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MOAPA BAND OF PAIUTE INDIANS GOVERNMENTAL AND FISCAL IMPACT REPORT

Prepared for the
Clark County Department of Comprehensive Planning
Nuclear Waste Division



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EXECUTIVE SUMMARY

In August of 2000, the Clark County Nuclear Waste Division approved a study to examine the governmental fiscal impacts of shipping high-level nuclear waste (HLW) through Clark County. This report contains the results of a fiscal impact study of the Moapa Band of Paiutes, a small Native American community located 55 miles northeast of the City of Las Vegas. The fiscal analysis contained in this report did not attempt to estimate the total costs to the Moapa community of the Department of Energy (DOE) shipping HLW, but only the increments or additional costs that would be directly attributable to the siting of the repository at Yucca Mountain and HLW shipping campaign. However, because the Tribe has not yet established emergency response capabilities, the costs of preparedness for the tribe amounts to new and major capacity-building. The fiscal impact analysis used a case study approach that provided tribal personnel with three scenarios each describing a “future” shipping campaign, and asked how the scenarios would impact their resources and departments. In the case of public safety, after determining the current capacity, tribal personnel were asked to compile a list of resources, training, personnel, equipment, and capital outlays necessary for the tribe to be able to ensure the public health, safety and welfare of the community.

The scenarios were rooted in the DOE’s Draft Environmental Impact Statement (DEIS) and contained one “benign” scenario in which shipping occurs as planned and without incident; a second scenario that described an accident but did not result in any release of radioactive materials; and a third scenario with a serious accident and release of radioactive materials resulting in a fire and plume of radioactive materials. The accidents were located at Interstate 15 and the Moapa exist three years after shipping may commence. Interstate 15 is identified in the DEIS as a potential route for the shipping campaign. Each of the scenarios contains some

estimate of property value impacts based on property value diminution studies conducted by UER for the state in the summer of 2000 that used similar scenarios and interviewed appraisers and lenders in the Valley. However, for the Moapa community, given its taxing structure as a sovereign entity, loss in property values alone would not be an important area in terms of impacts to the Tribe. The loss in revenues in Moapa-owned and operated businesses along I-15, however, would be a significant impact area.

The results of the study not only indicate serious potential costs to the tribe's government, but also identify areas where the Tribe is potentially particularly vulnerable to negative impacts resulting from the shipping campaign especially in the areas of agricultural development on the reservation and in a business enterprise along I-15.

The major potential costs and vulnerabilities to the Moapa tribe to the year 2007 when shipping is proposed to begin include the following:

- The projected fiscal cost for capacity-building in the public safety area is over \$9 million in order to prepare for and have the capacity to partially respond to a Scenario 3 event.
- The majority of the projected costs will fall in the area of public safety, including fire and rescue, emergency medical, and the establishment of an Office of Emergency Management/Coordination. Currently, the tribe does not possess the resources, training and capability to respond to serious emergency situations.
- The tribe's economic base is relatively weak dependent on a combined gaming center and store located on I-15, some agricultural production, and leasing reservation land for cattle grazing. Personal income comes primarily from employment outside the reservation. The tribe is vulnerable to a major downturn in tourism and visitation that may use I-15. An accident, as shown in Scenario 3, could potentially end 90%, if not more, of the tribe's

revenue stream for a considerable length of time depending on the nature of the contaminated plume, length of cleanup efforts, public perceptions of risk, and other behavioral factors.

- The Tribe could be placed in a position where for sometime it is no longer able to establish new growth and business development if the events in Scenario 2 or 3 were to occur because of revenue shortfalls. Moreover, agricultural development and sales may be severely impacted.
- This study is the initial step in projecting the potential negative fiscal impacts from the repository and proposed shipping campaign of HLW. It is also clear that the Tribe's cultural and social assets may also be threatened.
- The tribe's plans for economic growth in two areas—along I-15 and agricultural development on the reservation are particularly vulnerable because of their location relative to the potential shipment route. Any stigma related to shipping nuclear waste or an incident is likely to have adverse impacts on the tribe's plans for growth.

1.0 INTRODUCTION TO THE STUDY

In August of 2000, the Moapa Band of Paiutes made a decision to work with Urban Environmental Research LLC through the Clark County Nuclear Waste Division to undertake a governmental fiscal impact analysis of the effects of shipping high-level nuclear waste through or near its community. Approval for the governmental fiscal impact study was given for each of the following entities in Clark County: North Las Vegas, the City of Las Vegas, Henderson, along with Boulder City, Mesquite and the Moapa Tribe. These community studies are the first in the valley to project the fiscal impacts from the potential shipment of high-level nuclear waste (HLW) on city and tribal governmental agencies and services.

The investigation has given particular attention to the public safety agencies in each of the communities, as they have been identified in other studies as likely to be the agencies most critically impacted by such a shipping campaign. In addition, the public safety agencies' programmatic, training, and fiscal needs in providing for emergencies are explicitly recognized and identified in the NWPA, NWPAA, and through the NEPA as being part of the federal responsibility in siting and shipping HLW. Finally, it is these agencies that are charged with protecting the health, safety and welfare of citizens in an emergency, and they must be prepared to respond should a radiological incident or emergency occur.

These governmental fiscal impact studies carried out in the County are designed to be similar to fiscal studies that have been performed on Nevada's State agencies by the principals of Urban Environmental Research from 1987 through 1997. The state fiscal studies were performed at specified intervals on the same state agencies over time as more and more information about the nature of the repository and the HLW shipping campaign became known. These state fiscal impact studies at first discovered low levels of awareness among state personnel concerning the

HLW repository, the siting process and how it might affect their agency. Over time however, not only did state personnel exhibit increasing knowledge about the siting, but also about the potential impacts on their governmental unit and agency. This increased knowledge and familiarity was not only a function of the increasing amount of information available about the repository, but it was also result of the agencies' personnel beginning to realize that potentially adverse fiscal impacts might result from such a siting as they reflected about the details of the repository and the shipping of the HLW through the state. Just as in these State fiscal studies, scenarios have been used to provide all local agency directors and staff with similar conditions (scenarios) on which to base their assessments of fiscal impacts and projected needs of their agencies. Because this is the first such study in Clark County of these entities, it is also likely that overtime tribal personnel will become more familiar with the details and potential impacts from a HLW repository and concomitant shipping campaign. As this familiarity with the details of the repository project increases, the range of projections from the siting and transportation campaign will narrow just as they have with state agencies. Indeed, there was an earlier effort in the Valley in January of 1995 to attempt to gain perspective on the public safety needs in the Las Vegas area should the proposed Yucca Mountain repository move forward. The report issued out of this effort by the Public Safety Advisory Group was a needs assessment, and it did not attempt to estimate the fiscal costs of meeting the public safety needs that were identified. Nevertheless, as a result of this 1995 study of public safety needs, we anticipated greater awareness and knowledge about the repository among the public safety agency personnel than otherwise would have been encountered.

Before discussing the methodology that was employed (next section of the report), it is important to first take note of a primary aspect of the study. What is being studied and estimated

is not the total fiscal cost or budget of any governmental entity, but rather the increment or additional cost to governmental units that is directly attributable to the repository's siting at Yucca Mountain and the related HLW shipping campaign. Hence, the cost estimates are fiscal impacts that will be directly attributable to the siting, and would not be incurred if the repository and shipping campaign do not occur. What this study estimates is the additional services and costs, for example in the area of emergency services, that is necessary as a result of the siting and waste transport based on three different transportation of HLW shipping scenarios. These scenarios are discussed in detail below and are provided in Appendix A, but note that each contains a different set of conditions concerning the future of HLW transport should the Department of Energy (DOE) move forward with its plans contained in its Draft Environmental Impact Statement (DEIS) for the repository. It is to the methodology of the study and the construction of the scenarios that the report now turns.

1.1 History of Governmental Fiscal Impact Methods

Governmental fiscal impact analysis has a long history in both the planning and the intergovernmental finance fields. Early fiscal impact studies emerged from the need of local communities to estimate impacts on their local revenues and their ability to deliver city services. These needed fiscal and service estimates were the result of the constantly increasing **public costs** associated with land development. In addition, these studies recognized the increasing costs resulting from public service demands of various forms of residential and nonresidential growth.

Fiscal impact analysis is used by municipalities in forecasting the public costs resulting from increased demands caused by growth. In a similar vein, such impact analysis can, and is, applied to estimating the public costs from a particular or group of private projects of significant size as cities attempt to determine fiscal impacts so that they may levy concomitant impact fees.

For example, fiscal impact assessment has been done on forecasting the public costs and revenues of various growth management policies or large central city developments.

Fiscal impact analysis may also be found in the intergovernmental fiscal literature focusing on mandates and their costs. Mandates are often defined very simply as any legislative or executive order that conditions or regulates the behavior of another level of government. Mandates entail the imposition of authority by one level of government on another and often take the form of rules and regulations. Most frequently mandates originate at the state level of government and are imposed on local governments. One study showed that between 1990-1993, the average state passed 37 mandates on to its local governments per legislative session. In another study that examined just seven bills introduced in Congress in 1991, it was estimated that the cost of this legislation to the states was estimated at over \$1.6 billion. The research literature increasingly has demonstrated the expanding costs of mandates by the federal government on the states' governments, and similarly increasing costs on local governments resulting from state mandates.

These costs have resulted in efforts by the federal government, but mostly by the states, including Nevada, to estimate, and in some cases at the state level to reimburse, the costs of mandates on impacted governments. The growth of estimating the effects of mandates, known as fiscal noting, is most impressive. Mushkatel and Pijawka noted the following in summarizing this growth: in 1978 only four states had reimbursement programs for local governments to cover the costs of state mandated programs; in 1985, 15 states had adopted such programs with another 41 states attaching fiscal notes to legislation estimating impacts. These two authors have demonstrated that both the Nuclear Waste Policy Act (NWPA) and the Nuclear Waste Policy Act

Amendments of 1987 (NWPAA) contain several mandates for Nevada and her municipalities that involve fiscal costs that can and should be reimbursed.

