

## **IMPACT ASSESSMENT AND MONITORING STRATEGIES FOR LOCAL GOVERNMENTS**

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### **ABSTRACT**

This paper summarizes the results of the socio-economic impact assessment studies conducted by Clark County, Nevada. The results that were incorporated into "Clark County's Impact Assessment Report" were submitted to the United States Secretary of Energy in 2002. It should be noted that this paper does not address the technical, environmental, and transportation findings that were also incorporated into the Impact Assessment Report. The paper begins with a brief summary of the bases for Clark County's activities. This is followed by an overview of the methodology and findings from the studies that have been conducted in the areas of:

- economic impacts;
- property value impacts;
- public safety impacts;
- other non-public safety governmental impacts; and
- monitoring strategies

### **INTRODUCTION**

Since 1983, Clark County has been recognized as an active participant in monitoring the United States Department of Energy's DOE Yucca Mountain nuclear waste program efforts. In 1987, DOE officially designated Clark County as an "Affected Unit of Local Government (AULG)" under provisions of the NWPAA, when the search for a geologic repository study site was reduced to only one alternative: Yucca Mountain. The Nuclear Waste Policy Act (NWPA) was designed to establish a location for a geologic high-level nuclear waste repository. In 1987, Clark County was designated by the United States Congress and the DOE as an "affected unit of local government" (AULG) under the Nuclear Waste Policy Act, as amended (NWPAA).

The AULG designation was an acknowledgement by the federal government that activities associated with the Yucca Mountain Project could result in considerable impacts to our residents and community. In fact, the provisions under the Act enable Clark County to determine "any potential economic, social, public health and safety, and environmental impacts of a repository," 42 U.S.C. Section 10135(c)(1)(B)(i). Under the provisions of the NWPAA, AULG's are authorized to conduct a broad range of activities in conjunction with DOE's site characterization activities at Yucca Mountain. These

activities include reviewing and commenting on various DOE documents; independent socio-economic, environmental and technical impact analysis; and, public outreach and information dissemination.

In addition to the NWPAA, applicable case law supports Clark County's efforts to fully identify potential impacts. In *County of Esmeralda v. Department of Energy*, 925 F.2d 1216 (9<sup>th</sup> Cir. 1991), the court stated: "Affected unit status is also meant to ensure that all potential harms from repository operation – whatever the current estimate of their probability—are sufficiently studied before Yucca Mountain is approved as a repository."

Further, under the National Environmental Policy Act (NEPA), the DOE is required to follow specific processes for identifying and assessing environmental impacts that may result from the operation of a nuclear waste repository at Yucca Mountain.

## **ECONOMIC IMPACTS**

Clark County, with a land area of over 8,060 square miles, is the fastest growing county in the United States. At the time of the decision to narrow the DOE's search for a suitable site to store high-level radioactive nuclear waste (HLNW), Clark County's population was half what it is today, over 1.6 million. Over the next twenty years, the area's population is expected to reach 2.8 million. With more than 36 million visitors annually, the primary engine that drives economic growth is the gaming and tourism industries. Also key to Clark County's economic growth are service and construction-oriented businesses.

In a region where the concept of "perception is reality" is particularly marked, the stigma and perception of any danger associated with high-level radioactive nuclear waste presents a very real and significant threat to Clark County residents, businesses, and visitors. As such, Clark County has taken a lead role within the State of Nevada to assess and monitor potential impacts.

For example, Clark County identified potential effects on the tourism industry of the DOE's proposal to ship high-level waste through Clark County to a repository at Yucca Mountain as a key area for study. In order to identify both the nature and the range of concerns of key tourism leaders, focused, confidential interviews were conducted with 14 gaming executives and a representative of one of their trade associations. The gaming executives represented 10 casinos that generate 95.5% of the Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) within Clark County's gaming industry.

