water Clansman, and who was my step-grandfather since he was married to my grandmother. He was a young man of the time. Those were the troublemakers moved into this hogan.

One of them, and old man known as Yellow Fermented Chewer left the mob that night and went to spread the word to the people beyond the mountain. That night the people in I don't know how big an area got the story by grapevine. And they set out with guns and bows and arrows. I don't know how many there were from there. I don't recall just to those people were who came as reinforcements from beyond the mountain. But these are things that I heard. They all passed the night over at that big hogan, and we went to spend the night at our own home.

So at Fort Defiance they heard the news that had been brought to them and the chief of the soldiers at Water Flows into the Rock was told about it. In the morning they set out from Water Flows into the Rock. It is said that they began moving at dawn. We spent the night at home.

The grandfather my uncle, said, "I wonder what's happening now? Let's go and take it in

again.”

When they went back there I went along. Some more people joined us and we went down there on foot. It wasn't far. As we walked along, the soldiers were moving over their opposite us, down through a flat.

“Let's go! Let's go! Let's get them before they get to the store. Before they get to the store! Before they get to the store!” said Black Horse excitedly.

When this happened Black Horse's henchmen spoke without effect because there were others were trying to keep order, and who said “No” to the proposal to attack the soldiers.

But his boys were really impatient. They were rubbing their guns. Then the one to whom I referred as Slender Lava said, “No!” He spoke thus because he knew they lacked the wherewithal to win the fight.

Then the person whom I said was known as Sucker was sent to the trading post. Presently he came back from there on horseback.

“They say to wait, boys. They say to wait,” he said.

Then Black Horse's boys really became impatient.

They sent Sucker back over there again.

“Go over there and tell them, ‘No.’ Tell them not to give us that kind of talk. Tell them it's going to be now. We'll tear the building to pieces. What can they do? Go tell them that's our answer,” said Black Horse.

Sucker galloped over there and told them that, and then he returned at a gallop.

“They tell you to wait. The one who says that is the leader of those soldiers who arrived, and he is a War Chief (officer). It is not a man you threw owed yesterday who is saying that,” he said as he ran back again on horseback.

Then the men on this side said, “It's a fact. You never know. You don't know what they have in mind in saying this – they might have a better idea for settling it. So don't say anything,” said those on the side who were acting as go-betweens.

Finally many of us started over there, some on foot to and some on horseback. We got to the trading post. The soldiers were there on the inside. There were many pack mules, more than twenty I guess. They had all been inside the wool storage shack, with their packs still on. Across from the wool storage shack a gun had been placed to cover its approaches. So in case Black Horse carried out his threat, the soldiers were ready.

Then opposite us on the other side of the place called Blue Clay Point horses were seen to be going, and many people too. There were more than twenty. They could be seen going up their over the crest of the hill.

“If they appear over the hill – if they're serious in their threat – if they come close, I'll go out there in the open to meet them,” said the War Chief. “If they are serious about it, and if one of them aims at me with one of those guns you see them holding up out there, all of you fire a volley at him,” said the Officer. That was the plan on the inside.

Then they appeared, coming over the hilltop. They were coming towards us. At this point Sucker rode back and forth telling them to take it easy. Later, when his voice gave out, he merely gestured about.

We were standing by the trading post. There were many of us. We were standing close to a recess in the wall of the building where we could run for protection. When they had drawn near, Chee Dodge brought out a chair. He put it down beside the building, and then went back inside. We were all looking over toward where the horses were approaching. They were holding many guns up, and they were also holding arrows. There were none without weapons. There were many coming, and they were spread out quite wide.

Then the white man came out. It was the War Chief. He was from Fort Wingate, and was dressed in a black coat. He took it off and draped it over the chair that had been placed there. Then he unbuttoned his cuffs. He rolled up his sleeves like a person who is going to

start washing himself. When he came out he came with his arms of and his hands behind his head. Then Chee Dodge came back out.

"He says to come closer," said Chee to the horsemen.

They drew closer.

"Common closer," he again said.

The horsemen drew closer.

"Now that's close enough, he says to you, my friends. That's enough, Black Horse. Lay your gun on the ground and go up to him, the officers says," said Chee, referring to Black Horse as some kind of relative like "older brother."

Several of them got quickly down from their horses. They came up one after another. The officer still stood with his hands raised. Black Horse walked up and shook hands with him. I don't remember walked he said at that time. What the officers said was interpreted. I still remember some of that.

"He says to you, 'all right, that's fine'," said Chee to Black Horse.

Then those who followed him came off one by one and shook hands with the officer.

"It's enough," said Black Horse and the officer to each other, as they embraced and patted each other on the shoulder.

At that point peace was restored, I guess.

Those who were behind Black Horse all shook hands with the officer. They did this after laying their weapons on the ground. They came up and did it empty-handed. That's how peace was restored. And there was the sound of people expressing their thankfulness.

"That's enough my boys. Now food will be passed out for you. You can go back home braced by a meal," they were told.

I didn't realize the seriousness of it at that time. At that time I was just a "young punk," that's probably the reason. I was just there with the crowd for fun. I had fun with it, just like that something that is carried on for fun.

The following account of the same incident is reported in *Navajo Places*:

Combative Navajo Agent Henry F. Shipley took shelter in this post in October 1892 after an abortive meeting with Navajo headman Black Horse and his followers, who were resisting the taking of Indian children to the distant boarding schools. The badly beaten Shipley, already suffering from a broken nose and bruises, was dragged into the trading post by Chee Dodge and others, saving his life. They were besieged in the post for 36 hours, during which time Black Horse's followers continuously jeered them and threatened to kill them. A Navajo policeman accompanying Shipley escaped unseen and returned with a contingent of 11 soldiers, breaking up the siege. Shipley returned to Ft. Defiance without any children from the Round Rock area. Interestingly, Black Horse apparently was not resisting the forced education, but was protesting the crowded conditions of the boarding schools, the rampant illnesses among the students, and the poor food.¹⁰

¹⁰ *Navajo Places – History, Legend, Landscape*, Laurance D. Linford, University of Utah Press, Salt Lake City; 2000. pp. 125.

