State of Nevada

Solid Waste Management Plan

2007

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For the
Nevada State Environmental Commission

EXECUTIVE SUMMARY

Nevada's Solid Waste Management Plan *(Plan)* provides a description of the existing framework for solid waste management within the applicable laws, regulations and infrastructure within the State. The *Plan* describes governmental roles and responsibilities, statewide trends in solid waste management, the assessment of Nevada's municipal solid waste management systems, and solid waste management issues and future considerations.

Nevada Revised Statute 444.570 requires the State Environmental Commission (SEC), in cooperation with governing bodies of Nevada's municipalities, to develop a statewide solid waste management system plan. The plan is reviewed and revised every five years. This *Plan* is intended to fulfill this requirement and to provide guidance, and information to support:

1. Adoption of solid waste management regulations by the SEC;
2. Efforts undertaken by the Nevada Division of Environmental Protection (NDEP) before the Nevada Legislature regarding the allocation of solid waste program resources;
3. Development and implementation of solid waste management plans and ordinances administrated by Nevada's municipal governments; and
4. Activities by other stakeholders who provide solid waste services to the communities, businesses and residents of Nevada.

In Nevada, state and local governmental entities share certain roles and responsibility for solid waste regulations and program management. Governmental authority is defined in the Nevada Revised Statutes (NRS 444.440 – 444.645, see Appendix 5) and the Nevada Administrative Code (NAC 444.570 – 444.7499, see Appendix 6). The authority to regulate solid waste is assigned by statute to the Southern Nevada Health District (formerly Clark County Health District) in Clark County and to the Washoe County District Health Department in Washoe County. In all other areas of the State, the NDEP within the Department of Conservation and Natural Resources (DCNR) retains jurisdiction for solid waste regulations and program management. The regulatory programs implemented by the solid waste authorities primarily focus on the administration of the environmental protection standards for the collection and disposal of solid waste; the NDEP has additional responsibilities for statewide planning, public information and education. The local

municipal governments are responsible for planning and implementing a municipal solid waste management system for all solid waste generated within their municipalities.

Statewide Trends: Statewide trends in solid waste management are discussed in Section 2 of the *Plan* under the headings of Landfills, Collection, Waste Generation and Recycling Rates, Importation, and Data Collection and Reporting.

Since the early 1990's, the trend in solid waste management has been moving toward a more regionalized infrastructure. While Nevada landfills range in size from very small (3 tons per day) to one of the largest in the country (over 11,000 tons per day), the two largest landfills (Apex in southern Nevada and Lockwood in the north) receive about 90% of all the waste disposed. Reflecting the State's unprecedented population growth, the amount of solid waste disposed in Nevada has steadily increased. The importation of solid waste to Nevada has also increased significantly in recent years, gaining 700% for the period 1993 to 2005. Moreover, the probability for waste importation to Nevada remains high, as existing and potential new landfills become positioned to accept larger amounts of imported waste.

Solid Waste Management System: Section 3 of the *Plan* presents an assessment of each county's solid waste management system. Each assessment (contained in Appendix 3) is composed of a county map showing solid waste facilities and a companion profile that describes the county's solid waste infrastructure and services. The assessments can be used as benchmarks for tracking solid waste system changes in each county, or for comparing one county's system to another's.

Solid Waste Management Issues: Section 4 of the *Plan* discusses solid waste management issues and future considerations. The issues are grouped under the headings of Landfills, Recycling and Waste Prevention, Importation of Solid Waste, Special Waste Management, Rural Solid Waste Management, Illegal Dumping and Open Burning, and State and Local Funding. Following each of the sections, the *Plan* provides future considerations to improve Nevada's solid waste management system.

Landfill Liner Requirements and more: Section 4.1 provides information about landfill liner requirements, bioreactor landfills, postclosure care timeframes, and conventional final cover designs.

Regarding landfill liner requirements, the *Plan* recognizes that site-specific conditions are important for making liner decisions. Nevertheless the *Plan* notes that further development of disposal infrastructure (with or without liners) must focus on careful assessment of landfill designs that are protective of the environment.

Another issue addressed in the *Plan* is the concept of "bioreactor" landfills. These landfills introduce liquids into the waste mass to promote waste decomposition. In Nevada, making these types of innovative landfill designs possible would require amending State regulations through adoption of certain USEPA rules.

Recycling and Waste Prevention: Recycling and waste prevention is discussed in Section 4.2 of the *Plan*. As way of background, in 1991 Assembly Bill 320 was enacted by the Nevada Legislature; the law set the stage for Nevada's entrance into the world of recycling. State law now sets a recycling goal of 25% within each municipality that has a recycling program. Since Nevada began tracking recycling rates, the statewide rate has steadily increased to over 21%. Although rates in Washoe County and Carson City have surpassed the 25% goal, the rate in Clark County has remained below the goal.

NDEP continues to promote recycling in Clark County and has implemented measures to increase recycling activity. The Nevada Legislature passed a requirement for the large urban counties to promote recycling in the business community by providing information on the availability of recycling services when an application is received for a new or renewal business license. Another modification was a requirement for any county with a population greater than 40,000 to conduct a biennial review of its recycling program and submit its findings and proposed revisions to the NDEP for approval. Other statutory changes have been made to increase recycling at public buildings. Section 4.2.4 of the *Plan* provides items for future consideration to improve recycling.

Waste Importation: Solid waste importation is discussed in Section 4.3 of the *Plan*. As noted above the importation of solid waste in Nevada is increasing. Business interests and rural community development planners are marketing Nevada's waste disposal capacity to out-of-state customers. Given this trend and the US Supreme Court's prohibition against restrictions on the flow of waste, it appears Nevada will remain a "net" waste importer. Imported waste falls outside of Nevada's Tire Fee revenue, which is the revenue stream that funds statewide as well as certain local activities dedicated to implementing Nevada's solid waste management regulations. To defray the cost of managing and regulating solid waste, the 2005 Nevada Legislature did pass legislation to allow the State Environmental Commission (SEC) to establish fees for the disposal of solid waste or for the issuance of permits or other approvals by NDEP. While these fees would only be subject to solid waste management facilities within DCNR's jurisdiction (15 counties, excluding Clark and Washoe), the *Plan* notes that NDEP may (at some point in the future) petition the SEC to collect fees to defray the costs of managing and regulating solid waste.

Special Waste Management: The *Plan* discussed Special Waste Management in Section 4.4. Special Wastes require unique handling due to certain physical, chemical or biological characteristics of the waste. An example of an emerging Special Waste is mercury. NDEP has developed a webpage (http://ndep.nv.gov/mercury/mercury_recycling.htm) and an informational brochure that addresses the proper disposal of household waste mercury. The action was taken following incidents involving the spill of elemental mercury at local schools. It's worth noting here that household generated materials that have the characteristics of hazardous waste are exempt from hazardous waste regulation.

Other special wastes of concern are medical and pharmaceutical wastes. Waste from medical and veterinary facilities are generally handled by medical waste services throughout the State, but services for home-generated medical and pharmaceutical wastes are limited.

Electronic waste (E-waste) is a special waste that is currently receiving national attention. The volume of E-waste is rapidly growing and various components of this waste stream (e.g. TV screens, computer monitors, cell phones) have been identified in some states as hazardous wastes. As both industry and government seek to alleviate the problem on a national level, public education is needed in Nevada concerning proper recycling and disposal options. NDEP provides continued

support for E-waste collection events. Section 4.4.6 provides items for future consideration concerning special waste management.

Rural Solid Waste Management: The *Plan* discusses rural solid waste management in Section 4.5. Several municipalities in rural Nevada are struggling to provide the basic elements of a solid waste management system. Improving rural solid waste management may be accomplished through more coordinated planning efforts, enhancement of training programs for landfill operators, and public education. The State's recycling and solid waste grant program can also help to supplement local government planning efforts and equipment acquisition. Section 4.5.1 provides items for future consideration.

Illegal Dumping and Open Burning: Illegal dumping and open burning is covered in Section 4.6 of the *Plan*. Illegal or open dumping is a persistent problem in both rural and urban areas of Nevada. Illegal dumping problems are fundamentally local in nature and combating the issue through a combination of solid waste management planning, public education, and coordinated enforcement will help reduce the problem. Local community groups have made great strides in controlling illegal dumping by coordinating community cleanup projects, involving the local government, and producing public information campaigns. Section 4.6.1 provides items for future consideration on illegal dumping and open burning.

State and Local Funding: Section 4.7, of the *Plan* evaluates the adequacy of the State Tire Fee; the fee funds the three solid waste management authorities in Nevada. Tire Fee revenues have decreased considerably when compared to the tonnage of waste disposed since the fee was established in 1991. At issue is the adequacy of NDEP's portion of the fee to carry out State responsibilities for planning, public information/education, and solid waste management regulation in Nevada's 15 counties. As well, the Tire Fee revenue may well be inadequate to support a "set aside" for recycling programs and local assistance grants for solid waste projects. As mentioned above, at some point in the future NDEP may be required to petition the SEC for authority to collect fees, pursuant to NRS 444.560, to defray the costs of managing and regulating solid waste within the State's jurisdiction.

Nevada's rural local governments may also require increased funding to support local waste management operations. Although local taxing authority may be available, the tax base for some communities may not be sufficient to generate needed revenues. In such locations, private solid waste companies may also not be profitable, leaving the municipality to face significant challenges for meeting community solid waste needs in a manner that complies with all applicable environmental regulations. Section 4.7.3 provides items for future consideration.

Key Stakeholders: This *Plan* is intended to be a guide and an informational resource to support solid waste management laws, regulations and policies. Key users are the Nevada Legislature, NDEP, the Southern Nevada Health District, the Washoe County District Health Department, other state & local agencies, all municipal governments in Nevada and the State Environmental Commission. The *Plan* may also be useful to Nevada's waste management service providers, including landfill operators, refuse collectors and recyclers, as well as solid waste generators, including all of Nevada's industries, businesses and residents. Implementation of items in the *Plan* that are identified for "future consideration" could further enhance a sound program of solid waste management in Nevada.

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1. Introduction

1.1 Scope and Purpose

The management of solid waste is a vital part of the infrastructure of any city or county. Local reuse and recycling programs help conserve resources and instill a "conservation ethic" in citizens. Cost-effective and efficient waste collection systems help to prevent illegal dumping and protect public health. Properly designed, well-operated landfill sites ensure safe disposal of solid waste. Planning and implementing a system to effectively manage solid waste is a responsibility of local government.

State government's primary role is regulatory with respect to solid waste management, by implementing the regulations adopted by the State Environmental Commission. The statutes and regulations governing solid waste management in Nevada are NRS 444.440 – 444.645 (Appendix 5) NAC 444.570 – 444.7499 (Appendix 6) and NRS 444A.010 – 444A.110 (Appendix 7) NAC 444A. 005 – 444A.655 (Appendix 8). Appendix 1 contains a list of the amendments to the Nevada Revised Statutes (NRS) and Nevada Administrative Codes (NAC) pertaining to solid waste management. Solid waste planning, agency coordination and public education are also responsibilities of the State. NRS 444.570 (Appendix 5) requires the State Environmental Commission to develop a statewide plan for management of solid waste and to update the plan every five years. This planning requirement gives the State an opportunity to assess solid waste management systems statewide, and to review the efficacy of existing laws and regulations.

Ensuring safe handling of solid waste continues to be a central part of the Nevada Division of Environmental Protection's (NDEP) mission. Toward that end, this solid waste management plan (*Plan*) reviews the status of collection and disposal systems within each County. It also considers the adequacy of landfill standards in light of recent trends toward importation of solid waste to rural disposal facilities. Finally, this *Plan* attempts to identify viable economic incentives and other methods that will encourage the most efficient use of resources, reduction of waste generation and optimum recovery of resources from the solid waste stream.

In general Nevada's infrastructure for solid waste collection and disposal has improved dramatically over the past ten years, especially in rural areas of the State. Curbside recycling services are now widely available in major urban areas, and a composting industry has emerged in northern Nevada.