Overall, most of the executives believe that despite short-term cyclical responses to national and worldwide economic conditions, the overall trend for the gaming industry in the absence of high-level radioactive nuclear waste shipments is positive. Further, all of the gaming executives interviewed expressed concern that an accident, even a minor one along a route anywhere in Clark County, could have a devastating impact on their business. While some representatives were unsure of the scientific viability of the Yucca Mountain repository, all indicated that under no circumstance should trucks carrying high-level radioactive nuclear waste come through Clark County. Several noted that just the transportation of high-level radioactive nuclear waste coming from California through Clark County en route to Yucca Mountain, could significantly affect their business in an adverse manner. These industry representatives noted that congestion, particularly on weekends along the California/Nevada transportation corridor, has already proved problematic. They believe the addition of slow moving trucks containing such dangerous wastes will increase the likelihood and severity of an accident, discouraging some Californians from driving to Las Vegas. These representatives stated that Californians make up 30% of the visitors to Clark County. The increase in congestion along the California/Nevada corridor, combined with rising energy costs, is seen as a significant risk to gaming in Southern Nevada, especially for the Las Vegas downtown casinos.

According to the gaming industry executives, the most serious risk is from the stigma that will result if there is a HLNW transportation accident of any kind involving the shipment of high-level radioactive nuclear waste. These representatives referenced the media coverage that is likely to accompany any incident involving a vehicle transporting HLNW. Several stated that an accident anywhere in Clark County would be reported worldwide and would be linked to Las Vegas because it is the nearest media outlet.

In order to understand how the Yucca Mountain Project might influence visitation rates, a survey of 1,013 visitors was conducted in early December 2001. Among those surveyed, 25% indicated that just the shipment of high-level radioactive nuclear waste through Clark County would affect their decision to visit Las Vegas in the future, even if there were no incidents of any type. Among the 25% who indicated that the shipments of high-level radioactive nuclear waste would affect their decision to visit, 77% stated that they would reduce their visits and 12% stated that they would never visit Las Vegas again.

In the event of a HLNW transportation accident, even a minor accident, 37% of the visitors surveyed indicated that it would affect their decision to visit Las Vegas. Among these visitors, 49% stated that they would never visit Las Vegas again and 47% said that the frequency of their visits would decrease. If a serious accident resulting in a release of radiation were to occur, those surveyed indicated that the results would be devastating. Almost 80% noted that it would affect their decision and of those who stated that it would affect their decision, 62% stated that they would never visit Las Vegas again and 35% indicated that they would reduce the frequency of their visits.

### **Property Value Impacts**

A scenario-based survey methodology of experts, i.e., Clark County lenders and appraisers, was used to measure the nature and extent of any potential property value change that might occur as a result of the HLNW shipment campaign. The scenarios used in the property value study, are also used as part of the analysis of impacts on both public safety agencies and other governmental agencies within Clark County. These scenarios are described below. In addition, public opinion surveys were conducted to corroborate the findings of the technical experts.

### **Expert Opinion**

The results of focused interviews with Clark County lenders and appraisers were applied to the assessed valuation data for three groups of land uses within Clark County. UER conducted a survey of 18 Clark County lenders and 35 certified appraisers in May 2000.

Under the first scenario, the appraisers and lenders were asked to evaluate whether there would be any changes in property values along the corridor if “no event” occurred, but there was adverse publicity, particularly, at the onset of the shipment campaign. This scenario was assigned to three discreet residential, commercial, and industrial properties that were characterized in terms of size, location, lease fees, and other factors. The lenders and appraisers were also asked to differentiate the level of impact, if any, that might be experienced at two varying distances along the corridor (within 1 mile of the shipment route and within 1 to 3 miles of shipment routes). A second scenario describes a HLNW shipment accident where no release of radiation occurs. The third scenario describes a serious HLNW shipment accident that is accompanied by a release of radiation.

Table I summarizes the results of the property value loss under each of the scenarios as estimated by the Clark County bankers and lenders. According to the lenders and appraisers, residential properties would lose the most value in percentage terms under each of the scenarios. For example, under Scenario 1, when the rates of property value diminution are applied to residential fair market value data at a distance

of up to three miles from the Beltway route, the diminution ranges from \$203.2 million to \$462.5 million. From the I-15 route, the diminution ranges from \$243.6 million to \$549.6 million (Table I). These figures suggest that among those most experienced with estimating Clark County property values, there is a perception that significant adverse impacts will occur along either of the Clark County routes proposed, for all property types examined, even under the most benign scenario.

