

RESOLUTION OF THE  
RESOURCES AND DEVELOPMENT COMMITTEE  
23<sup>rd</sup> Navajo Nation Council --- Third Year, 2017

AN ACTION

RELATING TO RESOURCES AND DEVELOPMENT COMMITTEE; APPROVING THE  
INTEGRATED SOLID WASTE MANAGEMENT PLAN FOR THE NAVAJO NATION

BE IT ENACTED:

SECTION ONE. AUTHORITY

- A. The Resources and Development Committee is established as a standing committee of the Navajo Nation Council with oversight committee for the Division of Community Development. 2 N.N.C. § 500(A); 2 N.N.C. § 501(C)(1).
- B. The Resources and Development Committee shall exercise oversight authority over water, land, the environment and environmental protection. 2 N.N.C. § 500(A).
- C. The Resources and Development Committee has the authority to promulgate rules and regulations governing environmental protection and the development of Navajo Nation lands. 2 N.N.C. § 501(B)(1).

SECTION TWO. FINDINGS

- A. The Navajo Nation Division of Community Development (DCD) has submitted an Integrated Solid Waste Management Plan for the Navajo Nation which is attached as **Exhibit A**.
- B. "[A]n Integrated Solid Waste Management Plan (ISWMP) is a document that outlines how the Nation will reduce, manage and dispose of its solid waste. An ISWMP will assist and guide the development and implementation of a solid waste management program by establishing what actions need to be taken and by setting the criteria for decision-making." **Exhibit A**, page 2.
- C. The Integrated Solid Waste Management Plan has been reviewed through the Executive Official Review system and the Division of Community Development and the Department of Justice have found the document to be "sufficient." See **Exhibit B**.

- D. It is in the best interest of the Navajo Nation to approve the Integrated Solid Waste Management Plan for the Navajo Nation.

**SECTION THREE. APPROVING THE INTEGRATED SOLID WASTE MANAGEMENT PLAN FOR THE NAVAJO NATION**

The Navajo Nation hereby approves the Integrated Solid Waste Management Plan for the Navajo Nation which is attached as **Exhibit A.**

**CERTIFICATION**

I, hereby certify that the following resolution was duly considered by the Resources and Development Committee of the 23<sup>rd</sup> Navajo Nation Council at a duly called meeting at the Eastern RBDO Building, Churchrock, Navajo Nation (New Mexico), at which a quorum was present and that same was passed by a vote of 4 in favor, 0 opposed, 1 abstained on this 22<sup>nd</sup> day of November, 2017.



Benjamin Bennett, Vice Chairperson  
Resources and Development Committee  
of the 23<sup>rd</sup> Navajo Nation Council

Motion: Honorable Walter Phelps  
Second: Honorable Jonathan Perry



# PRELIMINARY FINAL INTEGRATED SOLID WASTE MANAGEMENT PLAN FOR NAVAJO NATION

NALE-15-034-17-448

APRIL 2017



201 N. Church Street  
Suite 300  
Las Cruces, NM 88001  
(575) 532-1526

# PRELIMINARY FINAL INTEGRATED SOLID WASTE MANAGEMENT PLAN FOR NAVAJO NATION

Zia Project # NALE-15-034  
Document # NALE-15-034-17-448  
Date: 24 April 2017

*Prepared for:*

**The Navajo Nation,  
Division of Community Development  
James Benally, SES-SWMP  
P.O. Box 1904  
Window Rock, AZ 86515**

*Submitted by:*

*Author(s):*



\_\_\_\_\_  
Richard Hertzberg

and

\_\_\_\_\_  
Edward H. Martinez

*QA Reviewer:*

\_\_\_\_\_  
Edward H. Martinez

*QC Reviewer:*

\_\_\_\_\_  
Emma Jones

201 N. Church St. Ste. 300  
Las Cruces, NM 88001  
(575) 532-1526 voice  
(575) 532-1587 fax

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## ***PRELIMINARY FINAL***

# **Integrated Solid Waste Management Plan (ISWMP, Plan) for Navajo Nation (NN)**

### **1.0 ECONOMICS OF SOLID WASTE MANAGEMENT OPERATIONS**

There are basic, fundamental factors that have the most impact on the finances and logistics of solid waste management functions. The importance of ***volume aggregation and consolidation*** cannot be overstated. The more material that is handled by a particular solid waste operation – collection for example – the lower the per unit (ton) costs are generally speaking. To repeat for emphasis, the higher the volume of waste the lower the unit cost.

For example, assume a regular garbage truck costs between \$ 85 per hour to service a route. The biggest influence on garbage collection costs is the time / distance between can / container pickups. Typically, rural customers have the highest collection cost and urban customers the least. If the collection cost is \$ 85 per hour for example, and 10 customers are picked up in a rural area, the average cost per customer is \$ 8.50 (\$ 85 / 10 customers). In comparison, if there are 100 pickups per hour in an urban or suburban setting, the cost is \$ 0.85 per customer.

These economic principles also apply to landfills, waste-to-energy plants, transfer stations, recycling processing facilities, composting sites – in other words, throughout the entire range of solid waste management operations. The more units (tons) that operating and capital costs can be spread across, the lower the per unit cost. Thus, cost – effectiveness is directly related to the ability to achieve high levels of volume aggregation and consolidation for any given operation.

This discussion is relevant to the Navajo Reservation because the conditions that characterize the Reservation undermine accomplishing volume aggregation / consolidation and cost – effectiveness.

These conditions are:

- A huge service area that is predominantly rural.
- A widely dispersed population.
- No landfills located within the Reservation.
- No large – scale transfer stations located within the Reservation.
- Long haul distances to off – Reservation landfills from convenience centers and collection points, which are situated largely at the Chapter level.
- Individual service arrangements or agreements between generators (for example, Chapters, commercial businesses, institutions) and service providers.
- No central organization and administration for the delivery of solid waste services by the Navajo Nation government.
- Lack of transparency and accountability regarding setting and review of rates.



## **2.0 PROJECT PURPOSE AND PREPARATION PROCESS**

### **2.1 PROJECT PURPOSE**

The purpose of this effort is to assist the Navajo Nation to develop an Integrated Solid Waste Management Plan (ISWMP), which is a document that outlines how the Nation will reduce, manage, and dispose of its solid waste. An ISWMP will assist and guide the development and implementation of a solid waste management program by establishing what actions need to be taken and by setting the criteria for decision-making.

Planning is the first step in designing or improving a solid waste management system. An ISWMP assists in taking institutional, social, financial, economic, technical, and environmental factors into consideration when managing solid waste systems. It provides the Nation's management and Council a practical document that can help guide solid waste management efforts. Specifically the ISWMP will:

- Define current waste management practices
- Identify problems and deficiencies with the current system
- Identify opportunities for improvement in the current system
- Set priorities for action to address problems and affect improvement
- Identify potential metrics to use in measuring progress toward implementing actions
- Identify the resources needed and develop budgets and schedules
- Support future proposals for solid waste management grants and funding needs

### **2.2 PLAN PREPARATION PROCESS AND METHODOLOGY**

The development of an ISWMP entails both the substance of the Plan and opportunities for stakeholders to review and comment upon that substance. Putting together a solid waste plan is a process with parallel technical and communication elements that need to be coordinated. A stakeholder involvement strategy is necessary.

This Plan was prepared in accordance with the Environmental Protection Agency's (EPA) Five Elements of a Tribal ISWMP (see Appendix A for full text). Those Five Elements are summarized as follows:

- Description of the Community Service Area
- Description of the Tribe's Solid Waste Program Structure and Administration
- Description of the Tribe's Current and Proposed Waste Management Practices
- Description of the Funding, Sustainability, and Long – Term Goals of the Tribe's Solid Waste Program
- Demonstration of Approval of the Plan by Appropriate Governing Body

The Five Elements for a Tribal ISWMP are intended as guidance, not requirements. However, in assessing funding requests from federal sources a tribe's plan can be reviewed to determine whether it has addressed the Five Elements.

Stakeholders who were important to development of the ISWMP are the Navajo Nation Council (NNC), the Navajo Nation President and Vice – President, the Council's Resource Development Committee (RDC; also referred to as the Oversight Committee), Navajo Environmental Protection Agency (Navajo EPA), Navajo Nation Solid Waste Management Program (NNSWMP), Chapters, public and private sector providers of solid waste services (refuse collection, hauling, transport, transfer, disposal / landfilling), and the general public.

## 2.3 KEY QUESTIONS

It is necessary to state that at the outset of the planning process an effort was undertaken to obtain data / information from the Chapters, private haulers, and landfill operators in order to answer these basic questions:

1. How much refuse being generated from within the Navajo Nation boundaries is being disposed annually?
2. Who is collecting, hauling, and transporting this material and what areas of the Reservation are they operating in?
3. What landfills are receiving and disposing of the waste?
4. Where are convenience centers and collection points for trash located within the Reservation?
5. What contracts exist for what services and who are the involved parties?
6. What are the waste flow patterns, in other words, where is most of the refuse coming from within the Reservation?
7. What are the costs associated with the various solid waste management functions, operations, and services?

To secure responses to the above – noted questions several types of outreach were attempted over a period of several weeks. A survey was sent out to all the Chapters (see Appendix B). A survey was sent to waste haulers operating within the Reservation based on a list provided by NNSWMP personnel (see Appendix B for survey; haulers include Checkerboard Refuse Disposal Service, Navajo Sanitation, Inc., Republic Services, and Waste Management). Publicly – and privately – operated landfills near the Navajo Nation were identified through communication with respective state solid waste agencies in New Mexico, Arizona, Utah, and Colorado and then subsequently contacted. Emails and telephone calls were used to engage these entities in sharing data / information regarding the questions above.

### 3.0 SUMMARY OF INITIAL DATA / INFORMATION COLLECTION EFFORT

As noted previously, the primary sources for preliminary data / information are the Chapters, haulers, landfills, and State solid waste agencies. Despite repeated attempts at contacting representatives of these entities, few results were yielded, as discussed further.

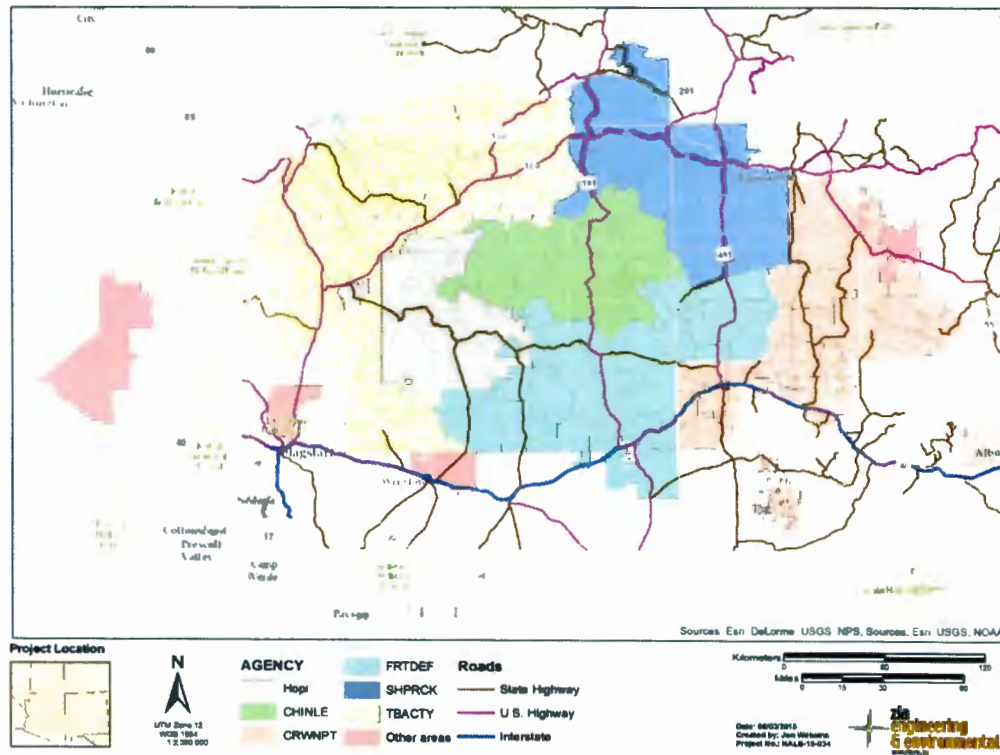
- Zia communicated with State agencies and Navajo Nation SWMP staff regarding current permitted landfill sites near the Nation to determine available waste disposal locations.
- Zia prepared a questionnaire, which was distributed, to all 110 Chapters by Nation personnel. Zia has received no responses. We followed up and called each Chapter. Based on phone conversations it was initially determined that 71 Chapters had some kind of site where trash could be placed – either a convenience center or collection point; 15 Chapters have no centrally located container(s) (they use nearby sites or bins at other Chapters) and 24 Chapters did not return phone calls.
- Nation staff provided Zia with contacts for the haulers servicing the Nation. Zia then contacted each of these haulers by either phone and/or email. None of the haulers responded to our inquiries. Most notably, Navajo Sanitation, Inc. – which is clearly the service provider most prevalent throughout the Nation – has not cooperated with our efforts.
- Based on telephone conversations, it was determined that State solid waste agencies in the New Mexico Environment Department (NMED) and Arizona Department of Environmental Quality (ADEQ) do not document disposed tonnage by hauler or source.
- There are 13 landfills located adjacent to the Nation (New Mexico – 6, Arizona – 4, Colorado – 2, Utah – 1). Operators for seven of these facilities responded, however only two – Cinder Lake and Painted Desert (in Flagstaff and Joseph City, Arizona respectively) – track how much refuse comes directly from the Nation. None of the other sites can separately identify volumes generated by the Nation or the population bases producing those volumes.

Given the lack of substantive results discussed above, further data / information collection efforts were suspended. It did not seem justifiable to spend additional project resources trying to secure data / information when it was either unavailable or when those who have it were non-responsive.

However, we did secure two excellent, diverse population and demographic database documents: *Navajo Population Profile – 2010 U.S. Census*, / Navajo Division of Health and Navajo Epidemiology Center and *Demographic Analysis of the Navajo Nation Using 2010 Census and 2010 American Community Survey Estimates* / Arizona Rural Policy Institute. Using these databases, and an approximate per capita annual waste generation rate, we estimated the yearly quantities of disposed waste and the major geographical areas within the Nation that are generating the refuse. These calculations were based on a figure of 2.17 pounds of waste generated per capita, per day as provided by NNSWMP personnel. Nation SVWMP staff agreed to this approach as the most viable methodology for quantifying disposed waste quantities given the lack of information from waste generators and service providers concerning refuse management methods and costs.

#### 4.0 DESCRIPTION OF THE PLANNING AREA

A map showing the boundaries of the Navajo Nation is presented below.



**Figure 1: Navajo Nation Planning Area**

This section determines and characterizes the planning area that will be focused on by the Plan. Data / information are provided about the following topics:

- Current population
- Population growth rate and projected population
- Demographics
- Number of households
- Climate
- Natural resources
- Geological and geographic features
- Economic activity / types of businesses
- Political and institutional structure

## **4.1 CURRENT POPULATION**

According to the 2010 Census there are 173,667 persons (Navajo plus others) located within the Navajo Nation. The Navajo Nation encompasses approximately 27,425 square miles; therefore, there is an average population of 6.3 persons per square mile.

As noted in Figure 1, the Navajo Nation is separated into five Agencies:

- Fort Defiance Agency
- Crownpoint or Eastern Agency
- Chinle or Central Agency
- Tuba City or Western Agency
- Shiprock or Northern Agency

Using the 2010 Census data, the following population data is provided for each of the Navajo Nation Agencies:

- Fort Defiance Agency – 43,940
- Central Agency – 27,823
- Western Agency – 37,613
- Northern Agency – 30,945
- Eastern Agency – 33,316

## **4.2 POPULATION GROWTH RATE AND PROJECTED POPULATION**

Zia contacted the Navajo Nation Census Office which worked on the Navajo Population Profile that was based on the 2010 Census data and was put together primarily by the Navajo Division of Health and the Navajo Epidemiology Center (published in December 2013). Based on this discussion, a representative stated that 2.5% was the value used for estimating population growth on an annual basis.

Shown in Table 1 is the 1980 through 2010 populations based on historical census data. The data shown in Table 1 for the post-2010 population projections is based on an assumed 2.5% annual increase provided by the Census Office.



**Table 1: Historical and Projected Population**

YEAR	POPULATION	GROWTH RATE	SOURCE
1980	140,984	■	Data from 2010 Census, p. 49
1990	155,876	14,892 (+1.015%/yr)	Data from 2010 Census, p. 49
2000	180,462	24,586 (+1.5%/yr)	Data from 2010 Census, p. 49
2004	188,975	8,513 (+1.1%/yr)	Data from Chapter Images: 2004 Edition
2010	173,667	- 15,308 (-1.4%/yr)	Data from 2010 Census
2015	196,488	+2.5%/year	Projected estimate
2020	222,308	+2.5%/year	Projected estimate
2025	251,522	+2.5%/year	Projected estimate
2030	284,574	+2.5%/year	Projected estimate
2035	321,969	+2.5%/year	Projected estimate
2040	364,278	+2.5%/year	Projected estimate
2045	412,147	+2.5%/year	Projected estimate
2050	466,307	+2.5%/year	Projected estimate
2055	527,584	+2.5%/year	Projected estimate

**NOTE:** The population data indicated an increase of 8,513 persons between 2000 and 2004 (+1.1% per year) and a decrease of 15,308 persons between 2004 and 2010 (-1.4% per year). The documents reviewed did not provide reasons for either increases or decreases in the population data.

### 4.3 DEMOGRAPHICS AND HOUSEHOLDS

In 2010, there were 49,946 households within the Navajo Nation with an average household size of 3.5 persons and an average family size of 4.1 persons. A "household" is identified as a person or group of people who occupy a housing unit.

Family households (76%) characterize the Navajo Nation, although traditional married couple families are in the minority (39%). Households headed by a female (as single mothers) account for 26% of all Navajo Nation households.

Demographic information was obtained from the Demographic Analysis of the Navajo Nation prepared by the Arizona Rural Policy Institute for the Navajo Nation Planning and Development Department. This document was compiled using 2010 Census data and based on that information. Using the 2010 Census data, the data shown in Table 2, shows the age groupings for the 2010 population:

**Table 2: Age Groupings**

Age Groupings	Total Navajo Nation
Under 5 years	15,167
5 to 9 years	15,391
10 to 14 years	16,290
15 to 17 years	10,996
18 and 19 years	7,034
20 years	3,094
21 years	2,801
22 to 24 years	7,421
25 to 29 years	10,511
30 to 34 years	9,801
35 to 39 years	9,996
40 to 44 years	10,312
45 to 49 years	11,811
50 to 54 years	10,801
55 to 59 years	8,668
60 and 61 years	3,178
62 to 64 years	3,811
65 and 66 years	2,228
67 to 69 years	3,090
70 to 74 years	4,425
75 to 79 years	3,242
80 to 84 years	1,966
85 years and older	1,633
<b>Total</b>	<b>173,667</b>

In 2010, the median age at the Navajo Nation was 28.5 years old.

Based on a review of the 2010 demographics information, the median annual household income within the Navajo Nation is \$27,389. The per capita income within the Navajo Nation is \$10,695. The income data is provided in 2010 inflation-adjusted dollars. The household income data could impact what solid waste management alternatives may be viable for consideration (lower income groups have less ability to finance a solid waste disposal system) and the amount of disposed waste (decreased consumption due to financial constraints is associated with reduced waste generation). Approximately 26% of the households within the Navajo Nation have Social Security income. Based on the demographics information, there are 43,398 households within the Navajo Nation and they are separated into the income categories shown in Table 3:

**Table 3: Income Categories**

Annual Household Income Table	Total Navajo Nation	
Total Households	43,398	%
Less than \$10,000	10,188	23%
\$10,000 to \$14,999	3,877	9%
\$15,000 to \$24,999	7,032	16%
\$25,000 to \$34,999	5,133	12%
\$35,000 to \$49,999	5,674	13%
\$50,000 to \$74,999	5,816	13%
\$75,000 to \$99,999	3,247	7%
\$100,000 to \$149,999	1,923	4%
\$150,000 to \$199,999	306	1%
\$200,000 or more	202	0%

*Note – there is a discrepancy between the household number cited above (43,398) and the one cited earlier (49,946); however, both are from the same source document cited in this section*

Also per the 2010 Census data, income within the Navajo Nation is separated into the types or sources identified in Table 4.

**Table 4: Income Types / Sources**

Household Income and Benefits	Population / \$
Households with earnings	28,335
Households with SS Income	11,097
Households with Supplemental SSI	7,121
Households with Public Assistance Income	3,489
Households with Cash Assistance, Food Stamps / SNAP	9,465
Households with Retirement Income	5,936
Mean Household Income	\$37,794
Mean Household Earnings	\$45,909
Mean Household SSI	\$10,629
Mean Household Retirement Income	\$14,384
Mean Household Cash / Public Assistance Income	\$4,113

Based on this data, 65% of the households within the Navajo Nation have earned income, which may impact their ability to directly finance a solid waste disposal system through the payment of user fees.

Using this data, approximately 63,554 persons within the Navajo Nation are living below the poverty level (about 38%). There are 6,083 persons over the age of 65 who live below the poverty level and 38% of the Navajo Nation tribal members are rated as severely poor. Poverty data for the Navajo Nation is summarized in Table 5.

**Table 5: Poverty Profile and Distribution**

Category	Population	% of Population
Persons for whom poverty status is determined	168,461	■
Persons in poverty	63,544	38%
Persons under 18 for whom poverty status is determined	56,678	
Persons under 18 in poverty	24,794	44%
Persons aged 18 to 64 for whom poverty status is determined	96,259	
Persons aged 18 to 64 in poverty	32,667	34%
Persons over 65 for whom poverty status is determined	15,524	
Persons over 65 in poverty	6,083	39%
Persons in families for whom poverty status is determined	150,517	
Persons in families in poverty	52,791	35%
Unrelated persons in poverty	10,753	6%

#### 4.4 CLIMATE

Three distinct climates are found within the Navajo Nation: the colder and also humid climate of the heights (Chuska Mountains and Defiance Plateau); the semi-arid steppe climate of the mesas and the high plains; and the comparatively warm desert, including the lower portions of the Chaco and Chinle valleys and portions of the southern, western, and northwestern parts of the Navajo Nation. Eight percent of the nation is classified as humid, 37 per cent as steppe, and 55 percent as desert. In general, most of the climate within the Navajo Nation ranges from arid to semi-arid.

Temperatures in the heights average from 43° to 50° F, with a low of 4°F and a high of 80°F. The steppe zone has an annual average temperature range from 45° to 50°F, with a low of 10°F and a high of 88°F. Temperatures in the desert zone average 50° to 60°F, with a low of 11°F and a high of 110°F.

The annual rainfall in the heights ranges from 16 to 27 inches. The annual rainfall in the steppe zone ranges from 12 to 16 inches. The annual rainfall in the desert zone ranges between 7 and 11 inches. The annual precipitation in large portions of the Navajo Nation is less than 10 inches per year. Precipitation is generally low to moderate in the early winter, increasing in February and March, and then dropping off quickly in April. May through June is generally very dry throughout the region. July and August are typically considered the wet months with monsoon thundershowers, providing as much as 70 percent of the annual precipitation totals for parts of the Navajo Nation.



Snowstorm events can occur from November through April and annual snowfall totals can range from 18 inches in the lower areas to over five feet in the Chuska Mountains and Defiance Plateau areas. Many tertiary-classed roads (unpaved) become impassable during heavy snowfall and during heavy melt periods. Collection and removal of refuse containers can be delayed when these kinds of conditions prevail.

Thunderstorms do not usually impact primary transportation routes unless hail is present or flash floods result in localized flooding of roads. Thunderstorms and snowmelt have the greatest potential impact on non-paved, graded roads, especially those built on mudstone or shale. Often after a severe storm or a series of storms, some tertiary-classed roads will become impassable for up to a week. Solid waste planning that involves collection points on tertiary-classed roads should allow for sufficient waste storage during a two- to three-day interruption in waste hauling service due to weather-related events.

#### **4.5 NATURAL RESOURCES**

Coal, oil, and uranium mining have provided a foundation of the Navajo economy since the 1920s. Historically, the petroleum industry extracts approximately 4.5 million cubic feet of natural gas and 6.1 million barrels of oil per year from the Navajo Nation. The Peabody Coal Company and Pittsburgh and Midway Coal Company historically produced approximately 23 million tons of coal per year from the Navajo Nation. Uranium mining has been sporadic in the U.S. since the 1970s. The federal Uranium Mill Tailings Remedial Action (UMTRA) Project provided more than a decade of work for Navajo tribal members after closure of some uranium mines. Most of the coal, petroleum, and uranium deposits are located within the eastern portion of the Navajo Nation.

There are approximately 523,000 acres of Ponderosa Pine and Douglas Fir forests and 4.5 million acres of Pinon Pine and Juniper forests. Timber removal was a moderate economic activity until the sawmill within the Nation boundaries (Navajo, NM) closed in the 1990s.

There are approximately 1.4 million acres of land within the Navajo Nation that are suitable for agriculture (8%). Agricultural operations run by the Nation itself (Navajo Agricultural Products Industry – NAPI) are a major employment base for the Nation but outside of NAPI operations, the agricultural industry is a fairly minor industry base within the Nation.

Moderate income is obtained from both Navajo run and private operating tourist attractions at Lake Powell, Canyon de Chelly, Chaco Canyon, Monument Valley and similar areas.

#### **4.6 GEOLOGIC AND GEOGRAPHIC FEATURES**

The Navajo Nation is located within the south portion of the Colorado Plateau Physiographic Province, a function of the Laramide Orogeny that contributed to formation of the Rocky Mountains and an uplift area that encompasses portions of Colorado, Utah, Arizona, and New Mexico. Geologic features within the Navajo Nation include regional uplifts (Chuska Mountains, Lukachukai Mountains, Carrizo Mountains, and the Defiance Plateau), monoclines, broad basins, diatremes, and laccoliths.



The geologic setting of the Navajo Nation is made up of the Chuska Mountains and Defiance Uplift that separate the San Juan Basin to the east and the Black Mesa-Holbrook Basin to the west. The San Juan Basin is bounded on the east by monoclines and underlying basement faults of the Chama and Nacimiento-San Pedro Mountains, on the south by the Zuni Uplift, on the west by the Defiance Uplift, and to the north by the Hogback monocline and La Plata Mountains. West of the Defiance Uplift is the Black Mesa-Holbrook Basin complex, bounded on the south by the faulted escarpment of the Mogollon Rim, to the west by the Echo Cliffs and East Kaibab monoclines and to the north by the Comp Ridge monocline of the Monument Upwarp. Paleo-faults are located along the edges of the uplifts.

The geologic history of the Navajo Nation goes back more than 1.8 billion years. Precambrian basement rock is made up of mostly metamorphic rock. Paleozoic rocks are composed of thick layers of limestone, sandstone, siltstone, and shale that accumulated in shallow continental tropical seas during the Pennsylvanian and Mississippian periods. Many of the older sandstone outcrops are from the Cutler Formation of the Permian Period. Mesozoic unmetamorphosed sedimentary rocks were formed mostly by terrestrial deposits and are mainly sandstones with some shale. Cenozoic rocks include igneous intrusions (mid-Tertiary), diatremes and terrace gravels.

## **4.7 MAJOR TRANSPORTATION ROUTES**

### **4.7.1 Primary Transportation Routes**

Primary transportation routes are all-weather highways, most of which have paved shoulders. These routes can handle larger waste transport vehicles, are less impacted by winter and summer storm events than other less well-designed highways. The grades are lesser for the most part and the roads have fewer steep curves that could slow larger vehicles.

#### **US Highway 89 – Flagstaff to Page, Arizona**

This is an all-weather two-lane paved highway, which covers 93 miles, oriented mostly from north to south, along the western border of the Navajo Nation. The Bitter Springs, Cameron, Bodaway, Coppermine, and LeChee Chapters are located along this highway. Tuba City is located 10 miles east of the junction of Highways 89 and 160. The highway is generally level with minimal steep grades, and will only be impacted during summer weather if severe storm events cause flash flooding. The steepest grade and curve area is in the northernmost portion of the highway between Bitter Springs and Page. There is approximately 180 feet of relief where Highway 89 crosses The Gap.

#### **US Highway 160/64 – Tuba City, Arizona to Shiprock, New Mexico**

This is an all-weather two-lane paved highway that covers 180 miles, in an east-west direction, along the northwestern portion of the Navajo Nation. This highway bisects the Tuba City, Shonto, Tonalea, Kayenta, Dennehotso, Mexican Water, Red Mesa and Teec Nos Pos Chapters. The highway is generally slightly curved with no significant steep grades. This highway is the primary east-west highway transportation route across the Navajo Nation.

**US Highway 491 – Shiprock to Gallup, New Mexico**

This is an all-weather paved highway that covers 113 miles from the Colorado-New Mexico border to Gallup, New Mexico. Highway 491 is a four-lane divided highway from Shiprock south to Naschitti (57 miles). It is a 2-lane highway with shoulders from Naschitti south to Tohatchi. It is briefly a four-lane highway again in Tohatchi and switches back to a two-lane highway as it goes farther south to Chee Dodge Elementary School. After the school, it converts back into a four-lane highway going south to Gallup. There are no steep grades or sharp curves on this highway to impede waste hauling traffic.

**US Interstate 40 – Flagstaff, Arizona to Albuquerque, New Mexico**

This all-weather four-lane limited access divided highway covers the 348 miles from Flagstaff to Albuquerque. With the exception of the Continental Divide area between Thoreau and Gallup, New Mexico, the highway does not have significant grades. This highway provides an east-west route along the southern margin of the Navajo Nation. Waste is hauled in multiple directions along this highway from southern chapters to the Flagstaff, Joseph City, Thoreau and Albuquerque area landfills.

**US Highway 191 – Bluff, Utah to Chambers, Arizona**

This highway is an all-weather two-lane highway that covers 171 miles from Bluff, Utah, to Chambers, Arizona through the central portion of the Navajo Nation. It is mostly a two-lane highway. The highway transitions to four lanes as it passes through Chinle and paved road shoulders are present in smaller urban areas and extending approximately 12 miles north of Chambers. It is a three-lane road (two north-bound lanes) near Wide Ruins. This highway does not have any significant grades or curves to impede waste hauling.

**US Highway 64 – Shiprock to Farmington, New Mexico**

US Highway 64 (formerly Highway 550) is a four-lane divided highway that connects Shiprock with the Farmington area. This highway is relatively flat with gentle curvature. Refuse can be transported on this road to the San Juan County, New Mexico Crouch Mesa Landfill, located east of Farmington, New Mexico.