1.2 Governmental Roles and Responsibilities

1.2.1 Municipal Governments

Each municipality or health district in Nevada is required by NRS 444.510 (Appendix 5) to develop and carry out a plan for a "solid waste management system" which is defined in statute as "the entire process of storage, collection, transportation, processing, recycling and disposal of solid waste. The term includes plans and programs for the reduction of waste and public education." Municipalities are also required to implement recycling requirements in NRS 444A.040 (Appendix 7). In order to carry out these responsibilities, the statutes give authority to municipalities to adopt ordinances, acquire land, offer franchises for solid waste collection, and levy appropriate fees (these fees are not subject to the fee revenue cap specified in NRS 354.5989).

Local governments are also largely responsible for enforcing statutory prohibitions against unlawful dumping. Amendments to the solid waste statutes adopted by the 71st Nevada Legislature (2001) provide significant authority to local government agencies and peace officers to levy civil and criminal penalties for illegal dumping. Unauthorized dumping is a misdemeanor subject to penalties, community service sentences and revocation of business licenses.

1.2.2 Health Districts

In Clark and Washoe Counties, the health districts are the primary regulatory agencies over solid waste management. The State statutes designate these agencies as the *"Solid Waste Management Authorities"* within their respective jurisdictions, although the health district programs are subject to periodic review by the NDEP. The NDEP retains the ultimate authority to implement municipal landfill regulations in the health districts, if necessary. In addition to enforcing unlawful dumping provisions, the health districts are responsible for issuing permits and conducting compliance inspections at disposal sites, transfer stations, materials recovery facilities, and other facilities that handle or process solid waste within their jurisdiction. The governing boards of the health district may adopt ordinances governing solid waste disposal sites and solid waste management systems, or any part thereof that are more restrictive than those adopted by the State Environmental

Commission and other solid waste management regulations as long as they do not conflict with the SEC regulations. The Washoe County District Health Department, through an inter-local agreement, also exercises regulatory authority over the Lockwood Regional Landfill, located in Storey County.

1.2.3 State Government

The NDEP has the responsibilities of solid waste planning, permitting, compliance monitoring, enforcement, and implementation of a public information and education programs. In addition, the NDEP has responsibilities under NRS 444A (Appendix 7) for implementing the program for recycling. The State Environmental Commission has the authority to adopt solid waste and recycling regulations.

The NDEP is the designated solid waste management authority in all areas of the State, except Clark and Washoe Counties. The NDEP is also tasked with the periodic review of the programs of the other Solid Waste Management Authorities, primarily to ensure that their permitting and compliance monitoring programs are consistent with the State and Federal municipal landfill criteria.

Nevada received approval from the US EPA in 1994 to enforce federal municipal landfill regulations. In order to receive approval, the State had to demonstrate that its regulations were at least as stringent as the Federal landfill criteria and that it had adequate resources and authority to enforce the standards. The NDEP and the health districts have the responsibility to ensure compliance with the minimum federal standards for municipal landfills. While procedures are established in statute for the NDEP to exercise authority over Clark and Washoe Counties to enforce solid waste laws and regulations, if necessary, the US EPA retains authority to take enforcement action if evidence is found that handling or disposal of solid waste is presenting an imminent and substantial endangerment to public health or the environment, or where there are violations of the federal landfill criteria and the State has failed to take action to remedy the situation.

1.2.4 Tribal Governments

Neither the NDEP nor the health districts have authority to regulate solid waste management on tribal lands. Federal Subtitle D regulations are self-implementing on tribal lands; however the US EPA may issue site-specific flexibility waivers for landfills on tribal lands if the site wishes to establish a flexible performance standard rather than use the prescriptive standards set forth in 40 CFR Part 258 (Appendix 9). This ensures that landfills located on tribal lands may apply for the same flexibility available to landfills in states with EPA-approved MSWLF permit programs.

The Nevada Rural Water Association (NvRWA), under a contract with the US Dept. of Agriculture has provided technical assistance to tribes on solid waste issues. Historically, coordination between the tribes and the NDEP on solid waste issues has been informal, yet solid waste management issues clearly cross jurisdictional boundaries. Open burning (air pollution), collection and recycling services on and off tribal land, and protection of surface water and groundwater from landfill contaminants are examples. NRS 444A.040 (Appendix 7) requires municipalities with approved recycling programs to make them available to reservations and colonies within their jurisdictions. In 2003, a tribal liaison position was established within the NDEP in an effort to improve coordination among Nevada's tribal and municipal agencies.

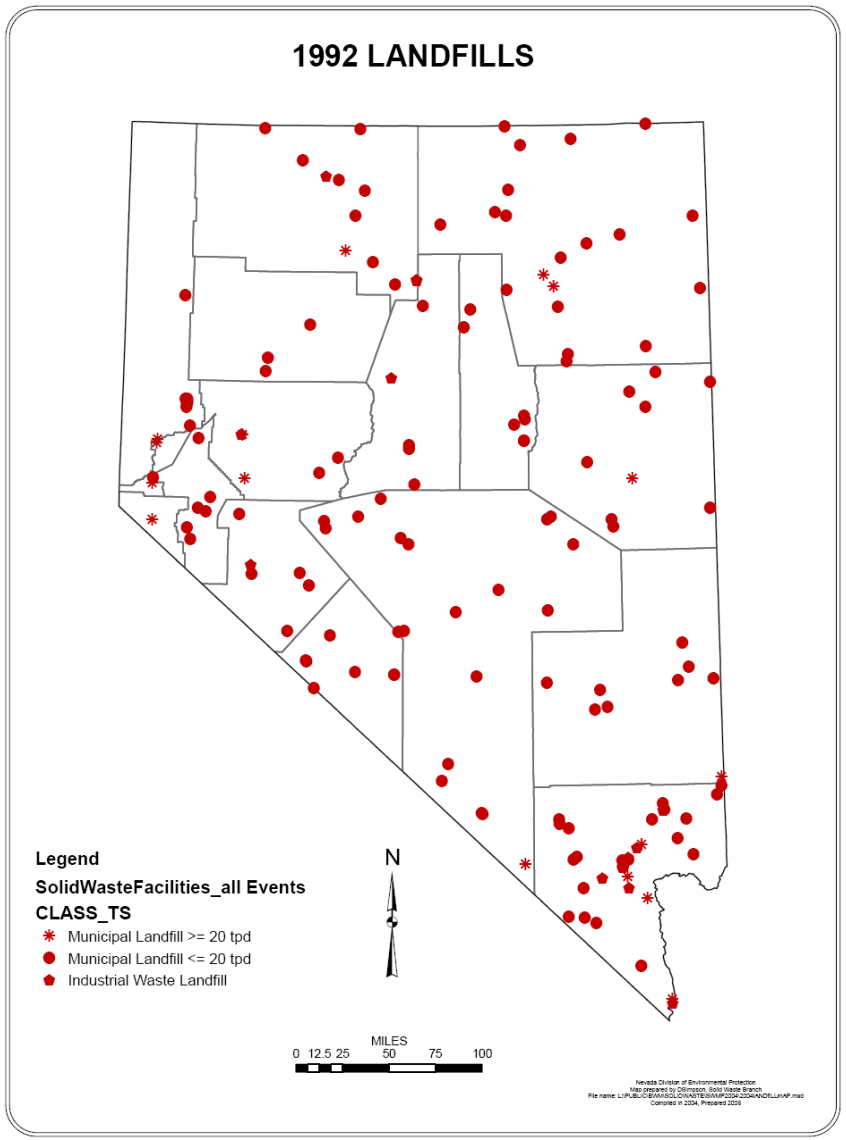
1.2.5 Federal Facilities

The Federal government operates solid waste facilities, including landfills, on some of the Department of Defense (DoD) and Department of Energy (DOE) installations within Nevada. These landfills service only the installations and are not open to the general public. A number of the facilities lie within restricted areas and are regulated through the NDEP Bureaus of Federal Facilities (DOE) or Bureau of Corrective Actions (DoD). The remaining solid waste facilities under Federal control are regulated, as normal, through the appropriate solid waste management authority.

2. Statewide Trends in Solid Waste Management

2.1 Landfills

Implementation of more stringent State and Federal landfill regulations in the 1990's drove the regionalization of the solid waste collection and disposal infrastructure. Figure 1 illustrates the distribution of municipal landfills before and after the implementation of the more stringent standards. More than 100 small, rural, open dumps have been closed in favor of regional municipal



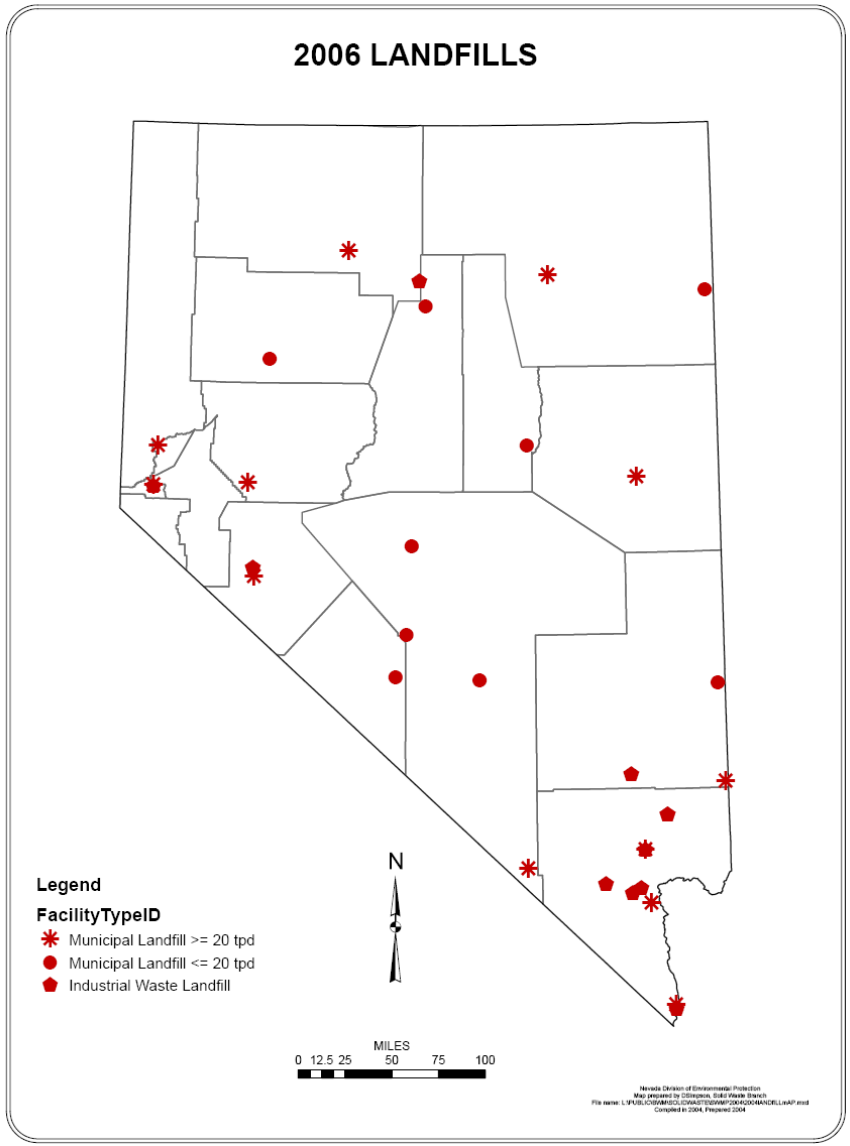


Figure 1. Distribution of municipal and industrial solid waste landfills in Nevada in 1992 and in 2006. Over one hundred landfills were closed in Nevada between 1992 and 2006 as a result of consolidating the solid waste infrastructure to regional landfills, transfer stations, and waste storage bins.

landfills and the associated network of transfer stations and public waste storage bins. The map in Appendix 4 of this *Plan* illustrates the distribution of the solid waste infrastructure within Nevada in 2007.

The relative size of currently operating landfills range from very large to extremely small and generally correspond with the distribution of the State's population (Figure 2). Two landfills receive roughly 90% of the waste disposed of in Nevada: the Apex landfill serving the Las Vegas valley, and the Lockwood Landfill serving primarily the Reno-Sparks area. Both of these landfills are privately owned and operated.