The findings also indicate that increasing the severity of events within the scenarios, as illustrated in Scenario 2 and 3, results in significantly larger rates of impact. Under Scenario 3, the most serious accident event evaluated, residential property diminution rises to \$5.3 billion - \$6.2 billion within 3 miles of the Beltway route and \$6.2 billion - \$7.3 billion within 3 miles of the I-15 route.

While the many uncertainties surrounding the DOE's proposed HLNW shipment campaign make it impossible to estimate the nature and extent of any property value reductions, there is no doubt that it poses a significant threat to property values in Clark County.

### **Public Opinion**

A random survey of 512 Clark County residents was conducted by the Canon Center at University of Nevada Las Vegas (UNLV) in August 2000. The purpose of the survey was to identify the attitudes, opinions, and perceptions of Clark County, Nevada residents regarding property values in Clark County, and to characterize their beliefs about the potential impacts of the proposed shipments on property values along the transportation corridor.

The survey found that over one-half of the residents of Clark County consider the risk of an accident from the transportation of radioactive wastes to be serious or very serious. Approximately 80% of the respondents indicated that they were familiar with the proposed Yucca Mountain Project, while 75% said that they knew about the DOE's plans to ship high-level radioactive nuclear waste through Clark County.

Altogether almost 82% of the respondents stated that a nearby high-level radioactive nuclear waste route would either "decrease a lot" or "decrease somewhat" their likelihood of purchasing a residential property. Seventy-eight percent of the respondents utilized negative terms to describe the effects of the proposed high-level radioactive nuclear waste shipment campaign through Clark County.

Forty percent of the respondents indicated that commercial property would decrease with another 5.8% indicating generally "negative effects" on properties. Interestingly, 6.2% responding to this open-ended question suggested adverse effects on business operations located near these routes. In contrast to the general question on property values, 33.9% of responses to the question on commercial properties indicated that there would be "no effect" on these values. Almost three-fourths of the respondents declared that they would not consider purchasing property along the transportation routes under any conditions.

Eighty-two percent of the respondents believe such a property would sell for less, than an identical property that is not near such a route; 15% think it would not make a difference; and only the remaining 3% believe it would sell for more.

Of the 369 Clark County respondents who expect lower selling prices for homes near shipment routes, the mean expected drop in selling price in Clark County is estimated at approximately 25% compared to identical homes not near a highway that transports high-level radioactive nuclear waste.

## **Economic Losses Based Upon Property Values and Population Estimates**

UNLV's Center for Business and Economic Research (CBER) was requested to utilize the results from the lenders and appraisers survey as input into the Regional Economic Model, Inc. (REMI) and to compare these outputs to the normal REMI outputs. CBER estimated minimum and maximum impacts on employment, income, expenditures, and population. The REMI model utilizes 1992 dollars. Therefore, all dollars reflected in this section are in 1992 constant dollars. This resulted in estimates that are extremely conservative.

### **Minimum Impacts (Based Upon Scenario 1)**

The impacts identified as minimum impacts within Scenario 1 (trucks utilizing the Clark County transportation system without incident) are as follows. Employment would be reduced by 5,393 jobs. Gross Regional Product (Spending) would be reduced by \$185 million. This is a one-year figure and will be cumulative over the life of the project to \$5.6 billion. Real Disposable Income would be reduced by \$136 million for one year. Cumulatively, over the life of the project, losses of Real Disposable Income could exceed \$4.7 billion. Population would be reduced by 11,294 people. This is an average population loss over the life of the project. Of interest to note is that over this last decade, the population within Clark County has never declined and in fact has grown, on average, 6.27% per year.

### **Maximum Impacts (Based Upon Scenario 3)**

The impacts identified as maximum impacts within Scenario 3 (a serious accident including the release of radioactive materials involving the Clark County transportation system) are as follows:

- Employment would be reduced by 54,429 jobs. It should be noted that this is equivalent to increasing the current unemployment rate by approximately 6.5% (roughly 10 times the impact under Scenario 1) to more than 13%.
- Gross Regional Product (Spending) would be reduced by \$1.4 billion. This is a one-year figure and will be cumulative over the life of the project to \$68.1 billion. This is equivalent to the expenditures made by over 30 major hotel properties.
- Real Disposable Income would be reduced by \$686 million for one year. Cumulatively, over the life of the project, this figure rises to \$42.1 billion.
- Population would be reduced by 90,718 people, more than 8 times the loss under Scenario 1. This is an average population loss over the life of the project.