Round Rock School. Round Rock eventually received a school of its own which has grown from a small school building to a large complex. The following petition was made by Round Rock Chapter residents to the Commissioner of Indian Affairs in 1939.



Photograph by Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NE14-238): Round Rock School building with children playing, February 1953.

Petition for a Day School at Round Rock, Arizona -

We, the people of the Round Rock Community, do earnestly request that a Day School be built at Round Rock, Arizona and give the following reasons for requesting this Day School:

There are approximately 90 children of school age within a radius of 8 to 10 miles of Round Rock.

Practically all of these children live at Round Rock the year round.

About 30 children is all the bus can haul at present.

Because of the time spent going to and from the Lukachukai school those who go in to work for clothing can get in only a half day's work.

The bus leaves Round Rock about 7:00 am and arrives back at Round Rock about 4:30 pm, making a long day for the children but a short day in the school-room.

We believe that a two-room day school at Round Rock could be operated with very little transportation.

A day school at Round Rock would give the parents a better chance to work out clothing accounts.

Gold Tooth Begay, Tribal Council
Sam James, Chapter President
Tunnie Yazzie, Vice President
Ray James, Secretary and Ditch Boss
Guy Uskiliith (54788)
Charlie Wagner
Sinnajinni
Oshihi
Hosteen Tom Begay
Gold Tooth Slim¹¹

Round Rock Mill brings back Memories¹²:

There was a time in Round Rock when Navajo Fry bread really meant Navajo Fry bread.

During the Franklin Roosevelt Administration, when John Collier was Commissioner of Indian Affairs, Round Rock was the site of a flour mill. It was part of the Community Help Program that Collier started in the 1940s.

"I remember, at the end of the day, we would be covered with the dust of white flour," said Peter Deswood, Sr.

The mill processed wheat from Round Rock, Many Farms, Lukachukai, Tsaile and Wheatfields, which got its name from always having the most wheat. Deswood

¹¹ *For Our Navajo People, Diné Letters, Speeches & Petitions 1900 – 1960*, Peter Iverson Ed., University of New Mexico Press, Albuquerque, NM; 2002. Pp. 53-54

¹² Jennifer Yazzie and Mike Deswood, *Round Rock Today*, Vol. 1 No. 1, 1996 by Round Rock AmeriCorps. Pp. 5.

remembers families from Wheatfields hauling grain in a wagon pulled by horses. "They had so much that the family members would be gone for two or three days," he said.



Photographed by Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NA8-32): Navajo Tribal Flour Mill in Round Rock, May 14, 1943.

The location of the two-story mill was just west of the trading post, in what is now the Round Rock Elementary School ground. "I remember my dad helping build the mill," said Deswood. "He would work at the lake making the adobe bricks which were used. The bricks were made out of sand, grain cob and water which was mixed with a wooden paddle that was turned by a donkey going round and around. We then poured the mixture into a wooden box to be sun baked for a day or two."

Though the mill has long been shut down, the remnants of the building has been used and reused by the community. In the 1950's, Robert Roessel converted the storage room at the mill into a classroom. "We were able to add two teachers because of the conversion and the building next to it was used for community meetings," he said.



Photographed by Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NA8-16): Navajo Flour Mill dedication at Round Rock, December 28, 1940

Aa Nída' diijéé' -- Jackrabbit Hunting¹³:

"It was the winter of my 13th birthday. We were coming back from Sh□□□□ tó (Sun Spring Water) to summer camp to get the last bag of white corn from the previous summer. The snow was a foot deep and we were going through Tó □igaii (White Water Pond). My father (Cháálá Wai) saw a jackrabbit trail in the snow and he had my mother stop the wagon. We did and father got off his horse and followed the rabbit trail. It led him a couple of yards. Sure enough, the rabbit was hiding under a snow covered rabbit bush. Just when the rabbit jumped to run, my father threw a thumb sized pebble at it. Without missing it, he hit the rabbit and while stunned, father used the end of his whip to kill it. I remember having a wonderful rabbit stew that evening at summer camp," said Mary Rose Deswood. This is one of the many stories she told me.

During the spring, the residents of Round Rock would meet at the store to relay information about events that were going to take place. They participated in many of the events. This is a story of how the residents of Round Rock worked together and helped each other out.

Here are some of the names of hunters that participated in one of the many events that took place in Round Rock:

Cháálá Wai y□□□	Norton Benally y□□□
Bi □ ahinii y□□□	Ray Johnson y□□□
Hastiin Bee' ádíláhi y□□□	Thomas Johnson
Ch'iyáán lít'íní y□□□	John Yuth
Hastiin Gadí y□□□	Thomas Wagner
Bitsii' □itsoii y□□□	Ash□□hí Nééz y□□□
Ashkii Ásh□□hí y□□□	Biina y□□□
Bushy Hari y□□□	Hastiin Ayóó Ání□ nézí
Atsidii y□□□	Harry Begay
Yé'li Yázhi y□□□	Nák'ei Aznillii Yázhi y□□□
John Tsoh y□□□	Hastiin Yaa Ní' nit'i'i y□□□
Tótsohnii Deal y□□□	James Yazzie y□□□
Adika'ii y□□□	Tsii' Yisch'illii y□□□
John Peshtoney y□□□	Ace y□□□

¹³ Story written by Mike Deswood a Round Rock Chapter member.