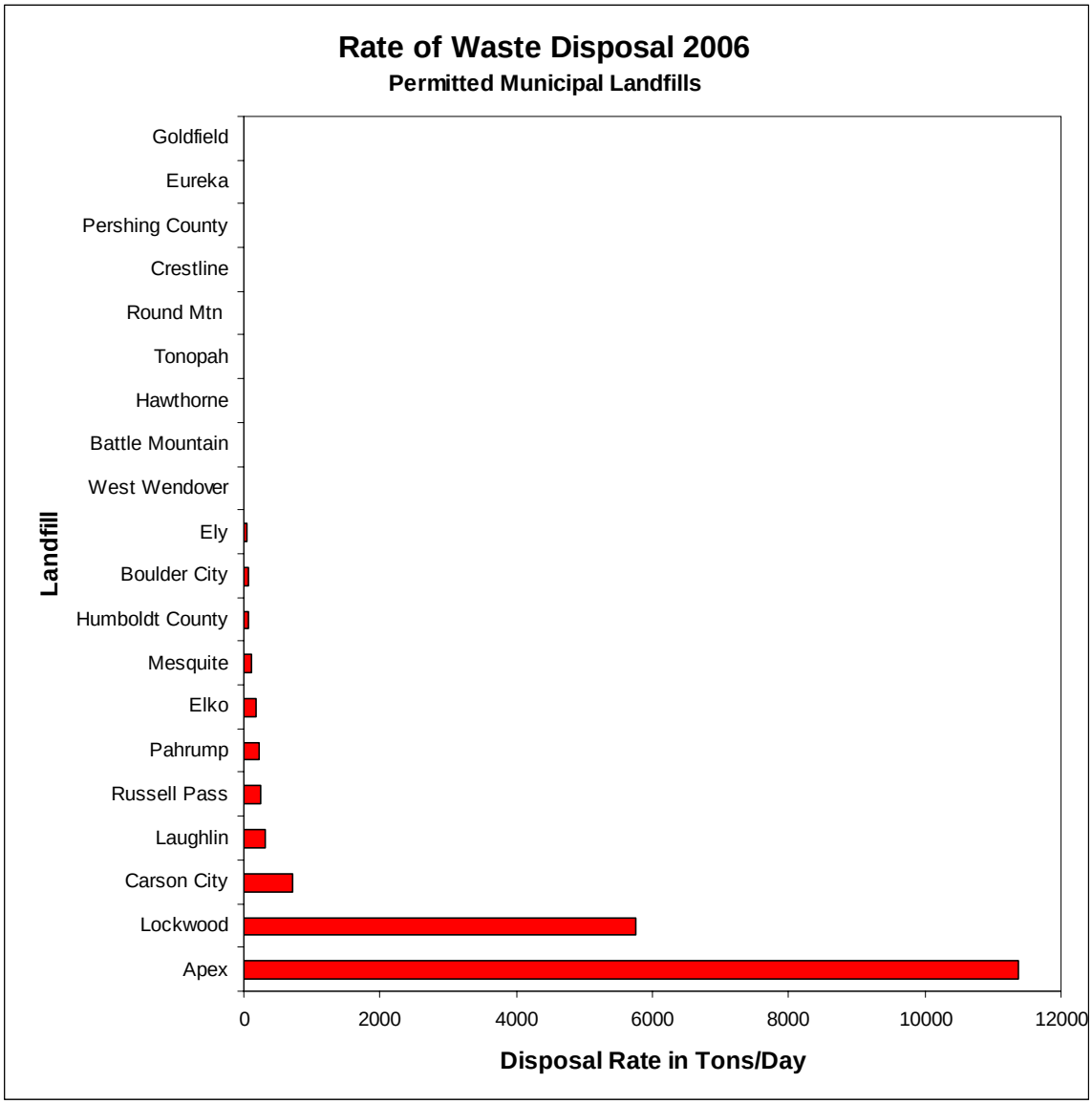


Figure 2. Daily disposal rate at permitted municipal landfills (averaged over 365 days).

Apex is Nevada's largest landfill and ranks as one of the largest municipal landfills in the nation (based on annual tonnage of solid waste received for disposal), receiving over 11,000 tons of solid waste per day on average. One of Nevada's smallest landfills is the Goldfield landfill, which serves a population of less than 1,500 people in Esmeralda County. The Goldfield landfill receives about 3 tons of solid waste per day on average.

In general, most of Nevada's landfills have disposal capacity well into the future. The NDEP has encouraged municipalities to plan for and take measures to assure adequate future landfill capacity. Appendix 2 provides a summary of active municipal waste landfills including their capacities and projected closure.

2.2 Collection and Transport

Solid waste collection has changed in two important respects. First, bi-weekly collection of recyclables at single-family homes became available in Clark, Washoe, and Carson City Counties pursuant to the municipal recycling program requirements that were adopted in 1991. The second change was the establishment of an extensive network of transfer stations and rural public waste storage bin facilities from which waste is hauled, at least weekly, to regional landfills. The waste collected at the transfer stations or public waste storage bin facilities is transported in covered roll-off or waste transfer trucks to the landfill. Waste is often transported over County lines to a regional landfill. A few of the public waste storage bin facilities in Clark, Washoe and Storey counties have attendants and charge disposal fees, but most of the public waste storage bin facilities are unattended and are maintained at the county's expense, either directly or through a county contractor. Transfer station and public waste storage bin facility locations are listed below and shown on the map in Appendix 4.

Transfer Stations

Clark:	Cheyenne (North Las Vegas), Henderson, Sloan
Churchill:	Fallon
Douglas:	Gardnerville
Elko:	Jackpot
Lyon:	Fernley, Smith Valley, Sutro (Dayton), Yerington
Washoe:	Incline Village, Reno, Stead

Public Waste Storage Bin Facilities

Clark:	Searchlight, Sandy Valley, Mt. Charleston, Moapa Valley
Elko:	Tuscarora, Wells, Midas, Jarbidge, Montello, Carlin, Pilot Valley
Esmeralda:	Fish Lake Valley, Silver Peak
Eureka:	Crescent Valley
Humboldt:	Kings River, Orovada, Paradise Valley, Denio
Lander:	Kingston
Lincoln:	Rachel, Alamo, Hiko, Panaca, Pioche, Dry Valley, Caliente, Ursine
Mineral:	Mina-Luning
Nye:	Beatty, Amargosa Valley, Belmont, Manhattan
Pershing:	Grass Valley, Unionville, Imlay
Storey:	Virginia City
Washoe:	Gerlach, Empire

Subject to franchises awarded by the municipalities, Waste Management, Inc. and Republic Services of Southern Nevada (Republic) collect nearly all of the municipal waste in the urban areas of Reno and Las Vegas, respectively. About 15 smaller companies provide waste pickup to businesses and residences throughout the rest of the State. The municipal governments of Fallon, Gardnerville, Minden, and Caliente operate their own garbage collection services. Residential collection service costs are between $11 and $12 per month in Clark, Washoe and Carson City. In rural counties the range is wider, between $5 and $19 per month. In sparsely populated areas of the State, such as Esmeralda County, residents must haul their own waste to the nearest landfill or public waste storage bin facility.

2.3 Waste Generation and Recycling

As depicted in Figure 3, the total amount of solid waste disposed in Nevada has steadily increased. The increase in industrial waste disposal shown in 1999 was due to the initial reporting of waste disposed at the Wells Cargo construction and demolition debris landfill in Clark County. Statewide the amount of material diverted for recycling remained somewhat consistent between 10 and 15% until 2003 and 2004 when it increased to 19% and 21%, respectively. This increase is believed to be attributed to the growing demand for recycled materials. While there is significant local variation in recycling rates, Washoe County and Carson City have steadily improved their recycling rates and have consistently met or exceeded the recycling goal of 25%. Clark County's rate has remained below the 25% goal.

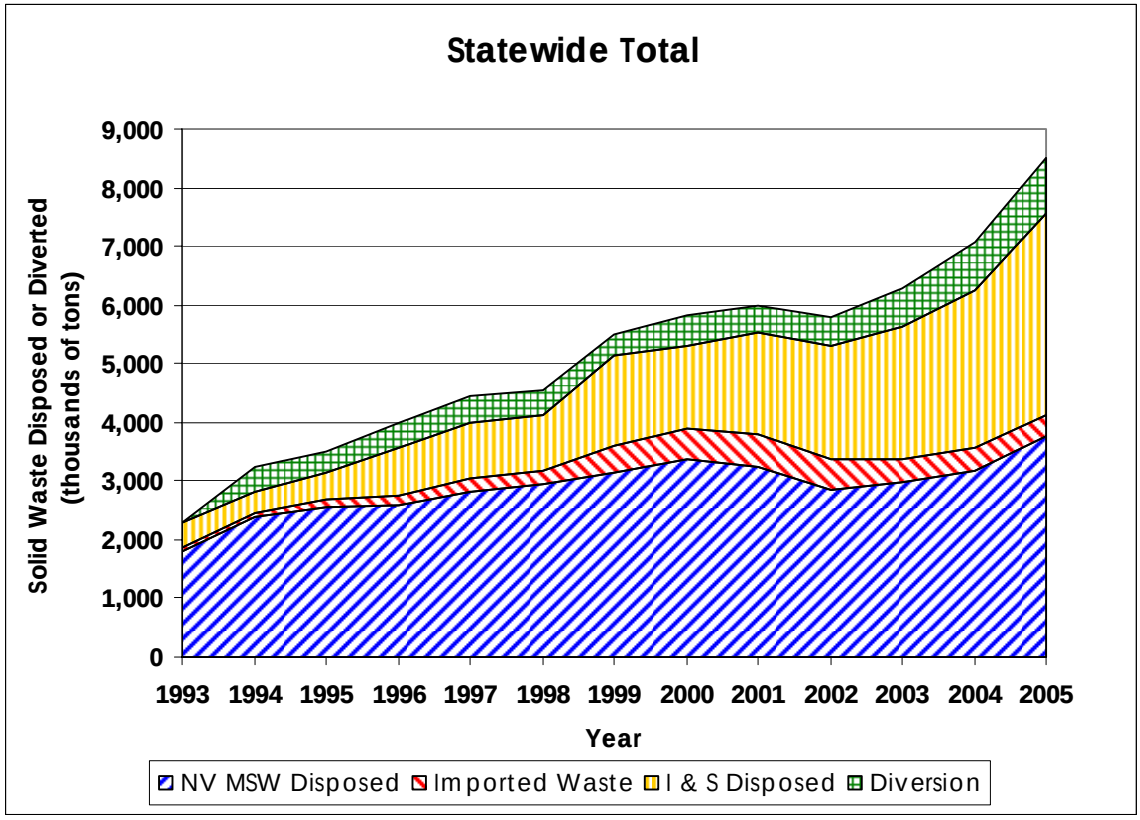


Figure 3. Total municipal solid waste plus industrial & special waste and imported waste disposed and diverted in Nevada. Diversion (recycling) data was first reported in 1994.

2.4 Importation

The amount of solid waste imported from out-of-state has increased almost 700% during the period from 1993 to 2005. The Lockwood Regional Landfill, located east of Reno-Sparks in Storey County, has received virtually all of this imported waste. Lockwood, which is owned and operated by Waste Management, Inc., is the regional landfill servicing much of western Nevada, including Washoe, Storey, Lyon, Douglas and part of Churchill County. In addition, Lockwood receives waste from several areas in California, including the Lake Tahoe Basin, the northern Sierra corridor and the City of Sacramento (Figure 6). The amount of waste imported to Nevada presently accounts for about 10% of the municipal solid waste disposed in Nevada. This amount currently represents less than 1% of the waste generated in California.