**New Mexico Highway 371 – Farmington to Thoreau, New Mexico**

Highway 371 (also called the Bisti Highway) is a mostly two-lane paved highway that covers the 110 miles between Farmington and Thoreau, New Mexico. Highway 371 is four-lane through Farmington and transitions to three lanes (two south-bound lanes) for a distance of approximately three miles. It has paved shoulders and passes through certain sections. Except for curves and grades in the Smith Lake area and immediately south of Farmington, the highway is generally flat with minimal curves. This highway is the transport corridor for waste northward to the San Juan County, New Mexico landfill. The southern portion of the highway offers transportation access for waste disposal at the Red Rocks Regional landfill located northeast of Thoreau.

**Arizona Highway 98 – Page, Arizona to Highway 160**

This two-lane paved highway with paved shoulders covers the 66 miles between Page and the connection with US Highway 160 near Shonto, Arizona. There is a long up-grade from Page to the Kaibeto area and locally there are numerous curves between Kaibeto and Shonto.

The paved Navajo Route 224 leading past Shonto, Arizona eventually ends in a steep grade two-lane dirt road (tertiary) leading to the Shonto Chapter House. Navajo Route 16, bypassing Inscription House toward Navajo Mountain Chapter is paved to about 15 miles prior to Navajo Mountain.

**US Highway 163 – Kayenta, Arizona to Mexican Hat, Utah**

Highway 163 is a paved two-lane highway extending 44 miles from Kayenta, Arizona, to Mexican Hat, Utah. The highway is generally grade-free and relatively straight. It does not have paved shoulders. This highway serves as the transportation route for waste traveling from the Kayenta area to the San Juan County Landfill, located north of Bluff, Utah. This route can be used to transport waste from the Oljato Chapter to the transfer station located in Mexican Hat, Utah.

**New Mexico Highway 550 – Bloomfield to Bernalillo, New Mexico**

Highway 550 extends 166 miles from Bloomfield to Bernalillo. This four-lane paved highway can handle waste vehicles at highway speed its entire length. Currently the northern portion of the highway is the transportation access to the San Juan County, New Mexico landfill. Waste from the chapters in Sandoval County (Counselor, Ojo Encino, Pueblo Pintado, and Torreon) can be transported along this route to the Sandoval County Landfill, located south of Bernalillo.

**Navajo Highway 12 – Lupton to Fort Defiance, Arizona**

Highway 12 is a two-lane paved highway with paved shoulders extending 32 miles from Fort Defiance to the US Interstate 40 intersection at Lupton, Arizona. There is a grade immediately north of Lupton, but southbound waste hauling trucks should not be impacted. This highway serves as the transportation route for waste being hauled south from the Fort Defiance/St. Michaels area.

**4.7.2 Secondary Transportation Routes**

The secondary transportation routes are two-lane highways that may not have the construction design to handle larger waste hauling vehicles at highway speeds. Portions of these highways may have grades or curves that result in slower transit times, increase wear on vehicles and create the potential for traffic congestion problems.

**Navajo Service Route 9 – Twin Lakes to Crownpoint, New Mexico**

Navajo Service Route 9 is a 43 mile two-lane paved road with shoulders that connects the Twin Lakes Chapter with the Crownpoint Chapter. From Crownpoint, New Mexico Highway 371 goes south to I-40 and Thoreau, New Mexico. Navajo Service Route 9 is a potential waste outlet for the Twin Lakes, Coyote Canyon, and Nahodishgish Chapters.

**Arizona Highway 264 – Tuba City to Window Rock, Arizona**

Arizona Highway 264 is a two-lane paved highway without shoulders that crosses from east to west across the southern portion of the Navajo Nation and through the Hopi Reservation. The Hard Rocks, Tuba City, Tonalea, and Coalmine Canyon Chapters may use Highway 264 to access the Hopi Landfill. From Tuba City to Kykotsmovi (Hopi Landfill) is a distance of approximately 53 miles. From the eastern margin of the Hopi Reservation to Window Rock is a distance of approximately 80 miles. Highway 264 can handle all types of waste vehicles.



The portion of the highway (89 miles) across the Hopi Reservation has had highway expansions but remains narrower along mesa ascensions and downgrades, with curves, and at some places with narrowed shoulders. This highway may handle smaller waste vehicles better than larger and heavier ones even though numerous diesel trucks utilize it for transportation. The Hopi Landfill is located north of Second Mesa toward the Hard Rocks Chapter area, and is accessed by an unpaved but graded dirt road approximately five miles in length.

**New Mexico Highway 602 – Gallup to Ramah, New Mexico via New Mexico Highway 53**

The distance from Gallup to Ramah, New Mexico, is approximately 42 miles. Waste from Ramah, Breadsprings, and Chichiltah Chapters can be hauled north to the Gallup transfer station on this two-lane paved highway (New Mexico Highway 53 is also a two-lane paved road). Roll-off truck hauling waste can use this route.

**Arizona Highway 77 – Holbrook to Jeddito, Arizona**

Waste from the Dilkon, Indian Wells, and the Jeddito chapters can be hauled on this two-lane highway southward approximately 64 miles to Holbrook, Arizona and then westward to the Painted Desert Landfill at Joseph City, Arizona which only takes commercial haulers. Jeddito is an isolated Navajo chapter that is located within the southeast portion of the Hopi Reservation.

**Navajo Highway 15 – Winona to Ganado, Arizona**

Navajo Highway 15 is an approximately 129-mile two-lane paved east-west highway that traverses the southern portions of the Western and Fort Defiance Agencies. The eastern portion of the road has potential for waste traveling between the southwestern-most chapters in the Fort Defiance Agency and Ganado.

**Arizona Highway 87 – Winslow to Second Mesa, Arizona (Hopi Reservation)**

Arizona Highway 87 is a 75-mile two-lane paved highway connecting the Winslow area with the Hopi Reservation. This road has limited potential as a major waste-hauling route, but does serve as access to the Teesto and Dilkon areas.

**Navajo Highway 12 – Round Rock to Fort Defiance, Arizona**

Navajo Highway 12 is a 73-mile two-lane paved highway that connects Round Rock with the Window Rock-Fort Defiance area. As the road crosses the north end of the Defiance Plateau, this route should not be used to haul larger waste vehicles between these two points because of steep grades. The northern portion of this highway serves as an outlet for waste from the Lukachukai and Upper Greasewood (Greasewood Springs) Chapters that could be hauled northwestward. The southern portion of the road serves as an outlet for wastes generated in the Crystal and Red Lakes Chapters that need to be hauled toward Fort Defiance.

**Navajo Highway 16 and 4 – Forest Lake to Chinle, Arizona**

Navajo Highways 16 and 4 are two-lane paved highways, narrow in part with some curves that will slow larger waste vehicles. This route is an important outlet for waste generated in the Pinon, Forest Lake, Low Mountain, Blue Gap, and Cottonwood Chapters to be hauled to the Chinle area.

#### 4.7.3 Tertiary Transportation Routes

The tertiary roads on the Navajo Nation lack pavement or gravel bases over most of their entire roadway distances. Additionally these roads often lack bridges or culverts and are subject to closures during summer thunderstorm and winter snowstorm events. These roads are typically narrow with little room for passing vehicles. Waste transport vehicles would experience abnormal wear if constantly used on such routes. If solid waste collection sites need to be located on these routes, the Navajo Nation will be encouraged to upgrade these roads to a secondary status at a minimum. Chapters on the Reservation that have predominately tertiary-classed roads include Black Mesa, Navajo Mountain, Mexican Springs, Sweetwater and Casamero Lake.

### 4.8 ECONOMIC ACTIVITY / TYPES OF BUSINESSES

Based on our review of the two previously cited population / demographics documents (*Navajo Population Profile: 2010 U.S. Census and Demographic Analysis of the Navajo Nation*), shown in Table 6 is a summary of employment by occupations within the Navajo Nation:

**Table 6: Types of Employment**

CATEGORY	Population	% of Employed
Civilian employed population 16 years and over	44,757	■
Management, business, science, and arts occupations	11,477	25.6%
Service occupations	11,249	25.1%
Sales and office occupations	8,190	18.3%
Natural resources, construction, and maintenance occupations	6,190	17.1%
Production, transportation, and material moving occupations	44,757	13.8%
<b>INDUSTRY</b>		
Civilian employed population 16 years and over	44,757	■
Agriculture, forestry, fishing, hunting, and mining	1,847	4.1%
Construction	5,021	11.2%
Manufacturing	1,803	4.0%
Wholesale trade	472	1.1%
Retail trade	4,449	9.9%
Transportation, warehousing, and utilities	2,428	5.4%
Information services	243	0.5%
Finance, insurance, real estate, rental and leasing	933	2.1%
Professional, scientific, management, administrative and waste management services	908	2.0%
Education services, healthcare and social assistance	16,189	36.2%
Arts, entertainment, recreation, accommodation and food service	4,472	10.0%
Other services except public administration	1,272	2.8%
Public administration	4,720	10.5%



#### 4.8.1 Industrial Parks

Information obtained from the Navajo Nation Department of Industrial Development indicates that there are nine designated industrial parks within the Navajo Nation:

1. Chinle, Arizona – tenants include Coca Cola, White Mesa Materials, Navajo Housing Authority, and Navajo Tribal Utility Authority.
2. Dennehotso, Arizona – has not been developed and does not have any tenants at this time.
3. Fort Defiance, Arizona – tenants include Design Data Solutions, Navajo Housing Authority, Navajo Arts and Crafts Enterprise (located now in Window Rock, AZ), and the Apache County offices.
4. Leupp, Arizona – tenants include Tooh Dineh Industries and Navajo Family Farms Co-op.
5. Church Rock, New Mexico – tenants include Eastern Navajo Economic Development Office, Gallup Recycling, Cabinets Southwest, Inc., US Department of Agriculture Food Distribution, and the Fire Rock Navajo Casino.
6. Shush Be Toh, New Mexico – has not been developed and does not have any tenants at this time.
7. Shiprock, New Mexico – tenants include Ayani Neez, Inc., Navajo Ace Home Center, Shiprock Subway, Silver State Construction Co., 491 Dine Pizza Co., Farmers Insurance Group, Navajo Nation Shiprock Temporary Assistance for Needy Families (located now in Farmington, NM), Tohatchi Area of Opportunity and Services, Inc., Home for Women and Children, Navajo Nation Design and Engineering Department, and the University of Utah.
8. Navajo Forest Products Industry (NFPI), New Mexico – the sawmill closed in the early 1990s; there had been logging at the Navajo Nation since the 1880s; it currently appears to be unoccupied buildings.
9. Navajo Agricultural Products Industry (NAPI), New Mexico – NAPI irrigates 76,000 acres near Farmington, New Mexico, and tenants in the industrial park include Raytheon Missile Systems, Upland Desert Popcorn Co., Navajo Mesa Farms, Bureau of Indian Affairs Roads Department, and LGM Beans.

Others within the Navajo Nation – for example, hotels, restaurants, service stations – are clustered in the larger populated areas such as Window Rock, Kayenta, Tuba City, and Chinle.

#### 4.9 POLITICAL AND INSTITUTIONAL STRUCTURE

The Navajo Nation government is divided into three main branches – Executive, Legislative, and Judicial. The President and Vice – President of the Nation lead the Executive Office; these are elected positions. The legislative branch consists of the Navajo Nation Council with 24 delegates led by a Speaker. These are also elected positions with each delegate representing approximately the same number of people. The intention in periodically formulating and reformulating the election areas is to achieve political equity so no community, Chapter, or cluster of Chapters has more delegates than another. There are four Standing Committees of the Navajo Nation Council – Budget and Finance; Health, Education, and Human Services; Resources and Development; Law and Order. The lead entity in the Judicial Branch is a three – member Supreme Court presided over by a Chief Justice.

The Navajo Nation is divided into five large administrative units called Agencies and within them are 110 Chapters, which historically are based on familial and kinship relationships. The distribution of Chapters by Agency is as follows: Western – 18, Eastern – 31, Northern – 20, Central – 14, Fort Defiance – 27.

There are 23 Grazing Districts comprised of adjoining geographical Chapters. The Chapters are represented by an elected grazing official to speak for them at district meetings and Agency – wide meetings as well.

There are also 10 Administrative Service Centers (ASCs, see map, Appendix C) that assist in coordinating activities among Chapters. Both the Grazing Districts and ASCs have been used in the past by the Navajo Nation Solid Waste Management Program for dissemination of brochures, flyers, and other similar informational materials about proper solid waste disposal, recycling, and source reduction practices plus the operation and maintenance of solid waste facilities.

The Navajo Nation central government headquarters is in Window Rock, Arizona. The government was reorganized in 1991 into the Executive, Legislative, and Judicial branches. The government consists of the following divisions and departments:

Offices of the President and Vice President	Division of General Services
Office of the Controller (Division of Finance)	Division of Human Resources
Office of the Attorney General	Division of Diné Education
Office of Management and Budget	Division of Transportation
Tax Commission	Division of Natural Resources
Telecommunication Regulatory Commission	Division of Community Development
Navajo Gaming Regulatory Office	Division of Economic Development
Environmental Protection Agency	Division of Public Safety
	Division of Health
	Division of Social Services

#### 4.9.1 Agencies and Chapters

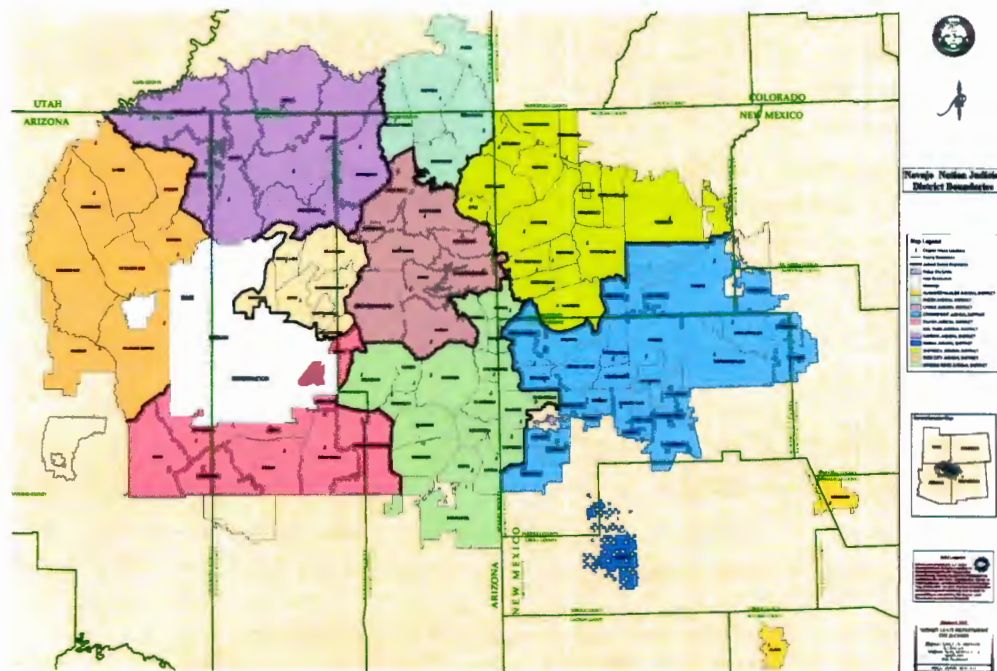
As indicated previously, the Navajo Nation is divided geographically into five Agencies that perform administrative, governmental, and political functions:

- |                                                                                                                                                         |                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Chinle or Central Agency</li><li>• Crownpoint or Eastern Agency</li><li>• Tuba City or Western Agency</li></ul> | <ul style="list-style-type: none"><li>• Shiprock or Northern Agency</li><li>• Fort Defiance Agency</li></ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

Also as indicated previously, the Agencies are further divided into 110 Chapters, which are governmental entities delegated to address local issues pertaining to the land and health status of their respective Chapter populations. The following Chapters are located within the five Navajo Nation Agencies:

1. Northern Agency – Aneth, Beclabito, Burnham, Cove, Upper Fruitland, Gadii'ahi, Hogback, Mexican Water, Nenahnezad, Newcomb, Red Mesa, Red Valley, Rock Point, San Juan, Sanostee, Sheep Springs, Shiprock, Sweetwater, Teec Nos Pos, and Two Grey Hills (20 Chapters).
2. Western Agency – Bird Springs, Bodaway/Gap, Cameron, Chilchinbeto, Coalmine Mesa, Coppermine, Dennehotso, Inscription House, Kaibeto, Kayenta, LeChee, Leupp, Navajo Mountain, Oljato, Shonto, Tolani Lake, Tonalea, and Tuba City (18 Chapters).
3. Eastern Agency – Alamo, Baca, Becenti, Bread Springs, Cañoncito (Tohajiilee), Casamero Lake, Chichiltah, Church Rock, Counselor, Crownpoint, Huerfano, Iyanbito, Lake Valley, Little Water, Manuelito, Mariano Lake, Nageezi, Nahodishgish, Ojo Encino, Pinedale, Pueblo Pintado, Ramah, Red Rock, Rock Springs, Smith Lake, Standing Rock, Thoreau, Torreon, Tsayato, White Horse, and White Rock (31 Chapters).
4. Central Agency (Chinle Agency) – Black Mesa, Chinle, Forest Lake, Hard Rock, Lukachukai, Many Farms, Nazlini, Pinon, Rough Rock, Round Rock, Tachee / Blue Gap, Tsale / Wheatfields, Tselani, and Whippoorwill (14 Chapters).
5. Fort Defiance Agency – Cornfields, Coyote Canyon, Crystal, Dilkon, Fort Defiance, Ganado, Greasewood, Houck, Indian Wells, Jeddito, Kinlichee, Klagetoh, Low Mountain, Lupton, Mexican Springs, Nahatadzil, Naschitti, Oak Springs, Red Lake, Sawmill, St. Michaels, Steamboat, Teesto, Tohatchi, Twin Lakes, White Cone, and Wide Ruins (27 Chapters).

It is noted that in some cases Chapter boundaries cross county and / or state lines.



**Figure 2: Agency and Chapter Boundaries of the Navajo Nation**



## 5.0 EXISTING SOLID WASTE MANAGEMENT PRACTICES

This section describes present solid waste management practices, policies, and programs for the collection, handling, storage, transfer, and disposal of solid waste.

### 5.1 LANDFILLS

Zia contacted the Arizona Department of Environmental Quality (AZDEQ) and the New Mexico Environment Department (NMED) for a current list of landfills and transfer stations in the vicinity of the Navajo Nation. Zia also performed an Internet search for landfills and transfer stations in Utah and Colorado that are in the vicinity of the Navajo Nation. The same landfills were identified during the current effort as were documented during the 2002 Solid Waste Plan.

Research as well as the previous study indicated that there are thirteen (13) perimeter landfills in the vicinity of the Navajo Nation. They are located in four states: Utah – 1; Colorado – 2; Arizona – 4; and New Mexico – 6. The thirteen facilities were contacted multiple times by telephone and email. Some of the landfills declined to provide information, in which case information from the 2002 study was used. Information regarding the thirteen perimeter landfills is presented in Table 7. The thirteen landfills located outside but reasonably close to the Reservation boundaries were also contacted to see if any of the facilities kept records of how many tons were coming from the Navajo Nation. Only Painted Desert Landfill and Cinder Lake Landfill (both in Arizona) have such information.

**Table 7: 2015 – 2016 Navajo Nation Landfill (LF) Inventory**

<b>Landfill</b>	<b>1/ Cerro Colorado Landfill</b>	
<b>Location</b>	18000 Cerro Colorado Road, Albuquerque, Bernalillo County, NM 86004 35° 00' 34" North / 106° 52' 34" West	
<b>Owner / Operator</b>	Owner: City of Albuquerque Operator: City of Albuquerque, Solid Waste Management Department Contact: City of Albuquerque, Solid Waste Management Department, 4600 Edith Boulevard NE, Albuquerque, NM 87101 (505) 761-8100 Director – John Soladay; Assistant Director – Jill Holbert	

Operations: seven days per week; opened May 1990; 860 acres total, 390 acres permitted for disposal; 450,000 tons per year; tipping fee: \$7.50 for 0-500 pounds, \$14.99 for 501-1,000 pounds, \$22.48 for 1001-1500 pounds, \$30 for 1501-2000 pounds, \$30 per ton, \$39.86 per ton for special wastes, \$47.25 per ton for petroleum-contaminated soil, and \$116.48 per ton of tires. A manifest is required for 10 or more tires; accepts municipal solid wastes and petroleum-contaminated soil; recycling offered for common recycling materials (plastics, paper, cardboard, metals (not glass)) and tires; not accepting construction and demolition debris, hazardous, asbestos, radioactive, special wastes, liquids, pesticides or herbicides, automotive batteries, PCBs, motor oil, ash, or medical wastes; Waste Management hauls to LF from To'hajilee, quantity unknown.

Life Expectancy: approximately 50 years, current permit expires 2020

<b>Landfill</b>	<b>2/ Crouch Mesa Landfill / San Juan County Landfill</b>
<b>Location</b>	78 County Road 3140, 6 miles east of Farmington, San Juan County, NM 36° 45'57" North / 108° 02' 42" West
<b>Owner / Operator</b>	Owner: San Juan County Operator: Waste Management Contact: Waste Management - (505) 344-1121

Operations: Seven days a week

160 acres total; 3,000 cubic yards or ~750 tons per day; accepts municipal solid wastes, clean construction and demolition debris, and killing plant offal; recycling for cardboard, newspaper, aluminum cans; no tires, asbestos, ash, medical wastes, free liquids, special wastes, petroleum contaminated soil, paints, oil, automobile bodies, roofing tar, fluorescent tubes, or biohazardous wastes.

<b>Landfill</b>	<b>3/ Red Rock Regional Landfill</b>
<b>Location</b>	101 Red Mesa Bluffs Drive, Thoreau, McKinley County, NM 87323 35° 27' 02" North / 108° 06' 57" West
<b>Owner / Operator</b>	Owner: Northwest New Mexico Regional Solid Waste Authority Operator: Northwest New Mexico Regional Solid Waste Authority Contact: Northwest New Mexico Regional Solid Waste Authority, PO Box 1330, Thoreau, NM 87323 - (505) 905-8400 Operations Manager – Gary Ford

Operations: five days per week plus half day on Saturday; opened 1996; 640 acres total, 170 acres currently permitted for disposal; 300 tons per day; tipping fee: \$35 per ton; \$200 per ton for tires or \$3 per tire; accepts municipal solid wastes, construction and demolition debris, and petroleum-contaminated soil; recycling offered: tires; not accepting hazardous wastes, paints, oil, liquids, friable and non-friable asbestos.

Life Expectancy: approximately 60 - 70 years

This landfill has scales – as do the Gallup and Milan transfer stations. Receive trash from Checkerboard Sanitation, Navajo Sanitation, and Waste Management. Does not track tons from the Navajo Nation, they track it by county and state.

<b>Landfill</b>	<b>4/ Rio Rancho Landfill</b>
<b>Location</b>	402 Industrial Park Loop, 33 <sup>rd</sup> & Northern Blvd., Rio Rancho, Sandoval County, NM 87124 35° 16'46" North / 106° 39' 59" West
<b>Owner / Operator</b>	Owner: Waste Management of New Mexico Operator: Waste Management of New Mexico (505) 892-2055 or (505) 433-6053 District Manager – Steve Micili

Operations: Weekdays plus half day Saturday; 4,500 cubic yards or ~1,300 tons per day; accepts municipal solid wastes.



<b>Landfill</b>	<b>5/ Sandoval County Landfill</b>
<b>Location</b>	2708 Iris Road NE, Rio Rancho, Sandoval County, NM 35° 18' 29" North / 106° 37' 21" West
<b>Owner / Operator</b>	Owner: Sandoval County Operator: Sandoval County Contact: Sandoval County, 2708 Iris Road NE, Rio Rancho, NM 87124 (505) 867-0814 Manager – Robert Sanchez

Opened: 1970; 177 acres total, 163 acres permitted for disposal; 400 tons per day; tipping fee: \$4.75 per level pickup, \$9.50 for over-bed pickup, \$10.50 for over-cab pickup, \$24/ton for County residents, \$25 per ton for non-county residents, \$29/ton for construction / demolition debris from County residents, \$30/ton for C&D debris from non-county residents. Accepts municipal solid wastes, construction and demolition debris, pre-approved sludge; not accepting hazardous wastes, metal frame demolition with concrete, concrete larger than 3 feet, vehicle bodies, engine blocks, paints, solvents, computers, oil, oil filters, fireworks, dead animals, televisions, tires, car batteries, pool chemicals, pesticides, antifreeze, aerosol spray cans, ammunition, medical wastes, propane tanks, barbecue charcoal.

Life Expectancy: 8-10 years for current cells, about 18 years total.

<b>Landfill</b>	<b>6/ Socorro County Landfill</b>
<b>Location</b>	2465 Highway 1, Socorro, Socorro County, NM 87801 34° 00' 04" North / 106° 54' 03" West
<b>Owner / Operator</b>	Owner: City of Socorro Operator: Socorro County Contact: City of Socorro Landfill, Socorro, NM 87801 - (575) 835-4279 Manager – Michael Lucero

Operations: six days per week; opened approximately 1990; 126 acres total, 4 acres currently permitted for disposal, 60 to 75 tons per day; tipping fee = \$30 per ton residential; \$35 per ton for construction and demolition debris; accepts municipal solid wastes, construction and demolition debris, pre-approved sludge, tires, and appliances; not accepting special wastes, liquids, petroleum-contaminated soil, asbestos. Life Expectancy: current permit is for approximately 20 more years, lots of room to expand. Alamo Chapter uses this landfill for waste disposal.

<b>Landfill</b>	<b>7/ Blue Hills Regional Landfill</b>
<b>Location</b>	140 W. Cleveland Street, St. Johns, Apache County, AZ 85936 34° 31'43" North / 109° 18' 47" West
<b>Owner / Operator</b>	Owner: Apache County Operator: Blue Hills Environmental Association Contact: Blue Hills Environmental Association; PO Box 175 St. Johns, AZ 85936 (928) 337-4019 or (928) 338-1628 or (877) 725-2135 toll free Manager – Ray Davis

Operations: five days per week (Tuesday through Saturday); opened 1991; 161 acres total; 25 to 30 tons per day; tipping fee = \$50 per ton; accepts municipal solid wastes, construction and demolition debris, petroleum contaminated soil, medical waste, and non-friable asbestos; recycling for metal, tires, cardboard, and plastics at the transfer stations; life expectancy is more than 100 years.

<b>Landfill</b>	<b>8/ Cinder Lake Landfill</b>
<b>Location</b>	6770 Cinder Lake Landfill Road, Flagstaff, Coconino County, AZ 86004 35° 18' 34" North / 111° 31' 07" West
<b>Owner / Operator</b>	Owner: City of Flagstaff Operator: City of Flagstaff Contact: City of Flagstaff, 211 West Aspen, Flagstaff, AZ 86001 (928) 779-7685 or (928) 527-1927 or (928) 213-2122 Landfill Manager – Mike Gallegos also contact Brian Bluelake at (928) 213-2124

Operations: six days per week; opened 1965; 248 acres total; 200 tons per day; tipping fee = \$44.22 per ton residential, \$20 per pickup truck of construction/demolition, \$20 per trailer of construction/demolition; accepts municipal solid wastes, construction and demolition debris, non-friable asbestos, petroleum-contaminated soil, medical wastes; recycling offered for household hazardous wastes in April, and accepts common recyclable materials; not accepting special wastes, liquids, friable asbestos, tires.

Life Expectancy: more than 10 years;

Navajo Sanitation hauls to this LF; the landfill has scales; 62 tons this year from Navajo Nation out of a total of 107,426 tons from all sources.

Does not have information about which chapters haul to the landfill, has heard that trash comes from as far away as Tuba City. Navajo Sanitation hauled to Cinder Lake LF periodically – only January, February, and September for this year.

<b>Landfill</b>	<b>9/ Hopi Landfill</b>
<b>Location</b>	17 miles north of Kykosmotovi, Navajo County, AZ 35° 57' 10" North / 110° 42' 59" West
<b>Owner / Operator</b>	Owner: Hopi Tribe Operator: Hopi Tribe Contact: Hopi Tribe, Kykosmotovi, AZ 86039 – (928) 725-3732 or (928) 401-1273 Contact Hard Rock Chapter President Timothy Johnson

Operations: five days per week; opened more than 10 years ago; 100 acres total; 250 cubic yards per day; tipping fee: \$20 per small truck load, \$30 per large truck load, \$5-\$30 white goods, \$15-\$25 electronics, tires \$1 each, dump truck \$125, semi-tractor trailer \$300; accepts municipal solid wastes, construction and demolition debris, tires; recycling offered: metal and tires; not accepting hazardous wastes, acids, ammunition, batteries, engines or vehicles, flares, fireworks, herbicides, pesticides, liquids, asbestos, medical wastes, paints, thinners, pressurized containers, smoke detectors, used oil, antifreeze, degreasers, and petroleum-contaminated soil.

Life Expectancy: did not answer this question

<b>Landfill</b>	<b>10/ Painted Desert Landfill / Pen Rob Landfill</b>
<b>Location</b>	9001 North Porter Road, Joseph City, Navajo County, AZ 86032 34° 59' 59" North / 110° 20' 12" West
<b>Owner / Operator</b>	Owner: Waste Management of Arizona, Inc. Operator: Waste Management of Arizona, Inc. Contact: Waste Management of Arizona, Inc., PO Box 190, Joseph City, AZ 86032 (928) 288-3605 Manager – Gary Hunt

Operations: five days per week; opened 1984; 640 acres total, 322 acres permitted for disposal; tipping fee = \$50.75 per ton; accepts municipal solid wastes, construction and demolition debris, friable and non-friable asbestos, yard wastes, and petroleum-contaminated soil; not accepting hazardous wastes, paints, oil, liquids.

Life Expectancy: approximately 150 years

Navajo Sanitation and Waste Management haul to this landfill; has scales; approximately 1,000 tons per month from the Navajo Nation. Chapters that contribute to the landfill are Chinle and Dilkon. Large housing project (All Nations) dropping off two roll-offs per day.

<b>Landfill</b>	<b>11/ Bondad Landfill / Transit Waste Landfill</b>
<b>Location</b>	1500 County Road 318, 15 miles south of Durango, La Plata County, CO 37° 03'25" North / 107° 51' 44" West
<b>Owner / Operator</b>	Owner: WCA Waste Corp. Operator: Transit Waste, LLC Contact: Transit Waste, LLC, 1500 E. County Road 318, Durango, Colorado 81301 (970) 247-0646 or (970) 247-8295 General Manager – Bill Rose

Operations: Six days a week; 47 acres total, 27 acres currently permitted for

500 cubic yards per day; accepts municipal solid wastes, clean construction and demolition debris, and non-friable asbestos; recycling for metal, newspapers, and cardboard; no tires or biohazardous wastes.