William H. Sassaman
photographer, Courtesy
Museum of New Mexico,
Negative # 22554
Navajo, Charlie Mitchell,
medicine man and
interpreter, August 1929

New Beginning for Diné Bikéyah. Over the past one hundred and thirty-three years, the federal government recognition of Diné Bináhasdzo¹⁴ has grown through additional treaties to its present size of 16,000,000 acres and satellite reservations – Cañoncito, Ramah, Alamo and the New Lands. The Diné have gone through periods of rebuilding their flocks and their livelihoods and periods of deprivation, from drought and livestock reduction. In Round Rock there have been periods of relative prosperity brought about from the discovery and mining of coal and then uranium – and also, the aftermath of sickness and environmental damage. The Diné have seen technological changes that have changed transportation from horseback to 4x4's, communication via cell phone and satellite internet linkages, and a greater freedom in education. Governance too has changed and the Navajo Nation continues to move towards greater sovereignty over their internal affairs and Chapters towards more autonomy from Window Rock.

Diné Bikéyah and along with it, Round Rock, is at the beginning of a new time. This is a time of greater independence for the Chapter when it can determine its own future and a time to reach far beyond its borders to a wider world of opportunities. It is the strength and intelligence of the Diné that will take them through this new and unknown path with success and the ability to hold onto the land, the traditions and the very center of being Diné.



Photographed by Milton 'Jack' Snow,
Courtesy of the Navajo Nation Museum,
Window Rock, AZ, (catalogue #NA8-
11): Navajos inside the Navajo Flour
Mill, December 28, 1940. Dedication of
the new mill with Eva John, Ruth (wife)
and John Goldtooth, Charlie Wagner,
and Hastiin Hair Tie Bundle (Stella
Goldtooth's father)



Photographed by Milton
'Jack' Snow, Courtesy of
the Navajo Nation
Museum, Window Rock,
AZ, (catalogue #NA8-32):
Far left: Navajo known
as White Hair Begay and
next to him is the father
of Mike and Harry Begay
from Round Rock. Both
are viewing the Navajo
Flour Mill on
December 28, 1940.



Photographed by Milton
'Jack' Snow, Courtesy of
the Navajo Nation
Museum, Window Rock,
AZ, (catalogue #NA8-5):
Navajo worker
demonstrates to Hastiin
Bitterwater the new mill in
Round Rock, December
28, 1940.



Photographed by Milton
'Jack' Snow, Courtesy of
the Navajo Nation
Museum, Window Rock,
AZ, (catalogue #NN11-
207): Marie Lee Yazzie
and friend at sheep corral
in Round Rock,
no date given

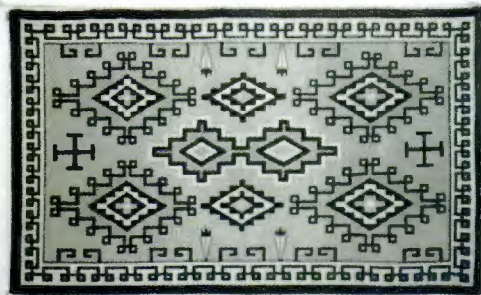
¹⁴ Navajo Reservation



Photographed by Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NN11-16): Round Rock community working on sheep dipping, May 1941



Photographed by Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NN1-97.B): Navajos at water hole in Round Rock, no date given



Photographed by Milton 'Jack' Snow, Courtesy of the Navajo Nation Museum, Window Rock, AZ, (catalogue #NC9-101): Navajo natural color rug woven by unknown person from Round Rock, June 1937

Appendix C

Selected Housing Characteristics

Selected Economic Characteristics



DP03

SELECTED ECONOMIC CHARACTERISTICS

2008-2012 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Subject	Round Rock Chapter; Navajo Nation Reservation and Off-Reservation Trust Land, AZ--NM--UT			
	Estimate	Margin of Error	Percent	Percent Margin of Error
EMPLOYMENT STATUS				
Population 16 years and over	857	+/-162	857	(X)
In labor force	351	+/-69	41.0%	+/-6.0
Civilian labor force	351	+/-69	41.0%	+/-6.0
Employed	249	+/-54	29.1%	+/-5.3
Unemployed	102	+/-35	11.9%	+/-3.7
Armed Forces	0	+/-12	0.0%	+/-3.7
Not in labor force	506	+/-123	59.0%	+/-6.0
Civilian labor force	351	+/-69	351	(X)
Percent Unemployed	(X)	(X)	29.1%	+/-8.0
Females 16 years and over	482	+/-100	482	(X)
In labor force	214	+/-53	44.4%	+/-8.0
Civilian labor force	214	+/-53	44.4%	+/-8.0
Employed	167	+/-43	34.6%	+/-7.5
Own children under 6 years	226	+/-71	226	(X)
All parents in family in labor force	134	+/-55	59.3%	+/-15.5
Own children 6 to 17 years	484	+/-127	484	(X)
All parents in family in labor force	241	+/-86	49.8%	+/-13.1
COMMUTING TO WORK				
Workers 16 years and over	249	+/-54	249	(X)
Car, truck, or van -- drove alone	202	+/-51	81.1%	+/-8.0
Car, truck, or van -- carpooled	33	+/-17	13.3%	+/-6.5
Public transportation (excluding taxicab)	0	+/-12	0.0%	+/-12.2
Walked	7	+/-6	2.8%	+/-2.5
Other means	4	+/-5	1.6%	+/-2.2
Worked at home	3	+/-5	1.2%	+/-2.0
Mean travel time to work (minutes)	42.6	+/-7.9	(X)	(X)
OCCUPATION				