Nevada first required fiscal noting in its 1993 legislation (NRS 218.272 – 218.276). The state does not require reimbursement of county and local governments affected by legislation. The Legislative Counsel Bureau, Fiscal Analysis Division is responsible for preparing fiscal notes under a variety of conditions set out in the legislation that need not concern us here. The Fiscal Analysis Division details the effects of certain bills, resolutions, and ballot questions. The degree of complexity and the methods used varies from state to state in projecting costs. What is consistent for the planning based fiscal impact projections, and these mandated fiscal notes, is that they entail cost projections for government.

1.2 Methodological Approaches to Governmental Fiscal Impact Analysis

The potential fiscal costs to government in the form of expenditures include increased operating expenditures (salaries, training, services, statutory and material costs) and capital outlays. Some types of fiscal impact analysis focus primarily on population and or employment multipliers and the resulting fiscal costs to government associated with these changes. These studies tend to be formula driven or multiplier types of studies as applied to public services to determine the increased costs based on a per unit expenditure. This ‘average’ costing per unit technique is the first type of approach to fiscal impact analysis and is often used in large siting impact studies. For example, the City of Las Vegas Planning Department along with the Department of Finance use a model for projecting fiscal impacts from development that is a variant of this average costing approach.

Average costing approaches often do not consider existing excess or deficient capacity that might exist for particular services. That is, the possibility that a new mandate or requirement

might fall at the threshold level, requiring new capital construction, equipment or personnel to meet the demands of the new requirements, or in this case the new repository project and the associated costs due to expanded transportation demands. Hence, because the existence of current capacity can heavily affect the potential costs that a new project has on government (e.g. existing capacity is deficient and the requirements of the new project, plant, policy lead to government failure to provide adequate services) the average costing approaches may not be appropriate for estimating fiscal impacts.

The second approach, and the one utilized in this study, is a marginal cost approach. This approach takes into account existing supply and demand relationships by determining existing excess or deficient capacity, projecting the new demand and determining what additional (if any) capacity at what cost is necessary. In instances where communities or government have excess capacity, the fiscal impact projections using a marginal cost approach will lag behind average costing techniques or be roughly similar. When there are deficiencies in capacity, or where government is providing services at its full capacity, average costing approaches will not provide an accurate estimate because they may not account for the costs of new plants, personnel, equipment, training (etc.).

Within these two general approaches, average and marginal costing, there are three variants of each. For our purposes, it is important to note that the three marginal costing approaches consist of the 1) case study, 2) comparable city, and 3) employment anticipation techniques. One selects the method depending in large part on the nature of the problem faced. The marginal cost approaches are most appropriate when confronting unique projects or developments. Unfortunately there are neither any comparably sized or situated cities that can be used for easy comparisons concerning expenditures (etc.), nor is there reason to anticipate that

there will be sufficient numbers of employees from the siting to warrant the use of the third approach. Instead, the case study marginal cost approach is adopted here. This case study approach is particularly well suited for rapidly growing areas where over-used service capacities are likely to exist, and where the average of yesterday's costs per capita multiplied by the population to be added is not a good indicator of future costs. Rather, this approach is ideally suited when it is necessary to be sensitive to existing excess, deficient or strained service capacity, and is invaluable for examining fiscal impacts from non-residential or public facility projects.

1.3 The Case Study Method for Projecting Governmental Fiscal Costs

The case study method uses site-specific investigations to find areas of excess or deficiency in public service delivery capacity. Excess capacity exists when there is capacity beyond that needed to accommodate existing service need or demand, and deficient capacity exists when the current capacity is below what is needed or near the limits of what can be provided as in the case of the Moapa tribe. These deficient or excess service capacities are subtracted from or added to the projected estimates of operating and capital demands. Hence, excess existing capacity can actually mitigate the effects of a project on a community, as it may already possess the capacity to meet these future or projected service needs and demands. Alternatively, should a community be at peak capacity or deficient capacity already exists, then additional demand may have far greater impact than an average cost technique would project. In fiscal impact analysis used by planners, when a new development results in, for example a new fire station, or rescue station, the new development may be charged for the entire cost. In a similar vein if a new project or mandate results in the necessity of new equipment, training, or

various capital outlays, the relevant acts (NWPA, NWPAA) specify that the agent of these new costs be charged for the entire amount of the new capacity.

Several assumptions underlie the use of the case study cost projection method. Briefly, the first assumption is that communities differ in the degree to which they exhibit excess or deficient capacity. The second assumption is that marginal changes in providing various municipal and county services are a reaction to service excesses or deficiencies. A third assumption is that local standards (not national ones) in large part represent the criteria by which local excess and deficient service levels will be measured. Finally and most importantly, local department heads and personnel are the individuals that are best suited and most knowledgeable about the service capacity of their agencies, and about the future service needs associated with new projects or mandates. It is this case study method that has been used extensively on state agency personnel in Nevada to project the costs of the high-level nuclear waste repository at the state governmental level.

The case study methodology for estimating fiscal impacts was adopted for projecting fiscal costs to the city governmental agencies for each of the cities being examined and the Moapa Tribe. This case study methodology for projecting governmental fiscal costs from the repository program on local government and public safety agencies entailed the following steps:

- a. Convene a meeting of city and tribal representatives (and their selected emergency service representative from their city) to the Clark County Nuclear Waste Division's (NWD) Advisory Committee to explain the purpose and methodology of the study and enlist their cooperation.
- b. Contact and interview the city and tribal representatives to the County Nuclear Waste Division's Advisory Committee to identify the likely agencies that will be impacted.
- c. Contact and interview these key governmental and public officials (emergency management, police, fire, budget, education, health, planning, personnel, assessor, environmental, public information, aviation, communications, human resources, and

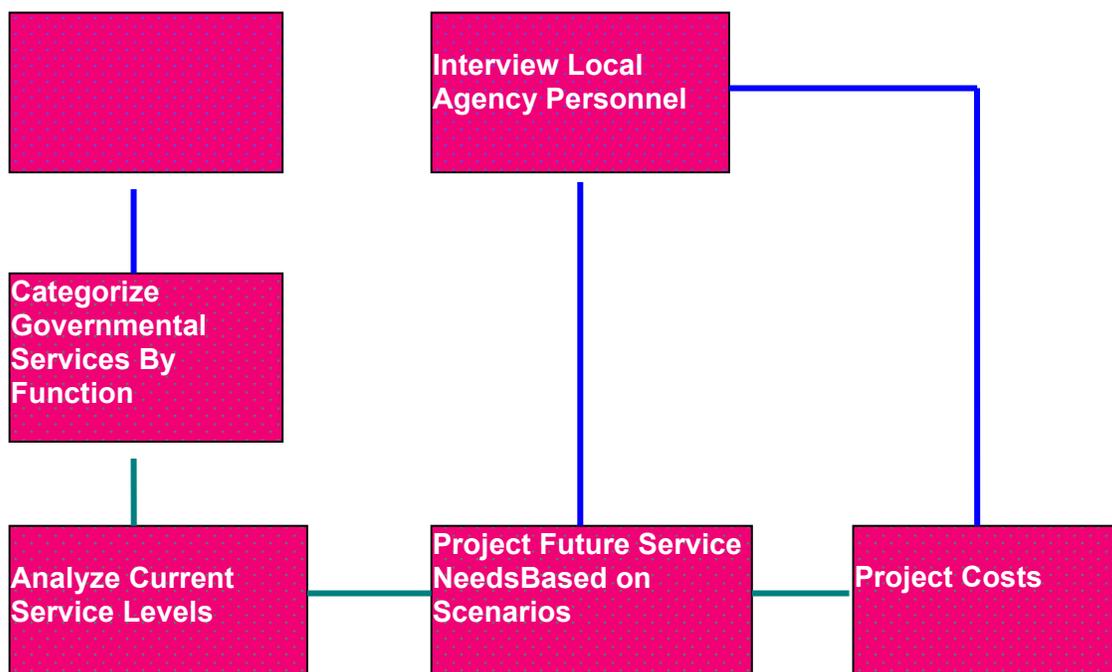
others). In the Moapa Tribe, the manager of the tribe's Environmental Protection Department coordinated this task and provided the information needed for the study.

- d. Categorize current local governmental services by function and the administrative agencies responsible for each (particular attention to each community's governmental organization is required at this stage);
- e. Determine current levels of service provision, as well as existing service excess or deficiency for various public services;
- f. Project future service needs and demands using existing mandates and agency responsibilities, as well as through the interviews conducted;
- g. Interview local agency personnel to determine how their departments will respond to the **scenarios** characterizing the nature of the future repository and transportation of waste, and how these scenarios will either result in the necessity of expanded capacities (or not) and the projected response of the agency;
- h. Estimate fiscal costs that will be incurred by each affected agency and the affected units of local government as a result of their projected response to the scenarios (needed training, equipment, operational expenditures, and capital outlays over the life cycle of the project).

These steps in the methodology that was employed can be collapsed, and be viewed diagrammatically as the basic approach to projecting fiscal impacts from the proposed repository for city agencies (see Figure 1). In Figure 1, the approach to projecting the fiscal impacts is outlined and it can be seen clearly that the process is iterative and non-linear. These steps are not linear as there are several contacts and interviews with agency personnel as the study progresses. Frequently, after an interview with agency personnel it is necessary to again interview that individual for clarification or draw on their expertise to adequately project the impacts of the project. Often interviews with agency staff member results in being referred to another member of an agency's personnel. In addition, in order to increase the comparability of the projections, interview schedules contained a basic set of questions that were developed and used for each informant interviewed. These interview schedules may be found in Appendix B. In the Moapa case, the tribe's environmental protection coordinator discussed the study with the UER

interviewer; provided a tour of the community; introduced the study to key tribal council personnel, and provided required data as a response to the scenario-based questions. As a response to additional costs especially in the public safety area and other socioeconomic impacts, information was collected by the tribe’s environmental protection coordinator from multiple tribal and national sources.