<b>Landfill</b>	<b>12/ Montezuma County Landfill</b>
<b>Location</b>	26100 County Road F, Cortez, Montezuma County, Colorado, 81321 37° 17' 47" North / 108° 34' 16" West
<b>Owner / Operator</b>	Owner: Montezuma County Operator: Montezuma County Contact: Montezuma County, 26100 Road F, Cortez, CO 81321 (970) 565-9858 Manager – Jack Powers

Operations: six days per week; County took over in 1994 but it was open before that; 360 acres total, 52 acres permitted for disposal; 70 to 80 tons per day, lower in the winter, higher in the summer; tipping fee: \$38.55 per ton for County residents, \$34.70 per ton for compacted construction / demolition debris; accepts



municipal solid wastes, construction and demolition debris, dead animals, non-friable asbestos, and petroleum-contaminated soil; recycling offered for common recycling materials (plastics, paper, cardboard, metals, and white goods); not accepting hazardous wastes, friable asbestos, paints, oil, automobile bodies, roofing tars, fluorescent tubes, or medical wastes.

Life Expectancy: approximately 40 years, a lot of surrounding undeveloped land for expansion

Receive a negligible amount from Navajo Nation, mostly from dumpster at a private grocery store. Waste Management hauls to the landfill; the landfill has scales; does not keep track of how many tons come from Navajo Nation, does not know what chapters contribute to the landfill.

<b>Landfill</b>	<b>13/ White Mesa Landfill / San Juan County Landfill</b>
<b>Location</b>	S. Highway 191 Mile Marker 35, Blanding, San Juan County, UT 84511 37° 25' 07" North / 109° 29' 27" West
<b>Owner / Operator</b>	Owner: San Juan County Operator: San Juan County Contact: San Juan County; PO Box, Monticello, UT 84535 (435) 678-3070 Manager – Theran Yoakim

Operations: five days per week; opened 1996; 260 acres total; did not provide tons per day; tipping fee = \$30 per ton residential and construction / demolition debris; accepts municipal solid wastes, construction / demolition debris, non-friable asbestos, petroleum-contaminated soil, medical wastes; recycling offered for tires; not accepting special wastes, liquids, friable asbestos

Life Expectancy: more than 50 years.

Navajo Sanitation, Baker Sanitation out of Cortez, CO, and Waste Management haul to the landfill; the landfill has scales; this landfill receives trash from Montezuma Creek, Kayenta, Red Mesa, Aneth, Rough Rock, Mexican Water, Oljato, Denneshotso, Chilchinbeto, Shonto, Navajo Mountain, and other nearby chapters.

## 5.2 TRANSFER STATIONS

Zia contacted the Arizona Department of Environmental Quality (AZDEQ) and was provided an Internet link to a list of transfer stations by county in the State ([http://www.azdeq.gov/enviro/waste/solid/transfer\\_station.html](http://www.azdeq.gov/enviro/waste/solid/transfer_station.html)). However, we were advised that the list may be incomplete and / or not current. Per that list, Arizona transfer stations in the vicinity of the Navajo Nation appear to be as follows:

### 5.2.1 Arizona

#### Apache County, AZ

**Sanders Transfer Station** (928.337.2357) – This transfer station receives less than 180 cubic yards (CY) per day and is operated by Blue Hills Environmental, Inc. The Sanders Transfer Station is located in the vicinity of the Nahata Dził, Lupton, Houck, and Wide Ruins Chapters of the Fort Defiance Agency.

#### **Coconino County, AZ**

**Page Transfer Station** (928.645.3885) – This transfer station receives more than 180 CY / day and is operated by Allied Waste Services of Page, AZ. The Page Transfer Station is located in the vicinity of the LeChee, Copper Mine, Inscription House, and Kaibeto (plus the north tip of Bodaway / Gap) Chapters of the Western Agency.

#### **Navajo County, AZ**

**Joseph City Solid Waste Transfer Station** (928.288.3455) – This transfer station receives less than 180 CY / day and is operated by Navajo County. It is located south of the Indian Wells and Dilkon Chapters of the Fort Defiance Agency.

**Holbrook Municipal Solid Waste Transfer Station** (928.524.2159) – The Holbrook transfer station receives less than 180 CY / day and is operated by the City of Holbrook. It is located south of the Greasewood Springs and Wide Ruins Chapters of the Fort Defiance Agency.

**Winslow Transfer Station** (928.613.0154) – The Winslow transfer station receives less than 180 CY / day and is operated by the City of Winslow. It is located south of the Birdspring, Leupp, and Tolani Lake Chapters of the Western Agency.

#### **5.2.2 New Mexico**

Zia also contacted the New Mexico Environment Department (NMED) and was provided with two Internet links regarding transfer stations, convenience centers, collection centers / points, and other disposal sites in the state:

<https://www.env.nm.gov/swb/documents/NMSolidWasteFacilities-June2015.pdf> (list of solid waste facilities in New Mexico); and

<https://www.env.nm.gov/swb/documents/FinalUpdatedStateMapLFClosurestatus8-3-15.pdf> (map of permitted landfills in New Mexico).

The following disposal sites (transfer stations, convenience centers, collection centers / points) appear to be located within reasonable proximity of Navajo Nation Chapters in New Mexico.

#### **Cibola County, NM**

**Blue Water Lake Convenience Center** (505.905.8402) – This convenience center is operated by the Northwest New Mexico Regional Solid Waste Authority and is located northeast of the Ramah Chapter of the Eastern Agency.

**Cubero Convenience Center** (505.905.8402) – This convenience center is operated by the Northwest New Mexico Regional Solid Waste Authority and is located west of the Tohajiilee Chapter of the Eastern Agency.

**Pinehill Convenience Center** (505.905.8402) – This convenience center is operated by the Northwest New Mexico Regional Solid Waste Authority and is located at Pinehill, New Mexico, within the Ramah Chapter of the Eastern Agency.



**Seboyeta Convenience Center** (505. 905.8402) – This convenience center is operated by the Northwest New Mexico Regional Solid Waste Authority and is located northwest of the Tohajiilee Chapter of the Eastern Agency.

**McKinley County, NM**

**McKinley County Transfer Station** (505.863.5776) – This transfer station is operated by the Northwest New Mexico Regional Solid Waste Authority. It is surrounded by the Chichiltah, Bread Springs, Manuelito, Red Rock, Tsayatoh, Rock Springs, Church Rock, Pinedale, and Iyanbito Chapters of the Eastern Agency.

**San Juan County, NM**

**Huerfano Collection Center** (505.320.6352) – This collection center is operated by San Juan County. It is located along State Road 550 approximately 26 miles south of Bloomfield, New Mexico, within the Huerfano Chapter of the Eastern Agency.

**Kirtland Collection Center** (505.598.9472) – This collection center is operated by San Juan County. It is located north of the Upper Fruitland and Nenahnezad Chapters in the Northern Agency.

**La Plata Collection Center** (505.326.3454) – This collection center is operated by San Juan County. It is located off the Reservation and east of the Hogback Chapter in the Northern Agency.

**Sand Springs Collection Center** (505.320.0553) – This collection center is operated by San Juan County. It is located at Burnham Junction near the Burnham, Newcomb, Two Grey Hills / Toadlena, Sanostee, and Sheep Springs Chapters in the Northern Agency.

**Shiprock Collection Center** (505.320.0395) – This collection center is operated by San Juan County. It is located within the Shiprock Chapter of the Northern Agency and serves the Gadiiahi / Tokoi, Beclabido, Teec Nos Pos, Red Valley, Cove, and Hogback Chapters.

**Upper Fruitland Collection Center** (505.320.0711) – This collection center is operated by San Juan County and is located between Nenahnezad and the Upper Fruitland Chapters in the Northern Agency.

**Waterflow Collection Center** (505.598.-5494) – This collection center is operated by San Juan County. It is located east of the Hogback Chapter in the Northern Agency.

**5.2.3 Utah**

The following transfer stations identified in Utah were identified as within close enough proximity to serve the Navajo Nation:

**San Juan County, UT**

**Mexican Hat Transfer Station** is located north of the Kayenta Chapter of the Western Agency.

**Bluff Transfer Station** is located north of the Dennehotso Chapter (Western Agency) and also north of the Mexican Water and Red Mesa Chapters (Shiprock Agency).

#### 5.2.4 Proximity and Distance

It is noted that the Mexican Hat Transfer Station, Bluff Transfer Station, and commercial enterprises near Monument Valley (for example, schools, airport, hotels, medical clinic) within the Oljato Chapter haul to the Blanding, Utah landfill. The Blanding Landfill is located approximately 10 miles northwest of the Aneth Chapter (Shiprock Agency) and north of the Red Mesa Chapter (Shiprock Agency).

As detailed previously, there are thirteen landfills located around the perimeter of the Navajo Nation. The Socorro Landfill is relevant only to the Alamo Chapter of the Eastern Agency. The Sandoval County Landfill, Rio Rancho Landfill, and Cerro Colorado Landfill are relevant primarily to the Tohajiilee Chapter of the Eastern Agency. The Ramah, Tohajiilee, and Alamo chapters are not contiguous with the remainder of the Navajo Nation. The landfills and distances to the nearest Chapter house are summarized in Table 8 (it is based on the 2002 Solid Waste Plan).

**Table 8: Landfill Distance to Nearest Chapter House**

State	Landfill	Distance (miles)
AZ	Cinder Lakes	40 from Cameron, 68 from Tuba City
AZ	Painted Desert	47 from Dilkon
AZ	Blue Hills	54
AZ	Hopi	28
CO	Montezuma County	55
CO	Transit Waste	44
NM	Red Rock	6
NM	Crouch Mesa	28
NM	Rio Rancho	38
NM	Sandoval County	38
NM	Cerro Colorado	26
NM	Socorro	60
UT	White Mesa	33

Another perspective on the distance between waste generation sources in the Navajo Nation and available disposal sites is offered in Table 9, below (based on the 2002 Solid Waste Plan). With the exception of the Shiprock and Crownpoint areas, the distances to the nearest solid waste disposal facility from the larger population centers in the Navajo Nation are typically in excess of 40 miles. In the case of the Chinle community, the nearest landfills are more than 100 miles.

**Table 9: Distance to Landfills from Population Centers**

Population Center	Landfills / Distance
Tuba City	Cinder Lake, AZ / 68 miles
Kayenta	San Juan County, UT / 76 miles Montezuma County, CO / 114 miles
Shiprock	Crouch Mesa, NM / 38 miles Montezuma County, CO / 42 miles
Chinle	Red Rock, NM / 146 miles Painted Desert, AZ / 135 miles Blue Hills, AZ / 138 miles
Fort Defiance / Saint Michaels	Red Rock, NM / 64 miles Blue Hills, AZ / 100 miles Painted Desert, AZ / 109 miles
Crownpoint	Red Rock, NM / 20 miles Crouch Mesa, NM / 86 miles

### 5.3 NAVAJO NATION SOLID WASTE ACT AND REGULATIONS

Within the Solid Waste Act Subchapter 1, Section 107 – A, Item 5 establishes the authority of the Nation to assess fees on those involved with waste collection, transportation, storage, processing, and disposal. Subchapter 1, Section 108 contains language that provides broad, expansive authority to the Nation and to Navajo Nation EPA in particular for actions that assure consistency with all provisions of the Solid Waste Act. Both the Solid Waste Act and associated Regulations are mainly devoted to criteria for siting, constructing, permitting, financing, and maintaining a variety of solid waste facilities such as a landfill, transfer station, recyclables processing or composting operation, none of which presently exist within the Navajo Nation.

### 5.4 NAVAJO NATION SOLID WASTE MANAGEMENT PROGRAM (NNSWMP)

The NNSWMP is part of the Division of Community Development. The mission and purpose of the program is mainly to provide a variety of services to the Chapters that support solid waste management methods that are operationally efficient, economically cost-effective, and environmentally sound. These services, which encourage and emphasize local responsibility, include the following:

- Education
- Training
- Workshops
- Technical assistance
- Planning
- Information on facility set – up and maintenance
- Organizing Spring clean – up events
- Coordination with other tribal, municipal, county, state, and federal agencies / entities
- Identifying and securing funding from outside sources

## **5.5 NAVAJO NATION ENVIRONMENTAL PROTECTION AGENCY (NNEPA)**

Per the Navajo Nation Solid Waste Act (see Appendix D), the Navajo Nation EPA is responsible for compliance and enforcement of solid waste management codes, ordinances, and regulations through its Waste Regulatory and Compliance Department. In addition, the Resource Conservation and Recovery Program in that Department provides outreach materials for Navajo Nation Chapters (Appendix E). Specifically NNEPA is concerned with compliance / enforcement of the Navajo Nation Solid Waste Act, Subchapter 2, Sections 201 and 204.

Section 201 prohibits disposal of solid waste "...in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance." It is understood this prohibition includes open dumping, open burning, and dumping trash into a waterway. Section 204 explicitly prohibits open dumping. Subchapter 503 defines civil and criminal penalties for violations of designated parts of the Navajo Nation Solid Waste Act.

## **5.6 METHODS OF WASTE DISPOSAL**

There are two types of disposal options available within the Navajo Nation – convenience centers or stations and collection points. These are both distinguished from transfer stations. A transfer station is typically a fully or partially enclosed structure capable of receiving and temporarily storing large quantities of trash. There is a below – grade area where a transfer truck is located with the top open. Material is unloaded on to a tipping floor and pushed over the edge of the floor into the transfer truck. There are no known transfer stations within the Navajo Nation. The use of the term "transfer station" noted above is consistent with the definition of this kind of facility presented in the Navajo Nation Solid Waste Act, Subchapter 1: General Provisions, Section 102 – A, item 20.

A convenience center has one or more roll – off and / or compactor containers (30 to 40 cubic yard capacity) for refuse and sometimes a container(s) for recyclables (commingled or separated). A small office or gatehouse would be provided for attending staff to track incoming loads and assure that patrons are using proper procedures for waste disposal.

A collection point is usually one 30 or 40 cubic yard container surrounded by a fence that is open during specified days / times without necessarily any staff present.

The following photographs presented show the difference between a convenience center and collection point as found in the Navajo Nation.





*Photograph 1: Signage for Convenience Center operated by Baahaali and Chichiltah Chapters*



*Photograph 2: Refuse compaction container at Baahaali / Chichiltah Convenience Center*





Photograph 3: Container for recyclables at Baahaali / Chichiltah Convenience Center



Photograph 4: Signage for Sand Springs Convenience Center



**Photograph 5: Entrance to Sand Springs Convenience Center**



**Photograph 6: Container for recyclables at Sand Springs Convenience Center**



Photograph 7: Signage for Shiprock Convenience Center



Photograph 8: Entrance to Shiprock Convenience Center



### 5.6.1 Convenience Centers and Collection Points

## Chinle Agency

**Collection Points: Tsaile / Wheatfields**

Convenience Centers: Alamo, Breadspings, Crownpoint, Lake Valley, Ramah

### Fort Defiance Agency

Collection Points: Cornfields, Crystal, Dilkon, Greasewood Springs, Houck, Indian Wells, Low Mountain, Lupton, Mexican Springs, Nahata, Dziil, Steamboat, Teestoh, Twin Lakes



### Shiprock Agency

Convenience Centers: Upper Fruitland / Nenahnezad, Shiprock, Sand Springs  
Collection Points: Beclabito

### Western Agency

Convenience Centers: Bodway / Gap, Cameron, Lechee, Kaibeto, Leupp, Tonalea, Tuba City  
Collection Points: Copper Mine, Tolani Lake

The Navajo Nation EPA's outreach piece titled "No Open Dumping Allowed" lists 56 Chapters with either convenience centers or collection points for waste disposal.

## 5.6.2 Chapter Telephone Interview Results

The Navajo Nation Division of Community Development submitted a questionnaire to each of the 110 Chapters requesting information about local solid waste management practices. None of the questionnaires were returned. Zia subsequently called each Chapter. Responses were received from 86 Chapters and 24 Chapters did not return the telephone calls. Of the responding Chapters, 71 have a container for solid wastes (located at either a convenience center or collection point) and 15 stated that they have no containers but use nearby transfer stations or bins at adjacent Chapters. Information obtained from telephone contact with the Chapters is summarized in Table 10

(Note – small container is defined as 4 to 6 cubic yards [cy] in capacity; NWNMRSWA = Northwest New Mexico Regional Solid Waste Authority).

**Table 10: Chapter Solid Waste Management Telephone Survey**

AGENCY	CHAPTER	REMARKS	CONTAINER	HAULER	COLLECTION FREQUENCY
CHINLE	Black Mesa		Small/not shared	Navajo Sanitation	1/week
	Forest Lake	Take trash to mine			
	Hard Rock	Take trash to Hopi Landfill			
	Pinon		No response		
	Tachee/Blue Gap		40 cy/not shared	Navajo Sanitation	Every 2 months
	Whippoorwill	Facility closed	No bin		
	Chinle		40 cy/shared	Navajo Sanitation	Not provided
	Many Farms		small/not shared	Navajo Sanitation	1/week
	Nazlini		40 cy/not shared	Navajo Sanitation	1/month
	Rough Rock		No response		
	Tselani/ Cottonwood	Families haul to Chinle or Pinon			
	Lukachukai		40 cy/not shared	Navajo Sanitation	Sporadic
	Round Rock		small/not shared	Navajo Sanitation	1/week
	Tsaile/Wheatfields		No response		

PRELIMINARY FINAL Navajo Nation  
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AGENCY	CHAPTER	REMARKS	CONTAINER	HAULER	COLLECTION FREQUENCY
EASTERN NAVAJO AGENCY	Becenti		small/not shared	Navajo Sanitation	1/week
	Crownpoint		40 cy/not shared	Checkerboard	1/two weeks
	Lake Valley		small/shared	San Juan County	Sporadic
	Little Water		No response		
	Nahosdishgish	1 small dumpster	Used for special events	Navajo Sanitation	sporadic
	Pueblo Pintado		40 cy/not shared	Checkerboard	1/month
	Standing Rock		No response		
	Torreon/Star Lake		40 cy/not shared	NWNMRSWA	1/two weeks
	White Horse Lake		40 cy/not shared	NWNMRSWA	1/month
	White Rock	Families haul to Lake Valley site		San Juan County	
	Baca	No response			
	Bread Springs	Facility shared With Chichiltah			
	Casamero Lake	Waste can be taken to Red Rocks Landfill			
	Chichiltah	Facility shared with Bread Springs			
	Church Rock	No response			
	Iyanbito		40 cy/not shared	NWNMRSWA	1/two months
	Manuelito	No response			
	Mariano lake		Small/not shared	Checkerboard	2/month
	Pinedale	Former site removed			
	Red Rock		Small/not shared	Navajo Sanitation	1/week
	Rock Springs	No response			
	Smith Lake	No response			
	Thoreau	No response			
	Tsayatoh	No response			
	Counselor	No response			
	Huerfano	2 small bins at Senior Citizen Center	40 cy/not shared	Navajo Sanitation	Both bins 1/week
	Nageezi	No response			
	Ojo Encino	No response			
	Tohajilee		40 cy/not shared	Mora Waste Mgmt.	2-3 hauls/month
	Alamo	Socorro County	No response		
	Ramah		2 small bins, 1 at Ramah, 1 at Pinehill	County hauls both	1/week, both bins
FORT DEFIANCE AGENCY	Dilkon		two 40 cy containers	Waste Management	Sporadic
	Indian Wells	No response			
	Jeddito	No response			
	Low Mountain		Two small bins	Navajo Sanitation	1/week
	Teestoh	No response			
	White Cone		40 cy/not shared	Waste Management	Approx. every 3 weeks
	Coyote Canyon		40 cy/not shared	Checkerboard	Every 4 to 5 months
	Mexican Springs		40 cy/not shared	Private Person	1/month
	Naschitti	Sand Springs site also available	40 cy/not shared	Waste Management	1/week

PRELIMINARY FINAL Navajo Nation  
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AGENCY	CHAPTER	REMARKS	CONTAINER	HAULER	COLLECTION FREQUENCY
FORT DEFIANCE AGENCY	Tohatchi	McKinley County Transfer Station available	40 cy/shared	Checkerboard	Sporadic
	Twin Lakes	No response			
	Cornfields		40 cy/share	Navajo Sanitation	1/month
	Ganado		40 cy/share	Navajo Sanitation	2/month
	Greasewood Springs		40 cy/not shared	Navajo Sanitation	Every 2-3 weeks
	Kinlichee		40 cy/not shared	Navajo Sanitation	Sporadic
	Klagetoh		40 cy/not shared	Navajo Sanitation	1/month
	Steamboat		40 cy/share	Navajo Sanitation	Does not know
	Wide Ruins		40 cy/not shared	Navajo Sanitation	1/week
	Crystal		40 cy/not shared	Navajo Sanitation	1/week
	Fort Defiance		40 cy/not shared	Navajo Sanitation	1/month
	Houck		40 cy/not shared	Navajo Sanitation	1/month
	Lupton		40 cy/not shared	Navajo Sanitation	2 to 3 months
	Nahata Dzill		No bin, no curbside	Haul to Navajo/Hopi Relocation Center	
	Oak/Pine Springs		Small/not shared	Navajo Sanitation	Sporadic
	Red Lake	No response			
	St. Michaels		No answer on size/not shared	Navajo Sanitation	1/week
	Sawmill		40 cy/not shared	Navajo Sanitation	Every 2 weeks
SHIPROCK AGENCY	Mexican Water	Chapter bins previously	Small container made by Chapter; not shared	Hauled by Chapter	Sporadic
	Red Mesa	Chapter bins previously	Small homemade container not shared	Hauled by Chapter	Every 2 weeks
	Rock Point		Small, not shared	Navajo Sanitation	1/week
	Sweetwater		No response		
	Teec Nos Pos		40 cy, not shared	Navajo Sanitation	1/week
	Aneth		Small, not shared	Navajo Sanitation	1/month
	Beclabito		Small, not shared	Waste Management	Every 2 weeks
	Cove		2 small, not shared	Waste Management	Both every week
	Gadii'ahi		Small, not shared	Navajo Sanitation	1/week
	Hogback		Small, shared	Navajo Sanitation	Every 1 or 2 weeks
	Newcomb		40 cy, shared	Waste Management	1/week
	Red Valley		Small, not shared	Navajo Sanitation	1/week
	Sanostee		Medium, not shared	Navajo Sanitation	Sporadic
	Sheep Springs		Small, not shared	Navajo Sanitation	1/week
	Shiprock		Convenience Center, shared	San Juan County	2/week
	Two Grey Hills		No bins, take trash to Burnham Junction		
	Burnham		No bins, take trash to Burnham Junction		
	Upper Fruitland		Small, not shared	Waste Management	1/week
	Nenahnezad		Small, not shared	Waste Management	Every 2 weeks
	San Juan		No bin, haul trash to another site		

AGENCY	CHAPTER	REMARKS	CONTAINER	HAULER	COLLECTION FREQUENCY
WESTERN NAVAJO AGENCY	Coppermine		40 cy, not shared	Republic	4 to 6 months
	Kaibeto		40 cy, shared	Navajo Sanitation	2/month
	LeChee		Seven small, share with Bodaway	Navajo Sanitation	
	Tonalea		Two 40 cy, shared	Navajo Sanitation	Both bins every quarter
	Inscription House		40 cy, not shared	Navajo Sanitation	1/week
	Navajo Mountain		Small, not shared	Navajo Sanitation	1/week
	Shonto		Two small, shared	Navajo Sanitation	Both 1/week
	Bodaway/Gap	No response			
	Cameron	No services			
	Coalmine Canyon	No response	No response		
	Tuba City		Convenience Center, several large & small containers	Navajo Sanitation	1 to 2 times/day
	Birdsprings		No bin, trash hauled to Winslow, AZ		
	Leupp		40 cy, not shared	Navajo Sanitation	Twice per month
	Tolani Lake		40 cy, share	Navajo Sanitation	Every 3 to 4 weeks
	Chilchinbeto	No bins		Haul to Kayenta Township	
	Dennehotso		40 cy, not shared	Kayenta Township	Every 3 to 4 weeks
	Kayenta		40 cy	Kayenta Township	1/Week
	Oljato	No bins		Haul to Kayenta Township	

## 6.0 QUANTIFICATION AND ASSESSMENT OF THE WASTESTREAM

Based on the availability / accessibility of data / information from public and private sector sources, this section covers the following points:

- Per capita waste generation rate.
- Overall waste tons being disposed from the Navajo Nation on an annual basis.
- Major sources of disposed tons by geographical location / area / region of the Navajo Nation.

### 6.1 DEFINITION OF WASTESHEDS

While there are numerous existing administrative / political / institutional frameworks used for organizing the Navajo Nation, none of them are based on concentrations of solid waste generation and their geographical relationship to transportation routes and disposal sites. To properly evaluate current waste management methods and potential options it is useful to define "wastesheds" that take into account population distribution, highways / roads, and the landfills that are near the Reservation boundaries. In addition, the wastesheds offer the Navajo Nation central government an opportunity to assess its role in solid waste management relative to the services and infrastructure that are presently in operation.



Using the approach described above, six wastesheds were identified and are portrayed in the text, tables, and maps presented through the remainder of this section:

- Central – Apache County, Arizona Wasteshed Area
- Western Wasteshed Area
- East – McKinley County, New Mexico Wasteshed Area
- South Central Wasteshed Area
- North Central Wasteshed Area
- Northeast – San Juan County, New Mexico Wasteshed Area

Population data and a waste generation estimates provided by Navajo Nation Solid Waste Management Program staff (waste generation = 2.17 pounds / person / day or approximately 0.4 tons / year) were used to prepare the wasteshed descriptions. Taken together, the six wastesheds equate to a population of 170,918 and an annual disposed tonnage of 67,673. According to the 2010 U.S. Census there are 173,667 people within the Navajo Nation. Using this higher value, the annual disposed tonnage for this population would be 69,467 tons. Thus, the wasteshed description methodology based on Chapter populations and disposed tons come close to accounting for the total population and disposed tonnage of the entire Navajo Nation.

Three Chapters, Alamo, Ojo Encino and Tohajiilee, are located within close proximity of the Albuquerque metropolitan area and for that reason are not included in the Navajo Nation wasteshed areas.

Table 11 shown below summarizes the wasteshed areas (tons refers to annual disposed tonnage):

**Table 11: Summary of Wasteshed Disposed Tonnage**

Wasteshed	Chapters	Population	Tons
<i>Central</i>	20	44,189	17,496
Western	12	23,642	9,361
East	30	35,153	13,918
South Central	14	16,840	6,668
North Central	12	22,995	9,105
Northeast	20	28,099	11,125
<b>Totals</b>	<b>108</b>	<b>170,918</b>	<b>67,673</b>

The text, tables, and maps that follow offer a detailed portrait of each wasteshed.

## 6.2 NAVAJO CENTRAL – APACHE COUNTY, AZ AREA WASTESHED DISPOSAL SCENARIO

### Primary Landfill: Red Rock Regional Landfill

The most logistically feasible destination for waste generated in the Central Apache County, Arizona portion of the Navajo Nation is the Red Rock Regional Landfill in Thoreau, NM operated by the Northwest New Mexico Regional Solid Waste Authority (NWNMRWSA). Navajo Sanitation is currently delivering most of the waste generated within this area to the landfill. The refuse is collected and transported to the Navajo Sanitation transfer station located north of Window Rock. At the transfer station, waste is consolidated into 40 foot walking floor trailers and hauled to the landfill. The tipping fee at the Red Rock Landfill is \$ 35 per ton.

**Table 12: Central – Apache County, AZ Area  
Wasteshed Population & Disposed Tonnage**

Agency	Chapter	Population	Disposal Site / Chapter House Location	Annual Tons Disposed
Chinle	Chinle	8,005	Chinle, AZ	3,169
Ft. Defiance	Cornfields	911	Cornfields, AZ	361
Ft. Defiance	Fort Defiance	5,856	Fort Defiance, AZ	2,319
Ft. Defiance	Ganado	2,504	Ganado, AZ	991
Ft. Defiance	Houck	1,436	Houck, AZ	569
Ft. Defiance	Kinlichee	1,610	Kinlichee, AZ	637
Ft. Defiance	Klagetoh	909	Klagetoh, AZ	360
Chinle	Lukachukai	2,154	Lukachukai, AZ	853
Ft. Defiance	Lupton	902	Lupton, AZ	357
Chinle	Many Farms	2,738	Many Farms, AZ	1,084
Chinle	Nazlini	1,260	Nazlini, AZ	499
Chinle	Rough Rock	947	Rough Rock, AZ	375
Ft. Defiance	Nahata Dzill	1,731	Sanders, AZ	685
Ft. Defiance	Sawmill	1,054	Saw Mill, AZ	417
Ft. Defiance	St. Michaels	5,643	St. Michaels, AZ	2,234
Ft. Defiance	Steamboat	1,226	Steamboat, AZ	485
Chinle	Tselani/Cottonwood	1,425	Tselani, AZ	564
Chinle	Tsaile/Wheatfields	2,250	Wheatfields, AZ	891
Ft. Defiance	Wide Ruins	1,095	Wide Ruins, AZ	434
Ft. Defiance	Oak/Pine Springs	533	Window Rock, AZ	211
<b>TOTALS</b>		<b>44,189</b>		<b>17,496</b>

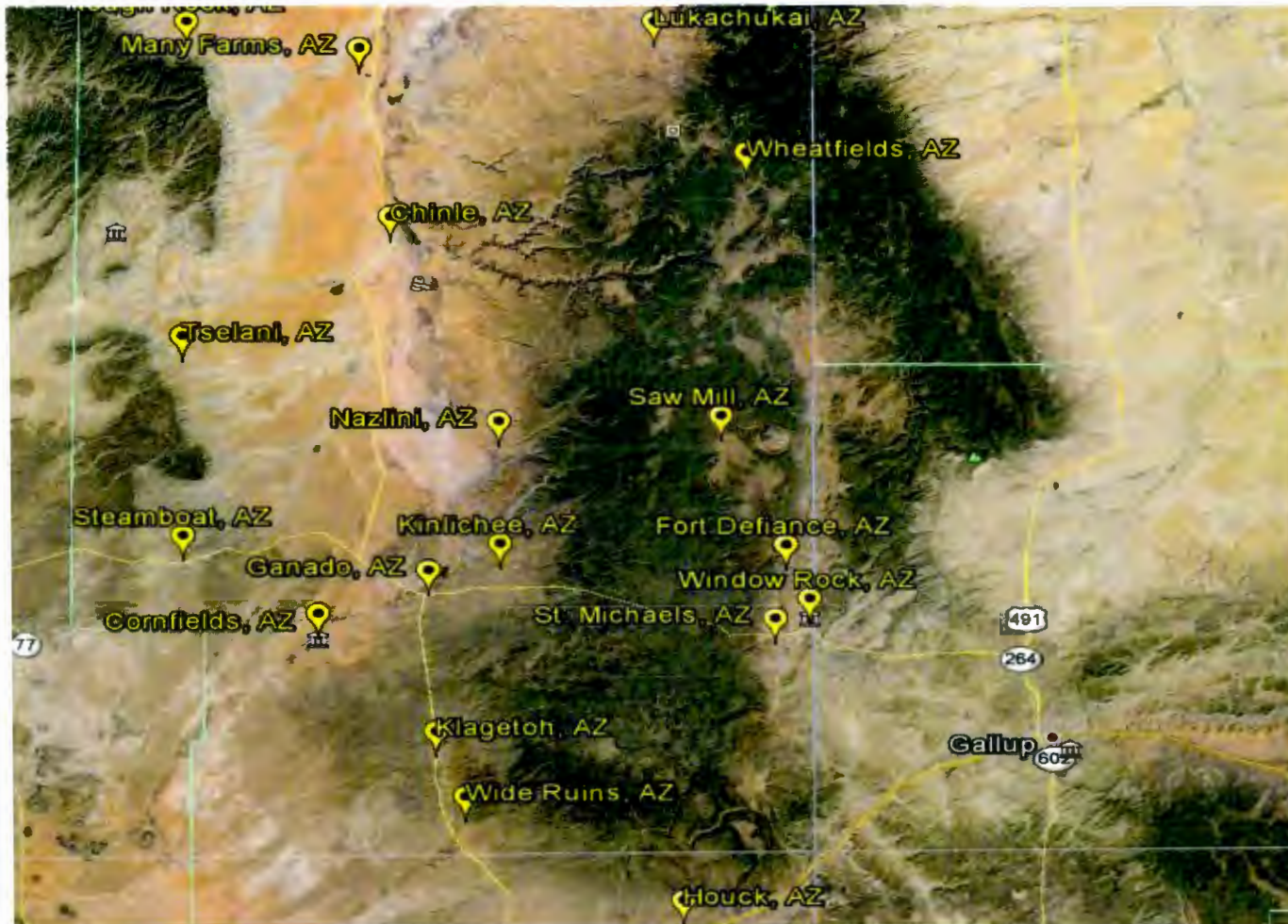


Figure 3: Central – Apache County, AZ Area Wasteshed Map



### 6.3 NAVAJO WESTERN AREA WASTESHED

#### **Primary Landfill: Cinder Lake Landfill**

The most logistically feasible destination for waste generated from the Chapters in western Coconino County, AZ would be the Cinder Lake Landfill operated by the City of Flagstaff. Convenience centers, where refuse may be brought for disposal, are operated and maintained by the Broadway-Gap, Cameron, Kaibeto, LeChee, Leupp, Tonalea, and Tuba City Chapters. A majority of the population and Chapter houses are located on US Route 89 from Flagstaff to Page; on State Route 98 from Page to the junction of US Route 160; and from US Route 160, southwest, back to US Route 89 through Tuba City. The town of Leupp is the exception. Waste generated in Leupp can be delivered to the Cinder Lake Landfill via Indian Route 15. Navajo Sanitation and Republic Services provide waste collection in some areas of Coconino County. Disposal at a secondary landfill could be completed at the Painted Desert Landfill located north of Joseph City on Interstate 40.