Subject	Round Rock Chapter; Navajo Nation Reservation and Off-Reservation Trust Land, AZ--NM--UT			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Civilian employed population 16 years and over	249	+/-54	249	(X)
Management, business, science, and arts occupations	99	+/-34	39.8%	+/-11.4
Service occupations	63	+/-22	25.3%	+/-7.4
Sales and office occupations	27	+/-17	10.8%	+/-6.2
Natural resources, construction, and maintenance occupations	38	+/-20	15.3%	+/-7.7
Production, transportation, and material moving occupations	22	+/-15	8.8%	+/-5.6
INDUSTRY				
Civilian employed population 16 years and over	249	+/-54	249	(X)
Agriculture, forestry, fishing and hunting, and mining	0	+/-12	0.0%	+/-12.2
Construction	29	+/-18	11.6%	+/-7.1
Manufacturing	0	+/-12	0.0%	+/-12.2
Wholesale trade	0	+/-12	0.0%	+/-12.2
Retail trade	11	+/-10	4.4%	+/-4.0
Transportation and warehousing, and utilities	0	+/-12	0.0%	+/-12.2
Information	0	+/-12	0.0%	+/-12.2
Finance and insurance, and real estate and rental and leasing	10	+/-10	4.0%	+/-4.2
Professional, scientific, and management, and administrative and waste management services	0	+/-12	0.0%	+/-12.2
Educational services, and health care and social assistance	170	+/-46	68.3%	+/-11.0
Arts, entertainment, and recreation, and accommodation and food services	0	+/-12	0.0%	+/-12.2
Other services, except public administration	0	+/-12	0.0%	+/-12.2
Public administration	29	+/-21	11.6%	+/-8.0
CLASS OF WORKER				
Civilian employed population 16 years and over	249	+/-54	249	(X)
Private wage and salary workers	44	+/-21	17.7%	+/-8.0
Government workers	205	+/-51	82.3%	+/-8.0
Self-employed in own not incorporated business workers	0	+/-12	0.0%	+/-12.2
Unpaid family workers	0	+/-12	0.0%	+/-12.2
INCOME AND BENEFITS (IN 2012 INFLATION-ADJUSTED DOLLARS)				
Total households	326	+/-54	326	(X)
Less than \$10,000	77	+/-25	23.6%	+/-6.5
\$10,000 to \$14,999	11	+/-10	3.4%	+/-3.1
\$15,000 to \$24,999	75	+/-27	23.0%	+/-7.2
\$25,000 to \$34,999	44	+/-21	13.5%	+/-5.8
\$35,000 to \$49,999	40	+/-21	12.3%	+/-6.5
\$50,000 to \$74,999	55	+/-25	16.9%	+/-7.1
\$75,000 to \$99,999	14	+/-13	4.3%	+/-4.0
\$100,000 to \$149,999	10	+/-9	3.1%	+/-2.6
\$150,000 to \$199,999	0	+/-12	0.0%	+/-9.5
\$200,000 or more	0	+/-12	0.0%	+/-9.5
Median household income (dollars)	25,000	+/-5,183	(X)	(X)
Mean household income (dollars)	33,034	+/-4,621	(X)	(X)
With earnings				
Mean earnings (dollars)	41,203	+/-6,377	(X)	(X)
With Social Security				
Mean Social Security income (dollars)	11,506	+/-3,112	(X)	(X)
With retirement income				
Mean retirement income (dollars)	12,580	+/-3,026	(X)	(X)
With Supplemental Security Income				
	58	+/-25	17.8%	+/-7.3

Subject	Round Rock Chapter; Navajo Nation Reservation and Off-Reservation Trust Land, AZ--NM--UT			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Mean Supplemental Security Income (dollars)	10,366	+/-3,260	(X)	(X)
With cash public assistance income	70	+/-25	21.5%	+/-7.0
Mean cash public assistance income (dollars)	5,570	+/-1,342	(X)	(X)
With Food Stamp/SNAP benefits in the past 12 months	131	+/-33	40.2%	+/-8.4
Families	237	+/-48	237	(X)
Less than \$10,000	39	+/-21	16.5%	+/-7.9
\$10,000 to \$14,999	3	+/-5	1.3%	+/-1.9
\$15,000 to \$24,999	52	+/-23	21.9%	+/-8.2
\$25,000 to \$34,999	38	+/-19	16.0%	+/-7.0
\$35,000 to \$49,999	32	+/-20	13.5%	+/-8.2
\$50,000 to \$74,999	49	+/-22	20.7%	+/-8.6
\$75,000 to \$99,999	14	+/-13	5.9%	+/-5.5
\$100,000 to \$149,999	10	+/-9	4.2%	+/-3.7
\$150,000 to \$199,999	0	+/-12	0.0%	+/-12.8
\$200,000 or more	0	+/-12	0.0%	+/-12.8
Median family income (dollars)	30,724	+/-4,751	(X)	(X)
Mean family income (dollars)	38,600	+/-6,060	(X)	(X)
Per capita income (dollars)	8,107	+/-1,558	(X)	(X)
Nonfamily households	89	+/-29	89	(X)
Median nonfamily income (dollars)	11,750	+/-8,779	(X)	(X)
Mean nonfamily income (dollars)	17,067	+/-6,728	(X)	(X)
Median earnings for workers (dollars)	30,610	+/-7,370	(X)	(X)
Median earnings for male full-time, year-round workers (dollars)	53,333	+/-21,845	(X)	(X)
Median earnings for female full-time, year-round workers (dollars)	31,932	+/-6,992	(X)	(X)
HEALTH INSURANCE COVERAGE				
Civilian noninstitutionalized population	1,519	+/-293	1,519	(X)
With health insurance coverage	1,046	+/-209	68.9%	+/-8.1
With private health insurance	396	+/-124	26.1%	+/-7.9
With public coverage	702	+/-197	46.2%	+/-9.7
No health insurance coverage	473	+/-170	31.1%	+/-8.1
Civilian noninstitutionalized population under 18 years	732	+/-182	732	(X)
No health insurance coverage	209	+/-96	28.6%	+/-11.1
Civilian noninstitutionalized population 18 to 64 years	672	+/-138	672	(X)
In labor force:	346	+/-70	346	(X)
Employed:	244	+/-55	244	(X)
With health insurance coverage	151	+/-41	61.9%	+/-11.3
With private health insurance	130	+/-39	53.3%	+/-11.1
With public coverage	41	+/-19	16.8%	+/-7.3
No health insurance coverage	93	+/-36	38.1%	+/-11.3
Unemployed:	102	+/-35	102	(X)
With health insurance coverage	67	+/-28	65.7%	+/-17.2
With private health insurance	20	+/-15	19.6%	+/-14.5
With public coverage	47	+/-23	46.1%	+/-14.5
No health insurance coverage	35	+/-22	34.3%	+/-17.2
Not in labor force:	326	+/-99	326	(X)
With health insurance coverage	193	+/-63	59.2%	+/-15.8
With private health insurance	63	+/-40	19.3%	+/-11.0
With public coverage	130	+/-54	39.9%	+/-15.5
No health insurance coverage	133	+/-76	40.8%	+/-15.8