Figure 1 Methodological Approach



The first meeting (Step 1 above) to explain the purpose of the study and enlist support of the city members of the NWD’s Advisory Committee, designated representatives from public safety agencies and tribal representatives was held on August 23, 2000 at the Clark County Governmental Complex. Fourteen representatives from the four cities and Tribes involved in the study attended the meeting along with several governmental agency representatives from the State, County, and Regional Transportation Commission. Immediately following the meeting, interview appointments were made with each of the city and tribal representatives present.

1.4 The Scenarios

An additional methodological step was taken to obtain as accurate projections of fiscal impacts as possible, and to augment the research design being used. The interview schedules that were developed were all based on three scenarios of the future transportation of nuclear waste through the valley. These three scenarios contained descriptions of the shipping campaign described in the Department of Energy's (DOE) Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High Level Nuclear Radioactive Waste at Yucca Mountain, Nye County, Nevada (DEIS). The first two scenarios flow directly out of this section of the DEIS and describe: a) a "benign" future shipping campaign beginning in 2007 with no events occurring over the twenty four years of shipments, and b) a future containing an incident described by the DEIS in which a cask containing nuclear waste breaks free of the trailer, remains intact and releases no radiation. The final scenario was developed by the state of Nevada's transportation expert on shipping high-level nuclear waste using information in the DEIS (Section J.4.2. Transportation Accident Scenarios pp. J-52 – 72). This third scenario contains a serious accident in which radioactive waste materials are dispersed over a wide area. In each community's set of scenarios the site of the transportation incident occurs at a different location. For the Moapa community, the site of the accident is at the junction of I-10 and the Moapa exit (Route 168).

In addition, each scenario contained a description of the projected effects of that shipping scenario on property values within one mile, and one to three miles of the transportation corridor (see Appendix A for the complete scenarios). These projected property value impacts for residential, commercial and industrial property were based on the study recently completed in the Las Vegas Valley that estimated property value diminution effects from waste shipments. This

property value research utilized the same three scenarios (without the projected property value impact projections) and was based on interviews with experienced real estate appraisers and bankers in Clark County, as well as a separate survey of Clark County residents.

TABLE 1 SUMMARY OF SCENARIOS	
Scenarios	Description
1	No accident of any kind has occurred. However, anti-nuclear environmental groups and property owners along the route (who claim that their property values will decrease) have generated considerable publicity. Residential property values have declined an average of 3.5% within one mile of the transportation corridor, while commercial properties have declined an average of 3.2% and industrial properties have declined an average of 1.25% within one mile of the transportation corridor.
2	Shipments of nuclear waste to the Yucca Mountain repository site have progressed for several years without incident. Three days after New Year's Day 2010, the driver of a truck transporting nuclear waste loses control of the vehicle and runs into the median of Interstate 15. The cask containing the nuclear waste breaks away from the trailer and skids 50 yards along the median of I-15. The cask remains intact and no radiation is released, but the national media covers the event heavily. Residential property values decline an average of 7.96% within one mile and an average of 4% between 1 and 3 miles of the transportation corridor; commercial property values decline an average of 7.4% within one mile and an average of 3% between 1 and 3 miles of the transportation corridor. Finally, industrial property values decline an average of 5.3% within one mile and an average of 2% between 1 and 3 miles of the transportation corridor.
3*	An accident involving a truck carrying spent nuclear fuel and a gasoline tanker on I-15 and the Moapa exist. The accident triggers a chain reaction collision. Twenty-seven civilians, four sheriff's deputies, and seven firefighters are hospitalized after exposure to radiation at the site of accident. Another 1,000 or more persons are exposed to radiation from the fire's radioactive plume. Experts indicate that 5 to 200 latent cancer fatalities may result from the accident. The affected highway and several access ramps are closed for four days. The two drivers of the spent fuel hauler and the gasoline tanker, and one driver-escort, died from head injuries and burns. Six months later the cleanup effort is still under way, and thousands of lawsuits have been filed. Preliminary reports estimate cleanup costs and economic losses in excess of \$1 billion. Residential property values decline an average of 33.8% within one mile and an average of 23.6% between 1 and 3 miles of the transportation corridor; commercial property values decline and average of 31.9% within one mile and an average of 20% between 1 and 3 miles of the transportation corridor. Finally, industrial property values decline an average of 25.5% within one mile and an average of 16.7% between 1 and 3 miles of the transportation corridor.

*Source: State of Nevada, Nuclear Waste Project Office.

This research design not only permits cross walks between the state sponsored property value study, but also provides the community personnel being interviewed with considerable

detail about the number and nature of the projected shipments of waste. Each scenario also contained the number of projected shipments and the potential routes this waste would be shipped along. The scenarios are summarized in Table 1.

By providing the scenarios that were based on DOE's own DEIS, a series of credible futures could be constructed with some additional detail to provide agency personnel in the cities and the Moapa community. This additional detail serves to aid in familiarizing personnel with the project but also insures comparability among the communities. By using the scenarios personnel from different communities are responding to the same description of the transportation shipping campaign. The only factor that varies in the scenarios is the location of the incidents in two of the scenarios for each community. Yet it must be emphasized, that because this study is the first effort to study fiscal impacts from the HLW repository in these communities and the Moapa, tribe, the level of information of governmental personnel interviewed varies dramatically. In the State fiscal impact studies it was noted that agency personnel grew in their understanding of potential impacts as they became more familiar with the characteristics of the project. In a similar vein, this first effort often could not estimate actual dollar costs because of the lack of necessary details in the scenarios or because agency personnel had not had the time to study and reflect on potential impacts. In these instances, areas of vulnerability have been identified and elucidated where it is likely to be negatively impacted but no range of dollar estimates is yet available. Moreover, often the first interviews, with additional time to evaluate and study future needs, information on projected requirements (and sometimes costs) were determined and made available to the researchers. This was principally the case in the Moapa community.

2.0 THE MOAPA RESERVATION AND NUCLEAR WASTE TRANSPORTATION: BACKGROUND

The proposed nuclear waste repository and the transportation of high-level nuclear waste and spent-fuel has been identified as a source of potential and perhaps significant impacts to the economy, culture and social well-being of Native American tribes in southern Nevada. The Department of Energy's Draft Environmental Impact Statement regarding the proposed Yucca Mountain repository site has identified Indian tribes as potentially impacted communities as part of its environmental justice consideration. Members of Native American tribes live in communities either in close proximity to the potential repository and/or potential transportation routes for the shipment of nuclear waste.

The reservation of the Moapa Band of Paiute Indians, in southern Nevada, is located very close to Interstate 15, a route identified for possible shipments of high-level nuclear waste. In fact, the major source of revenue for the tribe—a gaming center-store, is situated at I-15 and exist 75. Interstate 15 may be used to transport nuclear waste southward from Utah to State Route 95 to the repository at Yucca Mountain. As a result, the Moapa Tribe may experience significant vulnerabilities because of its location to a shipment route. As was mentioned in the introduction, the identification of these vulnerabilities and possible impacts from transporting nuclear waste, in addition to estimating the costs to prepare and respond to potential accidents, are the objectives of this report.

The research and report identifying the type of impacts that could be experienced by the Moapa community and the nature and magnitude of the governmental fiscal costs to the tribe were accomplished through interviews with key tribal personnel; a site visit to the community; identification of needs through reviews of tribal documents; and reviews of reports that specifically addressed potential impacts of the repository program on Native American tribes.

Many of the latter research reports were completed under contract with the State of Nevada Nuclear Waste Project Office. One report, *Community Health Information Project, Moapa Band of Paiute Indians*, prepared by Dr. Molly Dufort in 1996, was particularly useful as a background document for this research.

The Moapa Band of Paiute Indians live on the Moapa Reservation located in Clark County, approximately 105 air miles from the repository site and 165 highway miles east-northeast. Located approximately 55 miles northeast of the City of Las Vegas, tribal lands are within five miles of I-15, a proposed route for shipping nuclear waste (Dufort, 1996). The major source of revenues for the tribe is a truck stop-store-casino enterprise located on I-15. Moreover, the one major route (Route 168) for entry to and exit from the reservation cuts I-15 near the town of Moapa. Because of the location of the community and its key economic investment, the routing of nuclear waste along I-15 has the potential to adversely impact the health of community residents, its economic base, and cultural-spiritual assets strongly associated with tribal land.

The Moapa reservation was identified as an impacted community for assessing repository-related impacts for a number of reasons as follows:

- a. The community has the potential for experiencing significant direct and indirect impacts from the transportation of nuclear waste along I-15. These impacts can result from a nearby accident event or from stigma-induced effects.
- b. The community has a past history of exposure and problems related to environmental contamination including possible health impacts as a “downwinder” community. The transportation of nuclear waste projected over a 24-year shipment period next to the

Moapa community could present a serious cumulative risk and environmental justice problem.

- c. The community has already explicitly expressed concerns over potential threats related to possible shipment accidents: the decline in their economic base; diminution of their cultural assets; and deterioration of economic development goals and plans. According to tribal spokespersons, these concerns have not been addressed by the U.S. DOE.
- d. The community has made plans for economic development that targets the I-15 corridor. The Tribe is concerned that these plans will be at risk if and when the route is selected for nuclear waste shipments. Economic development plans and expansion of the tribe's agricultural base will require use of the I-15 corridor. The use of the I-15 to carry high-level nuclear waste is in direct conflict with the economic and social aspirations of the Moapa community.