These estimates under Scenario 3 reflect an expected magnitude of impact. However, it is difficult to verify the duration and likelihood of this impact based upon the information provided by the DOE to date.

## **PUBLIC SAFETY IMPACTS**

The following fiscal impacts reflect an integrated view of impacts to all public safety agencies in Southern Nevada. Because of the length of time between now and when shipments may actually begin, the ambiguities surrounding the actual shipment routes and the modal mix, the estimated fiscal projections are tentative. The integrated impact study does not attempt to estimate the total costs to public safety agencies within Clark County government and its local jurisdictions from the Department of Energy's shipping of high-level radioactive nuclear waste. Rather, only the incremental or additional

costs to governmental entities that would be directly attributable to the siting of the repository at Yucca Mountain and the subsequent shipping campaign are projected. This fiscal impact study of public safety agencies uses a scenario based case study approach consistent with the survey of bankers and lenders. Public safety personnel were asked to describe how the events would impact their agency. Public safety personnel were then asked to compile a list of resources, training, personnel, equipment, and capital outlays necessary for them to be able to ensure the public health, safety, and welfare and to carry out their agency's mission for each of the three scenarios.

Despite the high degree of professionalism and organization, none of the public safety agencies are currently adequately prepared, trained, or equipped to respond to any of the three high-level radioactive nuclear waste shipping scenarios used in the study. This finding is consistent with the 1995 Public Safety Advisory Committee's report that examined public safety needs in Clark County.

For example, the current County Emergency Operations Center that would be the focal point of the County's response to an incident involving high-level radioactive nuclear waste is only adequate for a very short duration event. Further, Southern Nevada hospitals are not adequately equipped, nor are personnel properly trained to effectively manage a high-level radioactive nuclear waste incident like that contained in Scenario 3. The hospital system is already strained under current needs, and the projected hospital needs for the area are daunting. This system will not be adequate to handle the events described in the scenarios in this study.

The total projected cost to just the public safety agencies examined in this study to be adequately prepared for a Scenario 3 event is \$359,986,630 (Table II). The largest projected costs to these public safety agencies fall under the categories of facilities, equipment, personnel, and training. For police services, the projected fiscal cost is over \$72.5 million for the communities examined in this study. The Fire Departments' projected fiscal costs total over \$275.3 million, and the Offices of Emergency Management fiscal cost projections total over \$12 million. These cost projections are for the agencies to be prepared for a Scenario 3 incident beginning in 2010. The projections do not include costs that will be recurring such as vehicle and equipment replacement costs or the dollar costs of training new employees after 2007. Hence, the fiscal cost projections in the report will tend to underestimate (are conservative) some of the fiscal impacts to the public safety agencies.

Additional Haz/Mat Radiological personnel, training, and equipment are viewed as critical needs among the public safety agencies (Table II). The hospitals lack sufficient decontamination facilities, equipment, and trained personnel.

Current planning activities are progressing, regional public safety organizations are beginning to grapple with the problems posed by high-level radioactive nuclear waste shipments, and a Southern Nevada hospital system approach is developing with the help of the Clark County Health District. There is a critical need for a strong regional effort to ensure that the County, the municipalities, and the Moapa Band of Paiutes are prepared for high-level radioactive nuclear waste shipments. Additional resources for the hospitals and the Health District are not projected in this study, only their training and equipment needs.

## **NON-PUBLIC GOVERNMENTAL IMPACTS**

Impacts to all Clark County non-public safety governmental departments were also analyzed using the same case study approach employed with both the public safety agencies and with the lenders and appraisers. County agency personnel were presented with the three HLNW transportation scenarios, and were asked to describe how each of the events would influence their agency. County personnel then provided a first estimation of the additional resources, training, personnel, equipment, and capital outlays that would be required by their agency to carry out their responsibilities under each of the three scenarios.