The tipping fee at Cinder Lake is \$ 44.17 per ton for Coconino County residents. Waste generated outside the County is charged \$ 79.88 per ton.

**Table 13: Western Area Wasteshed  
Population & Disposed Tonnage**

Agency	Chapter	Population	Disposal Site / Chapter House Location	Annual Tons Disposed
Western Navajo	Bodaway/Gap	1,704	Broadway Gap, AZ	675
Western Navajo	Cameron	1,122	Cameron, AZ	444
Western Navajo	Coalmine Mesa	691	Tuba City, AZ	274
Western Navajo	Coppermine	590	Page, AZ	234
Western Navajo	Inscription House	1,252	Inscription House, AZ	496
Western Navajo	Kaibeto	1,963	Kaibeto, AZ	777
Western Navajo	Lechee	1,660	LeChee, AZ	657
Western Navajo	Leupp	1,611	Leupp, AZ	638
Western Navajo	Navajo Mountain	542	Tonalea, AZ	215
Western Navajo	Tolani Lake	647	Tolani Lake, AZ	256
Western Navajo	Tonalea	2,595	Tuba City, AZ	1,027
Western Navajo	Tuba City	9,265	Tuba City, AZ	3,668
<b>TOTALS</b>		<b>23,642</b>		<b>9,361</b>





**Figure 4: Western Area Wasteshed Map**  
(locations in blue=convenience centers operated by Coconino County)

## 6.4 NAVAJO EAST – MCKINLEY COUNTY, NM AREA WASTESHED

### Primary Landfill: Red Rock Regional Landfill

The most logistically feasible landfill for waste generated from Navajo Nation Chapters in McKinley and Cibola Counties, NM would be the Red Rock Landfill in Thoreau, operated by the Northwest New Mexico Regional Solid Waste Authority (NWNMRSWA). Refuse collection and transport services in the area are being provided by Navajo Sanitation, Waste Management, Checkerboard Disposal, and NWNMRSWA. NWNMRSWA also operates the transfer station in Gallup as well as the convenience center in the Ramah Chapter near Mountain View, NM.

The current tipping fee at the Red Rock Landfill is \$35 per ton. The tipping fee for waste delivered to the transfer station in Gallup is \$42 per ton.

**Table 14: Navajo East - McKinley County, NM Area  
Wasteshed Population & Disposed Tonnage**

Agency	Chapter	Population	Disposal Site / Chapter House Location	Annual Tons Disposed
Eastern Navajo	Alamo	2,006	Alamo, NM	794
Eastern Navajo	Becenti	403	Becenti, NM	160
Eastern Navajo	Bread Springs / Baahaali	908	Bread Springs, NM	360
Ft. Defiance	Coyote Canyon	685	Brimhall, NM	271
Eastern Navajo	Casamero Lake	518	Casamero Lake, NM	205
Eastern Navajo	Chichiltah	1,443	Chichiltah, NM	571
Eastern Navajo	Church Rock	2,868	Churchrock, NM	1,136
Eastern Navajo	Counselor	870	Counselor, NM	344
Eastern Navajo	Crownpoint	2,729	Crownpoint, NM	1,081
Eastern Navajo	Red Rock	1,866	Gallup, NM	739
Eastern Navajo	Rock Springs	1,866	Gallup, NM	739
Eastern Navajo	Tsayatoh	658	Gallup, NM	261
Eastern Navajo	Iyanbito	890	Iyanbito, NM	352
Eastern Navajo	Little Water	427	Little Water, NM	169
Eastern Navajo	Manuelito	264	Manuelito, NM	105
Eastern Navajo	Mariano Lake	823	Mariano Lake, NM	326
Eastern Navajo	Nahosdishgish	408	Nahosdishgish, NM	162
Ft. Defiance	Red Lake	2,028	Navajo, NM	803
Eastern Navajo	Pinedale	1,109	Pine Dale, NM	439
Eastern Navajo	Baca	789	Prewitt, NM	312
Eastern Navajo	Pueblo Pintado	419	Pueblo Pintado, NM	166
Eastern Navajo	Ramah	1,400	Ramah, NM	554
Eastern Navajo	Smith Lake	1,086	Smith Lake, NM	430
Eastern Navajo	Standing Rock	951	Standing Rock, NM	377
Eastern Navajo	Thoreau	641	Thoreau, NM	254
Ft. Defiance	Mexican Springs	1,418	Tohatchi, NM	561
Ft. Defiance	Tohatchi	1,450	Tohatchi, NM	574
Eastern Navajo	Torreón/Star Lake	1,612	Torreón, NM	638
Ft. Defiance	Twin Lakes	2,212	Twin Lakes, NM	876
Eastern Navajo	White Horse Lake	406	White Horse Lake, NM	161
<b>TOTALS</b>		<b>35,153</b>		<b>13,918</b>





Figure 5: East – McKinley County, NM Area Wasteshed Map

## 6.5 NAVAJO SOUTH CENTRAL AREA WASTESHED

### Primary Landfill: Painted Desert Landfill

The most logistically feasible destination for waste generated from Chapters in the central area of Navajo County, AZ and a portion of western Apache County, AZ would be the Painted Desert Landfill located north of Joseph, AZ. The population within this wasteshed is the lowest, as is the estimated waste generation. Roadway access to many of the Chapters in this region is limited. State Routes 77, 87, and 264 provide primary access to the secondary roads that lead to many of the remotely situated Chapter houses. Navajo County doesn't provide or regulate waste collection or disposal services.

**Table 15: South Central Area Wasteshed  
Population & Disposed Tonnage**

Agency	Chapter	Population	Disposal Site / Chapter House Location	Annual Tons Disposed
Chinle	Black Mesa	428	Black Mesa, AZ	169
Chinle	Tachee/Blue Gap	1,178	Blue Gap, AZ	466
Chinle	Forest Lake	471	Forest Lake, AZ	186
Chinle	Hard Rock	1,161	Pinon, AZ	460
Chinle	Pinon	2,751	Pinon, AZ	1,089
Chinle	Whippoorwill	1,489	Whippoorwill, AZ	590
Ft. Defiance	Dilkon	2,110	Dilkon, AZ	835
Ft. Defiance	Greasewood Springs	1,320	Greasewood Springs, AZ	523
Ft. Defiance	Indian Wells	989	Indian Wells, AZ	392
Ft. Defiance	Jeddito	1,180	Jeddito, AZ	467
Ft. Defiance	Low Mountain	754	Low Mountain, AZ	299
Ft. Defiance	Tees Toh	930	Tees Toh, AZ	368
Ft. Defiance	White Cone	1,284	White Cone, AZ	508
Western Navajo	Birdsprings	795	Dilkon, AZ	315
<b>TOTALS</b>		<b>16,840</b>		<b>6,668</b>





Figure 6: South Central Area Wasteshed Map

## 6.6 NAVAJO NORTH CENTRAL AREA WASTESHED

### Primary Landfill: White Mesa Landfill

The North Central Wasteshed includes 12 Chapters in northern Apache and Navajo Counties in Arizona and southern San Juan County in Utah. The most logistically feasible disposal destination for waste generated in these Chapters is the White Mesa Landfill located south of the town of White Mesa in Utah. The Chapter houses are located on or within close proximity to US Routes 160, 163, and 191, Arizona State Route 98 and Utah State Route 162.

Management of waste is presently handled by disparate methods including hauling by the Chapters and private companies. Kayenta generates the majority of waste within this wasteshed and would likely be best served by a collection service and an off-load / re-load transfer operation. The remaining towns could be serviced by a drop-off site / convenience center utilizing a drop box collected once a week or a compaction unit serviced less frequently.

The tipping fee at White Mesa Landfill is \$ 30 per ton.

**Table 16: North Central Area Wasteshed  
Population & Disposed Tonnage**

Agency	Chapter	Population	Disposal Site / Chapter House Location	Annual Tons Disposed
Western Navajo	Chilchinbeto	1,165	Chilchinbeto, AZ	461
Western Navajo	Dennehotso	1,462	Dennehotso, AZ	579
Western Navajo	Kayenta	6,211	Kayenta, AZ	2,459
Shiprock	Aneth	1,989	Montezuma Creek, UT	788
Western Navajo	Oljato	2,214	Monument Valley, UT	877
Shiprock	Red Mesa	1,222	Red Mesa, AZ	484
Shiprock	Mexican Water	933	Red Mesa, AZ	369
Shiprock	Rock Point	1,273	Rock Point, AZ	504
Chinle	Round Rock	1,566	Round Rock, AZ	620
Western Navajo	Shonto	2,124	Shonto, AZ	841
Shiprock	Sweetwater	1,535	Teec Nospos, AZ	608
Shiprock	Teec Nos Pos	1,301	Teec Nospos, AZ	515
<b>TOTALS</b>		<b>22,995</b>		<b>9,105</b>





Figure 7: North Central Area Wasteshed Map

## 6.7 NAVAJO NORTHEAST – SAN JUAN COUNTY, NM AREA WASTESHED

### Primary Landfill: Crouch Mesa Landfill

The most logistically feasible destination for waste generated from the Chapters in San Juan County, NM is the Crouch Mesa Landfill owned by San Juan County and operated by Waste Management. San Juan County has an extensive network of convenience stations for refuse disposal located throughout the County. Sites located in the Navajo Nation include Fruitland, Huerfano, Lake Valley, Sand Springs, and Shiprock.

Navajo Sanitation and Waste Management currently provide collection in the more populated sections of this region. Chapters with larger populations are located in close proximity to the refuse drop-off site that is along US Route 64 as well as the Crouch Mesa Landfill. Regular waste collection is also provided to residents along the US 64 corridor. Container or drop box service could be provided to all of the Chapter houses located south of US Route 64. US Routes 491 and 550 and NM State Route 371 run north-south and provide good access to the less populated areas within San Juan County.

The tip fee at the Crouch Mesa Landfill is \$ 0 for County residents. Waste delivered to the convenience stations is charged at \$ 1.00 per bag or \$ 6.00 per pick-up bed (3 cubic yards).

**Table 17: Northeast – San Juan County, NM Area  
Wasteshed Population & Disposed Tonnage**

Agency	Chapter	Population	Disposal Site / Chapter House Location	Annual Tons Disposed
Shiprock	Beclabito	479	Beclabito, NM	190
Shiprock	Cove	430	Cove, AZ	170
Eastern Navajo	White Rock	76	White Rock, NM	30
Ft. Defiance	Crystal	670	Crystal, NM	265
Shiprock	San Juan	500	Fruitland, NM	198
Shiprock	Upper Fruitland	2,751	Fruitland, NM	1,089
Eastern Navajo	Huerfano	2,633	Huerfano, NM	1,043
Eastern Navajo	Lake Valley	306	Lake Valley, NM	121
Eastern Navajo	Nageezi	1,095	Nageezi, NM	434
Ft. Defiance	Naschitti	1,500	Naschitti, NM	594
Shiprock	Nenahnezad	1,292	Nenahnezad, NM	512
Shiprock	Bumham	280	Newcomb, NM	111
Shiprock	Newcomb	629	Newcomb, NM	249
Shiprock	Two Grey Hills	500	Newcomb, NM	198
Shiprock	Red Valley	1,471	Red Valley, AZ	582
Shiprock	Sanostee	1,795	Sanostee, NM	711
Shiprock	Sheep Springs	801	Sheep Springs, NM	317
Shiprock	Cudeii	550	Shiprock, NM	218
Shiprock	Hogback	1,215	Shiprock, NM	481
Shiprock	Shiprock	9,126	Shiprock, NM	3,613
<b>TOTALS</b>		<b>28,099</b>		<b>11,125</b>





Figure 8: Northeast – San Juan County, NM Area Wasteshed Map  
(Chapters=yellow font, convenience centers=blue font)

## 7.0 ANALYSIS OF EXISTING SOLID WASTE MANAGEMENT PRACTICES

This section describes strengths, weaknesses, advantages, disadvantages, challenges and opportunities to present solid waste management methods in the Navajo Nation.

It is important to note that none of the recommendations of the 2002 Solid Waste Plan were implemented because the Plan was never formally adopted by the Navajo Nation. Basic solid waste management techniques are essentially the same as when that Plan was written during the period of 2000 – 2002. All waste is being disposed off – Reservation. There are a variety of public sector and private sector parties carrying out different operational functions. Chapters and commercial / institutional / governmental generators make their own contractual and payment arrangements with service providers for collection, hauling, transfer, transport, and disposal. There is no central Navajo Nation solid waste authority and at this point little ability to influence what happens at the local level. Chapters receive Navajo Nation General Fund monies to cover a variety of expenses, including solid waste management. However, reliable, specific data or information on these expenditures were not available.

The terms “patchwork”, “fragmented”, and “highly de-centralized” accurately describe the present situation where the 110 Chapters can determine their own approach to solid waste management and there is no common, unified strategy as formulated and administered by the Navajo Nation government.

Further, in considering the functional components of a solid waste management system – collection, transfer, disposal, waste reduction / recycling, promotion / education, organization / administration – the role of the Navajo Nation central government appears to be minimal. The Navajo Nation does not direct the movement of material (this is referred to as “flow control”) coming from the Reservation at any point in the six wastesheds defined in Section 6. As currently structured, it is basically “on the sidelines” with little power or authority to impact existing solid waste management activities.

This situation has largely evolved over time without the input of comprehensive, systematic planning and analytic evaluation. It consists of numerous formal and informal arrangements between service providers – especially Navajo Sanitation, Inc. – and various generators, including Chapters, commercial businesses, institutions, and government entities at the tribal, federal, state, county and municipal levels.

In reality, flow control is presently largely exercised by Navajo Sanitation. As a result of the Navajo Nation's relatively passive role in solid waste, and the procurement preference for Navajo owned / certified businesses, Navajo Sanitation has a virtual monopoly over garbage collection, transport, transfer, and disposal services for a majority of the overall Navajo Nation. This amounts to a nearly exclusive franchise without any of the accountability measures or benefits to the Nation that would typically be part of a franchise agreement such as payment of an annual franchise fee, establishment of minimum service standards, annual rate reviews, financial disclosure, regular reporting requirements, equipment repair and replacement schedules, site inspections, and so on.

Some decision – makers in the Navajo Nation government have periodically expressed the belief that a landfill established within the Navajo Nation would be more economically beneficial and offer cost reductions in comparison to sending refuse to landfills outside the Reservation. However, without accurate data / information about current disposed tonnages and costs, this would be difficult to assess. Further, under the current uncontrolled and non-regulated condition, the question must be asked; if the Navajo Nation establishes their own landfill, how will it get tonnage? Would there have to be flow control implemented to guarantee tonnage for the facility to be economically competitive with off-Reservation disposal? The answer to this last question is certainly “Yes” since there is no point in having a landfill unless waste is brought to it for disposal and those bringing the waste are charged a per ton “tipping fee” that would cover construction and operational expenses.

The Navajo Nation central government / administration needs to determine the answers to the following two questions: Is flow control authority legally feasible? What would have to be done from several perspectives – political, institutional, cultural – for the Navajo Nation central government / administration to exercise flow control over material generated within its boundaries?

The core issue the Navajo Nation needs to address through preparation of this Integrated Solid Waste Management Plan is, “What role does it want to have in solid waste management?”

Based on current circumstances, the Navajo Nation lacks a policy framework through which to exercise leverage or influence on solid waste management practices. The limited involvement of the Nation is split between the Solid Waste Management Program (Division of Community Development) and the Navajo Nation EPA; both function at a minimal, peripheral level regarding solid waste. There is no central Navajo Nation Solid Waste Authority with substantive powers and resources. Despite receiving financing for solid waste services from the General Fund, Chapters are not required to report on expenditures for these services or held accountable for the services provided and what they accomplish. Private haulers currently operate outside the administrative, managerial, and regulatory purview of the Navajo Nation.

## **8.0 PRIORITIES AND PRINCIPLES FOR FUTURE SOLID WASTE MANAGEMENT PRACTICES**

A policy framework leading to a more proactive role for the Navajo Nation in solid waste management would be based on the priorities and principles outlined below.

- There would be a balanced allocation of roles / responsibilities between the private sector and different political / administrative / institutional entities with the Navajo Nation (primarily central government, Agencies, Chapters) based on the assets, expertise, and authorities of the involved parties.
- Navajo Nation supervision of solid waste management procedures, operations, and infrastructure needs to be established in a revised Solid Waste Act and accompanying Regulations. These would apply to private sector service providers and generators as well as generators within the tribal, federal, state, county, and local government sectors.



- Present and future solid waste management responsibilities of the Navajo Nation should be consolidated into a central Solid Waste Authority.
- More formal and extensive partnerships with ongoing cooperation and coordination between the Navajo Nation, Chapters, and private sector service providers would be pursued.
- The aim of such partnerships is to deal efficiently and cost – effectively with the operational / logistical challenges of solid waste management in a large geographical setting where population and material generating areas are widely dispersed.
- The actual costs of providing core solid waste management services needs to be much more closely documented and every effort made to spread those costs over the largest possible rate base.
- Maximum use of existing public and private sector equipment, facilities, and infrastructure for solid waste management available to the Navajo Nation would be emphasized prior to the Nation itself undertaking capital expenditures.
- The Navajo Nation should pursue solid waste management policies and practices that advance the values of environmental protection, materials conservation, and long-term sustainability.

## 9.0 NAVAJO NATION LANDFILL ANALYSIS

A detailed economic analysis regarding establishing and operating a landfill within the Navajo Nation was performed in response to ongoing interest on the part of some decision – makers in such an operation. The full detailed analysis is included in Appendix F. This section summarizes the results of the analysis.

The analysis is based on a hypothetical landfill site of 40 acres total divided into operating units for the placement of waste called cells. It is assumed that since the landfill operation is located within the Navajo Nation there is no expense involved with purchasing property for the facility. Four cells are anticipated. The analysis entails estimating costs for siting, permitting, construction, equipment, and operations.

It is emphasized that accurate, reliable data about how much material is actually being disposed by residential and commercial / institutional generators from within Navajo Nation does not exist. This data would have to be obtained from the private refuse haulers operating within the Reservation. However at the present time there is no formal arrangement or relationship between the Navajo Nation and the haulers requiring providing such data to the Nation upon request. Therefore, to perform the hypothetical landfill analysis, waste disposal projections were calculated based on per capita waste disposal estimates from the Navajo Nation Solid Waste Management Program (see Section 6.1). To illustrate the impact of landfill volumes on costs, three different annual disposed tonnage levels were used: 75,000, 125,000, and 175,000 tons per year.



It is also assumed for purposes of the analysis that a Navajo Nation landfill would meet all relevant regulatory requirements of Subtitle D, Resource Conservation and Recovery Act. This would be essential to be considered for Federal funding opportunities related to landfill siting, construction, operation and ultimate closure.

Establishment of flow control by the Navajo Nation over the total waste stream generated within the Nation is necessary to even contemplate siting, building, and operating a landfill. Even with such flow control, a Navajo Nation landfill would be in competition with surrounding landfills for material from outside the Nation. With these assumptions and understandings, it is estimated that stand – alone, up front expenses for site feasibility evaluation and permitting would be between \$ 745,000 to \$930,000, as itemized in Table 18.

**Table 18: Landfill Permitting Costs in Arizona**

Task	Cost
Arizona DEQ fees	\$100,000
Site Plan Engineering	\$500,000 to \$600,000
Survey / Aerial Mapping	\$75,000 to \$100,000
Agency / Zoning Fees	\$20,000 to \$30,000
Public Education / Outreach Consultants	\$50,000 to \$100,000
<b>Total Cost</b>	<b>\$745,000 to \$930,000</b>

The standard way to portray bottom line costs for a landfill is to determine the disposal cost per ton that incorporates facility construction, equipment, and operation. The per ton disposal cost is directly related to the amount of refuse coming into the landfill. The more material there is, the greater the potential for a lower disposal cost since there are more units (tons) to spread costs over. This is demonstrated in Table 19.

**Table 19: Build Costs for a Landfill**

Annual Tons	75,000	125,000	175,000
<b>Expected Landfill Life</b>	34	20	15
<b>Life per Cell in Years</b>	8.49	5.10	3.64
<b>Cell 1 Build Year</b>	2020	2020	2020
<b>Cell 2 Build Year</b>	2027	2024	2023
<b>Cell 3 Build Year</b>	2035	2028	2026
<b>Cell 4 Build Year</b>	2043	2032	2029
<b>Cell 1 Build Cost</b>	\$7,920,715	\$7,920,715	\$7,920,715
<b>Cell 2 Build Cost</b>	\$9,019,353	\$8,332,488	\$8,169,106
<b>Cell 3 Build Cost</b>	\$10,567,610	\$9,019,353	\$8,669,121
<b>Cell 4 Build Cost</b>	\$12,381,639	\$9,762,838	\$9,199,740
<b>Year 1 Disposal Cost per Ton</b>	<b>\$41.41</b>	<b>\$36.23</b>	<b>\$34.70</b>

Siting and constructing a landfill is a long, costly, and complex process requiring various types of technical expertise. At the present time that expertise is not possessed by Navajo Nation. Therefore, undertaking a landfill project would put the Nation in the position of depending on, and paying for, outside consultants and contractors for a considerable period.

The cost estimates for establishment of a Navajo Nation landfill do not include expenses for an expanded or upgraded refuse transfer and transport infrastructure to move material to a landfill because the precise landfill location is not known given the limits of this hypothetical analysis. If such infrastructure were built and considered part of the overall Navajo Nation waste disposal system, it would be included in the disposal cost per ton, thus increasing that cost.

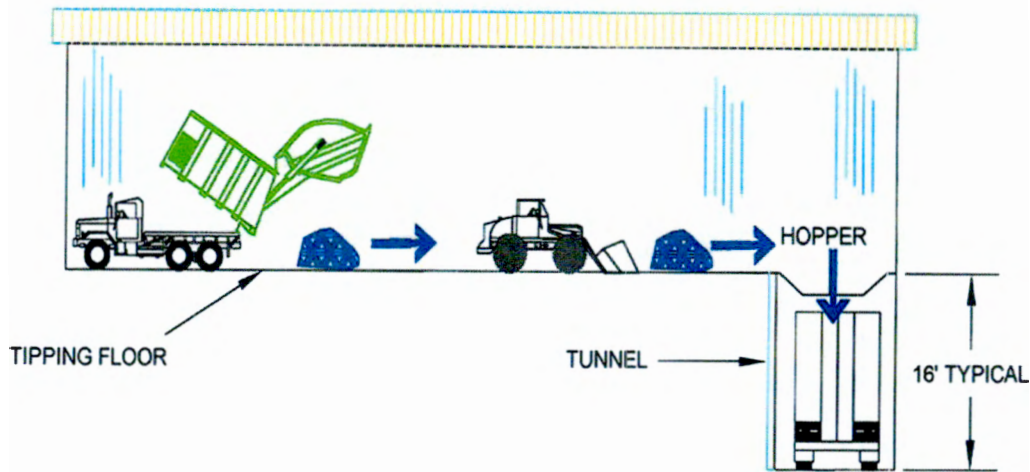
Similarly, the landfill closure / post – closure cost estimate in the analysis is a rough approximation because it would depend on the landfill location and specific tonnages received. Inclusion of actual closure / post – closure costs would likely increase the projected disposal cost per ton as well.

## **10.0 TRANSFER AND CONVENIENCE STATIONS**

### **10.1 TRANSFER STATIONS**

As was noted in Section 9, the cost estimates for a Navajo Nation landfill do not include expenses for an expanded or upgraded refuse aggregation / consolidation / transport infrastructure to move material to a landfill because the precise landfill location is not known. Such an infrastructure would consist of a small number of transfer stations (anticipate no more than two to three) with larger handling and storage capacity than the collection points / convenience centers now found throughout the Reservation and identified in the six wastesheds described in Sections 6.2 to 6.6. It should be stressed that implementation of transfer stations would only be recommended under the scenario that the Navajo Nation desires to initiate operation of their own landfill facility and/or to obtain more direct control of waste hauling throughout the Nation.

For purposes of further hypothetical analysis, it has been assumed that two transfer stations would be included as parts of the overall infrastructure requirements to better assure maximum capture of waste materials. Based on the assumption of a centralized landfill location, and the configuration of the six wastesheds, the most logical sites for transfer stations would be one site on the west side of the Nation area and one site on the east side of the Nation area. As used here, the term “transfer station” refers to a partially enclosed structure that is largely paved for ease of entry and exit; that has a below – grade area for placement of a transfer vehicle which is filled with waste from above using a front – end loader or similar equipment; and that has unloading zones for both regular garbage trucks, roll – off containers, and separated areas for general public pick – up trucks, trailers, and automobiles. A simple and typical transfer station configuration is depicted in Figure 9.



**Figure 9: Typical Simple Transfer Station Configuration**  
(From HIS "Solid Waste Management in Indian Country", 2015)

For identification of hypothetical costs associated with such a transfer station facility various assumptions were made as follows:

- It is assumed the landfill will be sited on 1-2 acres and that the land will be provided by the Nation at no cost to the project.
- The overall site will be chain link fenced for site security
- It is assumed that the transfer station area will be approximately 15,000 square feet in area with a metal roof but no building sides.
- Trash fencing will be installed on three sides of the building
- The floor will be concrete and the building will have an asphalt approach ramp but not be paved from exterior site entrance to the building

It is also assumed for purposes of the analysis that a Navajo Nation transfer station would meet all relevant regulatory requirements of Subtitle D, Resource Conservation and Recovery Act. This would be essential to be considered for Federal funding opportunities related to transfer station siting, construction, and operation.

With these assumptions and understandings, it is estimated that the estimated cost for design, permitting and construction of a single "simple" transfer station would be between \$540,000 to \$670,000, as itemized in Table 20. These costs would then be doubled assuming construction of two transfer stations as discussed above.

**Table 20: Transfer Station Estimated Costs**

Task	Cost
<b>Design / Permitting</b>	
Agency fees	\$10,000
Site Plan Engineering	\$70,000 to \$90,000
Survey / Aerial Mapping	\$15,000 to \$20,000
Public Education / Outreach	\$20,000 to \$30,000
<b>Subtotal Design / Permitting Cost =</b>	<b>\$115,000 to \$150,000</b>
Site Grading	\$15,000 to \$20,000
Site Fencing (assume 1-acre)	\$15,000 - \$20,000
Site Asphalt	\$15,000 - \$20,000
Building	\$100,000 - \$130,000
Concrete	\$250,000 - \$300,000
Railing, Signage, Trash Fence and Other Ancillaries	\$30,000
<b>Subtotal Construction Cost =</b>	<b>\$425,000 to \$520,000</b>
<b>Total Estimated Transfer Station Cost =</b>	<b>\$540,000 - \$670,000</b>

In addition to the design, permitting and construction costs, equipment costs would include at least one loader and one transfer truck per station with preferably a second loader and/or truck as back-up. It is also assumed that there would be at least three personnel per station (gate attendant, loader operator, transfer truck driver). Thus, operational costs should easily be assumed to be at least \$400,000 - \$500,000 per year per station to allow for labor, fuel costs and periodic repair and replacement of equipment. Using these values, under the scenario of operation of two transfer stations, just the annual operations costs itself would likely result in an additional \$10.00 to \$13.33 per ton for disposal costs for the approximate volume of waste generation currently assumed throughout the Nation. Shown in Table 21 is a summary of the anticipated disposal cost per ton impacts for the operational costs of two transfer stations for various waste generation scenarios.

**Table 21: Cost Per Ton For Operations of Two Transfer Stations**

Annual Tons	75,000	125,000	175,000
<b>Transfer Station Operations Costs</b>			
<b>2 Stations @ \$800,000 / yr</b>	\$10.67 / ton	\$6.40 / ton	\$4.57 / ton
<b>2 Stations @ \$1,000,000 / yr</b>	\$13.33 / ton	\$8.00 / ton	\$5.71 / ton

## 10.2 CONVENIENCE STATIONS

Per the response that was obtained and summarized in Section 5 regarding Chapters which currently have convenience centers, it is estimated that 71 Chapters currently have some level of convenience center available to them. Using this information as well as the locations of surrounding landfill sites, Zia undertook an analysis in an attempt to identify areas of the Navajo Nation that have fairly significant population base and that do not have some type of



disposal site (either landfill or convenience location) within approximately 60 miles. Based on this analysis, there was a total of six (6) sites which were located where it is recommended that a new convenience site be located. These recommendations are as follows and shown in Figure 10:

**Counselor Chapter:** The Counselor Chapter was recommended for a Convenience Station Location because it is the second largest Chapter in population in the area and is centrally located between other surrounding Chapters. The Counselor Chapter also has very good access to US 550 Highway, which will accommodate surrounding Chapters.