The Moapa community, while culturally and historically rich, has experienced economic hardships and does not have sufficient capacity to prepare and respond to possible accidents that may result from shipping nuclear waste. Nor, given past experience, can the tribe rely on an effective response from other governmental jurisdictions. It is important to evaluate the public safety capacity needs for the tribe and associated costs in the context of routing nuclear waste near and through the Moapa community.

The projection of costs to the Tribe in the public safety area is based on specific tribal needs and experience. The identified needs are based on the Moapa community's population, location, and response capacities for events depicted in the transportation scenarios. There was no attempt made in this analysis to evaluate a regional approach to public safety capacity incorporating the Moapa Tribe and the nearby communities of Moapa, Glendale, Overton ,

Logandale and Clark County. Therefore, the costs of such items as an Hazardous Materials Response unit, supplies and training, were not included specifically for the Tribe. For example, a Haz Mat/Rad unit would have to serve a larger population than the tribe alone.

3.0 LOCATION AND BRIEF HISTORY

Established officially in 1873, the Moapa Band of Paiute Indians is located in the northeastern section of Clark County, 55 miles northeast of Las Vegas and five miles north of Interstate 15 off Nevada Highway 7. The reservation is 72,000 acres in size located in a valley surrounded by mountains. The Muddy River traverses the reservation with final drainage into Lake Mead east of the reservation. The nearest small towns to the reservation are Moapa and Glendale, both within six miles. The town of Moapa is the site of a post office, a volunteer fire facility, and an elementary school utilized by the tribe. Overton and Loganville, the nearest communities, are approximately 30 miles to the east of the Moapa reservation.

Overton provides middle school education for the tribe's children and Logandale has a regional high school. The major road in and out of the reservation is Route 168 which links the reservation to these communities. Overton and Loganville, east of I-15, provide basic services to the reservation population including churches, retail stores, banks, governmental offices, and medical facilities including a small hospital. Although a small volunteer fire station is sited in the town of Moapa, it is outdated, lacks sufficient equipment for major emergencies, and requires volunteer support from the region. The communities also provide out-of-reservation employment opportunities in the retail, medical and education sectors. Outside employment is the major source of personal income for tribal members, but governmental jobs is the principal employer on the reservation.

The Moapa Band of Paiutes are part of the Southern Paiute Nation whose traditional lands covered Southern Nevada. The original reservation in 1873 had a total of 2 million acres. Two years later it was reduced to 1000 acres of land by the federal government. The loss of the tribe's original territory was followed by years of neglect, health epidemics and economic distress. However, in 1981 the U.S. government restored 70,565 acres to the tribe. In 1941, the tribe's governing body, the Tribal Business Council, was established. That same year, individual land allotments returned to communal tribal ownership and much of the land was subsequently leased to non-tribal members until 1968. Currently, some of the land continues to be leased for open cattle grazing, but the tribe also operates its own farming and agricultural enterprises. In 1965, the federal Claims Commission awarded the Southern Paiute Tribes \$0.28 per acre compensation of land confiscated in the late 1800s. The Moapa Tribe uses 60 percent of this compensation for a capital fund for improvements and economic development (MBP, Fact Sheet, no date).

The number of official tribal "members" today may be around 290 persons, with approximately 180 to 190 residing on the reservation (Moapa Band of Paiutes, Fact Sheet, no date). The total number of persons who live on the reservation is estimated to be between 400 and 425 persons today. There are approximately 80 individual family homes, 40 HUD low-income housing units, and a Senior Center.

The population of the Moapa community has been stable over the last few years and there are strong familial ties with the Las Vegas Paiute Tribe. In fact, medical services for the Moapa reservation are managed by the Las Vegas Paiute Tribe. In terms of ethnic diversity, there are both Native Americans from other tribes, Paiutes, and non-Indians in the community, principally through inter-marriage. In a report on the community health of the Moapa reservation, Dufort

(1996) found that of the 290 tribal members, 174 persons were between the ages of 19 and 54; 50 persons in the 13-18 age category; 43 children under the age of 12 years; and 23 adults 55 years of age and older.

The restoration of traditional lands was and continues to be an important policy objective of the Tribe. Currently, the Tribe has plans to purchase land from the Bureau of Land Management on the east side of the current reservation land and bordering I-15. The restoration of the tribe's traditional lands is important both from a cultural/spiritual and historic perspective and the need for economic development. The land surrounding the reservation is culturally significant to the lives of the present-day Moapa Band of Paiutes and is viewed as a life-force. According to interviews with tribal personnel, when land becomes available for purchase, federal law permits the tribe to buy first, as a means to return lost land to the reservation. The BLM is viewed as having a "trust responsibility" to the tribe.

The plan to restore and purchase traditional tribal land from the BLM is considered to be important for the future development of the tribe. It is viewed as significant in terms of spiritual and historic values; and is also seen as a means to expand economic development, a priority for the tribe. The fact that nuclear waste may be carried through or near this land is viewed as a direct and serious conflict with cultural, economic development and environmental justice goals.

(Interview with C. Meyers)

"Our valley flourishes once again with the revival of our tribal farms. In partnership with outside interests, we anticipate increased development and industry in our lands through careful planning, mindful of our responsibility to preserve and protect the land. A Paiute elder said, "If you take care of the land, it will take care of you" (T. Eugene, MBP, Fact Sheet).

In a similar vein, Muddy River flows through the reservation and finally drains into Lake Mead. The river is a critical element in the life of the Moapa community, not only as a source of

irrigation water for agriculture but for the community's social and cultural well-being.

Historically the river was central to Moapa Indian life, as a place for social interaction, a source for cultural ceremonies, healing, and farming. Plans are being considered for expanding the community's agricultural base to include fruits and nuts and green house development.

The water from Muddy River is viewed by tribal personnel as indispensable for the tribe's economic future. The potential for contamination of the river from unprotected industrial development and possible nuclear waste transportation incidents is an area of significant concern to tribal members. From a cultural perspective, the river water is also used for spiritual purposes and health restoration through the tribe's sweat lodges three to four times annually.

“The river is like us. If it is not here; we are not here. We have always used the river” (C. Meyers, Personal Interview).

4.0 ECONOMIC DEVELOPMENT ON THE MOAPA RESERVATION

The return of 70,000 acres of traditional Indian lands in 1981 has provided the basis for expanded economic development and plans on this land. Economic development is viewed as a priority by the governing tribal body, the Tribal Business Council. It is important to recognize the importance priority given to economic development goals by the tribe, given its 30 to 48 percent unemployment rate. For example, in 1996, 85 percent of tribal households were found in a survey to be “within the very low income to low and moderate income limits” (Dufort, 1996, p.35). Employment and revenue sources for the community are as follows:

- a. An important source of employment consists of jobs in the governmental and service provision sector on the reservation. These sources include the health clinic, the Senior Center, tribal government offices and a tribal store located on the reservation. A gaming center-store is also located on Interstate 15. Approximately 90 percent (\$2.3 million) of the tribe's revenues was estimated to be generated through the Moapa Tribal Enterprises,

which owns and operates the gaming center and store. The Tribe is planning to significantly expand this enterprise into a regional truck stop/gaming center. Recent plans by the Moapa tribe to purchase BLM land is also motivated by economic development goals along the I-15 corridor. As stated earlier, it is this route that may be used to transport nuclear waste. This may result in serious vulnerabilities to the tribe's most important revenue source –the gaming-store center, in addition to and planned new economic growth in the I-15 corridor.

- b. Members of the Moapa Tribe are also employed in local areas off the reservation and in the Las Vegas area. A nearby fiberglass manufacturer employs several community members as does a local sand and gravel plant. A coal-fired plant located near the Moapa reservation provides additional but limited employment. Although these “outside” enterprises employ tribal persons, the level of employment is relatively small and there is concern that there may be environmental health problems associated with these places located near the reservation.
- c. Another source of revenue for the tribe is 300 acres of land devoted to alfalfa production and plans are being considered to expand the community's agricultural base to include fruits, nuts and other exotics. Currently 15-20 persons are employed on 5.5 acres of green houses.

The sources of tribal revenues and personal income are primarily from employment in governmental and social services in the tribe, reservation businesses, agricultural development, leases of reservation land for cattle grazing, utility rights of way, and from employment in communities near the reservation. Tribal members view the tribe's economic base and plans for economic growth to be potentially vulnerable from the transportation of nuclear waste.

5.0 PAST AND EXISTING ENVIRONMENTAL EXPOSURE

Interviews with the coordinator of the tribe's Department of Environmental Protection indicated past and current health problems that may be associated with environmental exposure. When asked about health conditions, the following health problems were identified: thyroid conditions, diabetes, respiratory diseases, lupus, and use of illegal drugs. Health problems were seen as widespread, significant and debilitating and often caused by environmental conditions. According to Dufort (1996) who completed a preliminary health study of the Moapa reservation, many of these conditions "are viewed as the results of exposure to environmental toxins" (p. 30). Moreover, the perception of a high incidence of thyroid problems among adults and elderly persons is associated with "downwind" effects of atmospheric testing at the Nevada Test site in the 1950s.

Respiratory problems may be widespread, and according to Dufort (1996) the cause is multi-sourced: influenced by earlier radioactive dust from atmospheric testing; exacerbated by dust from the arid environment; and from industrial activities including ash waste ponds (from a nearby coal-burning power plant) and a gravel plant (Dufort, 1996, p. 33). The interview with Mr. Calvin Meyers focused on the dust emanating from the coal-burning plant as a potential source of toxic exposure. The plant is located between I-15 and the reservation, within 5 miles of residents. Also there is a closed cyanide pond near the reservation from an old and now abandoned gold mining operation.