The results of the study indicate significant negative impacts on many of Clark County governmental agencies (Table III). The potential vulnerabilities, as well as a first estimation of the likely fiscal impacts to these agencies, are described in the report entitled Non-Public Safety Governmental and Fiscal Impact Report (UER, 2001). These results are preliminary and will need to be refined over time.

The potential fiscal impacts to these non-public safety governmental agencies in order to prepare for the commencement of the high-level radioactive waste shipments to Yucca Mountain (adjusted to the year 2007 as reflected in the DEIS) are likely to reach almost \$40 million. These include almost \$6.3 million in additional personnel costs; almost \$20 million in expenditures for radiation health and safety, approximately \$13 million in equipment and capital expenditures, as well as communication training, changes to various County planning documents, and public outreach.

If a Scenario 2 type of high-level radioactive nuclear waste incident were to occur, many of the agencies indicated that they would experience additional impacts. However, only three of the agencies felt that they could quantify these impacts based on the available information. According to the estimates provided by these three agencies, a Scenario 2 event would result in another \$1 million in expenditures, primarily for overtime and some additional training. As studies are completed, agencies should be better able to more accurately and completely define vulnerabilities.

The potential magnitude of a Scenario 3 high-level radioactive nuclear waste accident was the most severe. The fiscal impacts within just a one-year period were estimated by twelve non-public safety agencies at almost \$122 million. These include an additional \$6 million in personnel costs; over \$645 thousand in additional training costs; and almost \$47 million in equipment and capital costs, a decline in revenues of \$7 million and additional medical expenditures of \$61.5 million. It should be noted that many of these costs would likely last for well over the year that has been estimated in this report.

Table I Property Value Diminutions under Three Scenarios within 3-Mile Distance of Two of the Proposed Routes: Beltway and I-15

Groups	Residential		Commercial		Industrial	
	Low Range	High Range	Low Range	High Range	Low Range	High Range
Scenario 1	\$203,219,474	\$549,526,426	\$5,615,300	\$72,531,494	\$5,919,186	\$25,012,894
Scenario 2	\$646,024,023	\$1,392,987,706	\$12,424,417	\$171,126,151	\$1,5892,269	\$83,790,291
Scenario 3	\$5,269,739,823	\$7,318,862,089	\$171,414,257	\$926,894,417	\$125,658,343	\$507,543,183

Table II 2 Total Projected Costs by Community/County

	Police	Fire	Emergency Management	Cost
Clark County	\$67,686,369	\$195,896,055	\$10,614,385	\$274,196,809
Las Vegas	*	\$44,596,793	\$561,265	\$45,158,058
North Las Vegas	\$711,021	\$22,421,402	\$207,623	\$23,340,046
Henderson	\$952,427	\$285,933	\$148,569	\$1,386,929
Mesquite	\$2,828,960	\$4,151,451	***	\$6,980,411
Boulder City	\$404,880	**	**	\$404,880
Moapa	N/A	\$8,038,644	\$480,853	\$8,519,497
Totals	\$72,583,657	\$275,390,278	\$12,012,695	\$359,986,630

\* Las Vegas Metro provides services to both Clark County and the City of Las Vegas

\*\* Because of the projected distance to the high-level radioactive nuclear waste shipment corridor, Boulder City estimated impacts only for the Police Department.

\*\*\* In Mesquite, Emergency Management is a function of the Fire Department and thus costs are combined under Fire.

Table III Summary Preparedness Costs for Non-Public Safety Agencies

Agency	Personnel*	Equipment And Capital Costs**	Training And Plans*	Fiscal Impacts
Administrative Services			\$184,481	\$184,481
Aviation	\$3,137,924	\$9,849,703	\$1,506,596	\$14,494,223
Comprehensive Planning	\$882,058		\$2,248,560	\$3,130,618
District Attorney	\$139,406			\$139,406
General Services	\$143,896			\$143,896
Health District	\$383,721	\$3,000,000	\$1,048,083	\$4,431,804
Parks and Recreation	\$263,808	\$112,568	\$491,950	\$868,326
Public Communications			\$368,962	\$368,962
Regional Transportation Commission*, **	\$455,658		\$12,500,000	\$12,955,658
School District	\$863,371		\$1,430,763	\$2,294,134
Social Services			\$119,913	\$119,913
TOTALS*, **	\$6,269,842	\$12,962,271	\$19,899,308	\$39,131,421
CUMULATIVE TOTALS 2007 - 2031	\$228,593,827		\$122,669,481	\$351,263,108

\* Personnel, training, information development/distribution, and plan development costs are adjusted using a 3% inflation factor through 2007.