**Smith Lake Chapter:** The Smith Lake Chapter was recommended for a Convenience Station Location because it is the second largest Chapter in population in the area and is centrally located between other surrounding Chapters. The Smith Lake Chapter also has good access to NM 371 State Highway to accommodate surrounding Chapters.

**Church Rock Chapter:** The Church Rock Chapter was recommended for a Convenience Station Location because it is the largest chapter in population in the area and is centrally located between other surrounding Chapters. The Church Rock Chapter also has very good access to Interstate 40 and NM 566 State Highway, which will accommodate the other Chapters very well. Standing Rock, Nahodishgish and Pinedale chapters have the option to use the Smith Lake Convenience Station recommended above. *Note: This area has Chapters from two different Agencies; Eastern and Fort Defiance. There will have to be mutual agreement between the two Agencies to share the recommended Convenience Station.*

**Tsaile/ Wheat Fields Chapter:** The Tsaile/ Wheat Fields Chapter was recommended for a Convenience Station Location because it is the largest Chapter in population in the area and is centrally located between surrounding Chapters. The Tsaile/Wheat Fields Chapter also has very good access to Arizona Indian Route 12, which will accommodate surrounding Chapters very well. *Note: This area has chapters from three different Agencies; Shiprock, Chinle and Fort Defiance. There will have to be mutual agreement between the three Agencies to share the recommended Convenience Station.*

**The Pinon Chapter:** The Pinon Chapter was recommended for a Convenience Station Location because it is the largest Chapter in population in the area and is centrally located between surrounding Chapters. The Pinon Chapter also has very good access to Arizona Indian Route 41 and Indian Route 8030, which will accommodate the surrounding Chapters well. *Note: This area has Chapters from two different agencies; Western and Chinle. There will have to be mutual agreement between the two Agencies to share the recommended Convenience Station.*

**Teestoh Chapter:** The Teestoh Chapter was recommended for a Convenience Station Location because it is the third largest Chapter in population in the area and is centrally located between surrounding Chapters. The Teestoh Chapter also has very good access to Arizona Indian Route 60 and Arizona 87 State Highway, which will accommodate surrounding Chapters well. *Note: This area has Chapters from two different Agencies; Fort Defiance and Western. There will have to be mutual agreement between the two Agencies to share the recommended Convenience Station.*

It is suggested that typical cost for establishment of a convenience station is estimated to be approximately \$30,000 to \$40,000 per site to include purchase of bins, fencing, signage, etc. Based on this, \$180,000 to \$200,000 would be required to provide the recommended six convenience station sites.

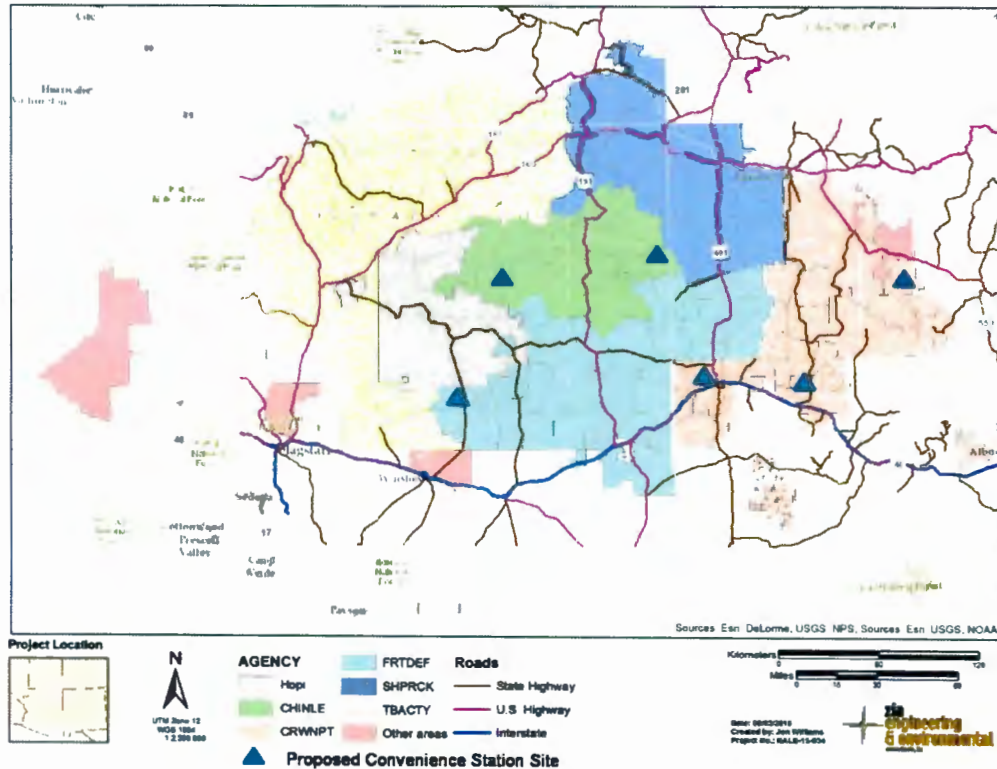


Figure 10: Navajo Nation Recommended Additional Convenience Station Sites

## 11.0 CONCLUSIONS AND RECOMMENDATIONS

### 11.1 CONCLUSIONS

Taking into consideration Sections 7 through 9, it is concluded that the Navajo Nation has at the present time, little ability to influence the nature and cost of solid waste management services provided within the Reservation. This is because its role is limited to promotion / education / outreach / assistance at the Chapter level and enforcement of outdated regulations (see Sections 5.4 and 5.5 regarding Solid Waste Management Program and Navajo EPA respectively). Solid waste is not currently viewed as a resource that should be managed for the benefit of the Nation as a whole. The de – centralized, fragmentary set of formal and informal

arrangements between local waste generators and private sector service providers are not consistent with the basic economic and operational principles of the solid waste industry, which are based on achieving economies of scale through material aggregation and consolidation.

As a consequence of this situation there is no existing reliable data / information about how much refuse is being generated and disposed, where it is being taken, who is providing what services to whom, and what the costs of these services are.

The response of some decision – makers to this lack of control has been to advocate establishing a landfill within the Navajo Nation on the assumption that this would be cheaper than current methods of transporting trash to off – Reservation landfills. However, there are no policies in place that would cause private haulers to deliver refuse to such a landfill, and the expenses involved in siting, permitting, constructing, equipping, and operating the facility and related transfer stations are quite significant (see Sections 9 and 10). Estimates of these costs show that implementation of a scenario of establishment of a Navajo Nation owned and operated facility and related infrastructure would result in a greater disposal cost than currently provided by surrounding landfill facilities. Further, the expertise to accomplish these activities does not currently exist within the Navajo Nation and would necessitate contracting with outside entities.

The policy recommendations and steps in the next section are designed to place the Navajo Nation in a more proactive role regarding solid waste management with new responsibilities and powers, while at the same time achieving a balanced allocation of those responsibilities / powers with other involved parties, mainly the Chapters and private service providers. The recommendations are intended to result in the following features of a new solid waste management system for the Navajo Nation:

- Cooperation and coordination
- Shared control
- Efficiency
- Reliability
- Flexibility
- Transparency and accountability in rate – setting
- Support for waste reduction and recycling
- Ongoing public awareness and education

In addition to the policy recommendations and steps discussed in the subsequent subsection, recommendations for establishment of an additional six convenience stations are also suggested per Section 10.2 of this Plan.

## 11.2 POLICY RECOMMENDATIONS AND STEPS

The recommended solid waste management policy framework for the Navajo Nation is presented below as a package of sequential steps that would be implemented in the order presented. It is anticipated the Navajo Nation would require consultant assistance to carry out portions of the recommendations for an estimated cost between \$90,000 and \$150,000. The assistance includes technical, legal, and communication expertise.

### **Step 1: Establish Navajo Nation Solid Waste Authority**

The existing and future solid waste responsibilities and powers of the Navajo Nation would be merged into a single agency – a Solid Waste Authority with an Administrator and a Board of Directors. The Authority could be a separate organization or be part of a current Navajo Nation central government entity. The Authority staff will work with the consultant to implement the package of recommendations that follow.

### **Step 2: Promulgate Flow Control / Modify Solid Waste Act and Related Regulations to Implement Flow Control Requirements**

Establish “flow control” authority over all solid waste materials generated within the boundaries of the Navajo Nation. Such waste would be defined as a resource of the Navajo Nation and subject to existing and future versions of the Solid Waste Act and Solid Waste Regulations. As necessary existing regulations would have to be modified and codified to formalize this control.

### **Step 3: Issue Permits**

Require all solid waste service providers (private and public) operating within Navajo Nation to obtain a permit and abide by the stipulations thereof. The stipulations will include but are not limited to, providing data regarding tons of refuse collected, handled, or disposed on a monthly basis; providing a current rate structure for services offered; providing an equipment inventory documenting the type, age, and condition of such equipment and a related repair / replacement schedule for each item listed.

### **Step 4: Define Services**

Prepare a comprehensive description of the solid waste management services that should be available in the Navajo Nation organized according to Agencies, watersheds (as defined in the Solid Waste Plan), Administrative Service Centers, or some other appropriate administrative / institutional structure. During this step, issues such as recycling and handling of special and hazardous wastes should be considered as part of the anticipated scope.

### **Step 5: Formulate Request – for – Proposals (RFP)**

Develop an RFP for the desired solid waste management services to be issued to the private and public sectors. The intent of the RFP process is to award one or more long – term, exclusive franchise agreements for the entire Navajo Nation or for designated territorial areas of the Nation. The selected service provider(s) will be required to pay an annual franchise fee and abide by the terms / conditions of the franchise agreement which shall include, but are not limited to minimum service standards, performance criteria, collaborative rate – setting, annual rate reviews, equipment and facility inspections, maintenance / repair / replacement procedures,



regular data collection, periodic reporting, protocols for responding to complaints, and Navajo employment preference measures. The RFP also includes a draft franchise agreement for consideration by prospective respondents.

**Step 6: Issue RFP**

Distribute the RFP. Conduct mandatory pre – proposal meeting to discuss RFP and respond to questions. Send out any necessary clarifications / addenda for the RFP to potential respondents. Set up group / committee to evaluate proposals.

**Step 7: Assessment of Proposals and Recommendation**

The Evaluation Committee will review the technical proposals and first determine if there is any that are non-responsive based on the requirements of the RFP. Issues that may need to be resolved by further information from the proposers will be identified. Then the cost elements of the proposals would be reviewed to determine if they need to be clarified by the proposers. The Evaluation Committee would summarize its findings for Navajo Nation decision-makers and determine if any of the proposers are deemed not qualified.

The Evaluation Committee then offers a recommendation to decision – makers concerning the highest ranked service provider or providers, including any implications of options proposed or exceptions taken to the draft franchise agreement by respondents to the RFP.

**Step 8: Selection of Service Provider(s)**

The Executive and Legislative Branches of the Navajo Nation Government will consider the recommendation of the Evaluation Committee and decide either to adopt it or instruct the Committee and the Solid Waste Authority how to proceed with the procurement process.

**Step 9: Negotiate and Execute Franchise Agreement(s)**

Negotiation and execution of the franchise agreement(s) would likely entail input from the Executive and Legislative Branches, the Department of Justice / Office of the Attorney General, the Evaluation Committee, the Solid Waste Authority, and the consultant.

**Step 10: Revise and Update Solid Waste Act and Regulations**

Based on the final terms and conditions of the franchise agreement(s) for solid waste management services, the Navajo Nation Solid Waste Act and associated Regulations should be revisited and revised and updated again to be consistent with the final negotiated terms and conditions.

**Step 11: Implement Plan, Education and Outreach and Franchise Oversight**

Under this step, the Navajo Nation Solid Waste Authority will provide oversight of the franchise operations to ensure compliance by the franchise providers with agreed upon standards. It is also assumed that Navajo Nation staff will conduct an aggressive education and outreach effort with the Chapters and general public regarding the Plan and franchise programs implementation and impacts to service and costs for the Chapters and the public.

## **12.0 PUBLIC OUTREACH AND AGENCY APPROVALS PROCESSES**

Throughout the overall ISWMP process, there has been significant effort towards promoting agency and stakeholder involvement in the process. This has specifically included the following activities:

- Through phone call efforts, coordination with individual Chapters regarding current status of solid waste management practices and processes;
- Coordination with primary private service providers/stakeholders through meetings and phone interviews to obtain information on current waste practices, statistics and also to obtain input on primary recommendations proposed in the Plan; and,
- Coordination with Navajo Nation and Regional BIA, IHS and Regional EPA offices to obtain input on the overall process and specifically on the draft Plan document.

Discussion of activities conducted for each of these efforts is summarized in subsequent paragraphs within this Section.

### **12.1 COORDINATION EFFORTS DURING PLAN DEVELOPMENT**

Overall Plan development effort was initiated through detailed planning and coordination with the Navajo Nation Solid Waste Management Program (NNSWMP). Subsequent planning meetings involved the Regional IHS and BIA offices as well as the Regional EPA office through phone conference. In addition, meetings were also held with Navajo EPA and the Navajo Office of Attorney General. Finally, input was also sought from the Navajo Nation President and Vice President regarding process and priorities.

As noted previously, outreach with the 110 individual Chapters was also sought. The Navajo Nation Division of Community Development submitted a questionnaire to each of the 110 Chapters requesting information about local solid waste management practices. None of the questionnaires were returned. Zia subsequently called each Chapter. Responses were received from 86 Chapters and 24 Chapters did not return the telephone calls.

Outreach with current commercial service providers including phone discussions and/or meetings with Navajo Sanitation, Inc., Northwest New Mexico Regional Solid Waste Authority, Checkerboard Refuse Disposal Service, Republic Services, and Waste Management. While minimal information was forthcoming from these entities, generally effort was made to brief those regarding potential recommendations from the Plan.

As the Plan recommendations were being formulated, a formal meeting and presentation was made to the Navajo Council's Resource Development Committee (RDC; also referred to as the Oversight Committee). This meeting was public noticed beforehand and meeting and presentation were conducted on March 15, 2016. In addition, presentation was made to Council delegates on June 21, 2016 to educate them on the overall Plan development process and preliminary recommendations.

## 12.2 REVIEW AND OUTREACH FOR THE DRAFT PLAN

Upon completion of the preliminary Draft Plan, it was distributed for review to the following individuals for review and comment:

- James Benally – Navajo Nation Solid Waste Management Program
- Ethal Branch – Navajo Department of Justice
- Dr. Donald D. Benn and Frederick Sherman – Navajo EPA
- Rose Duwyenie – Navajo Region BIA
- Kelly Mortensen – Indian Health Service
- Shannon Davis – US EPA/Region 9

Feedback and comments were minimal and positive and were incorporated in the final Plan document. Specifically, the comments from Ms. Shannon Davis of the US EPA/Region 9 office were as follows:

*“Thank you for the opportunity to provide comments on the proposed Integrated Solid Waste Plan (ISWMP) for the Navajo Nation. The draft plan is exceptionally well-written and comprehensive, and it lays out a very clear path towards a more sustainable solid waste program for the Navajo Nation Council to consider. As you know, the Nation needs a Council approved ISWMP in order to be eligible for GAP solid waste funding.*

*The draft plans contains both broad as well as specific suggestions. I want to highlight two of them.*

**1. Importance of solid waste volume aggregation and consolidation.**

*One of the biggest opportunities for Navajo Nation is to view solid waste as a resource that can be managed for the benefit of the Nation as a whole. In order to use this resource, it needs to be aggregated and consolidated, and its flow needs to be controlled. This will provide, in part, the financial foundation needed to administer a comprehensive solid waste management program. Currently, the services are very de-centralized and fragmented with little coordination, cooperation or transparency.*

**2. Solid waste policy framework**

*An important first step laid out in the ISWMP draft is to establish a Navajo Nation Solid Waste Authority. This step, the first of 11 recommended steps, is key to ensuring a successful solid waste management program. All other steps are contingent on establishing an authority, which can then regulate the flow of materials using regulatory tools like permitting and franchise agreements. Please feel free to contact me if you have any questions or would like to discuss things further.”*

### 12.3 APPROVAL PROCESS FOR THE PLAN

As noted by the comments from the US EPA Regional Office, the Plan must be adopted by the Nation in order for it to allow the Nation to be eligible for federal funding to implement various needs and recommendations identified by the Plan. This specifically involves consideration and action by the Navajo Nation Legislative Council which is comprised of Chapter representatives from the 110 Chapters throughout the Nation. The process involved to bring the Plan before the Legislative Council of the Nation triggers requirements specifically under 2 N.N.C. §164(A). This generally includes the following:

- Submittal by the applicable member of Executive Branch or Navajo Nation Department to the Department of Justice for review prior to seeking a Council Delegate Sponsor. Review will be completed within seven days of submittal. Office of Management and Budget and Office of the Comptroller will also review if the proposed action will have a financial impact on the Nation's
- Upon review and approval of Department of Justice a Council Delegate Sponsor can be sought for the proposed Council action.
- Once the Section 164 Review process is completed and a Council Delegate is identified as the sponsor for the legislation, the proposed legislation will be posted on-line for a five day public comment period.
- After the five day comment period, the proposed legislative action will either be assigned to a Council committee for further preliminary review and/or will be approved to go to the entire Council for consideration and action. Public notice of the proposed Council action will also be made prior to Council meeting.
- Assuming approval by the Council and adoption of the recommendations of the Plan, then a copy of the Council action will be inserted into the Final Plan document and will be published.



# **APPENDIX A**

## **Environmental Protection Agency's (EPA) Five Elements of a Tribal ISWMP**

## **The Five Elements of a Tribal Integrated Waste Management Plan**

These 5 elements represent the basic requirements that must be included in a tribe's IWMP for that plan to be considered adequate for GPRA purposes. Plans not meeting all 5 elements may be adequate if a region determines that one or more elements are not necessary for a tribe's situation.

### **1. Description of the community service area**

Details that describe the community service area may include the following: population and demographics, community assets and resources, households and housing, population projections, economy, climate, geography, and geology and natural resources. This background will provide valuable information when preparing later sections of the ISWMP and to inform readers of the needs in the local community service area. Defining the current and projected extended community that may be served by the program is important to better address current and future solid waste needs. Educational and cultural traditions in many communities can be used to the advantage of the solid waste management program by increasing awareness, pride, and community involvement to maintain a successful program.

Information about the number and location of households and housing clusters can be used as a basis for predicting rates of waste generation, assessing proposed alternatives, developing the fee structure, and predicting revenue. Population projections and related waste generation rates can be used to estimate the lifespan of available disposal facilities and to predict future needs of the solid waste program. Details about the local economy can be used to assess community-specific economic needs and to predict the specific solid waste needs of industrial generators. Information about local climate conditions may determine the feasibility of waste collection, storage, transfer, and disposal plans. Geographical features may limit final disposal options and dictate special needs of the solid waste program. Finally, information about the geological and engineering properties of the surface and subsurface is particularly important when considering landfill site selection, closure of existing dumps, and economic feasibility studies.

### **2. Description of the Tribe's solid waste program structure administration**

Details about the program administration and management will provide a basis for decisions about long-term management plans and will clarify necessary improvements to maintain a successful solid waste program. A description of codes and ordinances and details about related enforcement policies are important in maintaining compliance.

### **3. Description of the Tribe's current and proposed waste management practices**

This section describes the current and proposed waste management practices in detail to assess strengths and weaknesses of existing and proposed practices. Current waste management practices should include information about: current waste generators; the amount and composition of waste generated; estimated future waste generation growth rates; unmanaged waste sites; collection, transfer and disposal of household, special, and hazardous waste; waste reduction practices; and descriptions of facilities, regional infrastructure, and current partnerships. Presenting the current waste management practices in detail will clarify the elements of the existing program that are successful and any that should be improved in the future. Proposed waste management practices should include information about: special considerations, limitations, and inefficiencies of the

## The Five Elements of a Tribal Integrated Waste Management Plan

current program; equipment and facility needs; a detailed alternatives analysis, including information about the cost and feasibility of the alternatives considered; and details about proposed waste management, including information about collection, transfer, disposal, special and hazardous waste, waste reduction, potential partnerships, compliance and enforcement, community education, and implementation. Presenting the proposed waste management practices in detail will clarify the aspects of the considered alternatives that are the most beneficial to the solid waste program. Presenting information about the proposed partnerships, enforcement policies, community education and implementation will provide governing bodies and potential funding sources with evidence that the plan is well thought out and likely to be successful.

### **4. Description of the funding and sustainability and the long-term goals of the Tribe's solid waste program**

This section describes the financial implementation and long-term goals and strategies to provide a basis for fee structure and for requesting financial assistance. This section should also provide evidence that the solid waste management program is capable of effectively supplying service to the community. A description of the sustainability and long-term goals of the solid waste management program demonstrates a commitment to improving services beyond basic compliance.

### **5. Demonstration of approval of the plan by appropriate governing body**

Demonstrate how and when the plan was approved or acknowledged and by what entity. Ideally, approval or acknowledgement would be by Tribal Council Resolution.

## **APPENDIX B**

### **Waste Surveys**



# THE NAVAJO NATION

RUSSELL BEGAYE **PRESIDENT**  
JONATHAN NEZ **VICE PRESIDENT**

September 28, 2015

CHAVEZ JOHN,  
Acting Division Director

DIVISION OF  
COMMUNITY  
DEVELOPMENT

PO Box 1904  
Window Rock, AZ  
86515

PH: 505.371.8466  
Fax: 505.371.8472

WEBSITES:  
NNDCD.org  
NavajoChapters.org

*Mission:  
Provide  
opportunities for the  
Navajo communities  
to be self-governing  
and self-sufficient.*

TO: Navajo Nation Chapters

FROM:   
Chavez John, Acting Division Director  
Division of Community Development

SUBJECT: Solid Waste Data

The Navajo Nation's Solid Waste Management Program within the Division of Community Development is developing a Long-Range Comprehensive Solid Waste Management Plan for the Navajo Nation. Zia Engineering & Environmental Consultants, LLC, has been retained to write the Plan. The purpose of the Plan is to examine methods of handling the solid waste we generate that are operationally efficient, economically cost-effective, and environmentally beneficial.

In this regard we are officially requesting of your respective chapter, any and all data concerning the items and questions listed below that your chapter has records of; if possible, please provide data for an entire calendar or fiscal year.

1. Name and contact information for person providing data.
2. How is refuse collected in your chapter? Does the chapter have a transfer station/ convenience center? A pick-up service? Both?
3. What private companies and/or public agencies are involved in collecting, transporting, and disposing of waste?
4. Do you have a contract(s) for any of these functions and if so with who? Please provide copy of contract(s).
5. Where is the waste taken after it is removed from the chapter?
6. How many tons of waste are disposed of by the chapter on a monthly or annual basis?
7. What are the costs for collecting, transporting, and disposing of refuse from the chapter?

Provide your data to Mr. Richard Hertzberg, Senior Project Manager, Zia Engineering & Environmental Consultants, LLC, by email at [rhertzbg@aol.com](mailto:rhertzbg@aol.com) or [rhertzberg777@gmail.com](mailto:rhertzberg777@gmail.com)

and carbon copy your data to James Benally, SES, Solid Waste Management Program, at [jb.toda@nnswwmp.org](mailto:jb.toda@nnswwmp.org).

As such, the Division of Community Development and Solid Waste Management Program, respectively requests your assistance and cooperation to provide the requested data. Should your chapter have any concerns or questions, direct them to Solid Waste Management Program at (928) 871-6309 or by email to Mr. Benally's above email address. The Division of Community Development and Solid Waste Management Program appreciates your assistance and cooperation.

xc: Files

---

**October 2, 2015**

**To: Solid Waste Haulers Servicing the Navajo Nation (NN)**

**From: Chris Bell / Zia Engineering & Environmental Consultants**

**Subject: Data / Information Requests for Solid Waste Plan**

The Navajo Nation Division of Community Development has retained Zia Engineering & Environmental Consultants (Zia) to assist with development of a Long-Range Comprehensive / Integrated Solid Waste Management Plan (Plan). The purpose of the Plan is to examine solid waste management options that are operationally efficient, economically cost-effective, and environmentally beneficial for the NN.

The initial part of the planning process is to determine where waste is generated, consolidated, transported, and disposed along with the quantities of material associated with these activities. The Zia Project Team needs to determine the amounts of waste disposed; where most of that material is coming from (Agency, Chapter, community / municipality); how refuse is handled (collection service, convenience center, transfer station); and which landfills are being used for disposal of waste generated within the NN.

We need your help in order to understand and document the flow of waste from inside the NN to respective landfills. Therefore, we are requesting your input to the questions listed below to support preparation of the NN Solid Waste Plan. Please provide answers in writing to Chris Bell at [chris@bell-cpa.com](mailto:chris@bell-cpa.com) or via phone call at 360 / 210-4344.

1. What is the annual waste tons collected by your company for the most recent 12-month period (either calendar or fiscal year)?
2. How many tons were collected from:
  - a. Residential collection routes (using cans / carts)
  - b. Commercial collection routes (using bins / other containers)
  - c. Convenience centers / drop-off sites
3. What transfer stations and / or landfills do you use for disposal of NN refuse?
  - a. How many tons were delivered to each during the most recent 12-month period?
4. If transfer stations were constructed in the NN, what locations would you recommend and why?

5. How many Chapters that you work with have convenience centers / drop-off sites and which ones are they?
6. How many residential customers do you currently provide with waste collection services?
7. Do you have a standard rate schedule for service and if so would you be willing to provide a copy?
8. How many housing areas / locations are currently receiving weekly collection?
  - a. How many housing locations or customers have roll carts?
9. Do you provide curbside waste collection to rural areas other than the housing areas and if so where?
  - a. What is the frequency of collection – weekly, every-other-week, or other?
10. How many commercial customers subscribe to waste collection services?

**Your cooperation is appreciated, and feel free to contact Chris Bell with any questions or concerns regarding this questionnaire.**

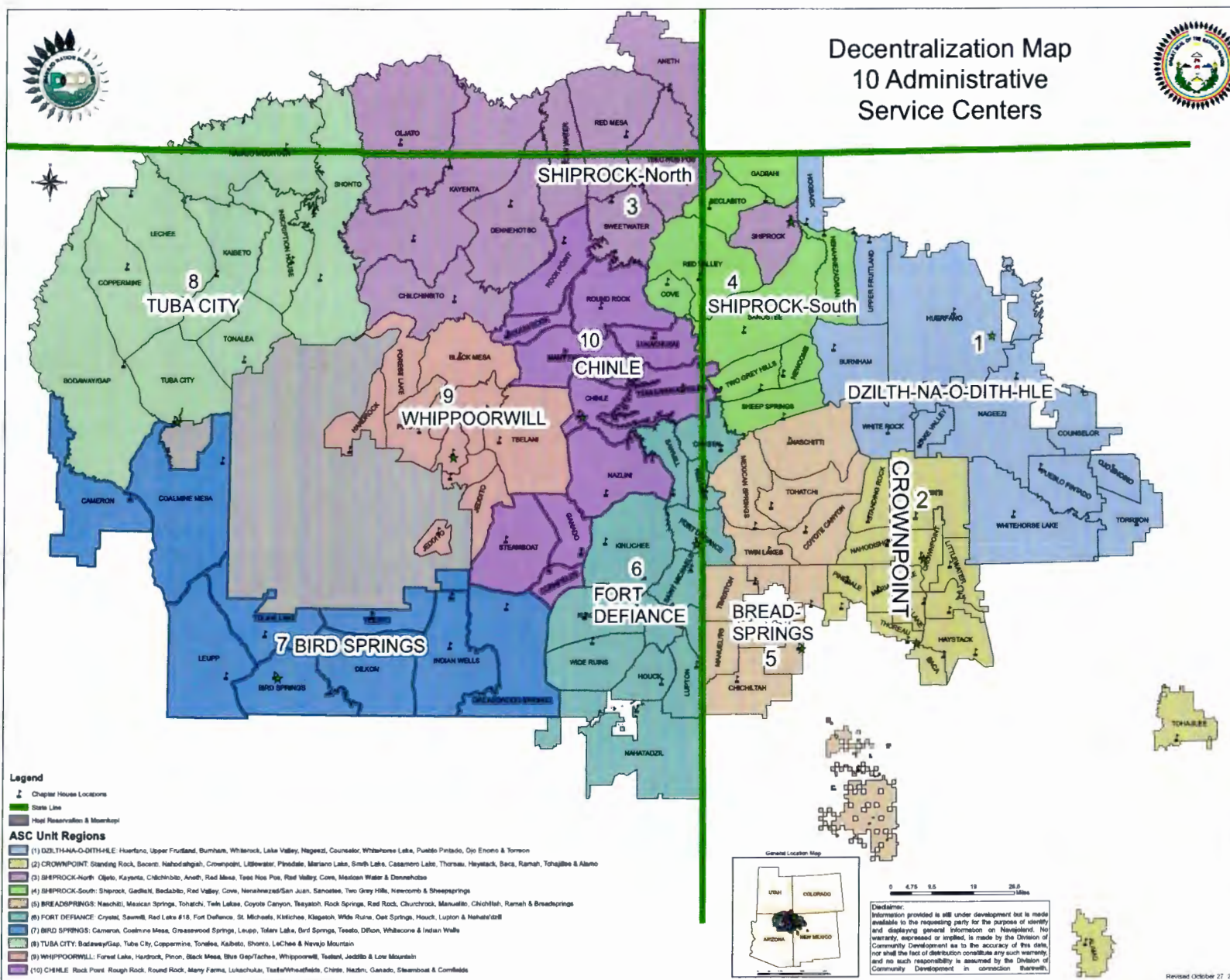


## **APPENDIX C**

### **Administrative Service Centers (ASCs) Map**



## Decentralization Map 10 Administrative Service Centers



## **APPENDIX E**

### **Navajo Nation Outreach Materials Brochures**

April 2015

**THE NAVAJO NATION ENVIRONMENTAL PROTECTION AGENCY**  
P. O. Box 339, Window Rock, Arizona 86515 ■ Telephone: (928) 871-7751 ■ Fax: (928) 871-7818  
[www.navajonationepa.org](http://www.navajonationepa.org) / [www.azdeq.gov](http://www.azdeq.gov) / [www.nmrecycle.org](http://www.nmrecycle.org)

# NO OPEN DUMPING ALLOWED

## NAVAJO NATION SOLID WASTE ACT, SECTION 204

### USE A TRANSFER STATION, CONVENIENCE BIN, OR A PERMITTED LANDFILL.

TRANSFER STATION LOCATIONS:		CONVENIENCE BINS AT CHAPTER HOUSES:	
Alamo, NM	Leupp, AZ	Baca/Prewitt, NM	Manuelito, NM
Bluehills (Sanders, AZ)	Nenahnezad, NM	Becabito, NM	Nahata Dził, AZ
Bodaway/Gap, AZ	Pinehill, NM	Blue Gap/Tachee, AZ	Ojo Encino, NM
Breadsprings, NM*	Pinon, AZ	Cornfields, AZ	Red Valley, AZ
Chinle, AZ	Ramah, NM	Crystal, NM	Shonto, AZ
Coppermine (Page, AZ)	Sand Springs (Bumham, NM)	Dennehotso, AZ	Standing Rock, NM
Coyote Canyon, NM	Shiprock, NM	Dilkon, AZ	Steamboat, AZ
Crownpoint, NM	Tohajilee, NM	Greasewood Springs, AZ	Teesto, AZ
Fort Defiance, AZ*	Tohatchi, NM	Houck, AZ	Tolani Lake, AZ
Gallup, NM (McKinley County)	Tonalea, AZ	Indian Wells, AZ	Twin Lakes, NM
Ganado, AZ	Tuba City, AZ	Jeddito, AZ	Wheatfields, AZ
Huerfano (Dzili-na-o-dilthle), NM	Upper Fruitland, NM	Kinlichee, AZ	Whitehorse Lake, NM
Kaibeto, AZ	Waterflow, NM	Little Water, NM	<b>NOTE: LOCATIONS CAN CHANGE CAMERON CLOSED, USE TUBA CITY OR FLAGSTAFF LANDFILL.</b>
Kayenta, AZ	Whiterock, NM	Lukachukai, AZ	
Lake Valley, NM		Lupton, AZ	
PERMITTED LANDFILL AUTHORIZED BY STATE (BULKY WASTE OR LARGE VOLUMES OF WASTE):			
Blue Hills LF, St. Johns, AZ (928) 337-4019		Red Rocks Regional LF, Thoreau, NM (505) 905-8400	
Cinder Lakes LF, Flagstaff, AZ (928) 527-1927		Sandoval County LF, Rio Rancho, NM (505) 867-0816	
Crouch Mesa LF, Aztec, NM (505) 334-1121		Socorro County LF, Socorro, NM (575) 418-7706	
Montezuma County LF, Cortez, CO (970) 565-9858		White Mesa LF, Bluff, UT (435) 678-3070	
Painted Desert LF, Joseph City, AZ (*) (928) 454-2045		(*) Commercial Solid Waste Haulers Only	

### IT'S NAVAJO NATION LAW

#### NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 2, PROHIBITED ACTS:

##### SECTION 201. Disposal, Collection, Transporting, Processing: It shall be unlawful for any person to:

- Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance;
- Dispose of any solid waste in a place other than a facility which is in compliance with these [Solid Waste] Regulations and other applicable laws.