Many of the health problems experienced by tribal members are viewed to be linked to earlier atmospheric testing, especially respiratory problems, lupus and cancer. Based on the study by Dufort (1996), there is a widespread belief that "many of the older people who died in the late 1950s and 1960s died from cancer resulting from exposure to radiation" (p.46). Several years

back, applications for compensation from the U.S. Department of Justice's Radiation Compensation Program were provided to the members of the Moapa Tribe. Moreover, there is knowledge of other Southern Paiute reservations who have been exposed to radiation from atmospheric testing, especially the Shivitts, a tribe near St. George, Utah. This background is important to understand because it provides insight on the high levels of concern expressed over the risks of nuclear waste transport, the sensitivity to potential stigma effects, and the social impacts that may occur in the community.

Concerns over health seem to be prevalent among tribal members and these concerns are often related to exposure from environmental contaminants. (Dufort, 1996) with respect to environmental concerns, a number of issues were raised during an interview with the tribal coordinator for environmental protection. These are as follows:

- a. Health problems among tribal members due to past and present environmental exposure are a concern. Attempts to obtain information on the magnitude and nature of the contaminants have not always been successful. In her report on health, Dufort recommends the establishment of health databases and an historical overview of medical records including data from Citizen Alert Native American Program's radiation education programs. Moreover she argues that "detailed research regarding past radiation exposure as a "downwind" community from the NTS should be conducted" (Dufort, p. 61).
- b. There is some concern that Muddy River may contain contamination. This is important because the quality of the water is critical for the tribe's plan for agricultural production. A possible accident on I-15 that could result in radioactive contamination of the river is recognized as a concern because of the planned use of the water for expanding agriculture on the reservation.

6.0 CURRENT RESOURCES AND GOVERNMENTAL FISCAL: IMPACTS

It is important to analyze the governmental service functions to ascertain both current capacities and additional costs to the tribe as a result of the repository program and the nuclear waste shipment campaign. Information on current capacity and additions required in the public safety, emergency management area were provided by the tribe's environmental protection coordinator during personal interviews. A list including facilities, equipment and training was submitted to Clark County's Nuclear Waste Division on March 01, 2001.

6.1 The Public Safety Function: Medical, Fire and Police

6.1.1 Current Capacities

In a small community such as the Moapa Tribe, the fire, emergency medical and emergency management agencies are integrated into a public safety function rather than estimate costs department-by-department. Currently, there is no emergency management office for the tribe and emergency medical responses are accomplished without the tribe's own emergency vehicles. Essentially, the fire and rescue functions are covered by local and County volunteer services and are not found on the Moapa reservation. Therefore, for the Moapa Tribe, the costs of public safety preparedness for nuclear waste transportation can be translated into the development of new and major capacity-building rather than adding to existing capacity.

Current medical services are provided through a health care delivery system managed by the Las Vegas Paiute Tribe, known as the Community Health Services Program. This program is an outpatient delivery system (Indian Health Service) but managed by the tribe. This program provides contracts with physicians to serve reservation communities on a referral basis. In 1995 the budget for the Community Health Services Program was \$350,000. In addition to the comparatively limited health services delivery system, monthly clinics are held on the

reservation which provides psychological, vision and allergy clinics (Dufort, 1996). Medical services on the reservation also include daily, weekly and quarterly based service provisions. For example, a physician-nurse team is available twice weekly; a community health nurse is available on a twice weekly basis providing, health education, immunization, and a diabetes clinic. Two Community Health Representatives provide ongoing health services, including home health visits, work with the Senior Center, and emergency medical treatment on-site only. Serious medical attention for tribal members occurs at the Overton hospital or in Las Vegas. A 1996 assessment of health services provisions for the Moapa community concluded that health services delivery was severely restricted and that on-site needs included a dialysis clinic, a full-time physician and new expanded health facilities.

A particular area of concern of tribal members, especially given the proposed shipment campaign, is the deficiency in emergency medical capacity. Only a few persons are certified in EMT procedures. Although the Moapa township can provide some EMTs and ambulance service for the tribe and these are not always available when needed. The Moapa Tribe does not own or operate an ambulance. According to interviews, the dependence on other localities for emergency medical transportation results often in extremely delayed service; typically the ambulance arrives between 30 and 45 minutes (which compares to two hours on the average a few years back).

Fire and rescue operations are based on the County volunteer fire department and there is virtually no experience, equipment, or training related to hazardous materials or radiological exposure. While there is a fire station, several miles from the reservation, it is located in the town of Moapa and there are no clearly defined MOUs with the tribe. There is also little readiness, equipment or training at the regional level to respond to a nuclear waste contingency. While we

are assessing the needs of the Tribe specifically in this report, it has become clear that a capacity assessment for the larger area is also in order given the current dependence by the Moapa Tribe on regional resources and the uncertainty of impacts from a major accident on I-15 involving nuclear waste transport.

In the area of police capacity, Moapa has two full-time police officers who are not trained in radiological emergency response, nor are they sufficiently equipped for such an event. There is virtually no equipment for radiological incidents. Salaries are estimated at \$100,000 per year and another \$150,000 for equipment (trucks), supplies and fuel. The Nevada Highway Patrol substation is located one-half mile from the reservation on Route 168, and there is a perception that the twelve troopers in the larger area could coordinate a nearby transportation emergency.

As can be seen from these baseline data the Moapa community is seriously deficient in capacity in the public safety area including fire, emergency medical and police, and is largely dependent on outside service and mostly volunteer providers.

Another problem identified is the lack of Memoranda of Understanding among local and County jurisdictions and the Moapa community. Based on the inventory of resources available in the tribe and the interviews with Moapa personnel, it is safe to say that Moapa is deficient in capacity in meeting the public safety needs of the community. The transportation of nuclear waste and the potential of an accident as characterized in the transportation scenarios will result in major costs to the tribe to build its capacity in order to enable the tribe to respond in a limited way (fire suppression, emergency medical and evacuation) to a Scenario 2 or 3 accident. A Scenario 3 event, at the Moapa exist and I-15 may place Moapa residents in clear danger of contamination and may result in the closure of the key access routes. The costs to train, equip, and prepare the Moapa Tribe to respond to potential transportation incidents is the objective of

the next section of the report which estimates and projects these costs based on needs identified by the tribe.

6.1.2 Fiscal Costs for Public Safety

The Moapa Tribe identified the following facilities, equipment and training in order to be prepared for the transportation of nuclear waste across tribal lands and respond to a mishap on Scenarios 2 and 3. It is clear that even with new and expanded capacity, an emergency involving the release of radioactive materials near or onto the tribe will require emergency management support from outside the tribe. For example, a hazardous materials response unit was not included as an item by the Tribe. It is important that the County consider a Haz Mat/Rad Unit for the larger area and provide MOUs with the tribe for its possible use in an emergency. The costs included in this report are those that will provide first-on-scene responses by trained firefighters and be able to manage emergency response on tribal lands. The cost estimates are based on a shipment campaign beginning in 2007 with a scenario-based accident occurring in 2010. The inflation factors and equipment/training costs are based on the City of Las Vegas Fire and Rescue Department's estimates, but adjustments have been made to reflect the size of the Moapa community and its needs. The Moapa Tribe identified the following needs in the public safety area:

- a. Tribal Emergency Response
 - a. Emergency Fire Response (Suppression)
 - i. Equipment—fire truck and associated supplies
 - ii. Training for fire fighters
 - iii. Supplies—suits, oxygen tanks, generators, radios, (etc.)
 - b. Emergency Medical Response

- i. Rescue Truck-ambulance and assorted supplies
 - ii. Trained paramedics or EMT
- b. Tribal Emergency Response Support
 - a. Fire Station/dispatch center (operational 24 hours/day)
 - b. Tribal Emergency Operations Center building, personnel and support/ supplies

C. Administration/Governmental Costs

- a. Development of Memoranda of Understanding between tribe and other agencies (State, County, DOE and other federal agencies)
- b. Attorney time
- c. Tribal emergency response coordinator, funding, training plus support staff
- d. Administrative cost and personnel for handling planning, RFPs, purchasing etc.
- e. Tribal council time

As stated earlier, the current capacity of the Moapa tribe in the public safety area is seriously deficient to deal with the type of accidents in Scenario 2 and 3. The medical and fire emergency equipment and training related to a potential accident involving nuclear waste is virtually non-existent. Interviews suggested that there is a necessity for the Tribe to be somewhat self-sufficient in the emergency response area given its responsibility as a “nation” and the fact that is relatively isolated. Memoranda of Understanding among various local entities will certainly help in terms of shared resources, coordination and planning, but will not provide assurance to the tribe of its responsibility for its own safety. Capacity-building from the ground up is seen as warranted by the Tribe based on the shipment scenarios. The cost estimates are based on a limited capacity to respond to a Scenario 3 event for year 2007. Table 2 provides a summary of the cost estimates which are also detailed in Appendix C.

TABLE 2 SUMMARY OF VULNERABILITIES		
Agency	Cost	
City of Moapa Fire and Rescue		
Personnel	1,791,292	
Equipment	216,546	
Apparatus	1,200,257	
Facilities	4,735,965	
Training and Planning	81,183	
Update Haz-Mat Emergency Plan	13,401	
Subtotal		8,038,643
Office of Emergency Management		
Personnel		
Planning, Operations, Exercise, and Training	154,000	
Support Staff – 2.5 FTE	49,353	
Capital Project		
New Emergency Operations Center	1,457,892	
Equipment		
Communications, Computers, & Audio/Video	277,500	
Subtotal		1,938,745
Grand Total		9,977,388

Outside of emergency fire and medical trucks, supplies and associated equipment, and personnel training, two major cost items include a fire station/dispatch center and an Emergency Operations Center. Both of these facilities assumed to be smaller in size than similar facilities in the City of Las Vegas and these facilities will not require land acquisition costs. As Table 3 shows, the costs for a fire station, equipment, fire and rescue trucks, and training will amount to an estimated \$8,038,643 by year 2007. Costs for a new Emergency Operations Center and related equipment, training and personnel are estimated at \$1.9 million. The establishment of fire and rescue capacity and infrastructure in addition to an emergency management capability will cost the Moapa Tribe an estimated \$9,977,388 by 2007.