There is a potential for a significant increase in importation of solid waste into Nevada. Although the Apex Landfill is not currently receiving imported waste, it is privately-owned (Republic Services of Southern Nevada) and positioned on a rail line, making future

importation a viable enterprise. Apex's estimated life under the current permit is in excess of 40 years, and Republic owns additional acreage at the site that would allow for further expansion. The Crestline Landfill, located in Lincoln County near Panaca, is also privately-owned and positioned to receive rail-hauled waste. Crestline is currently operating as a Class II landfill serving the very modest disposal needs of Lincoln County, yet the facility has obtained a Class I permit (660 acre disposal area) to receive a large volume of solid waste per day once lined disposal cells are constructed and financial assurance for closure is demonstrated. In 2004 the Crestline Landfill was purchased by NORCAL Waste Systems, Inc., a solid waste management company with operations in California. It remains to be seen when, or whether, NORCAL will obtain contracts for waste importation and disposal that would justify the landfill's expansion to a Class I facility. In 2006, the Rawhide Landfill was permitted as a Class I disposal site on the former Rawhide-Denton Mine site. The mine's open pit and peripheral surface area will be utilized for municipal solid waste disposal. The Rawhide Landfill is owned by Nevada Resource Recovery Group (NRRG) of Nevada.

The NDEP has received notice of additional large municipal solid waste landfills being proposed in northern Nevada; though formal applications have not yet been submitted. These large scale landfill proposals have been welcomed by the local communities as a potential source of local government revenue. Other rural municipal governments have shown interest in developing their own commercial waste disposal facilities. The City of Fallon recently increased its permitted disposal rate at the Russell Pass Landfill, while both the City of Elko and Humboldt County have sought to expand landfill capacity beyond the needs of the local communities. These efforts to gain new landfill capacity present the potential for significant importation of out-of-state waste. Whether the potential for large-scale importation is realized or not depends on the regional market for solid waste disposal, the availability of disposal capacity in the region, and the feasibility of individual projects. Imported waste is generally "dead waste" which has already been stripped of any value/recyclables before it gets to Nevada. Whether waste importation is seen by Nevadans as an opportunity for economic development or as exploitation of Nevada resources by other states, recognition of this potential enterprise may require the re-evaluation of the State's landfill regulatory program and its implementation.

2.5 Data Collection and Reporting

Reliable data on the quantities of solid waste disposed and recycled are necessary in order to conduct State and municipal waste management planning, assure future disposal capacity and provide citizens with a means to measure the success of local efforts to recycle and reduce waste. Terms used in this *Plan* include:

- *Municipal solid waste (MSW):* solid waste from residential, commercial and institutional waste generators
- *Industrial waste*: non-hazardous solid waste generated at industrial plants; also includes construction and demolition debris
- *Special waste*: solid waste that requires special handling due to its physical, biological or chemical nature, eg. medical waste, asbestos waste
- *Recycling rate:*

$$\frac{\text{MSW recycled}}{\text{MSW disposed + MSW recycled}} \times 100\%$$

Waste imported from outside of Nevada is not counted in the recycling rate.

The data referred to in the above sections are useful for discussing trends and making comparisons, although there are areas where information is lacking or questionable. The following provides general comments on the quality and interpretation of the solid waste data.

2.5.1 Disposal Quantities and Per Capita Generation Rates

On a statewide basis Nevada's solid waste disposal data is reliable. Quarterly, semi-annual or annual disposal reports are required from all landfills. The larger landfills weigh the incoming waste on scales, which captures over 95% of Nevada's disposed waste. The smaller landfills, however, do not have scales and use volume estimates with conversion factors to calculate and report tonnage disposed. In the rural counties, wide variations in per capita generation rates, shown on Figure 4, highlight the inexact nature of volume estimates. The anomalously low rates of Lander and Pershing Counties are probably due to underestimating disposal volume. It is unclear why Churchill's rate is low, since all of this county's waste is disposed at either the Lockwood Landfill or City of Fallon Landfill, both of which have scales. Figure 5 shows greater consistency in the disposal data gathered from landfills with scales. These data indicate a weighted average MSW generation rate of over 10 pounds/person/day.

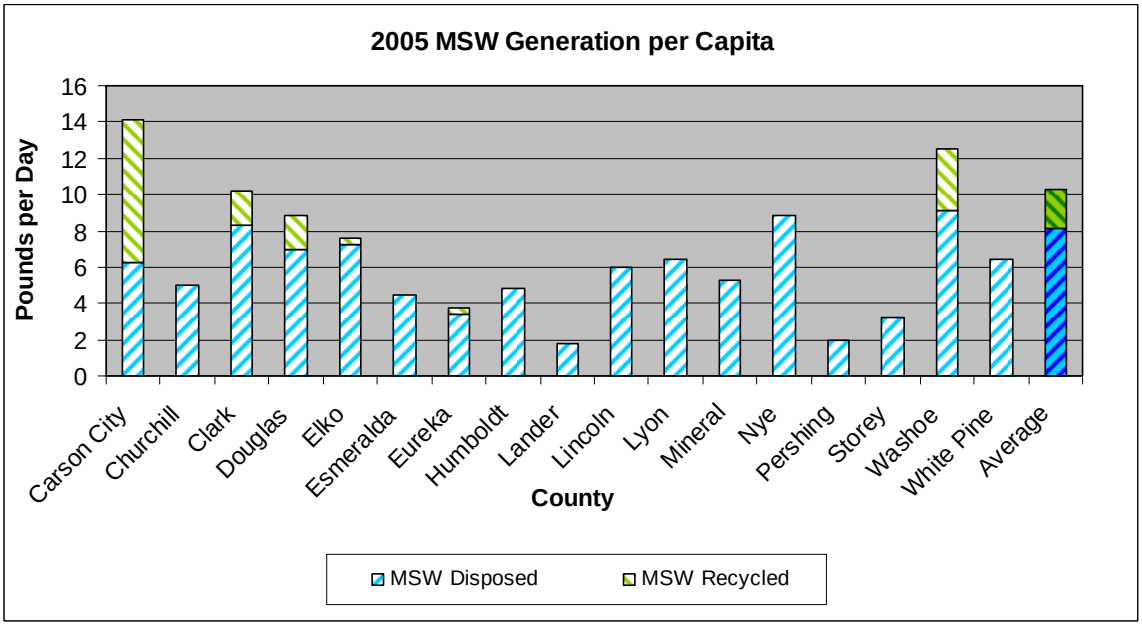


Figure 4. Municipal solid waste generated per capita for each County. Esmeralda, Eureka, Lander, Lincoln, Mineral, Nye, Pershing, and White Pine weight is calculated from volume estimates. The generation rate in the figure represents landfilled or diverted MSW by County origin. The average represents the weighted average based on population. (The most current data compiled is calendar year 2005)

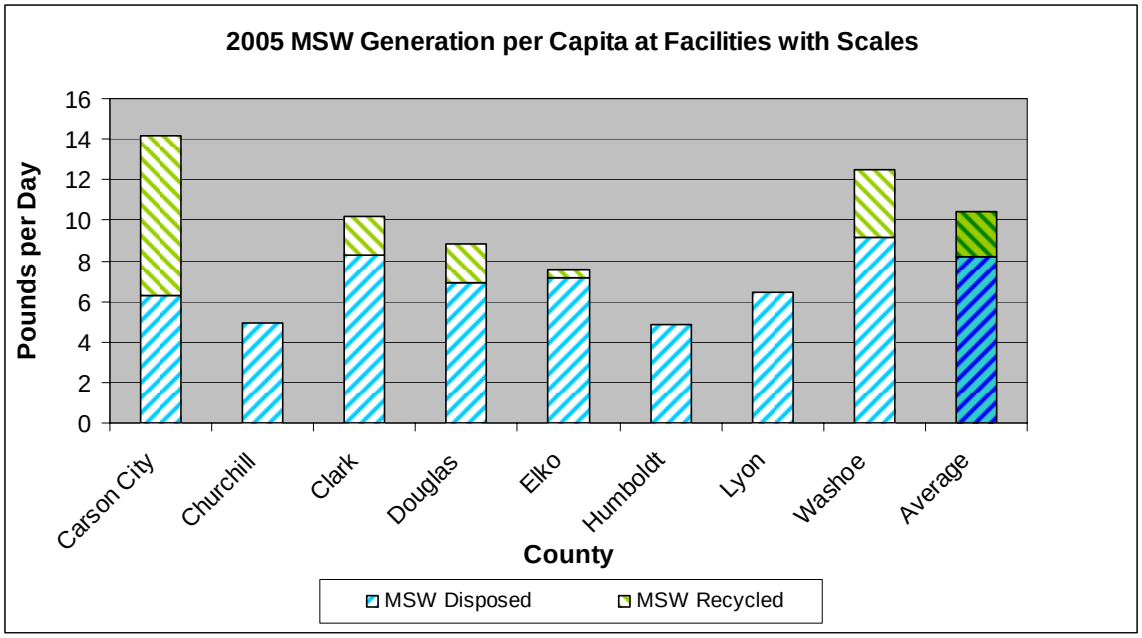


Figure 5. Municipal solid waste generated per capita for each county using disposal sites equipped with scales. The generation rate in the figure represents landfilled or diverted MSW by County origin. The average represents the weighted average based on population. (The most current data compiled is calendar year 2005)

It has been suggested that Nevada's tourism economy has an effect on the municipal waste generation rate. The Las Vegas Convention and Visitor's Authority reports that over 35 million people visit the area per year. These visitors are transient generators of municipal solid waste and are not counted in with the resident population. As such, per capita waste generation tends to be higher in the high-tourism areas than in non-tourism economies. A waste characterization study would be needed to assess waste generation patterns associated with tourism and to better explain the variation in generation rates of Nevada's municipalities.

2.5.2 Recycling Quantities

The 66th Nevada Legislature (1991) set a goal of recycling 25% of the total solid waste generated in each municipality. In order to evaluate progress toward this recycling goal, the NDEP surveys county recycling rates each year. While the concept of recording and reporting the quantities of all the materials recycled may seem simple, it demands the effort and cooperation of municipal governments, recycling centers and disposal services to gather and record accurate data. In counties with populations greater than 40,000, recycling centers are required to submit a certified annual report of the types as well as volume materials recycled to the municipal government. The municipalities compile this information into their annual recycling rate report to the NDEP. As is often the case, the municipalities do not receive complete and/or accurate reports in a timely manner, requiring prompting and/or follow-up with the recycling centers. Although regulations require recycling centers to report, there are no penalty provisions for failure to submit. The municipality must also take care to avoid double counting materials, which happens, for example, if a recyclable material generator and the recycling center that receives it both report it as recycled. Finally, in reviewing the municipal reports, the NDEP checks the data to verify its accuracy. Any abnormal or inconsistent numbers are flagged and the reporting county is contacted for additional information or clarification.

The Biennial Recycling and Waste Reduction Report attempts to answer the question of "how well Nevada is recycling?" Looking at the county and statewide data and comparing it to past years can verify if the State is making progress. Comparing the recycling rate for one county

to that of another is also useful in that the area with the higher rate may be doing something worthy of imitation. Yet one must use caution when drawing conclusions from such comparisons. The 2005 urban municipality recycling rate varies between Clark County's rate of 19% to Carson City's and Washoe County's rates of 47% and 27%, respectively. This brings to question, are the differences real, or simply a reflection of differences in calculation methodology?

Historically, the NDEP's experience in working with the municipalities that conduct the recycling rate calculations suggest that Washoe County and Carson City are more effective at collecting the recycling data, partly because the recyclers in the north are more habituated to the routine of annual reporting and more cooperative in this effort. With this in mind, it may be that the Clark County recycling rate is under-reported.

Another data anomaly worth noting is that Clark County's waste generation rate (i.e. the amount disposed plus the amount recycled) is significantly lower than that of Washoe County or Carson City (see Figure 5). This is an unexpected finding, for which no explanation has been put forth to date.

It is important that the State and the local governments provide reliable and meaningful measures of recycling rates. In order to build public confidence in the reports, it is also important that the data collected be verifiable, and that the terms and methods used in calculating the rate be simple, consistent and available for public review. The SWMA's have agreed upon a standard set of reporting criteria and are working with the local governments and recyclers to improve the collection and reporting of recycling data.

NDEP and the solid waste management authorities have partnered with U.S. EPA Region 9 to develop consistent recycling reporting data between the Pacific Southwest states to facilitate the sharing of recycling program opportunities for improvement as well as interstate recycling measurement issues. In collecting and reporting data, the State and local governments will strive to clearly identify municipal solid waste and construction and demolition debris recycling data using U.S. EPA's definitions.