##### SECTION 204: Open Dumping:

- All open dumping shall be prohibited.

##### Pursuant to the NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 503, JUDICIAL ENFORCEMENT:

- **Civil penalties:** A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- **Criminal penalties:** Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or imprisonment for not more than 180 days per violation or both.

- PLEASE **DO NOT BURN** TRASH, REPORT ALL OPEN BURNING TO NAVAJO NATION EPA, AIR QUALITY PROGRAM AT (928) 729-4096

- PLEASE **DO NOT DUMP** INTO A WATERWAY, REPORT DUMPING INTO A WATERWAY TO NAVAJO NATION EPA, WATER QUALITY PROGRAM AT (928) 871-7185

**REPORT ILLEGAL OPEN DUMPING (928) 871-7751 OR FAX INFORMATION TO (928) 871-7818**

[www.navajonationepa.org](http://www.navajonationepa.org)



April 2015

**REPORT ILLEGAL OPEN DUMPING (928) 871-7751 OR FAX INFORMATION TO (928) 871-7818**

# **TRASH SAFETY TIPS**

**Potential Roadway Hazards to Avoid and Using Common Sense**



- |                                            |                                   |
|--------------------------------------------|-----------------------------------|
| 1. Sharp Objects                           | 11. Containers with bodily fluids |
| 2. Reptiles (Listen, Look, and Avoid)      | 12. Sick animals/rodents          |
| 3. Animals that could attack               | 13. Insects that bite or sting    |
| 4. Uneven ground or rodent holes           | 14. Traffic                       |
| 5. Weight of object, use your legs to lift | 15. Harmful plants like cactus    |
| 6. Medical waste                           | 16. Moldy waste                   |
| 7. Car batteries (Acid content)            | 17. Broken glass                  |
| 8. Ammonia or Clorox bottles w/ fluids     | 18. Rusty tin cans, nails, etc.   |
| 9. Animal droppings                        | 19. Other roadway waste           |
| 10. Barbed wire fences                     |                                   |

## Alamo Chapter:



"Just Say NO to Open Dumping."

Isolation is felt to be the main drawback on the Alamo Navajo reservation. This has impacted on education and socioeconomic conditions of the reservation and created gaps between Alamo and the main Navajo Reservation, which is situated 220 miles southeast of the Navajo Nation capitol of Window Rock. It is 30 miles from the border town of Magdalena, New Mexico, a town of about 861 people.

The nearest largest city is Socorro, New Mexico, 57 miles to the southeast. Socorro had a population of 8,159 according to the 1990 census; it serves as the county seat of Socorro County. The reservation is generally semi-arid, rangeland, some rolling hills, badlands, volcanic rock formations, and mountains.

The Alamo Chapter conducts monthly meetings to keep Residents formed; residents have a forum to express their Opinions to their Navajo Nation Council Delegate or to decide on Matters concerning their chapter.

"Servicing the Governmental Needs of the Alamo Chapter residents."

**Illegal open dumping** should be reported to Navajo Nation Environmental Protection Agency, Resource Conservation & Recovery Program at (928) 871-7751.

**Open burning** should be reported to the NNEPA, Air Quality Program at (928) 729-4156/4096.

### IT'S NAVAJO NATION LAW

#### NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 2, PROHIBITED ACTS:

SECTION 201. Disposal, Collection, Transporting, Processing: It shall be unlawful for any person to:

- > Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance;
- > Dispose of any solid waste in a place other than a facility which is in compliance with these [Solid Waste] Regulations and other applicable laws.

#### SECTION 204: Open Dumping:

- > All open dumping shall be prohibited.

Pursuant to the NAVAJO NATION SOLID WASTE ACT,

#### SUBCHAPTER 503, JUDICIAL ENFORCEMENT:

- > **Civil penalties:** A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- > **Criminal penalties:** Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or

## Alamo Chapter

### ALAMO

### CONVENIENCE CENTER



**Open 5 Days/Week  
(Daytime is Best)**

ALAMO CHAPTER  
P. O. Box 827  
Magdalena, New Mexico 87825  
(575) 854-2686  
FAX: (575) 854-2685

## KEEPING IT CLEAN!



If the Alamo Chapter House Convenience Center is not open please use the Sandoval County Landfill:  
Sandoval County Landfill and Composting Facility  
2708 Iris Rd NE, Rio Rancho, NM

-Hours of operation are Monday through Saturday, 8:00 a.m. to 4:00 p.m., closed Sundays and most holidays.  
-Hand Loads larger than a standard pickup truck, must be in the gate before 3:30 pm or will need to bring it back the next working day, this includes all trailers, no exceptions, due to time restraints of our normal operating hours.  
May stop operations during high winds, rain or snow.

### Materials accepted at the landfill:

Residential and Construction & Demolition waste (no asbestos, must provide copy of document of inspection if building was built prior to 1980).

Fee Schedule

Sandoval County Landfill & Composting Facility

### Rates or Tipping Fees:

Pick-up size load, bed level \$4.75 per load County residents. \$5.25 for non-County residents.  
Loads over bed level and up to cab level \$9.50 County residents. \$10.50 non-County residents.  
Loads larger or in trailer are \$24 per ton County residents. \$25 per ton non-County residents.  
Residential Waste, \$0.50 per bag, maximum of 4 bags. concrete larger than 2x2 is \$29 per ton County residents. \$30 per ton non-County residents.  
Composting: Green waste, branches, leaves, grass clippings, plants, and manure.  
Rates are pick-up size load \$3.25 for County residents. \$3.75 for non-County residents.  
Loads over pick-up size are \$17 per ton County residents. \$18 per ton non-County residents.  
Tree trunks & stumps special handling rate \$37 per ton County residents, \$38 per ton non-County residents.  
Compost and Mulch (wood chips) – Fees apply.

Other fees do apply, see listing at site.

All loads must be tarped, an additional no tarp fee will be added: \$5 residential, \$20 Commercial.

## WASTE NOT ACCEPTED:

- **No** Dead Animals
- **No** Hot Ash Barrels
- **No** Waste Tires
- **No** Hazardous Waste
- **No** Medical Waste

## Permitted Landfills:

- ❖ Blue Hills LF, St. Johns, AZ; call (928) 337-4019
- ❖ Cinder Lakes LF, Flagstaff, AZ; call (928) 527-1927
- ❖ Painted Desert LF, Joseph City, AZ (\*); call (928) 454-2045 (\*) Commercial Solid Waste Haulers Only
- ❖ Crouch Mesa LF, Aztec, NM; call (505) 334-1121
- ❖ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400



**Disposal:** All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible. The metal in a box spring mattress is scrap metal.

- ❖ Sandoval County LF, Rio Rancho, NM; call (505) 867-0816
- ❖ Socorro County LF, Socorro, NM; call (575) 418-7706
- ❖ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ❖ White Mesa LF, Bluff, UT; call (435) 678-3070

## Other Transfer/Center Stations:

- ❖ Cuba - Collection or convenience station is located at 51 Southern All-Around Road, Cuba, New Mexico
- ❖ Canon - Collection or convenience station is located at 118 Hwy 4, Canon, NM
- ❖ Pena Blanca Collection or convenience station is located at 22 Camino de Comunida, Pena Blanca, NM

## ALAMO CHAPTER OFFICIALS:

Mr. Stanley Herrera-President

Mr. Earl Apachito-Vice President

Miss Veronica Smith-Secretary/Treasure

Mr. Steve Apachito-Land Board Member

Mr. George Apachito-Council Delegate

Mr. Norman M. Begay-LDA-Representative

E-Mail:[alamo@navajochapters.org](mailto:alamo@navajochapters.org)

## Kayenta Chapter:



"Just Say NO to Open Dumping."

All trash issues are the responsibility of the person who purchases any item that will be thrown away after its use.

Arizona State law has requirements for throwing away medical waste and tires. Please bend syringe needles, and place into a thick plastic jug then mark **DO NOT RECYCLE** on it and tape the top close. You can throw away at a transfer station.

Coconino County will take tires in Flagstaff.

Report Open Dumping to Navajo Nation EPA at (928) 871-7751.

### IT'S NAVAJO NATION LAW

#### NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 2, PROHIBITED ACTS:

**SECTION 201. Disposal, Collection, Transporting, Processing:** It shall be unlawful for any person to:

- Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance;
- Dispose of any solid waste in a place other than a facility which is in compliance with these [Solid Waste] Regulations and other applicable laws.

#### **SECTION 204: Open Dumping:**

- All open dumping shall be prohibited.

Pursuant to the NAVAJO NATION SOLID WASTE ACT,

#### **SUBCHAPTER 503, JUDICIAL ENFORCEMENT:**

- **Civil penalties:** A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- **Criminal penalties:** Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or

## KAYENTA CHAPTER

### KAYENTA TOWNSHIP TRANSFER STATION



**Open 5 Days/Week  
(Daytime is Best)**

The Kayenta Township  
P. O. Box 1490  
Kayenta, Arizona 86033  
(928) 697 - 8451  
FAX: (928) 697 - 8461



## KEEPING IT CLEAN!

### Kayenta Chapter:

The Kayenta Township operates the Kayenta Transfer Station for area residents to use.

The following information is to inform those individual using the facility of fees, hours of operations, allowed and disallowed items at this facility. This will be strictly enforced:

#### Fees for Residential Trash

Extra Small Bags shopping bag size	.25
Small Bags 13 gallon. Tall Kitchen Bag	.50
Large Bags 33 gallon	.75
Extra Large Bags 50 gallons	\$1.00
Loose Trash	
Small Pick-up Bed-Level Small Pick-up Bed-Level	\$5.00
Small Pick-up Bed Heaped	\$6.00
Short Bed Regular Pick Up Level	\$7.00
Short Bed Regular Pick Up Heaped	\$8.00
Long Bed Regular Pick Up Level	\$9.00
Long Beg Regular Pick Up Heaped	\$10.00
Flat Bed Level	\$10.00
Flat Bed Heaped	\$11.00
Barrels of Ash	
Barrel of Ash or Burnt Trash ♦ 50 Gallons	\$2.00
All Tires (Limit of 4 Tires)	\$2.00 each

#### OUR NEW BIN RENTAL RATES:

1. 40 CUBIC YARD OPEN BINS @ \$648.00 / PULL
2. 20 CUBIC YARD OPEN BINS @ \$473.00 / PULL
3. 8 CUBIC YARD BINS @ \$56.00 / PULL
4. USED OIL @ \$ .50 A GALLON \*EPA LICENSED\*

EPA # NNR000122358 (Accepted at Transfer

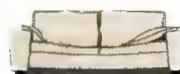
Station.)

### WASTE NOT ACCEPTED:

- **No** Dead Animals
- **No** Hot Ash
- **No** Waste Tires
- **No** Hazardous Waste
- **No** Medical Waste
- **No** Commercial or Business Waste

### Permitted Landfills:

- ♦ Blue Hills LF, St. Johns, AZ; call (928) 337-4019
- ♦ Cinder Lakes LF, Flagstaff, AZ; call (928) 527-1927
- ♦ Painted Desert LF, Joseph City, AZ (\*); call (928) 454-2045 (\*) Commercial Solid Waste Haulers Only
- ♦ Crouch Mesa LF, Aztec, NM; call



**Disposal:** All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible.

(505) 334-1121

- ♦ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400
- ♦ Sandoval County LF, Rio Rancho, NM; call (505) 867-0816
- ♦ Socorro County LF, Socorro, NM; call (575) 418-7706
- ♦ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ♦ White Mesa LF, Bluff, UT; call (435) 678-3070

### Other Transfer Stations:

- ♦ Coppermine Transfer Station, Page, AZ
- ♦ Tuba City Transfer Station, Tuba City, AZ

### CHAPTER OFFICIALS:

**Stanley Clitso, President**

**Sally Choe, Vice-President**

**DeLight Butler, Secretary/Treasurer**

**Albert Page Tinhorn, Chapter Manager**

**Mariah City, Administrative Assistant**

**Town Manager**

**Chris Burnside, Public Information Officer**

**Boaz Blair, Transfer Station Operator**

**Kayenta Township, P. O. Box 1490, Kayenta, AZ 86033 – (928) 697-8451**

## Newcomb Chapter:



"Just Say NO to Open Dumping."

All trash issues are the responsibility of the person who purchases any item that will be thrown away after its use.

New Mexico State law has requirements for throwing away medical syringes and tires. Please bend syringe needles, and place into a thick plastic jug then mark DO NOT RECYCLE on it and tape the top close. You can throw away at a transfer station.

Crouch Mesa landfill takes tires for a small fee per tire.

**If you have questions on any of San Juan County's transfer or convenience centers operation, please call San Juan County Solid Waste Department at (505) 334-4523.**

Report Open Dumping to Navajo Nation EPA at (928) 871-7751.

### IT'S NAVAJO NATION LAW

#### NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 2, PROHIBITED ACTS:

SECTION 201. Disposal, Collection, Transporting, Processing: It shall be unlawful for any person to:

- > Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance;
- > Dispose of any solid waste in a place other than a facility which is in compliance with these [Solid Waste] Regulations and other applicable laws.

#### SECTION 204: Open Dumping:

- > All open dumping shall be prohibited.

Pursuant to the NAVAJO NATION SOLID WASTE ACT,

#### SUBCHAPTER 503, JUDICIAL ENFORCEMENT:

- > **Civil penalties:** A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- > **Criminal penalties:** Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or

## T'iis Nideeshgizh Chapter

### SAND SPRINGS

### CONVENIENCE STATION



**Open 5 Days/Week  
(Daytime is Best)**

**NEWCOMB CHAPTER**

P.O. Box 7946

Newcomb, NM 87455

Phone: (505) 696-3300/3436

Fax: (505) 696-5475

## KEEPING IT CLEAN!



### Sand Springs Convenience Station

Corner of N5 and Hwy 419

Open: 9:00am - 5:00pm Tuesday through Saturday

Closed: Sunday and Monday

The following information is to inform those individual using the facility. This will be strictly enforced:

#### ALLOWED:

Household trash (waste), weeds, cans, glass, cardboard, glass, clothes, paper, aluminum, steel, plastics, small tree branches, and lumber

#### DISALLOWED:

Liquid, toxic, medical, hot ash barrels, grease, pesticides, paint, car/truck batteries, dead animals, antifreeze, appliances with freezer, waste oil

**“NO OPEN DUMPING”**

### WASTE NOT ACCEPTED:

- **No** Dead Animals
- **No** Hot Ash Barrels
- **No** Waste Tires
- **No** Hazardous Waste
- **No** Medical Waste
- **No** Commercial or Business Waste

### Permitted Landfills:

- ❖ Blue Hills LF, St. Johns, AZ; call (928) 337-4019
- ❖ Cinder Lakes LF, Flagstaff, AZ; call (928) 527-1927
- ❖ Painted Desert LF, Joseph City, AZ (\*); call (928) 454-2045 (\*) Commercial Solid Waste Haulers Only
- ❖ Crouch Mesa LF, Aztec, NM; call



**Disposal:** All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible. The metal in a box spring mattress is scrap metal.

(505) 334-1121

- ❖ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400
- ❖ Sandoval County LF, Rio Rancho, NM; call (505) 867-0816
- ❖ Socorro County LF, Socorro, NM; call (575) 418-7706
- ❖ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ❖ White Mesa LF, Bluff, UT; call (435) 678-3070

### Other Transfer/Center Stations:

- ❖ Hilltop, #28 CR 7100, 10 S of Bloomfield
- ❖ Huerfano, 12574 Hwy 550, Huerfano
- ❖ Kirtland, 141 Cty Rd 550, Kirtland
- ❖ LaPlata, \$5 Cty Rd 6500, Farmington
- ❖ Shiprock, NM Hwy 491 North, Shiprock
- ❖ Upper Fruitland, 3 miles S of Nenahnezad
- ❖ Waterflow, 3574 Hwy 64

### CHAPTER OFFICIALS:

#### Chapter Officials:

David Randolph, Sr., President  
Irving Gleason, Vice President  
Donna Benally, Secretary-Treasurer  
Lawrence Gould, Grazing Member  
LoRenzo Bates, Council Delegate

#### Administration:

Lawrence John, Manager  
Janice Padilla, Administrative Assistant

**NOTE:** If you have questions on any of San Juan County's transfer or convenience centers operation, please call San Juan County Solid Waste Department at (505) 334-4523.

## Oljato Chapter:



"Just Say NO to Open Dumping."

All trash issues are the responsibility of the person who purchases any item that will be thrown away after its use.

Arizona State law has requirements for throwing away medical waste and tires. Please bend syringe needles, and place into a thick plastic jug then mark **DO NOT RECYCLE** on it and tape the top close. You can throw away at a transfer station.

Coconino County will take tires in Flagstaff.

Report Open Dumping to Navajo Nation EPA at (928) 871-7751.

### IT'S NAVAJO NATION LAW

#### NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 2, PROHIBITED ACTS:

SECTION 201. Disposal, Collection, Transporting, Processing: It shall be unlawful for any person to:

- Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance;
- Dispose of any solid waste in a place other than a facility which is in compliance with these [Solid Waste] Regulations and other applicable laws.

#### SECTION 204: Open Dumping:

- All open dumping shall be prohibited.

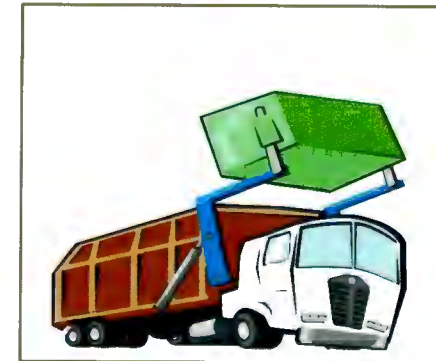
Pursuant to the NAVAJO NATION SOLID WASTE ACT,

#### SUBCHAPTER 503, JUDICIAL ENFORCEMENT:

- Civil penalties: A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- Criminal penalties: Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or

## OLJATO CHAPTER

### KAYENTA TOWNSHIP TRANSFER STATION



**Open 5 Days/Week  
(Daytime is Best)**

The Kayenta Township  
P. O. Box 1490  
Kayenta, Arizona 86033  
(928) 697 - 8451  
FAX: (928) 697 - 8461



## KEEPING IT CLEAN!

**Ojajato Chapter: The Kayenta Township operates the Kayenta - Hours of Operation:**

Monday Friday 8:00 am to 5:00 pm

Saturday 12:00 pm to 5:00 pm

Holiday Schedule: Trash Pick Up

Compactor/Transfer Station Community Awareness

The following information is to inform those individual using the facility of fees, hours of operations, allowed and disallowed items at this facility. This will be strictly enforced:

### Kayenta Township Transfer Station Residential Rates

Residential trash:

Extra Small Bags- Shopping Bag Size: \$.50

Small Bags- 13 Gallon and Tall Kitchen Bags: \$1.00

Large Bags- 33 Gallon: \$1.50

Extra Large Bags-50 Gallon: \$2.00

Loose Trash:

Small Bed Pick Up Level: \$6.25

Small Bed Pick Up Heaped: \$7.50

Short Bed Regular Pick Up Level: \$8.75

Short Bed Regular Pick Up Level Heaped: \$10.00

Long Bed Regular Pick Up Level: \$11.25

Long Bed Regular Pick Up Level Heaped: \$12.50

Flat Bed-Level: \$12.50

Flat Bed-Heaped: \$13.50

Construction Waste and Refuse/Per Cubic Yard: \$20.50

**Other:**

1/2 Barrel of Ash: \$1.25

Barrel of Ash: \$2.50

Stove: \$10.00

Dryer: \$10.00

Washer: \$11.25

Battery: \$1.25

Tires: \$2.50

Water Heater 7 to 10 Gallons: \$5.00

Water Heater 30 to 40 Gallons: \$7.50

Swamp Cooler-Small: \$ 5.00

Swamp Cooler-Large: \$ 7.50

Bath Tub-Plastic: \$6.25

Bath Tub-Steel: \$18.75

Sink/Toilet: \$5.00

Refrigerator: w/o Freon: \$12.50

Refrigerator with Freon: \$62.50

Mattress or Box Spring (Twin): \$1.25

Mattress or Box Spring (Full, Queen, King): \$2.50

Small Couch: \$1.50

Large Couch: \$2.50

Used Motor Oil/Per Gallon: \$.50

**\*Cubic Yards will be determined by measuring or Truck Bed\***

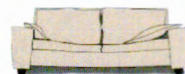
**Note:** Residential and Industrial Trash collection fees and rates subject to change without notice.

## WASTE NOT ACCEPTED:

- **No** Dead Animals
- **No** Hot Ash
- **No** Waste Tires
- **No** Hazardous Waste
- **No** Medical Waste
- **No** Commercial or Business Waste

## Permitted Landfills:

- ❖ Blue Hills LF, St. Johns, AZ; call (928) 337-4019
- ❖ Cinder Lakes LF, Flagstaff, AZ; call (928) 527-1927
- ❖ Painted Desert LF, Joseph City, AZ (\*); call (928) 454-2045 (\*) Commercial Solid Waste Haulers Only
- ❖ Crouch Mesa LF, Aztec, NM; call



**Disposal: All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible.**

- (505) 334-1121
- ❖ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400
- ❖ Sandoval County LF, Rio Rancho, NM; call (505) 867-0816
- ❖ Socorro County LF, Socorro, NM; call (575) 418-7706
- ❖ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ❖ White Mesa LF, Bluff, UT; call (435) 678-3070

## Other Transfer Stations:

- ❖ Coppermine Transfer Station, Page, AZ
- ❖ Tuba City Transfer Station, Tuba City, AZ

### CHAPTER OFFICIALS:

Vacant, Chapter President

Albert Holiday, Vice-President

LaNell Menard-Parrish,  
Secretary/Treasurer

Benedict Daniels, Grazing  
Representative

## Pinedale Chapter:



"Just Say NO to Open Dumping."

All trash issues are the responsibility of the person who purchases any item that will be thrown away after its use.

New Mexico State law has requirements for throwing away medical syringes and tires. Please bend syringe needles, and place into a thick plastic jug then mark DO NOT RECYCLE on it and tape the top close. You can throw away at a transfer station.

Red Rock Regional landfill, Thoreau, NM is the closest permitted landfill to Pinedale, and they charge a tipping fee for disposal. The landfill is operated by the New Mexico Solid Waste Regional Authority.

Report Open Dumping to Navajo Nation EPA at (928) 871-7751.

### IT'S NAVAJO NATION LAW

#### NAVAJO NATION SOLID WASTE ACT, SUBCHAPTER 2, PROHIBITED ACTS:

SECTION 201. Disposal, Collection, Transporting, Processing: It shall be unlawful for any person to:

- Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance;
- Dispose of any solid waste in a place other than a facility which is in compliance with these [Solid Waste] Regulations and other applicable laws.

#### SECTION 204: Open Dumping:

- All open dumping shall be prohibited.

Pursuant to the NAVAJO NATION SOLID WASTE ACT,

#### SUBCHAPTER 503, JUDICIAL ENFORCEMENT:

- Civil penalties: A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- Criminal penalties: Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or

## To Beehwiisgani Chapter

### GALLUP TRANSFER STATION



**Open 5 Days/Week  
(Daytime is Best)**

#### PINEDALE CHAPTER

P. O. Box 3,  
Churchrock, New Mexico 87311  
Phone: (505) 786-2208/2209  
Fax: (505) 786-2211

## KEEPING IT CLEAN!



### McKinley County Transfer Station

107 Hasler Valley Road  
Gallup, NM (505) 863-5776  
Monday thru Saturday 8:00am to 5:00pm (last load 4:30)  
Closed Sunday

Here's what you can take to the Transfer Station:

**ALUMINUM:** cans as well as (clean) baking pans and foil; NO food residue, please!

**CARDBOARD:** corrugated only. We also accept brown paper (shopping bags, etc.); no waxed cardboard or other paper.

**PAPER:** white & color paper, mail, catalogues, magazines, shredded paper, soft bound books, phone books, paperboard (floppy, pressed material-cereal boxes, paper towel rolls).

**PLASTICS:** # 1 & # 2 plastic bottles with necks only. Labels are okay, please remove caps- NO food or oil (or other) residue, please!

**STEEL/TIN CANS:** labels are okay, but NO food (or other) residue, please.

**ELECTRONIC WASTE:** Computer servers, flat-screen monitors, printers, scanners, copiers, fax machines, phones, microwaves, computer mice, keyboards & small appliances.

### WASTE NOT ACCEPTED:

- **No** Dead Animals
- **No** Hot Ash Barrels
- **No** Waste Tires
- **No** Hazardous Waste
- **No** Medical Waste
- **No** Commercial or Business Waste

### Permitted Landfills:

- ❖ Blue Hills LF, St. Johns, AZ; call (928) 337-4019
- ❖ Cinder Lakes LF, Flagstaff, AZ; call (928) 527-1927
- ❖ Painted Desert LF, Joseph City, AZ (\*); call (928) 454-2045 (\*) Commercial Solid Waste Haulers Only
- ❖ Crouch Mesa LF, Aztec, NM; call



**Disposal:** All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible. The metal in a box spring mattress is scrap metal.

- (505) 334-1121
- ❖ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400
- ❖ Sandoval County LF, Rio Rancho, NM; call (505) 867-0816
- ❖ Socorro County LF, Socorro, NM; call (575) 418-7706
- ❖ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ❖ White Mesa LF, Bluff, UT; call (435) 678-3070

### Other Transfer/Center Stations:

- Breadsprings Transfer Station, Highway 602, 14 miles South of Gallup, NM

### CHAPTER OFFICIALS:

#### Chapter Officials:

Willie Norton, President  
Vacant, Vice-President  
Sarah Jackson, Secretary/Treasurer  
William Murphy, Land Board  
Edmund E. Yazzie, Council Delegate

#### Administration:

Angeline Burnside - Community Services

Coordinator

Felicia John - Accounts Maintenance Specialist

**NOTE: Call (505) 863-5776 if you have any questions for the transfer station.**

## Shiprock Chapter Government:



"Just Say NO to Open Dumping."

All trash issues are the responsibility of the person who purchases any item that will be thrown away after its use.

New Mexico State law has requirements for throwing away medical syringes and tires. Please bend syringe needles, and place into a thick plastic jug then mark DO NOT RECYCLE on it and tape the top close. You can throw away at a transfer station.

Crouch Mesa landfill takes tires for a small fee per tire.

**If you have questions on any of San Juan County's transfer or convenience centers operation, please call San Juan County Solid Waste Department at (505) 334-4523.**

Report Open Dumping to Navajo Nation EPA at (928) 871-7751.

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#### SECTION 204: Open Dumping:

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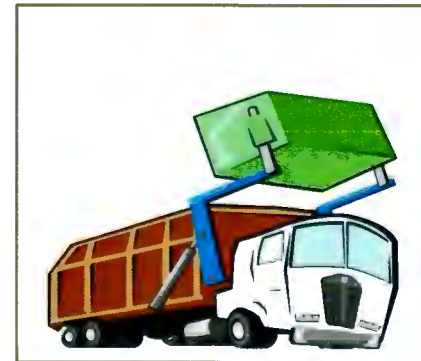
Pursuant to the NAVAJO NATION SOLID WASTE ACT,

#### SUBCHAPTER 503, JUDICIAL ENFORCEMENT:

- Civil penalties: A maximum amount per day per violation of not less than \$500.00 but not to exceed \$25,000.00. Whenever a person has violated, or is in violation of, any provision, requirement or prohibition of this chapter.
- Criminal penalties: Any person who intentionally: Violates any provision, requirement or prohibition of this chapter shall, upon conviction, be punished by a fine in a maximum amount of not less than \$500.00 but not to exceed \$5,000.00 per day per violation or

## Tse'Bit'ai' Chapter

### SAN JUAN COUNTY TRANSFER STATION



**Open 5 Days/Week  
(Daytime is Best)**

**SHIPROCK CHAPTER GOVERNMENT**

P.O. Box 3810

Shiprock, NM 87420

Phone: (505) 368-1081

Fax: (505) 368-1092



## KEEPING IT CLEAN!



### Shiprock Convenience Station

NE Cortez Highway

Shiprock, NM

505-320-0395

Open 8:00am - 6:00pm Monday through Sunday

The following information is to inform those individual using the facility. This will be strictly enforced:

#### ALLOWED:

Household trash (waste), weeds, cans, glass, cardboard, glass, clothes, paper, aluminum, steel, plastics, small tree branches, and lumber

#### DISALLOWED:

Liquid, toxic, medical, hot ashes barrels, grease, pesticides, paint, car/truck batteries, dead animals, antifreeze, appliances with freezer, waste oil

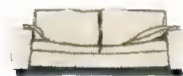
**“NO OPEN DUMPING”**

### WASTE NOT ACCEPTED:

- **No** Dead Animals
- **No** Hot Ash Barrels
- **No** Waste Tires
- **No** Hazardous Waste
- **No** Medical Waste
- **No** Commercial or Business Waste

### Permitted Landfills:

- ❖ Blue Hills LF, St. Johns, AZ; call (928) 337-4019
- ❖ Cinder Lakes LF, Flagstaff, AZ; call (928) 527-1927
- ❖ Painted Desert LF, Joseph City, AZ (\*); call (928) 454-2045 (\*) Commercial Solid Waste Haulers Only
- ❖ Crouch Mesa LF, Aztec, NM; call



**Disposal:** All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible. The metal in a box spring mattress is scrap metal.