First year administrative costs will include: attorney fees for developing MOUs, insurance, additional staff time for purchasing activity, mechanical support for the public safety

equipment; and additional tribal council time. Such cost are estimated to be around \$250,000 to \$400,000.

An Emergency Operations Center is proposed to be established including a coordinator and operations staff. This office will be responsible for the coordination of emergency response planning, establishing links with other jurisdictions, developing and updating plans for contingencies, and managing exercises. The EOC's major role is planning and preparing for an incident related to HLW transportation and coordinating emergency management functions in case of an emergency event.

Appendix C shows the costs of building public safety capacity beginning in the year 2007 when shipments of nuclear waste are likely to occur. The assumptions used in the fiscal analysis are based on the needs identified by tribal personnel and data from the City of Las Vegas Fire and Rescue. The assumptions include personnel costs for 20 firefighters at a cost of \$1.8 million in year 2007. Equipment needed for 20 firefighters to respond to an accident event is estimated to be \$216,545 excluding emergency trucks. One fire truck, a medium-size rescue unit and equipment (ambulance) would incur costs estimated at \$1.2 million. The establishment of a fire station facility (two-thirds the size similar of Las Vegas facilities) would cost approximately \$4.7 million in 2007 including operating costs. This figure excludes land acquisition costs to the Tribe.

6.2 Vulnerabilities to Business and Economic Development Plans

Under Scenario 1, shipments of nuclear waste commences in 2007, and continues without incident for 24 years. Under this scenario, three areas of vulnerability have been identified. Based on possible stigma-induced effects, revenues are likely to be reduced due to declines in tourist and truck traffic along I-15 that utilizes or will utilize the Moapa Tribal Enterprise gaming

center and store. Currently, an estimated \$2.3 million annually is generated through this enterprise and it is an important source of revenue for other economic development activity by the Tribe. The amount of such potential loss through stigma effects is uncertain at this time, but it may thwart existing plans for expanding the enterprise into a regional truck stop and other tribal developments along I-15.

Scenario 2 will have both short-term and long-term impacts on the tribe's plans for development. The loss of access along I-15, will result in revenue losses for the gaming center. Depending on stigma-induced behavior, that may result in declining tourist travel along I-15, long-term revenue impacts may occur in the tribe's store/casino. Road closures may also result in lack of access to places of employment located outside the reservation. However, such personal income losses should be short-lived.

The occurrence of an event depicted in Scenario 3 may be devastating to the tribe. To reiterate, in the third year of the shipping campaign, a truck carrying a cask of nuclear waste is involved in a major accident at the Moapa exit and Interstate 15. Radioactive materials are dispersed over a wide area. Although the affected highway is closed for seven days, cleanup is still under way six months later and completed in one year. Commercial property values decline by over 30% within one mile of the route.

The impacts resulting from such an accident can be devastating to the economic base of the Moapa Tribe and could be a major health catastrophe depending on the location of the radioactive plume. Given the location of the accident in the scenario, it is likely that the casino/store enterprise would close for at least one year with a loss of an estimated \$2.3 million. Based on the public's perception of risk and stigma-induced effects that may result, tourist traffic along I-15 may decline resulting in long-term revenue losses for the Tribe.

The loss in tribe's revenue stream from the gaming center will certainly impede development plans along I-15 and on the reservation, furthering revenue losses from proposed future development. Revenues to the tribe from the casino center and store is important for tribal investments and sustainable agricultural development on the reservation. A decline or loss of the most important source of revenue for the tribe will be a significant impact.

As described earlier, the Tribe is making progress in a number of agricultural projects including cattle grazing, alfalfa production, and green house products. Depending on the location of the radioactive plume, it is possible that all agricultural activity may be terminated. This would be a severe blow to the potential for farming on tribal lands and may result in a long-lasting loss in income. Stigma-like effects could potentially also result in serious losses to the tribe's agricultural base due to buyer reluctance to purchase its products.

Personal income losses resulting from road closures would impact a large segment of the tribal population that works outside the reservation. Based on the scenarios, such closures would be short-lived. Long-term losses in personal income could occur if sources of employment outside the reservation were to be exposed to radioactive materials.

The amount of revenue losses in this analysis are uncertain for a variety of reasons—length and location of contamination, public perceptions of risk, and other market factors. It is however likely that serious economic losses and declines in personal income will occur under conditions characterized in Scenario 3.

6.3 Cultural, Social and Spiritual Impacts

Shipments of nuclear waste through or near the Moapa Tribe will have negative impacts on the Tribe's cultural and spiritual traditions as well as social life and well-being. Although many of these issues are fully developed elsewhere (see Fowler's studies completed for the

Nuclear Waste Program Office, State of Nevada), the Moapa Tribe has expressed specific concerns in this area. These concerns are as follows:

- a. Based on the return of 70,000 acres of land in 1981, the Tribe has re-established tribal farms and agriculture. This is important economically, but also culturally, because it represents renewed economic independence, restoration of traditional land, farming, and a possible return of offspring. The re-establishment of social networks and restoring traditional lands are fundamental to the tribe's social well-being. It is the threat of the potential harm to the tribe's basic social and economic structure that is associated with nuclear waste transportation.
- b. The Tribe has experienced historical vulnerabilities ranging from the loss of land, health problems that are prevalent and associated with environmental pollution and high unemployment rates. The transportation of nuclear waste through tribal lands is viewed as a serious issue at a time when the tribe has made significant economic and social progress.
- c. Disruptions due to shipment accidents would adversely impact interactions with other Paiute tribes and extended families; prevent access to schools outside the reservation; and reduce personal income. The accidents envisioned in Scenarios 2 and 3 would restrict mobility and result in adverse impacts to social well-being.
- d. There is strong spiritual link between the tribe and the land. One notion is that the Paiutes are obligated and responsible to help protect the land or "The earth may lose its power and not help tribal peoples in this life or after this life". The shipment of nuclear waste through tribal lands is viewed as an antithesis of this spiritual belief.

"Our belief in where we go after death may be no longer" [because of lack of stewardships of the land]

e. The tribe is small and linked to a particular place. Because of their small number, there is concern that an accident affecting the Moapa community as a place may result in permanent displacement and loss of their very existence as a tribe. Social impacts from an accident involving the release of radioactive materials may also result from: restricting areas for gathering traditional medicines; restrictions on gathering traditional foods; loss of personal visitations; and closure of access/routes to schools, hospitals and jobs. (One alternative route from the reservation extends 70 miles).

7.0 SUMMARY OF VULNERABILITIES

Table 3 identifies the key areas of vulnerability for the Moapa Tribe.

TABLE 3		
SUMMARY OF VULNERABILITIES OF THE MOAPA TRIBE: SCENARIO 3		
Area	Cost	Vulnerability
Fire and Emergency Medical		There is virtually no current capacity. Costs are for capacity-building for preparedness and response capabilities. MOUs with other entities are critical but a certain level of autonomy is required from the tribal perspective.
1. Personnel	\$ 1,791,292	
2. Equipment	\$ 216,546	
3. Apparatus	\$ 1,200,257	
4. Facilities	\$ 4,735,965	
5. Training	\$ 81,183	
Subtotal	\$ 8,038,643	
Emergency Operations Center and Operations	\$ 1,938,745	
Economic Losses		Loss of \$2.3 million in revenues (current dollars) per year as result of potential closure of gaming center-store on I-15.
		Loss of investment revenues for planned future growth
		Loss of agricultural revenues either because of contamination or long-term stigma effects related to food products
		Losses in personal income from above impacts (Long-Term) and from lack of access to jobs outside of reservation (Short-

TABLE 3		
SUMMARY OF VULNERABILITIES OF THE MOAPA TRIBE: SCENARIO 3		
Area	Cost	Vulnerability
		Term)
Transportation		One major access road to I-15 and other communities. The alternative is a 70-mile unpaved country road. This road will need to be upgraded and paved as an alternative evacuation route for the tribe. A bus will be required to evacuate tribal seniors and those in poor health.
Economic Development		Loss of expansion of gaming center-store into a regional truck stop
		Loss of expansion of agriculture on the reservation
		Loss of future land and economic development along I-15
Social Well-Being		Disruption of inter-tribal relationships
		Disruption of personal income flows to families
		Mental anguish over loss of land-tribal relationships (spiritual values)

8.0 CONCLUSIONS

The analysis of the Moapa Band of Southern Paiutes' vulnerabilities and fiscal impacts from the shipping of HLW through and near its lands has demonstrated that the Moapa Tribe is a community whose existing socioeconomic fabric and future growth, may be significantly impacted by the shipping of HLW especially in cases of accidents. Because there is minimal public safety capacity in the tribe today, basic capacity-building to prepare for a possible accident will require major investments in equipment, facilities, planning and training. The fiscal impacts to the tribe's government in the public safety area should shipping of HLW commence will be major given current levels.

The dependence on revenues to the tribe from the gaming center-store located on I-15 and located close to the postulated accident site leaves the tribe in an extremely vulnerable

position in terms of economic well-being since that enterprise generates 90 percent of the tribe's revenues. Unfortunately, economic plans for the tribe also calls for the expansion of this enterprise into a regional truck stop and additional developments along I-15. The shipment of nuclear waste along I-15 may seriously thwart the potential of these plans. Any development along the shipment route may lose property value but also revenues from peoples' reluctance to travel and stop at those locations. An incident along I-15 near the Moapa exit will likely cause adverse impacts to the tribe's agricultural production and sales, an area identified as a priority for future economic growth. Shipping nuclear waste through tribal lands will also have adverse impacts to the tribe's cultural, spiritual and social values which can not be mitigated.