3. Assessment of Municipal Solid Waste Management Systems

Appendix 3 contains a map and corresponding one-page solid waste profile for each county in Nevada. Each map provides a "snapshot" of the existing solid waste infrastructure. Each profile provides the following information:

- Local solid waste planning authority
- Population and solid waste trends
- Active municipal waste landfills
- Solid waste and recyclables collection services
- Number of Recycling drop-off sites
- Household hazardous waste collection services

The solid waste trends presented in the solid waste profiles are as follows:

- *Municipal solid waste (MSW) generated:* solid waste generated within the county from residential, commercial and institutional sources.
- *Industrial/special waste disposed:* solid waste generated from industrial sources that do not have on-site disposal facilities. The waste may come from within or outside the county. Examples are construction/demolition debris, waste tires, sludges.
- *Imported waste disposed:* solid waste disposed in Nevada that was generated outside the State.
- *Recycling rate:* Recycling rates are for MSW only and are presented as historically reported. The "recycling rate" is calculated by the tons recycled divided by the tons generated.

4. Solid Waste Management Issues and Future Considerations

The disposal and recycling regulations that have been adopted and implemented in Nevada, since 1991, have significantly changed the way solid waste is managed in Nevada. In reviewing the current status of Nevada's solid waste management systems some "old problems" persist while some new issues have been identified. As Nevada's solid waste authority, we have to ask; do our solid waste management systems comply with applicable Federal and State standards, protect public health and the environment, enhance the beauty of the landscape and conserve natural resources? Are Nevada's solid waste laws and regulations

adequate to achieve the goals for which they were adopted? This section of the *Plan* describes some issues that deserve attention and suggests strategies for addressing them. The issues are grouped under the general headings of: *Landfills, Recycling and Waste Prevention, Importation of Solid Waste, Special Waste Management, Rural Solid Waste Management, Open Dumping and Open Burning,* and *State and Local Funding*.

4.1 Landfills

Since the Federal Subtitle D of the Resource Conservation and Recovery Act (RCRA) criteria were established in 1991, landfill researchers and operators have pointed to problems with the criteria and suggested potential alternatives to address them. Liner requirements and alternative cover criteria have come to question in arid environments. In Nevada, recent proposals to develop large commercial facilities have raised concern about the current requirements for containment of landfill leachate and gas.

4.1.1 Liner Requirements

All municipal waste landfills in Nevada are required to conform to Federal standards adopted under RCRA Subtitle D. The Federal regulations and the approved State regulations require a composite liner of clay and plastic membrane for all new or expanding landfills that receive an average of more than 20 tons per day of waste (Class I facility). However, landfill owner/operators may apply to the Solid Waste Management Authority to approve an alternative design if a landfill owner/operator can demonstrate that the landfill design is sufficient to protect the waters of the State from degradation by pollutants or contaminants. This *Plan* recognizes that site-specific conditions should be considered and taken into account in further development of our disposal infrastructure, and that, with attention to detail and careful oversight of proposed designs, approved landfill designs can be protective of the environment.

4.1.2 Bioreactor Landfills

The standard approach to landfill design in Nevada is commonly known as the “dry tomb,” achieved by the minimization of leachate generation by the exclusion of liquids from the buried waste. Some researchers have criticized the “dry tomb” design, contending that it delays decomposition of waste such that the waste will always present a threat to groundwater.

An alternative technology, the "bioreactor" landfill, is gaining more attention among regulators and the waste industry to address this concern. A bioreactor landfill employs leachate recirculation and the controlled addition of liquids to promote waste decomposition. Bioreactor landfills are currently operating in other states, but it remains to be seen whether bioreactor designs will be safe and economical landfill alternatives for Nevada, where climatic and hydrogeologic conditions appear to favor the indefinite containment of solid waste in a "dry tomb."

In March 2004 the USEPA revised its municipal landfill criteria to allow states to issue Research, Development and Demonstration (RD&D) permits that allow variances from the standard landfill operation criteria, design criteria and final cover requirements in the closure and post-closure care criteria. The Federal RD&D rule requires that any permit issued under the rule must, *"include terms and conditions at least as protective"* as the standard municipal landfill design. One requirement of a permit with this flexibility is the requirement to collect data and report on the performance of the designs. These permits would be issued for 3 years extendable up to a maximum of 12 years. Data gathered under the RD&D rule will help regulators and landfill owners evaluate the performance of these designs under different climatic conditions. With the RD&D flexibility a variety of innovative landfill designs is possible. In order to have the flexibility to try new technologies, such as the "bioreactor" landfill, Nevada would have to amend the solid waste regulations by adopting the RD&D rule.

4.1.3 Postclosure Care Period

Landfill owners are required to provide postclosure care for a 30-year period following the site's final closure in order to maintain the final cover, monitor and manage explosive gas and if applicable, monitor groundwater, and maintain and operate the leachate collection system. Recent advocates for revision of the postclosure care criteria have noted that the 30-year time period is arbitrary and have suggested that the standard should be based on risk – that postclosure care should continue until the waste no longer poses a threat to groundwater. In addition to leachate management concerns, the long-term integrity of the final cover is a concern for all Nevada landfills because natural forces may eventually impair every final cover, thus compromising the integrity of the waste containment system.

While thirty years is the standard postclosure period under Nevada regulations, the solid waste authority may alter the time frame. A shorter period may be approved if the owner demonstrates that it is sufficient to protect the environment; a longer period may be required if the authority determines that this is necessary to protect the environment. Lacking an agreed-upon method for making such a demonstration, a 30-year period has been accepted as default in Nevada, as in most states. As a result, planning and cost estimates for postclosure care are developed on the assumption that it will last thirty years. In order to interject the flexibility in the regulation, a methodology needs to be developed to evaluate landfill performance and environmental risk during the postclosure period. Such a methodology would provide regulatory agencies with criteria for approving demonstrations, as well as an incentive for landfill owners to design, operate and close landfills in a manner that would reduce the time during which they pose a threat of contaminant release. The Environmental Research and Education Foundation (EREF) has initiated the development of such a methodology and published its progress in the document *A Performance-Based Approach to Ending Post-Closure Care at Municipal Solid Waste Landfills* available online at http://www.erefdn.org/.

4.1.4 Final Cover Design

The current prescriptive standard for a municipal solid waste landfill cover consists of an 18-inch thick layer of compacted clay topped by a 6-inch layer of soil capable of supporting vegetation. The clay layer provides the barrier to impede moisture percolation into the waste mass. In the last few years, researchers have asserted that the wetting-drying cycles resulting from direct exposure to the atmosphere cause cracks to develop in the clay. New data suggest that such covers may quickly fail within only a few of these wetting-drying cycles.

While the literature contains several alternative final cover (AFC) design concepts, the evapo-transpiration cover (ET cover) is showing the most promise for Nevada's arid climate. Such covers can be designed to exceed the percolation reduction performance of conventional covers and also offer other advantages, such as ease of construction and increased long-term cover integrity. While Nevada regulations allow Solid Waste Management Authorities to approve AFC designs that achieve an equivalent reduction in percolation as the prescriptive cover design, few permit applications have incorporated them to date. The absence of AFC design work in Nevada may be due to the lack of familiarity with AFCs, the lack of a standardized

approach to demonstrations of equivalency, and applicants' fears of the inevitable delay involved with a regulatory review of an innovative design.

As noted previously in Section 4.1.2 above, US EPA recently amended the Federal landfill standards to allow states to issue RD&D permits that authorize variations from certain of the criteria, including the final cover design. While the RD&D rule would require that any alternative cover be at least as protective as the prescriptive design, the owner/operator of the landfill must demonstrate that no moisture will escape from the landfill to the surrounding surface and groundwater.

4.1.5 Landfill Gas

Since the Federal municipal waste landfill criteria were adopted in 1991, landfill design and operation has become increasingly important for the proper management of landfill gas. The landfill gas regulations were written primarily to prevent explosion hazards due to the generation and migration of methane. It was a commonly held belief that arid landfills do not generate significant quantities of landfill gas, and that this issue was of little importance in Nevada. However, the Apex in southern Nevada collects and continually flares gas that is generated at the facility.

Due to changes in Federal clean air regulations and information accumulated from landfill research and operational data, landfill gas issues are beginning to be seen in a different light. Three points deserve mention:

- In 1996 *New Source Performance Standards* (NSPS) and *Emission Guidelines* (EG) were adopted under provisions of the federal Clean Air Act to reduce emissions of air pollutants resulting from waste decomposition at municipal landfills. Six Nevada landfills are subject to NSPS or EG requirements because they exceed the permitted capacity threshold established in the federal rules. In conjunction with these rules, EPA established the *Landfill Methane Outreach Program* to promote gas collection and energy recovery development. Landfill gas projects may help larger Nevada landfills to meet financial objectives while reducing air pollution, conserving energy and complying with air pollution standards. Data collected pursuant to these regulations may prove useful in landfill design, operation, monitoring, closure and postclosure care.

- The assumption that arid landfills do not produce gas is contradicted by the experience of the Apex Landfill in Clark County, which has been collecting and flaring gas since

shortly after it began accepting waste in 1993. While it has been suggested that this apparent anomaly is due to higher moisture content in Clark County's municipal waste, it may be partially due to Apex having an HDPE liner impeding downward migration of the gas.

- Landfill gas migration is now recognized as a potential source of groundwater contamination. Remediation investigations at arid landfills in Arizona, California and elsewhere suggest that the migration of volatile organic compounds (VOC) in the gas phase is a more likely mechanism of groundwater contamination at such sites than leachate migration.[1]

4.1.6 Items for future consideration, Sec. 4.1 - Landfills

1. In reviewing any request for a new or expanded landfill that proposes to use an alternative liner design, the Solid Waste Management Authorities (SWMA's) should conduct a comprehensive detailed engineering evaluation to ensure that the application conclusively demonstrates that the proposed design is sufficient to protect the waters of the State from contamination.

2. The SWMA's could consider seeking amendment of the Nevada Administrative Code to allow solid waste management authorities to issue RD&D permits for bioreactor landfills and alternative final covers in conformance with federal requirements contained in CFR 40 §258.4 (Appendix 9).

3. The SWMA's should monitor the development of tools, methods and criteria (EREF and others) that can be used to establish the end of postclosure care based on landfill performance (e.g., whether the landfill has ceased to pose a threat to human health and the environment).

4. The SWMA's should continue to monitor and evaluate landfill gas detection and collection data at Nevada's municipal waste landfills and investigate the conditions of landfill gas generation.

4.2 Recycling and Waste Prevention

Since Nevada's recycling goal of 25% was established by legislation adopted in 1991, Carson City and Washoe County have made significant progress in recycling and have surpassed the goal. Clark County's recycling rate has remained below the goal. With the exception of Humboldt County, which modified their property tax structure in 2006 to allocate funds for a recycling program in Winnemucca, minimal recycling is occurring in the rural Counties. With

[1] Murray, R., Samorano, D., Masbruch, K., and Petersen, N. 1991. An Empirical Model for Vapor Transport in Arid Landfills. Seminar Presentation, 1991.

the majority of the State's population located in the greater Las Vegas area the greatest opportunities for improving a statewide recycling rate lie in Clark County.

4.2.1 Improving Recycling in Clark County

In the last few years, the NDEP has promoted recycling in Clark County and implemented measures to increase recycling activity. In March 2001, the NDEP co-hosted a Recycling Forum with the Southern Nevada Health District in Las Vegas, with support provided by US EPA Region IX staff. Key stakeholders and citizens were asked to identify what they perceive to be barriers to recycling and to suggest strategies for improving recycling programs. Below are a few findings from this forum.