Subject	Round Rock Chapter; Navajo Nation Reservation and Off-Reservation Trust Land, AZ--NM--UT			
	Estimate	Margin of Error	Percent	Percent Margin of Error
PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL				
All families	(X)	(X)	34.2%	+/-9.5
With related children under 18 years	(X)	(X)	46.0%	+/-11.3
With related children under 5 years only	(X)	(X)	45.0%	+/-38.2
Married couple families	(X)	(X)	25.0%	+/-12.2
With related children under 18 years	(X)	(X)	34.4%	+/-15.8
With related children under 5 years only	(X)	(X)	57.1%	+/-53.9
Families with female householder, no husband present	(X)	(X)	47.3%	+/-16.2
With related children under 18 years	(X)	(X)	59.7%	+/-20.3
With related children under 5 years only	(X)	(X)	38.5%	+/-49.5
All people	(X)	(X)	47.3%	+/-9.6
Under 18 years	(X)	(X)	57.2%	+/-11.8
Related children under 18 years	(X)	(X)	57.2%	+/-11.8
Related children under 5 years	(X)	(X)	52.2%	+/-14.7
Related children 5 to 17 years	(X)	(X)	59.2%	+/-12.4
18 years and over	(X)	(X)	38.0%	+/-9.2
18 to 64 years	(X)	(X)	40.5%	+/-10.3
65 years and over	(X)	(X)	23.5%	+/-16.5
People in families	(X)	(X)	46.8%	+/-10.2
Unrelated individuals 15 years and over	(X)	(X)	53.0%	+/-16.1

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

There were changes in the edit between 2009 and 2010 regarding Supplemental Security Income (SSI) and Social Security. The changes in the edit loosened restrictions on disability requirements for receipt of SSI resulting in an increase in the total number of SSI recipients in the American Community Survey. The changes also loosened restrictions on possible reported monthly amounts in Social Security income resulting in higher Social Security aggregate amounts. These results more closely match administrative counts compiled by the Social Security Administration.

Workers include members of the Armed Forces and civilians who were at work last week.

Industry codes are 4-digit codes and are based on the North American Industry Classification System 2007. The Industry categories adhere to the guidelines issued in Clarification Memorandum No. 2, "NAICS Alternate Aggregation Structure for Use By U.S. Statistical Agencies," issued by the Office of Management and Budget.

While the 2008-2012 American Community Survey (ACS) data generally reflect the December 2009 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2008-2012 American Community Survey

Explanation of Symbols:

1. An "X" entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An "-" entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval

or upper interval of an open-ended distribution.

3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.

4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.

5. An '****' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.

6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.

7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.

8. An '(X)' means that the estimate is not applicable or not available.



DP04

SELECTED HOUSING CHARACTERISTICS

2009-2013 American Community Survey 5-Year Estimates

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Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Subject	Round Rock Chapter, Navajo Nation Reservation and Off-Reservation Trust Land, AZ-NM-UT			
	Estimate	Margin of Error	Percent	Percent Margin of Error
HOUSING OCCUPANCY				
Total housing units	543	+/-42	543	(X)
Occupied housing units	353	+/-44	65.0%	+/-5.7
Vacant housing units	190	+/-32	35.0%	+/-5.7
Homeowner vacancy rate	1.6	+/-2.0	(X)	(X)
Rental vacancy rate	0.0	+/-48.8	(X)	(X)
UNITS IN STRUCTURE				
Total housing units	543	+/-42	543	(X)
1-unit, detached	409	+/-41	75.3%	+/-5.6
1-unit, attached	6	+/-6	1.1%	+/-1.1
2 units	0	+/-12	0.0%	+/-5.8
3 or 4 units	0	+/-12	0.0%	+/-5.8
5 to 9 units	0	+/-12	0.0%	+/-5.8
10 to 19 units	0	+/-12	0.0%	+/-5.8
20 or more units	0	+/-12	0.0%	+/-5.8
Mobile home	128	+/-34	23.6%	+/-5.8
Boat, RV, van, etc.	0	+/-12	0.0%	+/-5.8
YEAR STRUCTURE BUILT				
Total housing units	543	+/-42	543	(X)
Built 2010 or later	0	+/-12	0.0%	+/-5.8
Built 2000 to 2009	114	+/-33	21.0%	+/-5.6
Built 1990 to 1999	142	+/-31	26.2%	+/-5.4
Built 1980 to 1989	128	+/-30	23.6%	+/-5.3
Built 1970 to 1979	59	+/-22	10.9%	+/-4.0
Built 1960 to 1969	71	+/-24	13.1%	+/-4.3
Built 1950 to 1959	8	+/-9	1.5%	+/-1.6
Built 1940 to 1949	17	+/-13	3.1%	+/-2.3
Built 1939 or earlier	4	+/-5	0.7%	+/-1.0
ROOMS				
Total housing units	543	+/-42	543	(X)
1 room	174	+/-35	32.0%	+/-6.2