APPENDIX A

Methodological Notes

A.1 HISTORY OF GOVERNMENTAL FISCAL IMPACT METHODS

Governmental fiscal impact analysis has a long history in both the planning, and the intergovernmental finance fields. Early fiscal impact studies emerged from the need of local communities to estimate impacts on their local revenues and their ability to deliver city services. These needed fiscal and service estimates were the result of the constantly increasing public costs associated with land development. In addition, these studies recognized the increasing costs resulting from public service demands of various forms of residential and nonresidential growth.

Fiscal impact analysis is used by municipalities in forecasting the public costs resulting from increased demands caused by growth. In a similar vein, such impact analysis can, and is, applied to estimating the public costs from a particular or group of private projects of significant size as cities attempt to determine fiscal impacts so that they may levy concomitant impact fees. For example, fiscal impact assessment has been done on forecasting the public costs and revenues of various growth management policies or large central city developments.

Fiscal impact analysis may also be found in the intergovernmental fiscal literature focusing on mandates and their costs. Mandates are often defined very simply as any legislative or executive order that conditions or regulates the behavior of another level of government. Mandates entail the imposition of authority by one level of government on another and often take the form of rules and regulations. Most frequently, mandates originate at the state level of government and are imposed on local governments. One study showed that between 1990-1993, the average state passed 37 mandates on to its local governments per legislative session. In another study that examined just seven bills introduced in Congress in 1991, it was estimated that the cost of this legislation to the states was estimated at over \$1.6 billion. The research literature increasingly has demonstrated the expanding costs of mandates by the federal government on the

states' governments, and similarly increasing costs on local governments resulting from state mandates.

These costs have resulted in efforts by the federal government, but mostly by the states, including Nevada, to estimate, and in some cases at the state level to reimburse, the costs of mandates on impacted governments. The growth of estimating the effects of mandates, known as fiscal noting, is most impressive. Mushkatel and Pijawka noted the following in summarizing this growth: in 1978 only four states had reimbursement programs for local governments to cover the costs of state mandated programs; in 1985, 15 states had adopted such programs with another 41 states attaching fiscal notes to legislation estimating impacts. These two authors have demonstrated that both the Nuclear Waste Policy Act (NWPA) and the Nuclear Waste Policy Act Amendments of 1987 (NWPAA) contain several mandates for Nevada and her municipalities that involve fiscal costs that can and should be reimbursed.

Nevada first required fiscal noting in its 1993 legislation (NRS 218.272 – 218.276). The state does not require reimbursement of county and local governments affected by legislation. The Legislative Counsel Bureau, Fiscal Analysis Division is responsible for preparing fiscal notes under a variety of conditions set out in the legislation that need not concern us here. The Fiscal Analysis Division details the effects of certain bills, resolutions, and ballot questions. The degree of complexity and the methods used varies from state to state in projecting costs. What is consistent for the planning based fiscal impact projections and these mandated fiscal notes is that they entail cost projections for government.

A.2 METHODOLOGICAL APPROACHES TO GOVERNMENTAL FISCAL IMPACT ANALYSIS

The potential fiscal costs to government in the form of expenditures include increased operating expenditures (salaries, training, services, statutory and material costs) and capital outlays. Some types of fiscal impact analysis focus primarily on population and or employment multipliers and the resulting fiscal costs to government associated with these changes. These studies tend to be formula driven or multiplier types of studies as applied to public services to determine the increased costs based on a per unit expenditure. This ‘average’ costing per unit technique is the first type of approach to fiscal impact analysis and is often used in large siting impact studies.

Average costing approaches often do not consider existing excess or deficient capacity that might exist for particular services. That is, the possibility that a new mandate or requirement might fall at the threshold level, requiring new capital construction, equipment or personnel to meet the demands of the new requirements, or in this case the new repository project and the associated costs due to expanded transportation demands. Hence, because the existence of current capacity can heavily affect the potential costs that a new project has on government (e.g. existing capacity is deficient and the requirements of the new project, plant, policy lead to government failure to provide adequate services) the average costing approaches may not be appropriate for estimating fiscal impacts.

The second approach, and the one utilized in this study, is a marginal cost approach. This approach takes into account existing supply and demand relationships by determining existing excess or deficient capacity, projecting the new demand and determining what additional (if any) capacity at what cost is necessary. In instances where communities or government have excess

capacity, the fiscal impact projections using a marginal cost approach will lag behind average costing techniques or be roughly similar. When there are deficiencies in capacity, or where government is providing services at its full capacity, average costing approaches will not provide an accurate estimate because they may not account for the costs of new plants, personnel, equipment, training (etc.).

Within these two general approaches, average and marginal costing, there are three variants of each. For our purposes, it is important to note that the three marginal costing approaches consist of the 1) case study, 2) comparable city, and 3) employment anticipation techniques. One selects the method depending in large part on the nature of the problem faced. The marginal cost approaches are most appropriate when confronting unique projects or developments. Unfortunately, there are neither any comparably sized or situated cities that can be used for easy comparisons concerning expenditures (etc.), nor is there reason to anticipate that there will be sufficient numbers of employees from the siting to warrant the use of the third approach. Instead, the case study marginal cost approach is adopted here. This case study approach is particularly well suited for rapidly growing areas where over-used service capacities are likely to exist, and where the average of yesterday's costs per capita multiplied by the population to be added is not a good indicator of future costs. Rather, this approach is ideally suited when it is necessary to be sensitive to existing excess, deficient or strained service capacity, and is invaluable for examining fiscal impacts from non-residential or public facility projects.

A.3 THE CASE STUDY METHOD FOR PROJECTING GOVERNMENTAL FISCAL COSTS

The case study method “employs intensive site-specific investigations to determine categories of excess or slack in public service delivery capacity.” Excess capacity exists when there is capacity beyond that needed to accommodate existing service need or demand, and deficient capacity exists when the current capacity is below what is needed or near the limits of what can be provided. These deficient or excess service capacities are subtracted from or added to the projected estimates of operating and capital demands. Hence, excess existing capacity can actually mitigate the effects of a project on a community, as it may already possess the capacity to meet these future or projected service needs and demands. Alternatively, should a community be at peak capacity or deficient capacity already exists, then additional demand may have far greater impact than an average cost technique would project. In fiscal impact analysis used by planners, when a new development results in, for example a new fire station, or rescue station, the new development may be charged for the entire cost. In a similar vein if a new project or mandate results in the necessity of new equipment, training, or various capital outlays, the relevant acts (NWPA, NWPAA) specify that the agent of these new costs be charged for the entire amount of the new capacity.

Several assumptions underlie the use of the case study cost projection method. Briefly, the first assumption is that communities differ in the degree to which they exhibit excess or deficient capacity. The second assumption is that marginal changes in providing various municipal and county services are a reaction to service excesses or deficiencies. A third assumption is that local standards (not national ones) in large part represent the criteria by which local excess and deficient service levels will be measured. Finally and most importantly, local

department heads and personnel are the individuals that are best suited and most knowledgeable about the service capacity of their agencies, and about the future service needs associated with new projects or mandates. It is this case study method that has been used extensively on state agency personnel in Nevada to project the costs of the high-level nuclear waste repository at the state governmental level.

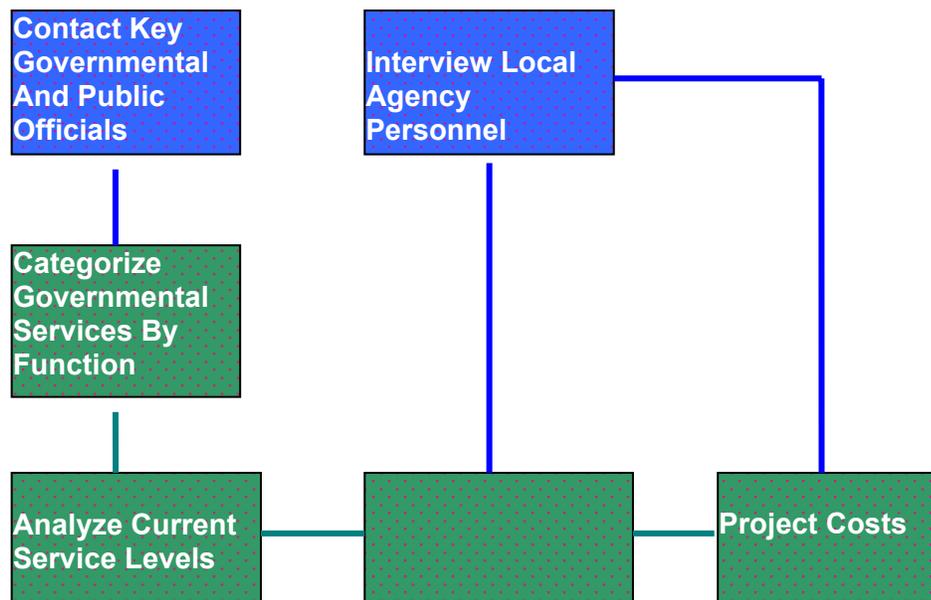
The case study methodology for estimating fiscal impacts was adopted for projecting fiscal costs to the governmental agencies in incorporated cities in Clark County. This methodology entails the following steps:

1. Convene a meeting of city and tribal representatives (and their selected emergency service representative from their city) to the Clark County Nuclear Waste Division's (NWD) Advisory Committee to explain the purpose and methodology of the study and enlist their cooperation.
2. Contact and interview the city representative to the County Nuclear Waste Division's Advisory Committee to identify the likely city agencies that will be impacted.
3. Contact and interview these key governmental and public officials (emergency management, police, fire, budget, planning).
4. Categorize current local governmental services by function and the administrative agencies responsible for each (particular attention to each community's governmental organization is required at this stage);
5. Determine current levels of service provision, as well as existing service excess or deficiency for various public services;
6. Project future service needs and demands using existing mandates and agency responsibilities, as well as through the interviews conducted;
7. Interview local agency personnel to determine how their departments will respond to the scenarios characterizing the nature of the future repository and transportation of waste, and how these scenarios will either result in the necessity of expanded capacities (or not) and the projected response of the agency;

8. Estimate fiscal costs that will be incurred by each affected agency and the affected units of local government as a result of their projected response to the scenarios (needed training, equipment, operational expenditures, and capital outlays over the life cycle of the project).