- One way to improve may be to have a legal requirement to drive recycling. The 25% recycling goal is simply a goal, not a mandate.
- Add a local Clark County recycling coordinator to the County staff to serve as an advocate and source of recycling information, similar to Washoe County who has a recycling coordinator on staff.
- Increase efforts to promote recycling and provide public information and education related to recycling.
- Improve recycling opportunities for apartment dwellers by providing bins designated for recyclables throughout the complexes, curbside collection service, and provide additional drop-off centers that accept recyclable materials.
- Pursue a coordinated effort to encourage recycling in the commercial sector.
- Consider modifying the recycling and garbage collection frequency, because twice weekly garbage collection and twice monthly recycling collection tends to promote waste generation and disposal rather than recycling.
- Promote local markets for recyclable materials to enhance recycling of some materials that face unfavorable economic conditions due to distant markets and transport costs.
- Improve the reliability of recycling information submitted to the NDEP and used to calculate recycling rates.

Following the Clark County Recycling Forum, a number of actions were taken to improve recycling. The NDEP launched a modest advertising campaign in the Las Vegas Valley to promote recycling, including television and outdoor advertising. The NDEP's recycling hotline was advertised which resulted in a measurable increase in calls to the hotline. In

addition, the NDEP has provided continued support for the UNLV Rebel Recycling program that provides a drop-off recycling center to area residents and the University community.

In 2002, the US EPA Region IX also sponsored a study by the Tellus Institute, culminating in a report titled *"Assessing the Potential for Resource Management in Clark County, Nevada."* Resource Management, in this context, refers to a method of contracting for disposal services where incentives for recycling and waste prevention are built into the contract. Tellus examined franchise agreements for most municipalities in Clark County and assessed the potential for increasing recycling through a resource management approach to franchise contracts. This study provides valuable information that could guide local government leaders and disposal companies toward a win-win revision of the existing franchise agreements. Region IX has also provided grant funding to the Clark County Public Education Foundation (http://www.ccpef.org/), a non-profit group in Clark County that set up an educational re-use warehouse. Local institutions and businesses donate materials and tools, including computer equipment that teachers can use in their classrooms.

The Southern Nevada Health District and the Nevada Division of Environmental Protection co-hosted the Las Vegas Recycling Summit in 2006. The objective of the summit was to motivate discussions about recycling amongst the business community, elected officials, governing agencies, and the public. Of primary concern was how, collectively, these entities can improve avenues to encourage recycling and begin to develop a strategy to increase the recycling rate.

4.2.2 Legislative Changes to Municipal Recycling Programs

Chapter 444A of the Nevada Revised Statutes and Administrative Code sets up a 3-tiered structure of municipal recycling programs based on county population size. Counties with populations greater than 100,000 are required to have a higher level of service available than smaller Counties with populations between 40,000 and 100,000. No requirements apply in counties that have a population smaller than 40,000. Clark and Washoe Counties are in the upper tier; Carson City and Douglas and Elko Counties are in the second tier.

Introduced in the 72nd Nevada Legislative Session (2003), AB-447 contained several changes to recycling programs, including the requirement that the upper tier (Clark and Washoe Counties) establish a County recycling coordinator position and to revise the County building codes to require large apartment complex and commercial building developments provide space for recycling containers. Each of these provisions would have laid important groundwork for recycling programs in our urban communities had AB-447 not died in committee; two other important provisions in AB-447 survived to become part of SB-396 concerning municipal recycling programs, which was passed in the 73rd Legislative Session (2005). One was a requirement for the large urban counties to promote recycling in the business community by providing information on the availability of recycling services when an application is received for a new or renewal business license (NRS 44A.040.1.d, see Appendix 7). This provision will provide greater transparency of the recycling programs in our urban areas and should create new opportunities for commercial recycling. The second modification was a requirement for any county with a population greater than 40,000 to conduct a biennial review of its recycling program and submit its findings and proposed revisions to the NDEP for approval (NRS 444A 050.2.b, see Appendix 7). This provision strengthens a pre-existing requirement to make communities periodically assess their progress toward recycling goals. The 74th Legislative Session (2007) passed AB-178 which amended NRS 444A to include "The board of county commissioners in a county whose population is 400,000 or more shall, in conjunction with each licensed hauler of garbage and refuse operating in the county, establish a pilot program for collecting and separating recyclable material that has the potential to be used as a source of renewable energy or converted into renewable fuel. The pilot program must include an exploration of technologies and processes that are able to use recyclable material as a source of renewable energy or convert recyclable material into renewable fuel." The 74th Legislature also passed SB-331 which modifies NRS 444A.110 requiring the NDEP to encourage the Nevada System of Higher Education to research and develop methods for the reduction, reclamation and conversion of solid waste.

While other statutory revisions could benefit recycling, many of the same benefits may be achieved through initiatives at the local level. The biennial municipal recycling program review provides municipal solid waste planners with an opportunity to consider whether

changes such as revisions to local ordinances or franchises, municipal government staffing, funding reallocations, etc., are appropriate to reach community and State recycling goals.

4.2.3 Recycling at Public Buildings

Public buildings continue to present opportunities to reduce waste and increase recycling. Assembly Bill 564, passed in the 70th Nevada Legislative Session (1999), amended several statutes related to recycling at public buildings. In general, the revisions:

- Broadened requirements for the recycling programs in Clark and Washoe Counties to ensure the availability of recycling collection services at public buildings.

- Authorized the appropriate rule-making bodies to prescribe procedures for the recycling of paper and other waste materials produced by the following governmental entities:
    - Courts
    - Legislature
    - State government offices
    - School districts and
    - University of Nevada and Community College System

- Assigned the NDEP the responsibility to assist State agencies in developing and carrying out recycling programs within State buildings.

Pursuant to the above amended statutes, the State Environmental Commission adopted NAC revisions to the municipal recycling program regulations in Ch. 444A, and the State agency recycling requirements in Ch. 232. In October 2001, the NDEP issued a model plan for public building recycling programs.

Although the legal authority to implement recycling programs has been significantly broadened, public building recycling programs have achieved only spotty success, even in urban areas where collection services should be available. The following lists possible improvements to consider for expanding public building recycling programs:

- Increase the space for recycling containers
- Include recycling provisions in janitorial service contracts
- Provide information on availability of recycled material collection service
- Included collection of recyclable materials at public buildings in solid waste franchise agreements

In an effort to improve recycling at public buildings in Clark County, the NDEP administered an EPA grant in 2004-2005 to identify and assess recycling in large public buildings and commercial office complexes in the Las Vegas area, and to identify the recycling services

available to them, providing public information about and facilitating access to these services. The report on this study is online at: http://nevadarecycles.gov/main/pb_model_report07.htm.

4.2.4 Items for future consideration, Sec. 4.2 - Recycling and Waste Prevention

1. Consider making recycling available to apartment-dwellers through either: 1) statutory revisions that would require the large municipalities to adopt ordinances requiring that provisions for storage of recyclable material be included in applications for building permits for new multi-family residential complexes with 20 or more units, or 2) coordination with local governments and franchisees to provide more drop-off centers in areas lacking convenient access to them.

2. Coordinate with the State Public Works Board and other agencies to promote the allocation of space and facilities for recycling in new public buildings.

3. Improve the submission of recycling center reports by seeking statutory changes that would establish penalties for non-reporting and make the report a condition of renewal of a municipal business license. Add a statutory provision for confidentiality to protect the interests of reporting businesses.

4. Improve accountability of municipalities with approved recycling programs by enforcing the requirement to conduct a biennial assessment of their recycling programs, including recommendations, and submitting them to the NDEP for approval.

5. Establish a program to provide State recognition to individuals, institutions and businesses for outstanding efforts to reduce waste and recycle.

6. Continue to investigate the feasibility of adoption of a State "Bottle Bill," or beverage container redemption value.

7. Coordinate with State agencies on recycling within agency offices to conform with NAC 444A.500 (Appendix 8) and pursue expansion of the recycling efforts to include other recyclables such as bottles, cans, etc.

8. Encourage and support opportunities to develop organic materials composting and/or anaerobic digestion for green waste, wood waste, food waste, and food soiled paper.

4.3 Importation of Solid Waste

In several areas of the nation waste importation has become a controversial issue. Especially in the Eastern part of the country, where space is at a premium, solid waste tends to flow across state lines from areas of higher to lower urbanization. Because the US Supreme Court has ruled that waste is an article of commerce, no State or local government can establish rules that discriminate against disposal of waste based on its State of origin.

Federal landfill standards established in the last decade caused a trend toward regionalization of landfills. As previously noted, in addition to the large increases in waste importation over the last decade, both business interests and rural community development planners have begun to market existing, and potential, Nevada disposal capacity to out-of-state customers. Please see Figure 6 for a graphic depiction of the origin and disposition of Nevada's current waste importation.

Given this trend and the US Supreme Court's prohibition against restrictions on the flow of waste, it appears that Nevada is likely to remain a "net" waste importer. Arguments can be made that solid waste importation provides an economic benefit to local communities, provides jobs, and offsets community solid waste management's costs. This *Plan* suggests Nevada should focus on how to be better prepared to manage the additional waste in a manner that continues to protect public health and the environment, while promoting an ethic of waste reduction and resource conservation.

While some may see the economic benefits of waste importation, there are also costs. Solid waste importation brings with it more truck traffic and more roadside litter along routes to Nevada's landfills. There is also a regulatory burden - new landfills, transfer stations and transportation mean additional permitting application reviews, and facility inspections. Industrial and special wastes that are generated in other states also bring new regulatory challenges to Nevada.

Opinions differ as to whether the current funding for Nevada's solid waste programs is sufficient, yet it is clear by some indicators that it is decreasing. Revenue for the management of solid waste in Nevada primarily comes from a $1 fee (Tire Fee) on the purchase of new tires, making the account funded by Nevada residents and businesses. The Washoe County District Health Department supplements their portion of the tire fee by collecting permit fees from haulers and generators that take waste (including out-of-state) to the Lockwood Regional Landfill in Storey County. As solid waste importation increases, the ratio of revenue to waste disposed ($ in solid waste management account/ton waste) decreases (see Figure 8). This trend is one indicator of the resources available for regulation of solid waste.

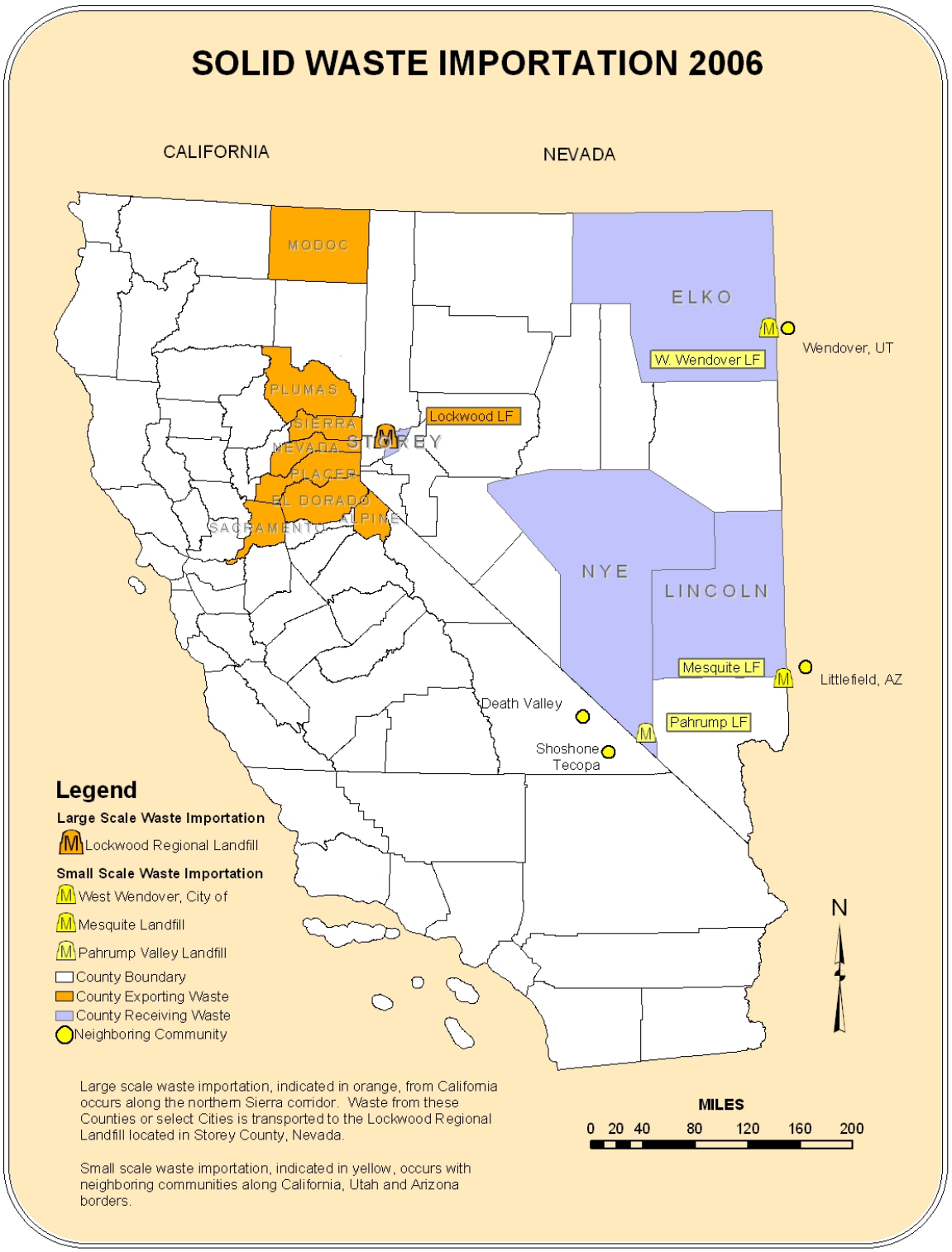


Figure 6. Solid waste importation into Nevada from surrounding States.