(505) 334-1121

- ❖ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400
- ❖ Sandoval County LF, Rio Rancho, NM; call (505) 867-0816
- ❖ Socorro County LF, Socorro, NM; call (575) 418-7706
- ❖ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ❖ White Mesa LF, Bluff, UT; call (435) 678-3070

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- ❖ Huerfano, 12574 Hwy 550, Huerfano
- ❖ Kirtland, 141 Cty Rd 550, Kirtland
- ❖ LaPlata, \$5 Cty Rd 6500, Farmington
- ❖ Sand Springs, Burnham Jct.
- ❖ Upper Fruitland, 3 miles S of Nenahnezad
- ❖ Waterflow, 3574 Hwy 64

### CHAPTER GOVERNMENT OFFICIALS:

**Duane “Chili” Yazzie, President**

**Tommie Yazzie, Vice-President**

**Dr. J. Kaibah Begay, Secretary/ Treasurer**

**Tom Chee, Council Delegate**

**Rory Jaques, Planner**

**Joe Smart Sr., Advisory Committee**

**Eva B. Stokely, Advisory Committee**

**Elizabeth – Advisory Committee**

## Tohajiilee Navajo Chapter:



"Just Say NO to Open Dumping."

Tohajiilee, formerly known as the **Canoncito Indian Reservation**, is a non-contiguous section of the **Navajo Nation** lying in parts of western **Bernalillo**, eastern **Cibola**, and southwestern **Sandoval** counties in the **U.S.** state of **New Mexico**, west of the city of **Albuquerque**. It has a land area of 121.588 square miles (314.911 km<sup>2</sup>) and a **2000 census** population of 1,649 people. The land area is only about 0.5% of the entire Navajo Nation's total. The name comes from the **Navajo** phrase *tó hajiileehé*, meaning "where people draw up water by means of a cord or rope one quantity after another".<sup>[1]</sup>

The Tohajiilee Navajo Chapter was one of three Navajo Chapters, behind Nahata Dził and Ramah, to adopt an Amended Navajo Flag which adds Ramah, Alamo, Tohajiilee, Aneth, and New Lands or Nahata Dził Chapters to the **Navajo Nation Flag** created in 1968. The Chapter voted on September 16, 2014 by a vote of 27-07-02 by a resolution, which was presented by a man from Sanders, Arizona named Marlon Murphy Begay

**Illegal open dumping** should be reported to Navajo Nation Environmental Protection Agency, Resource Conservation & Recovery Program at (928) 871-7751.

**Open burning** should be reported to the NNEPA, Air Quality Program at (928) 729-4156/4096.

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## Tohajiilee Navajo Chapter

### TOHAJIILEE

### CONVENIENCE CENTER



**Open 5 Days/Week  
(Daytime is Best)**

Tohajiilee Navajo Chapter  
P. O. Box 3398  
Tohajiilee, NM 87026  
Telephone: (505) 908-2730/2732  
Fax: (505) 908-2731

## KEEPING IT CLEAN!



Tohajiilee Chapter Navajo Nation

If the Tohajiilee Navajo Chapter House Convenience Center is CLOSED please use the Bernalillo County Landfills operated by Waste Management:

Hours of Operation: Mon-Fri 8:00am-5:00pm

Telephone: (505) 892-1200

- ❖ Rio Rancho landfill, 33<sup>rd</sup> Street & Northern Blvd., Rio Rancho, NM 87124
- ❖ Valencia Regional landfill and Recycling Facility, 1600 Hwy. 6 NW, Los Lunas, NM 87031
- ❖ Waste Management of New Mexico, Belen Transfer Station, Calle Baca, Belen, NM 870022

We accept the following Non-Hazardous Materials at the landfills:

Auto Shredder Fluff  
Bioremediation  
Biosolids  
Construction & Demolition Debris  
Drum Management-Solids  
Industrial & Special Waste,  
Municipal Solid  
Waste, Tires,  
Yard Waste

REPORT ILLEGAL DUMPING TO NNEPA: (928) 871-7751

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- ❖ Red Rocks Regional LF, Thoreau, NM; call (505) 905-8400



**Disposal:** All bulky waste should go to permitted landfills, especially old furniture. Please break down if possible. The metal in a box spring mattress is scrap metal.

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- ❖ Montezuma County LF, Cortez, CO; call (970) 565-9858
- ❖ White Mesa LF, Bluff, UT; call (435) 678-3070

### Other Transfer/Center Stations:

- ❖ Cuba - Collection or convenience station is located at 51 Southern All-Around Road, Cuba, New Mexico
- ❖ Canon - Collection or convenience station is located at 118 Hwy 4, Canon, NM
- ❖ Pena Blanca Collection or convenience station is located at 22 Camino de Comunida, Pena Blanca, NM

### TOHAJIILEE NAVAJO CHAPTER OFFICIALS:

Raymond Secatero, President

John Chavez, Vice President

Virginia Platero, Secretary/Treasurer

Glen Begay, Land Board Member

Norman M. Begay, Council Delegate

Nora J. Morris, Community Service Coordinator

Carol J. Piaso, Account Maintenance Specialist

[tohajiilee.navajochapters.org](http://tohajiilee.navajochapters.org)

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## Tohatchi Chapter

### TOHATCHI

### TRANSFER STATION



**Open 5 Days/Week  
(Daytime is Best)**

**Tohatchi Chapter**  
P.O. Box 1236  
Tohatchi, New Mexico 87325  
Phone: 505 733-2845  
Fax: 505 733-2847



## KEEPING IT CLEAN!



According to the Navajo legend, First Woman and First Man gifted the Chuska Mountains with herbs and medicine. From the time of emergence, the Chuska Mountains provides livelihood for the Dineh; from medicine to food and game, and protection from enemies. Tohatchi was a rendezvous point for the ancient and it is today - for the young and old.

The Tohatchi Chapter conducts meetings monthly to keep residents informed; residents have a forum to express their opinions to their Navajo Nation Council Delegate or to decide on matters concerning their chapter.

"Servicing the Governmental Needs of the Tohatchi Chapter Residents."

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- ❖ Sand Springs, Burnham Jct., Burnham
- ❖ Shiprock, NE Cortez Highway, Shiprock
- ❖ Upper Fruitland, 3 miles S of Nenahnezad
- ❖ Waterflow, 3574 Hwy 64

### TOHATCHI CHAPTER OFFICIALS:

*Herman Morris, President*

*Julie A. Badonie, Vice-President*

*Rosie Jones Deschiney, Secretary/Treasurer*

*Edison D. Jones, Grazing Official*

*Mel R. Begay, Council Delegate*

PRELIMINARY FINAL Navajo Nation  
Solid Waste Management Plan

## **APPENDIX F**

### **Navajo Nation Landfill Analysis**



DRAFT  
NAVAJO NATION LANDFILL ANALYSIS

*June 2016*

# Draft Navajo Nation Landfill Analysis

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## 1.0 MSW Landfill Overview

Federal Subtitle D Solid Waste regulations require modern Municipal Solid Waste (MSW) landfills and Construction and Demolition (C&D) waste landfills to be designed and operated to prevent impacts to air quality, groundwater quality, and surface water quality. This is accomplished by placing MSW and C&D waste into containment areas commonly called cells. These cells are lined with a composite liner system that separates waste placed in the cell from groundwater. The composite liner is covered with a Leachate Collection and Removal System (LCRS) that removes



water that has percolated through the solid waste. The collected leachate must be treated or disposed. In the Southwest's dry climate, disposal by evaporation or recirculation back into the waste is a viable option. As waste is placed into cells, interim and final cover systems are placed over the waste to prevent surface water and rain water from contacting the waste. In some areas, systems are installed to remove landfill gases generated within the waste so that air quality is protected.

The permitting, design, and construction process leading up to eventual operation of a new MSW landfill is complex. The process could include the following steps:

- Selecting a group of potential sites;
- Performing a fatal flaw analysis of the selected site or sites;
- Site characterization including geologic, hydrogeologic and geotechnical investigations;
- Land use permitting such as a conditional and or special use permit;
- Wetlands mitigation permitting, where applicable;
- Air quality permits such as new source performance standards (NSPS) permits and potentially Title V permits;
- Solid waste landfill approvals;
- General conditional use permits for buildings and supporting infrastructure;
- Preparation of construction documents;
- Bidding and award of a construction contract;
- Landfill / facility construction;
- Construction management, construction quality assurance, and construction certification.

## 2.0 Landfill Site Selection

Sites are chosen because of its potential hydrogeologic and geotechnical advantages, which included favorable groundwater conditions and the availability of low permeability soil that could potentially be used for liner material. Both of these considerations are good ones for a new landfill, but they are far from the only considerations. A favorable groundwater protection condition is the highest priority; however, availability of low permeability soil is no longer a key factor due the availability of geosynthetic liner materials such as High Density Polyethylene (HDPE) geomembrane, and Geosynthetic Clay Liners (GCL). These two products, when installed together, comprise a Subtitle D compliant composite liner system that can be constructed virtually anywhere on the Navajo Nation. Therefore site geotechnical issues become much less relevant to the site selection process.



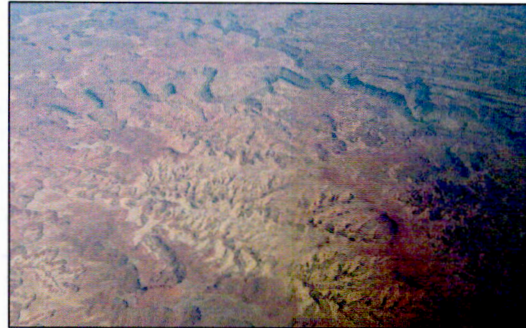
The site selection process can be divided into two general categories; (1) technical, and (2) non-technical. The technical side of the process involves hydrogeologic analysis, engineering design, and economics. The non-technical process is largely a public process that involves education, public participation and to some degree a political process. Ultimately the two processes merge into a selected site that is environmentally sound and one that does not disrupt the day to day lives of the population it serves.

The technical side of the site selection process would likely include the following:

- A review of all potentially available sites;
- A technical process to reduce all potentially available sites to a few viable alternatives;
- Availability to required utilities and roads;
- Research into the known hydrogeologic conditions at the viable sites;
- A fatal flaw analysis of the viable sites that is based on Subtitle D location standards;
- Conceptual designs for the selected viable sites.
- The non-technical process would likely include the following:
  - A series of public meetings focused on educating the public on modern landfill design and operations techniques;
  - Graphic presentations conceptually showing a modern landfill operating within the selected viable site(s);
  - Tribal Council meetings to consider and select the final site.

### 3.0 Land Use

Once a final site is selected the solid waste landfill approval process would include a conditional / special use permitting process. To complete the land use process, a detailed description of how the land will be used is required. For this reason, much of the information prepared to obtain approval of a new landfill (hydrogeologic report, design report, design drawings, operating plans, closure plans) can also be utilized to apply for, and obtain a land use permit. Because of this common use of information, the land use permitting and landfill approval processes would likely proceed on a parallel path.



Both the landfill approval and land use processes include public participation. Public reaction to a new landfill is difficult to predict; however, potential opposition could be mitigated during the process. History indicates that some form of negative response should be expected. Because of this potential negative response, a plan for continued public awareness and education regarding the design and operation of modern landfills may be as important to the project as the design itself. The land use process may require participation of a public affairs consultant and potentially a land use attorney.

### 4.0 Landfill Approval

The following describes a process to obtain approval of a new solid waste disposal facility and the process generally complies with Subtitle D requirements.

#### 4.1 Fatal Flaw Analysis

The first step is typically a fatal flaw analysis of the selected site(s). This work is accomplished immediately following site identification and before significant time and effort are spent on the landfill and land use approval efforts. The fatal flaw analysis will focus on documenting compliance with the following location restrictions:

- Location within 10,000 feet of an airport runway used by turbojet aircraft or within 5,000 feet of any airport runway end used by only piston-type aircraft;
- Location in a 100-year flood plain;
- Location within a wetland;
- Location within 200 feet of a fault visible at the surface or shown on a published topographical or geological map that has had displacement in Holocene time
- Location in a seismic impact zone;
- Location in an unstable area that more likely than not will result in differential settling or ground failure under static conditions or during an earthquake, which pose a potential risk to the integrity of containment structures.

Although procedures exist to mitigate against these location restrictions, one or all of them could stop a solid waste landfill approval process for any given site. Therefore, completing this analysis very early in the process is critical.

## **4.2 Site Characterization and Hydrogeologic Report**

The next step in the approval process is a thorough site characterization. This includes a combination of records research, and site specific subsurface investigations. The goal of the work is to characterize the geologic, hydrogeologic, and geotechnical aspects of the site with respect to the site's compatibility with MSWLF design standards. The work commonly involves the installation of groundwater monitoring wells that are utilized to define aquifer conditions and to determine background groundwater quality.

Subsurface investigations are also performed to determine the geotechnical aspects of the site. These conditions include soil and bedrock stability, soil and bedrock characteristics, foundation characteristics, and the availability of materials that can be utilized to construct, operate and close the landfill.

## **4.3 Design Report**

The design report provides critical design information regarding site analysis, landfill design, and landfill closure. Its primary purpose is to document design methodology and design results that demonstrate that the proposed landfill meets all design standards of the solid waste regulations. Critical elements and components of the landfill that would be described in the design report may include:

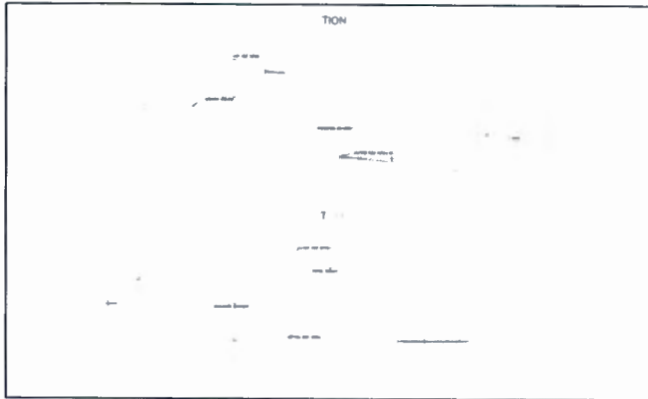
- A demonstration regarding compliance with location restrictions,
- Climate conditions at the site,
- The proposed site classification,
- A summary of the hydrogeologic and geotechnical aspects of the site,
- A foundation analysis related to subsurface conditions at the site,
- Landfill design capacity, and site life information,
- Site soil balance,
- Composite liner design,
- Composite liner stability analysis,
- Leachate collection and removal system design,
- HELP modeling,
- Leachate treatment / disposal design,
- A phasing plan for site development and closure,
- Closure design,
- Final cover stability analysis,
- Landfill gas collection and control system design,
- Stormwater run on and run off control design,
- General operational guidelines,
- Waste types that are accepted.



#### 4.4 Design Drawings

Design drawings are prepared that complement the design report. They graphically present how the landfill will be constructed, operated and closed. Typical drawings included in a permit application include:

- Cover sheet,
- Regional site plan and vicinity plan,
- Site plan and current topographic information,
- A landfill subgrade plan indicating the base grades of the entire proposed landfill footprint before composite liner construction,
- A composite liner and LCRS plan indicating the limits of composite liner and components of the LCRS;
- Landfill cross sections indicating the relationship between original ground surface, groundwater contours, composite liner surface, and final cover surface,
- A landfill phasing plan that indicates the sequence of cell development, waste fill placement, and final closure over the entire life of the landfill,
- Sections and details for the composite liner, LCRS, final cover, and landfill gas collection and control system, and
- Sections and details of the stormwater management systems.



#### 4.5 Construction Quality Control and Quality Assurance Plan

The purpose of the construction quality control and quality assurance plan is to guide third party observation, testing, and documentation during construction. The goal is to have a plan in place that demonstrates that the landfill is constructed in compliance with the design and permit.

Contents of a typical plan include the following information:

- An introduction that defines the format of the document and provides definitions specific to terms used in the document,
- A definition of personnel and organizations that will be implementing the plan and their roles,
- Information regarding various project related meetings,
- A definition of general CQA procedures including items such as project reporting, data collection, record keeping, and project filing,
- A testing program specific to interface shear testing of composite liner and final cover system components,

- CQA procedures related to earthwork construction,
- CQA procedures related to geosynthetics manufacturing and installation, and
- CQA procedures for mechanical components such as leachate pumping and piping systems, and landfill gas collection systems.

#### 4.6 Plan of Operation

The Plan of Operation defines how the landfill will be operated over the life of the facility.

Elements of the plan can include:

- A description of personnel and equipment necessary to operate the facility,
- Site access controls, and systems for accepting and/or rejecting waste that arrives at the facility,
- Procedures for placing the various types of waste accepted at the landfill,
- Procedures for placing special wastes such as biosolids, asbestos, medical waste, or industrial wastes,
- Procedures for constructing and maintaining temporary stormwater and snow management systems,
- Procedures for controlling odor, dust, litter, noise, vectors, birds,
- Operating procedures during severe weather events,
- Emergency and site safety procedures,
- Procedures for operating, inspecting, maintaining and repairing the LCRS,
- Procedures for operating, inspecting, maintaining and repairing landfill gas collection and control systems,
- Procedures for inspecting, maintaining and repairing final cover systems that are sequentially installed while other portions of the landfill remain active,
- Procedures for operating, inspecting, maintaining and repairing leachate treatment systems; and
- Record keeping and reporting procedures.



#### **4.7 Closure, Post-Closure Plan and Financial Assurance Plan**

The Closure and Post-closure Plan (C/PCP) presents plans to close, perform post-closure monitoring and maintenance, and provide closure and post-closure financial assurance for a MSWLF.



The closure plan contains a planned approach to close the landfill and incorporates design information provided in the design report.

The post-closure plan describes tasks that will be performed during the post-closure period including environmental monitoring, plans to perform post-closure inspections, maintenance, and repair, and procedures for decommissioning leachate treatment systems.

The financial assurance plan describes how the owner will fund future closure and post-closure activities.

#### **4.8 Related Permitting Requirements**

In addition to the special land use and solid waste landfill approval process, many other permits may be required to construct and operate landfill systems and support infrastructure. For example, a landfill is considered a new emission source under federal and state air quality regulations, and for that reason air quality permitting related to a new emission source (landfill gas) may be required.

If a new leachate treatment system is required, then the permitting requirements for a waste water treatment facility, which by themselves can be complex, would be required. However, given the arid nature of Arizona / New Mexico, a simple evaporation pond and/or leachate re-circulation are the likely disposal method for leachate.

If an existing waste water treatment system were used to treat landfill leachate, upgrades and additional permitting for an existing system may be required.

Support infrastructure such as buildings, roads, and utilities all have a level of design and land use permitting that must be completed.

#### **5.0 Landfill Construction**

Construction documents are prepared once all design and permitting efforts are complete. These documents define construction of the initial cell development and any support infrastructure necessary to bring the landfill on line and provide for its operation. Construction documents include bidding requirements, contract forms, contract conditions, technical specifications, and drawings. Design information provided in the design report and engineering

drawings are used to prepare project specific technical specifications and construction drawings for each phase of landfill development, including the initial phase.

### 5.1 Construction, Project Management, and CQA

This first phase of construction for a new landfill is typically the most diverse and expensive phase of development. In addition to constructing the first lined landfill cell, support infrastructure, much of which will be in place for the entire life of the landfill, must also be constructed.



### 5.2 Permitting, Design, and Construction Costs

The cost to permit, design and construct a new MSWLF can vary dramatically from site to site. On the permitting side three things tend to drive the costs, 1) complexity of site conditions, 2) public acceptance of the facility, 3) the regulatory environment.

Design costs are typically driven by site conditions. For example, if groundwater is very deep below the ground surface, then the cost of installing a groundwater monitoring system may be very high. If the site is located in an exceptionally severe climate, designs to control storm water and to minimize leachate production are emphasized and become costly. If new leachate treatment systems are required, then a whole new set of design problems exist, which require additional engineering costs.

Construction costs are generally driven by the complexity of the site, availability of natural resources (such as clay for liner system, and gravel for LCRS), and geographic location. While the unit costs of installing composite liner and leachate collection systems components can be reasonably estimated, costs for leachate treatment are difficult to estimate until designs are nearly complete. The geographic location of a site also impacts costs related to labor, mobilizing equipment, and shipping materials.

Given these cost variables, developing a new MSW landfill on the Navajo Nation is likely to cost the same or potentially less than other similar landfills in the state of Arizona. Factors that may drive these costs include the following:

- **Public Perception** - The solid waste management planning process should provide a clear understanding of the process and remove any negative perceptions of the modern MSWLF.
- **Site Characterization** - These costs will be driven by the depth to groundwater and size of the site.
- **Complexity of Site Conditions and Terrain** - The site selection process can help control this cost by selecting an arid site, with good access to roads and utilities that complies with location restrictions, has available construction materials, and has little or no stormwater runoff conditions.



- Severe Weather Conditions - Site selection process should help select a site with low / no water impact, low wind conditions, and favorable temperature conditions.
- Leachate Treatment - Selecting a site in arid weather conditions should result in treating leachate by evaporation in a lined evaporation pond, or recirculation into the waste, both of which are low cost treatment and disposal options.
- Geographic location - Any site chosen within the boundaries of the Navajo Nation would be reasonably close to materials, labor and equipment that could be mobilized to construct and operate the facility.

The following table summarizes the expected cost to plan and permit a landfill in Arizona.

*Table 1: Landfill Permitting Costs in Arizona*

Task	Cost
Arizona DEQ fees	\$100,000
Site Plan Engineering	\$500,000 to \$600,000
Survey / Aerial Mapping	\$75,000 to \$100,000
Agency/Zoning Fees	\$20,000 to \$30,000
Public Education / Outreach Consultants	\$50,000 to \$100,000
<b>Total Cost</b>	<b>\$745,000 to \$930,000</b>

Table 2 summarizes an estimated range of costs to complete the permitting, design and construction of the first cell of new MSW landfill. These costs are limited to those that would be incurred to permit, design, construct and operate a MSWLF with disposal capacity for up to 175,000 tons of MSW. Beyond the initial five years, additional engineering and construction costs would be required to expand the lined area of the landfill and its operating life, but these costs would be much less than the original permitting and land use costs.

*Table 2: Build Cost for a MSW Landfill*

Annual Tons	75,000	125,000	175,000
Expected Landfill Life	34	20	15
Life per Cell in Years	8.49	5.10	3.64
Cell 1 Build Year	2020	2020	2020
Cell 2 Build Year	2027	2024	2023
Cell 3 Build Year	2035	2028	2026
Cell 4 Build Year	2043	2032	2029
Cell 1 Build Cost	\$7,920,715	\$7,920,715	\$7,920,715
Cell 2 Build Cost	\$9,019,353	\$8,332,488	\$8,169,106
Cell 3 Build Cost	\$10,567,610	\$9,019,353	\$8,669,121
Cell 4 Build Cost	\$12,381,639	\$9,762,838	\$9,199,740
Year 1 Disposal Cost per Ton	<b>\$41.41</b>	<b>\$36.23</b>	<b>\$34.70</b>

**Navajo Landfill**  
**Estimated Disposal Fee for Various Incoming Waste Volumes**

**Navajo Landfill - 75,000 TPY**

	Start	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Incoming Waste Tons		75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Cumulative Tons		75,000	150,000	225,000	300,000	375,000	450,000	525,000	600,000	675,000	750,000
Percentage of Total Capacity		2.94%	5.89%	8.83%	11.77%	14.72%	17.66%	20.60%	23.55%	26.49%	29.43%
<b>Rate Cost Components</b>											
Cell Build Costs (no interest)		\$ 17.76	\$ 17.76	\$ 17.76	\$ 17.76	\$ 17.76	\$ 17.76	\$ 20.23	\$ 20.23	\$ 20.23	\$ 20.23
Operating Costs		\$ 18.65	\$ 19.02	\$ 19.40	\$ 19.79	\$ 20.18	\$ 20.59	\$ 21.00	\$ 21.42	\$ 21.85	\$ 22.28
Closure Cost		\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 6.00
<b>Cost per Ton</b>		<b>\$ 41.41</b>	<b>\$ 41.78</b>	<b>\$ 42.16</b>	<b>\$ 42.55</b>	<b>\$ 42.95</b>	<b>\$ 43.35</b>	<b>\$ 46.23</b>	<b>\$ 46.65</b>	<b>\$ 47.07</b>	<b>\$ 48.51</b>

**Navajo Landfill - 125,000 TPY**

	Start	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Incoming Waste Tons		125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Cumulative Tons		125,000	250,000	375,000	500,000	625,000	750,000	875,000	1,000,000	1,125,000	1,250,000
Percentage of Total Capacity		4.91%	9.81%	14.72%	19.62%	24.53%	29.43%	34.34%	39.25%	44.15%	49.06%
<b>Rate Cost Components</b>											
Cell Build Costs (no interest)		\$ 17.76	\$ 17.76	\$ 17.76	\$ 18.69	\$ 18.69	\$ 18.69	\$ 18.69	\$ 20.23	\$ 20.23	\$ 20.23
Operating Costs		\$ 13.47	\$ 13.74	\$ 14.01	\$ 14.29	\$ 14.58	\$ 14.87	\$ 15.17	\$ 15.47	\$ 15.78	\$ 16.09
Closure Cost		\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 6.00
<b>Cost per Ton</b>		<b>\$ 36.23</b>	<b>\$ 36.50</b>	<b>\$ 36.77</b>	<b>\$ 37.98</b>	<b>\$ 38.26</b>	<b>\$ 38.55</b>	<b>\$ 38.85</b>	<b>\$ 40.70</b>	<b>\$ 41.01</b>	<b>\$ 42.32</b>

**Navajo Landfill - 175,000 TPY**

	Start	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Incoming Waste Tons		175,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000
Cumulative Tons		175,000	350,000	525,000	700,000	875,000	1,050,000	1,225,000	1,400,000	1,575,000	1,750,000
Percentage of Total Capacity		6.87%	13.74%	20.60%	27.47%	34.34%	41.21%	48.08%	54.95%	61.81%	68.68%
<b>Rate Cost Components</b>											
Cell Build Costs (no interest)		\$ 17.76	\$ 17.76	\$ 18.32	\$ 18.32	\$ 18.32	\$ 19.44	\$ 19.44	\$ 19.65	\$ 19.65	\$ 19.65
Operating Costs		\$ 11.94	\$ 12.18	\$ 12.42	\$ 12.67	\$ 12.92	\$ 13.18	\$ 13.44	\$ 13.71	\$ 13.99	\$ 14.27
Closure Cost		\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 6.00
<b>Cost per Ton</b>		<b>\$ 34.70</b>	<b>\$ 34.94</b>	<b>\$ 35.74</b>	<b>\$ 35.99</b>	<b>\$ 36.24</b>	<b>\$ 37.62</b>	<b>\$ 37.89</b>	<b>\$ 38.36</b>	<b>\$ 38.64</b>	<b>\$ 39.92</b>

40 ACRE MSW LANDFILL WITH INFRASTRUCTURE - 75,000 Tons Per Year								
Bid Item Number	Description	Unit	Quantity	2016 Unit Price	2020 Amount	2028 Amount	2036 Amount	2044 Amount
			base cost	\$ 1.00	\$ 1.08	\$ 1.27	\$ 1.49	\$ 1.74
	<b>LANDFILL AND INFRASTRUCTURE</b>							
1	Mobilization	LS	1	\$250,000	\$ 270,608	\$ 317,060	\$ 371,487	\$ 435,256
2	Surveying	LS	1	\$25,000	\$ 27,061	\$ 31,706	\$ 37,149	\$ 43,526
3	Stripping to Stockpile	CY	16,130	\$2.15	\$ 37,538	\$ 43,982	\$ 51,532	\$ 60,378
4	Excavation to Stockpile (down 35')	CY	612,500	\$3.25	\$ 2,154,717	\$ 2,524,594	\$ 2,957,964	\$ 3,465,726
5	Excavation to Engineered Fill	CY	75,000	\$4.45	\$ 361,262	\$ 423,276	\$ 495,935	\$ 581,067
6	Composite Liner Subgrade Preparation	ACRE	10.0	\$1,500	\$ 16,236	\$ 19,024	\$ 22,289	\$ 26,115
7	12-inch Diameter SLCRS Riser and SLCRS Gravel	EA	1	\$14,000	\$ 15,154	\$ 17,755	\$ 20,803	\$ 24,374
8	Geosynthetic Clay Liner	SF	435,600	\$1.05	\$ 495,083	\$ 580,068	\$ 679,643	\$ 796,310
9	Geomembrane	SF	435,600	\$0.90	\$ 424,357	\$ 497,202	\$ 582,551	\$ 682,551
10	Geocomposite LCRS	SF	435,600	\$1.00	\$ 471,507	\$ 552,446	\$ 647,279	\$ 758,390
11	LCRS Gravel	CY	2,000	\$45.00	\$ 97,419	\$ 114,142	\$ 133,735	\$ 156,692
12	Geotextile Separator Covering LCRS Gravel	SF	70,000	\$0.20	\$ 15,154	\$ 17,755	\$ 20,803	\$ 24,374
13	Operations Layer	CY	32,260	\$5.75	\$ 200,786	\$ 235,253	\$ 275,636	\$ 322,951
14	6-inch Diameter LCRS Collection Pipe and Cleanout	LF	2,800	\$18.00	\$ 54,555	\$ 63,919	\$ 74,892	\$ 87,748
15	Leachate Force Main, Cleanouts	LF	750	\$45.00	\$ 36,532	\$ 42,803	\$ 50,151	\$ 58,760
16	Panels	EA	2	\$30,000	\$ 64,946	\$ 76,095	\$ 89,157	\$ 104,461
17	LCRS Risers	EA	4	\$18,000	\$ 77,935	\$ 91,313	\$ 106,988	\$ 125,354
18	Plywood Termination	LF	400	\$2.75	\$ 1,191	\$ 1,395	\$ 1,635	\$ 1,915
19	Perimeter Chain Link Fence and Gates	LF	3,734	\$30	\$ 121,239	\$ 142,050	\$ 166,435	\$ 195,005
20	Electrical Supply to Leachate Pumps and Office	LS	1	\$75,000	\$ 81,182	\$ 95,118	\$ 111,446	\$ 130,577
21	Heat Cable and Insulation	LS	1	\$6,000	\$ 6,495	\$ 7,609	\$ 8,916	\$ 10,446
22	Seeding, Tackifier and Mulch	ACRE	0	\$1,200	\$ -	\$ -	\$ -	\$ -
23	Landfill Access Road Earthwork	LS	1	\$160,000	\$ 173,189	\$ 202,919	\$ 237,752	\$ 278,564
24	Landfill Access Road Base Course (1 mile road)	SY	42,240	\$17.00	\$ 777,273	\$ 910,699	\$ 1,067,029	\$ 1,250,195
25	Modular Office	LS	1	\$95,000	\$ 102,831	\$ 120,483	\$ 141,165	\$ 165,397
26	New Culverts	LF	1	\$11,000	\$ 11,907	\$ 13,951	\$ 16,345	\$ 19,151
27	Stormwater Control Ditches	LF	1,000	\$6.00	\$ 6,495	\$ 7,609	\$ 8,916	\$ 10,446
28	Landfill Gas Probes	LF	320	\$185	\$ 64,080	\$ 75,080	\$ 87,968	\$ 103,069
29	Groundwater Monitoring Wells	EA	3	\$54,000	\$ 175,354	\$ 205,455	\$ 240,723	\$ 282,046
30	Sanitary facilities and dumpster	EA	1	\$5,500	\$ 5,953	\$ 6,975	\$ 8,173	\$ 9,576
31	All environmental/dust controls and SWPPP	EA	1	\$25,000	\$ 27,061	\$ 31,706	\$ 37,149	\$ 43,526
	<b>SUBTOTAL 40 ACRE LANDFILL with 4 - 10 acre cells</b>				<b>\$6,375,098</b>	<b>\$7,469,443</b>	<b>\$8,751,644</b>	<b>\$10,253,945</b>
	<b>LEACHATE POND</b>							
32	Earthwork	CY	8,000	\$6.00	\$ 51,957			
33	Secondary liner	SF	21,780	\$0.80	\$ 18,860			
34	Geocomposite Leak Detection	SF	21,780	\$0.90	\$ 21,218			
35	Primary Liner	SF	21,780	\$0.80	\$ 18,860			
36	Liner Ballast	LS	1	\$29,000	\$ 31,391			
37	Collection Sump and Pump	LS	1	\$24,000	\$ 25,978			
38	Fencing	LF	500	\$30.00	\$ 16,236			
	<b>SUBTOTAL LEACHATE POND</b>				<b>\$184,501</b>			
	<b>TOTAL LANDFILL CONSTRUCTION ESTIMATE</b>				<b>\$6,559,599</b>	<b>\$7,469,443</b>	<b>\$8,751,644</b>	<b>\$10,253,945</b>
	<b>15 Percent Contingency</b>				<b>\$983,940</b>	<b>\$1,120,417</b>	<b>\$1,312,747</b>	<b>\$1,538,092</b>
	<b>TOTAL LANDFILL CONSTRUCTION ESTIMATE</b>				<b>\$7,543,538</b>	<b>\$8,589,860</b>	<b>\$10,064,390</b>	<b>\$11,792,037</b>
	<b>FIXED COSTS</b>							
	Engineering Oversight / Project Management 5% of Cost				\$377,177	\$429,493	\$503,220	\$589,602
	Estimated Total Build Cost for MSW Landfill with Leachate Evaporation System				<b>\$7,920,715</b>	<b>\$9,019,353</b>	<b>\$10,567,610</b>	<b>\$12,381,639</b>