These steps in the methodology that was employed can be collapsed, and be viewed diagrammatically as the basic approach to projecting fiscal impacts from the proposed repository for city agencies (Figure A-1). Figure A-1 outlines the approach to projecting the fiscal impacts and it can be seen clearly that the process is iterative and non-linear. These steps are not linear as there are several contacts and interviews with agency personnel as the study progresses. Frequently, after an interview with agency personnel it is necessary to again interview that individual for clarification or draw on their expertise to adequately project the impacts of the project. Often interviews with agency staff members results in being referred to another member of an agency's personnel. In addition, in order to increase the comparability of the projections, interview schedules contained a basic set of questions that were developed and used for each informant interviewed.

Figure A-1 – Methodological Approaches



The first meeting (Step 1 above) to explain the purpose of the study and enlist support of the city members of the NWD's Advisory Committee, designated representatives from public safety agencies, and Tribal representatives was held on August 23, 2000 at the Clark County Governmental Complex. Fourteen representatives from the four cities and Tribes involved in the study attended the meeting along with several governmental agency representatives from the State, County, and Regional Transportation Commission. Immediately following the meeting, interview appointments were made with each of the City and Tribal representatives present.

APPENDIX B

Transportation Scenarios

B.1 GENERAL INFORMATION

Over the next 24 years, beginning July 2007, the U.S. Department of Energy plans to ship high-level nuclear waste through Clark County to a repository to be built at Yucca Mountain, Nevada. The U.S.DOE plans to ship:

Number of Highway Shipments Expected - All Truck Scenario

Total number of truck shipments projected over a 24 year shipping period:	49,500
Number of shipments per year:	2,063
Number of shipments per week:	40
Number of shipments per day:	5.7

The shipment routes are as follows: (See attached map for route depictions)

- **I-15 south from the Utah border to U.S. 95 north**
- **I-15 south from the Utah border to the northern Las Vegas Beltway to U.S. 95 north**
- **I-15 north from the California border to U.S. 95 north**
- **I-15 north from the California border to the southern Las Vegas Beltway to U.S. 95 north**

These shipment numbers and routes were used to establish context for interviews with local government and tribal officials. The three scenarios remained the same for the interviews in each community, but different routes and locations of incidents were used within the respective jurisdictions.

B.2 TRANSPORTATION SCENARIO 1

Under Scenario 1, no accident of any kind has occurred by the end of the third year of shipments, and the probability of an accident is remote. However, interested parties have generated considerable adverse publicity. Residential property values have declined an average of almost 4% within one mile of the transportation corridor, while commercial properties have declined an average of 3% and industrial properties have declined an average of just over 1% within one mile of the transportation corridor.

B.3 TRANSPORTATION SCENARIO 2

Shipments of nuclear waste to the Yucca Mountain repository site progress for three years without incident. Three days after New Year's Day 2010, the driver of a truck transporting nuclear waste loses control of the vehicle and the truck overturns at I-15 at Exit 122. The cask containing the nuclear waste breaks away from the trailer and skids 50 yards. *The cask remains intact and no radiation is released*, but the local and national media cover the event heavily. Emergency management personnel respond effectively to the incident and redirect traffic until it is determined that no radiation was released. Within one day traffic resumed on I-15.

B.4 TRANSPORTATION SCENARIO 3

In the third year of the shipping campaign, a truck carrying one cask of nuclear waste from a reactor destined for the Yucca Mountain high-level radioactive waste repository is involved in a major accident on I-15 at Exit 122. The spent fuel truck overturns at 60 mph. Seconds later, a fully loaded gasoline tanker crashes into the wreckage and bursts into flames. The fire burns for more than two hours.

Winds carry the fire plume towards populated areas, dispersing radioactive materials over a wide area. Five persons receive doses of radiation at levels that result in cancer fatalities.

The affected highway is closed for seven days. The two drivers of the spent fuel hauler and the gasoline tanker, and one driver-escort, die from head injuries and burns. Six months later, the cleanup effort is still under way and is completed within one year. The accident receives repeated worldwide news coverage.

Residential property values decline an average of 34% within one mile and an average of 24% between one and three miles of the transportation corridor; commercial property values decline an average of 32% within one mile and an average of 20% between one and three miles

of the transportation corridor. Finally, industrial property values decline an average of 25% within one mile and an average of 17% between one and three miles of the transportation corridor.

APPENDIX C

Moapa Band of Paiutes Projected Cost Estimates

APPENDIX C
Emergency Operations Center
Projected Costs

Item Description	Structure	Site	Extended Cumulative Cost
Site Acquisition Cost		\$0	
5,000 SF Building @ \$153.00/SF	\$765,000		
On Site Improvements		\$183,333	
Off Site Improvements		\$50,000	
Subtotal	\$765,000	\$233,333	\$998,333
General Conditions, Bonds, Ins, Overhead & Profit at 15%	\$114,750	\$35,000	
Subtotal	\$879,750	\$268,333	
Escalation to Construction Mid. 10 mths. @ 2.5%	\$21,994	\$6,708	
Construction Contingency @ 10%	\$87,975	\$26,833	
Bid Document Contingency @ 5%	\$43,988	\$13,417	
Subtotal	\$153,956	\$46,958	
Estimated Bid	\$1,033,706	\$315,292	\$1,348,998
City Architectural Services	\$0	\$0	
ACEP Survey Services	\$0	\$20,000	
ACEP Aerial Mapping Services	\$0	\$0	
ACEP Soils Report	\$0	\$4,500	
ACEP Civil Engineering	\$0	\$31,067	
DEC Structural, Mech, Plumb, Elect Engineering	\$14,067		
Construction Cost Estimate and Schedule Services	\$2,750		
Subtotal	\$16,817	\$55,567	\$1,421,381
Desert Tortoise Fee		\$0	
Water District Application Fee		\$1,500	
Mercury Blueprint	\$15.44		
Printing of Bid Documents	\$1,328		
Construction Materials Testing Services	\$8,333		
Special Inspection Fees	\$9,333		
Utility Connection Fees		\$16,000	
Subtotal	\$19,010	\$17,500	\$1,457,892
Communications, Computer & Audio/Video Equipment	\$250,000		
Equipment Contingency @ 10%	\$27,500		
Subtotal	\$277,500		\$1,735,392
Total Cumulative Project Cost			\$1,735,392
TRAINING AND STAFF COSTS			
800 Hours Staff Training for EOC Operations & Recovery Procedures			
40 hour course for 1 Moapa Chief Executive @ \$100/hr.			\$4,000.00
300 Hours Staff Time to Revise Emergency Operations Plan			
1 FTE @ \$50/hr			\$150,000.00
Hire 2.5 FTE - Administrative Assistant/Clerical Staff			
1 Emergency Management Assistant @ \$49,353/yr			\$49,353.00
Total Cumulative Training and Staff Cost Projections			\$203,353.00

*Note: Cost projections are calculated using 2001 financial data and market values.

APPENDIX C. Fire Department Projected Budget

PERSONNEL		Cost Ea.	1st Year Cost		Inflation% (annually)	Projected 2007 \$\$\$
<i>20 Firefighters as follows:</i>						
	1 Captain	84,867.69	84,867.69			
	17 Firefighters	68,608.54	1,166,345.18			
	2 Paramedics	78,363.37	156,726.74			
			1,407,939.61	Personnel Total	3.5%	1,791,292.37
<u>EQUIPMENT</u>						
	Radiological Survey Meters Victoreen 450B's: 20@	1,925.00	38,500.00			
	Annual Calibrations 20@	170.00	3,400.00			
	Personal Victoreen Dosimeters 20@	495.00	9,900.00			
	Annual Calibrations 20@	80.00	1,600.00			
	Revealer Dosimeter Reader Kit	2,995.00	2,995.00			
	20 air packs	3,000.00	60,000.00			
	5 one hour light weight bottles	1,000.00	5,000.00			
	1 portable decontamination tents for hospitals	32,500.00	32,500.00			
			153,895.00	Equipment Total	5%	216,545.72
<u>APPARATUS</u>						
	1 Truck Companies	600,000.00	600,000.00			
	Equipment - stock the truck companies	18,000.00	18,000.00			
	1 Medium Duty Rescue Units	171,000.00	171,000.00			
	Equipment - stock the rescue units	64,000.00	64,000.00			
			853,000.00	Apparatus Total	5%	1,200,256.66
<u>FACILITIES</u>						
	Fire Station	3,102,000.00	3,102,000.00			
	Operating Cost		432,050.00			
			3,534,050.00	Facilities	5%	4,735,965.00

APPENDIX C. Fire Department Projected Budget

					Total		
TRAINING & PLANNING							
<i>Costs associated with the Recruit Academy for 20 new personnel:</i>							
Books			161.80	3,236.00			
Turnouts			1,200.00	24,000.00			
General class costs, supplies, reproductions, etc.			168.95	3,379.00			
Drill field costs			1,354.00	27,080.00			
Includes Benefits @ 1.5 Overtime				57,695.00	Recruit	5%	81,182.66
					Total		
Update Haz-Mat Emergency Plan as an annex.				10,000.00			
				10,000.00	Update Plan	5%	13,400.96
					Total		
				\$ 6,016,579.61	Grand Total		\$ 8,038,643.37