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The columns that identify the rating class and limiting features show no more than five limitations for any given soil. The soil may have additional limitations]

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1:							
Akhoni	45	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Typic Argiustolls	30	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Tuntsa	15	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
2:							
Aneth	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Naha	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Sheppard	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
3:							
Aquima	40	Not limited		Not limited		Not limited	
Rizno	35	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
Begay	20	Not limited		Not limited		Not limited	
4:							
Aquima	70	Somewhat limited Shrink-swell	0.10	Somewhat limited Shrink-swell	0.06	Somewhat limited Shrink-swell	0.10
Ustic Haplocambids	15	Somewhat limited Depth to hard bedrock Shrink-swell	0.06 0.04	Very limited Depth to hard bedrock Depth to soft bedrock Shrink-swell	1.00 0.95 0.04	Somewhat limited Depth to hard bedrock Shrink-swell	0.06 0.04

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
6:							
Arches	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Begay	25	Not limited		Not limited		Not limited	
Mido	20	Not limited		Not limited		Somewhat limited	
						Slope	0.88
8:							
Begay	90	Not limited		Not limited		Not limited	
9:							
Begay	45	Not limited		Not limited		Not limited	
Gullied Land	40	Not rated		Not rated		Not rated	
10:							
Begay	75	Not limited		Not limited		Not limited	
Mido	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
13:							
Claysprings	45	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.13
Lithic Torriorthents	25	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Typic Torriorthents	20	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
17:							
Denazar	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
Sheppard	30	Not limited		Not limited		Somewhat limited	
						Slope	0.13

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
17:							
Lithic Torriorthents	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
24:							
Jocity	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Subsidence risk	0.74	Subsidence risk	0.74	Subsidence risk	0.74
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Tezinie	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.11	Shrink-swell	0.50
		Subsidence risk	0.01	Subsidence risk	0.01	Subsidence risk	0.01
Nazlini	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Subsidence risk	0.11	Subsidence risk	0.11	Subsidence risk	0.11
25:							
Kachina	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.13
Evpark	25	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.16	Shrink-swell	0.50	Depth to hard bedrock	0.16
Gladel	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
26:							
Lithic Haplustepts	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Jacks	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
26: Pachic Haplustolls	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Slope Shrink-swell	0.50 0.50
27: Lithic Ustic Torriorthents	65	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50
Begay	25	Somewhat limited Subsidence risk	0.01	Somewhat limited Subsidence risk	0.01	Somewhat limited Subsidence risk	0.01
28: Marcou	65	Very limited Flooding Subsidence risk	1.00 0.01	Very limited Flooding Subsidence risk	1.00 0.01	Very limited Flooding Slope Subsidence risk	1.00 1.00 0.01
Claysprings	20	Very limited Flooding Depth to hard bedrock Depth to soft bedrock Shrink-swell	1.00 0.84 0.50 0.50	Very limited Flooding Depth to hard bedrock Depth to soft bedrock Shrink-swell	1.00 1.00 1.00 0.50	Very limited Flooding Depth to soft bedrock Depth to hard bedrock Shrink-swell	1.00 1.00 0.84 0.50
29: Moenkpie	50	Very limited Ponding Flooding Depth to hard bedrock	1.00 1.00 1.00	Very limited Ponding Flooding Depth to hard bedrock	1.00 1.00 1.00	Very limited Ponding Flooding Depth to hard bedrock	1.00 1.00 1.00
Rock outcrop	35	Not rated		Not rated		Not rated	
30: Monue, moderately deep	95	Somewhat limited Depth to hard bedrock	0.03	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.03
32: Monue	40	Not limited		Not limited		Not limited	
Sheppard	40	Not limited		Not limited		Not limited	
Nakai	15	Not limited		Somewhat limited Depth to hard bedrock	0.42	Not limited	

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
33: Nakai	90	Not limited		Not limited		Not limited	
34: Nakai	60	Not limited		Somewhat limited Depth to hard bedrock	0.08	Not limited	
Somorent	25	Somewhat limited Depth to hard bedrock Depth to soft bedrock	0.90 0.50	Very limited Depth to hard bedrock Depth to soft bedrock	1.00 1.00	Somewhat limited Depth to soft bedrock Depth to hard bedrock	1.00 0.90
40: Plumasano	40	Not limited		Not limited		Not limited	
Lithic Ustipsamments	25	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
Royosa	20	Not limited		Not limited		Not limited	
43: Rock outcrop	45	Not rated		Not rated		Not rated	
Arches	25	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.13
Shedado	15	Not limited		Somewhat limited Depth to hard bedrock	0.08	Not limited	
45: Rock outcrop	50	Not rated		Not rated		Not rated	
Shinume	40	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
46: Sheppard	45	Not limited		Not limited		Not limited	
Aneth	30	Not limited		Not limited		Not limited	
Marcou	20	Not limited		Not limited		Not limited	