\*\* Equipment, Facilities/Capital costs are adjusted using 5% inflation factor through 2007.

## MONITORING STRATEGIES

Given the unprecedented magnitude and duration of DOE's proposal, as well as the many unanswered questions about the number of shipments and the modal mix, the dollar estimate of impacts described above should be viewed as preliminary. In order to refine these estimates, Clark County Comprehensive Planning Department's Nuclear Waste Division has continued to assess potential impacts. In addition, the County has developed a monitoring program that will capture changes to the social, environmental, and economic well-being of its residents resulting from the Yucca Mountain Project and other significant events within the County. The monitoring program will be used as an "early warning system" that will allow Clark County decision makers to proactively respond to impacts from the Yucca Mountain Project. Because of the nature of the Yucca Mountain Project, it is expected that impacts will be experienced in the future; in fact, impacts already are being experienced by some Clark County agencies at this time. Other agencies likely will not experience any impacts prior to commencement of the HLNW shipment campaign. In order to fully understand the nature and magnitude of impacts, it is critical that efforts to track impacts be implemented at this time. For example, the Fire Department has already spent considerable time in planning, training, and estimating impacts.



The proposed monitoring system is composed of the five components described as follows:

- Monthly Economic, Public Health & Safety Environmental, and Quality of Life Indicator Indices
- Quarterly Indicator Report
- Annual Business, Developer and Community Quality of Life Surveys
- Focused Interviews & Survey of Clark County Agencies

### **Monthly Indicator Indices**

The monitoring program is based on selecting and monitoring performance indicators that provide an early warning that changes are occurring that could affect the social, economic, and environmental well-being of Clark County residents. These indices are modeled after the Southern Nevada Index of Leading Economic Indicators (SNILEI), which is produced by the University of Nevada, Las Vegas. In fact, some of the economic indicators suggested for the monitoring system are part of SNILEI. The key difference between the SNILEI and the proposed monitoring system is that the SNILEI focuses on the overall economic well-being of all of Southern Nevada. The four proposed indices focus on indicators that provide insight into how well Clark County governmental agencies are performing and monitors impacts from factors such as the Yucca Mountain Project that might adversely affect services provided by these agencies. Four indices are proposed: economic, environmental, public health and safety, and community well-being. These indices are composed primarily of outcome measures, which will be maintained on an intranet or Internet site for easy access by Clark County decision makers.

### **Quarterly Indicator Reports**

In addition to the monthly indicator indices, quarterly reports will be prepared that examine the trends within each of the indices in greater depth. These quarterly reports also will allow additional factors to be evaluated, as appropriate. The quarterly reports, like the monthly indicators, will focus on outcome measures that can be used by decision makers to identify changes within Clark County on a near-term basis. The quarterly reports will be maintained on an intranet or Internet site so that they can be easily accessed.

### **Annual Surveys**

To supplement the monthly indicator indices and the quarterly reports, three annual surveys are proposed as part of the monitoring system. These three surveys will be designed to provide richer detail on the perception of various stakeholders on how well Clark County is succeeding in delivering services and to identify the nature and extent of any impacts resulting from the proposed Yucca Mountain Project.

Two of the surveys will focus on gauging impacts to Clark County's economic well-being. One will be a survey of the business community that will be designed to measure, across the full array of business stakeholders, how well Clark County is serving their needs; the factors that are influencing the current business climate; and any impacts that they are experiencing as a result of the Yucca Mountain Project. The second economic survey will focus on the development community. This stakeholder group is particularly important to the future growth within Clark

County. A survey of developers may reveal subtle changes that are an early indicator of potentially adverse impacts from the Yucca Mountain Project. For example, changes in the cost of capital or in absorption rates for new residential communities may indicate stigma-associated impacts are beginning to occur even before these impacts are of the magnitude that they can be observed in monthly assessed valuation data.