4.3.1 Items for future consideration, Sec. 4.3 - Importation of Solid Waste

1. The NDEP may be required, in the future, to petition the SEC for authority to collect fees, pursuant to NRS 444.560 (Appendix 5), to defray the costs of managing and regulating solid waste within the jurisdiction of the NDEP.

4.4 Special Waste Management

Special wastes are those that require special handling or disposal because of their physical, chemical or biological characteristics. Examples of special waste types include waste tires, vehicle batteries and motor oil, household hazardous waste, medical (bio-hazardous) waste, liquid waste (e.g. septic pumping), petroleum contaminated soil, appliances, junk automobiles and electronic wastes (e.g. computers, monitors etc.). For the most part, Nevada's municipal waste programs have developed suitable facilities and procedures for managing these wastes; however, there are a few persistent or emerging problems with special wastes as noted in the next sections.

4.4.1 Waste Tires

Nevada has adopted regulations governing the management and transportation of waste tires but is one of the few States that still allow the landfilling of whole tires. Owing to the fact that most landfills accept tires, and that waste tire haulers are required to document proper disposal, Nevada does not have a large illegal tire dumping problem. On the other hand, because of the low-cost disposal option and the relatively high cost of tire recycling, waste tire recycling markets have not developed in Nevada. The landfilling of whole tires is operationally challenging, however, and is an inefficient use of disposal capacity. As a result, some landfill owners/operators have recently raised waste tire disposal fees, which could result in recycling being seen as a more attractive means of managing waste tires. Nevada's *Waste Tire Management Plan* (1994) recommends the development of tire-derived fuel (TDF) markets, such as cement and lime kilns, as a viable means of reducing waste tire landfilling while recovering their energy value.

4.4.2 Household Hazardous Waste (HHW)

Materials that have the characteristics of hazardous waste, if generated in households, are exempt from hazardous waste regulation. While household wastes such as solvents, cleaning compounds and pesticides can be legally disposed in municipal landfills, many citizens and

local governments seek environmentally preferable methods for their disposal or recycling. NRS 444A.040 (Appendix 7) provides that municipalities with populations greater than 40,000 shall have a program for HHW management. In the Las Vegas valley, Douglas County and Carson City, a comprehensive HHW drop-off service is available to residents at no charge. In the Reno-Sparks area a private hazardous waste management company provides this service (drop-off) for a fee; however, it is unlikely that it serves the purpose of diversion of HHW from the municipal waste stream. Residents are far less likely to use such a service if they must pay to do so. Many rural counties collect used vehicle batteries and oil for recycling, but few of them have comprehensive HHW programs.

Elemental mercury recently received media attention following several incidents in Nevada. This attention has caused many citizens to inquire about proper disposal of elemental mercury from their homes, perhaps discovered in household storage or generated from discarded mercury-containing devices such as thermostats and thermometers. As a result, the NDEP developed a webpage and an informational brochure to provide information regarding the proper disposal of household waste mercury. The local waste disposal company or district health department remains the first point of contact for specific information regarding proper disposal. Information and assistance regarding the disposal of household hazardous waste may also be obtained from the NDEP.

4.4.3 Medical Waste

There are services throughout the State for the collection and disposal of medical waste generated in health care and veterinary facilities. Services for home-generated medical waste are not available, however. Sharps, medical instruments such as needles or lancets that are generated in the home are of particular concern because, they may become contaminated with blood-borne pathogens and are able to create a route of entry to the body. Sharps in the municipal waste stream pose a health hazard to sanitation workers who transport or work at facilities that manage household waste. While it may never be possible to fully eliminate sharps from the ordinary municipal waste stream, services that encourage separation from the municipal waste stream and the proportion of the use of sharps containers could further reduce the hazards to sanitation workers.

The Southern Nevada Health District solid waste management authority intends to adopt ordinances to provide for the storage, handling, processing, and disposal of medical waste to insure the safety of the public's health in Clark County. The Washoe County District Health Department has comprehensive Biohazardous Waste ordinances in place to regulate medical waste, including sharps. The Washoe County District Health Department is currently working with the garbage franchise holder to implement a "Sharps by Mail" program for sharps generated within households.

4.4.4. Pharmaceuticals and Personal Care Products

Disposal of excess pharmaceutical products has gained the attention of solid waste managers because of objections to the formerly-favored method of flushing unused drugs down the sink or toilet. Recent studies have shown that common drugs, and chemicals contained in personal care products, have appeared in the nation's surface waters at low concentrations (See USEPA webpage*:* http://www.epa.gov/esd/chemistry/pharma/faq.htm - Inwhattypes). While advances in chemical analysis have made it possible to detect these contaminants at trace levels in drinking water sources, little is known about their potential effects on human health or the environment at these levels. Although the potential for human health effects due to the presence of pharmaceutical wastes in drinking water is of concern, the effects on aquatic organisms may be more pronounced due to their continual exposure.

While the discharge of pharmaceuticals from manufacturing and the medical profession is already well defined and controlled, quantities released from diffuse sources (e.g. household waste) are harder to estimate or control. Diffuse sources include human excretion of ingested drugs and the disposal of excess drugs in the sanitary sewer or home septic system. A useful introduction to the complex issue of excess medication disposal can be found on the USEPA webpage: http://www.epa.gov/esd/chemistry/pharma/faq.htm - disposal. It is recommended that Nevada solid waste managers monitor emerging data on the environmental impacts of pharmaceutical wastes and the development of new management programs for them.

4.4.5 Electronic Waste

This wastestream (televisions, home computers, cell phones and other electronic equipment) is generated in increasing quantities in homes, schools and businesses throughout the nation.

Some of these wastes fail hazardous waste toxicity characteristic tests and must, therefore, be managed according to hazardous wastes rules. Most notably, cathode ray tubes (CRTs) – the glass screen component of TVs and computer monitors – typically contain several pounds of lead. There is a cost to properly dispose of a standard sized monitor, or ship it to a glass recycling facility. Due to the waste management cost, electronic wastes are often stored indefinitely in warehouses and garages.

The electronic waste problem is not unique to Nevada. The States of California, Maine, Maryland, and Washington have already adopted laws and regulations to identify the responsibilities for funding and building the infrastructure to manage this waste. The *National Electronics Products Stewardship Initiative (NEPSI),* a multi-stakeholder effort to develop a national program for electronic waste recovery, dissolved in 2005 after failing to reach an agreement among manufacturing interests whether the program should be based on the collection of an "advance recovery fee" at the time of retail sale of the product, or on assigning responsibility to individual manufacturers to take back their waste products for proper management. A bill introduced in the U.S. Congress in 2004 that would begin to address this problem on a national level also failed to gain the support of stakeholders. In Nevada's 73rd Legislative Session (2005), AB-65 was introduced. This bill, which died in committee, would have imposed a ban on the landfilling of, "CRTs, laptop computers and similar video display devices" and would have required the NDEP to establish a program to recycle these wastes. The bill did not include funding provisions, however, without which an effective program would be impossible. "End-of-life" management of electronic wastes is an issue that is likely to become more pressing for Nevada unless a national program is established through Congressional action.

4.4.6 Items for future consideration, Sec. 4.4 - Special Wastes

1. Waste Tires: Continue to evaluate tire landfilling practices (ex. whole tire versus quartered), hazards, and disposal costs and investigate the current potential for TDF and tire recycling markets in Nevada.

2. Household Hazardous Waste: Continue to provide household hazardous waste startup grant funding to rural local governments that are willing to cover program maintenance costs.

3. Mercury: Continue to assist with and promote the collection of elemental mercury from the public. Continue with development of public education on the hazards of elemental mercury and the availability of non-hazardous alternative products.

4. Medical Waste: Promote the development of community collection programs for household sharps. Provide public information on existing sharps mail-in programs.

5. Electronic Wastes: In consultation with stakeholders, assess the current state of e-waste management in Nevada, identify potential health and environmental threats, and provide program recommendations. Continue to provide support for electronic waste collection events.

4.5 Rural Solid Waste Management

A quality solid waste management system depends upon an adequate infrastructure, proper equipment, trained personnel and good planning. Solid waste management programs in rural Nevada often face challenges not seen in urban areas:

- A weaker economic base with limited tax revenue
- Insufficient personnel resources
- Poor economy of scale
- Long transport distances that translate into increased costs
- Lack of recycling infrastructure

Rural local governments own all of Nevada's rural landfills, with a couple exceptions, and the public works departments operate most of them. Although many of these landfills are exempt from the federal requirements for engineered liners and ground-water monitoring, the standards of location, design, operation, closure/post-closure care and financial assurance still apply. With implementation of the RCRA Subtitle D criteria, the rural solid waste infrastructure changed from a few scattered open dumps to engineered solid waste landfills and satellite public waste storage bin facilities. With these changes more equipment was needed – bins for storage, trucks for hauling, dozers, compactors and earthmovers for landfill operations. The demand for new skills of landfill operation, solid waste planning and environmental compliance also emerged. The county governments are responsible for meeting these needs, but in several areas of the State one or more of the elements are deficient, resulting in non-compliance with solid waste regulations.

The Nevada Rural Water Association (NvRWA), a non-profit organization funded by the US Department of Agriculture, has met some of these needs by assisting rural governments with

grant applications, solid waste planning, researching equipment purchases, technical guidance and training. The NDEP supports the continuation of this program.

4.5.1 Items for future consideration, Sec. 4.5 - Rural Solid Waste Management

1. Coordinate solid waste planning with Land Use Master Plans and investigate the use of State Land Use Planning Advisory Council as a solid waste planning forum.

2. Enhance existing, or establish new, training programs to help rural landfill operators meet certification requirements.

3. Continue to provide grants that support rural local governments with solid waste planning, equipment acquisition and cleanup of illegal dump sites.

4.6 Illegal Dumping and Open Burning

Illegal or open dumping is a persistent problem in both rural and urban areas of Nevada, and is perhaps best addressed within the context of the municipal solid waste management plan. The first condition for reducing illegal dumping is a solid waste management system that provides convenient solid waste services at reasonable prices. Once this is available, municipal governments can address illegal dumping through coordinated efforts of public information and enforcement by the local government, law enforcement, prosecutors and judges. NRS 444.621 to 444.645 (Appendix 5) provides municipal governments with the authority to prosecute and penalize illegal dumpers. It is recommended that local efforts consider whether the following would help to the control illegal dumping in their communities:

- Increase the convenience and/or decrease the cost of using authorized disposal services and facilities

- Assure enforcement of the laws against illegal dumpers in small communities

- Promote coordination among local peace officers, prosecutors and courts to address illegal dumping problems

Illegal dumping problems are fundamentally local in nature. Progress in controlling them depends on the citizens and elected municipal officials putting a priority on having a clean community. Elko is an outstanding example of an area in rural Nevada where this has happened. Starting in 2005, the City of Elko led a concerted effort to reduce illegal dumping by involving its citizens and community leaders in a new organization, *Elko County Against Illegal Dumping* (ECAID). ECAID activities include scheduled community cleanup projects,

promoting local government coordination, and a public information campaign. The Southern Nevada Health District holds a monthly Hearing Officer public meeting to hear solid waste violation cases. Most of the cases presented are due to illegal dumping, although violations of NRS 444.440 to NRS 444.645 or any regulations adopted pursuant to those sections are eligible.