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
50:							
Tekapo	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Lithic Ustic Torriorthents	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
						Slope	0.13
Rock outcrop	15	Not rated		Not rated		Not rated	
51:							
Trail	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Ives	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.01			Shrink-swell	0.01
Riverwash	15	Not rated		Not rated		Not rated	
56:							
Tuntsa, moderately deep	45	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
Akhoni	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Cumulic Endoaquolls	10	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	0.88	Depth to saturated zone	1.00	Depth to saturated zone	0.88
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
58:							
Typic Haplustolls, moderately deep	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.03	Depth to hard bedrock	1.00	Depth to hard bedrock	0.03
Rock outcrop	30	Not rated		Not rated		Not rated	
Typic Ustipsamments	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Dwellings and Small Commercial Buildings

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
61:							
Ustic Torriorthents	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.84	Depth to hard bedrock	1.00	Depth to hard bedrock	0.84
		Large stones	0.80	Large stones	0.80	Large stones	0.80
Eslendo	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Rock outcrop	25	Not rated		Not rated		Not rated	
64:							
Ustifluventic Haplocambids	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.25			Shrink-swell	0.25
Ustic Haplocambids, rocky	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.06	Shrink-swell	0.50	Depth to hard bedrock	0.06
Riverwash	15	Not rated		Not rated		Not rated	
65:							
Water	100	Not rated		Not rated		Not rated	

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

"Dwellings" are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

"Small commercial buildings" are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil Features

Chirle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

[Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total	Uncoated steel	Concrete
		In	In		In	In		
1: Akroni	Lithic bedrock	3-20	---	Indurated	---	---	Moderate	Low
Typic Argustolls	---	---	---	---	---	---	Moderate	Low
Turtea	---	---	---	---	---	---	Moderate	Moderate
2: Aneth	---	---	---	---	---	---	Low	Low
Naha	---	---	---	---	---	---	Moderate	Low
Sheppard	---	---	---	---	---	---	Low	Low
3: Aquima	---	---	---	---	---	---	Moderate	Low
Rizno	Lithic bedrock	3-20	---	Indurated	---	---	Moderate	Low
Begay	---	---	---	---	---	---	Moderate	Low
4: Aquima	---	---	---	---	---	---	Moderate	Low
Ustic Haplocambids	Paralithic bedrock Lithic bedrock	15-40 20-60	---	Moderately cemented Very strongly cemented	---	---	Low	Moderate
6: Arches	Lithic bedrock	3-20	---	Indurated	---	---	Low	Low

Soil Features

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
6:									
Begay	---	---	---	---	---	---	Moderate	Low	Low
Mkdo	---	---	---	---	---	---	Low	Low	Low
8:									
Begay	---	---	---	---	---	---	Moderate	Low	Low
9:									
Begay	---	---	---	---	---	---	Moderate	Low	High
Gullied Land	---	---	---	---	---	---	---	---	---
10:									
Begay	---	---	---	---	---	---	Moderate	Low	Low
Mkdo	---	---	---	---	---	---	Low	Low	Low
13:									
Claysprings	Densic bedrock	3-20	---	Noncemented	---	---	Low	Moderate	Moderate
Lithic Torriorthents	Lithic bedrock	3-20	---	Indurated	---	---	Low	Low	Low
Typic Torriorthents	---	---	---	---	---	---	Low	Low	Low
17:									
Denazar	---	---	---	---	---	---	Low	Low	Low
Sheppard	---	---	---	---	---	---	Low	Low	Low
Lithic Torriorthents	Lithic bedrock	3-20	---	Indurated	---	---	Low	Low	Low

Soil Features

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
24:									
Jocky	---	---	---	---	---	---	Moderate	Moderate	Moderate
Tezinle	---	---	---	---	---	---	Low	Moderate	Moderate
Nazlini	---	---	---	---	---	---	Moderate	Low	Moderate
25:									
Kachina	---	---	---	---	---	---	Moderate	Low	Low
Evpark	Lithic bedrock	20-40	---	Indurated	---	---	Moderate	Moderate	Low
Gladel	Lithic bedrock	3-20	---	Indurated	---	---	Moderate	Moderate	Low
26:									
Lithic Haplustepts	Paralithic bedrock	3-20	---	Weakly cemented	---	---	Moderate	Moderate	Low
	Lithic bedrock	3-20	---	Indurated					
Jacks	---	---	---	---	---	---	Low	High	Low
Pachic Haplustolls	---	---	---	---	---	---	Low	High	Low
27:									
Lithic Ustic Torriorthents	Lithic bedrock	3-20	---	Indurated	---	---	Moderate	Moderate	Moderate
Begay	---	---	---	---	---	---	Moderate	Low	Moderate
28:									
Marcou	---	---	---	---	---	---	Moderate	Low	Moderate

Soil Features

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top <i>In</i>	Thickness <i>In</i>	Hardness	Initial <i>In</i>	Total <i>In</i>		Uncoated steel	Concrete
28: Claysprings	Densic bedrock Lithic bedrock	3-20 15-40	0-15 ---	Noncemented Indurated	---	---	Low	High	Moderate
29: Moenkopie	Lithic bedrock	3-20	---	Very strongly cemented	---	---	Moderate	Low	Low
Rock outcrop	---	---	---	---	---	---	---	---	---
30: Monue, moderately deep	Lithic bedrock	20-40	---	Indurated	---	---	Moderate	Low	Low
32: Monue	---	---	---	---	---	---	Moderate	Low	Low
Shppard	---	---	---	---	---	---	Low	Low	Low
Nakai	Lithic bedrock Paralithic bedrock	40-60 40-60	---	Indurated Moderately cemented	---	---	Moderate	Low	Low
33: Nakai	---	---	---	---	---	---	Moderate	Low	Low
34: Nakai	Lithic bedrock	40-60	---	Indurated	---	---	Moderate	Low	Low
Somorent	Paralithic bedrock Lithic bedrock	3-20 15-40	---	Weakly cemented Indurated	---	---	Moderate	Low	Low
40: Plumasano	---	---	---	---	---	---	Moderate	Low	Low