ADEQ permit fees - \$100,000  
 Site plan engineering - \$500,000 to \$600,000  
 Survey/Aerial Mapping - \$75,000 to \$100,000  
 County zoning fees - \$20,000 to \$30,000  
 Outside Consultants, meetings, signs, printing, etc. (general estimate) - \$50,000 to \$100,000

Total Permitting \$745,000 to \$930,000



40 ACRE MSW LANDFILL WITH INFRASTRUCTURE - 125,000 Tons Per Year								
Bid Item Number	Description	Unit	Quantity	2016 Unit Price	2020 Amount	2024 Amount	2028 Amount	2032 Amount
			base cost	\$ 1.00	\$ 1.08	\$ 1.17	\$ 1.27	\$ 1.37
	<b>LANDFILL AND INFRASTRUCTURE</b>							
1	Mobilization	LS	1	\$250,000	\$ 270,608	\$ 292,915	\$ 317,060	\$ 343,196
2	Surveying	LS	1	\$25,000	\$ 27,061	\$ 29,291	\$ 31,706	\$ 34,320
3	Stripping to Stockpile	CY	16,130	\$2.15	\$ 37,538	\$ 40,633	\$ 43,982	\$ 47,608
4	Excavation to Stockpile (down 35')	CY	612,500	\$3.25	\$ 2,154,717	\$ 2,332,334	\$ 2,524,594	\$ 2,732,702
5	Excavation to Engineered Fill	CY	75,000	\$4.45	\$ 361,262	\$ 391,041	\$ 423,276	\$ 458,167
6	Composite Liner Subgrade Preparation	ACRE	10.0	\$1,500	\$ 16,236	\$ 17,575	\$ 19,024	\$ 20,592
7	12-inch Diameter LCRS Riser and LCRS Gravel	EA	1	\$14,000	\$ 15,154	\$ 16,403	\$ 17,755	\$ 19,219
8	Geosynthetic Clay Liner	SF	435,600	\$1.05	\$ 495,083	\$ 535,894	\$ 580,068	\$ 627,885
9	Geomembrane	SF	435,600	\$0.90	\$ 424,357	\$ 459,337	\$ 497,202	\$ 538,187
10	Geocomposite LCRS	SF	435,600	\$1.00	\$ 471,507	\$ 510,375	\$ 552,446	\$ 597,985
11	LCRS Gravel	CY	2,000	\$45.00	\$ 97,419	\$ 105,449	\$ 114,142	\$ 123,551
12	Geotextile Separator Covering LCRS Gravel	SF	70,000	\$0.20	\$ 15,154	\$ 16,403	\$ 17,755	\$ 19,219
13	Operations Layer	CY	32,260	\$5.75	\$ 200,786	\$ 217,337	\$ 235,253	\$ 254,645
14	6-inch Diameter LCRS Collection Pipe and Cleanout	LF	2,800	\$18.00	\$ 54,555	\$ 59,052	\$ 63,919	\$ 69,188
15	Leachate Force Main, Cleanouts	LF	750	\$45.00	\$ 36,532	\$ 39,544	\$ 42,803	\$ 46,332
16	Panels	EA	2	\$30,000	\$ 64,946	\$ 70,300	\$ 76,095	\$ 82,367
17	LCRS Risers	EA	4	\$18,000	\$ 77,935	\$ 84,359	\$ 91,313	\$ 98,841
18	Plywood Termination	LF	400	\$2.75	\$ 1,191	\$ 1,289	\$ 1,395	\$ 1,510
19	Perimeter Chain Link Fence and Gates	LF	3,734	\$30	\$ 121,239	\$ 131,233	\$ 142,050	\$ 153,760
20	Electrical Supply to Leachate Pumps and Office	LS	1	\$75,000	\$ 81,182	\$ 87,874	\$ 95,118	\$ 102,959
21	Heat Cable and Insulation	LS	1	\$6,000	\$ 6,495	\$ 7,030	\$ 7,609	\$ 8,237
22	Seeding, Tackifier and Mulch	ACRE	0	\$1,200	\$ -	\$ -	\$ -	\$ -
23	Landfill Access Road Earthwork	LS	1	\$160,000	\$ 173,189	\$ 187,466	\$ 202,919	\$ 219,646
24	Landfill Access Road Base Course (1 mile road)	SY	42,240	\$17.00	\$ 777,273	\$ 841,345	\$ 910,699	\$ 985,770
25	Modular Office	LS	1	\$95,000	\$ 102,831	\$ 111,308	\$ 120,483	\$ 130,415
26	New Culverts	LF	1	\$11,000	\$ 11,907	\$ 12,888	\$ 13,951	\$ 15,101
27	Stormwater Control Ditches	LF	1,000	\$6.00	\$ 6,495	\$ 7,030	\$ 7,609	\$ 8,237
28	Landfill Gas Probes	LF	320	\$185	\$ 64,080	\$ 69,362	\$ 75,080	\$ 81,269
29	Groundwater Monitoring Wells	EA	3	\$54,000	\$ 175,354	\$ 189,809	\$ 205,455	\$ 222,391
30	Sanitary facilities and dumpster	EA	1	\$5,500	\$ 5,953	\$ 6,444	\$ 6,975	\$ 7,550
31	All environmental/dust controls and SWPPP	EA	1	\$25,000	\$ 27,061	\$ 29,291	\$ 31,706	\$ 34,320
	<b>SUBTOTAL 40 ACRE LANDFILL with 4 - 10 acre cells</b>				<b>\$6,375,098</b>	<b>\$6,900,611</b>	<b>\$7,469,443</b>	<b>\$8,085,166</b>
	<b>LEACHATE POND</b>							
32	Earthwork	CY	8,000	\$6.00	\$ 51,957			
33	Secondary liner	SF	21,780	\$0.80	\$ 18,860			
34	Geocomposite Leak Detection	SF	21,780	\$0.90	\$ 21,218			
35	Primary Liner	SF	21,780	\$0.80	\$ 18,860			
36	Liner Ballast	LS	1	\$29,000	\$ 31,391			
37	Collection Sump and Pump	LS	1	\$24,000	\$ 25,978			
38	Fencing	LF	500	\$30.00	\$ 16,236			
	<b>SUBTOTAL LEACHATE POND</b>				<b>\$184,501</b>			
	<b>TOTAL LANDFILL CONSTRUCTION ESTIMATE</b>				<b>\$6,559,599</b>	<b>\$6,900,611</b>	<b>\$7,469,443</b>	<b>\$8,085,166</b>
	<b>15 Percent Contingency</b>				<b>\$983,940</b>	<b>\$1,035,092</b>	<b>\$1,120,417</b>	<b>\$1,212,775</b>
	<b>TOTAL LANDFILL CONSTRUCTION ESTIMATE</b>				<b>\$7,543,538</b>	<b>\$7,935,703</b>	<b>\$8,589,860</b>	<b>\$9,297,941</b>
	<b>FIXED COSTS</b>							
	Engineering Oversight / Project Management 5% of Cost				\$377,177	\$396,785	\$429,493	\$464,897
	<b>Estimated Total Build Cost for MSW Landfill with Leachate Evaporation System</b>				<b>\$7,920,715</b>	<b>\$8,332,488</b>	<b>\$9,019,353</b>	<b>\$9,762,838</b>

ADEQ permit fees - \$100,000  
 Site plan engineering- \$500,000 to \$600,000  
 Survey/Aerial Mapping - \$75,000 to \$100,000  
 County zoning fees - \$20,000 to \$30,000  
 Outside Consultants, meetings, signs, printing, etc. (general estimate) - \$50,000 to \$100,000

Total Permitting \$745,000 to \$930,000



40 ACRE MSW LANDFILL WITH INFRASTRUCTURE - 175,000 Tons Per Year								
Bid Item Number	Description	Unit	Quantity	2016 Unit Price	2020 Amount	2023 Amount	2026 Amount	2029 Amount
			base cost	\$ 1.00	\$ 1.08	\$ 1.15	\$ 1.22	\$ 1.29
	<b>LANDFILL AND INFRASTRUCTURE</b>							
1	Mobilization	LS	1	\$250,000	\$ 270,608	\$ 287,171	\$ 304,749	\$ 323,402
2	Surveying	LS	1	\$25,000	\$ 27,061	\$ 28,717	\$ 30,475	\$ 32,340
3	Stripping to Stockpile	CY	16,130	\$2.15	\$ 37,538	\$ 39,836	\$ 42,274	\$ 44,862
4	Excavation to Stockpile (down 35')	CY	612,500	\$3.25	\$ 2,154,717	\$ 2,286,602	\$ 2,426,561	\$ 2,575,086
5	Excavation to Engineered Fill	CY	75,000	\$4.45	\$ 361,262	\$ 383,374	\$ 406,839	\$ 431,741
6	Composite Liner Subgrade Preparation	ACRE	10.0	\$1,500	\$ 16,236	\$ 17,230	\$ 18,285	\$ 19,404
7	12-inch Diameter SLCRS Riser and SLCRS Gravel	EA	1	\$14,000	\$ 15,154	\$ 16,082	\$ 17,066	\$ 18,110
8	Geosynthetic Clay Liner	SF	435,600	\$1.05	\$ 495,083	\$ 525,386	\$ 557,544	\$ 591,670
9	Geomembrane	SF	435,600	\$0.90	\$ 424,357	\$ 450,331	\$ 477,895	\$ 507,146
10	Geocomposite LCRS	SF	435,600	\$1.00	\$ 471,507	\$ 500,367	\$ 530,994	\$ 563,495
11	LCRS Gravel	CY	2,000	\$45.00	\$ 97,419	\$ 103,382	\$ 109,709	\$ 116,425
12	Geotextile Separator Covering LCRS Gravel	SF	70,000	\$0.20	\$ 15,154	\$ 16,082	\$ 17,066	\$ 18,110
13	Operations Layer	CY	32,260	\$5.75	\$ 200,786	\$ 213,075	\$ 226,117	\$ 239,958
14	6-inch Diameter LCRS Collection Pipe and Cleanout	LF	2,800	\$18.00	\$ 54,555	\$ 57,894	\$ 61,437	\$ 65,198
15	Leachate Force Main, Cleanouts	LF	750	\$45.00	\$ 36,532	\$ 38,768	\$ 41,141	\$ 43,659
16	Panels	EA	2	\$30,000	\$ 64,846	\$ 68,921	\$ 73,140	\$ 77,616
17	LCRS Risers	EA	4	\$18,000	\$ 77,935	\$ 82,705	\$ 87,768	\$ 93,140
18	Plywood Termination	LF	400	\$2.75	\$ 1,191	\$ 1,264	\$ 1,341	\$ 1,423
19	Perimeter Chain Link Fence and Gates	LF	3,734	\$30	\$ 121,239	\$ 128,659	\$ 136,534	\$ 144,891
20	Electrical Supply to Leachate Pumps and Office	LS	1	\$75,000	\$ 81,182	\$ 86,151	\$ 91,425	\$ 97,020
21	Heat Cable and Insulation	LS	1	\$6,000	\$ 6,495	\$ 6,892	\$ 7,314	\$ 7,762
22	Seeding, Tackifier and Mulch	ACRE	0	\$1,200	\$ -	\$ -	\$ -	\$ -
23	Landfill Access Road Earthwork	LS	1	\$160,000	\$ 173,189	\$ 183,790	\$ 195,039	\$ 206,977
24	Landfill Access Road Base Course (1 mile road)	SY	42,240	\$17.00	\$ 777,273	\$ 824,848	\$ 875,336	\$ 928,913
25	Modular Office	LS	1	\$95,000	\$ 102,831	\$ 109,125	\$ 115,804	\$ 122,893
26	New Culverts	LF	1	\$11,000	\$ 11,907	\$ 12,636	\$ 13,409	\$ 14,230
27	Stormwater Control Ditches	LF	1,000	\$6.00	\$ 6,495	\$ 6,892	\$ 7,314	\$ 7,762
28	Landfill Gas Probes	LF	320	\$185	\$ 64,080	\$ 68,002	\$ 72,164	\$ 76,582
29	Groundwater Monitoring Wells	EA	3	\$54,000	\$ 175,354	\$ 186,087	\$ 197,477	\$ 209,564
30	Sanitary facilities and dumpster	EA	1	\$5,500	\$ 5,953	\$ 6,318	\$ 6,704	\$ 7,115
31	All environmental/dust controls and SWPPP	EA	1	\$25,000	\$ 27,061	\$ 28,717	\$ 30,475	\$ 32,340
	<b>SUBTOTAL 40 ACRE LANDFILL with 4 - 10 acre cells</b>				<b>\$6,375,098</b>	<b>\$6,765,305</b>	<b>\$7,179,396</b>	<b>\$7,618,832</b>
	<b>LEACHATE POND</b>							
32	Earthwork	CY	8,000	\$6.00	\$ 51,957			
33	Secondary liner	SF	21,780	\$0.80	\$ 18,860			
34	Geocomposite Leak Detection	SF	21,780	\$0.90	\$ 21,218			
35	Primary Liner	SF	21,780	\$0.80	\$ 18,860			
36	Liner Ballast	LS	1	\$29,000	\$ 31,391			
37	Collection Sump and Pump	LS	1	\$24,000	\$ 25,978			
38	Fencing	LF	500	\$30.00	\$ 16,236			
	<b>SUBTOTAL LEACHATE POND</b>				<b>\$184,501</b>			
	<b>TOTAL LANDFILL CONSTRUCTION ESTIMATE</b>				<b>\$6,559,599</b>	<b>\$6,765,305</b>	<b>\$7,179,396</b>	<b>\$7,618,832</b>
	<b>15 Percent Contingency</b>				<b>\$983,940</b>	<b>\$1,014,796</b>	<b>\$1,076,909</b>	<b>\$1,142,825</b>
	<b>TOTAL LANDFILL CONSTRUCTION ESTIMATE</b>				<b>\$7,543,538</b>	<b>\$7,780,101</b>	<b>\$8,256,305</b>	<b>\$8,761,657</b>
	<b>FIXED COSTS</b>							
	Engineering Oversight / Project Management 5% of Cost				\$377,177	\$389,005	\$412,815	\$438,083
	<b>Estimated Total Build Cost for MSW Landfill with Leachate Evaporation System</b>				<b>\$7,920,715</b>	<b>\$8,169,106</b>	<b>\$8,669,121</b>	<b>\$9,199,740</b>

ADEQ permit fees - \$100,000  
 Site plan engineering - \$500,000 to \$600,000  
 Survey/Aerial Mapping - \$75,000 to \$100,000  
 County zoning fees - \$20,000 to \$30,000  
 Outside Consultants, meetings, signs, printing, etc. (general estimate) - \$50,000 to \$100,000

Total Permitting \$745,000 to \$930,000

# Landfill Operational Costs

Operating Costs		Units		Scenario 1	Units		Scenario 2	Units		Scenario 3		
Annual Tons		75,000			125,000			175,000				
Daily Tons		208			347			486				
Incoming Loads		10.42			17			24				
Equipment Operators	Full time operator @ \$30 per hr.	\$	30	3	187,200		4	249,600		5	312,000	
Spotters / Utility	Full time operator @ \$20 per hr.	\$	20	0	-		1	41,600		2	83,200	
Scale house attendant	Full time attendant @ \$20 per hr.	\$	20	1.5	62,400		1.5	62,400		1.5	62,400	
LF Supervisor	Full time @ \$75,000 per year	\$	75,000	1	75,000		1	75,000		1	75,000	
Overtime	5% of hourly labor			5%	12,480		5%	17,680		5%	22,880	
Temporary	1% of hourly labor			1%	2,496		1%	3,536		1%	4,576	
FICA	FICA / MC employer cost is 7.7% of wages			7.7%	26,147		7.7%	34,636		7.7%	43,124	
Health Ins.	\$1,200 per full time employee per month	\$	1,200		79,200		\$	1,200	108,000	\$	1,200	136,800
401k	Employer match at 2% of wages			2%	6,742		2%	8,926		2%	11,110	
Unemployment Ins.	Tax is estimated at 3% of wages			3%	10,187		3%	13,494		3%	16,802	
Worker's Comp.	Tax is estimated at 4% of wages			4%	13,583		4%	17,993		4%	22,402	
Total Labor Expense					475,435			632,865			790,294	
Equipment Dep. & Interest	See Landfill Equipment Cost worksheet				511,546			511,546			511,546	
Equipment Operations and R&M	See Landfill Equipment Cost worksheet				211,500			306,900			518,400	
Equipment Rent					12,000			12,000			12,000	
Facility Operating Costs					40,000			50,000			60,000	
Safety, Insurance & Claims					32,000			40,000			45,000	
LF FA, Leachate & Other					12,000			12,000			12,000	
Professional Fees					49,000			54,000			65,000	
Administrative Costs					35,000			40,000			45,000	
Travel & Entertainment					8,000			10,000			14,000	
Utility Costs					12,000			14,000			16,000	
Operational Expenses					923,046			1,050,446			1,298,946	
Total Expenses					\$ 1,398,481			\$ 1,683,310			\$ 2,089,240	
Cost per Ton					\$ 18.65			\$ 13.47			\$ 11.94	
Incoming Tonnage			75,000	125,000	175,000							
Labor		\$	475,435	\$ 632,865	\$ 790,294							
Equipment Depreciation & Interest		\$	511,546	\$ 511,546	\$ 511,546							
Equipment Operational Expense		\$	211,500	\$ 306,900	\$ 518,400							
Other Operational Costs		\$	108,000	\$ 128,000	\$ 145,000							
Admin and Sales Expense		\$	92,000	\$ 104,000	\$ 124,000							
Total Operational Cost		\$	1,398,481	\$ 1,683,310	\$ 2,089,240							

## Landfill Equipment Costs

Equipment	Totals	Cat 826H Compactor	Cat D8T Dozer	Cat 627H Scraper	Water Truck (used)	Notes
Cost	\$ 725,000	\$ 630,000	\$ 780,000	\$ 70,000		A
Interest @ 6% for 5 years	\$ 115,977	\$ 100,780	\$ 124,775	\$ 11,198		B
Annual Fixed Cost	\$ 168,195	\$ 146,156	\$ 180,955	\$ 16,240		C
<b>Annual Depreciation and Interest</b>						
Scenario 1	\$ 511,546	\$ 168,195	\$ 146,156	\$ 180,955	\$ 16,240	D
Scenario 2	\$ 511,546	\$ 168,195	\$ 146,156	\$ 180,955	\$ 16,240	D
Scenario 3	\$ 511,546	\$ 168,195	\$ 146,156	\$ 180,955	\$ 16,240	D
Fuel consumption per hr. (in gallons)	11	11	18	4		E
Diesel cost per gallon	\$ 4.00	\$ 4.00	\$ 4.00	\$ 4.00		F
a. Fuel cost per hour	\$ 44.00	\$ 44.00	\$ 72.00	\$ 16.00		G
b. R&M per Hour	\$ 25.00	\$ 25.00	\$ 25.00	\$ 5.00		H
c. supplies and other costs	\$ 10.00	\$ 10.00	\$ 10.00	\$ 5.00		I
Operational Cost per Hour (a+b+c)	\$ 79.00	\$ 79.00	\$ 107.00	\$ 26.00		J
<b>Daily Operational Hours</b>						
Scenario 1	7.25	3	3	1	0.25	K
Scenario 2	10.25	4	4	2	0.25	K
Scenario 3	17.5	7	7	3	0.5	K
Scenario 4	38	14	14	8	2	K
<b>Annual Operational Cost</b>						
Scenario 1	\$ 211,500	\$ 85,320	\$ 85,320	\$ 38,520	\$ 2,340	L
Scenario 2	\$ 306,900	\$ 113,760	\$ 113,760	\$ 77,040	\$ 2,340	L
Scenario 3	\$ 518,400	\$ 199,080	\$ 199,080	\$ 115,560	\$ 4,680	L

### Notes

- A: Approximate equipment cost
- B: Interest cost for equipment at 6% for 5 years
- C: A + B / 5 years
- D: Annual fixed cost based on the incoming tons and required pieces of equipment
- E: Fuel consumption per hour
- F: Assumed cost per gallon for diesel fuel
- G: E x F
- H: Approximate R&M cost per hour
- I: Supplies includes filters and fluids
- J: Sum of Fuel, R&M costs, and supplies (Item G + Item H + Item I)
- K: Estimated daily operational hours for each piece of equipment
- L: 360 days of operation x daily hours (Item K) x Operational Cost per Hour (Item J)

**Equipment Note:** Source of the updated equipment cost is Jim Rose from Empire Cat in Phoenix

**PLANNING COST ESTIMATES  
LANDFILL  
ENGINEERED CONTAINMENT SYSTEM (10 ACRE CELL)**

**Planning Cost Estimate**

**Engineered Containment System (10 acre cell)**

**ASSUMPTIONS:** 10-acre cell, extends 35 ft below grade, and has 3:1 interior slopes below grade.

Square Cell (934 feet x 934 feet)

<b>Total Footprint (ac)</b>	10
<b>Width x Length (assume square cell)</b>	660
<b>Top Width (ft)</b>	660
<b>Top Width + Anchor Trenches (ft)</b>	690
<b>Bottom Width (ft)</b>	480
<b>Top Length (ft)</b>	660
<b>Top Length + Anchor Trenches (ft)</b>	690
<b>Bottom Length (ft)</b>	480
<b>Surface Water Diversion (ft)</b>	1580
<b>Cell Depth (ft)</b>	35

Volumes	CF	CY
Center	8,064,000	298,667
Sides (2)	1,512,000	56,000
Ends (2)	1,512,000	56,000
Corners (4)	378,000	14,000
Volume to Grade		424,667
Volume to 35' Above Grade		424,667
<b>Total Cell Volume</b>		<b>849,333</b>
Pounds per Cubic Yard		1,500
Total Tons for Cell Volume		637,000
Assumed 4 - 10 acre cells		2,548,000
Fill Tons below grade		318,500
Next Cell build		445,900



Document No. 007917Date Issued: 04/27/2017**EXECUTIVE OFFICIAL REVIEW**Title of Document: NN-Solid Waste Management PlanContact Name: BENALLY, JAMESProgram/Division: DIV. OF COMMUNITY DEVELOPMENTEmail: jbenally@nndcd.orgPhone Number: 928-871-6091/6211

RECEIVED

APR 27 2017

DIVISION OF  
COMMUNITY  
DEVELOPMENT

<input type="checkbox"/>	<b>Business Site Lease</b>			<b>Sufficient</b>	<b>Insufficient</b>
	1. Division:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
	2. Office of the Controller:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
	(only if Procurement Clearance is not issued within 30 days of the initiation of the E.O. review)				
	3. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Business and Industrial Development Financing, Veteran Loans, (i.e. Loan, Loan Guarantee and Investment) or Delegation of Approving and/or Management Authority of Leasing transactions**

1. Division:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Fund Management Plan, Expenditure Plans, Carry Over Requests, Budget Modifications**

1. Office of Management and Budget:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. Office of the Controller:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Navajo Housing Authority Request for Release of Funds**

1. NNEPA:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Lease Purchase Agreements**

1. Office of the Controller:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
(recommendation only)				
2. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Grant Applications**

1. Office of Management and Budget:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. Office of the Controller:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☒ **Five Management Plan of the Local Governance Act, Delegation of an Approving Authority from a Standing Committee, Local Ordinances (Local Government Units), or Plans of Operation/Division Policies Requiring Committee Approval**

1. Division:	<u>Gary Began</u>	Date: <u>4/28/17</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Office of the Attorney General:	<u>Blankhat</u>	Date: <u>7/6/17</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

☐ **Relinquishment of Navajo Membership**

1. Land Department:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. Elections:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Land Withdrawal or Relinquishment for Commercial Purposes**

			Sufficient	Insufficient
1. Division:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Land Withdrawals for Non-Commercial Purposes, General Land Leases and Resource Leases**

1. NLD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. F&W	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. HPD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
4. Minerals	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
5. NNEPA	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
6. DNR	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
7. DOJ	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Rights of Way**

1. NLD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. F&W	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. HPD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
4. Minerals	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
5. NNEPA	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
6. Office of the Attorney General:	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
7. OPVP	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Oil and Gas Prospecting Permits, Drilling and Exploration Permits, Mining Permit, Mining Lease**

1. Minerals	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. OPVP	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. NLD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **Assignment of Mineral Lease**

1. Minerals	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. DNR	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. DOJ	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **ROW (where there has been no delegation of authority to the Navajo Land Department to grant the Nation's consent to a ROW)**

1. NLD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. F&W	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. HPD	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
4. Minerals	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
5. NNEPA	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
6. DNR	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
7. DOJ	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
8. OPVP	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>

☐ **OTHER:**

1. _____	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. _____	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
3. _____	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
4. _____	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>
5. _____	_____	Date: _____	<input type="checkbox"/>	<input type="checkbox"/>



# NAVAJO NATION DEPARTMENT OF JUSTICE

## DOCUMENT REVIEW REQUEST FORM



DOJ	
04-28-17	1033am
DATE / TIME	
<input type="checkbox"/> 7 Day Deadline	
DOC #:	007917
SAS #:	
UNIT:	ECOW

☐ RESUBMITTAL

\*\*\* FOR NNDJ USE ONLY - DO NOT CHANGE OR REVISE FORM. VARIATIONS OF THIS FORM WILL NOT BE ACCEPTED. \*\*\*

CLIENT TO COMPLETE			
DATE OF REQUEST:	4/27/2017	DIVISION:	DCD
CONTACT NAME:	James Benally	DEPARTMENT:	CPMD
PHONE NUMBER:	(928) 871-6091/6211	E-MAIL:	jbenally@nndcd.org
TITLE OF DOCUMENT: <i>Integrated Solid Waste Management Plan for Navajo Nation</i>			
DOJ SECRETARY TO COMPLETE			
DATE/TIME IN UNIT:	5.23.17 @ 4pm	REVIEWING ATTORNEY/ADVOCATE:	Harrison Kaur
5/1/17	Sam		6.5.17
DATE TIME OUT OF UNIT:	7.6.17 @ 4:40 PM		
DOJ ATTORNEY / ADVOCATE COMMENTS			
5/23/17 Reassign to NRU			
7/6/17 Legally sufficient. (Comments from client NNEPA caused delay. These comments are not critical but will be provided to ECDU.)			
REVIEWED BY: (Print)	Date / Time	SURNAMED BY: (Print)	Date / Time
A. Kaur	7/6/17	V. Blackhat	7/6/17 2:05pm
DOJ Secretary Called: Jackie		for Document Pick Up on 7.6.17 at 4257 By: RJ	
PICKED UP BY: (Print)		DATE / TIME:	

NNDJ/DRRF-July 2013

COMPLETED



DOWNED



# THE NAVAJO NATION

RUSSELL BEGAYE  
JONATHAN NEZ

DCDA-M17051

## MEMORANDUM

TO : ALL CONCERNED

FROM :   
Carl Smith, Executive Director  
Division of Community Development

DATE : April 27, 2017

SUBJECT : DELEGATION OF AUTHORITY

In my absence from the office on April 28, 2017 at 8:00 AM to 5:00 PM, Mr. Casey Begay will assume the delegation of authority to act in my capacity. He will be delegated to handle administrative matters and have signatory authority for routine documents, except those matters that he feels require my attention.

Your cooperation and assistance is expected and appreciated.

Acknowledged by:

  
Casey Begay, Department Manager II  
Division of Community Development

CARL SMITH  
Executive Director

DIVISION OF  
COMMUNITY  
DEVELOPMENT

PO Box 1904  
Window Rock, AZ  
86515

PH: 928.871.7182  
Fax: 928.871.7189

WEBSITES:  
NNDCD.org  
NavajoChapters.org

MISSION:  
Provide  
opportunities for  
the Navajo  
communities to be  
self-governing and  
self-sufficient.