The third survey that is proposed will be a county-wide survey of community well-being. This type of survey has proven a successful tool for measuring how Clark County residents perceive their quality of life. This type of survey can be a valuable tool for identifying changes in public perception that may occur as a result of the Yucca Mountain Project. For example, over the last 15 years, a preponderance of surveys of Clark County residents has found broad opposition to the Yucca Mountain Project. If HLNW shipments commence, the public's opposition to the Yucca Mountain Project may result in an increased dissatisfaction with the quality of life within Clark County. If this occurs, it could be an early warning of even more dire future economic consequences. Clark County residents have repeatedly indicated in a variety of polls and surveys that they believe the quality of life within their community is quite satisfactory and Clark County decision makers have worked to maintain and increase the quality of life for its residents and visitors.

#### **Focused Interviews with Clark County Agencies**

Over the last three years, the Clark County Department of Comprehensive Planning's Nuclear Waste Division has been compiling a baseline of governmental agency capacity to absorb impacts from the Yucca Mountain Project. This baseline and first estimation of impacts have been discussed earlier in this paper. Because of the magnitude of the proposed project and the long lead time necessary to adequately prepare, focused interviews with Clark County agencies will continue to be conducted throughout the duration of Clark County's oversight of the proposed Yucca Mountain project.

#### **ASSESSMENT AND MONITORING TOOLS**

The following tools are among those that can be used by local governments to assess and monitor the impacts of a national nuclear waste repository with long-term implications. These tools can be used in any community of any size in order to estimate and track the socioeconomic, infrastructure, and environmental impacts resulting from the location of such a facility near a community, or the transportation of radioactive waste to the facility over a period of time.

Table IV Impact Assessment Toolbox

Description of Impact	Suggested Tools
Property Values (e.g. residential, commercial, industrial land uses)	Survey/interview subject matter experts; research assessed and appraised valuations of a variety of land uses; analysis and reporting by subject matter experts; DOE and State of Nevada transportation scenarios; monitoring system to determine actual impacts over time
Public Safety (fire, police, emergency management)	Survey/interview subject matter experts; research local government budget history and estimates of future needs; analyze response times, incident delay probabilities, accident probabilities, and estimated clean-up costs; analysis and reporting by subject matter experts; DOE and State of Nevada transportation scenarios; monitoring system to determine actual impacts over time
Local Government Operations (non-public safety)	Survey/interview subject matter experts; research local government budget history and estimates of future needs; monitoring system to determine actual impacts over time
Socioeconomics/ Population	Census figures; Analysis of growth trends; employment data; business development data; population models such as REMI; analysis and reporting by subject matter experts; surveys; monitoring system to determine actual impacts over time
Environment (air, water, species)	DOE and State of Nevada transportation scenarios; Air quality data; water quality data; evaluate endangered or threatened species plans or programs; review by subject matter experts
Stigma	Customer surveys of key local industry or businesses; interviews with key industry executives; surveys of local residents; track local and national media reports

## CONCLUSION

Effective assessment and monitoring of potential impacts of the proposed Yucca Mountain repository are critical to understanding and preparing for appropriate actions to protect the health, safety and welfare of Clark County residents and visitors. Clark County has implemented a variety of methodologies and tools for conducting assessments and monitoring the evolving nature of impacts, public and expert perception of the impacts, and requirements of stakeholders affected by the Yucca Mountain project.

## REFERENCES

- 1 Urban Environmental Research, L.L.C, "Clark County Property Value Report on the Effect of DOE's Proposal to Ship High-Level Radioactive Waste to a Repository at Yucca Mountain", (June 2001).
- 2 Urban Environmental Research, L.L.C, "Impacts to Clark County Public Safety Agencies Resulting from the Yucca Mountain Project" (June 2001).
- 3 Urban Environmental Research, L.L.C, "Impacts to Clark County Non-Public Safety Governmental Agencies Resulting from the Yucca Mountain Repository, (June 2001).
- 4 Urban Environmental Research, L.L.C., "Gaming Industry Impacts Resulting from the DOE's Yucca Mountain Proposal (June 2001).