Soil Features

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
40:									
Lithic Ustipsamments	Lithic bedrock	3-20	---	Indurated	---	---	Low	Low	Low
Royosa	---	---	---	---	---	---	Low	Low	Low
43:									
Rock outcrop	---	---	---	---	---	---	---	---	---
Arches	Lithic bedrock	3-20	---	Indurated	---	---	Low	Low	Low
Shedado	Lithic bedrock	20-60	---	Indurated	---	---	Moderate	Low	Low
45:									
Rock outcrop	---	---	---	---	---	---	---	---	---
Shinume	Lithic bedrock	3-20	---	Very strongly cemented	---	---	Moderate	Low	Low
46:									
Sheppard	---	---	---	---	---	---	Low	Low	Low
Aneth	---	---	---	---	---	---	Low	Low	Low
Marcou	---	---	---	---	---	---	Moderate	Low	Low
50:									
Tekapo	Densic bedrock	3-20	---	Noncemented	---	---	Low	Moderate	Moderate
Lithic Ustic Torriorthents	Lithic bedrock	3-20	---	Very strongly cemented	---	---	Moderate	Low	Moderate
Rock outcrop	---	---	---	---	---	---	---	---	---

Soil Features

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
51:									
Trail	---	---	---	---	---	---	Low	High	Low
Ives	Strongly contrasting textural stratification	20-40	---	Noncemented	---	---	Moderate	High	Low
Riverwash	---	---	---	---	---	---	---	---	---
58:									
Turkey, moderately deep	Lithic bedrock	20-40	---	Indurated	---	---	Moderate	Low	Low
Akhoni	Lithic bedrock	3-20	---	Indurated	---	---	Moderate	Low	Low
Cumulo Endoaquolls	---	---	---	---	---	---	Moderate	High	Moderate
58:									
Type Haplustolls, moderately deep	Lithic bedrock	20-40	---	Indurated	---	---	Low	Low	Moderate
Rock outcrop	---	---	---	---	---	---	---	---	---
Type Ustipsamments	---	---	---	---	---	---	Low	Low	Moderate
81:									
Ustic Torriorthents	Lithic bedrock	20-40	---	Indurated	---	---	Low	Low	Low
Escondo	Lithic bedrock Dense bedrock	3-40 3-20	---	Indurated Noncemented	---	---	Moderate	High	Moderate
Rock outcrop	---	---	---	---	---	---	---	---	---

Soil Features

Chinle Area, Parts of Apache and Navajo Counties, Arizona, and San Juan County, New Mexico

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
64:									
Ustifluventic Haplocambids	---	---	---	---	---	---	Moderate	Low	Low
Ustic Haplocambids, rocky	Lithic bedrock	20-60	---	Very strongly cemented	---	---	Moderate	High	Low
Riverwash	---	---	---	---	---	---	---	---	---
65:									
Water	---	---	---	---	---	---	---	---	---

Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. "Depth to top" is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

"Subsidence" is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

"Potential for frost action" is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as "low," "moderate," or "high," is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as "low," "moderate," or "high." It is based on soil texture, acidity, and amount of sulfates in the saturation extract.



ROUND ROCK CHAPTER
P.O. BOX 10 ROUND ROCK, AZ 86547
PHONE#: (928)-787-2510/2511 FAX#: (928)-787-2512

COUNCIL DELEGATES
NELSON BEGAYE

January 12, 2016

To: Nelson BeGaye, Delegate
Navajo Nation Council

From:

Robert Wagner, Vice President
Round Rock Chapter

Subject: Round Rock Land Use Plan

Please find attached our Land Use Plan. We hereby request you to sponsor legislation for certification by the Resources and Development Committee.

This morning we (chapter officials) met with our consultant, Wynette Arviso and she provided a copy of the review completed by Division of Community Development. A copy is attached. After reviewing the comments and discussing our land use plan, we have determined that we are ready to move this important document forward for certification.

Your prompt attention to this request is greatly appreciated. As you know, we need a certified land use plan to support our ICIP fund requests. Thus, your effort in obtaining certification is critical. Let us know if you have any questions.

Thank you very much!!

CC: Kellywood Harvey, Sr., President
Harrison Roy, Sec/Treasurer
Wynette Arviso, JJ Clacs & Company
Round Rock Chapter



Kellywood Harvey, Sr.
President

Robert Wagner
Vice-President

Harrison Roy
Sec/Treasurer

Alfred Yazzie
Grazing Representative

Vacant
Comm. Ser. Coordinator

Mary L. John
A.M. Coordinator

Review of Round Rock Chapter Manual

The review of Round Rock Chapter Land Use Plan Manual appears to be updated regarding the Community Assessment portion of the manual. **It was difficult to cross-reference without access to the original manual.** For example, in certain area of community assessment such as housing, demographic portion, others seem to have an updated 2010 data. The cited source used was *US Census Bureau 2008-2012*. The chapter history portion was inserted in middle section of community assessment portion might be appropriate if it was inserted at the beginning of the manual.

The Land Suitability, Infrastructure Analysis and Index also looks sufficient without any changes as is contain in the original manual. There appears to no major significant changes i.e. site identification, etc. As was stated earlier, **it was difficult to cross-reference without access to the original manual.** Due to the complex nature of the Land Use Plan manual, it would be appropriate if Economic Plan was also included, but this only a recommendation.

-Shirlene
Div. of Comm. Dev.