Open burning of household garbage and non-vegetation refuse is not only a public nuisance but also presents a threat to public health and the environment due to the emission of toxic substances. The US EPA has determined that open burning constitutes the largest source of dioxins released to the environment in the United States, far exceeding the emissions from commercial waste incinerators. Dioxins are carcinogenic substances that persist in the environment where it can be taken up in the food chain. Not only can nearby residents be exposed through smoke inhalation, but dioxins that falls on crops can be absorbed by plants and animals and ultimately by human consumers of those products.

In 2004 the NDEP Bureau of Air Quality tried to address this problem by proposing new regulations limiting the open burning of solid wastes. As a result of opposition expressed to this change, especially from certain rural areas, it was determined that additional public information and education is needed before this issue will be resolved statewide. The proposed amendments were withdrawn, but some local ordinances were adopted to address this issue.

4.6.1 Items for future consideration, Sec. 4.6 - Open Dumping and Open Burning

1. Provide assistance to rural local government elected officials and staff that want to address illegal dumping problems, including:
   - Public information and education
   - The use of State grants to improve rural solid waste infrastructure
   - On-site workshops to develop local strategies that include all entities and personnel that can influence open dumping

2. Local governments, in jurisdictions where illegal dumping has become a commercial enterprise, should consider adoption of a “generator responsibility” ordinance.

3. Conduct public outreach and education on the risks of open burning and build support for burn restrictions in rural communities.

4.7 State and Local Funding

4.7.1 Solid Waste Management Authorities

Funding for solid waste management is provided primarily through the $1 fee (Tire Fee) per tire sold at retail collected by the State Department of Taxation, and distributed as follows:

NV Division of Environmental Protection:	44.5%
Southern Nevada Health District:	30%
Washoe County District Health Dept.:	25%
NV Department of Taxation:	0.5%

Figure 7 shows tire fee revenue by fiscal year from 1994 to 2006. The upward revenue trend of 5.9% average per year from 1994-2006 is higher than the growth in Nevada's population of 5.0% average per year (Nevada State Demographer data 1994 - 2006). The upward trend in tons of solid waste disposed, 9.3% average per year from 1994-2006, is due to a combination of increasing waste importation and to the increasing construction/demolition (C&D) wastestream resulting from the construction related to Nevada's high growth rate (see Figure 3). In 1994, Tire Fee revenue brought in about 32¢/ton of waste disposed; twelve years later (2006) it amounts to 22¢/ton (Figure 8). The upper curve in Figure 8 shows the change in ratio of Tire Fee revenue per ton of waste disposed. The lower curve is the same ratio adjusted for an average inflation rate of 2.7% annually showing the original 32¢/ton in 1994 declining to 15¢/ton in constant dollars, yielding more than a 50% decrease in revenue per ton of waste disposed in 2006.

While the above revenue-to-waste analysis suggests that the Tire Fee revenue may have eroded to the point of insufficiency, it should be noted that the costs to regulate solid waste are not proportional to the tonnage disposed. Regulatory costs are more likely to be influenced by the number and types of facilities, and the quality, diversity and sources of solid waste.

In an attempt to address solid waste management funding needs while ensuring that imported waste supports its share of the cost for solid waste management, the NDEP proposed a modest tipping fee in the 72nd Nevada Legislative Session (2003). The proposal didn't receive the

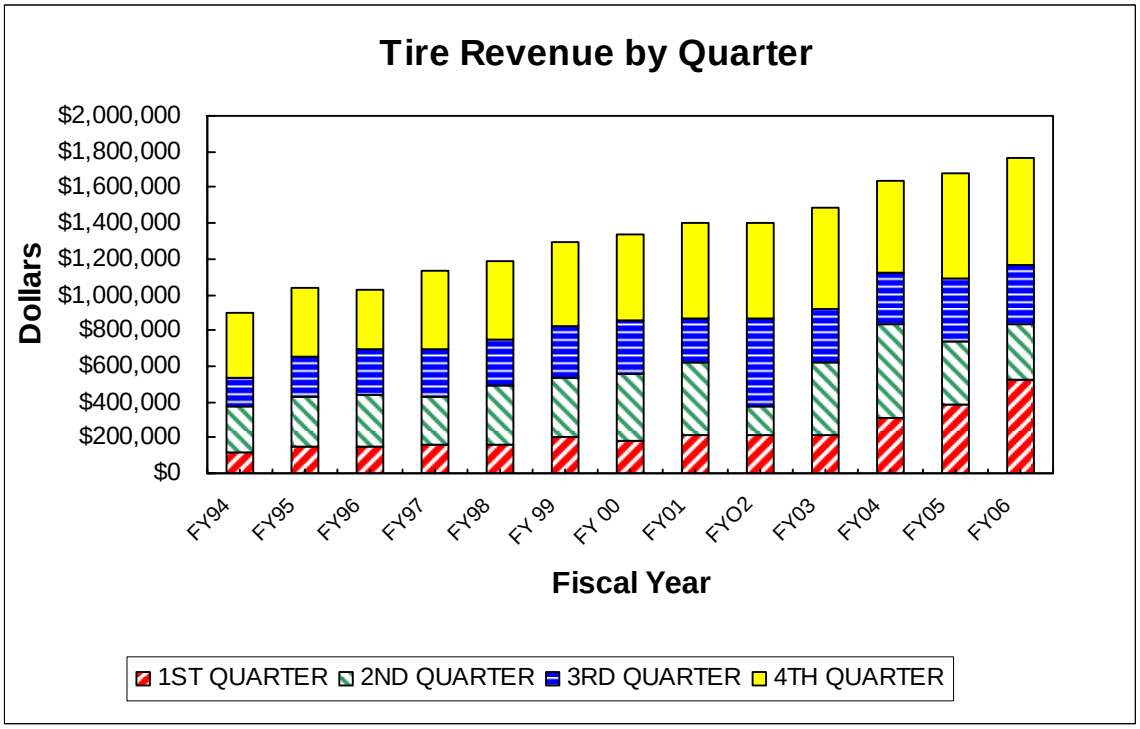


Figure 7. Revenue collected from tire fee for fiscal years 1994 to 2006.

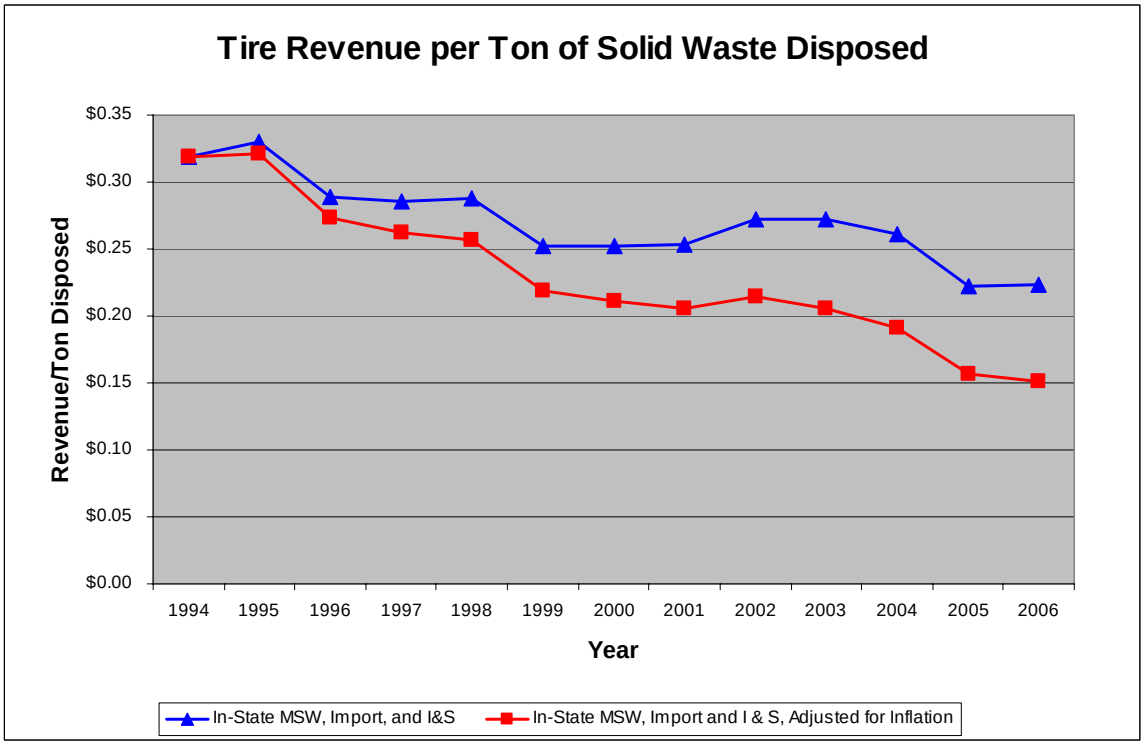


Figure 8. Trend of revenue collected for each ton of solid waste disposed. The red line is deflated pursuant to the average inflation rate of 2.7 for years 1994-2006 (U.S. Department of Labor, Bureau of Labor Statistics, not seasonally adjusted, west urban, all items)

necessary support, however, and died in committee. The concept of charging a fee on waste to regulate waste is a logical revenue structure and one that has worked in many other States. It also has the added advantage of capturing revenue from imported waste, something that the current Tire Fee does not do.

The Nevada 73rd Legislature (2005) passed SB 396 (NRS 444.560, see Appendix 5), which included a provision to allow the SEC to establish a schedule of fees for disposal of solid waste or for the issuance of permits or other approvals for the operation of solid waste management facilities. This means of enhancing and maintaining program revenue has always been available to the Health Districts, both of which have supplemented the Tire Fee revenue with permit fees for solid waste haulers and management facilities. NRS 444.560 (Appendix 5) provides the opportunity to collect fees to provide a revenue supplement to the NDEP's solid waste program.

4.7.2 Local Government

Local government has the responsibilities of municipal solid waste planning, recycling program development and implementation, public information and the prevention of illegal dumping. Additionally, most of Nevada's rural governmental entities own and operate their community disposal sites. Local solid waste management may be funded through disposal fees at the landfill gate, property tax assessments, from the general fund, or a combination of these.

The high cost to operate a municipal landfill in compliance with State and Federal regulations has driven the closure of most rural landfills, leaving the remote communities faced with the dilemma of either paying for a landfill or for long-distance waste transportation. In some counties, budget shortages have led to inadequate staffing, lack of training and equipment, and insufficient operating funds; conditions that have contributed to rural landfills operating in minor violation of regulations and permit requirements.

Several rural local governments are exploring waste importation as a strategy to generate revenue, not only for their solid waste management programs, but also for general fund enhancement. When developing importation strategies, a municipality can either establish and operate its own commercial landfill, or negotiate a "host" fee with a private landfill developer

that generates revenue for the County/municipality based on the tons of waste received at the landfill.

4.7.3 Items for future consideration, Sec. 4.7 - State and Local Funding

1. Evaluate funding sources and costs for solid waste management for each rural county to determine the need for financial assistance to rural local governments for solid waste management.

2. In the future the NDEP may be required to petition the SEC for authority to collect fees, pursuant to NRS 444.560 (Appendix 5), to defray the costs of managing and regulating solid waste within the jurisdiction of the NDEP.

3. A State “Bottle Bill”, or beverage container redemption value, has worked in other States as a way to enhance revenue for regulatory oversight of solid waste management and rural local government assistance.